ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Katie Hobbs
Governor

Karen Peters
Cabinet Executive Officer
Executive Deputy Director

Submitted online via EPA's Central Data Exchange, State Plan Electronic Collection System (SPeCS)

October 3, 2023

Martha Guzman, Regional Administrator
U.S. Environmental Protection Agency, Region 9
Mail Code ORA-1
75 Hawthorne Street
San Francisco, CA 94105

RE: Submittal of the Arizona Department of Environmental Quality's SIP revision: 2023 Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 SO_2 NAAQS

Dear Administrator Guzman:

The Arizona Department of Environmental Quality (ADEQ) hereby adopts and submits to the U.S. Environmental Protection Agency (EPA) the enclosed *Arizona State Implementation Plan Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 SO_2 NAAQS*, as a revision to the Arizona State Implementation Plan (SIP). ADEQ makes this submission pursuant to Arizona Revised Statutes (A.R.S.) §§ 49-104, 49-106, 49-404, 49-406, 49-425, and 49-426 and the Code of Federal Regulations (CFR) Title 40, Part 51.

The purpose of this SIP revision is intended to satisfy CAA requirements and show attainment of the 1971 and 2010 SO_2 National Ambient Air Quality Standard for the Hayden SO_2 Planning Area. This SIP is intended to correct the deficiencies identified in EPA's limited approval/limited disapproval (85 FR 70483 (Nov. 5, 2020)) and partial approval/partial disapproval (85 FR 71547 (Nov. 10, 2020)). Additionally, this SIP revision includes a revised good engineering practice (GEP) demonstration study pursuant to 40 CFR § 51.118. This SIP revision consists of copies of the authorizing statutes cited above (Enclosure 1) and the SIP revision described above (Enclosure 2). This letter and the attached enclosures will be delivered to EPA through the SPeCS submittal system pursuant to 40 CFR § 51.103(a).

Contingent upon the Arizona Governor's approval to conduct a rulemaking pursuant to A.R.S. § 49-1039, ADEQ intends to conduct a rulemaking to incorporate the relevant permit conditions including in the SIP revision as Appendix A into a state rule.

ADEQ requests that EPA review and approve this SIP revision into the Arizona SIP. If you have any questions, please contact Kelly MacKenzie, Air Quality Improvement Planning Section, Air Quality Division, at (602) 784-1603 or mackenzie.kelly@azdeq.gov.

Sincerely,

DocuSigned by:
Daniel Czecholinski
4D858E29B49B4E2...

Daniel Czecholinski, CHMM
Director, Air Quality Division

Enclosures (2)

cc: Meredith Kurpius, EPA Region 9
Anita Lee, EPA Region 9
Ashley Graham
Charlotte Withey
Gwen Yoshimura
Idalia Perez

ADEQ
Arizona Department
of Environmental Quality

Enclosure 1
Authorizing Statutes:

Delegation of Authority
A.R.S. § 49-104
A.R.S. § 49-106
A.R.S. § 49-404
A.R.S. § 49-406
A.R.S. § 49-425
A.R.S. § 49-426

Air Quality Division

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ADEQ Arizona Department of Environmental Quality

Memorandum

Date: February 28, 2023
To: Daniel Czecholinski, Air Quality Division Director
From: Karen Peters, Director
Subject: Air Quality Division Delegation of Authority

Under A.R.S. §49-104 (D) (2), I authorize you, Daniel Czecholinski, Division Director, Air Quality Division, Arizona Department of Environmental Quality, to perform any act, including execution of any pertinent documents, which I, as Director of the Arizona Department of Environmental Quality, am authorized or required to do by law with Respect to A.R.S Title 49, Chapters 1 and 3 and any other acts related to air quality including personnel actions.

This authority shall remain in effect until it is revoked or upon your separation from the Arizona Department of Environmental Quality. You may further delegate this authority in the best interest of the agency, however, those delegations must be in writing and you must forward a copy of any further delegations to me.

This delegation is effective as of February 28, 2023, and revokes all earlier delegations. I ratify all acts performed by you as Air Quality Division Director concerning the duties and functions in this delegation memorandum.

DocuSigned by:
Karen Peters
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Karen Peters
Director

3/1/2023
Date

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49-104. Powers and duties of the department and director

A. The department shall:

1. Formulate policies, plans and programs to implement this title to protect the environment.

2. Stimulate and encourage all local, state, regional and federal governmental agencies and all private persons and enterprises that have similar and related objectives and purposes, cooperate with those agencies, persons and enterprises and correlate department plans, programs and operations with those of the agencies, persons and enterprises.

3. Conduct research on its own initiative or at the request of the governor, the legislature or state or local agencies pertaining to any department objectives.

4. Provide information and advice on request of any local, state or federal agencies and private persons and business enterprises on matters within the scope of the department.

5. Consult with and make recommendations to the governor and the legislature on all matters concerning department objectives.

6. Promote and coordinate the management of air resources to ensure their protection, enhancement and balanced utilization consistent with the environmental policy of this state.

7. Promote and coordinate the protection and enhancement of the quality of water resources consistent with the environmental policy of this state.

8. Encourage industrial, commercial, residential and community development that maximizes environmental benefits and minimizes the effects of less desirable environmental conditions.

9. Ensure the preservation and enhancement of natural beauty and man-made scenic qualities

9. Ensure the preservation and enhancement of natural beauty and man-made scenic qualities.

10. Provide for the prevention and abatement of all water and air pollution including that related to particulates, gases, dust, vapors, noise, radiation, odor, nutrients and heated liquids in accordance with article 3 of this chapter and chapters 2 and 3 of this title.

11. Promote and recommend methods for the recovery, recycling and reuse or, if recycling is not possible, the disposal of solid wastes consistent with sound health, scenic and environmental quality policies. The department shall report annually on its revenues and expenditures relating to the solid and hazardous waste programs overseen or administered by the department.

12. Prevent pollution through the regulation of the storage, handling and transportation of solids, liquids and gases that may cause or contribute to pollution.

13. Promote the restoration and reclamation of degraded or despoiled areas and natural resources.

14. Participate in the state civil defense program and develop the necessary organization and facilities to meet wartime or other disasters.

15. Cooperate with the Arizona-Mexico commission in the governor's office and with researchers at universities in this state to collect data and conduct projects in the United States and Mexico on issues that are within the scope of the department's duties and that relate to quality of life, trade and economic development in this state in a manner that will help the Arizona-Mexico commission to assess and enhance the economic competitiveness of this state and of the Arizona-Mexico region.

16. Unless specifically authorized by the legislature, ensure that state laws, rules, standards, permits, variances and orders are adopted and construed to be consistent with and no more stringent than the corresponding federal law that addresses the same subject matter. This paragraph does not adversely affect standards adopted by an Indian tribe under federal law.

17. Provide administrative and staff support for the oil and gas conservation commission.

B. The department, through the director, shall:

1. Contract for the services of outside advisers, consultants and aides reasonably necessary or desirable to enable the department to adequately perform its duties.

2. Contract and incur obligations reasonably necessary or desirable within the general scope of department activities and operations to enable the department to adequately perform its duties.

3. Utilize any medium of communication, publication and exhibition when disseminating information, advertising and publicity in any field of its purposes, objectives or duties.

4. Adopt procedural rules that are necessary to implement the authority granted under this title, but that are not inconsistent

4. Adopt procedural rules that are necessary to implement the authority granted under this title, but that are not inconsistent with other provisions of this title.

5. Contract with other agencies, including laboratories, in furthering any department program.

6. Use monies, facilities or services to provide matching contributions under federal or other programs that further the objectives and programs of the department.

7. Accept gifts, grants, matching monies or direct payments from public or private agencies or private persons and enterprises for department services and publications and to conduct programs that are consistent with the general purposes and objectives of this chapter. Monies received pursuant to this paragraph shall be deposited in the department fund corresponding to the service, publication or program provided.

8. Provide for the examination of any premises if the director has reasonable cause to believe that a violation of any environmental law or rule exists or is being committed on the premises. The director shall give the owner or operator the opportunity for its representative to accompany the director on an examination of those premises. Within forty-five days after the date of the examination, the department shall provide to the owner or operator a copy of any report produced as a result of any examination of the premises.

9. Supervise sanitary engineering facilities and projects in this state, authority for which is vested in the department, and own or lease land on which sanitary engineering facilities are located, and operate the facilities, if the director determines that owning, leasing or operating is necessary for the public health, safety or welfare.

10. Adopt and enforce rules relating to approving design documents for constructing, improving and operating sanitary engineering and other facilities for disposing of solid, liquid or gaseous deleterious matter.

11. Define and prescribe reasonably necessary rules regarding the water supply, sewage disposal and garbage collection and disposal for subdivisions. The rules shall:

(a) Provide for minimum sanitary facilities to be installed in the subdivision and may require that water systems plan for future needs and be of adequate size and capacity to deliver specified minimum quantities of drinking water and to treat all sewage.

(b) Provide that the design documents showing or describing the water supply, sewage disposal and garbage collection facilities be submitted with a fee to the department for review and that no lots in any subdivision be offered for sale before compliance with the standards and rules has been demonstrated by approval of the design documents by the department.

12. Prescribe reasonably necessary measures to prevent pollution of water used in public or semipublic swimming pools and bathing places and to prevent deleterious conditions at those places. The rules shall prescribe minimum standards for the design of and for sanitary conditions at any public or semipublic swimming pool or bathing place and provide for abatement as public nuisances of premises and facilities that do not comply with the minimum standards. The rules shall be developed in cooperation

nuisances of premises and facilities that do not comply with the minimum standards. The rules shall be developed in cooperation with the director of the department of health services and shall be consistent with the rules adopted by the director of the department of health services pursuant to section 36-136, subsection I, paragraph 10.

13. Prescribe reasonable rules regarding sewage collection, treatment, disposal and reclamation systems to prevent the transmission of sewage borne or insect borne diseases. The rules shall:

(a) Prescribe minimum standards for the design of sewage collection systems and treatment, disposal and reclamation systems and for operating the systems.

(b) Provide for inspecting the premises, systems and installations and for abating as a public nuisance any collection system, process, treatment plant, disposal system or reclamation system that does not comply with the minimum standards.

(c) Require that design documents for all sewage collection systems, sewage collection system extensions, treatment plants, processes, devices, equipment, disposal systems, on-site wastewater treatment facilities and reclamation systems be submitted with a fee for review to the department and may require that the design documents anticipate and provide for future sewage treatment needs.

(d) Require that construction, reconstruction, installation or initiation of any sewage collection system, sewage collection system extension, treatment plant, process, device, equipment, disposal system, on-site wastewater treatment facility or reclamation system conform with applicable requirements.

14. Prescribe reasonably necessary rules regarding excreta storage, handling, treatment, transportation and disposal. The rules may:

(a) Prescribe minimum standards for human excreta storage, handling, treatment, transportation and disposal and shall provide for inspection of premises, processes and vehicles and for abating as public nuisances any premises, processes or vehicles that do not comply with the minimum standards.

(b) Provide that vehicles transporting human excreta from privies, septic tanks, cesspools and other treatment processes shall be licensed by the department subject to compliance with the rules. The department may require payment of a fee as a condition of licensure. The department may establish by rule a fee as a condition of licensure, including a maximum fee. As part of the rulemaking process, there must be public notice and comment and a review of the rule by the joint legislative budget committee. The department shall not increase that fee by rule without specific statutory authority for the increase. The fees shall be deposited, pursuant to sections 35-146 and 35-147, in the solid waste fee fund established by section 49-881.

15. Perform the responsibilities of implementing and maintaining a data automation management system to support the reporting requirements of title III of the superfund amendments and reauthorization act of 1986 (P.L. 99-499) and article 2 of this chapter.

16. Approve remediation levels pursuant to article 4 of this chapter.

17. Establish or revise fees by rule pursuant to the authority granted under title 44, chapter 9, article 8 and chapters 4 and 5 of this title for the department to adequately perform its duties. All fees shall be fairly assessed and impose the least burden and cost to the parties subject to the fees. In establishing or revising fees, the department shall base the fees on:

(a) The direct and indirect costs of the department's relevant duties, including employee salaries and benefits, professional and outside services, equipment, in-state travel and other necessary operational expenses directly related to issuing licenses as defined in title 41, chapter 6 and enforcing the requirements of the applicable regulatory program.

(b) The availability of other funds for the duties performed.

(c) The impact of the fees on the parties subject to the fees.

(d) The fees charged for similar duties performed by the department, other agencies and the private sector.

18. Appoint a person with a background in oil and gas conservation to act on behalf of the oil and gas conservation commission and administer and enforce the applicable provisions of title 27, chapter 4 relating to the oil and gas conservation commission.

C. The department may:

1. Charge fees to cover the costs of all permits and inspections it performs to ensure compliance with rules adopted under section 49-203, except that state agencies are exempt from paying those fees that are not associated with the dredge and fill permit program established pursuant to chapter 2, article 3.2 of this title. For services provided under the dredge and fill permit program, a state agency shall pay either:

(a) The fees established by the department under the dredge and fill permit program.

(b) The reasonable cost of services provided by the department pursuant to an interagency service agreement.

2. Monies collected pursuant to this subsection shall be deposited, pursuant to sections 35-146 and 35-147, in the water quality fee fund established by section 49-210.

3. Contract with private consultants for the purposes of assisting the department in reviewing applications for licenses, permits or other authorizations to determine whether an applicant meets the criteria for issuance of the license, permit or other authorization. If the department contracts with a consultant under this paragraph, an applicant may request that the department

expedite the application review by requesting that the department use the services of the consultant and by agreeing to pay the department the costs of the consultant's services. Notwithstanding any other law, monies paid by applicants for expedited reviews pursuant to this paragraph are appropriated to the department for use in paying consultants for services.

D. The director may:

1. If the director has reasonable cause to believe that a violation of any environmental law or rule exists or is being committed, inspect any person or property in transit through this state and any vehicle in which the person or property is being transported and detain or disinfect the person, property or vehicle as reasonably necessary to protect the environment if a violation exists.

2. Authorize in writing any qualified officer or employee in the department to perform any act that the director is authorized or required to do by law.

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49-106. Statewide application of rules

The rules adopted by the department apply and shall be observed throughout this state, or as provided by their terms, and the appropriate local officer, council or board shall enforce them. This section does not limit the authority of local governing bodies to adopt ordinances and rules within their respective jurisdictions if those ordinances and rules do not conflict with state law and are equal to or more restrictive than the rules of the department, but this section does not grant local governing bodies any authority not otherwise provided by separate state law.

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49-402. State and county control

A. The department shall have original jurisdiction over such sources, permits and violations that pertain to:

1. Major sources in any county that has not received approval from the administrator for new source review under the clean air act and prevention of significant deterioration under the clean air act.

2. Smelting of metal ore.

3. Petroleum refineries.

4. Coal fired electrical generating stations.

5. Portland cement plants.

6. Air pollution by portable sources.

7. Air pollution by mobile sources for the purpose of regulating those sources as prescribed by article 5 of this chapter and consistent with the clean air act.

8. Sources that are subject to title V of the clean air act and that are located in a county for which the administrator has disapproved that county's title V permit program if the department has a title V program that has been approved by the administrator. On approval of that county's title V permit program by the administrator, the county shall resume jurisdiction over those sources.

B. Except as specified in subsection A of this section, the review, issuance, administration and enforcement of permits issued pursuant to this chapter shall be by the county or multi-county air quality control region pursuant to the provisions of article 3 of this chapter. After the director has provided prior written notice to the control officer describing the reason for asserting jurisdiction and has provided an opportunity to confer, the county or multi-county air quality control region shall relinquish

jurisdiction and has provided an opportunity to confer, the county or multi-county air quality control region shall relinquish jurisdiction, control and enforcement over such permits as the director designates and at such times as the director asserts jurisdiction at the state level. The order of the director which asserts state jurisdiction shall specify the matters, geographical area, or sources over which the department shall exercise jurisdiction and control. Such state authority shall then be the sole and exclusive jurisdiction and control to the extent asserted, and the provisions of this chapter shall govern, except as provided in this chapter, until jurisdiction is surrendered by the department to such county or region.

C. Portable sources under jurisdiction of the department under subsection A, paragraph 6 of this section may be required to file notice with the director and the control officer who has jurisdiction over the geographic area that includes the new location before beginning operations at that new location.

D. Notwithstanding any other law, a permit issued to a state regulated source shall include the emission standard or standard of performance adopted pursuant to section 49-479, if such standards are more stringent than those adopted by the director and if such standards are specifically identified as applicable to the permitted source or a component of the permitted source. Such standards shall be applied to sources identified in subsection A, paragraph 2, 3, 4 or 5 of this section only if the standard is formally proposed for adoption as part of the state implementation plan.

E. The regional planning agency for each county which contains a vehicle emissions control area shall develop plan revisions containing transportation related air quality control measures designed to attain and maintain primary and secondary ambient air quality standards as prescribed by and within the time frames specified in the clean air act. In developing the plan revisions, the regional planning agency shall consider all of the following:

1. Mandatory employee parking fees.

2. Park and ride programs.

3. Removal of on-street parking.

4. Ride share programs.

5. Mass transit alternatives.

6. Expansion of public transportation systems.

7. Optimizing freeway ramp metering.

8. Coordinating traffic signal systems.

9. Reduction of traffic congestion at major intersections.

10. Site specific transportation control measures.

11. Reversible lanes.

12. Fixed lanes for buses and carpools.

13. Encouragement of pedestrian travel.

14. Encouragement of bicycle travel.

15. Development of bicycle travel facilities.

16. Employer incentives regarding ride share programs.

17. Modification of work schedules.

18. Strategies for controlling the generation of air pollution by nonresidents of nonattainment or maintenance areas.

19. Use of alternative fuels.

20. Use of emission control devices on public diesel powered vehicles.

21. Paving of roads.

22. Restricting off-road vehicle travel.

23. Construction site air pollution control.

24. Other air quality control measures.

F. Each regional planning agency shall consult with the department of transportation to coordinate the plans developed pursuant to subsection E of this section with transportation plans developed by the department of transportation pursuant to any other law.

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49-404. State implementation plan

A. The director shall maintain a state implementation plan that provides for implementation, maintenance and enforcement of national ambient air quality standards and protection of visibility as required by the clean air act.

B. The director may adopt rules that describe procedures for adoption of revisions to the state implementation plan.

C. The state implementation plan and all revisions adopted before September 30, 1992 remain in effect according to their terms, except to the extent otherwise provided by the clean air act, inconsistent with any provision of the clean air act, or revised by the administrator. No control requirement in effect, or required to be adopted by an order, settlement agreement or plan in effect, before the enactment of the clean air act in any area which is a nonattainment or maintenance area for any air pollutant may be modified after enactment in any manner unless the modification insures equivalent or greater emission reductions of the air pollutant. The director shall evaluate and adopt revisions to the plan in conformity with federal regulations and guidelines promulgated by the administrator for those purposes until the rules required by subsection B are effective.

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49-406. Nonattainment area plan

A. For any ozone, carbon monoxide or particulate nonattainment or maintenance area the governor shall certify the metropolitan planning organization designated to conduct the continuing, cooperative and comprehensive transportation planning process for that area under 23 United States Code section 134 as the agency responsible for the development of a nonattainment or maintenance area plan for that area.

B. For any ozone, carbon monoxide or particulate nonattainment or maintenance area for which no metropolitan planning organization exists, the department shall be certified as the agency responsible for development of a nonattainment or maintenance area plan for that area.

C. For any ozone, carbon monoxide or particulate nonattainment or maintenance area, the department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall, by November 15, 1992, and from time to time as necessary, jointly review and update planning procedures or develop new procedures.

D. In preparing the procedures described in subsection C of this section, the department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall determine which elements of each revised implementation plan will be developed, adopted, and implemented, through means including enforcement, by the state and which by local governments or regional agencies, or any combination of local governments, regional agencies or the state.

E. The department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall enter into a memorandum of agreement for the purpose of coordinating the implementation of the procedures described in subsection C and D of this section

D of this section.

F. At a minimum, the memorandum of agreement shall contain:

1. The relevant responsibilities and authorities of each of the coordinating agencies.

2. As appropriate, procedures, schedules and responsibilities for development of nonattainment or maintenance area plans or plan revisions and for determining reasonable further progress.

3. Assurances for adequate plan implementation.

4. Procedures and responsibilities for tracking plan implementation.

5. Responsibilities for preparing demographic projections including land use, housing, and employment.

6. Coordination with transportation programs.

7. Procedures and responsibilities for adoption of control measures and emissions limitations.

8. Responsibilities for collecting air quality, transportation and emissions data.

9. Responsibility for conducting air quality modeling.

10. Responsibility for administering and enforcing stationary source controls.

11. Provisions for the timely and periodic sharing of all data and information among the signatories relating to:

(a) Demographics.

(b) Transportation.

(c) Emissions inventories.

(d) Assumptions used in developing the model.

(e) Results of modeling done in support of the plan.

(f) Monitoring data.

G. Each agency that commits to implement any emission limitation or other control measure, means or technique contained in the implementation plan shall describe that commitment in a resolution adopted by the appropriate governing body of the agency. The resolution shall specify the following:

1. Its authority for implementing the limitation or measure as provided in statute, ordinance or rule.

2. A program for the enforcement of the limitation or measure.

3. The level of personnel and funding allocated to the implementation of the measure.

H. The state, in accordance with the rules adopted pursuant to section 49-404, and the governing body of the metropolitan planning organization shall adopt each nonattainment or maintenance area plan developed by a certified metropolitan planning organization. The adopted nonattainment or maintenance area plan shall be transmitted to the department for inclusion in the state implementation plan provided for under section 49-404.

I. After adoption of a nonattainment or maintenance area plan, if on the basis of the reasonable further progress determination described in subsection F of this section or other information, the control officer determines that any person has failed to implement an emission limitation or other control measure, means or technique as described in the resolution adopted pursuant to subsection G of this section, the control officer shall issue a written finding to the person, and shall provide an opportunity to confer. If the control officer subsequently determines that the failure has not been corrected, the county attorney, at the request of the control officer, shall file an action in superior court for a preliminary injunction, a permanent injunction, or any other relief provided by law.

J. After adoption of a nonattainment or maintenance area plan, if, on the basis of the reasonable further progress determination described in subsection F of this section or other information, the director determines that any person has failed to implement an emission limitation or other control measure, means or technique as described in the resolution adopted pursuant to subsection G of this section, and that the control officer has failed to act pursuant to subsection I of this section, the director shall issue a written finding to the person and shall provide an opportunity to confer. If the director subsequently determines that the failure has not been corrected, the attorney general, at the request of the director, shall file an action in superior court for a preliminary injunction, a permanent injunction, or any other relief provided by law.

K. Notwithstanding subsections A and B of this section, in any metropolitan area with a metropolitan statistical area population of less than two hundred fifty thousand persons, the governor shall designate an agency that meets the criteria of section 174 of the clean air act and that is recommended by the city that causes the metropolitan area to exist and the affected county. That agency shall prepare and adopt the nonattainment or maintenance area plan. If the governor does not designate an agency, the department shall be certified as the agency responsible for the development of a nonattainment or maintenance area plan for that area.

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49-425. Rules; hearing

A. The director shall adopt such rules as the director determines are necessary and feasible to reduce the release into the atmosphere of air contaminants originating within the territorial limits of the state or any portion thereof and shall adopt, modify and amend reasonable standards for the quality of and emissions into the ambient air of the state for the prevention, control and abatement of air pollution. Additional standards shall be established for particulate matter emissions, sulfur dioxide emissions and other air contaminant emissions determined to be necessary and feasible for the prevention, control and abatement of air pollution. In fixing such ambient air quality standards, emission standards or standards of performance, the director shall give consideration but shall not be limited to the relevant factors prescribed by the clean air act.

B. No rule may be enacted or amended except after the director first holds a public hearing after thirty days' notice of such hearing. The proposed rule, or any proposed amendment of a rule, shall be made available to the public at the time of notice of such hearing.

C. The department shall enforce the rules adopted by the director.

D. All rules enacted pursuant to this section shall be made available to the public at a reasonable charge on request.

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49-426. Permits; duties of director; exceptions; applications; objections; fees

A. A permit shall:

1. Be issued by the director in compliance with the terms of this section.

2. Be required for any person seeking a compliance extension pursuant to section 49-426.03, subsection B, paragraph 3 and section 112(a)(5) of the clean air act and for any person beginning actual construction of or operating any source, except as prescribed in subsection B of this section or section 49-426.01.

B. The provisions of this section shall not apply to motor vehicles, to agricultural vehicles or agricultural equipment used in normal farm operations, or to fuel burning equipment which, at a location or property other than a one or two family residence, is rated at less than one million British thermal units per hour. The director may establish by rule additional sources or classifications of sources for which a permit is not required and pollutant-emitting activities and emissions units at permitted sources that are not required to be included in the permit. The director shall not adopt such rules unless the director makes a written finding with supporting facts that the exempted source, class of sources, pollutant-emitting activities or emissions units will have an insignificant adverse impact on air quality. In adopting these rules, the director may consider any rule that is adopted by the administrator pursuant to section 502 of the clean air act and that exempts one or more source categories from the requirement to obtain a permit under title V of the clean air act.

C. Every application for a permit shall be filed in the manner and form prescribed by the director, and shall contain all the information necessary to enable the director to make the determination to grant or deny such application. The director shall establish by rule requirements for permit applications, including the standard application form for title V sources. The director shall establish by rule requirements for applications for general permits. An application for a permit issued pursuant to title V of

the clean air act shall include a compliance plan that describes how the applicant will comply with all of the applicable requirements of this chapter and the clean air act, including a schedule of compliance and a schedule under which progress reports will be submitted to the director at least every six months. The director may require that such application include all sources that are used or to be used by the applicant in a certain process or a single facility or location. Before acting on an

sources that are used or to be used by the applicant in a certain process or a single facility or location. Before acting on an application for a permit, the director may require the applicant to furnish further information or further plans or specifications. The director shall act, within a reasonable time, on such application and shall notify the applicant in writing of the proposed approval or denial of such application, except that the director may have a reasonable period of time in which to gather information, inspect premises, and issue such permits. The director shall adopt rules that establish procedures for determining when applications are complete, for processing applications and for reviewing permit actions. The director shall also establish by rule criteria for determining reasonable times for processing permit applications. Rules adopted pursuant to this subsection for permits issued pursuant to title V of the clean air act shall conform to the requirements of section 505(a) of the clean air act.

D. The director shall give notice of a proposed permit for a source required to obtain a permit pursuant to title V of the clean air act once each week for two consecutive weeks in two newspapers of general circulation in the county in which the source is or will be located. The notice shall describe the proposed permit and air contaminants to be emitted and shall state that any person may submit comments on the proposed permit and may request a public hearing. The director shall require the applicant at the time of the first notice to post the site where the source is or may be located. If permitted by federal, state and local law, the posting shall be prominently placed at a site that is under the applicant's legal control and that is adjacent to the nearest public roadway. The posting shall be visible to the public using the public roadway and shall contain the information in the notice that is published by the director. If a public hearing is requested, the director shall require the applicant to place an additional posting that provides notice of the public hearing. A posting shall be maintained until the public comment period on the proposed permit is closed. The director shall make available to the public notices of proposed permits. Each public notice that is issued under this chapter shall be mailed to the permit applicant, to the affected federal, state and local agencies and to those persons who have requested in writing copies of proposed permit action notices. During the public comment period, any person may submit a request to the department to conduct a public hearing for the purpose of receiving oral or written comments on the proposed permit. A written comment shall state the name and mailing address of the person, shall be signed by the person, his agent or his attorney and shall clearly set forth reasons why the permit should or should not be issued. Grounds for comment are limited to whether the proposed permit meets the criteria for issuance prescribed in this section or in section 49-427. The department shall consider and prepare written responses to all comments received during the public comment period including comments made at a public hearing conducted by the department. At the time a final permit decision is made, copies of the department's responses shall be made available to the applicant and any person who commented on the proposed permit.

E. Permits or revisions issued pursuant to this section or section 49-426.01 may be issued subject to such terms and conditions as are consistent with the requirements of this article, article 1 of this chapter and the clean air act and are found by the director to be necessary, following public notice and an opportunity for a public hearing as provided in subsection D or H of this section or in section 49-426.01, and subject to payment of a reasonable fee to be determined as follows:

1. For a source that is required to obtain a permit pursuant to title V of the clean air act, the director shall establish by rule a system of fees that is consistent with and equivalent to that prescribed by section 502 of the clean air act. These rules shall prescribe procedures for increasing the fee each year by the percentage if any by which the consumer price index for the immediately preceding calendar year exceeds the consumer price index for calendar year 1989.

2. For a facility that is required to obtain a permit pursuant to this chapter but that is not required to obtain a permit pursuant to title V of the clean air act, the director shall determine a fee based on the total actual cost of processing the permit application

title V of the clean air act, the director shall determine a fee based on the total actual cost of processing the permit application, but not exceeding twenty-five thousand dollars.

The director shall establish an annual inspection fee, not to exceed the average cost of inspection. The director shall adopt, by rule, criteria for determining fees and for public hearings.

F. Permits issued pursuant to this section shall be issued for a period of five years.

G. Except as provided in subsection H of this section, any person burning used oil, used oil fuel, hazardous waste or hazardous waste fuel in any machine, incinerator or device shall first obtain a permit from the director. Any permit issued by the director under this subsection shall contain, at a minimum, conditions governing:

1. Limitations on the types, amounts and feed rates of used oil, used oil fuel, hazardous waste or hazardous waste fuel which may be burned.

2. The frequency and types of fuel testing to be conducted by the person.

3. The frequency and type of emissions testing or monitoring to be conducted by the person.

4. Requirements for record keeping and reporting.

5. Numeric emission limitations expressed in pounds per hour and tons per year for air contaminants to be emitted from the facility burning off-specification used oil fuel, hazardous waste or hazardous waste fuel.

H. The director may issue a general permit for a defined class of facilities if the class contains a large number of facilities that are substantially similar in nature and that have substantially similar emissions and if the following conditions are met:

1. A general permit shall comply with all of the requirements for permits prescribed by this section except for the requirements of subsection D of this section and shall be consistent with the clean air act.

2. The director shall give notice of the proposed general permit once each week for two consecutive weeks in a newspaper of general circulation in each county. The notice shall describe the proposed general permit, the general class of sources that would be subject to the proposed permit and the air contaminants to be emitted. The notice shall also state that any person may submit comments on the proposed general permit and may request a public hearing. A written comment shall state the name of the person and the person's agent or attorney and shall clearly set forth reasons why the general permit should or should not be issued. Grounds for comment are limited to whether the proposed general permit meets the criteria for issuance prescribed in this section or section 49-427.

3. On issuance of a general permit any person seeking to permit a source under this subsection shall submit an application pursuant to subsection C of this section.

4. If the director approves an application to be permitted under a general permit, the director shall provide notice of the approval

4. If the director approves an application to be permitted under a general permit, the director shall provide notice of the approval in a newspaper of general circulation in the county in which the source is or will be located.

5. If a person violates a general permit, the director may require the source to obtain a permit pursuant to subsection A of this section.

6. A general permit may be revoked or revised at any time by the director if necessary to comply with this chapter. If the director revokes or revises a general permit, the director shall notify all persons whose sources are affected by the revocation or revision and shall include notice of procedures to obtain a permit pursuant to subsection A of this section or notice of procedures for compliance with the revisions.

7. The director by rule shall adopt procedures for the issuance of general permits.

8. The director may adopt conditions in a general permit applicable to sources located in a specified geographic area either independently of or upon petition by a county air pollution control officer.

I. Permits issued pursuant to this section for a source required to obtain a permit under title V of the clean air act shall contain all of the following:

1. Conditions reflecting all applicable requirements of this article and rules adopted pursuant to this article.

2. Enforceable emission limitations and standards.

3. A schedule for compliance, if applicable.

4. The requirement to submit at least every six months the results of any required monitoring.

5. Any other conditions that are necessary to assure compliance with this article and the clean air act, including the applicable implementation plan.

J. The director may refuse to issue any permit to any source subject to the requirements of title V of the clean air act if the administrator objects to its issuance in a timely manner as prescribed under title V of the act.

K. If an applicant has submitted a timely and complete application for a permit required under this section, but final action has not been taken on that application, failure to obtain a permit shall not be a violation of this chapter unless the delay in final action is due to the failure of the applicant to submit information required or requested to process the application. This subsection does not apply to any person required to obtain a permit before commencing construction of a source as required under this section or any person seeking a permit revision as provided under section 49-426.01.

L. The director may issue a single permit authorizing emissions from similar operations at multiple temporary locations, if the permit includes conditions that will assure compliance with all applicable requirements of this chapter and the clean air act at all locations. Any permit issued pursuant to this subsection shall require the applicant to notify the director in advance of each change in location. In issuing a single permit, the director may require a separate permit fee for operations at each location.

change in location. In issuing a single permit, the director may require a separate permit fee for operations at each location.

M. In the case of a permit with a term of three or more years issued pursuant to the requirements of title V of the clean air act to a major source, the director shall require revisions to the permit to incorporate applicable standards and regulations adopted by the administrator pursuant to the clean air act after the issuance of the permit. The director shall require any revisions as expeditiously as practicable, but not later than eighteen months after the promulgation of such standards and regulations. No permit revision shall be required if the effective date of standards and regulations is after the expiration of the permit. Any permit revision required pursuant to this subsection shall be treated as a permit renewal.

N. Any permit issued pursuant to the requirements of this article and title V of the clean air act to a unit subject to the provisions of title IV of the clean air act shall include conditions prohibiting all of the following:

1. Annual emissions of sulfur dioxide in excess of the number of allowances to emit sulfur dioxide held by the owners or operators of the unit or by the designated representative of the owners or operators.

2. Amounts in excess of applicable emission rates.

3. The use of any allowance prior to the year for which it was allocated.

4. Contravention of any other provision of the permit.

O. The director shall adopt a rule specifying the notice, public participation requirements and other permit issuance procedures for permits that are not issued pursuant to title V of the clean air act.

P. In determining whether a permitting threshold established pursuant to this section applies to an existing source, the director shall exclude particulate matter that is not subject to a national ambient air quality standard under the clean air act.

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ADEQ
Arizona Department
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Enclosure 2

Final SIP Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 SO_2 NAAQS

Air Quality Division

ADEQ
Arizona Department of Environmental Quality

Final SIP Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 SO_2 NAAQS

Air Quality Division
October 3, 2023

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Final SIP Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area

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Final SIP Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area

Completeness Criteria
(40 C.F.R. Part 51, Appendix V, § 2.0)

Appendix V § 2.1 - Administrative Materials

(a) A formal signed, stamped, and dated letter of submittal from the Governor or his designee, requesting EPA approval of the plan or revision thereof (hereafter "the plan"). If electing to submit a paper submission with a copy in electronic version, the submittal letter must verify that the electronic copy provided is an exact duplicate of the paper submission.

See the cover letter for this State Implementation Plan (SIP) submission signed by ADEQ Air Quality Director Daniel Czecholinski. Also included with this cover letter is a delegation of authority from Karen Peters, Director of ADEQ, to Daniel Czecholinski, authorizing Mr. Czecholinski to perform any act the ADEQ Director is authorize to perform under the state air quality statutes, including the submittal of SIPs to EPA.

(b) Evidence that the State has adopted the plan in the State code or body of regulations; or issued the permit, order, consent agreement (hereafter "document") in final form. That evidence shall include the date of adoption or final issuance as well as the effective date of the plan, if different from the adoption/issuance date.

Appendix A contains a copy of the final permit revision for the Hayden smelter.

(c) Evidence that the State has the necessary legal authority under State law to adopt and implement the plan.

Arizona is authorized to adopt and implement SIP revisions under Arizona Revised Statutes (A.R.S.) §§ 49-104, 49-106, 49-402, 49-404, 49-406, 49-425, and 49-426. Copies of these statutes are included in this SIP revision submittal as Appendix G.

(d) A copy of the actual regulation, or document submitted for approval and incorporation by reference into the plan, including indication of the changes made (such as redline/strikethrough) to the existing approved plan, where applicable. The submission shall include a copy of the official State regulation/document, signed, stamped, and dated by the appropriate State official indicating that it is fully enforceable by the State. The effective date of any regulation/document contained in the submission shall, whenever possible, be indicated in the regulation/document itself; otherwise the State should include a letter signed, stamped, and dated by the appropriate State official indicating the effective date. If the regulation/document provided by the State for approval and incorporation by reference into the plan is a copy of an existing publication, the State submission should, whenever possible, include a copy of the publication cover page and table of contents.

Table 1-1 below shows the final permit revisions being adopted and rule provisions being replaced by this SIP Revision. As mentioned above in (b), this SIP revision contains the final permit revision.

(e) Evidence that the State followed all of the procedural requirements of the State's laws and constitution in conducting and completing the adoption/issuance of the plan.

Appendix F contains the public process documentation showing that the State followed all requirements regarding adoption and issuance of the plan.

(f) Evidence that public notice was given of the proposed change consistent with procedures approved by EPA, including the date of publication of such notice.

Proof that ADEQ gave notice of the SIP Revision in accordance with A.R.S. § 49-444 is attached as Appendix F.

(g) Certification that public hearing(s) were held in accordance with the information provided in the public notice and the State's laws and constitution, if applicable and consistent with the public hearing requirements in 40 CFR 51.102.

The certification and other documents related to the public hearing are attached as Appendix F.

(h) Compilation of public comments and the State's response thereto.

Public comments and ADEQ's responsiveness summary are attached as Appendix F.

Appendix V § 2.1 - Technical Support

(a) Identification of all regulated pollutants affected by the plan.

This SIP revision applies to the 1971 and 2010 Sulfur Dioxide (SO_2) National Ambient Air Quality Standard (NAAQS).

(b) Identification of the locations of affected sources including the EPA attainment/ nonattainment designation of the locations and the status of the attainment plan for the affected areas(s).

Identification of the locations and sources affected by this plan are included in Chapters 1, 2, and 3. The information is also contained in the Hayden SO_2 Emissions Inventory (EI) Technical Support Document (TSD) (Appendix B) and Hayden SO_2 Modeling TSD (Appendix C). This SIP revision is applicable to the Hayden SO_2 nonattainment area (NAA) for the 1971 and 2010 SO_2 NAAQS.

(c) Quantification of the changes in plan allowable emissions from the affected sources; estimates of changes in current actual emissions from affected sources or, where appropriate, quantification of changes in actual emissions from affected sources through calculations of the differences between certain baseline levels and allowable emissions anticipated as a result of the revision.

The Hayden SO_2 Emissions Inventory TSD (Appendix B) contains the technical documentation and a detailed emissions inventory.

(d) The State's demonstration that the national ambient air quality standards, prevention of significant deterioration increments, reasonable further progress demonstration, and visibility, as applicable, are protected if the plan is approved and implemented. For all requests to redesignate an area to attainment for a national primary ambient air quality standard, under section 107 of the Act, a revision must be submitted to provide for the maintenance of the national primary ambient air quality standards for at least 10 years as required by section 175A of the Act.

The Hayden SO_2 Modeling TSD (Appendix C) contains the attainment demonstration for the 1971 and 2010 SO_2 NAAQS.

(e) Modeling information required to support the proposed revision, including input data, output data, models used, justification of model selections, ambient monitoring data used, meteorological data used, justification for use of offsite data (where used), modes of models used, assumptions, and other information relevant to the determination of adequacy of the modeling analysis.

Modeling information and the technical demonstration is contained in Appendix C.

(f) Evidence, where necessary, that emission limitations are based on continuous emission reduction technology.

The control strategy is discussed in Chapter 4 of the SIP revision. A copy of the final permit revision is located in Appendix A, and includes numerical fugitive emissions limits for the copper smelter in the nonattainment area. The permit contains particular work practice standards and recordkeeping/reporting requirements to ensure compliance with the emission limit and to ensure attainment of the 1971 and 2010 SO_2 NAAQS.

(g) Evidence that the plan contains emission limitations, work practice standards and recordkeeping/reporting requirements, where necessary, to ensure emission levels.

The control strategy is discussed in Chapter 4 of the SIP revision. A copy of the final permit revision is located in Appendix A, and includes numerical fugitive emissions limits for the copper smelter in the nonattainment area. The permit contains particular work practice standards and recordkeeping/reporting requirements to ensure compliance with the emission limit and to ensure attainment of the 1971 and 2010 SO_2 NAAQS.

(h) Compliance/enforcement strategies, including how compliance will be determined in practice.

Chapter 4 contains a summary and description of the permit revision regarding the requirements for compliance/enforcement strategies as well as a discussion of compliance is determined. The information is also contained in Appendix A.

(i) Special economic and technological justifications required by any applicable EPA policies, or an explanation of why such justifications are not necessary.

Chapter 4 discusses the need to vary from the use of CEMS to monitor fugitive emissions.

Final SIP Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area

Final SIP Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area

1 Introduction

This Chapter presents the general regulatory requirements for sulfur dioxide (SO_2) nonattainment areas as well as a description of the National Ambient Air Quality Standards, regulatory history of the Hayden SO_2 Nonattainment Area and the physical geography and economic status of the area.

1.1 Statement of Introduction and Purpose

The SO_2 standards were first codified in 1971.[1] On May 22, 1996, EPA promulgated several minor technical changes to the SO_2 NAAQS, but did not revise the level of the standard.[2] EPA retained the block averaging convention and adopted clarifying language in 40 CFR §§ 50.4 and 50.5. The second technical change was to state the level of the standard in parts per million (ppm) rather than micrograms per cubic meter ($\mu g/m^3$) (40 CFR §§ 50.4 and 50.5). This change made the SO_2 NAAQS consistent with the standards for other pollutants.

On June 22, 2010, the U.S. Environmental Protection Agency (EPA) revised the primary SO_2 National Ambient Air Quality Standards (NAAQS).[3] This revision established a new one-hour SO_2 standard at a level of 75 parts per billion (ppb), based on the three-year average of the annual 99th percentile of one hour daily maximum concentrations.[4]

On August 5, 2013, EPA designated 29 areas of the country as nonattainment for the 2010 SO_2 NAAQS.[5] Under the Clean Air Act (CAA), states must submit state implementation plans (SIPS) to meet the requirements of Section 172 and Sections 191 – 192 and show attainment of the NAAQS. EPA designated two areas in Arizona as nonattainment for the 2010 SO_2 standard, the Miami and Hayden Planning Areas.

This SIP revision is intended to satisfy CAA requirements and show attainment of the 1971 and 2010 SO_2 NAAQS for the Hayden SO_2 Planning Area. As will be described in greater detail below, this SIP is intended to correct the deficiencies identified in EPA's limited approval/limited disapproval and partial approval/partial disapproval.

[1] 36 FR 8,186 (Apr. 30, 1971); *see also* 36 FR 22,384 (Nov. 25, 1971).
[2] 61 FR 25,566 (May 22, 1996).
[3] 75 FR 35,519 (June 22, 2010).
[4] *Id.*
[5] 78 FR 47,191 (Aug. 5, 2013).

1.2 Rules to Be Added to and Removed from the SIP

Table 1-1 Rules to Be Added to and Removed from the SIP

Rule or Statute to be Removed	SIP Rule(s) Replaced
A.A.C. R18-2-B1302(C)(1), (E)(4), and (E)(6) Limits on SO_2 Emissions from the Hayden Smelter (23 A.A.R. 767, (Supp. 17-1)).	A.A.C. R18-2-B1302(C)(1), (E)(4), and (E)(6) will be replaced with the relevant facility permit provisions. A copy of the relevant final permit revision (No. 96410, Attachment "I") is attached as Appendix A. As will be described in greater detail, the final permit revision contains enforceable conditions to bring the area into attainment and cure the deficiencies identified in EPA's actions.

1.3 National Ambient Air Quality Standards

Title I of the CAA requires EPA to set NAAQS for pollutants that are considered harmful to both public health and the environment. Standards are set for six criteria pollutants: ground-level ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead.[6] EPA sets two types of NAAQS that include primary and secondary standards.[7] Primary standards are set to protect human health and secondary standards are established to protect public welfare, such as decreased visibility and damage to animals, crops, vegetation and buildings.[8]

The standard for each pollutant is set at a maximum concentration in either parts per million (ppm), parts per billion (ppb), or micrograms per cubic meter of air (µ/m3). Each standard also has a distinct averaging time in order to provide the necessary level of protection. These standards are reviewed every five years and are retained or revised based on review of scientific literature and analyses.[9]

1.4 National Ambient Air Quality Standards for Sulfur Dioxide

The SO_2 standards were first codified in Volume 42 of the Code of Federal Regulations (CFR), Part 410 on April 30, 1971.[10] On November 25, 1971, they were recodified at 40 CFR §§ 50.4 and 50.5.[11]

On May 22, 1996, EPA made several minor technical changes to the SO_2 NAAQS but did not revise the level of the standard.[12] EPA retained the block averaging convention and adopted clarifying language in 40 CFR 50.4 and 50.5. The second technical change was to state the level of the standard in parts per

[6] *See* 40 CFR Part 50.
[7] CAA § 109(b).
[8] *Id.*
[9] CAA § 109(d).
[10] 36 FR 8,186 (Apr. 30, 1971).
[11] 36 FR 22,384 (Nov. 25, 1971).
[12] 61 FR 25,566 (May 22, 1996).

million (ppm) rather than micrograms per cubic meter (µg/m3).[13] This change made the SO_2 NAAQS consistent with the standards for other pollutants.

On June 22, 2010, EPA revised the primary SO_2 NAAQS and established a new 1-hour standard at a level of 75 parts per billion (ppb), based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.[14] EPA also revoked both the existing 24-hour and annual primary SO_2 standards. The final rule made changes to ambient air monitoring networks requiring placement of monitors in Core Based Statistical Areas based on a population weighted emissions index. Table 1-2 illustrates historical and current SO_2 standards.

EPA reviewed the primary 2010 SO_2 NAAQS in 2019 as required under CAA § 109(d)(1) and concluded that retaining the standard without revision was appropriate.[15]

Table 1-2 Sulfur Dioxide Standards

Final Rule	Primary/Secondary	Averaging Time	Level	Form
1971[1]	Primary	24-hour	0.14 ppm	Not to exceed more than one per year
		Annual	0.03 ppm	Annual arithmetic mean
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year
		Annual	0.02 ppm	Annual arithmetic average
1973[2]	Secondary	Secondary 3-hour standard retained, without revision; secondary annual standard revoked		
1996[3]	Primary	Existing primary standard retained, without revision		
2010[4]	Primary	1-hour	75 ppb	99th percentile, averaged over 3 years
		Primary annual and 24-hour standards revoked.		

Source: U.S. Environmental Protection Agency, Timeline of Sulfur Dioxide National Ambient Air Quality Standards (NAAQS) (March 23, 2022). Retrieved from https://www.epa.gov/so2-pollution/timeline-sulfur-dioxide-national-ambient-air-quality-standards-naaqs.

[1] 36 FR 81,86 (Apr. 30, 1971).

[2] 38 FR 25,678; (Sept. 14, 1973).

[3] 61 FR 25,566 (May 22, 1996).

[4] 75 FR 35,520 (June 22, 2010); The 2010 SO_2 standard was reviewed in 2019 and retained without revision (*See* 84 FR 9,866 (Mar. 18, 2019)).

1.5 Regulatory Background

In 1972, Arizona submitted a SIP for all major sources in the state, which included all copper smelters. The portion of the SIP pertaining to attainment and maintenance of the SO_2 NAAQS did not sufficiently define emissions limitations or require permanent control of emissions from existing copper smelters and EPA

[13] 40 CFR §§ 50.4 and 50.5.

[14] 75 FR 35,519 (June 22, 2010).

[15] 84 FR 9,866 (Mar. 18, 2019).

disapproved the plan.[16] In the same action, EPA proposed revising regulations for control of SO_2 from all existing smelters in Arizona;[17] these regulations were not finalized. EPA subsequently established an SO_2 monitoring network around each smelter (June 1973 - October 1974) to gather air quality data upon which to base emissions limitations.

In 1977, the State developed rules for Supplementary Control Systems (SCS)[18], which enabled smelters to intermittently curtail emissions based on ambient air quality data. EPA disapproved this approach and required installation and operation of SO_2 emissions controls at all times to adequately meet the NAAQS. On January 4, 1978, EPA published final emissions limits for the Arizona smelters based on the 1973-1974 air quality data and the use of a proportional rollback model.[19] These regulations specified an emission rate and compliance test methods for each smelter. The 1977 CAA Amendments modified smelter control requirements to allow the temporary use of SCS while SO_2 emission limits were developed and also allowed certain smelters additional time to install emissions control technology.

In response to this action, Arizona developed new regulations and on September 20, 1979, submitted Multi-point Rollback (MPR) rules as a proposed revision to the Arizona SIP. The use of MPR to establish stack emissions limits in the rules addressed the problem of inherently variable SO_2 emissions from smelting operations by correlating the emissions frequency at various levels with the probability of violating the ambient standards. This technique "rolled back" a yearly emission profile to a level protective of the standards. The new regulations also set requirements for analyzing the impact of smelter SO_2 fugitive emissions on ambient air quality and the implementation of any necessary fugitive controls. The MPR rules were approved by EPA on January 14, 1983.[20]

Following EPA's approval of the MPR rule and a prior Consent Decree between EPA, ADEQ and ASARCO (#CIV 81-110-GLO-ACM, dated June 22, 1981), ASARCO began implementation of improved control technology. The improvements included replacement of 12 multiple-hearth roasters and two reverberatory furnaces with a new INCO flash smelting furnace, installation of a 650 ton per day oxygen plant to enrich process gases, and a new double-contact acid plant for treatment of process gas SO_2. These controls significantly reduced emissions and allowed the smelter to come into compliance with the emissions limits in the MPR rules. The Hayden smelter came into full compliance with the MPR regulations in 1984.

In April 1996, ASARCO submitted results of an SO_2 fugitive emissions study to ADEQ to fulfill outstanding SIP commitments for fugitive emissions analysis. ASARCO conducted an additional ambient impact analysis of maximum actual emissions (including both stack and fugitive) in relation to resulting ambient concentrations from 2001 and 2002.

[16] 37 FR 15,081 (July 27, 1972).
[17] *Id.*at 15,096.
[18] Prior to implementation of continuous control technology, supplementary Control Systems (SCS) utilized analysis of atmospheric conditions and monitored ambient concentration to vary the rate of smelter emissions to avoid exceedances of the NAAQS.
[19] 43 FR 755 (Jan. 4, 1978).
[20] 48 FR 1,717 (Jan. 14, 1983).

ADEQ conducted a rulemaking in 2002 to revise the SO2 emission limits in Arizona Administrative Codes (AAC) R18-2-715 and R18-2-715.01. In 2004, EPA approved AAC R18-2-715 (sections F, G, and H) and R18-2-715.01 into the SIP.[21] The new limits included stack and total emission limits and provided a considerable margin of safety to ensure protection of the 1971 SO2 NAAQS. Additionally, in 2002, ADEQ submitted an attainment and maintenance plan for the Hayden SO2 Nonattainment Area. EPA has not acted on the plan and the Hayden area remains nonattainment for the 1971 NAAQS.

In June 2010, EPA revised the NAAQS for SO_2, revoking the 1971 primary annual and 24-hour SO_2 standards for most of the country.[22]

On August 5, 2013 EPA designated the Hayden area as nonattainment for the 2010 SO_2 NAAQS. ADEQ submitted the *Arizona State Implementation Plan Revision: Hayden Sulfur Dioxide Nonattainment Area for the 2010 SO_2 NAAQS* and accompanying rules *to* EPA on March 8, 2017.[23] Then on November 14, 2018 EPA released the final rule, approving the rules submitted with the SIP in March 2017 into the Arizona SIP.[24]

On November 5, 2020 EPA published a limited approval and limited disapproval of the Hayden Smelter rule A.A.C. R18-2-B1302, submitted to EPA with the ADEQ 2017 SIP.[25] EPA issued its limited disapproval because some rule provisions conflict with the requirements of CAA §§ 110 and 172(c)(6). EPA found: 1) the rule does not contain any numeric emission limits or ongoing monitoring requirements corresponding to the levels of fugitive emissions that were modeled in the 2017 nonattainment SIP; 2) R18-2-B1302(E)(4) provides an option for alternative sampling points that could undermine the enforceable of the stack emissions limit; 3) R18-2-B1302(E)(6) allows for just under 10% of the total facility SO_2 emissions annually to be exempt from continuous emission monitoring system (CEMS) requirement; 4) the rule lacks a method for measuring or calculating emissions from the shutdown ventilation flue, which could compromise the enforceability of the main stack emissions limit; and 5) the rule lacks a method for calculating hourly SO_2 emissions.[26]

EPA published its "partial approval and partial disapproval" of the 2017 SIP on November 10, 2020.[27] This final action approved the emissions inventory element under CAA §§ 172(c)(3) and (4) and affirmed that the State met the new source review (NSR) requirement for the Hayden SO_2 NAA under CAA § 175(c)(5).[28] However, EPA disapproved the attainment demonstration, Reasonably Available Control Measures (RACM)/Reasonably Available Control Technology (RACT), enforceable emissions limitations, reasonable further progress (RFP), and contingency measures elements.[29]

[21] 69 FR 63,321 (Nov. 1, 2004).
[22] 75 FR 35,520 (June 22, 2010).
[23] 78 FR 47,191 (Aug. 5, 2013).
[24] 83 FR 56,736 (Nov. 14, 2018).
[25] 85 FR 70,483 (Nov. 5, 2020).
[26] *Id.* at 70,484; *see also* 85 FR 31,113 (May 22, 2020).
[27] 85 FR 71,547 (Nov. 10, 2020).
[28] *Id.* at 71,552.
[29] *Id.*

On January 31, 2022, EPA published in the federal register the agency's findings that the Hayden Nonattainment Area failed to attain the 2010 1-hour SO_2 primary NAAQS by the applicable attainment date of October 4, 2018.[30] In response to this publication, on March 31, 2022, Asarco LLC, filed a petition for review in the U.S. Court of Appeals for the Ninth Circuit. The petition challenges EPA's January 31, 2022 final rule.[31]

Table 1-3 Planning Dates

Important Plan Dates	
Description	**Date**
EPA's SO_2 Nonattainment Area Final Designation	August 5, 2013
First Nonattainment Area SIP due to EPA	April 6, 2015
First Nonattainment Area SIP submitted to EPA	March 8, 2017[32]
Attainment date	October 4, 2018
EPA's limited approval/ limited disapproval of A.A.C. R18-2-B1302	November 5, 2020
EPA's partial approval/ partial disapproval of the 2017 Hayden SO_2 Nonattainment Area SIP revision	November 10, 2020
Failure to attain determination	January 31, 2022
New SIP revision due	January 31, 2023
New Attainment Date	No later than January 31, 2027

1.6 Hayden SO_2 Nonattainment Area

Pursuant to CAA § 107(d), EPA designated areas as either "nonattainment," "attainment," or "unclassifiable" for the 2010 1-hour SO_2 primary NAAQS. The CAA defines a nonattainment area as an area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the NAAQS for a given pollutant.[33] EPA issued guidance in March 2011 to assist states with developing boundary recommendations.[34]

[30] 87 FR 4,805 (Jan. 31, 2022).
[31] Pl.'s Petition for Review, ASARCO LLC. V. EPA, (9th Cir. 2022) (No. 22-70058). The case remains on-going at the time of this submittal.
[32] 78 FR 47,191 (Aug. 5, 2013).
[33] CAA § 171(2).
[34] The 2011 guidance was replaced with the 2015 *Updated Guidance for Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard*. However, as the 2015 guidance was issued after the Hayden

On May 25, 2011 the State of Arizona recommended that two separate areas, the existing Hayden and Miami SO_2 planning areas, be designated nonattainment for the new standard. Arizona's two recommended nonattainment areas include all areas with monitored violations of the new standard as well as the primary emissions sources that likely contribute to those violations. Evidence accompanying the Governor's letter demonstrated that minimum monitoring requirements are currently met.

In a February 6, 2013 letter EPA notified the State of its intention to designate the Hayden and Miami planning areas as nonattainment, which was consistent with the Governor's recommendation.[35] On August 5, 2013 EPA officially designated the Hayden area as nonattainment for the 2010 primary 1-hour SO_2 NAAQS based on existing monitoring data from 2009-2011.[36]

1.6.1 Nonattainment Area Description

The Hayden SO_2 nonattainment area is comprised of nine townships in southern Gila County and central Pinal County; six adjacent townships are designated as unclassifiable (see Table 1-4). The current boundaries of the nonattainment and unclassified areas are codified under 40 CFR § 81.303. Figure 1-1 illustrates the location of the Hayden SO_2 nonattainment area.

Table 1-4 Hayden Sulfur Dioxide Area Description & Classifications

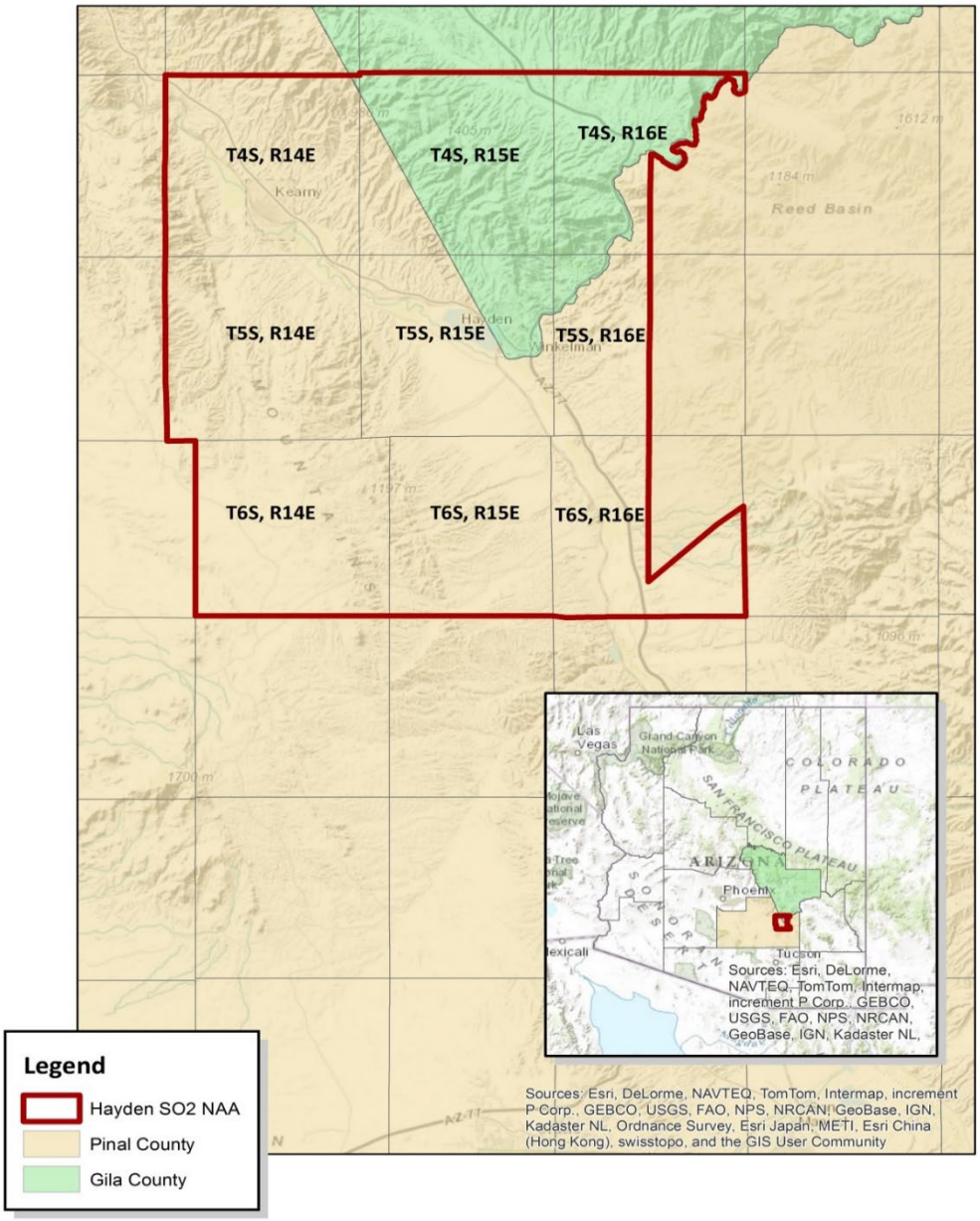
Designated Area	Does Not Meet Primary Standards	Cannot Be Classified
T4S, R14E	X	
T4S, R15E	X	
T4S, R16E	X	
T5S, R14E	X	
T5S, R15E	X	
T5S, R16E	X	
T6S, R14E	X	
T6S, R15E	X	
T6S, R16E	X	
T4S, R13E		X
T4S, R17E		X
T5S, R13E		X
T5S, R17E		X
T6S, R13E		X
T6S, R17E		X
Source: 40 CFR § 81.303		

SO2 boundaries were designated, it was not considered by ADEQ or EPA for the Hayden SO_2 nonattainment area designation.

[35] EPA, SO2 Designations – Round 1 Arizona State Recommendation and EPA Response, (last updated Nov. 29, 2021), https://www.epa.gov/sulfur-dioxide-designations/so2-designations-round-1-arizona-state-recommendation-and-epa-response.

[36] 78 FR 47,191 (Aug. 5, 2013).

Figure 1-1 Hayden Sulfur Dioxide Nonattainment Area

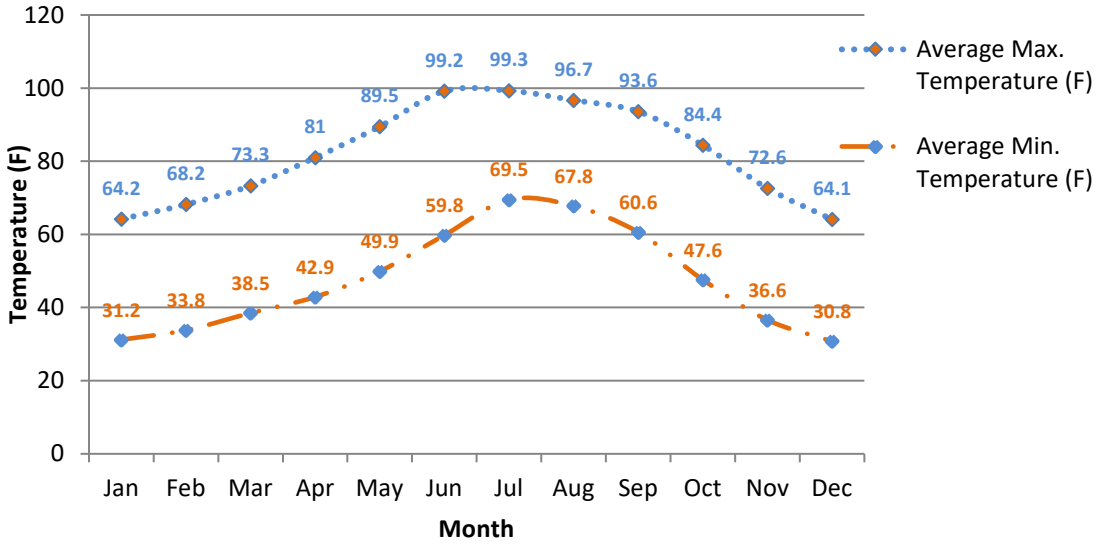


1.6.2 Climate and Geography

The Hayden SO_2 nonattainment area is located in southern and central Arizona and is situated within Gila and Pinal Counties. The Town of Hayden is located approximately 35 miles south of Globe and 30 miles southeast of Superior. Gila County, located in southern Arizona, encompasses approximately 4,752 square miles. Pinal County, located in central Arizona, encompasses approximately 5,374 square miles. Elevations range from 1,800 feet to more than 4,400 feet above sea level in the Hayden nonattainment area, with the Town of Hayden situated at an elevation near 2,050 feet above sea level. There are both desert terrain and mountain ranges across the southern Gila County and central Pinal County landscape.

The area includes both warm desert and cool alpine climates. The maximum average daily temperature reaches 99° F in July, and the minimum average daily temperature drops to 30° F in December.[37] The nonattainment area does not currently have a station available for monthly norms. The Town of Winkelman is located within the nonattainment area and has the only available minimum and maximum temperature averages (for years 1893-1980), taken from the Winkelman 6S Station (see Figure 1-2).[38]

Figure 1-2 Monthly Minimum and Maximum Temperature at Winkelman 6S Station (1893-1980)



The record monthly precipitation summary was obtained by the Ashurst-Hayden Dam station from 1956-2013 (See Figure 1-3). The driest time of the year is typically April through June, followed by September through November. There are generally two distinct rain seasons in the winter and late summer. Low pressure systems and cold fronts in December produce an average monthly total of 1.35 inches of rain or snow. Monsoon wind shift with increased moisture from Mexico in August produces an average monthly total of 1.39 inches of rain. Yearly average precipitation is 10.30 inches. Figure 1-4 shows the monthly average precipitation measured at the Winkelman 6S Station.[39]

[37] Western Regional Climate Center, Winkelman 6S, Arizona. (2015, November 5). Retrieved from http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az9420

[38] Ibid

[39] Western Regional Climate Center, Ashurst Dam, Arizona. (2015, November 5). Retrieved from http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az0498

Figure 1-3 Monthly Average Precipitation Summary at Ashurst-Hayden Dam Station (1956-2013)

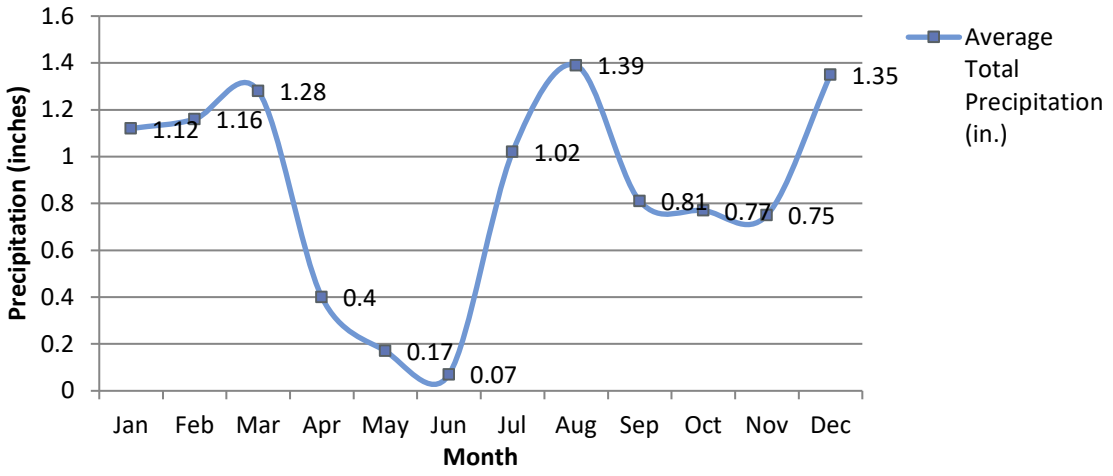
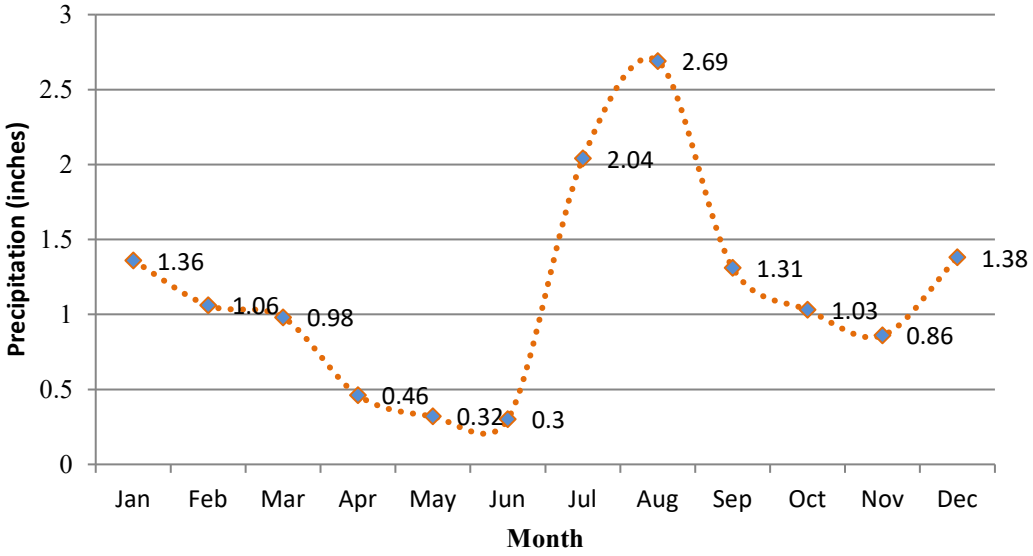


Figure 1-4 Monthly Climate Precipitation Summary at Winkelman 6S Station (1893-1980)



1.6.3 Population

Since the nonattainment area covers areas in portions of Gila and Pinal Counties, population data for both counties is included in the summary statistics in Table 1-5. According to the Arizona Office of Economic Opportunity's population projections, the Hayden SO_2 nonattainment area had a total population of 5,119

in 2021. While historic projections depicted the population of the Hayden nonattainment area remaining stable with the surrounding areas experiencing a slight increase in population in 2021, the Hayden Area experienced a significant decrease in population from 2018-2021. Table 1-5 provides a breakdown of the population within the Hayden SO_2 nonattainment area.

Table 1-5 Population Estimates for the Hayden SO_2 NAA and Surrounding Areas

Places	1990	2000	2005	2010	2015	2018	2021
Hayden SO_2 NAA - Gila Co.	962	1,225	1,253	1,279	1,291	1,315	514
Hayden SO_2 NAA - Pinal Co.	1,023	1,575	2,671	3,292	3,636	4,038	4,605[a]
Hayden*	910	892	766	662	622	622	512
Kearny*	2,265	2,249	2,026	1,950	2000	2063	1,741
Winkelman (Gila Co.)*	675	443	430	352	353	354	294
Gila County	40,300	51,335	52,523	53,597	54,100	55,100	53,525
Pinal County	116,800	179,727	250,195	375,770	415,000	460,900	439,128
Arizona	3,682,790	5,130,632	6,077,740	6,392,017	6,777,500	7,205,700	7,285,370

Source: Arizona Department of Administration – January 17, 2014, Internal Report
* Arizona Department of Administration, Population Estimates (November 3, 2015). Retrieved from https://population.az.gov/population-projections
* Arizona Department of Economic Opportunity, July 1, 2021 Population Estimates for Arizona's Counties, Incorporated Places and Unincorporated Balance of Counties, April 4. 2022, https://www.azcommerce.com/media/gmtnexac/july1_2021_arizona_population_estimates.pdf
[a] EPA, Nonattainment and Maintenance Area Population Tool: 2010 SO2, https://epa.maps.arcgis.com/apps/MapSeries/index.html?appid=7935a00e2554440a8daf6cc035b9455e

1.6.4 Economy

Gila County and Pinal County were formed from portions of Maricopa, Pinal, and Yavapai Counties in 1881 and 1875, respectively. The U.S. Forest Service manages over one half of Gila County as federal public land. Tribal land accounts for 37 percent of Gila County and is owned by the San Carlos, Tonto, and White Mountain Apache tribes. Individual and corporate ownership accounts for three percent; the U.S. Bureau of Land Management holds two percent; and the State of Arizona and other public lands comprise the remaining two percent.

In the 1880s, silver and copper mining brought many settlers to the area. Once silver reserves had been exhausted, copper mining became the focal point of the economy. Mining continues to support the area, but recreational activities, ranching, and tourism also contribute to the economy. Currently, ASARCO is a major copper smelting facility in the area. In 2015, Hayden smelter produced approximately 350 to 400 million pounds of copper annually.[40]

[40] Asarco – Grupo Mexico (2015, November 3). Retrieved from http://www.asarco.com/about-us/

The Hayden smelter has a direct impact on the economies of Gila County and Pinal County. In 2012, it contributed to $140.8 million in wages, salaries, and fringe benefits.[41] ASARCO also paid $28.6 million in property, severance, and sales taxes in 2012.[42] Additionally, ASARCO pays royalties on minerals mined from state leases and leases on Indian land. As of 2022, the Asarco has approximately 1,700 employees.[43] The Hayden smelter operations, owned and operated by Asarco, include a 27,400 ton/day concentrator, a 693,500 ton/year copper smelter, and a sulfuric acid plant that can produce over 300 million pounds of copper per year. When in full production, Hayden operations employs over 500 people and contributes over $45 million in wages, salaries and benefits each year which has a significant impact on the economies of Hayden, nearby communities in the NAA, and on Arizona's economy as a whole.

Table 1-6 shows the civilian labor force for Gila and Pinal Counties as well as the communities located in the Hayden SO_2 Nonattainment Area. Overall, the labor force was stable from 2010 to 2014, but experienced a slight decrease from 2018 to 2021.

Table 1-6 Labor Force Averages: Gila Co., Pinal Co., and Towns in Hayden SO_2 NAA (2018 – 2021)

Employment Status	2018	2019	2020	2021
Gila County				
Civilian Labor Force	21,396	21,410	21,008	20,673
Total Employment	20,150	20,191	19,387	19,485
Total Unemployment	1,246	1,219	1,621	1,188
Unemployment Rate	5.8%	5.7%	7.7%	5.7%
Pinal County				
Civilian Labor Force	180,081	189,834	191,074	195,251
Total Employment	171,088	180,277	176,674	184,680
Total Unemployment	8,993	9,557	14,400	10,571
Unemployment Rate	5.0%	5.0%	7.5%	5.4%
Hayden				
Civilian Labor Force	196	196	196	189
Total Employment	175	175	168	169
Total Unemployment	21	21	28	21
Unemployment Rate	10.7%	10.7%	14.3%	10.8%
Kearny				
Civilian Labor Force	1,030	1,086	1,090	1,117
Total Employment	983	1,036	1,015	1,167
Total Unemployment	47	50	75	55
Unemployment Rate	4.6%	4.6%	6.9%	5.0%

[41] *Id.*
[42] *Id.*
[43] Asarco – Grupo Mexico (2015, November 3). Retrieved from https://www.asarco.com/purpose/

Winkelman				
Civilian Labor Force	119	120	121	115
Total Employment	103	104	100	100
Total Unemployment	16	16	21	15
Unemployment Rate	13.4%	13.3%	17.4%	13.1%
Source: Arizona Commerce Authority. Retrieved from https://www.azcommerce.com/oeo/labor-market/data-access/				

Table 1-7 and Table 1-8 show the employment data, expressed as percentages of total non-farm employees, for Pinal and Gila Counties. In Gila County, mining is among the top four employment sectors. Natural resources (forestry, fishing, hunting), recreation, healthcare, and government are also in the top sectors.

Table 1-7 Gila County Civilian Employed Population 16 Years and Over (2019 U.S. Census Bureau)

Industry	Population	Percentage
Agriculture, forestry, fishing and hunting, and mining	1,577	8.2%
Construction	1,530	7.9%
Manufacturing	530	2.8%
Wholesale trade	232	1.2%
Retail trade	2,151	11.2%
Transportation and warehousing, and utilities	1,025	5.3%
Information	196	1.0%
Finance and insurance, and real estate and rental and leasing	850	4.4%
Professional, scientific, and management, and administrative and waste management services	1,160	6.0%
Educational services, and health care and social assistance	5,159	26.8%
Arts, entertainment, and recreation, and accommodation and food services	2,627	13.6%
Other services, except public administration	663	3.4%
Public administration	1,546	8.0%
Total	19,246	-
Source: U.S. Census Bureau, 2019. American Community Survey[44]		

Table 1-8 Pinal County Civilian Employed Population 16 Years and Over – 2019 U.S. Census Bureau

[44] 2019 American Community Survey 1-Year Estimates - Selected Economic Characteristics, https://data.census.gov/cedsci/table?q=DP03&g=0500000US04007,04021.

Industry	Population	Percentage
Agriculture, forestry, fishing and hunting, and mining	4,666	2.6%
Construction	15,154	8.5%
Manufacturing	9,493	7.9%
Wholesale trade	2,455	2.0%
Retail trade	15,497	8.7%
Transportation and warehousing, and utilities	10,402	5.8%
Information	2,422	1.4%
Finance and insurance, and real estate and rental and leasing	15,200	8.5%
Professional, scientific, and management, and administrative and waste management services	18,939	10.6%
Educational services, and health care and social assistance	34,377	19.2%
Arts, entertainment, and recreation, and accommodation and food services	14,673	8.2%
Other services, except public administration	8,210	4.6%
Public administration	13,876	7.8%
Total	165,364	-
Source: U.S. Census Bureau, 2019. American Community Survey[45]		

1.7 General SIP Approach – Statutory Requirements and Guidance

In November 1990, the United States Congress enacted a series of amendments to the CAA (CAAA). The revisions expanded and clarified planning provisions for areas not currently meeting the NAAQS.[46] The CAA, as amended, identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and attainment of the NAAQS, and incorporates more stringent sanctions for failure to attain or to meet interim milestones.

First, this section presents the relevant statutory requirements. Second, this section discusses the EPA's regulations that are required for this SIP revision. Third, this section discusses EPA's guidance for the 2010 SO_2 NAAQS.

[45] 2019 American Community Survey 1-Year Estimates - Selected Economic Characteristics. Retrieved from https://data.census.gov/cedsci/table?q=DP03&g=0500000US04007

[46] Clean Air Act Amendments of 1990, Pub. L. 101-549, 104 Stat. 2399 (1990).

1.7.1 CAA Requirements

Table 1-8 lists the CAA requirements and explains how the demonstrations contained in this document satisfy those obligations. The general planning and control requirements for nonattainment area plans are found in CAA sections 110, 172, and 176.

Table 1-9 Clean Air Act Regulatory Requirements for SO_2 Nonattainment SIPs

CAA Citation	Action to Meet Requirement	Location in SIP
CAA Title I – Air Pollution Prevention and Control; Part A – Air Quality and Emissions Limitations; Section 110 – Implementation Plans		
110(a)(2)	Clean Air Act section 110(a)(1) requires states to submit SIP revisions within three years following the promulgation of a new or revised NAAQS to provide for implementation and enforcement of such standards. Each of these SIPs must address certain basic elements or the "infrastructure" of its air quality management programs under CAA section 110(a)(2). These elements, detailed in CAA sections 110(a)(2)(A) through (M), include but are not limited to, provisions for monitoring, modeling, legal authority, and adequate resources designed to assure attainment and maintenance of the NAAQS. On July 23, 2013 ADEQ submitted to EPA the Arizona State Implementation Plan Revision under Clean Air Act Section 110(a)(1) and (2): Implementation of the 2010 Sulfur Dioxide National Ambient Air Quality Standard.	No additional location in document.
110(l)	"Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act." This SIP includes a discussion on anti-backsliding provisions to ensure that no other NAAQS will be inferred with.	Chapter 9
CAA Title I – Air Pollution Prevention and Control; Part D – Plan Requirements for Nonattainment Areas; Subpart 1 – Nonattainment Areas in General; Section 172. Nonattainment Plan Provisions in General; Subsection 172(c) Nonattainment Plan Provisions		
172(c)(1) – In General	"Such plan provisions shall provide for the implementation of all reasonably available control measures [RACM] as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology [RACT]) and shall provide for attainment of the national primary ambient air quality standards." U.S. EPA Guidance for 1-Hour SO_2 Nonattainment Area SIP Submission published on April 23, 2014 indicates that RACM/RACT may be satisfied through implementation of control measures that will bring the area into attainment. These measures include but are not limited to national	Chapter 4

CAA Citation	Action to Meet Requirement	Location in SIP
	and regional measures as well as facility level control. This SIP submission describes the control measure(s) that will reduce SO_2 emissions from the Hayden Copper Smelter, which include process and equipment upgrades.	
172(c)(2) – RFP [Reasonable Further Progress]	"Such plan provisions shall require reasonable further progress" defined in CAA Sec. 171(1) as "…such annual incremental reductions in emissions of the relevant air pollutant as are required… for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." The "*Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions*", describes reasonable further progress (RFP) as adherence to an ambitious compliance schedule. This submittal describes the compliance milestones and dates for implementation of the control measures at the Hayden Smelter.	Chapter 5
172(c)(3) – Inventory [Emissions]	"Such plan provisions shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area, including such periodic revisions as the Administrator may determine necessary to assure that the requirements of this part are met." ADEQ maintains a historical and current database of actual emissions from State permitted point and area sources. All nonpermitted source emissions data (i.e.: mobile sources) are obtained from EPA's national emissions inventory. Base-year (2011) and projected emissions (2018) are provided in the emissions inventory chapter and the Technical Support Document.	Chapter 3
172(c)(4) – Identification and Quantification	"Such plan provisions shall expressly identify and quantify the emissions, if any, of any such pollutant or pollutants which will be allowed, in accordance with Section 173(a)(1)(B), from the construction and operation of major new or modified stationary sources in each such area. The plan shall demonstrate to the satisfaction of the Administrator that the emissions quantified for this purpose will be consistent with the achievement of reasonable further progress and will not interfere with attainment of the applicable national ambient air quality standard by the applicable attainment date." The permit program requirements of CAA Section 173(a)(1)(B) are applicable to sources located in a "targeted economic development zone" as determined by the Administrator under consultation with the Secretary of Housing and Urban Development. No such zones are currently known to exist within the Hayden SO_2 Nonattainment Area.	No additional location in document.

CAA Citation	Action to Meet Requirement	Location in SIP
172(c)(5) – Permits for New and Modified Major Stationary Sources	"Such plan provisions shall require permits for the construction and operation of new or modified major stationary sources anywhere in the nonattainment area, in accordance with section 173." Arizona Revised Statutes Title 49, Chapter 3, Articles 1, 2, and 3 establish ADEQ and local agency authority for preconstruction review and permitting. Under the air permits program, sources that emit regulated pollutants are required to obtain a permit before constructing, changing, replacing, or operating any equipment or process which may cause air pollution. This includes equipment designed to reduce air pollution. Permits are also required if an existing facility that causes air pollution transfers ownership, relocates, or otherwise changes operations. Per the authority noted above, all new sources and modifications to existing sources in Arizona are subject to state requirements for preconstruction review and permitting pursuant to Arizona Administrative Code (AAC), Title 18, Chapter 2, Articles 2, 3, and 4 or relevant county rules. All new major sources and major modifications to existing major sources in Arizona are also subject to the nonattainment New Source Review (NSR) provisions of these rules or Prevention of Significant Deterioration (PSD) for attainment areas. On June 16, 2021, EPA finalized an approval of ADEQ's NSR rules. 86 FR 31,927 (June 16, 2021). With this action, ADEQ has a fully approved NSR/PSD requirements of CAA § 110(a)(2)(C) and 40 C.F.R. Part 51, Subpart I, that applies to the Hayden SO2 nonattainment area, with the exception of the requirements pertaining to greenhouse gases (GHGs). ADEQ is currently administering the NSR requirements for GHGs under a delegation agreement with EPA.	Chapter 8
172(c)(6) – Other Measures	"Such plan provisions shall include enforceable emissions limitations, and such other control measures, means or techniques …, as well as schedules and timetables for compliance, as may be necessary or appropriate to provide for attainment of such standard in such area by the applicable attainment date specified in this part." The requirements of this section are met through the implementation of the control strategy that will result in the attainment of the 2010 SO_2 NAAQS.	Chapter 4
172(c)(7) – Compliance with Section 110(a)(2)	"Such plan provisions shall also meet the applicable provisions of Section 110(a)(2)." The requirements of Section 110(a)(2) are detailed elsewhere in this Table.	No additional location in document.
172(c)(8) – Equivalent Techniques	"Upon application by any State, the Administrator may allow the use of equivalent modeling, emission inventory, and planning procedures, unless the Administrator determines that the proposed techniques are, in the aggregate, less effective than the methods specified by the Administrator." This document contains a discussion of the equivalent modeling technique employed for the attainment demonstration.	Chapter 5 and Appendix C

CAA Citation	Action to Meet Requirement	Location in SIP
172(c)(9) – Contingency Measures	"Such plan shall provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date applicable under this part. Such measures shall be included in the plan revision as contingency measures to take effect in any such case without further action by the State or the Administrator." The "*Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions*", indicates that EPA considers contingency measures for SO_2 nonattainment areas as air agencies having programs to identify sources of violations of the SO_2 NAAQS and follow-up for compliance and enforcement.	Chapter 6
CAA Title I – Air Pollution Prevention and Control; Part D – Plan Requirements for Nonattainment Areas; Subpart 1 – Nonattainment Areas in General; Section 176. Limitations on Certain Federal Assistance		
176(c) – [Transportation Conformity]	"Transportation conformity is required under Clean Air Act section 176(c) (42 U.S.C. 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with ("conform to") the air quality goals established by a state air quality implementation plan (SIP). Conformity, to the purpose of the SIP, means that proposed transportation activities will not: 1) cause new air quality violations, 2) worsen existing violations, or 3) delay timely attainment of the national ambient air quality standards [including any required interim emission reductions or milestones]." As stated in 40 CFR § 93.153(b), "Conformity determinations for federal actions related to transportation plans, programs and projects developed, funded, or approved under Title 23 U.S.C. or the Federal Transit Act (40 U.S.C. § 1601 et seq.) must meet the procedures and criteria of 40 CFR Part 51, subpart T, in lieu of the procedures set forth in this subpart." Title 40 CFR § 93.102(b) waives transportation conformity for SO_2 nonattainment and maintenance areas.	Chapter 7

CAA Citation	Action to Meet Requirement	Location in SIP
176(c) – [General Conformity]	Similar to Transportation Conformity, which applies to highways and mass transit projects, General Conformity is applicable to all other federally supported activities to ensure that the actions taken by federal agencies in nonattainment and maintenance areas do not interfere with a state's plans to meet national air quality standards. General conformity for the Hayden SO_2 Planning Area must be addressed to assure SO_2 emissions from any federal actions or plans do not exceed the rates outlined in 40 CFR § 93.153(b) (see 58 FR 63253; November 30, 1993). Criteria for making determinations and provisions for general conformity are located in R18-2-1438 of the Arizona Administrative Code. There are no known federal plans or actions affecting air quality currently in the Hayden area nor are any foreseen through the year 2026. ADEQ commits to review and comment, as appropriate, on any federal agency draft general conformity determination it receives pursuant to 40 CFR § 93.155 for activities planned for this air quality planning area.	Chapter 7
192 – Attainment Dates	*"Implementation plans for nonattainment areas for sulfur oxides or nitrogen dioxide with plans that were approved by the Administrator before November 15, 1990, but, subsequent to such approval, were found by the Administrator to be substantially inadequate, shall provide for attainment of the relevant primary standard within 5 years from the date of such finding."*	No additional location in document.

1.7.2 Compliance with other Federal Regulations

Title 40 of the Code of Federal Regulations (CFR) contains additional provisions for implementation of the NAAQS and development of state implementation plans. Table 1-10 lists applicable CFR sections for the Hayden SO_2 Nonattainment Area SIP. Sections other than those listed below may also apply.

Table 1-10 Code of Federal Regulation Requirements for the Hayden SO_2 Nonattainment Area SIP

40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards	
§§ 50.1-50.18	National primary and secondary ambient air quality standards under section 109 of the Clean Air Act are set forth in this part. Requirements include provisions for revocation of old standards, monitoring methods, interpretation of ambient data, and treatment of air quality monitoring data influenced by exceptional events. Applicable requirements include 50.1 through 50.4.
40 CFR Part 51, Requirements for Preparation, Adoption, and Submittal of Implementation Plans	
Subpart F - Procedural Requirements	
§§ 51.100 - 51.105	Requirements include (but are not limited to) provisions for: • Definitions (RACT, Compliance schedule, etc.) • Public hearings (requires 30 day notice, availability of plan in affected area, etc.) • Procedures for revision, submission, and approval of plans • Applicable requirements include 51.100 – 51.105
Subpart G - Control Strategy	
§§ 51.110 – 51.126	Requirements include (but are not limited to) provisions for: • Summary of ambient data in plan • Demonstration of adequacy of control measures (modeling) • Written approval for alternative models/attainment demonstration • Expected emissions reductions following application of controls • Expected ambient concentrations following application of controls • Data availability • Stack height provisions • Intermittent control systems • Enforcement and compliance • Applicable requirements include 51.110 – 116, and 118.
Subpart J – Ambient Air Quality Surveillance	
§ 51.190	References subpart C of part 58 for ambient air quality monitoring requirements.
Subpart K – Source Surveillance	

40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards	
§§ 51.210 - 214	Includes requirements regarding: • Emission reports and recordkeeping • Testing, inspection, enforcement, and complaints • Transportation control measures • Continuous emission monitoring • Applicable requirements include 51.210 – 212, and 214.
Subpart O – Miscellaneous Plan Content Requirements	
§§ 51.280 - 286	Includes requirements for: • Resources available for implementing the plan • Control measures adopted as rules and regulations
Subpart Q – Reports	
§§ 51.320 – 327	Includes requirements regarding: • Annual air quality data reporting • Annual source emissions reporting • Progress in plan enforcement
Subpart W – Determining Conformity of General Federal Actions to State or Federal Implementation Plans	
§§ 51.850 - 851	Contains provisions for assessing the conformity [“General Conformity”] of Federal actions to the applicable implementation plan, consistent with this section and 40 CFR part 93, subpart B as required by section 176(c) of the CAA (42 U.S.C. 7506).
Appendices to 40 CFR Part 51 (Appendices other than those listed may apply.)	
Appendix V to Part 51 – Criteria for Determining the Completeness Of Plan Submissions	“… Appendix V sets forth the minimum criteria for determining whether a State implementation plan submitted for consideration by EPA is an official submission for purposes of review under § 51.103.”
Appendix W to Part 51 – Guideline on Air Quality Models	“The Guideline provides a common basis for estimating the air quality concentrations of criteria pollutants used in assessing control strategies and developing emission limits.”
40 CFR Part 60, Standards of Performance for New Stationary Sources	
Subpart P – Standards of Performance for Primary Copper Smelters	
§§ 60.160 - 166	Includes requirements regarding: • Applicability and designation • Standard for SO_2 • Monitoring • Test methods
40 CFR Part 63, National Emissions Standards for Hazardous Air Pollutants (NESHAPS) for Source Categories	
Subpart QQQ/EEEEEE– NESHAPS for Primary Copper Smelting	

40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards	
§§ 63.1440 – 1459 §§ 63.2330 – 2406	Includes requirements regarding: • Emissions limitations • Work practice standards • Operations and maintenance requirements • Compliance requirements • Notifications, reports, and records

1.7.3 EPA Guidance

Effective October 4, 2013, EPA designated 29 areas within the country as nonattainment for the 2010 SO_2 NAAQS.[47] On April 23, 2014 EPA issued the *Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions.* This document provides guidance for SIP development to state, local, and tribal governments for areas designated as nonattainment for the 2010 SO_2 primary NAAQS.

[47] 78 FR 47,191 (Aug. 5, 2013).

2 Ambient Air Quality Monitoring

Arizona's ambient monitoring network consists of state and local stations designed to sample air pollutants in a variety of representative settings. Collected data are quality assured and reported to EPA's Air Quality System (AQS) for comparison to the NAAQS. Individual monitoring sites are combined into networks operated by a number of government agencies and regulated entities.

Protocols for SO_2 monitoring are established by EPA in the following sections of the CFR:

- 40 CFR Part 50, Appendix T;
- 40 CFR Part 51, Subpart K;
- 40 CFR Part 53, Subparts A, B, and C; and
- 40 CFR Part 58 and Appendices A, C, D, and E.

The primary goal of the monitoring network in Hayden SO_2 Nonattainment Area is to collect ambient data necessary to determine compliance with the air quality standards and fulfill regulatory requirements for SO_2 monitoring in the nonattainment area. This chapter provides a general description of monitoring sites, equipment, and NAAQS compliance in the Hayden SO_2 Nonattainment Area.

2.1 Hayden SO_2 Air Quality Monitoring Network

The State of Arizona established air quality monitoring sites in the Hayden area during 1970.[48] ASARCO began continuous ambient SO_2 air quality monitoring in the Hayden area in 1974. This monitoring network was established to provide spatial and temporal coverage to evaluate the ambient impact of smelter emissions. During this time period, the network included EPA, State of Arizona, and facility operated monitors that were used to identify maximum ambient impact areas using diffusion modeling, monitored atmospheric dispersion parameters, citizen observations, and ambient SO_2 monitoring.

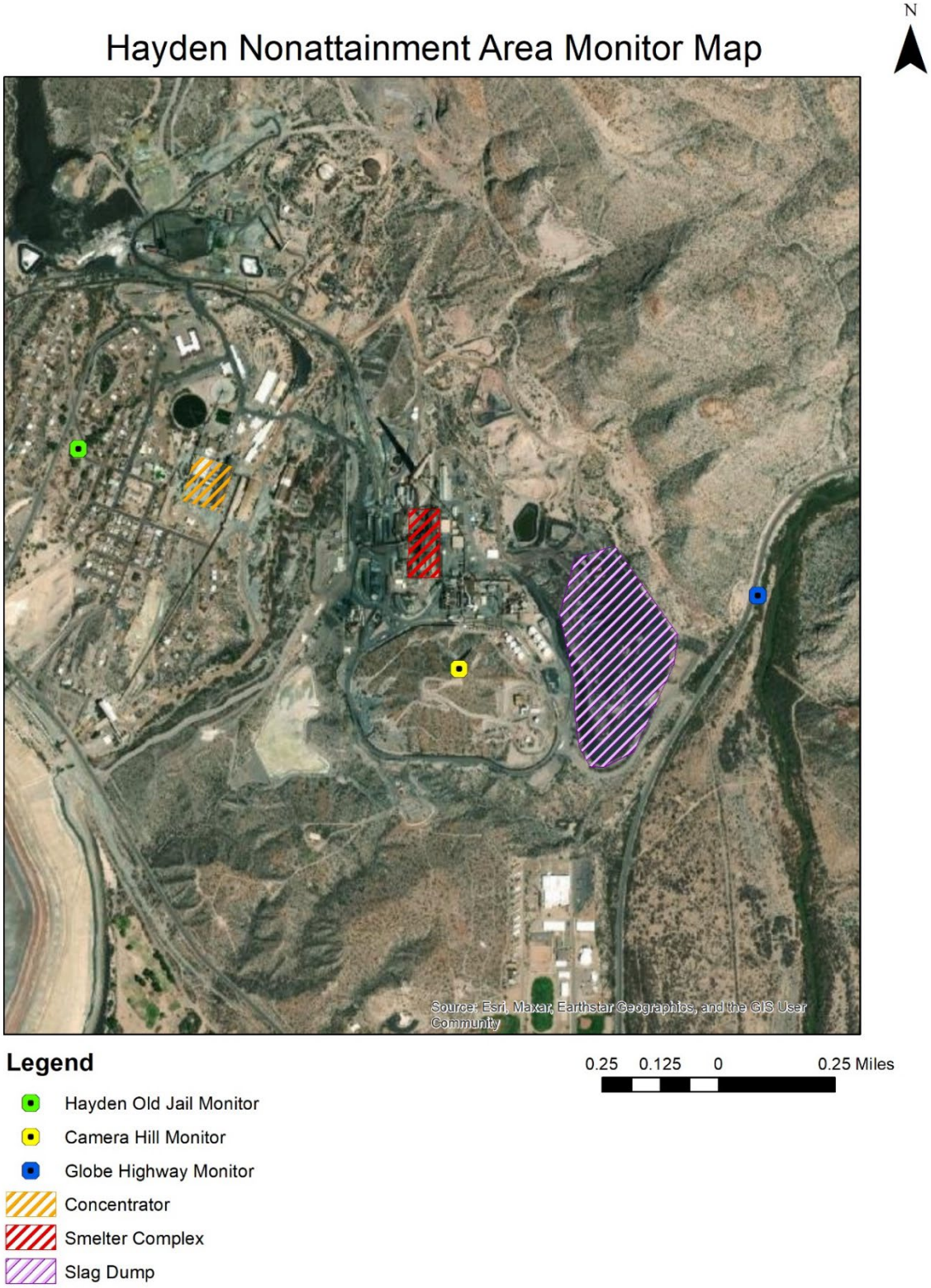
Currently, the Hayden SO_2 NAA includes two networks of monitors: one maintained by ADEQ and the other by ASARCO. The monitor at the Hayden Old Jail site is maintained by ADEQ and is the only AQS certified State and Local Air Monitoring Site (SLAMS) monitor in the Hayden area. Data from the ADEQ's Hayden Old Jail monitor was used as the basis for the nonattainment designation for the Hayden area. The monitoring data from the Old Jail is quality assured and quality controlled and is used for comparison to the NAAQS. The remaining SO_2 monitors in the Hayden SO_2 NAA (Garfield, Montgomery Ranch, Hayden Junction, and Globe Highway) are maintained by ASARCO for permit compliance and to support SIP requirements. Figure 2-1 shows the locations of the SO_2 monitors in the nonattainment area. Table 2-1 provides a listing of the monitors (facility-run and ADEQ operated) in the SO_2 network in the Hayden nonattainment area.

[48] Arizona State Department of Health, Environmental Health Services, Division of Air Pollution Control. (1974). Sulfur Dioxide Monitoring Network Study.

Table 2-1 Hayden SO_2 NAA Monitoring Network

Site	Operator/Network	Latitude	Longitude	Location Description
Hayden Old Jail (AQS ID 04-007-1001)	ADEQ/SLAMS	33.006179	-110.785797	This monitor is located adjacent to the abandoned Hayden Jail, within a relatively low topographic area adjacent to the Kennecott Avenue Wash in the town of Hayden. Residential property is located nearby to the East, North, and West. Active portions of the concentrator operations are located about 900 feet to the east.
Garfield Avenue	ASARCO/ Source	33.00255	-110.78471	Located close to the ambient air boundary and confirmed by modeling to be one of the monitors impacted primarily by fugitive SO2 emissions.
Globe Highway	ASARCO/ Met	33.00251	-110.76545	Located close to the ambient air boundary and confirmed by modeling to be one of the monitors impacted primarily by fugitive SO2 emissions.
Hayden Junction	ASARCO/Met	33.01125	-110.81135	Located further from the smelter and the town of Hayden than the other monitors. This monitor is not situated in an area heavily impacted by main stack emissions.
Hayden Old Jail	ASARCO/ Source	33.00621	-110.78645	Located close to the ambient air boundary and confirmed by modeling to be one of the monitors impacted primarily by fugitive SO2 emissions.
Montgomery Ranch	ASARCO/Met	33.02898	-110.81026	Located further from the smelter and the town of Hayden than the other monitors. This monitor is not situated in an area heavily impacted by main stack emissions.

Figure 2-1 Hayden SO_2 Nonattainment Area Monitor Locations



Source: Arizona Department of Environmental Quality

2.2 1-Hour SO_2 NAAQS Compliance

The CAA requires EPA to set national air quality standards for SO_2 and other pollutants considered harmful to public health and the environment. EPA is also required to periodically review and update those standards to ensure they provide adequate public health (primary standards) and environmental (secondary standards) protection.[49] In 2010, EPA revised the health-based NAAQS for SO_2 to a 1-hour standard of 75 parts per billion (ppb). The form of the standard was also revised to a three-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

Along with the new standard, EPA revised the data reporting requirements to include 1-hour average SO_2 concentrations and the maximum five-minute block average SO_2 concentration of each hour. EPA also issued new requirements for placement of monitors. These new monitoring requirements did not result in any SO_2 network changes for the Hayden nonattainment area.

2.3 SO_2 Data Summary

The data obtained from the Hayden Old Jail monitor is used to compare to the NAAQS because it meets the applicable requirements. A review of the SO_2 monitoring data in the Hayden nonattainment area verifies that SO_2 concentrations have exceeded the NAAQS each year since promulgation of the 2010 SO_2 standard.

Table 2-2 provides the maximum 1-hour average concentration and the 99th percentile of the annual distribution of daily maximum 1-hour average ambient SO_2 concentrations that occurred from 2016 to 2019. The highest maximum 1-hour concentration during this time period was at 359 ppb in 2016 and the highest annual 99th percentile 1-hour concentration was 947 ppb in 2016.

Table 2-2 Max Value and 99th Percentile SO_2 in Parts Per Billion (ppb), Hayden Old Jail

Year	Max 1-Hour Value	99th Percentile
2016	359	947
2017	280	450
2018	208	265
2019	191	273
Source: U.S. EPA, Air Quality System (AQS)		

The data collected from the monitors are used to calculate the design value for a given monitoring site. The one-hour SO_2 design value is the three-year average of the 99th percentile of the annual distribution of daily maximum one-hour average concentrations. Table 2-3 shows the three-year average design values for the Hayden Old Jail monitor from 2014 through 2021. As of January 31, 2022, EPA determined that the area had failed to attain the 2010 SO_2 NAAQS. The highest design value (295 ppb) occurred during the three-year period of 2015-2017 at the Hayden Old Jail (Table 2-3).

[49] CAA § 109(d).

Table 2-3 Hayden SO_2 Nonattainment Area Design Values 2014-2021 (ppb)

Monitor	2014-2016	2015-2017	2016-2018	2017-2019	2018-2020	2019-2021
Hayden Old Jail	280	295	282	226	134	65
Source: U.S. EPA, Air Quality System (AQS)						

3 Emissions Inventory

Section 172(c)(3) of the CAA requires nonattainment area plans include an emissions inventory from all significant sources within a planning area.

> *"Such plan provisions shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area, including such periodic revisions as the Administrator may determine necessary to assure that the requirements of this part are met." Clean Air Act § 172(c)(3) – Inventory [Emissions]*

The emissions inventory for point, area, and mobile sources of SO_2 in the Hayden NAA are presented in this chapter.

ADEQ employed a multi-method approach to compile the base year and projected attainment year inventories. ADEQ took a bottom up approach to determine the point source emissions in the Hayden NAA as the Agency expected these emissions to comprise the majority of the base year inventory. ADEQ used local and state-level permit data and surveys to estimate emissions for stationary point sources in both the Hayden NAA and the 50km buffer extending from the Hayden NAA boundary. ADEQ derived the applicable non-point sources from the 2017 National Emissions Inventory (NEI). Mobile emissions, including on-road and nonroad emissions, were obtained and projected using the Motor Vehicle Emissions Simulator 3 (MOVES3) model. ADEQ allocated these data to the Hayden NAA based on various methodologies, which are explained in greater detail in the *Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Technical Support Document* (Hayden EI TSD).

3.1 2017 Base Year Emissions Inventory

ADEQ identified the sources of SO_2 emissions within the Hayden SO_2 NAA, as well as the 50-kilometer (km) buffer zone. Figure 3-1 is a geographical representation of the location of these sources. Emissions inventories for the nonattainment area demonstrate that, although there are other sources of SO_2 emissions, the Asarco copper smelter is the primary source of SO_2 emissions, comprising 97.4% of actual and 84.8% of potential SO_2 emissions within the NAA. Of the three largest point sources located within both the Hayden SO_2 NAA and 50km buffer zone, the Asarco smelter accounted for 83.7% of actual and 73.6% of potential SO_2 emissions. The data show that no other point, area, or mobile sources contribute the same levels of SO_2 emissions in the Hayden Nonattainment Area as those attributed to the smelter.

Table 3-1 summarizes the broad approaches used to estimate SO_2 emissions in the Hayden NAA. ADEQ used a bottom-up approach to determining point source emissions in the Hayden NAA because these emissions were expected to comprise the majority of the base year inventory. Local and state-level permit data and surveys were used to estimate emissions for stationary point sources in both the Hayden NAA and a 50km buffer extending from the boundary of the NAA. ADEQ derived the remaining portions of the inventory from national level data obtained from the 2017 NEI. ADEQ allocated these data to the Hayden NAA based on various methodologies, which are explained in greater detail in the EI TSD.

Table 3-1 Emission Inventory Source Category, Approach and Data Source

Emission Inventory Source Category	Inventory Estimation Approach	Primary Data Sources
Point	Bottom-Up	Permit, Annual Emission Inventory Questionnaires
Nonpoint	Top-Down	2017 NEI
Mobile On-road	Top-Down	MOVES3
Mobile Non-road	Top-Down	MOVES3

3.2 Point Sources

For the purposes of the EI, major point sources are defined as stationary emissions sources that emit or have a potential to emit (PTE) greater than 100 tons per year (tpy) of SO_2 into the atmosphere. However, other permitted point sources that report SO_2 emissions greater than 0.1 ton and do not meet this emission threshold for SO_2 were still included in the inventory. ADEQ used the 2017 NEI as the basis for the point source emission inventory analysis. ADEQ chose to inventory the sources within the 50km buffer zone surrounding the Hayden SO_2 NAA as sources emitting more than 100 tpy might be significant enough that they to contribute to exceedances and violations of the monitor within the Hayden SO_2 NAA. Figure 3-1 shows the location of the point sources in the nonattainment area and the 50km buffer zone. Table 3-2 provides a listing of the sources in the nonattainment area and the buffer zone.

Figure 3-1 Hayden SO_2 NAA Point Source Map (2017 AEI)

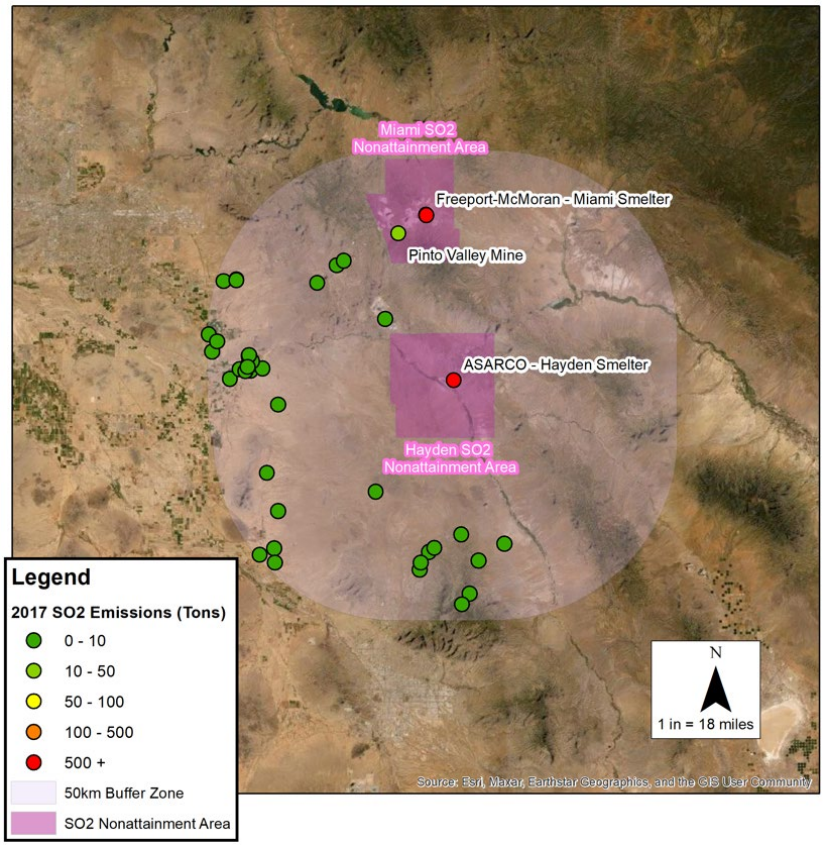


Table 3-2 Point Sources in Hayden SO_2 NAA & 50-km Buffer Zone (2017 AEI)

Hayden SO_2 NAA				
Facility	**Facility Type**	**Latitude**	**Longitude**	**2017 SO_2 Emissions (Tons)**
ASARCO Smelter	Copper Smelter	33.003378	-110.77632	20,498.8
50km Buffer Zone				
Facility	**Facility Type**	**Latitude**	**Longitude**	**2017 SO_2 Emissions (Tons)**
Calcium Carbonate Plant	Calcium Carbonate Manufacturer	33.288	-111.121	0.007
Tom Mix Compressor Station	Compressor Station	32.728	-111.006	1.52
Arizona Correctional Industries - Florence	Correctional Facility	33.027	-111.374	0.006
Biosphere 2	Research Facility	32.57861	-110.85056	0.02
Bonito Quarry	Sand and Gravel	32.55759	-110.70561	2.23
Cactus Landfill	Landfill	32.774	-111.324	0.69
Central Arizona Florence Correctional Complex	Correctional Facility	33.043	-111.371	0.09
Central Arizona Florence Correctional Complex	Correctional Facility	33.04417	-111.37916	0.12
Central AZ Correctional Fac. and ASP Florence West	Correctional Facility	33.03847	-111.37654	0.299
Cox Communications Pinal STC	Telecommunication	33.11643	-111.49666	0.00
Decorative Rock Sales L.L.C.	Sand and Gravel	32.589	-110.834	0.003
Durham Regional Landfill	Landfill	32.67992	-111.29127	0.56
EPCOR San Tan District - Anthem WRF	Wastewater Treatment Plant	32.94345	-111.29231	0.004
Eyman Complex	Prison	33.033	-111.338	0.25
Florence Hospital	Hospital	33.07368	-111.48685	0.197
Florence Plant	Asphalt Plant	33.05	-111.37	8.49
Freeport-McMoRan - Miami Mine	Mine	33.413889	-110.856944	0.27

Hayden SO_2 NAA				
Freeport-McMoRan - Miami Smelter	Copper Smelter	33.412655	-110.856538	648.69
Gft 2	Asphalt Plant	33.24795	-111.45364	Permitted in 2021
ICE - Florence Detention Center	Detention Facility	33.06385	-111.37891	0.4
Ironwood MSW Landfill	Landfill	33.007	-111.434	0.011
Oracle Compressor Station	Compressor Station	32.6228	-110.756	1.20
Oracle Ridge Mine	Mine	32.475599	-110.73166	0.06
Pinto Valley Mine	Mine	33.367223	-110.938611	49.29
Queen Creek Aggregate Processing & Hot Mix Asphalt	Asphalt Plant	33.09873	-111.47251	2.73
Queen Creek Pit	Sand and Gravel	33.25333	-111.41613	0.13
Queen Creek Plant	Asphalt Plant	33.251	-111.416	8.31
Ray Complex	Copper Mine	33.0018	-110.778	7.57
Red Rock Pumping Plant	Emergency Generator	32.5877	-111.30290	0.0
Red Rock Water Reclamation Facility	Wastewater Treatment Plant	32.57178	-111.34410	0.01
Resolution Copper Mining	Copper Mine	33.29989	-111.09928	0.65
SaddleBrooke One	Country Club	32.53425	-110.87770	0.002
Saddlebrooke Wastewater Treatment Plant	Wastewater Treatment Plant	32.55227	-110.87450	0.004
Saguaro Power Plant	Power Plant	32.5517	-111.3	0.22
San Manuel Schools	School	32.59861	-110.62944	0.001
Sarita Aerial Contractors	Airport	32.9356	-111.485	N/A
South Plant	Emergency Generator	33.03041	-111.40492	0.07
Superior Transfer Station	Transfer Station	33.24456	-111.17783	0.095
Trico Electric Cooperative	Electricity	32.449229	-110.754186	2.19
Town of Florence Well Site #1	Emergency Generator	33.06523	-111.37860	0.008
Town of Florence Well Site #5	Emergency Generator	33.02674	-111.38868	0.017
Town of Florence Well Site 3B	Emergency Generator	33.03594	-111.38259	0.004

Hayden SO_2 NAA
Source: Arizona Department of Environmental Quality (2022 Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix Emission B).

Examination of the sources in the area reveals that there are four major point sources, two located within the Hayden SO_2 NAA and two located within the 50-km buffer zone outside of the NAA (Table 3-3). The inventory shows that the Hayden Smelter is the primary source of SO_2 emissions in the nonattainment area. The Hayden smelter accounted for approximately 99.97% of SO_2 emissions in the NAA and 83.9% to the 50 km buffer zone in the base year 2017.[50]

The Freeport McMoRan Miami copper smelter and the Pinto Valley Mine are the two major sources located within the 50km buffer zone. Of these two sources, the Miami Smelter accounts for the majority of the emissions in the buffer zone (Table 3-3). Table 3-3 also provides the potential to emit and the annual SO_2 emissions for years 2016 through 2021 for the four major sources located in the nonattainment area and buffer zone.

Table 3-3 Major Point Source Emission Inventory in the Hayden SO_2 NAA & 50-km Buffer Zone

Major Point Source Emission Inventory							
Source	Actual SO_2 Emissions (Tons)						Facility SO_2 PTE[51] (tpy)
	2016	2017	2018	2019	2020	2021	
Hayden SO_2 NAA							
ASARCO LLC Hayden Smelter	18,987.9	20,498.8	7,999.7	2,018.9	0.03	0.02	2,524.1
50km Buffer Zone							
Freeport McMoRan Miami Smelter	4,121.7	3,930.3	232.5	337.9	329.1	266.1	648.7
Pinto Valley Mine	15.6	15.8	23.3	7.8	14.7	18.3	49.3
Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B)							

Of the two major point sources located within the Hayden SO_2 NAA, the ASARCO smelter accounted for 97.4% of actual and 84.8% of potential SO_2 emissions. Of the three largest point sources located within both the Hayden SO_2 NAA and 50km buffer zone, the ASARCO smelter accounted for 83.7% of actual and 73.6% of potential SO_2 emissions.

[50] Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area, (Appendix B) Section 1.2.

[51] Facility PTE is the maximum capacity of a stationary source to emit under its physical and operational design, including control devices or limits. 40 CFR § 63.2 "Potential to emit".

3.3 Nonpoint (Area) Sources

ADEQ based its nonpoint EI on data from the 2017 NEI by sector category. There are six primary categories of nonpoint sources that contribute to SO_2 emissions in Gila and Pinal County (Table 3-4) where the nonattainment area is located. The main source categories are fires, fuel combustion, industrial processes, non-industrial NEC (not elsewhere classified), solvents, and waste disposal.

Table 3-4 2017 Gila and Pinal County Nonpoint Source Emission Inventory

EI Sector	Gila County SO_2 (tons)	Pinal County SO_2 (tons)
Fires (agricultural, prescribed, wildfire)	302.29	7.36
Fuel Combustion (commercial/institutional)	0.06	5.82
Fuel Combustion (electric generation)	0.3	4.46
Fuel Combustion (industrial)	2.73	5.99
Fuel Combustion (residential)	0.64	2.54
Industrial Processes	0.13	23.57
Miscellaneous Non-Industrial NEC	0.001	0.02
Solvent - Industrial Surface Coating & Solvent Use	0.00	0.02
Waste Disposal	2.07	11.18
Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B).		

Land and population allocation methodologies were used to determine the SO_2 emissions from Gila and Pinal County in the Hayden NAA. For a detailed discussed of these methodologies, Appendix B. After allocating the emissions from each county, the main categories were fires and industrial processes (including mining) (Table 3-5).

Table 3-5 2017 Hayden SO_2 Nonattainment Nonpoint Source Emission Inventory

EI Sector	Pinal County NAA SO_2 (tons)	Gila County NAA SO_2 (tons)	Hayden SO_2 NAA Total
Fire – Agricultural Field Burning	0.1318	0.00063	0.13242
Fire – Prescribed	0.0562	0.53953	0.59573
Fire – Wildfire	0.10901	3.11558	3.22459
Fuel Combustion-Commercial/Institutional (biomass, natural gas, oil)	0.04695	0.0014	0.04835
Fuel Combustion-Electric Generation (natural gas, coal)	0.03599	0.00659	0.04258

EI Sector	Pinal County NAA SO_2 (tons)	Gila County NAA SO_2 (tons)	Hayden SO_2 NAA Total
Fuel Combustion-Industrial Boilers, Internal Combustion Engines (ICEs) (biomass, natural gas, oil)	0.04836	0.06002	0.10837
Fuel Combustion-Residential (natural gas, oil, other, wood)	0.02045	0.01407	0.03452
Industrial Processes	0.19006	0.00288	0.19294
Miscellaneous Non-Industrial NEC	0.00165	0.00101	0.00266
Solvent - Industrial Surface Coating & Solvent Use	0.00017	-	0.00017
Waste Disposal	0.09018	0.04545	0.13563
Total Nonpoint	**0.73082**	**3.78716**	**4.51798**

Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B).

As Table 3-5 shows, the primary source of nonpoint emissions is from fires, which includes agricultural, prescribed, and wildfire. Wildfires and prescribed burns are the lowest resolution of emissions in this category as they are localized and potentially unpredictable events, but are allocated to the NAA based on a simple land area allocation factor. There is the potential that no wildfires or prescribed burns are attributable to the Hayden SO_2 NAA, so ADEQ considers this a conservative estimate of emissions from this category. Total nonpoint SO_2 emissions for the 2017 base year in the nonattainment area were relatively small (5.089 tpy) when compared to the total emissions in Gila and Pinal Counties.

3.4 Mobile Sources

This section summarizes the mobile source emissions inventory. Mobile sources of SO_2 emissions include those from diesel and gasoline vehicles (both heavy and light duty), as well as aircraft and locomotives. The allocation methodologies used to estimate emissions were based on population and rail length, and are detailed in Appendix B.

On-Road Mobile Sources

The on-road emissions inventory for the Hayden NAA was developed using emissions estimates from the MOVES3 for each mobile source category within Gila and Pinal Counties. As Table 3-6 illustrates, on-road diesel and gasoline vehicles sources are primary contributors to SO_2 emissions in the nonattainment area. Total on-road emissions from diesel and gasoline vehicles within the nonattainment area are very small (0.201 tons).

Table 3-6 2017 Hayden SO_2 Nonattainment Mobile On-Road Emission Inventory

EI Sector	2017 Emissions (Ton)
Combination long-haul truck	0.0120

EI Sector	2017 Emissions (Ton)
Combination short-haul truck	0.0088
Light commercial truck	0.0078
Motor home	0.0013
Motorcycle	0.0012
Other buses	0.0008
Passenger car	0.0559
Passenger truck	0.1023
Refuse truck	0.0001
School bus	0.0007
Single unit long-haul truck	0.0065
Single unit short-haul truck	0.0035
Total	**0.2013**
Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B).	

Non-Road Mobile Sources

In the 2017 base Non-road mobile source emissions are primarily from aircraft, locomotives, diesel and gasoline non-road equipment as shown in Table 3-7.

Table 3-7 2017 Hayden SO_2 Nonattainment Mobile Non-Road Emissions Inventory

Non-Road Mobile	
Source	**2017 Emissions (ton)**
Agriculture	0.0000679
Airport Support	0.0000100
Commercial	0.0001025
Construction	0.0002699
Industrial	0.0000537
Lawn/Garden	0.0000763
Pleasure Craft	0.0002395
Railroad	0.0000008
Recreational	0.0003257
Non-Road Total	**0.0011**

3.5 Emissions Totals for All Sources

The 2017 base year emission inventory for point, non-point, and mobile sources shows that the ASARCO Smelter is the primary source of SO_2 emissions in the Hayden nonattainment area. Table 3-8 summarizes

the emissions in the Hayden NAA. As noted in Section 3.2, the Hayden Smelter accounts for over 99 percent of the SO_2 emissions in the nonattainment area. The only other large sources found within the 50km buffer zone are: the Miami Smelter and Pinto Valley Mine. These two points sources emit significantly less than the point source within the NAA, but still have the potential to impact the Hayden SO_2 NAA.[52]

Table 3-8 2017 Base Year Hayden SO_2 Nonattainment Area Emission Inventory Summary

Emission Inventory Source Category	Tons SO_2
Point Source – Asarco Smelter	20,498.80
50km Buffer Zone Point Source	3,982.26
Non-Point	5.09
On-Road Mobile	0.201
Non-Road Mobile	0.001
Total NAA Emissions	**20,504.09**
Total NAA & 50km Buffer Emissions	**24,486.352**
Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B).	

3.6 2026 Attainment Year Projected Emissions

ADEQ developed and used several growth factors to project SO_2 to the 2026 attainment year. Known regulations were used to develop control factors to determine how those regulations would influence future emissions. For additional details regarding the emissions methodologies, see Appendix B, Section 6, of the Emission Inventory TSD for the Hayden Sulfur Dioxide Nonattainment Area.

3.6.1 Point Sources – 2026 Attainment Year Projected Emissions

For point sources within the nonattainment area and the buffer zone, ADEQ examined if any current or expected permit revisions will affect the facility PTE or federally enforceable SO_2 emission limits. Table 3-9 provides the projected emissions from point sources in the nonattainment area as well as the 50 km buffer zone for 2026, compared to 2017. Table 3-9 shows emissions from the Hayden Smelter are projected to decrease by 2026.

ADEQ also projected that point source emissions in the buffer zone will decrease from the inventory base year as the Freeport Miami Smelter adds additional pollution controls.[53] The other facilities in the buffer zone do not currently have permits open for renewal or submitted to the agency for significant revisions. For this reason, ADEQ projects no change in emissions at the other facilities within the 50km buffer area.

Table 3-9 2026 Projected Hayden SO_2 NAA & Buffer Zone Point Source Emission Inventory

[52] *See* Appendix B.
[53] Appendix B, Section 7.1.

Source	2017 SO_2 Emissions (tpy)	2017 Facility SO_2 PTE (tpy)	Projected 2026 Facility SO_2 (tpy)
Hayden SO_2 NAA			
Asarco LLC Hayden Smelter	20,498.8	2,825.26	2,825.26
Hayden SO_2 NAA 50km Buffer Zone			
Freeport McMoRan Miami Smelter	648.69	648.7	648.69
Pinto Valley Mine	15.8	53.11	53.11
Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B).			

3.6.2 Non-Point Sources – 2026 Attainment Year Projected Emissions

As described in Appendix B, ADEQ used a population allocation methodology to develop the 2026 projected SO_2 emissions for non-point sources. Non-point source emissions are projected to decrease by approximately 0.095 percent by the attainment year (Table 3-10). Slight decreases are projected to occur in most source categories. ADEQ determined that no growth would be a conservative estimate for both wildfires and prescribed burns as the base year represents one of the worst wildfire seasons in recent Arizona history. ADEQ determined that assuming no growth in emissions from wildfires during the attainment year would match 2017 as best as possible.

Table 3-10 2026 Projected Hayden SO_2 Nonattainment Area Non-Point Emission Inventory

EI Sector	2017 NAA Emissions (tons)	2026 NAA Projected Emissions (tons)
Fires (ag burning, prescribed, wildfire)	3.9527	3.9527
Fuel Combustion-Commercial/Institutional (biomass, natural gas, oil)	0.04835	0.0404
Fuel Combustion-Electric Generation (natural gas, coal)	0.04258	0.0355
Fuel Combustion-Industrial Boilers, ICEs (biomass, natural gas, oil)	0.10837	0.0905
Fuel Combustion-Residential (natural gas, oil, other, wood)	0.03452	0.0287
Industrial Processes	0.19294	0.161
Miscellaneous Non-Industrial NEC	0.00266	0.0022
Solvent - Industrial Surface Coating & Solvent Use	0.00017	0.0001
Waste Disposal	0.13563	0.1131
Total Nonpoint	4.51798	4.422
Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B)		

3.6.3 Mobile (On-Road and Non-Road) Sources – 2026 Attainment Year Projected Emissions

This section summarizes the on-road and non-road mobile project emissions for the 2026 attainment year.

On-Road Mobile

Mobile sources account for the smallest portion of the SO_2 emissions in the Hayden NAA, with on-road sources ranking as the second smallest contributor. ADEQ used a scaling method in the MOVES to project on-road emissions to the 2026 attainment year to account for the variables and factors, other than population, that drive on-road mobile source emissions. The projections provided in Table 3-11 show increasing SO_2 emissions from on-road mobile sources. This increase is from on-road gasoline vehicles, both heavy and light duty, primarily from the Pinal County portion of the NAA.

Table 3-11 Projected Hayden SO_2 Nonattainment Area On-Road Mobile Emission Inventory for 2026

On-Road Mobile	
Source	**Annual Total (ton)**
Combination Long-haul Truck	0.008656
Combination Short-haul Truck	0.006037
Light Commercial Truck	0.003711
Motor Home	0.000792
Motorcycle	0.000686
Other Buses	0.000623
Passenger Car	0.025813
Passenger Truck	0.045906
Refuse Truck	0.000070
School Bus	0.000565
Single Unit Long-haul Truck	0.004242
Single Unit Short-haul Truck	0.002233
Transit Bus	0.000230
On-Road Total	**0.0996**
Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B).	

Non-Road Mobile

The non-road mobile emissions projections provided in Table 3-12 were derived using population projection methodologies. More details about these methodologies is provided in Appendix B, Section 6.

Table 3-12 2026 Projected Hayden SO_2 Nonattainment Area Non-Road Mobile Emission Inventory

Non-Road Mobile	
Source	**Annual Total (ton)**
Agriculture	0.000047
Airport Support	0.000009
Commercial	0.000079
Construction	0.000197
Industrial	0.000034
Lawn/Garden	0.000052
Pleasure Craft	0.000165
Railroad	0.000001
Recreational	0.000213
Non-Road Total	**0.0008**
Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B).	

3.7 Summary of 2017 Base Year and 2026 Projected SO_2 Emissions

Based on the information and data presented in the preceding sections, the ASARCO Hayden Smelter is the primary source of SO_2 emissions in the nonattainment area. Emissions from nonpoint and mobile sources will continue to be small emissions sources in the 2026 emissions inventory (Table 3-13). This section summarizes the base year and the attainment year emissions.

To ensure compliance with the 2010 SO_2 NAAQS (and the 1971 SO_2 NAAQS), ASARCO is implementing three projects to target fugitive emissions: the Uptake Improvement Project; the Fuming Ladle Capture Project and the Anode Furnace Secondary Hood System Project. As a result of these projects, SO_2 emissions in the Hayden SO_2 NAA are projected to decrease by approximately 87.7% by 2026. As noted in Table 3-13, the total 2026 emissions (point, nonpoint, and mobile) is projected to be substantially lower than 2017.

Table 3-13 2026 Attainment Year Projected Hayden Nonattainment Area SO_2 Emission Inventory Summary

Emission Inventory Source Category		Tons SO_2	
		2017 Actual	2026 Projected Emissions
Point	NAA	20,498.80	2,825.26
	50km Buffer Zone	3,982.26	905.79
Nonpoint		5.09	4.90
Mobile On-road		0.201	0.0008
Mobile Nonroad		0.001	0.0996
Total NAA Emissions		**20,504.09**	**2,830.26**

Total NAA & 50km Buffer Emissions	**24,486.35**	**3,739.87**

Source: Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area (Appendix B).

4 Control Strategy

Section 172(c)(1) of the CAA requires nonattainment area plans to include provisions for the implementation of control measures on sources of SO_2.

> *"Such plan provisions shall provide for the implementation of all reasonably available control measures [RACM] as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology [RACT]) and shall provide for attainment of the national primary ambient air quality standards."*

The control measures must be permanent, enforceable, and reduce emissions to levels that will allow the area to attain the NAAQS. This section provides an explanation of the applicable RACM/RACT controls for sources of SO_2 in the Hayden nonattainment area.

In 2016, Asarco began the Converter Retrofit Project (CRP), as required by the consent decree.[54] The purpose of the CRP was to reduce the smelter's SO_2 and lead concentrations to levels below the NAAQS. The CRP was completed in May 2018 and initial shakedown occurred in the next several months. The smelter, with the CRP, remained active until the Hayden smelter temporarily shut down due to a work stoppage on October 13, 2019.

In addition to the SO_2 controls implemented as part of the CRP, Asarco is proposing to implement three previously mentioned projects to control process fugitive emission at the Hayden smelter. This SIP revision discusses the control strategy from the 2017 Hayden SIP and the proposed new controls for the Hayden smelter. ADEQ anticipates that, taken together, the CRP and the new changes will sufficiently decrease SO_2 concentrations below the 2010 SO_2 NAAQS. Further, ADEQ is proposing these controls as the RACM/RACT for the Hayden smelter.

Section 4.1 describes the smelter areas and process in detail. Section 4.2 describes the CRP. Section 4.3 presents the three proposed process fugitive control projects. Section 4.4 presents the locations of SO2 emissions at the smelter. Section 4.5 presents the control strategies for this SIP revision. Section 4.6 contains this SIP revision's RACM/RACT determination.

4.1 Smelter Areas and Processes

This section describes the key smelter areas at the facility. Additionally, this section describes the various processes that occur at the facility.

4.1.1 Smelter Configuration

The smelter configuration and the location and height of SO_2 releases was a consideration in finding the Hayden smelter in compliance with the original multipoint rollback (MPR) limits and for the demonstration

[54] Consent Decree, United States of America v. Asarco LLC, CV-15-2206-PHX-DLR (D. Ariz. 2015), available at: https://www.epa.gov/enforcement/asarco-llc-settlement.

of attainment of the 1971 SO_2 NAAQS. The original MPR limits for the Hayden smelter were based on 1976 records of SO_2 emissions and ambient concentrations. The smelter achieved compliance with MPR emission limits in 1987 and though the smelter underwent major modifications and emission reductions over the years, the location and heights of SO_2 releases have changed only slightly. The MPR rules were approved by EPA on January 14, 1983.[55]

Emissions can be grouped into two categories based on the height of release, low- and high-level release. Low level emissions at heights generally less than 200 feet include fugitive emissions. High level emissions are predominantly from the 1000-foot main stack.

Smelting operations began at Hayden in 1912. The original facility employed twelve multiple-hearth roasters and two reverberatory furnaces to process copper sulfide ore. In 1983, the multiple-hearth roasters and reverberatory furnaces were replaced by an oxygen flash smelting process as well as converters and anode furnaces to produce anode copper. An oxygen plant produces oxygen for the furnace and a sulfuric acid plant recovers the sulfur dioxide produced during smelting. A water treatment plant recovers process water from both the acid plant and flash furnace gas cleaning systems for reuse. The following sections contain descriptions of the primary smelter areas and processes following completion of the CRP.

The Hayden smelting facility, following the CRP, consists of a flash furnace, three Peirce-Smith converters, three anode furnaces, an acid plant, and other support equipment. A flow diagram of the facility is provided in Figure 4-1 and the location of emissions points are shown in Figure 4-2.

Figure 4-1 Post CRP Smelter Configuration

[55] 48 FR 1,717 (Jan. 14, 1983).

Hayden Smelter
Simplified Flow Diagram Post-Retrofit

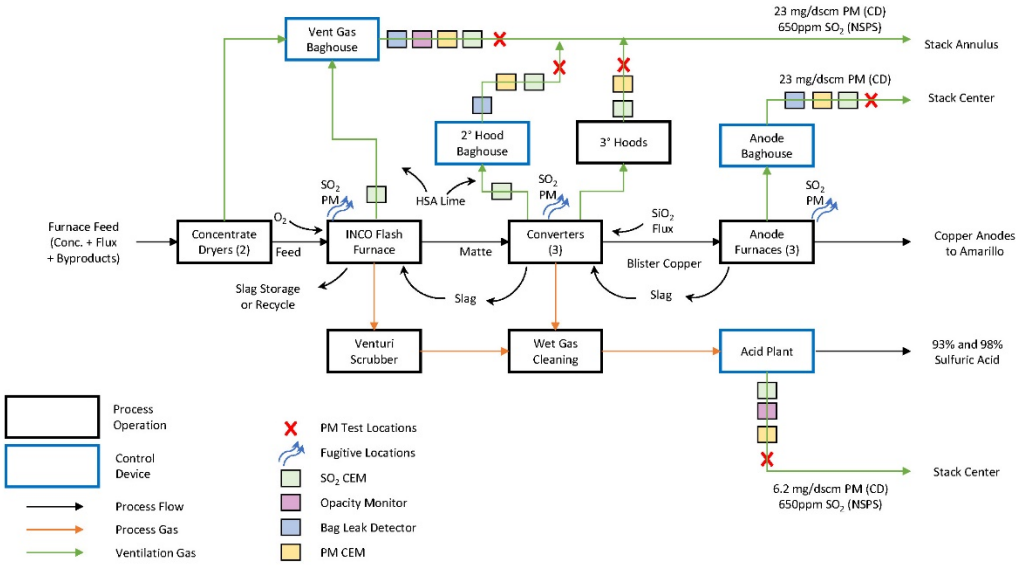
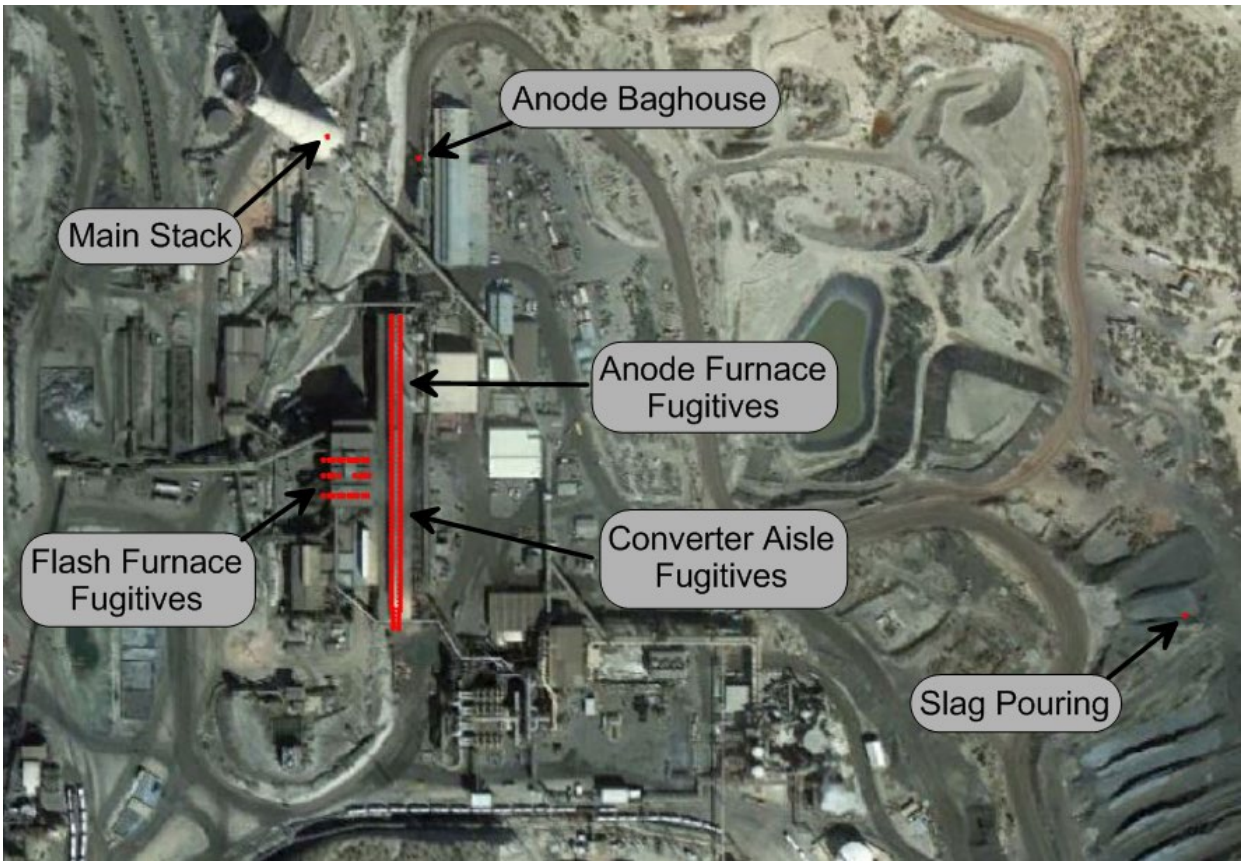


Figure 4-2 Modeled Emission Sources, post-CRP



4.1.2 Mining and Milling

Copper is used in many facets of everyday life, from plumbing to cell phones and architecture to medicine. To obtain pure copper for these uses, copper-bearing mineral (ore) is mined and processed via sequential beneficiation steps. These steps include: size reduction by means of crushing and milling; a flotation process that separates the metallic mineral from the non-metallic constituent, resulting in a higher-grade product (concentrate); and a waste stream (tailings). Asarco owns and operates several facilities that mine copper ore and supply copper concentrate to Asarco's Hayden Smelter.

4.1.3 Concentrate Feed and Preparation

Once the copper concentrate is received at the Hayden Smelter, it is sampled for metal and sulfur content for commercial and metallurgical control purposes. The concentrate is then transported to the bedding plant where a relatively homogenous "mix" of copper concentrate, silica flux, and recycled process by-products is prepared. This mix is the "feed material" that is fed to the INCO Flash Furnace. Prior to the introduction into the INCO Flash Furnace, the material is dried in one of two fluidized bed dryers before being recovered in an associated product baghouse. The dried feed is then conveyed to furnace bins, one for each of the four burners.

4.1.4 INCO Flash Furnace

Flash smelting occurs when the dried feed is introduced into the INCO Flash Furnace, along with 95 percent pure oxygen, through the burners. The combustible constituents of the feed (predominately sulfur) ignite, providing the heat to melt the feed mixture.

The molten material produced in the flash process separates into two layers, with the lighter top layer being iron-rich slag and the heavier lower layer being copper matte. The slag is skimmed off the top of the molten bath into large pots which are transported to the slag deposition area. The molten copper matte is tapped from the bottom of the furnace into a ladle and transferred by an overhead crane to the converter furnaces.

The matte tapping/slag skimming and dryer emissions are routed to a particulate control device (ventilation gas baghouse) before exiting the 1,000 foot stack annulus. The flash furnace process gases are conditioned through a series of unit operations en route to the acid plant for sulfur dioxide recovery before exiting the 1,000-foot stack center. The combination of the flash furnace and the ventilation gas baghouse is expected to achieve 97 percent emissions capture.

4.1.5 Peirce-Smith Converters

The molten matte from the flash furnace, containing approximately 58 percent copper, is then transferred to three large Peirce-Smith converters from the flash furnace for further processing. In the converters, air is injected beneath the molten bath through tuyeres to further remove sulfur and other impurities (blowing). The first stage of the converting process (slag blow) yields an iron-silicate slag that is returned to the flash furnace for additional copper recovery. The final stage of the converting process (copper blow) combusts the remaining sulfur to produce blister copper.

Each converter is equipped with primary and secondary hooding systems to ventilate the process. The primary hooding system captures process gases produced during blowing for conditioning through a series of unit operations en route to the acid plant for SO_2 recovery. As with the flash furnace process gas, the resultant acid plant tail gas exits the 1,000-foot stack center.

The secondary hooding system captures gases that escape the primary hood during blowing or that are emitted when the converter is performing secondary operations such as charging and skimming. Ventilation gases collected by the secondary hooding system are sent to the converter secondary hood baghouse for particulate removal before exiting the 1,000-foot stack annulus. Secondary hood gases routed to the secondary hood baghouse are treated by high surface area lime injection for SO2 control. The current, post-CRP configuration directs secondary hood gases captured during blowing to the acid plant for sulfur dioxide recovery. Secondary hood gases captured during secondary operations (charging and skimming) will still report to the converter secondary hood baghouse. Also, a feature of the CRP, a tertiary hooding system was installed to collect emissions from ladle transfers and/or emissions that may escape the primary and secondary hooding systems to be routed to the 1,000-foot stack annulus. The final product from the converters is called blister copper.

4.1.6 Anode Furnaces

Blister copper from the converters is transferred via ladle to the anode refining furnaces. The anode refining process consists of two stages: the oxidizing stage; and a reduction stage called "poling." Sulfur remaining in the blister copper is further oxidized to a finer endpoint than is achievable in the converter furnaces. Natural gas is then injected into the molten copper to scavenge oxygen that reacted with the copper during the converting process and the anode oxidizing cycle rather than creating sulfur dioxide, i.e., reducing the copper oxide back to copper. This produces anode copper (more than 99 percent pure) which is cast into anodes on two casting wheels, each with 16 anode molds. The anodes are then transported to Asarco's facility in Amarillo, Texas where the copper is further refined before being sold as copper wire or copper cake.[56]

In 2012, Asarco installed a ventilation system for the anode furnaces to collect process gases and control particulate matter with a baghouse. The baghouse initially exhausted through a dedicated stack, however the post-CRP configuration routes the exhaust to the 1,000-foot stack center.

4.1.7 Preheater

In April 2018 Asarco commissioned a new Acid Plant Preheater. The purpose of the preheater, which was designed and supplied by NORAM, is to reduce acid plant SO_2 emissions caused by cold catalyst due to start-ups and drops in SO2 strength and loss of conversion. The 2018 Acid Plant Preheater design encountered unexpected thermal stress issues, resulting in loss of some process gas to the preheater exhaust stream. ASARCO has redesigned and replaced the preheater to correct this problem.

4.1.8 Acid Plant

The exit gas from each converter is ducted to cyclones that remove heavy particulate from the gas streams. There are three cyclones for each converter, a total of nine. The dust collected in the cyclones is conveyed by screw conveyors to a dust bin for pick up by front end loader and recycled into the bedding system as smelter feed. Converter gases enter the cyclones at 800 degrees Fahrenheit and four percent SO_2.

The gases then report to the spray chambers for further cooling with water sprays. The flow is split equally between two identical chambers and is about 400 degrees Fahrenheit exiting the spray chambers. All of the gas then reports to the Cottrell sections that act as settling chambers. Any dust captured is collected by screw conveyors and sent to the pug mill so airborne particulate is minimized. The next step is the three induced draft (I.D.) fans that pull gases from the converters and send them to the scrubber system. These fans are each powered by a 500 H.P. constant speed electric motor. Outlet dampers provide draft for the converters by matching a set point on the Cottrell inlet header.

Converter gas finally enters the scrubbing system where it mixes with furnace gas in the 50 percent scrubber. This is a brick lined vessel with co-current sprays fed from a slurry type pump. The gas stream (converters and furnace) splits when it leaves the unit with half going to two (north and south) secondary

[56] *See supra* note 54.

scrubbers. These units are similar to the 50 percent scrubber except smaller. The gas stream then enters the gas cooling towers. Gas flows upwards through polypropylene packing against the liquor flow from sprays at the top of the tower. The dew point of the gas stream is lowered which forces water to drop out. This process further scrubs the gas and minimizes the amount of water being carried to the contact section of the plant. The liquor is pumped from the bottom of the towers through several plate and frame heat exchangers and then back to the top of the towers. The water used to cool the liquor is provided by a Marley cooling tower. The gas leaving the gas cooling towers is normally between 85 and 95 degrees Fahrenheit. The gas is dust free but totally humidified. The gas then moves to the mist precipitators which use electrostatic fields to remove contained water droplets. Process gas then reports through a fiberglass duct into the inlet of the drying tower. Treatment of the gas in the contact section consists of the following steps:

1. Drying of the sulfur dioxide (SO_2) gas from the gas purification system.
2. Conversion of sulfur dioxide gas to sulfur trioxide gas.
3. Absorption of the sulfur trioxide (SO_3) gas in sulfuric acid.

Prior to 1971, all smelting operations process gasses were emitted into the atmosphere after particulate removal by electrostatic precipitators. The installation of an acid plant in late 1971 added an SO_2 control for the primary converter gas. From sulfur balance data the average emissions were reported to be more than 100,000 tpy. A series of improvements in 1983 included replacement of twelve multiple-hearth roasters and two reverberatory furnaces with an INCO Flash smelting furnace. During the flash furnace conversion, Asarco also installed a 650 ton per day oxygen plant to enrich the smelting process gases and replaced the existing contact acid plant with a new double-contact acid plant with a production capacity of 2,820 tons of sulfuric acid per day for treatment of all flash furnace and converter primary process gases. Reduction of SO_2 emissions for this project was estimated at 63,584 tpy.

The double-absorption sulfuric acid plant is the predominant control device for primary process SO_2 emissions produced by the flash furnace and converters. The flash furnace provides a steady gas feed to the acid plant, enabling optimal plant performance. The acid plant provides control of process gas SO_2 at or below the outlet SO_2 concentration limit of 0.065 percent by volume set forth in the federal New Source Performance Standard 40 CFR 60, Part P. The SO_2 control performance for the Asarco acid plant is an outlet emission concentration of 0.015 percent by volume. The acid plant input of SO_2 gas is 80,000 ppm with an output of 150 ppm, resulting in a 99.81 percent recovery rate.

The annual average process capacity for the acid plant is 666,044 tons of acid per year. The average annual process rate for the smelter is estimated at 88 tons per hour (tph) of new sulfide concentrates. Recent process rates (1999 through 2001) have generally been within 80 percent of capacity. The production throughput of this facility is dependent upon the operational capacity of the sulfuric acid plant to treat SO_2 emissions from the flash furnace and the three converters. Currently, the acid plant has the capacity of processing the emissions from the flash furnace in combination with one of the three converters. An increase in furnace or converter facilities would require a corresponding increase in acid plant capacity.

The flash furnace, oxygen plant, acid plant, and other improvements made during the transition from the roasters and reverberatory furnaces to the flash furnace, subsequently reduced the SO_2 emissions rate by forty percent.

In 1998 Asarco modified the smelter's existing gas handling system and installed an $18.4 million dollar wet gas handling system. Existing equipment including a settling chamber, quench tower, and electrostatic precipitators were replaced with a saturation tower, Venturi scrubber, cooling condenser and ancillary equipment. This modification allowed flash furnace off gas to be treated at temperatures less than 200 degrees Fahrenheit compared to the previous system's 600 degrees Fahrenheit. As a result, the flash furnace off gas volume was lowered and consequently the grade of SO_2. This enabled the acid plant to provide more ventilation to the converters and reduce the SO_2 in the secondary hooding gases along with any fugitive emissions escaping the secondary hoods.

The average rate of SO_2 in the secondary hood gases was approximately 6,000 lb/hr in the period 1994 through 1997. This average has been reduced to approximately 3,000 lbs/hr since implementation of the flash furnace scrubber system, and is the largest component of the reduction in annual SO_2 emissions. The improved ventilation to the converters provided by the 1998 scrubber installation has decreased stack emissions and the associated fugitive emissions due to escape from the converter secondary hood system. The secondary hooding system is operated at the same nominal 250,000 scfm flow as prior to the modification, however, the SO_2 concentration in the secondary hooding gases has been reduced by half. A computerized process control system sets the system dampers at their maximum effectiveness based on the converter cycle. This system is designed to effectively capture fugitive emissions from the primary ventilation system and vent the gases to the stack. Consequently, emissions that escape the secondary hoods, primarily under roll in and roll out conditions, contain 50 percent less SO_2 compared to pre-scrubber operation, resulting in a significant reduction in fugitive SO_2 emissions.

Additional equipment improvements have been made to improve the collection and control of fugitive SO_2 emissions. As previously noted, sources of secondary process emissions are hooded to minimize release of fugitive emissions directly to the atmosphere. The captured gases are treated with lime injected into the flue system and then directed to baghouses prior to exhausting to the atmosphere. In 1996 Asarco installed a secondary hood baghouse at a cost of $4.2 million. The new equipment improved the control of fugitive emissions and reduced opacity. To further reduce fugitive SO_2 emissions, Asarco repaired converter flues, replaced primary converter hoods and jackets, rebuilt all units in the Cottrell electrostatic precipitator, installed concrete sumps and improved sprays in the gas spray chamber of the acid plant in 1991 at a cost of $915,000. In 1999, newly designed primary hood doors were installed on two converters. The new design, incorporating a flexible seal, improved the seal between the door and the primary hood and increased the capture efficiency of the primary hood to minimize escape of emissions to the secondary hood system. Additional doors were installed on the remaining three converters in 2000. After the change, a decrease in future sulfur oxides emissions is estimated at 827.6 tpy, which is approximately a five percent reduction in the total smelter emissions. These changes meet or exceed RACT requirements.

The emissions control improvements implemented at the Hayden smelter between 1971 and 2000 are summarized in Table 4-1 below.

Table 4-1 Implementation of SO_2 Process and Control Technology at the Hayden Smelter

Year	Equipment
1971	Installation of No. 1 Acid Plant.
1972	Acid Plant Mist Precipitator Modification.

Year	Equipment
	Installation of Reverberatory Vent Fans to improve ventilation.
1973	Installation of Acid Coolers (Crane) for improved acid plant performance and Matte Fume Vent to improve the capture of fugitive emissions.
1974	Installation of Converter Spray Chamber for particulate removal and Plate Heat Exchanger.
1975	Matte Fume Enclosing to improve the capture of fugitive emissions.
1976	Installation of Separator - Demister to improve acid plant performance.
1978	Installation of Flue Gas Sampling Station.
1980	Installation of secondary hooding on the converters to minimize release of fugitive emissions directly to atmosphere.
1983	Replacement of multiple-hearth roasters and reverberatory furnaces with an Inco flash smelting furnace and gas handling equipment including slag skimming hoods, matte tapping hoods, and slag return hoods at the flash furnace for improved sulfur recovery. Installation of gas cleaning mist precipitators.
1983/1984	Installation of Monsanto acid plant No. 2 for treatment of all primary process gases.
1988	Installation of acid plant APV Heat Exchanger to improve gas cleaning performance.
1989	Electric slag cleaning vessel with an SO_2 control device; a caustic scrubber that controls a portion of the overall SO_2.
1991	Shutdown of acid plant No.1. Repair of a gas-to-gas heat exchanger leak at the acid plant. Repaired converter flues; replaced primary converter hoods and jackets; rebuilt all units in the Cottrell electrostatic precipitator; installed concrete sumps and improved sprays in the gas spray chamber of the acid plant to reduce fugitive SO_2 emissions.
1993	Upgrade of acid plant mist precipitator and acid plant intermediate fan.
1993	Modification of flash furnace uptake and replacement of cooling fins on the settling chamber to prevent the generation of fugitive emissions caused by inadequate cooling.
1995	Replacement of acid plant heat exchanger and retube of cold heat exchanger.
1997	Retube of Tail Gas Reheater Heat Exchanger.
1998	Installation of wet gas handling system for improved treatment of furnace emissions. Installation of new Hot IP Heat Exchanger; Cold IP Heat Exchanger; SX Distribution in IP Absorbing Tower; Foxboro IA distributive process control system.
1999/2000	Redesign of converter primary hood doors. The gaps in the primary hoods at the converter mouths were redesigned and a flexible seal installed to minimize the escape of fugitive emissions to the secondary hooding system.
2000	CEM Upgrade (Stack Monitors)

4.2 Hayden Smelter Converter Retrofit Project

Shortly after the adoption of the 2010 SO_2 NAAQS, Asarco enlisted Gas Cleaning Technologies, Inc. (GCT) to review pollution control technology around the world in an effort to devise the best strategy to minimize SO_2 emissions at the Hayden Smelter in order to comply with the 2010 SO_2 NAAQS. As a solution, GCT developed the Converter Retrofit Project (CRP), which was designed to help the Hayden smelter attain the 2010 SO_2 NAAQS. In November 2015, before the CRP was fully permitted, EPA and Asarco entered a Consent Decree that primarily required Asarco to implement pollution controls for hazardous air pollutants (HAPs), which include lead (Pb), particulate matter (PM), and $S0_2$.[57] As part of the Consent Decree process, Asarco and GCT reworked the CRP to address three goals: (1) to help Asarco comply with the 2010 SO_2 NAAQS; (2) the 2008 Pb NAAQS; (3) and the Consent Decree with EPA. Ultimately, the CRP and the associated improved control technology aimed to mitigate harmful air pollutants in the Hayden nonattainment area.

On June 24, 2014, Asarco submitted a Class I Significant Permit Application to ADEQ, proposing upgrades to enhance the emission capture and control systems at the Hayden Smelter facility, referred to as the CRP. The following summarizes the enhancements that Asarco included in the CRP.

The five existing converters were replaced with three larger converters. This change allowed a single converter to blow at a time, which better matched the process gas volume from the converters to the gas processing capacity of the acid plant. This change, in combination with new, improved primary and secondary hoods, which reduced the volume of process gas spillage from the primary hood system to the secondary hood system during blowing operations.

A new primary gas system with water cooled primary hoods with a dedicated cooling tower was installed as part of the CRP. The new capture system was designed achieve 97 percent capture of converter blowing emissions. Secondary hoods were installed to direct the secondary hood exhaust from the blowing converter to the primary gas system for greater control of SO_2 emissions. The process gas captured by the secondary hood during blowing, is rerouted to the acid plant, providing for substantial control of the SO_2 that presently contributes the majority of the SO_2 in the main stack emissions; additionally, the slag return ventilation hoods were re-routed to the secondary hood baghouse. The secondary capture system is designed for 97 percent capture efficiency during converter blowing operations, and 90 percent capture efficiency during charging/skimming operations. In addition to the hooding systems, a new wet gas cleaning system/scrubber blowdown system was installed to improve the handling of process solids.

A tertiary gas collection system was installed to capture additional converter aisle emissions, such as emissions from ladle movements of molten material along the aisle. The tertiary gas collection system is routed to the annulus of the main stack. While this system does not reduce emissions, it captures any converter aisle emissions not collected by the primary and secondary systems and routes them to the main stack instead of allowing them to escape as fugitive emissions to the atmosphere at roof level. The tertiary system was designed to have a 95 percent capture efficiency.

An activated lime injection (high surface area, high efficiency) system replaced the old lime injection system that was located upstream of the secondary hood baghouse. The new system provides

[57] Access the Consent Decree from EPA's website here: https://www.epa.gov/enforcement/asarco-llc-settlement.

approximately 50 percent control of secondary hood system emissions routed to the baghouse during periods other than blowing. The efficiency of this control varies somewhat depending on the inlet concentration, with higher control efficiency likely during periods of higher inlet concentration and lower control efficiency possible during periods of lower inlet concentration.

The anode furnace baghouse stack was rerouted to the 1000-foot stack center, to reduce the possibility of building or topographical downwash causing excessive SO_2 concentrations near the smelter.

Improvements were made to the matte tapping and slag skimming ventilation systems to reduce fugitives emissions and to direct them to a new vent gas baghouse with high surface area lime injection in place of an older electrostatic precipitator system. This change further reduced fugitive SO_2 and particulate emissions.

ADEQ granted the permit application on December 28, 2015. More details concerning the CRP were provided in the ASARCO Converter Retrofit Permit application, Revision No. 60647.

4.3 Hayden Smelter Proposed Process Fugitive Control Projects

The CRP demonstrated annual performance consistent with Asarco and GCT's expectations from post-startup in 2018 and in 2019 until the temporary shutdown of the Hayden smelter in October 2019. Despite the CRP's demonstrated performance, the Hayden smelter encountered difficulties with the acid plant preheater and ambient monitors in and around the Hayden smelter registered sporadic concentrations at or above the level of the 2010 SO_2 NAAQS. These episodes ceased with the temporary shutdown in October 2019.

Asarco and GCT have studied the smelter performance data, ambient monitoring results and the partially completed fugitive study called for in the Consent Decree and 2017 draft SO_2 SIP. Based upon these data, Asarco and GCT are proposing three projects to further enhance the emissions performance of the Hayden smelter by further reducing process fugitives so that the 2010 SO_2 NAAQS will be consistently attained. The three proposed projects are described below:

Uptake Improvement Project. The Uptake Improvement Project involves the installation and ventilation of a partial enclosure around the INCO flash furnace uptake shaft to improve capture of any fugitives from the flash furnace and emissions generated during matte tapping and slag skimming activities. These emissions are ducted to the converter secondary hood baghouse, treated, and released to the annulus of the main stack. The uptake enclosure will be ventilated at all times except during brief periods where slag is returned to the furnace. As a result, the converter secondary hood baghouse system will handle the added ventilation point without an increase in system flow capacity.

In the partially completed fugitive study, it appears that there were episodes where emissions from the matte tapping/slag skimming area may have migrated from the flash furnace building into the converter aisle, anode aisle or material transfer area. Based upon engineering judgment and review of the fugitive study data, Gas Cleaning Technologies (GCT), Asarco's engineering design consultant, estimates that this project will improve capture in the flash furnace area on average around 10-15% and will substantially

reduce (e.g., 30% to greater than 50%) peak emissions observed during the fugitive study at both the flash furnace roofline and converter roofline monitoring systems.

Fuming Ladle Capture Project: The Fuming Ladle Capture Project will construct a hood and retaining walls to collect emissions from "fuming" ladles, which sometimes occur after a ladle is poured. The hood is ducted to the converter secondary hood baghouse, treated, and released to the main stack. As outlined below, GCT believes that fuming ladles contribute substantially to the peak concentrations seen during the fugitive study and this control should substantially reduce, if not mostly eliminate, that contribution. The new hood will only operate for the brief periods when a fuming ladle is present in the enclosure. It is anticipated that fuming ladles will be vented for 15-minute periods occurring 0 to 5 times per day. As a result, the secondary baghouse system can handle the added ventilation point without an increase in system flow capacity.

Anode Furnace Secondary Hood System*:* The Anode Furnace Secondary Hood System will construct secondary hoods, similar to those found on the converters, around the anode furnaces, allowing improved capture during operations. The hoods will be ducted to a new anode secondary hood baghouse and released to the annulus of the main stack. GCT estimates that Asarco should see fugitive roofline SO_2 reductions of approximately 80%, possibly more during peak emissions periods as a result of the addition of the anode secondary hood system. While main stack emissions would see a small actual increase, that increase would not exceed the existing 1069.1 lb/hr 14-day rolling average.

In designing these three projects, GCT and Asarco considered the results of the partially completed fugitive study and observations of the smelter while it was operating prior to its temporary shutdown in 2019. The controls are designed preferentially to address peak emissions periods, reducing the peak emissions to avoid short-term elevated ambient levels. Control efficiencies from these projects are expected to be higher for high emissions periods than for normal operating periods, when the existing controls already work well, as demonstrated by the fugitive study. The fugitive study showed that mean emissions are well below the proposed limits even without the additional controls contemplated in this proposal. With the addition of the proposed projects, the Hayden smelter is anticipated to attain the 2010 SO_2 NAAQS.

As a supplemental benefit, GCT has estimated that the secondary hood systems should reduce fugitive particulate matter emissions from the anode furnaces by seventy percent, perhaps more during peak emissions periods. These particulate reductions will also reduce lead emissions proportionally.

A copy of this final permit revision is attached as Appendix A.

4.4 Locations of SO_2 Emissions at the Hayden Smelting Facility

Emissions of SO_2 are primarily released into the atmosphere from five locations at Asarco's Hayden operations:

- Main smelter stack;
- Anode furnace roof monitors;
- Converter aisle roof monitors;

- Flash furnace building roof monitors; and
- Outdoor slag pouring.

Previously, the anode baghouse was a sixth location. However, the anode baghouse emissions have been rerouted to the main stack. The locations of these sources, all of which were modeled in the SO_2 air dispersion modeling analysis, are depicted in Figure 4-3. Figure 4-4 shows the flow diagram for the post-CRP configuration.

Figure 4-3 Modeled Emissions Sources, Hayden Smelter Configuration Post-CRP

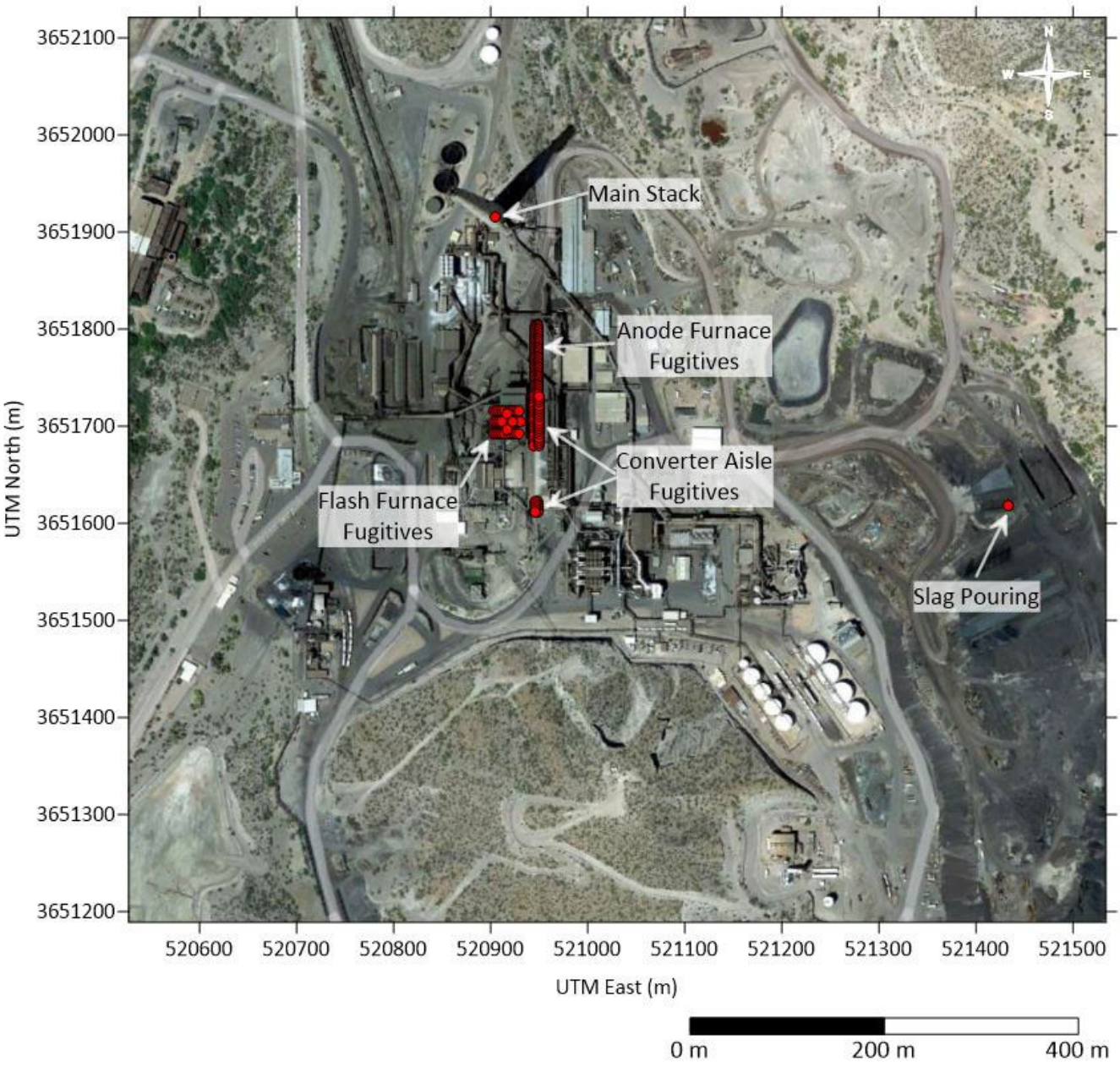
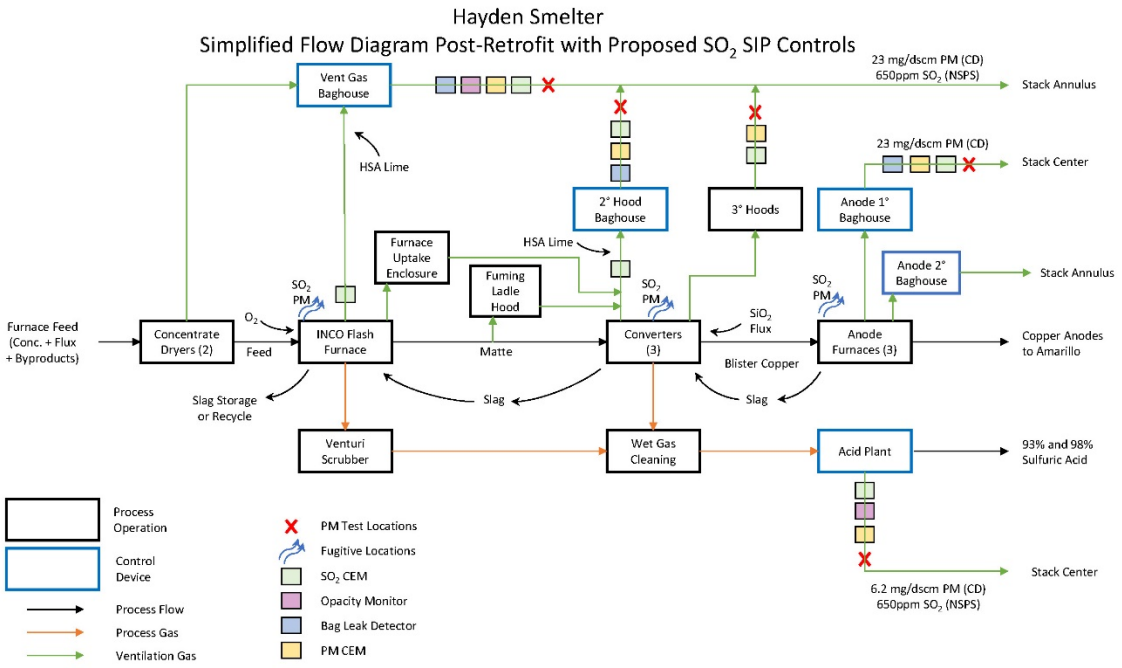


Figure 4-4 Hayden Smelter Diagram, post-CRP with Proposed SO_2 Controls



4.4.1 Point Sources – Stacks and Slag Pouring

This section provides descriptions point sources including: the main stack; k; and slag pouring.

Main Stack

The main smelter stack, which is comprised of an inner stack and an outer annulus, exhausts almost all the emissions from the smelting processes at the Hayden smelter. Treated emissions from the acid plant are exhausted through the main stack center. The secondary and tertiary converter ventilation gases and the vent gas baghouse emissions (flash furnace matte tapping, slag skimming, and concentrate dryers) are vented to the main stack annulus. The CRP also directed the anode furnace baghouse emissions to the inner (center) stack. The proposed Uptake Improvement and Fuming Ladle Control Projects will use the existing converter secondary hood baghouse that is routed to the main stack annulus. The proposed Anode Secondary Hood Project will add a new anode secondary hood baghouse that will also be routed to the main stack annulus.

A combined exhaust stream was defined for the stack's two emissions streams to account for the main stack plume rise in dispersion modeling. The calculation of this combined stream's parameters is based

on conservation of the total stack flow rate and release area, and calculation of an equivalent exhaust temperature, stack diameter, and exit velocity.[58]

There are two definitions of Good Engineering Practice (GEP) stack height: (i) formula GEP stack height and (ii) regulatory GEP stack height. EPA requires sources to evaluate building downwash effects when a stack is less than formula GEP stack height. Regulatory GEP stack height is either 65 meters or formula GEP stack height, whichever is greater. The EPA does not allow sources to take credit for ambient air concentrations that result from stacks that are higher than regulatory GEP stack height unless they meet the formula stack height criteria.

As discussed in ADEQ's March 2017 "Arizona State Implementation Plan Revision: Hayden Sulfur Dioxide Nonattainment Area for the 2010 SO_2 NAAQS", the GEP height for Asarco's main stack was assessed in a fluid modeling study jointly conducted by North American Weather Consultants and Colorado State University, with that study concluding that the stack's 1,000-foot height meets GEP stack height requirements. EPA subsequently approved Arizona's SIP determination of GEP stack height.[59] No structures have since been constructed at Asarco that would affect this determination.

At EPA's request in mid-2015 and 2022, Asarco reassessed the GEP stack height determination with respect to the current GEP regulations. This re-assessment confirmed that the original GEP stack height determination is consistent with the 1985 regulations and that the 1,000-foot stack remains an appropriate GEP determination. ADEQ reviewed available documents on the main stack GEP, and agreed that using the actual height of the main stack in modeling was appropriate. Therefore, Asarco's main stack was modeled at its true height of 1,000 feet. Additional information regarding GEP stack height for Asarco Hayden is located in the Hayden SO_2 Modeling TSD located in Appendix C.

Anode Furnace Baghouse Stack

As mentioned above, the anode furnace baghouse stack has been rerouted to the main stack.

Slag Pouring

Emissions of SO_2 are released to the atmosphere when molten slag is poured on the ground outdoors. Emissions modeled for this source are the hourly equivalent of those reported in Asarco's 2010 Emissions Inventory Questionnaire (EIQ) and represent the maximum possible SO_2 emissions that could occur in a single hour.

When molten slag is poured, the high temperature results in the gas rising rapidly into the air. To account for the rising buoyant plume, regulatory agencies have approved methods for calculating equivalent stack parameters for the purposes of the dispersion modeling of slag pouring gases. The Texas Air Control Board, a predecessor agency to the Texas Commission on Environmental Quality, approved such an approach. This approach involved the use of equivalent exhaust parameters, to account for plume rise in the modeling of slag pouring at Asarco's El Paso Smelter in 1992 and 2006 air quality permit reviews. ADEQ describes a similar process in its ADMG for the calculation and use of equivalent release parameters for

[58] *See* Appendix C.
[59] A copy of this white paper is attached as Appendix D.

modeling flares, a category of non-standard sources with heat release that cannot be treated in a straightforward way in dispersion models.

Using a methodology similar to ADEQ's, Asarco calculated an effective upward velocity for emissions arising from the pouring of the slag. This calculation, based on the physical properties of the slag and the nature and dimensions of the pour, is presented in Section 5 of Appendix C.

4.4.2 Fugitive Emissions

This section presents a description of fugitive emissions sources, including the: anode furnace; converter aisle; and flash furnace.

Anode Furnace

Emissions from the anode furnaces are primarily collected by the anode primary hoods, which capture emissions during the anode processing cycle and direct them to the anode furnace baghouse and then to the main stack center. Secondary emissions are generated during anode furnace charging and tapping emissions. The proposed Anode Secondary Hood Project will capture these emissions and route them to the anode secondary hood baghouse and then to the main stack annulus. The anode secondary hoods are designed to capture at least 80% of secondary emissions and more during peak periods.

Emissions from the anode furnace and aisle that are not captured and directed to the primary and secondary baghouses are vented through roof monitors on the penthouses which extend along the north-south axis of the anode building ridge line. To simulate the roof monitor emissions sources in the dispersion modeling, they were represented as a series of volume sources (80 total). For modeling purposes, the total fugitive emission rate from the anode aisle building was distributed evenly among the 96 individual volume sources.

Converter Aisle

Emissions from the converter aisle that are not captured and directed to the acid plant, converter secondary hood baghouse, or tertiary ventilation system are vented through roof monitors on each side of the penthouses which extend along the north-south axis of the converter building ridge line. To simulate the roof monitor emissions sources in the dispersion modeling, the emissions were represented as a series of volume sources (46 total). For modeling purposes, the total fugitive emission rate from the converter aisle building was distributed evenly among the 88 individual volume sources.

Flash Furnace

Emissions not captured from the flash furnace, matte tapping, and slag skimming operations and directed to the acid plant, vent gas baghouse or converter secondary hood baghouse are released through roof monitors that run east-west across the top of the flash furnace building. To simulate the roof monitor emissions sources in the dispersion modeling, the emissions were represented as a series of volume sources (32 total). For modeling purposes, the total fugitive emission rate from the flash furnace building was distributed evenly among the 49 individual volume sources.

The derivation of the initial horizontal and vertical dimensions for the emissions from the anode furnace, converter aisle, and flash furnace is presented in Section 6 of the Hayden Modeling TSD, located in Appendix C. The anticipated distribution of post-CRP SO_2 emission rates from each source is addressed in Section 6 of the Hayden Modeling TSD, Appendix C.

4.5 Control Strategy

First, this section describes the significant sources and categories in the nonattainment area. Second, this section describes the control strategy from the 2017 SO_2 NA SIP revision. Third, this section describes the new control strategy taken by this SIP revision.

4.5.1.1 Significant Sources/Categories

As indicated in Chapter 3, the primary point source in the Hayden nonattainment area is the Hayden Smelter, which accounts for 97.4% of actual and 84.8% of potential SO_2 emissions. Of the three largest point sources located within both the Hayden SO_2 NAA and 50km buffer zone, the Hayden smelter accounted for 83.7% of actual and 73.6% of potential SO_2 emissions. The Miami SO_2 area was designated nonattainment for the 2010 SO_2 NAAQS and is subject to a nonattainment area SIP to comply with the standard. Separate rules (A.A.C. Title 18, Chapter 2, Articles 13, Part C) and SIP process applies to the Miami SO_2 nonattainment area and the Miami smelter.

Nonpoint sources in the nonattainment area include fire (prescribed and wildfire), stationary source fuel combustion, and miscellaneous non-industrial sources. These sources account for less than one percent of the SO_2 emissions and are not considered a significant source category.[60]

Other nonpoint sources include mobile onroad and mobile nonroad sources. Both mobile source categories are affected by national fuel standards that lower the sulfur content of fuel, which result in low SO_2 emissions from these nonpoint sources.[61] As the significant source in the nonattainment area, Asarco must implement control measures at the Hayden Smelter to lower emissions and meet the 2010 SO_2 NAAQS.

4.5.2 2017 Control Strategy

Due to EPA's disapproval of the attainment demonstration, (and corresponding disapproval of the RACM demonstration), ADEQ provides this summary of the 2017 control strategy including the required level of control, significant sources, RACM/RACT analysis, a summary of A.A.C. R18-2-B102, a control measure summary.

4.5.2.1 Required Level of Control

[60] Arizona Department of Environmental Quality. (2023). Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area. (Appendix B.).
[61] Id.

Per the CAA, the control strategy must qualify as RACM/RACT. EPA's SO_2 Nonattainment Area SIP Guidance defines RACM as those measures necessary to reduce emissions as expeditiously as possible that result in attainment of the NAAQS, which can be obtained through the implementation of RACT controls.[62] These controls would be implemented on the primary/significant source(s) of SO_2 emissions in the nonattainment area. The controls in this SIP revision build upon the control strategy presented in the 2017 SIP revision.

4.5.2.2 RACT/RACM Analysis

In EPA's proposed partial approval/partial disapproval, EPA stated that the controls selected by ADEQ were consistent with RACM and RACT.[63] However, because the 2017 Hayden SO_2 SIP did not have an approvable attainment demonstration, EPA could not make a finding that these measures, at that time, constituted RACM/RACT.[64] ADEQ demonstrated that this RACM/RACT analysis, when taken with the additional proposed control strategy in this SIP revision (*see* Section 4.5.3, *infra*) meets the requirements for RACM and RACT. Therefore, ADEQ presents a summary of its prior RACM/RACT analysis, as the controls implemented in the 2017 SIP revision remain in place.

Per CAA requirements, the control technology must qualify as RACT/RACM. An air agency can make the determination that a given control or suite of controls is RACT/RACM based on an analysis of other controls by taking into consideration criteria such as:

- Controls used in similar industry identified as RACT.
- Controls used for BACT in PSD permits.
- Controls used as BART requirements for regional haze.
- Controls identified as RACM that lead to expeditious attainment of the NAAQS.

In the 2017 SIP revision, ADEQ reviewed EPA's RACT/BACT/LAER Clearinghouse (RBLC) for control technology applicable to SO_2 emissions. The RBLC database contains case-specific information on the best available air pollution technologies that have been required to reduce emissions of air pollutants from stationary sources. Since there are only three primary copper smelting facilities within the U.S., ADEQ's review focused on similar technology and controls were determined to be BACT for PSD permits. Table 4-2 contains a list of control technologies that have been implemented at several facilities within the U.S. that are comparable to those proposed to be implemented at the Hayden Smelter.

Table 4-2 U.S. EPA RACT Determinations (RACT/BACT/LAER Clearinghouse)

Pollutant	Source	Process/Control Technology	% Efficiency	Level of Control	Date of Determination
SO_2	Diamond Shamrock Refining Co LP; Valero McKee Refinery, Texas	SCOT Technology; Tail Gas Incinerators	99.8	BACT/PSD	12/20/2013

[62] U.S. EPA. (2014). Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions.
[63] 85 FR 31,118, 31,122 (May 22, 2020).
[64] Id.

Pollutant	Source	Process/Control Technology	% Efficiency	Level of Control	Date of Determination
SO_2	Rhodia Inc; Sulfuric Acid Plant, Texas	Caustic Scrubber	95	BACT/PSD	8/8/2013
SO_2	Navajo Refining Co; Artesia Refinery, New Mexico	Tail Gas Incinerator	99.8	BACT/PSD	12/14/2007
SO_2	Indiana Gasification, LLC; Wet Sulfuric Acid Plant, Indiana	Peroxide Scrubber	95	BACT/PSD	6/27/2012
SO_2	Seminole Fertilizer Corporation	Sulfuric Acid Plant	99.4	BACT/PSD	12/31/1992
SO_2	Piney Point Phosphates	Sulfuric Acid Plant; Double Absorption Process	98	BACT/PSD	2/17/1998
PM	Beta Steel	Meltshops; Electric Arc Furnaces; Direct Shell Evacuation and Scrubber	99.9	BACT/PSD	2/24/1992
PM	Nucor Steel	Electric Arc Furnace; Baghouse	99.0	BACT/PSD	7/11/2002
SO_2	Montgomery County & NW Maryland Waste Disposal	Incinerator, Waterwall Municipal Solid Waste; Spray Dryer (wet/dry scrubbing), Fabric Filter, Lime Injection	85	BACT/PSD	4/26/1990
PM	IMCO Recycling of Michigan LLC	Lime-Injected Baghouse to Control Melting and Fluxing Emissions	99	BACT/PSD	6/6/2005
SO_2	Auburn Nugget	Wet Scrubber	90	BACT/PSD	5/31/2005
SO_2	Interstate Lead Company, Inc.	Furnace, Blast (1), Reverberatory (1); Wet Scrubber with Ammonia	94.2	BACT/PSD	4/9/1991
Source: U.S. EPA – RACT/BACT/LAER Clearinghouse (RBLC), https://cfpub.epa.gov/RBLC/index.cfm?action=Home.Home&lang=eg					

The efficiencies presented in Table 4-2 are similar or lower than the projected efficiencies for the new control technology that will be implemented as part of the CRP. As noted in Section 4.2, the control efficiencies for the new technology will vary between 90 and 97 percent for a single system.

After reviewing similar technology and associated control efficiencies, in 2017 ADEQ determined that the new control technology proposed by Asarco for the Hayden Smelter are representative of RACT/RACM level of control. The controls proposed for the Hayden Smelter are similar to those used in other industries

and have the same or higher control efficiencies. All of the control technologies in Table 4-2 have been determined to be BACT control for PSD permitting purposes.

While these controls ultimately did not provide for attainment of the 2010 SO_2 NAAQS by the prior attainment date, the attainment demonstration (Chapter 5) shows that these controls in addition to the newly proposed controls are sufficient to attain the 2010 SO_2 NAAQS by the attainment date.

4.5.2.3 Emissions Reductions Goals – Attainment Measures

The primary emission reduction goal for the control strategy is to achieve attainment of the 2010 SO_2 NAAQS. Attainment will be accomplished through a permit revision for the Hayden Smelter that establishes a limit on SO_2 emissions as well as requirements for operational standards, monitoring, compliance demonstration, record keeping, and reporting.

4.5.2.4 Control Measure – A.C.C. R18-2-B1302

In the 2017 SIP revision, to reduce SO_2 emissions and attain the standard, ADEQ developed a source specific rule, A.A.C. R18-2-B1302, for the Hayden Smelter. As noted in EPA's limited approval/limited disapproval, EPA identified five deficiencies.[65] As will be discussed below, the final permit revision in this SIP revision corrects these deficiencies.

4.5.2.4.1 Control Measure Summary

The Hayden SO_2 rule (A.A.C. R18-2-B1302) was the attainment measure for the Hayden SO_2 nonattainment area in the 2017 SIP revision. The rule was developed specifically for the Hayden Smelter and incorporates the necessary emissions limits, operational standards, monitoring, compliance determination, recordkeeping, and reporting requirements. This is a state rule applicable to the Hayden Smelter only and it complies with requirements for RACT that are necessary to attain the 2010 SO_2 NAAQS.

The Hayden Smelting Facility is required to comply with the emission limit in the rule. Asarco must adhere to the provisions regarding operational standards for the capture systems, control devices, and the continuous monitoring systems (CEMS). Asarco is required to demonstrate compliance with the emissions limit using the method in A.A.C. R18-2-B1302(F)(1). Hourly emissions must be calculated according to the procedure described in A.A.C. R18-2-B1302(F)(2) and if no valid data is recorded for any given timeframe, Asarco must use the substitute data procedure in A.A.C. R18-2-B1302(F)(4). The rule also establishes criteria for recordkeeping and reporting, A.A.C. R18-2-B1302(G) and (H).

4.5.2.4.2 Implementation Schedule

The implementation of the 2017 SIP control strategy, namely the CRP and associated work, was completed in 2017-2018. Only the fugitive emissions study was only partially completed.

4.5.2.4.3 Authority

[65] *See supra* Section 1.5; 85 FR 70,483 (Nov. 5, 2020).

ADEQ has the statutory authority to adopt and implement rules under A.R.S. §§ 49-104 and 49-106. Additional authority is given through A.R.S. § 49-425 to adopt rules that are necessary to reduce air pollution.

4.5.2.4.4 Adequate resources

Nonattainment plans must also include a description of the resources available to the State and local agencies at the date of submission of the plan and of any additional resources needed to carry out the plan during the five-year period following its submission. The description must include projections of the extent to which resources will be acquired.[66]

As the implementing agency, the cost to ADEQ of rulemaking and enforcement of the rules and Asarco's Title V permit will be minimal. ADEQ's current full-time staff coordinated the development of the rules with Asarco and EPA; no additional resources were needed. ADEQ expects that its current permits and compliance staff is adequate to implement and enforce the new rules. Therefore, resources are already acquired and no resource-related projections are applicable.

Overall, ADEQ expects that the current resources available to the agency will be adequate to carry out this plan for the Hayden SO_2 nonattainment area.

4.5.2.4.5 Applicability

A.A.C. R18-2-B1302 applies to the owner or operator of the primary copper smelter located in Hayden, Arizona. The owner/operator is required to implement and comply with the provision of the rule at the Hayden Smelter. At the time of this SIP, Asarco is the owner/operator of the Hayden Smelter.

4.5.2.4.6 Recordkeeping and Reporting

Consistent with A.A.C. R18-2-306, the Hayden SO_2 rule contains requirements for record retention and reporting. Asarco is required to keep records of monitoring information for a period of at least five years. This includes measurements from the CEMS, compliance calculations, quality assurance and quality control activities, and all major maintenance activities. Records must be kept regarding the occurrence and duration of any startup, shutdown, or malfunction of smelter processes. In addition, records must be kept of CEMS breakdowns, repairs, maintenance, out of control periods, calibration checks, and zero and span adjustments. This is also consistent with requirements in Asarco's operating permit for the Hayden Smelter.

The rule also specifies the type and timing of the submittal of reports to ADEQ. Asarco must submit data assessment reports for each calendar quarter. In addition, excess emissions and monitoring system performance reports must be submitted twice per year. Notification is provided to ADEQ for commencement of construction for project improvements authorized by Significant Permit Revision #60647. Progress reports regarding construction will also be submitted to ADEQ.

4.5.2.4.7 Compliance and Test Methods

[66] C.A.A. § 110(a)(2)(E)(i); 40 CFR § 51.280.

A.A.C. R18-2-B1302 contains provisions regarding compliance and testing requirements. These provisions include requirements for continuous emissions monitoring, performance specifications, operational standards, and compliance demonstration.

The emission limitation for the Hayden Smelter is a combination of SO_2 emissions from the acid plant tail gas stack, secondary and tertiary converter ventilation gases, vent gas baghouse (flash furnace matte tapping, slag skimming, and concentrate dryers), and anode primary baghouse. Under A.A.C. R18-2-B1302(C)(1), the emissions limit from the main stack shall not exceed 1069.1 pounds per hour on a 14-operating day average basis unless 1518 pounds or less is emitted during each hour of the 14-operating day period.[67] As will be discussed below in Section 4.5.3, this SIP revision is proposing to change this from the dual limit described above to a single 1069.1 lb/hr, 14-operating day average limit. A summary of the attainment modeling demonstration supporting the emissions limit will be discussed in Chapter 5, with the full documentation in Appendix C.

Continuous Emissions Monitoring

Requirements for the operation and maintenance of the continuous emissions monitoring system (CEMS) are provided in A.A.C. R18-2-B1302(E). These include provisions for recording measurements, performance specifications, compliance certification, recordkeeping and reporting. The steps to correct deficiencies related to A.A.C. R18-2-B1302(E)(4) and (E)(6) are discussed in Section 4.5.3.8, *infra*.

As the owner/operator, Asarco shall install, calibrate, maintain, and operate a CEMS at each of the following locations: the exit of the acid plant, the exit of the secondary hood particulate control device after the High Surface Area (HSA) lime injection system, the exit of the flash furnace particulate control device after the HSA lime injection system, tertiary ventilation system prior to mixing with any other exhaust streams, and the anode furnace baghouse stack prior to mixing with any other exhaust streams. Provisions for performance and operating specifications are outlined in A.A.C. R18-2-B1302(E)(5).

The monitoring system must comply with conditions under 40 CFR Part 60, including quality assurance requirements in Appendix B, Performance Specifications 2 and 6, as well as Appendix F. The zero adjustments and calibration procedures will be checked at least once daily in accordance with a written procedure that is outlined in the operations and maintenance plan. To ensure proper function of the monitoring systems, the owner/operator is required to maintain and have on hand sufficient spare parts for the systems to repair or replace within six hours any equipment that fails during operation.

Asarco's operating permit for the Hayden Smelter requires the biannual submission of compliance certifications to ADEQ under A.A.C. R18-2-309 to demonstrate the compliance status of the source with all applicable permit conditions.

Operations and Maintenance Plan

Per A.A.C. R18-2-B1302(D)(2), Asarco is required to develop an operations and maintenance (O&M) plan for each capture system and/or control device used to control or ventilate process gas or emissions from the flash furnace including matte tapping, slag skimming, and slag return operations; converter primary

[67] A.A.C. R18-2-B1302(C).

hoods, converter secondary hoods, tertiary ventilation system, and anode refining operations. The plan shall establish the operating limits for the capture systems and control devices that are representative and reliable indicators of the performance of those systems. The specific initial operating limits are provided in A.A.C. R18-2-B1302(D)(2)(b). The O&M plan established requirements regarding preventative maintenance and inspections.

The initial O&M Plan was required to be submitted to ADEQ no later than May 1, 2018 and included initial volumetric flow monitoring provisions, the initial operational limits, the preventative maintenance procedures, and the inspection procedures. The owner/operator shall submit any revisions to the initial volumetric flow monitoring provisions and initial operational limits no later than six months after completion of a fugitive emissions study. Other plan revisions may be submitted to ADEQ at any time, when necessary. Plan revisions shall be submitted to ADEQ for approval and may be implemented upon submittal. Plans shall remain in effect until superseded or until disapproved by ADEQ.

Compliance Demonstration

Operating Day SO_2 Emissions Calculation

To determine compliance with the emission limit, the rule specifies the processes for calculating SO_2 emissions for each operating day and hourly emissions. As required by A.A.C. R18-2-B1302(F)(1), sum the hourly pounds of SO_2 for the current operating day and preceding 13-operating days to calculate the total pounds of SO_2 emissions over a 14-operating day averaging period.

Divide the total pounds of SO_2 emissions over the 14-operating day averaging period by 336 to calculate the 14-operating day average SO_2 emissions.

Hourly SO_2 Emissions Calculation

To calculate the hourly emissions, the rule specifies that for a full operating hour, at least four valid data points (one point in each 15 minute quadrant) are required to calculate the hourly average. For a partial operating hour, at least one valid data point in each 15-minute quadrant of the hour is required to calculate the hourly average.

If maintenance or quality assurance activities are performed and the unit operates in two or more quadrants of the hour, a minimum of two valid data points (separated by at least 15 minutes) is required to calculate the hourly average. If the unit operates in only one quadrant of the hours at least one valid data point is required. Unless a calibration error test is passed in the same hour of a failed test, all data for the hour is invalid. Data recorded during CEMS breakdown, repair, maintenance, out-of-control periods, calibration checks, and zero and span adjustments will not be counted in the data averages.

Smelter-Process Fugitives

Compliance with the approved smelter process fugitive modeling demonstration is shown by meeting the capture and control device operating parameters set forth in the approved capture and control system operations and maintenance plans. Any failure to comply with a plan requirement must be recorded and corrected and reported to ADEQ. Additionally, Asarco will conduct fugitive studies in accordance with

A.A.C. Title 18, Chapter 2, Appendix 14 to demonstrate that smelter process fugitives are being controlled in accordance with the approved modeling demonstration. If a fugitive study shows emissions are higher than those used in the approved modeling demonstration, Asarco must demonstrate that those higher emissions still support attainment or implement additional controls or both. The revised approach must be submitted to ADEQ, and if approved, ADEQ will submit such changes to EPA Region 9 as a SIP revision.

4.5.2.5 Asarco Hayden Smelter Permit Conditions

Asarco's current Operating Permit #1000042 was issued by ADEQ on October 9, 2001. The facility has the potential to emit greater than 100 tons per year of PM_{10}, SO_2 and nitrogen oxides (NO_x) and is classified as a Major Source according to state and federal law. The facility also has potential to emit more than 25 tons of HAPs and is a major source of HAPs emissions, therefore subject to National Emission Standards for Hazardous Air Pollutants (NESHAP) for Primary Copper Smelting Major Sources, 40 CFR 63 Subpart QQQ. Permit #53592 contains the necessary monitoring, recordkeeping, reporting and testing requirements to ensure compliance with various emission limitations and standards under state and federal laws. Table 4-2 below provides a list of the revisions for the current operating permit.

On December 28, 2015 ADEQ issued significant permit revision #60647 to the Asarco Hayden Smelter. This permit revision gave Asarco the authority to initiate construction of the converter retrofit project.

After the 2017 SIP revision was submitted to EPA, in April 2018, ADEQ issued a final permit renewal (#39948) (later amended #92669). This permit is broken into various attachments:

1) Requirements for Concentrator (Attachment "C");
2) Minor Source MACT requirements from NSPS Subpart EEEEEE – Attachment "D" (These requirements will go away once ASARCO starts complying with NSPS Subpart QQQ);
3) Major Source MACT Requirements from NSPS Subpart QQQ- Attachment "E" (Although ASARCO is currently complying with the minor source MACT, CD requires that prior to termination of the CD, ASARCO must agree to comply with NSPS Subpart QQQ);
4) Requirements from the Consent Decree – these are captured in all other attachments as applicable;
5) Requirement from SO2 SIP (This is currently State enforceable only as EPA has not yet approved) – these are captured in Attachments D and E);
6) Requirements from Multi Point Rollback rule A.A.C. R18-2-715, 715.01 – Attachment "F" (these requirements are currently enforceable – once SO2 SIP is approved by EPA, these requirements will go away.); and
7) Regional Haze requirements – Attachment "G." Additionally, ASARCO has a comprehensive fugitive dust plan and O&M plan approved by EPA

4.5.3 2022 Control Strategy

This section will describe: 1) the required level of control; 2) attainment measures; 3) authority; 4) the adequacy of resources; 5) applicability; 6) notice of standards); 7) compliance/implementation; 8) recordkeeping and reporting; 9) compliance and test method; and 10) enforceability concerns addressed by this control strategy.

As described in Section 4.3, *supra*, the Uptake Improvement Project, Fuming Ladle Capture Project, and Anode Furnace Secondary Hood System are expected to improve the capture of fugitive emissions and substantially reduce peak emissions. The control strategy for this SIP revision builds upon the one taken in the 2017 SIP revision, discussed above. The controls proposed by this SIP revision and the attached permit revision build upon the emission reductions achieved by the CRP to correct the deficiencies identified by EPA in its disapproval.

Based on the planned installation of the redesigned acid plant preheater and the three projects listed above, this SIP revision proposes the following fugitive SO_2 roofline monitoring system limits as appropriate and protective of the 1-hour SO_2 NAAQS. These limits would be in effect at all times when the underlying process units or operations are operating:

- Flash Furnace area: 38.5 lb/hr
- Converter aisle area: 10.0 lb/hr
- Anode aisle area: 9.0 lb/hr

These limits are enforceable as part Attachment I to Asarco's operating permit.[68]

Additionally, this plan revision seeks to modify the dual limit in A.A.C. R18-2-B1302(C)(1) to a single limit. Except for the disapproved elements of A.A.C. R18-2-B1302, EPA generally approved the rule into the Arizona SIP as a SIP strengthening measure. A.A.C. R18-2-B1302(C)(1) states: "Emissions from the Main Stack shall not exceed 1069.1 pounds per hour on a 14-operating day average unless 1,518 pounds or less is emitted during each hour of the 14-operating day period." EPA did not approve this dual limit as part of the attainment demonstration from the 2017 SIP revision.

As part of Appendix A, Asarco requested a voluntary permit condition (under A.A.C. R18-2-302.01) to adopt a single limit in that emissions from the Main Stack shall not exceed 1069.1 pounds per hour on a 14-operating day average. ADEQ believes that this approach is consistent with EPA's 2014 Guidance and therefore is approvable as part of the control strategy. As will be discussed in Section 9, moving from the approved dual limit to the single, 14-operating day limit will not interfere with any applicable requirement concerning attainment and reasonable further progress, or any applicable requirement.

Finally, the tables in Appendix 1 of Attachment I (Appendix A to this SIP revision) are required to be maintained in accordance with the provisions of this Attachment as an aid to the administration of this Attachment, but the Tables and information contained therein shall not constitute part of the state implementation plan. The Tables and the information contained therein are federally enforceable when the condition referring to them is federally enforceable.

Monitoring and compliance are discussed below.

4.5.3.1 Required Level of Control

Per the CAA, the control strategy selected must qualify as RACM/RACT. EPA's SO_2 Nonattainment Area SIP Guidance defines RACM as those measures necessary to reduce emissions as expeditiously as possible

[68] *See* Appendix A.

that result in attainment of the NAAQS, which can be obtained through the implementation of RACT controls.[69] These controls will be implemented on the primary/significant source(s) of SO_2 emissions in the nonattainment area and build upon the 2017 SIP revision's controls. As Chapter 5, *infra*, demonstrates, these proposed controls will result in attainment of the NAAQS as expeditiously as possible. As such, they meet the required level of RACM/RACT.

4.5.3.2 Emissions Reductions Goals – Attainment Measures

The primary emission reduction goal for the control strategy is to achieve attainment of the 1971 and 2010 SO_2 NAAQS. Attainment will be accomplished through a permit revision for the Hayden Smelter that establishes a limit on SO_2 fugitive emissions as well as requirements for operational standards, monitoring, compliance demonstration, record keeping, and reporting.

4.5.3.3 Authority

ADEQ has the statutory authority to adopt and implement rules under A.R.S. §§ 49-104, 49-106, 49-402(A)(2), 49-404(A), and 49-424(7). Additionally, ADEQ has authority to issue the permit revision pursuant to A.R.S. §§ 49-426(E) and (I).

4.5.3.4 Adequate resources

Nonattainment plans must also include a description of the resources available to the State and local agencies at the date of submission of the plan and of any additional resources needed to carry out the plan during the five-year period following its submission. The description must include projections of the extent to which resources will be acquired.[70]

As the implementing agency, the cost to ADEQ of rulemaking and enforcement of the rules and Asarco's Title V permit will be minimal. ADEQ's current full-time staff coordinated the development of the rules with Asarco and EPA; no additional resources were needed. ADEQ expects that its current permits and compliance staff is adequate to implement and enforce the new rules. Therefore, resources are already acquired and no resource-related projections are applicable.

Overall, ADEQ expects that the current resources available to the agency will be adequate to carry out this plan for the Hayden SO_2 nonattainment area through the next five years.

4.5.3.5 Applicability of the proposed permit revision

The final permit revision applies to the owner or operator of the primary copper smelter located in Hayden, Arizona. The owner/operator is required to implement and comply with the provisions of the operating permit at the Hayden Smelter. At the time of this SIP, Asarco is the owner/operator of the Hayden Smelter.

4.5.3.6 Notice of Standards

[69] U.S. EPA. (2014). Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions.
[70] CAA § 110(a)(2)(E)(i); 40 CFR § 51.280.

The provisions of permit revision are sufficiently clear so the regulated entity is on notice of all requirements. These provisions are based on a permit application by the owner/operator of the Hayden smelter. The effectiveness of the new standard and designation of nonattainment status has provided Asarco sufficient time to determine the appropriate control technology to ensure attainment of the 1971 and 2010 SO_2 NAAQS.

4.5.3.7 Compliance/Implementation Schedule

The compliance/limitation schedule is defined in Appendix A. The operational controls and limitations in Condition II of the permit revision shall be implemented upon smelter restart or the time specified in Condition II, whichever is later.[71] The requirements of Condition II are federally enforceable upon restart. The SO_2 limitations in Condition III (Sulfur Dioxide Emissions Limitations) of the permit revision shall become effective 60 days after the Hayden smelter achieves maximum production after restart or 180 days after restart, whichever occurs first. The requirements of Condition III are state enforceable only until the effective date of the EPA Administrator's action approving them as part of the SIP revision for sulfur dioxide control.[72]

4.5.3.8 Recordkeeping and Reporting

Consistent with A.A.C. R18-2-306, the Hayden SO_2 permit revision contains requirements for record retention and reporting. Asarco is required to keep records of monitoring information for a period of at least five years. This includes measurements from the CEMS, compliance calculations, quality assurance and quality control activities, and all major maintenance activities. Records must be kept regarding the occurrence and duration of any startup, shutdown or malfunction of smelter processes. In addition, records must be kept of CEMS breakdowns, repairs, maintenance, out of control periods, calibration checks, and zero and span adjustments. This is also consistent with requirements in Asarco's operating permit for the Hayden Smelter.

The rule also specifies the type and timing for submittal of reports to ADEQ. Asarco must submit data assessment reports for each calendar quarter. In addition, excess emissions and monitoring system performance reports must be submitted semiannually (twice per year). Notification is provided to ADEQ for commencement of construction for project improvements authorized by Significant Permit Revision #60647. Progress reports regarding construction will also be submitted to ADEQ.

4.5.3.9 Compliance and Test Methods

Regarding fugitive emissions monitoring, ADEQ notes that these proposed limits are contingent upon their being monitored in accordance with the existing fugitive study roofline monitoring system installed pursuant to the Consent Decree. As there is no otherwise regulatorily recognized method for gathering fugitive emissions data from the Hayden smelter. As ADEQ expressed in its comment letter to the Primary

[71] *See* Appendix A.
[72] *Id.*

Copper Smelter NESHAPS, EPA's reference methods are not compatible with the physical layout of the smelter.[73]

Asarco's proposed numeric emission limits for the Hayden smelter process fugitive sources that correspond to those modeled in its attainment demonstration. Those limits are 38.5 lb/hr for fugitive emissions from the INCO flash furnace, matte tapping and slag skimming areas; 10 lb/hr for fugitive emissions from the converter aisle; and 9 lb/hr for fugitive emissions from the anode furnaces, all as measured by the roofline monitoring system for each of these areas used during the fugitive study.

The fugitive roofline monitoring system uses a manifold system to take samples along the roofline of each area of the Hayden smelter. The sample is then routed past a continuous emissions monitoring system (CEMS) that provides a minimum of four samples per hour (1 for each 15 minute segment). Each roofline segment (flash furnace, converter aisle, and anode furnace area) has a separate system to measure emissions performance on an hourly basis and is directly comparable to the limit. The proposed permit requires maintenance of this system, appropriate calibration, maintenance, and data handling procedures to ensure enforceability. Data from this monitoring system collected during the incomplete fugitive study were used to develop the proposed engineering controls and the use of this system will provide a means to validate that the needed emissions reductions have been achieved.

Accordingly, because appropriate numeric emissions limits, using the averaging time of the NAAQS, with a continuous monitoring system in place, the requirements of CAA §§ 110 and 172(c)(6), the general preamble, and the 2014 SO_2 Guidance are met.

The proposed limits are contingent upon emissions being monitored in accordance with the existing fugitive study roofline monitoring system installed pursuant to the Consent Decree.[74] Due to the challenges of quantifying fugitive emissions and the inapplicability of the general Reference Methods sampling approaches, the proposed numeric limits are inseverable from the compliance methodology specified.

Compliance Demonstration

Requirements for the compliance demonstration are contained in the final permit revision.[75] This provides two compliance demonstrations, with the first being for main stack compliance.[76] The second, is the fugitive limit compliance demonstration.[77] Compliance with the main stack limit will be demonstrated by summing the emissions from each of the emission points CEMS, including the acid plant tail gas (flash furnace and converter blowing emissions), vent gas baghouse (flash furnace fugitives plus matte tapping and slag skimming emissions), secondary hood baghouse (converter secondary emissions, uptake improvement project and fuming ladle control emissions), converter tertiary hoods (converter tertiary

[73] Regulations.gov, Docket Number EPA-HQ-OAR-2020-0430, available at https://www.regulations.gov/docket/EPA-HQ-OAR-2020-0430.
[74] *See supra* note 54.
[75] Appendix A.
[76] Appendix A, Paragraph III.D.1.
[77] Appendix A, Paragraph III.D.2.

emissions), anode furnace baghouse and anode secondary hood baghouse and calculating a new 14-operating day average each operating day to compare to the 1069.1 lb/hr 14-operating day main stack limit. For the fugitive sources, compliance would be demonstrated by comparing the hourly emissions from each area (flash furnace, converter aisle, and anode aisle) gathered by the roofline monitoring system to their respective limit.

4.5.3.10 Enforceability Concerns Addressed by Permit Revision

In EPA's partial approval/partial disapproval, EPA expressed concern regarding two issues: 1) emergency shutdown ventilation; and 2) the main stack's compliance methodology CEMS data.

Regarding emergency shutdown ventilation, EPA noted that the procedures for calculating emergency shutdown ventilation are not specified in A.A.C. R18-2-B1302's language. To address this concern, the permit condition located at III.D.1.b. (*See* Appendix A) provides that the shutdown ventilation pounds are based on the maximum concentration of SO_2 anticipated in each segment of the system times the volume of the system for unplanned shutdowns and 10 percent of that quantity for planned shutdowns accompanied by running the evacuation system until total pounds of SO_2 to the main stack is less than 53.6 lb/hr. The condition also provides that any change to the design volume or SO_2 concentrations used shall be processed as a significant permit revision. The proposed condition balances enforceability with the possibility that the system may require redesign or replacement in the future without compromising enforceability. Change is not intended to cover minor fluctuations in volume due to material buildup in the duct between maintenance cycles but only a design change that would increase or decrease the volume of the system or an operational change that would increase the maximum anticipated SO_2 concentrations above the conservative values shown in the AP-42 Table 12.3.11 (smelting furnace fugitives adjusted for matte grade)).

Second, EPA approved the main stack limit into the SIP as a SIP strengthening measure. EPA stated "we are not evaluating its adequacy to ensure attainment of the 2010 SO_2 NAAQS because (1) ADEQ has not demonstrated that the emission limits in Rule B1302 are sufficient to provide for attainment, and (2) the stack emission limit is not fully enforceable due to various deficiencies in Rule B1302."[78] As part of this, EPA expressed concern that A.A.C. R18-2-B1302 lacks a definition of when CEMS data are valid and usable for compliance demonstration purposes, undermining enforceability.[79] To address this concern, the missing language is added as proposed condition III.D.2., adding the validation methodology language as an enforceable permit condition.

As will be discussed in Chapter 5, ADEQ anticipates that these changes will allow the Hayden SO_2 NAA to attain the 1971 and 2010 SO_2 NAAQS.

4.6 RACM/RACT Determination

ADEQ has determined that the controls proposed by Asarco for the Hayden Smelter constitute RACM/RACT. As shown in the previous section, the control technology has equivalent or higher control efficiencies and lower emissions limits when compared with similar controls that have been determined

[78] 85 FR 71,547, 71,551 (Nov. 10, 2020).
[79] *Id*.

to be BACT for PSD permitting purposes by EPA. The Hayden Smelter will achieve the lowest emissions that the source is capable of meeting by implementing the proposed control technology and by adhering to the requirements of A.A.C. R18-2-B1302. Additionally, the additional fugitive controls proposed by this SIP revision also constitute RACM/RACT.

5 Attainment Demonstration and Reasonable Further Progress

Section 172(c) of the CAA requires that nonattainment area plans include control measures that provide for attainment of the NAAQS by the attainment date as required in CAA, Subpart 5, § 192. Additional criteria for SIP submissions are also provided in CFR §§ 51.110 – 51.126. Plans must include a demonstration of attainment that supports the determination that necessary emissions reductions will occur from implementation of the control measure(s) in order to achieve the NAAQS. States must demonstrate the adequacy of control measures through an air quality modeling analysis showing that the selected emission limit will reduce emissions for the area to attain the standard.

The guidance for SO_2 nonattainment SIPs, the preamble for the 2010 SO_2 final rulemaking, and 40 CFR Part 51, Appendix W provide additional details and information on how to conduct modeling to support implementation of the SO_2 NAAQS. ADEQ appointed Asarco's modeling consultant , Blue Sky Modeling, to perform the attainment demonstration for the Hayden SO_2 nonattainment area SIP, while ADEQ used its expertise in an oversight and review capacity. The Hayden SO_2 Nonattainment Area Modeling TSD (Hayden SO_2 Modeling TSD) contains the detailed modeling analyses, calculations, and information to support the control measures. It also contains the emission limits and attainment demonstration results.

This chapter contains an overview of the modeling used for this attainment demonstration as well as the predicted ambient air concentrations and emission levels. The Hayden SO_2 Modeling TSD is located in Appendix C along with the Modeling Protocol and associated documents. Additionally, the basis of this modeling demonstration builds off the attainment demonstration that was submitted in the 2017 SIP revision. While EPA disapproved the previous attainment demonstration, the emissions reductions from the CRP and the reductions from the proposed changes in this SIP revision are sufficient to demonstrate attainment of the 2010 NAAQS by the new statutory attainment date.

5.1 Modeling Domain

The modeling domain for a planning area is dependent on the sources to model and the receptor network (grid). For this attainment demonstration, the boundary of the modeling domain is the entirety of the Hayden SO_2 Nonattainment Area and includes the sources that contribute to emissions that may result in exceedances and/or violations of the standard. Detailed information regarding the modeling domain is located in Section 3 of Appendix C.

5.1.1 Emission Sources

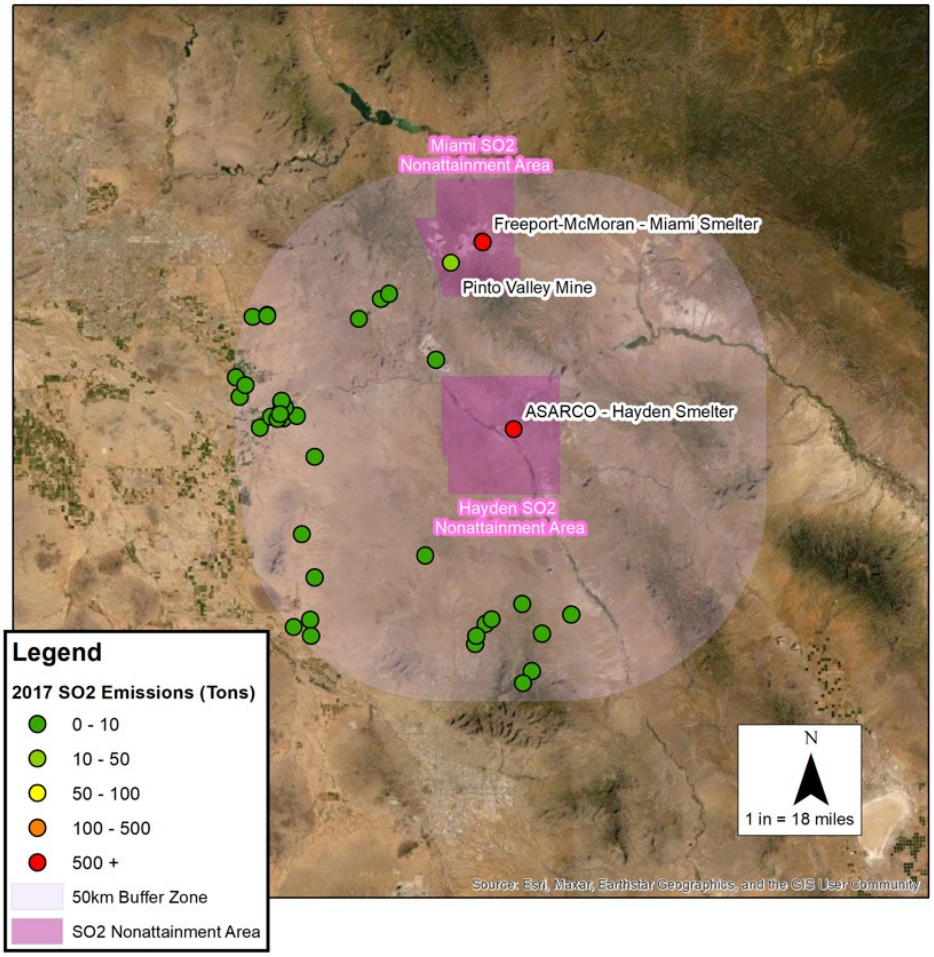
As noted in Chapter 3, the primary source of SO_2 emissions in the nonattainment area is the Hayden Smelter and accounts for approximately 99.97 percent of emissions.

In the 50 km buffer, the FMMI Miami Smelter and the Pinto Valley Mine are the primary sources of SO_2 emissions outside of the Hayden smelter; however, the Miami Smelter accounts for approximately 99.9 percent of SO_2 emissions. Even though it is located in the buffer zone, the Miami Smelter is unlikely to contribute to SO_2 emissions and exceedances in the Hayden SO_2 Nonattainment Area. Geographic features separate the facilities into two distinct air sheds and air quality analyses show that stack emission from

the Miami Smelter have minimal impact on monitors in the Hayden SO_2 Nonattainment Area.[80] Excluding the two smelters and the Pinto Valley Mine, there are no other point sources that emitted more than 25 tpy of SO_2 from 2018 to 2021. Due to these insignificant emissions, it is unlikely that the minor sources of SO_2 will contribute to a violation of the 2010 SO_2 NAAQS in the Hayden SO_2 Nonattainment Area.

The EPA requires background air quality estimates to be are added to modeling results for comparison with the NAAQS. Appendix W of 40 CFR Part 51 provides criteria for types of background concentrations to include in the modeling analysis. Background concentrations were included and represented by using the monitoring data collected from five ambient air monitors located near the Hayden Smelter during the shutdown of smelting operations. Four permitted sources were found to contribute to background emissions but their impacts were not discernable from local ambient data collected during smelter shutdowns.[81] The locations of the point sources are shown in Figure 5-1.

Figure 5-1 Locations of Point Sources in the Hayden SO_2 Nonattainment Area and 50km Buffer



[80] Appendix B, Section 3.1.1.
[81] Appendix B, Section 3.1.2 and 7.0.

5.1.2 Ambient Air Boundary and Receptor Grid

The land owned by Asarco that is contiguous to and includes Asarco's Hayden Operations covers an area in excess of 15 square miles. This area extends along and on either side of the Gila River Valley approximately 4.5 miles to the west of the plant and extends into the Dripping Spring Mountains to the north and northwest. Much of the area is inaccessible to the general public because it is either fenced or because of the steep and rugged nature of the terrain. As a result, much of Asarco's property is not considered ambient air. The area encompassing the actual processes and industrial activities associated with the Asarco Hayden Operations is considerably smaller and is located immediately to the north and east of the town of Hayden. Asarco relies on security patrolling and cameras in addition to fencing and steep/rough terrain. Fencing is in place where the smelter abuts the Town of Hayden.

Asarco followed ADEQ's Air Dispersion Modeling Guidelines (ADMG) to identify, for permitting modeling purposes, the Ambient Air Boundary (AAB), outside of which modeling receptors are to be placed. This perimeter consists of fencing, steep/rugged terrain, and what ADEQ designates as the process area boundary (PAB).

In defining the PAB, Asarco only included areas where processes, operations, and activities associated with and supporting Asarco's concentrating and smelting operations occur. The PAB included the locations of equipment and operations where handling, processing, movement, and management of feed materials, products, and byproducts are conducted. Asarco properties connected to the Hayden Operations but not part of the PAB. Asarco's AAB is shown in Figure 5-2. Appendix C contains more details regarding the definition of Asarco's AAB. In 2015, Asarco purchased additional land on the eastern side of the plant, near the slag dump. As this area is quite inaccessible to the public because of the steepness of the terrain, it was included in the AAB and PAB.

Figure 5-2 Asarco Ambient Air Boundary



The modeling domain centered on the Hayden smelting facility and encompassing the Hayden Nonattainment Area. The total area was approximately 33 km by 34 km and covered portions of Gila and Pinal Counties. Asarco then determined the locations of receptors in the modeling domain to estimate pollutant concentrations in the air quality model. Receptors are typically placed at locations where high concentrations may occur. Spacing of receptors near the source should be sufficient to capture expected concentration gradients around the locations of maximum modeled concentrations. In addition, receptors should be placed in all directions surrounding a project source to capture meteorological and chemical variability.[82]

Asarco placed 2,858 receptors in the modeling domain. Receptors along the AAB were spaced at 25 meters. Receptors between 500 meters and approximately 1500 meters had a spacing of 100 meters (including in areas of elevated terrain in the north). Receptors between approximately 1500 meters and 5500 meters were had a spacing of 500 meters. Receptors between 5500 meters and the Hayden NAA boundary had a spacing of 1000 meters. Receptors along the NAA boundary had a spacing of 2500 meters. The modeled receptors are shown in Figure 5-3. Figure 5-4 shows the modeled receptors focused on the Asarco smelter. Additional details regarding the modeling domain and receptors is in Appendix C.

[82] U.S. EPA. (2015). Guidance on the use of model for assessing the impacts of emission from single sources on the secondarily formed pollutants ozone and $PM_{2.5}$. Office of Air Quality Planning and Standards, Air Quality Analysis Division, Air Quality Modeling Group, Research Triangle Park, NC; July 2015, EPA-454/P-15-001.

Figure 5-3 Modeled Receptors in the Hayden Planning Area

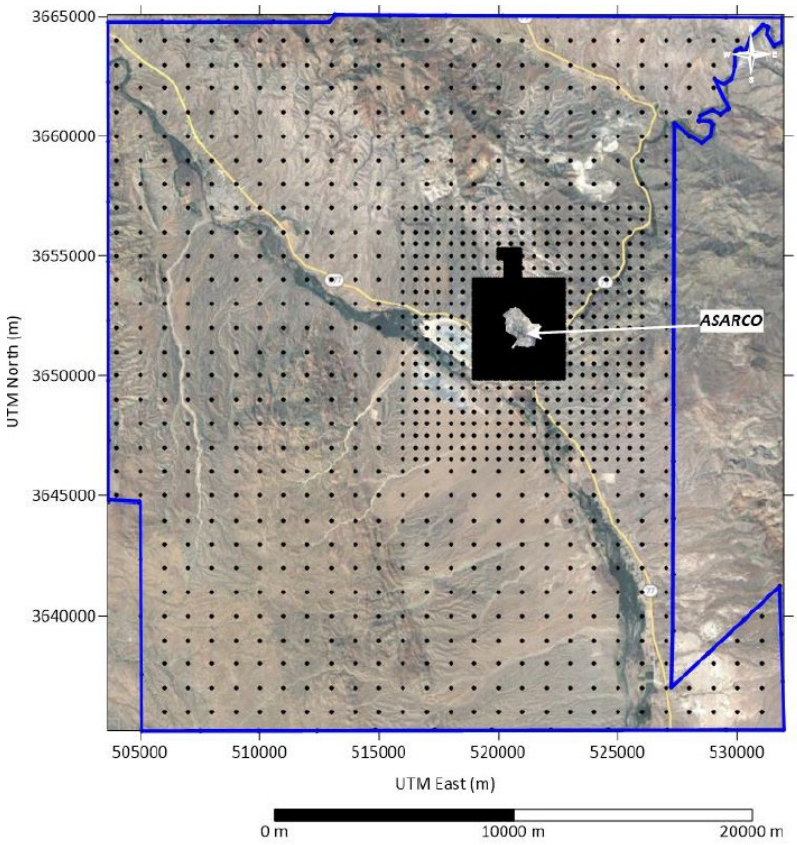
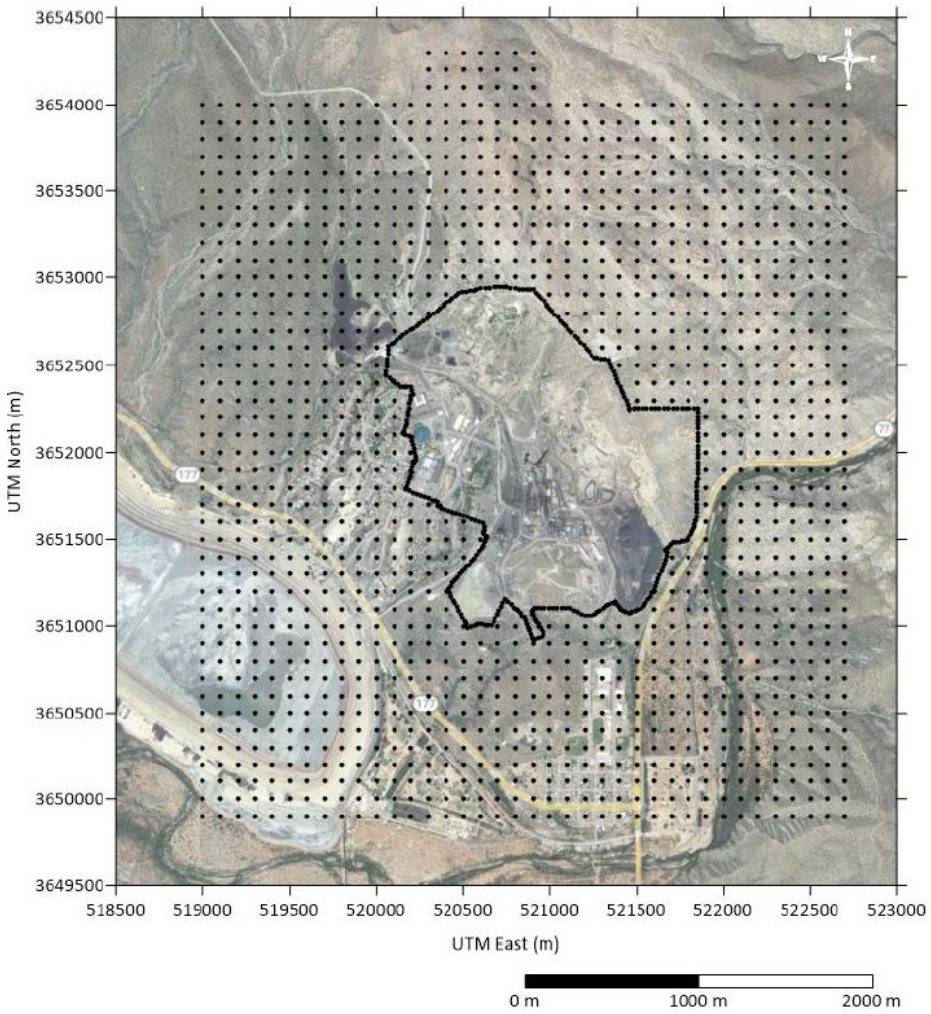


Figure 5-4 Modeled Receptors, Focused on Asarco



5.2 Model Selection

The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) is the preferred model under Appendix W for SO_2 modeling demonstrations. There is some flexibility on a case by case basis when an adequate analysis can be made that an alternative model performs better than the preferred model.[83] Some scenarios may occur where another preferred model, such as Buoyant Line and Point Source (BLP) would be used. The use of an alternative model must be review and approved by EPA.

Asarco used AERMOD Version 22112 to predict ambient concentrations in simple, complex, and intermediate terrain. AERMOD is the recommended sequential model in EPA's Guideline on Air Quality Models (GAQM) (40 CFR 51, Appendix W) (U.S. EPA, 2005) for near-field analysis. A detailed discussion of

[83] *Id.*

the model selection process and approach can be found in Appendix C, Section 4 of the Hayden SO_2 Modeling TSD.

5.3 Source Inputs

This section describes the smelter operations and source points and the GEP stack height.

5.3.1 Asarco Hayden Smelter Operations and Source Points

As described in Chapter 4, the Hayden Smelter operations consists of a flash furnace, three Peirce-Smith converters, three anode furnaces, an acid plant and other support equipment. The CRP included the replacement of the existing converters, modify the primary and secondary hooding, adding a tertiary hooding system, replacing the existing lime injection with activated lime injection, and several other modifications.[84] In addition to the CRP, Asarco proposed additional controls to be put in place on the Hayden smelter, described in Section 4.3, *supra*: 1) the replacement of the existing preheater at the double contact acid plant with a redesigned unit; 2) the Uptake Improvement Project; 3) the Fuming Ladle Capture Project; and 4) Anode Secondary Hood System.

Under the CRP implementation, SO_2 emissions are released into the atmosphere from five locations at Asarco's Hayden operations: the main smelter stack, the anode furnace roof monitors, the converter aisle roof monitors, the flash furnace building roof monitors, and outdoor slag pouring. Additional details regarding the source configuration, types, and release parameters are in Appendix C, Section 5.2.

5.3.2 Good Engineering Practice Stack Height

The CAA § 123 specifies that emission limitations established to meet a NAAQS for a regulated pollutant take into account good engineering practice (GEP) stack height. Additional provisions are located in 40 CFR §§ 51.100(ii)(3), (jj), and (kk). *See* Section 4.4.1, *supra*, and Section 5.3 of the Modeling TSD (Appendix C) for additional information regarding GEP stack height.

5.4 Modeling Results

This section provides an overview of the modeling results from the 2017 SIP revision and the updated results from Blue Sky Modeling, LLC, based on the proposed changes in this SIP revision.

5.4.1 2022 Modeling TSD

The EPA's April 2014 guidance for SO_2 SIP submissions provides direction to air agencies on determining emissions limits for averaging periods greater than 1 hour that still ensure compliance with the 2010 SO_2 NAAQS. EPA indicates that they will consider a longer-term limit as the product of the 1-hour CEV and the ratio of the 99th percentile emission rate of the averaging period in question to the 1-hour 99th percentile emission rate. The CEV is defined as "*…the hourly emission rate that the model predicts would result in the*

[84] See Chapter 4, *supra*, for additional details or Appendix C, Hayden SO_2 Attainment Demonstration.

5-year average of the annual 99th percentile of daily maximum hourly SO_2 concentrations at the level of the 1-hour NAAQS, given representative meteorological data for the area."[85] To determine the critical emissions value, the EPA guidance specifically states that dispersion modeling should be used.

5.4.1.1 2022 Modeling TSD

This section presents a summary of the Hayden SO_2 Modeling TSD (Appendix C). Table 5-1 presents the results of the 1-hr SO2 NAAQS modeling.

Table 5-1 Modeling Results, 1-hr SO_2 NAAQS

Highest 99th Percentile of Controlling 1-hr Concentrations (µg/m³)[a]	2010 SO_2 NAAQS (µg/m³)
195.97[b]	196.0
a. Includes background through the application of SEASHR in AERMOD. b. Highest 99th Percentile of Controlling 1-hr Concentrations predicted to occur at (521851.1 m, 3651825.4 m)	

As Table 5-1 demonstrates, the controlling 1-hr SO_2 concentration is below the 1-hr 2010 SO_2 NAAQS of 196 µg/m³. It is predicted to occur along the eastern side of the Asarco ambient air boundary. Modeled 1-hour SO_2 concentrations generally decrease very rapidly with distance from Asarco. *See* Appendix C, Section 8. The CEVs for this modeling were:

- Anode Furnace Fugitives: 9 lbs/hr;
- Converter Aisle Fugitives: 10 lbs/hr; and
- Flash Furnace Fugitives: 38.5 lbs/hr.[86]

Additionally, the Hayden SO_2 Modeling TSD evaluated the results of the 1971 SO_2 NAAQS in Table 5-2, below.[87]

Table 5-2 Modeling Results, 1971 SO_2 NAAQS

Averaging Period	Controlling Concentration (µg/m³)[a]	1971 SO_2 NAAQS (µg/m³)
3-hr	170.8[b]	1300
24-hr	51.7[c]	512
Annual	11.9[d]	80
a. Includes background through the application of SEASHR in AERMOD b. Highest second-high 3-hr concentration predicted to occur at (520537.1 m, 3652922.9 m) c. Highest second-high 24-hr concentration predicted to occur at (520615.8 m, 3651570.0 m) d. Highest annual concentration predicted to occur at (520611.7 m, 3651593.3 m)		

The Hayden SO_2 Modeling TSD shows that the controlling 3-hr, 24-hr and annual concentrations are below the 1971 SO_2 NAAQS. The controlling 3-hr concentration is predicted to occur along the northern side of

[85] *See supra* note 62, 22-23.
[86] Appendix C at 8-50.
[87] *Id.* at 8-45.

the AAB, while the controlling 24-hr and annual concentrations are predicted to occur along the western side of the AAB.

The modeled CEV emission rate for the Main Stack has not changed from the 2017 SIP revision. Under the additional proposed controls, the fugitive emissions will be captured and routed to the main stack. The previously modeled emission rate can accommodate the small addition of fugitive SO_2 now being routed to the Main Stack.[88]

5.5 Reasonable Further Progress

Section 172(c)(2) of the CAA requires that nonattainment area plans include a demonstration of reasonable further progress (RFP).

> *"Such plan provisions shall require reasonable further progress" defined in CAA Sec. 171(1) as "…such annual incremental reductions in emissions of the relevant air pollutant as are required… for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date."*

The EPA guidance for 1-hour SO_2 nonattainment area SIP submissions states that the CAA definition of reasonable further progress is less pertinent to pollutants such as SO_2. The General Preamble explains that RFP is considered "adherence to an ambitious compliance schedule." (74 FR 13,547; effective April 16, 1992.) The guidance for SO_2 plans goes on to say that RFP means that air agencies need to ensure that sources implement appropriate control measures as expeditiously as practicable by the applicable attainment date.

5.5.1 Compliance Schedule for Implementation

The Converter Retrofit Project for the Hayden Smelter Operations was completed in 2018. This section presents the compliance schedule for implementation of the Appendix A.

The effectiveness timeframes of the SO_2 limitations in the proposed permit revision are described in Appendix A. Appendix A contains Conditions II and III, which contain operational limitations and SO_2 emissions limits, respectively.

The operational controls and limitations in Condition II shall be implemented upon smelter restart or the time specified in Condition II, whichever is later. The requirements of Condition II are federally enforceable upon smelter restart.[89]

Condition IIII requirements shall become effective 60 days after the Hayden smelter achieves maximum production after smelter restart or 180 days after smelter restart.[90] Condition III requirements are state-

[88] *Id.* at Appendix H, 3.
[89] Appendix A.
[90] *Id.*

enforceable until the effective date of the Administrator's action approving them as part of the SIP revision for SO_2 control.[91]

5.6 Attainment Demonstration

As summarized in the preceding sections and provided in the Hayden SO_2 Modeling TSD, the technical demonstration and modeling shows that the area will attain the 1971 and 2010 SO_2 NAAQS with the completed CRP and the proposed modifications and upgrades to the Hayden Smelter (redesign of the acid plant preheater, the uptake improvement project, fuming ladle capture project, anode furnace secondary hood system), and single limit from the main stack.

[91] *Id.*

6 Contingency Measures

CAA § 172(c)(9) requires that nonattainment area SIPs include measures that will be implemented if an area: (1) fails to make RFP; or (2) fails to attain the SO_2 NAAQS by the applicable attainment date.

> *"Such plan shall provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date applicable under this part. Such measures shall be included in the plan revision as contingency measures to take effect in any such case without further action by the State or the Administrator."*

According to EPA's 2014 guidance for 1-hour SO_2 nonattainment area SIP submissions, contingency measures should consist of other available control measures that are not included in the control strategy for the nonattainment area SIP.[92] Prior EPA guidance has also explained that unlike controls for other criteria pollutants, the control efficiencies for SO_2 control measures are well understood and easier to quantify.[93] Therefore, recognizing that it would be unlikely for an area to implement the necessary emission controls yet fail to attain the SO_2 NAAQS, the EPA guidance concludes that "contingency measures" for SO_2 SIPs can mean that the State agency has a comprehensive program to identify sources of violations of the SO_2 NAAQS and to undertake an aggressive follow-up for compliance and enforcement including expedited procedures for establishing enforcement consent agreements pending the adoption of a revised SIP.[94] EPA's 2014 guidance confirms that this approach continues to be a valid approach for providing contingency measures for purposes of SO_2 SIPs.[95] In addition, EPA's guidance clarifies that this approach would not preclude an air agency from requiring additional measures that are enforceable and appropriate for a particular source category until more permanent measures can be put into place to correct the problem.[96] In either case, the contingency measures would need to be a fully adopted provision in the SIP that becomes effective where the area has failed to meet RFP, or fails to attain the SO_2 NAAQS by the statutory attainment date.[97]

As proposed by EPA, ADEQ's enforcement program meets the SIP infrastructure requirement under CAA § 110(a)(2)(C) for enforcement of control measures.[98] Accordingly, consistent with EPA's 2014 guidance, the Compliance and Enforcement Section of the Air Quality Division at ADEQ will provide for contingency measures through aggressive follow-up for compliance and enforcement, including expedited procedures for establishing enforcement consent agreements pursuant to state law at A.R.S. § 49-461. The assurance that the following procedures for contingency measures will be followed and commitments will be implemented and enforced is contained in state law at A.R.S. §§ 49-402, 49-404, and 49-406.

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[92] *See* EPA "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" at 41 (Apr. 23, 2014).
[93] *See* EPA, "SO_2 Guideline Document," EPA-452/R-94-0008, at 6-40 (Feb. 1994).
[94] *Id*. at 6-41.
[95] *See* EPA "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" at 42.
[96] *Id.*
[97] *Id.*
[98] *See* 97 FR 31,571, 31,575 (May 19, 2016); see also 77 FR 66,398, 66,401 (Nov. 5, 2012) (approving ADEQ's program for enforcement of control measures for purposes of Section 110(a)(2)(C) of the CAA). The identification and evaluation of ADEQ's enforcement authorities is provided in EPA's "Technical Support Document Evaluation of the Arizona Infrastructure SIP for 2010 NO_2 and 2010 SO_2," at 13-14 (Apr. 29, 2016).

EPA, in the proposed partial approval/partial disapproval, stated that "we agree that the Arizona SIP establishes a comprehensive enforcement program, allowing for the identification of sources of SO2 NAAQS violations and aggressive compliance and enforcement follow-up" which would have satisfied the 2014 SO2 Guidance's requirements for contingency measures.[99] EPA also stated that "the EPA's policy that a comprehensive enforcement program can satisfy the contingency measures requirement is premised on the idea that full compliance with the controls required in the plan will assure attainment."[100]

EPA's disapproval of the attainment demonstration contained in the 2017 SO_2 SIP revision led to the disapproval of the other SIP elements tied to the attainment demonstration.[101] This included, among other things, the 2017 plan's contingency measures.[102] Accordingly, ADEQ's contingency measures follow the same approach as the 2017 plan. The submission of the new attainment demonstration cures the deficiency with ADEQ's contingency measures because the basis for its disapproval was the disapproval of the attainment demonstration.

6.1 Contingency Measures for Failure to Make Reasonable Further Progress

As specified in Chapter 5 and Appendix C, RFP is demonstrated by adherence to the prescribed compliance schedule for the permit conditions related to the proposed permit revision controls. In the event that the owner or operator of the Hayden Smelter does not adhere to the compliance schedule contained in the proposed permit revision, ADEQ shall determine that the Hayden area has failed to make RFP. Upon such determination, ADEQ shall, pursuant to A.R.S. § 41-1009(J), provide notification of the compliance schedule violation to the owner or operator of the Hayden Smelter. If the violation is not corrected within 120 days of its receipt of such notification, the owner or operator of the Hayden Smelter is required to enter into an administrative Consent Order, or an executed agreement for a judicial Consent Judgment or Consent Decree, which will contain a compliance schedule resolving the violation.

6.2 Contingency Measures for Failure to Attain the SO_2 NAAQS by the Attainment Date

CAA § 179(c)(1) requires that EPA to determine whether the Hayden area attained the SO_2 NAAQS by the attainment date (i.e., January 31, 2027) as expeditiously as practicable, but not later than 6 months, after that date.[103] Given the three-year average form of the 1-hour SO_2 NAAQS, the determination of whether the Hayden area attained the SO_2 NAAQS by the January 31, 2027 attainment date will not be based on air quality monitoring data alone. According to EPA guidance, that determination will be based on available air quality data, dispersion modeling for the area, and a demonstration that the control strategy in the SIP has been fully implemented.[104] If EPA determines that the Hayden area failed to attain the SO_2 NAAQS by the attainment date, EPA will inform ADEQ by letter and publish a notification in the Federal

[99] 85 FR 31,118, 31,123 (May 22, 2020).
[100] *Id.*
[101] 85 FR 71,547 (Nov. 10, 2020).
[102] *Id.* at 71,552.
[103] 87 FR 4,805 (Jan. 31, 2022).
[104] EPA, "Attainment Determination Policy for Sulfur Dioxide Nonattainment Areas," at 2 (Jan. 26, 1996).

Register.[105] Upon such notification, ADEQ shall, as soon as practicable, notify the owner or operator of the Hayden Smelter of EPA's determination.

Upon receipt of notification by ADEQ that the Hayden area has failed to attain the SO_2 NAAQS by the attainment date, the owner or operator of the Hayden Smelter shall conduct an analysis to identify additional mitigation measures that may be needed to ensure the Hayden area attains the SO_2 NAAQS. Additional contingency measures considered for implementation might include:

- Revised or additional operating procedures consistent with good air pollution control practices;
- Changes or adjustments to existing emissions collection and control measures;
- Additional emissions collection and control measures; and
- Any other measures necessary to ensure the Hayden area attains the SO_2 NAAQS.

Within 45 business days following receipt of ADEQ's notice, the owner/operator of the Hayden Smelter shall submit a report to ADEQ that describes the analysis of additional mitigation measures and provides recommendations for implementation. No later than 90 business days following ADEQ's receipt of this report, and using all available valid data and upon consultation with the owner or operator of the Hayden Smelter, ADEQ shall make a determination regarding the implementation of any contingency measures needed to ensure that the Hayden area attains the SO_2 NAAQS. The selection of measures shall be based upon emission reduction potential, cost effectiveness, economic and social considerations, or other factors that ADEQ deems appropriate. The selected measures shall be required via an administrative Consent Order with a compliance schedule.

If necessary, the requirement for additional, permanent control measures shall be made by state rulemaking and SIP revision following the required public participation. EPA guidance explains, however, that where a control technology has recently taken effect and the state can determine based on recent monitoring data and other relevant information that the control strategy will result in attainment once three years of data that reflect those controls are available, the required SIP revision may consist of an affirmation of the previously-approved control strategy, but with the establishment of a new attainment date under CAA § 179(d)(3) that reflects three full years of its implementation.[106] In addition, if ADEQ can provide at least one calendar year of air quality monitoring data indicating the Hayden area is in fact attaining the SO_2 NAAQS, pursuant to EPA's "clean data" policy, certain SIP requirements, including contingency measures, could be suspended.[107]

[105] *Id*. at 3.
[106] EPA "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" at 11.
[107] *Id*. at 51-60.

7 Conformity

CAA § 176(c) requires that actions by federal agencies do not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS or interim reductions and milestones.[108] General conformity applies to any federal action (e.g., funding, licensing, permitting or approving) taking place in a nonattainment area, other than certain highway and transportation projects. EPA's General Conformity Rule establishes the criteria and procedures for determining if a federal action conforms to the SIP.

CAA § 176(c) also addresses transportation conformity requirements that ensure that federally supported highway and transit project activities are consistent with the SIP. Transportation conformity applies to areas that are designated nonattainment and those redesignated to attainment after 1990 for transportation-related criteria pollutants. EPA has indicated that due to the relatively small and decreasing amounts of sulfur in gasoline and on-road diesel fuel the rules regarding transportation conformity do not apply to SO_2 unless of the following situations occur: if the Regional Administrator or the director of a state air agency has found that transportation-related emissions of SO_2 as a precursor are a significant contributor to a $PM_{2.5}$ nonattainment problem, or if the SIP has established an approved or adequate budget for such emissions as part of the RFP, attainment or maintenance strategy.[109]

7.1 General Conformity

General conformity for the Hayden SO_2 Nonattainment Area must be addressed to assure that SO_2 emissions from any federal actions or plans do not exceed the rates outlined in 40 CFR § 93.153(b).[110] Criteria for making such determinations and provisions for general conformity are located in A.A.C. R18-2-1438. ADEQ commits to review and comment, as appropriate, on any federal agency draft general conformity determination it receives pursuant to 40 CFR § 93.155 for activities planned for this air quality planning area.

7.2 Transportation Conformity

According to EPA “transportation conformity determinations are not required in SO2 nonattainment and maintenance areas.”[111] On January 11, 1993, EPA put forth in its “transportation conformity rule, that highway and transit vehicles are not significant sources of SO2. Therefore, transportation plans, transportation improvement programs, and projects are presumed to conform to applicable implementation plans for SO2.”[112] This was restated in the final partial approval/partial disapproval for the 2017 plan.[113]

[108] U.S. EPA. (2014). Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions
[109] 40 CFR §§ 93.102(b)(1), (2)(v).
[110] 58 FR 63,253 (Nov. 30, 1993).
[111] 85 FR 31,118, 31,123 (May 22, 2020).
[112] 58 FR 3,768, 3,776 (Jan. 11, 1993); 85 FR 31,118, 31,123 (May 22, 2020).
[113] 85 FR 31,118, 31,124 (May 22, 2020).

8 New Source Review

The CAA, Title I, Part D contains the procedures and conditions under which a new major stationary source or major modification may obtain a preconstruction permit in an area designated nonattainment for any criteria pollutant. The nonattainment new source review (NNSR) permitting requirements in CAA §§ 172(c)(5) and 173 are among "the requirements of this part."[114]

EPA's 2014 SO_2 Guidance indicates that states with an existing NNSR permitting program applicable to areas previously designated under the 1971 SO_2 NAAQS may use that program to authorize the construction and/or modification of major stationary sources of SO_2 that would locate in an area designated under the 2010 SO_2 NAAQS. NNSR programs should ensure that construction and modification of major stationary sources will not interfere with RFP towards the attainment of the SO_2 NAAQS. Applicable requirements include but are not limited to:

- The installation of Lowest Achievable Emissions Rate (LAER) control technology;
- The acquisition of emissions reductions to offset new emissions of nonattainment pollutant(s);
- Certification that all major sources owned and operated in the state by the same owner are in compliance with all applicable CAA requirements;
- A demonstration via an analysis of alternative sites, sizes, production processes, and environmental control techniques shows that the benefits of a proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification; and
- An opportunity for a public hearing and written comment on the proposed permit.

The NNSR requirements apply on a pollutant-specific basis with respect to each nonattainment pollutant for which a source has the potential to emit in amounts greater than the applicable major source threshold for the pollutant (i.e., in major amounts [40 CFR § 51.165(a)(l)(iv)]). For new sources located in areas that are designated nonattainment for the 2010 SO_2 NAAQS, 100 tpy or more of SO_2 represents a major amount. Similarly, SO_2 NNSR requirements also apply to any existing major stationary source of SO_2 that proposes a major modification, i.e., a physical change or change in the method of operation that results in a significant net emissions increase ((40 tpy or more) of SO_2 [40 CFR § 51.165(a)(l)(x)(A)]).

8.1 NSR for the Hayden SO_2 Nonattainment Area

ADEQ has a permitting program in A.A.C. Title 18, Chapter 2, Article 4 - Permit Requirements for New Major Sources and Major Modifications to Existing Major Sources.

In 2012, ADEQ submitted a significant SIP revision designed to update to the Arizona SIP for New Source Review (NSR) to satisfy current federal NSR requirements.

On November 2, 2015, EPA published a limited approval and disapproval of the 2012 revision in the Federal Register.[115] The limited approval/limited disapproval found that the new and amended rules

[114] U.S. EPA. (2014). Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions
[115] 80 FR 67,319 (Nov. 2, 2015).

submitted by ADEQ contained some deficiencies but met most of the applicable CAA requirements for NSR programs and overall improved and strengthened the existing SIP.[116] The limited approval/limited disapproval deferred making a determination as to whether the 2012 submittal fully addressed section 189(e) of the CAA, as it relates to NNSR permitting requirements for major stationary sources of $PM_{2.5}$ precursors in $PM_{2.5}$ nonattainment areas.

On June 22, 2016, EPA published a limited disapproval of the NNSR provisions in ADEQ's 2012 SIP revision as they pertain to the Nogales and West Central Pinal $PM_{2.5}$ nonattainment areas.[117] EPA determined that the 2012 submittal did not satisfy CAA § 189(e) for these areas, because it neither contained rules regulating Volatile Organic Compounds (VOCs) or ammonia as $PM_{2.5}$ precursors nor included a demonstration showing that the regulation of VOCs or ammonia was not necessary.[118]

On April 28, 2017, ADEQ submitted a SIP revision to correct the deficiencies identified in the November 2015 limited approval/limited disapproval. The revision also corrected most of the deficiencies identified in the June 2016 limited disapproval with regard to $PM_{2.5}$ precursors. The revision did not, however, include a significant rate for ammonia or a demonstration that the regulation of ammonia as a precursor was not necessary, as required by 40 CFR §§ 51.165(a)(1)(x)(F) and 51.165(a)(13).

In a letter dated December 6, 2017, ADEQ committed to meet the requirements of section 189(e) either by revising A.A.C. R18-2-101(131) to add a significant rate for ammonia or by making a demonstration consistent with 40 CFR §§ 51.165(a)(1)(x)(F) and 51.165(a)(13) that the regulation of ammonia as a $PM_{2.5}$ precursor is not necessary. ADEQ stated that it would submit a SIP revision satisfying these conditions by the earlier of March 31, 2019 or one year from the date EPA takes final action on the April 2017 SIP revision and requested conditional approval of the April 2017 SIP revision based on this commitment.

On May 4, 2018, EPA published a notice of conditional approval of the April 2017 SIP revision as it relates to ammonia as a $PM_{2.5}$ precursor.[119] The notice concluded that "ADEQ's December 6, 2017 commitment letter provides adequate assurance that the one deficiency concerning ammonia as a PM[2.5] precursor will be addressed in a timely manner, consistent with CAA section 110(k)(4)."

On January 19, 2020, ADEQ submitted a SIP revision addressing this conditional approval.

On July 22, 2020, ADEQ submitted a minor NSR SIP revision that contained rule revisions and other demonstrations primarily intended to correct deficiencies to ADEQ's minor NSR program.

On June 16, 2021, EPA finalized its approval of both the January 19 and July 22 SIP revisions.[120] Therefore, ADEQ has a fully approved NSR program that applies to the Hayden SO2 nonattainment area. As the issues that formed the basis for EPA's limited disapproval in 2015 are now fully resolved.

[116] *Id.*
[117] 81 FR 40,525 (June 22, 2016).
[118] *Id.* at 40,526.
[119] 83 FR 1,212 (Jan. 10, 2018); 83 FR 19,631 (May 4, 2018).
[120] 86 FR 31,927 (June 16, 2021).

9 Demonstrating Noninterference Under Clean Air Act § 110(l)

Section 110(l) of the CAA provides that EPA shall not approve a SIP revision if it interferes with attainment, reasonable further progress, or other CAA requirements.

> Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act.

In addition to CAA § 110(l), CAA § 193 prohibits the modification of a control, or a control requirement, in effect or required to be adopted before November 15, 1990 in any nonattainment area unless such a modification ensures equivalent or greater emission reductions.

> Each regulation, standard, rule, notice, order and guidance promulgated or issued by the Administrator under this Act, as in effect before the date of the enactment of the Clean Air Act Amendments of 1990 shall remain in effect according to its terms, except to the extent otherwise provided under this Act, inconsistent with any provision of this Act, or revised by the Administrator. No control requirement in effect, or required to be adopted by an order, settlement agreement, or plan in effect before the date of the enactment of the Clean Air Act Amendments of 1990 in any area which is a nonattainment are for any air pollutant may be modified after such enactment in any manner unless the modification insures equivalent or greater emission reductions of such air pollutant.

To comply with CAA requirements, the 2010 SO_2 NAAQs final rule[121] states that the prior 24-hour and annual primary SO_2 NAAQS will remain in effect for one year following the effective date of the initial area designations under CAA § 107(d)(1) for the 2010 SO_2 NAAQS before being revoked under 40 CFR § 50.4(e). All SIP provisions under CAA §§ 110, 172, 175A, 191, and 192 for the 1971 SO_2 NAAQS must remain in effect until any revisions are consistent with CAA §§ 110(l) and 193. Therefore, states must continue to implement control strategies approved under the 1971 SO_2 NAAQS. This SIP revision addresses all outstanding requirements for the 1971 SO_2 NAAQS.

The control strategies described in this SIP revision are intended to subsume those contained in the "Final Hayden Sulfur Dioxide Nonattainment Area State Implementation and Maintenance Plan" submitted to EPA on June 27, 2002. The information contained in Chapters 4 and 5 evaluate the control strategies and emission reductions that will occur from implementation of the new control technology. The following sections demonstrate that the current SIP revision will meet all outstanding requirements for the 1971 SO_2 NAAQS or any other requirement of the Clean Air Act.

[121] 75 FR 35,520 (June 22, 2010).

9.1 Demonstrating Noninterference with Attainment of the National Ambient Air Quality Standards under Clean Air Act § 110(l)

Title I of the CAA requires EPA to set NAAQS for those pollutants that are considered harmful to public health or the environment. Accordingly, the air quality standards are divided into two types: primary and secondary. Primary standards are designed for the protection of public health and secondary standards are intended to protect public welfare, such as decreased visibility and damage to animals, crops, vegetation, and buildings.[122] To date, EPA has established standards for six common air pollutants referred to as criteria pollutants: carbon monoxide (CO), Pb, nitrogen dioxide (NO_2), ground-level ozone (O_3), PM, and SO_2. EPA is also required to periodically evaluate those standards and revise them if scientific analyses indicate new standards would be more protective of public health and welfare.

Under Clean Air Act § 107(d), states must make recommendations and EPA must designate areas that meet (attainment), cannot be classified, or do not meet (nonattainment) new or revised NAAQS. Based on air quality data and other factors, EPA designates areas as "nonattainment" if those areas are found to violate or contribute to violations of a NAAQS. Reasonable further progress is defined in Section 171 of the CAA as "…such annual incremental reductions in emissions of the relevant air pollutant…for the purpose of ensuring attainment of the applicable national ambient air quality standard..."[123]

The Hayden SO_2 Nonattainment Area is comprised of nine townships located in southern Gila County and central Pinal County; six adjacent townships are designated as unclassifiable. The area is designated as attainment or unclassifiable for O_3, CO, NO_2, $PM_{2.5}$, and PM_{10}. Table 9-1 shows the current designation status of the area for each criteria pollutant listed in 40 CFR § 81.303.[124]

Table 9-1 Attainment Status for the Hayden Planning Area

Pollutant	Primary/Secondary	Averaging Time	Designation
Carbon Monoxide (CO)	Primary (1971)	8-hour	Nonclassifiable/Attainment
		1-hour	Nonclassifiable/Attainment
Lead (Pb)	Primary and Secondary (2008)	Rolling 3 Month Average	Nonattainment
Nitrogen Dioxide (NO_2)	Primary (2010)	1-hour	Unclassifiable/Attainment
	Primary and Secondary (1971)	Annual	Cannot be classified or better than national standards
Ozone (O_3)	Primary and Secondary (2015)	8-hour	Unclassifiable/Attainment
	Primary and Secondary (2008)	8-hour	Unclassifiable/Attainment
$PM_{2.5}$	Primary (2012)	Annual	Unclassifiable/Attainment
	Secondary (1997)	Annual	Unclassifiable/Attainment
	Primary and Secondary (2006)	24-hour	Unclassifiable/Attainment

[122] U.S. Environmental Protection Agency, http://www.epa.gov/air/criteria.html. Date Accessed: October 29, 2013.
[123] CAA § 171(1).
[124] 40 CFR § 81.303.

Pollutant	Primary/Secondary	Averaging Time	Designation
PM_{10}	Primary and Secondary (1987)	24-hour	Nonattainment
Sulfur Dioxide	Primary (2010)	1-hour	Nonattainment
	Primary (1971)	24-hour	Nonattainment
	Primary (1971)	Annual	Nonattainment
	Secondary (1971)	3-hour	Nonattainment
Source: 40 CFR § 81.303			

As discussed above, ADEQ is requesting to replace the dual limit contain in A.A.C. R18-2-B1302(C)(1) for a single limit for SO_2 emissions from the main stack. As this single limit, that emissions from the main stack shall not exceed 1069.1 lb/hr, 14-day operating average, is more stringent than dual limit, ADEQ believes this change will not interfere with any applicable requirement concerning attainment and reasonable further progress. Finally, this approach is consistent with EPA's 2014 Guidance, Section V.D.2.b.[125]

9.2 Noninterference with Attainment of the 1971 SO_2 NAAQS

The Hayden SO_2 Nonattainment Area was initially designated under the 1971 SO_2 NAAQS in March 1978 and comprised all of Gila County.[126] The current boundaries of the nonattainment and unclassified areas are codified at 40 CFR § 81.303; see Table 1-2 located in Chapter 1 of this SIP document.

In 2006, EPA initiated a review of the air quality criteria for oxides of sulfur and the 1971 SO_2 primary NAAQS.[127] Taking into consideration available literature, technical information, and scientific recommendations, EPA proposed that the 24-hour and annual 1971 SO_2 NAAQS were not adequate to protect public health with a satisfactory margin of safety against respiratory problems associated with short-term SO_2 exposures.[128] On June 22, 2010 EPA promulgated the new 2010 SO_2 NAAQS establishing a new short-term primary SO_2 standard with a 1-hour (daily maximum) averaging time and a form defined as the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum SO_2 concentrations, and a level of 75 ppb.[129] In the same action, EPA also revoked the 1971 24-hour and annual standards recognizing that a 1-hour standard set at 75 ppb will have the effect of generally maintaining 24-hour and annual SO_2 concentrations well below the levels of the 1971 24-hour and annual standards.

In the 2010 SO_2 NAAQS final rule, EPA determined that the 1971 24-hour and annual primary SO_2 standard will remain in effect for at least one year following the effective date of the initial area designations before being revoked under 40 CFR 50.4(e). Any SO_2 areas with EPA approved attainment and maintenance SIPs for the 1971 SO_2 NAAQS, all provisions associated with those SIPs need to continue to be implemented until they are subsumed by any new EPA approved SIPs for the 2010 SO_2 NAAQS.[130] This would ensure

[125] U.S. EPA. (2014). Guidance for 1-Hour SO2 Nonattainment Area SIP Submissions.
[126] 43 FR 8,962, 8,968 (Mar. 3, 1978).
[127] 71 FR 28,023 (May 15, 2006).
[128] 75 FR 35,520 (June 22, 2010).
[129] *Id.*
[130] *Supra* note 125.

that both the new nonattainment NSR requirements and the general conformity requirements for a revised standard are in place so that there will be no gap in the public health protections provided by these two programs. It will also ensure that all nonattainment areas under the current NAAQS and all areas for which SIP calls have been issued would continue to be protected by currently required control measures.

The final regulations also stipulate that the 1971 SO_2 NAAQS shall remain in place for nonattainment areas not satisfying the requirements for a SIP call under the prior NAAQS. The 1971 SO_2 NAAQS will be revoked only after an air agency submits a SIP providing for attainment of the 2010 SO_2 NAAQS and it is approved by EPA.[131]

ADEQ submitted to EPA the Hayden SO_2 Nonattainment Area State Implementation and Maintenance Plan for the 1971 SO_2 NAAQS in June 2002. EPA has not acted on the June 2002 submittal. Per EPA's guidance, the 1971 standard will not be revoked until the SIP revision for the 2010 SO_2 NAAQS is submitted to and is approved by EPA. Therefore, the state is required to continue to implement provisions of the 2002 Hayden SO_2 SIP. When the 24-hour and annual SO_2 standards are officially revoked, all statutory requirements related to future state submission regarding the 1971 SO_2 standards under CAA §§ 110, 172, 175A, 191 and 192 no longer apply. This includes any remaining requirements for the submittal of second 10-year maintenance plan required under CAA § 175A.[132]

The attainment demonstration summarized in Chapter 5 of this SIP revision and provided in Appendix C show that the emission limit established for the Hayden Smelter will allow the area to attain the 2010 SO_2 NAAQS. Given the area will attain the new standard, which is more stringent than the previous standard, the control measures in this SIP revision addresses all outstanding requirements for the 1971 SO_2 NAAQS.

9.3 Noninterference with Attainment of the NAAQS for PM_{10}

Along with Miami, the Hayden area was originally designated as a Group I Area under the 1987 PM_{10} NAAQS. The State was required to submit a SIP revision within nine months of promulgation of the NAAQS.[133]

In a 1990 clarification, the combined Hayden/Miami Group I Area was specified to include all or part of 26 contiguous townships in and around the towns of Hayden and Miami. Consistent with EPA's PM_{10} grouping scheme, the Hayden/Miami Group I Area was designated and classified as a moderate PM_{10} nonattainment area upon enactment of the 1990 CAAA.[134]

In September 1989, ADEQ submitted the *Final PM_{10} State Implementation Plan for the Hayden Group I Area.* In July 1994, EPA proposed a limited approval/disapproval of the Hayden SIP. EPA proposed the limited disapproval primarily because the plan only addressed the Hayden portion of the nonattainment area. ADEQ submitted a formal petition to exclude the Miami area from the Hayden/Miami PM_{10} Nonattainment Area in November 1994. EPA advised ADEQ that because the Miami area had recorded

[131] *Id.*
[132] *Id.*
[133] *See* 52 FR 24,672 (July 1, 1987); *see* 52 FR 29,383 (Aug. 7, 1987).
[134] Clean Air Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399 (1990).

past exceedances of the total suspended particulate (TSP) standards and had met the 1990 PM_{10} nonattainment designation criteria, the Miami portion could not be excluded from nonattainment area status.

In July 2006, ADEQ requested that the Hayden/Miami PM_{10} Nonattainment Area be separated into two nonattainment areas. The request was based on topographical and climatological differences between the Hayden and Miami areas (the areas are in separate airsheds) and the clean PM_{10} air quality record in the Miami area (no exceedances have been recorded since PM_{10} monitoring began in 1987). On March 28, 2007, EPA concurred with ADEQ's request and the Hayden/Miami PM_{10} Nonattainment Area was officially split into two independent nonattainment areas.[135]

As the 2017 SIP revision demonstrated, the PTE from permitted sources in the PM_{10} nonattainment area have not changed and are not anticipated to change in the future years. ADEQ anticipated that actual emissions would continue to decrease.

GCT notes that the installation of the new projects should also provide secondary benefits that will further reduce fugitive PM_{10} emissions. For example, the Fuming Ladle Capture Project is designed to capture peak emissions that occur when a ladle "fumes" (e.g. emits a visible plume of SO_2 and PM) after pouring. This project and the Uptake Improvement Project are projected to control 90% of emissions between the two projects.[136] GCT estimated that the secondary hood systems will reduce fugitive particulate matter emissions from the anode furnaces by 70%. These PM reductions will also reduce lead emissions proportionally.[137]

Based on the reductions in PM_{10} emissions from activities at the Hayden Smelter and low ambient concentrations for the Hayden PM_{10} planning area, the CRP upgrades did not result in interference with the 1987 PM_{10} NAAQS.

9.4 Noninterference with Attainment of the 1978 Lead (Pb) NAAQS

In 1991, EPA finalized designations for the 1978 Pb NAAQS along with designations for ozone, CO, and PM.[138] Designations became effective on January 6, 1992. In January and February 1991, EPA notified Governors of affected states that they should proceed to designate as nonattainment those areas that had recorded violations of the 1978 Pb NAAQS. States that were designated nonattainment included Alabama, Georgia, Indiana, Minnesota, Montana, but not any areas in Arizona. As stated earlier, Hayden needs to attain the 2008 Pb NAAQS and thus, interference with the 1978 Pb NAAQS is not applicable.

9.5 Noninterference with Attainment of the 2008 Lead (Pb) NAAQS

Based on ambient air monitoring data that was available at the time of initial designations for the 2008 Pb NAAQS, the State recommended that EPA promulgate unclassifiable/attainment designations for the

[135] 72 FR 14,422 (Mar. 28, 2007).
[136] Appendix C, at 5-24.
[137] *Id.*
[138] *See* 56 FR 56,694 (Nov. 6, 1991).

entire state of Arizona, with the exception of the Hayden area. At that time, exceedances of the newly promulgated Pb NAAQS were recorded near the Hayden smelter, but not enough quality assured and certified monitoring data (per 40 CFR Part 58, Appendix A) was available to classify the area as nonattainment.[139] The State requested that EPA delay judgment on the designation of the nine townships centered on the Hayden smelter until further assessment of ambient air quality data. In the instance that the area was classified as nonattainment in the future, the State recommended that planning area boundaries be identical to those of the Hayden SO_2 Nonattainment Area. EPA concurred with Arizona's recommendations and designated the Hayden area as unclassifiable until further data could be gathered.[140]

On April 21, 2014, EPA notified Governor Brewer that violations of the Pb NAAQS had been measured in the Hayden area. Consequently, EPA redesignated the area to nonattainment, effective October 3, 2014.[141] The Hayden Pb Nonattainment Area boundary was based on the State's original boundary recommendations. EPA's action triggered CAA requirements under CAA § 110 for the State to submit a SIP revision that demonstrates how the area will attain the 2008 Pb NAAQS.

On March 3, 2017, ADEQ submitted *SIP Revision: Hayden Lead Nonattainment Area, March 2, 2017 Final* to demonstrate attainment of the 2008 Lead NAAQS in the Hayden planning area by the statutory attainment date of October 3, 2019. EPA approved the plan and associated control measures in 2018.[142]

On January 31, 2022, EPA issued a finding of failure to attain for the 2008 Pb NAAQS for the Hayden, AZ nonattainment areas.[143]

To satisfy CAA and other federal and state requirements, ADEQ is developing a subsequent SIP revision for the Hayden Pb Nonattainment Area. The purpose of the CRP and this SIP revision's proposed additional controls is to reduce emissions of SO_2, but it is anticipated that some of the new controls in the Uptake Improvement, Fuming Ladle Capture, and the Anode Furnace Secondary Hood System Projects will reduce particulate emissions, including leaded particulate.

9.6 Noninterference with Attainment of the NAAQS for CO, NO_2, and Ozone

The Hayden area is designated as attainment or unclassifiable for NO_2, CO, and O_3 (*see* Table 9-1).

Table 9-2 shows the emissions limits for NO_X, CO, and volatile organic compounds (VOCs) pre-CRP and post CRP. Post-control emissions are expected to decrease or remain the same as current levels. Given that the area is attainment/unclassifiable for NO_2 and CO, it is unlikely that the three improvement projects in this SIP revision will interfere with those NAAQS in the Hayden area.

Table 9-2 Proposed Emissions Limits for NO_X, CO, and VOCs, Post-CRP

[139] *See* 76 FR 72,099 (Nov. 22, 2011).
[140] *Id.* at 72,105.
[141] *Supra* note 10.
[142] *See* 83 FR 7,614 (Feb. 22, 2018); *see also* 83 FR 56,734 (Nov. 14, 2018).
[143] 87 FR 4,805 (Jan. 31, 2022).

Pollutant	Current Potential Emissions (tpy)	Post-Control Potential Emissions (tpy)	Emissions Difference (tpy)	Percent Difference
NO_X	31.3	31.2	-0.1	-47.8
CO	26.3	26.2	-0.1	-2.4
VOC	1.7	1.7	0	0
Source: Arizona Department of Environmental Quality (Mar. 9, 2017). Arizona SIP Revision: Hayden Sulfur Dioxide Nonattainment Area of the 2010 SO2 NAAQS.				

The primary constituents of O_3 (NO_X and VOC) are projected to decrease slightly or remain constant. Based on the recommendation of attainment/unclassifiable for NOX, CO, and VOCs the reductions in potential emissions achieved by the new control technology will result in noninterference with the O_3 NAAQS in the Hayden area.

9.7 Noninterference with Requirements for Regional Haze

The Hayden Smelter is subject to FIP requirements for NO_X and SO_2, and SIP requirements for PM_{10} under the Regional Haze Program. Under the FIP, the Hayden Smelter must comply with an annual emission limit of 40 tpy of NOx from the converters and anode furnaces. To control PM_{10}, the smelter must continue to use the existing controls and meet specified provisions of the NESHAPs for Primary Copper Smelters. The smelter must reduce SO_2 at both the converters and anode furnaces. The converters must comply with an emission limit of 99.8 percent control efficiency on a 365-day rolling average for the primary system and 98.7 percent efficiency on a 365-day rolling average for the secondary capture system. The smelter must impose a work practice standard requiring the anode furnaces to be charge only with blister copper or higher purity copper.

On August 15, 2022, ADEQ submitted its State Implementation Revision: Regional Haze Program (2018-2028). ADEQ deferred examination of the Hayden Smelter during the second implementation period due to existing effective controls to the facility.

9.8 Noninterference with Requirements for Consent Decree, CV-15-2206-PHX-JZB

On November 3, 2015 EPA and the Department of Justice announced a settlement with Asarco LLC requiring the company to install new equipment and pollution control technology to reduce emissions of toxic heavy metals at the Hayden Smelter. Asarco will also provide funding for local environmental projects, replace a diesel locomotive with a cleaner model, and pay a civil penalty.

The requirements outlined in the Consent Decree served as the foundation for the CRP and other control measures proposed in the 2017 SO_2 and Pb SIPs for the Hayden Nonattainment. The control technology and other requirements of this SIP revision comply with the settlement and will result in noninterference with Consent Decree, CV-15-2206-PHX-JZB.

Additionally, the controls proposed in this SIP revision are additive to the those in the CRP and the 2017 SIP revision. As such, they will not interfere with the Consent Decree.

9.9 Air Toxics

Copper smelters are required to comply with the National Emission Standards to Hazardous Air Pollutants (NESHAP) for Primary Copper Smelting. The applicable NESHAPs for primary copper smelters are 40 CFR Part 63, Subpart QQQ (for major sources) and Subpart EEEEEE (for area sources). The Hayden smelter's permit establishes effective limits that precludes it from being an area source if its potential to emit 10 tons/year of any HAP or 25 tons/year of any combination of HAPs, which Asarco denies has been the case. *See* Air Quality Permit 39948, Attachment "B" Condition II.A (limiting total HAP to less than 10 tons of any single HAP on a rolling 12-month basis and 25 tons of all HAPs on a rolling 12-month basis). These conditions are made enforceable by a comprehensive monitoring, testing, recordkeeping and compliance tracking program set forth in Conditions II.C. through D. Asarco asserts that the Hayden smelter has not exceeded those limits. Therefore, ADEQ concludes that this SIP revision will not interfere with any applicable air toxics requirements of the CAA.

10 Environmental Justice Concerns

This section describes environmental justice (EJ) concerns that might be involved with this SIP revision.

EPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The EPA further defines the term fair treatment to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies.[144]

First, this section examines EPA's EJ analysis in its proposed national emissions standards for hazardous air pollutants (NESHAP) for primary copper standards. Second, this section reviews the EJ Screen analysis performed by Asarco.

10.1.1 EPA's Proposed Subpart Part QQQ Analysis

As part of EPA's Residual Risk and Technology Review (RTR) for the primary cooper smelting NESHAPs, EPA performed a baseline demographic analysis to identify how risks are distributed among different demographic groups of populations living within 5 km and 50 km of the Hayden and Miami copper smelters.[145]

EPA's proposed fugitive lead controls for the Subpart QQQ RTR noted that benefits of process fugitive emissions reductions at the Hayden smelter will go primarily to those living closest to the Hayden smelter as fugitive emissions have the greatest impact on frontline/fenceline communities in the Hayden Nonattainment Area.

In the Subpart QQQ RTR for lead, EPA found that "modeled exceedances of the NAAQS based on estimated actual emissions were estimated to occur only in a small area near Freeport [located in Miami, AZ]" rather than near the Hayden smelter.[146]

EPA noted in the Subpart QQQ RTR proposed fugitive controls, the benefits of process fugitive emissions reductions at the Hayden smelter will go primarily to those living closest to the Hayden smelter as fugitive emissions tend to have the greatest impact on frontline/fenceline communities.[147]

10.1.2 Screening Analysis

As part of its permit application, Asarco conducted a screening analysis utilizing EPA's EJ Screen. EJ Screen is a mapping and screen tool developed by the EPA that uses a nationally consistent dataset and approach

[144] National Emissions Standards for Hazardous Air Pollutants: Primary Copper Smelting Residual Risk and Technology Review and Primary Copper Smelting Area Source Technology Review, 87 FR 1,616, 1,654 (Jan. 11, 2022) (internal citation omitted).
[145] *Id.*
[146] 87 FR 1,616, 1,642 (Jan. 11, 2022).
[147] *Id.* at 1,644.

for combining environmental and demographic socioeconomic indicators.[148] This screening analysis is attached as Appendix E. EJ Screen provided the information contained in Table 10-1, looking at communities within a 10-mile radius from the Hayden smelter.

Table 10-1 EJ Screen Summary

Demographic Indicator	Value	State Average	State Percentile
People of color	60%	45%	70th
Low income population	42%	35%	66th
Linguistically isolated population	1%	4%	48th
Unemployment rate	10%	6%	81st
Population < high school education	17%	13%	70th
Population > 64 years of age	23%	17%	32nd
EPA calculated Demographic index	51%	40%	70th

As EPA points out in its *Interim Environmental Justice and Civil Rights in Permitting*, tools like EJ Screen can help support consistent approaches by using standard benchmarks to characterize the potential for disproportionate impacts.[149] EJ Screen indices simplify the use of benchmarks for initial screening by highlighting indices at the 80th, 90th, or 95th percentiles.[150] The 80th, 90th, or 95th percentiles are highlighted by EJ Screen to examine the potential for disproportionate impacts relative to state, regional and national averages.[151]

Based on the EJ Screen analysis (Appendix E), the Hayden area only exceeds the 80th percentile for unemployment. All of the indicators are at or below the 70th percentile. EJ Screen reported one indicator, for lead paint as exceeding the 50th percentile. This is based on a percentage of housing that is pre-1960. Under the EJ Screen analysis the communities within the Hayden nonattainment area do not appear to be overburdened.

EPA's EJ Screen Tool does not explicitly include either the SO_2 NAAQS or the lead NAAQS in its calculations. State and Local Air Monitoring System (SLAMS) data show exceedances of the 1-hour SO_2 NAAQS prior to the CRP and that some exceedances occasionally occurred at a much lower ambient concentrations after the CRP was completed. Those exceedances were due in large part to damage at the double contact acid plant preheater, which allowed strong SO_2 gas to escape. The escaping strong gas caused most of the elevated SO_2 readings in the vicinity of the Hayden smelter after the completion of the Converter Retrofit Project. These episodes came to a stop when the smelter was temporarily shut down as a result of a work stoppage on October 13, 2019. Similarly, there were some exceedances of the lead NAAQS before the Converter Retrofit Project. Almost all exceedances stopped after the Converter Retrofit Project was completed. Since that time, there have been a few exceedances, likely related to construction work conducted in the vicinity of the monitor showing the elevated reading. Because the NAAQS are designed

[148] Env't. Prot. Agency, *What is EJ Screen?* (Oct. 11, 2022), https://www.epa.gov/ejscreen/what-ejscreen.
[149] Env't Prot. Agency, Interim Environmental Justice and Civil Rights in Permitting (Aug. 2022), pp. 8-9, https://www.epa.gov/system/files/documents/2022-08/EJ%20and%20CR%20in%20PERMITTING%20FAQs%20508%20compliant.pdf.
[150] *Id*.
[151] *Id.*

to be protective of human health, albeit with a margin of safety, persistent occasional exceedances of a NAAQS as occurred in the Hayden area prior to the temporary shutdown in 2019 could make these fenceline/frontline communities within the Hayden Nonattainment Area potentially overburdened, at least with respect to SO_2 and potentially lead. On the other hand, in the Subpart QQQ RTR for lead, EPA found that "modeled exceedances of the lead NAAQS based on estimated actual emissions were estimated to occur only in a small area near Freeport" rather than near the Hayden smelter.[152]

In its permit application, Asarco notes that data support the conclusion that the CRP, with the Uptake Improvement Project, Fuming Ladle Control Project and Anode Secondary Hoods Project, will reduce fugitive emissions from the smelter by approximately 45 pounds/hour and peek emissions by more. Based on this data, the controls in this SIP revision will reduce the number of individuals in communities of concern potentially elevated by SO_2 emissions. Therefore, ADEQ believes this SIP revision will reduce SO_2.emissions to achieve the NAAQS and not interfere with EJ.

[152] 87 FR. 1,616, 1,642 (Jan. 11, 2022).

11 Conclusion

On June 22, 2010, EPA revised the primary SO_2 NAAQS and established a new 1-hour standard at 75 parts per billion (ppb), based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations (75 FR 35519; June 22, 2010). EPA officially designated the Hayden area as nonattainment on August 5, 2013 for the 2010 SO_2 NAAQS based on existing monitoring data from 2009-2011.[153]

This submittal demonstrates that all of the essential regulatory elements have been met and the Hayden area will attain the 2010 primary SO_2 NAAQS. Attainment of the NAAQS is demonstrated through a comprehensive emissions inventory showing the Hayden Smelter is the primary source of SO_2 emissions in the planning area, extensive modeling to determine an emission limit that will attain the NAAQS, and the adoption of rules to ensure compliance with federal and state regulations. Additionally, this SIP revision will satisfy any remaining requirements for the 1971 SO_2 NAAQS.

[153] 78 FR 47,191 (Aug. 5, 2013).

ADEQ
Arizona Department
of Environmental Quality

Appendix A
Significant Permit Revision No. 96410, Attachment "I" Hayden Smelter Site-Specific SIP Requirements

Air Quality Division
October 3, 2023 Final Version

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PERMIT # 39948 (As amended by Significant Permit Revision No. 96410)
PLACE ID # 2435

PERMITTEE:	**ASARCO LLC**
FACILITY:	**Hayden Operations**
PERMIT TYPE	**Class I Air Quality Permit**
DATE ISSUED:	**December 24, 2018 (As amended on October 3, 2023)**
EXPIRY DATE:	**April 20, 2023**

SUMMARY

This renewal Title V permit is issued to ASARCO LLC, the Permittee, for the continued operation of their copper concentrator and smelter facilities located in Hayden, Gila County, Arizona. This is a renewal of Permit #1000042 and #M070399P1-99.

This permit is issued in accordance with Arizona Revised Statutes (ARS) 49-426. It contains requirements from Title 18, Chapter 2 of the A.A.C., Title 40 of the Code of Federal Regulations and a consent decree filed on December 30, 2015 in *United States v. ASARCO LLC*, No. CV-15-02206-PHX-DLR (D. Ariz.). All definitions, terms, and conditions used in this permit conform to those in the Arizona Administrative Code R18-2-101 et. seq. (A.A.C.), Title 40 of the Code of Federal Regulations (CFR) and CV-15-02206-PHX-DLR (D. Ariz.), except as otherwise defined in this permit.

Significant Permit Revision (SPR) No. 96410

This SPR authorizes the incorporation of the Uptake Improvement Project, Fuming Ladle Control Project and the Anode Furnaces Secondary Hood Project. In addition, it authorizes the addition of sulfur dioxide (SO_2) emission limitations at the Hayden smelter under Attachment "I": Hayden Smelter Site-Specific SIP Requirements as part of the state implementation plan (SIP) for the Hayden SO_2 Nonattainment Area.

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ATTACHMENT "I": HAYDEN SMELTER SITE-SPECIFIC SIP REQUIREMENTS

I. GENERAL REQUIREMENTS

A. The operational controls and limitations in Condition II shall be implemented upon smelter restart or the time specified in Condition II, whichever is later. The requirements of Condition II are federally enforceable upon smelter restart.

B. The requirements in in Condition III (Sulfur Dioxide (SO_2) Emissions Limitations) shall become effective 60 days after the Hayden smelter achieves maximum production after smelter restart or 180 days after smelter restart. The requirements of Condition III are state-only enforceable until the effective date of the Administrator's action approving them as part of the state implementation plan for sulfur dioxide control.

C. The Tables in Appendix 1 of this Attachment are required to be maintained in accordance with the provisions of this Attachment as an aid to the administration of this Attachment, but the Tables and information contained therein shall not constitute part of the state implementation plan. The Tables and the information contained therein are federally enforceable when the condition referring to them is federally enforceable.

D. Definitions for Purposes of this Attachment:

1. "Fuming ladle" shall mean a ladle emitting an abnormal amount of fume after discharge of material.

2. "Maintenance downturn" shall mean a scheduled maintenance period lasting at least eight (8) working hours.

3. "Smelter restart" shall mean the first day after permit issuance that concentrate is processed through the INCO flash furnace to produce matte.

II. OPERATIONAL LIMITATIONS

A. Flash Furnace Area Capture Improvements

1. The Permittee shall install additional hooding and interceptor walls (the "Uptake Improvement System") to improve the capture of fugitive emissions from the flash furnace area, matte tapping and slag skimming areas, route them to the existing converter secondary hood baghouse for fabric filter and high surface area lime injection control, and then to the annulus of the main stack.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

2. The Uptake Improvement System shall have a design evacuation rate of 50,000 to 60,000 cfm hourly average and shall operate when the flash furnace is in operation except for brief periods when slag is being returned to the flash furnace using the slag launder return. At those times, the ventilation for this system shall be switched to the slag return capture system and then switched back automatically to the Uptake Improvement System at the conclusion of the slag return cycle.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

3. Establishment of Operational Ranges

a. The Permittee shall establish a range of damper positions based upon the secondary hood baghouse flow monitor that provides reasonable assurance that the Uptake Improvement System exhaust flow is within the design range specified in Condition II.A.2. The ranges shall be established and verified by a stack test no later than 180 days after smelter restart and may be revised thereafter in the same fashion. The proposed ranges, stack test verifying evacuation rates compliant with Condition II.A.2, and proposed revision to Table 1 of Appendix 1 shall be submitted to the department within 45 days of the stack test. If the Director concurs that the proposed damper position ranges assure an exhaust flow compliant with Condition II.A.2, the Director shall issue a revised Table 1 of Appendix 1 reflecting the new damper position range. Thereafter, the Permittee shall comply with the approved Table 1 range. Until the first submittal is approved, the Permittee shall use ranges specified by the air pollution control designer. The current ranges are specified in Table 1 of Appendix 1 of this Attachment.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

b. The Permittee shall establish a timed interlock on the slag return launder such that when slag is returned to the flash furnace the ventilation air from the Uptake Improvement System is switched to the slag return capture system for a defined period of not less than 5 minutes nor more than 10 minutes and then returns to the Uptake Improvement System automatically. The Permittee shall optimize the period within the 5 to 10 minute range established during the initial 60-day optimization period by observation and analysis and thereafter as necessary. The first analysis, proposed time period, and proposed revisions to Table 2 shall be submitted no later than 75 days after smelter restart. The Director shall approve any period that falls within both the 5 to 10-minute range and a range between the mean and mean plus one standard deviation of observed slag return durations. If the Director concurs that the proposed range meets these requirements, the Director shall issue a revised Table 2. All analyses shall be submitted and approved by the Director. Until the first report is approved, the Permittee shall use ranges specified by the air pollution control designer. The current ranges are specified in Table 2 of Appendix 1 of this Attachment.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

4. Operational Requirements

The Permittee shall:

a. Operate the Uptake Improvement/Launder Return combined damper in accordance with the approved Table 1 range(s) at all times the flash furnace is operating and at all times matte tapping, slag skimming or slag return is occurring.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

b. Operate the timed interlock in accordance with the approved Table 2 value. Operators shall trigger the interlock prior to starting slag return and

may trigger the timed interlock again if slag is still returning at the end of the interlock cycle to minimize emissions.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

5. The Permittee shall inspect the Uptake Improvement System during each scheduled maintenance downturn to ensure that the hooding and walls are in proper position and that there are no visible accretions of material in the mouth of the hooding that would preclude efficient operation. The Permittee shall quarterly, evaluate the damper controlling air between the Uptake Improvement System and the slag return capture system to ensure it is operating properly. Records of these inspections shall be maintained for five (5) years.

[A.A.C. R18-2-B1302.D.1, -306.A.4.b, and ARS 49-426.E]
[State Enforceable Only]

B. Converter and Material Transfer Area Capture Improvements

1. The Permittee shall install a hood and interceptor walls (the "Fuming Ladle Capture System") to provide a system for the capture of fugitive emissions from fuming ladles in the converter aisle and material transfer areas, route them to the existing converter secondary hood baghouse for fabric filter and high surface area lime injection control, and then to the annulus of the main stack.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

2. The Permittee shall, whenever a fuming ladle is detected, promptly move the fuming ladle into the Fuming Ladle Capture System.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

a. The Permittee shall develop training for its employees responsible for ladle movement on identification of fuming ladles. The training shall be developed within 60 days of restart. Existing employees shall be trained within 90 days of restart and any new employees shall be trained before working ladle operations unsupervised by a trained operator. Employees shall be retrained once every five (5) years.

[A.A.C. R18-2-306.A.3.d and ARS 49-426.E]
[State Enforceable Only]

b. Training records for the operators shall be kept for (5) five years. The training and records shall be available for inspection.

[A.A.C. R18-2-306.A.4.b and ARS 49-426.E]
[State Enforceable Only]

3. The Fuming Ladle Capture System shall have a design evacuation rate of 40,000- to 50,000 cfm when a ladle is present within the hooded area. The capture system shall run until the ladle is removed or for at least 20 minutes after the ladle is placed in the containment. Fuming ladles shall not be removed from the Fuming Ladle Capture System containment unless fuming has stopped or the ladle is transported directly to the tunnel or within the capture area of a secondary hood.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

4. The Permittee shall conduct an initial flow test within 180 days of smelter restart to verify that the system achieves the design flow. The results of this flow test shall

be reported to the Department within 45 days of completion of the test.
[A.A.C. R18-2-306.A.3.d, -306.A.5.a, and ARS 49-426.E]
[State Enforceable Only]

5. The Permittee shall inspect the Fuming Ladle Capture System during each scheduled maintenance downturn to ensure that it is actuating properly, that the hoods and walls are in proper position, and there are no visible accretions of material in the mouth of the hood that would preclude efficient operation. Records of these inspections shall be maintained for five (5) years.
[A.A.C. R18-2-B1302.D.2.d, -306.A.4.b, and ARS 49-426.E]
[State Enforceable Only]

C. Anode Furnace Secondary Hood Capture and Control System

1. The Permittee shall install secondary hoods around each of the anode furnaces to improve the capture of fugitive emissions from the anode furnaces during charging, holding and processing, route the emissions to a new anode secondary hood baghouse for fabric filter control, and then to the annulus of the main stack. This is the Anode Secondary Hood System.
[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

2. The Anode Secondary Hood System

a. The Anode Secondary Hood System shall have an overall design evacuation rate for the total system of 150,000 cfm hourly average.
[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

b. The anode secondary hood baghouse shall have a maximum design emission rate of 0.002 gr/scf.
[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

c. Each secondary hood shall be equipped with dampers that can close completely and operate with a range from 20 to 100% to modulate flows to the individual anode furnace.
[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

d. The Anode Secondary Hood System shall be operated to achieve balanced flows (± 15%) on the two operating anode furnaces when neither are charging. When one anode furnace is charging, the Anode Secondary Hood System shall be balanced so that the charging furnace achieves a minimum of 100,000 cfm and the other operating furnace gets the balance.
[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

3. The Permittee shall establish a range of damper positions and total flow conditions based upon the anode secondary hood baghouse flow monitor that provides reasonable assurance that the Anode Secondary Hood System exhaust flow is within the design range. These ranges and flow conditions shall be verified during a performance test within 180 days of smelter restart and may be revised thereafter in the same fashion. The proposed ranges and flow conditions, stack test verifying evacuation rates compliant with Condition II.C.2.a and II.C.2.d, and proposed

revision to Table 3 of Appendix 1 shall be submitted to the department within 45 days of the stack test. If the Director concurs that the proposed damper position and flow ranges assure an exhaust flow compliant with Condition II.C.2.a and II.C.2.d, the Director shall issue a revised Table 3 of Appendix 1 reflecting the new damper position and flow ranges. Thereafter, the Permittee shall comply with the approved Table 3 ranges. Until the first performance test, the Permittee shall use ranges specified by the air pollution control designer. The current flows shall be specified in Table 3 of Appendix 1 of this Attachment. Damper positions shall be logged and the logs kept for five (5) years.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

4. Operational Requirements

The Permittee shall Operate the Anode Secondary Hoods in accordance with the approved Table 3 range(s) at all times the anode furnaces are operating.

[A.A.C. R18-2-B1302.D.1 and ARS 49-426.E]
[State Enforceable Only]

5. The Permittee shall inspect the Anode Secondary Hood System during each scheduled maintenance down turn to ensure that the dampers are working properly, the hoods and walls are in proper position and that there are no visible accretions of material in the mouth of the hoods that would preclude efficient operation. Records of these inspections shall be maintained for five (5) years.

[A.A.C. R18-2-B1302.D.1, -306.A.4.b, and ARS 49-426.E]
[State Enforceable Only]

III. SULFUR DIOXIDE (SO_2) EMISSION LIMITS

The requirements of Condition III are state-only enforceable until the effective date of the Administrator's action approving them as part of the state implementation plan for sulfur dioxide control.

A. Main Stack Limit

Sulfur dioxide emissions from the Main Stack shall not exceed 1069.1 lb/hr, 14-day operating average.

[A.A.C. R18-2-306.01 and ARS 49-426.E]
[State Enforceable Only]

B. Fugitive Emissions Limits

Effective 60 days after the Hayden smelter achieves maximum production after smelter restart, or 180 days after smelter restart, whichever occurs first.

1. Fugitive emissions of SO_2 from the INCO flash furnace, matte tapping and slag skimming areas shall not exceed 38.5 pounds/hour, as measured by the flash furnace roofline monitoring system.

[A.A.C. R18-2-B1302 and ARS 49-426.E]
[State Enforceable Only]

2. Fugitive emissions of SO_2 from the converter aisle area shall not exceed 10.0 pounds/hour, as measured by the converter aisle roofline monitoring system.

[A.A.C. R18-2-B1302 and ARS 49-426.E]
[State Enforceable Only]

3. Fugitive emissions of SO_2 from the anode furnaces shall not exceed 9.0 pounds/hour, as measured by the anode furnace roofline monitoring system.

[A.A.C. R18-2-B1302 and ARS 49-426.E]
[State Enforceable Only]

These limits shall apply when the underlying processes are in operation, including periods of startup, shutdown and malfunction.

[A.A.C. R18-2-B1302 and ARS 49-426.E]
[State Enforceable Only]

C. Monitoring

1. Main Stack Monitoring

Monitoring for the main stack emission limits in Condition III.A of this permit and A.A.C. R18-2-B1302, Subdivision C shall be as set forth in A.A.C. R18-2-B1302 Subdivision E with the following additional requirements:

a. *The Permittee shall install, calibrate,* maintain and operate *a CEMS for continuously monitoring and recording SO_2 emissions and stack gas volumetric flows at the exit of the Anode Secondary Hood Baghouse. This system shall be installed and a RATA successfully completed within 180 days of the effective date of this Section under Condition I.B.*

[A.A.C. R18-2-306.A.3.c, -306.A.3.d -331.A.3.c, -B1302.E, and ARS 49-426.E]
[Material Permit Conditions are defined by underline and italics]

b. The CEMS shall meet the requirements of A.A.C. R18-2-B1302(E)(2), (3), and (5), except that everywhere those provisions reference "subsection (E)(1)" it shall mean "subsection (E)(1) and Condition III.C.1.a of permit number 96410."

[A.A.C. R18-2-306.A.3.c, -B1302.E, and ARS 49-426.E]
[State Enforceable Only]

2. Fugitive Monitoring

Monitoring for the fugitive emission limits in Condition III.B of this permit shall be as follows:

a. *The Permittee shall install, calibrate,* maintain and operate *a CEMS for continuously monitoring and recording SO_2 emissions and volumetric flows at the roofline of the following areas when the underlying process units are operating:*

[A.A.C. R18-2-306.A.3.c, -306.A.3.d -331.A.3.c, -B1302.E, and ARS 49-426.E]
[State Enforceable Only]
[Material Permit Conditions are defined by underline and italics]

(1) Flash furnace roofline system, located on the penthouse and roof of the flash furnace building;

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

(2) Converter aisle roofline system, located at the north and south ends of the converter aisle, and

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

(3) Anode aisle roofline system, located over the anode furnaces.
[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

b. These systems shall be installed and certified successfully completed within 180 days of the effective date of this section under Condition I.B. The Permittee shall notify the Director in writing at least 30 days in advance of the initial certification testing performed on the CEMS.
[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

c. The CEMS shall meet the requirements of A.A.C. R18-2-B1302(E)(2), (3), and (5), except that everywhere those provisions reference "subsection (E)(1)" it shall mean "Condition III.C.2.a of Permit No. 96410" and everywhere those provisions specify a relative accuracy test audit (RATA) a cylinder gas audit (CGA) shall be used instead.
[A.A.C. R18-2-306.A.3.c, -B1302.E, and ARS 49-426.E]
[State Enforceable Only]

d. The Permittee shall develop a roofline monitoring system operations and maintenance plan (Roofline Plan) that addresses the roofline monitoring system required by Condition III.C.2.a. The Roofline Plan shall include the following elements:

(1) a diagram showing the location of each intake point and which intake points are directed to which CEMS;

(2) a protocol for how the intake points will be sampled by the CEMS;

(3) a description of each CEMS, its required QA/QC procedures and span;

(4) manufacturer's or installer's recommended zero adjustment and calibration procedures, which must provide for instrument readings before and after zero adjustments and calibrations, to be implemented at least once per operating day on the CEMS and at a frequency set forth in the protocol for flow meters;

(5) a list of replacement parts that shall be maintained on hand and ready for immediate installation on the CEMS within 6 hours and to allow fabrication of new sample runs and installation within 10 days;

(6) and equations showing how mass emission rates will be calculated.
[A.A.C. R18-2-B1302.D.2.a, e and ARS 49-426.E]
[State Enforceable Only]

e. The Permittee shall submit the Roofline Plan to the Department and EPA Region IX at least 90 days prior to smelter restart. The Permittee may submit other revisions at any time when necessary. All revisions shall be designed to achieve data collection at the roofline monitoring system

consistent with the attainment demonstration in the Hayden 2010 Sulfur Dioxide National Ambient Air Quality Standards Nonattainment Area SIP. Plans and plan revisions may be implemented upon submittal and shall remain in effect until superseded or until disapproved by the Department or EPA Region IX. Disapprovals are appealable agency action.

[A.A.C. R18-2-B1302.D.2.a, e and ARS 49-426.E]
[State Enforceable Only]

3. Emergency Shutdown Ventilation Flue Monitoring

The Permittee shall install instrumentation on the Emergency Shutdown Ventilation Flue to detect and record all periods that the bypass is in operation. The Permittee shall keep a log of all times of both damper positions and, when both dampers are open, whether the period is a planned or unplanned maintenance period. The Permittee shall log any periods when one damper is open and the other damper is closed stating when the malfunctioning damper was repaired. For purposes of this Attachment, "planned maintenance" means any period where the Permittee has shut down the associated emissions units and run the evacuation system until the inlet meter at the acid plant registers the equivalent of 53.5 lb/hr or less before opening the Emergency Shutdown Ventilation Flue. The inlet concentration shall be documented in the operating log.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

D. Compliance Demonstration

1. Main Stack Compliance Demonstration.

a. Compliance with the main stack limit in Condition III.A shall be demonstrated using the procedures in A.A.C. R18-2-B1302(F)(1), (2), (4) and (5) except as follows:

(1) "subsection (E)(1) and Condition III.C.1 of permit no. 96410 shall be substituted for "subsection (E)(1)" throughout;

(2) the provisions of subsection (F)(1)(c) shall not be used; and

(3) Notwithstanding subsections (F)(2)(a) and (F)(2)(b), the owner or operator may present any credible evidence as to the quantity or concentration of emissions during any period of missing data.

[A.A.C. R18-2-B1302 and ARS 49-426.E]
[State Enforceable Only]

b. For purposes of demonstrating compliance with the main stack limit in Condition III.A and A.A.C. R18-2-B1302(F)(1)(a), the pounds of SO_2 in the emergency shutdown vent shall be calculated for unplanned use of the emergency shutdown ventilation system as the total volume of the emergency shutdown system at the maximum expected SO_2 concentrations in each segment and 10 percent of that amount for planned shutdowns when the evacuation system is run until SO_2 emissions shown on the combined CEMS system are less than 53.5 lb/hr. Future changes to the design volume of the emergency shutdown system or to the maximum

SO_2 concentrations used in the calculation shall be submitted to the Department with a written justification for the change and revised calculations showing the newly calculated planned and unplanned shutdown emissions. This justification may be included as part of a required permit or permit revision. The change shall not be made until approved by the Director. A copy of the current calculations and planned and unplanned shutdown emissions values shall be included in Table 4 of Appendix 1 of this Attachment.

[A.A.C. R18-2-306.A.3.c, -B1302 and ARS 49-426.E]
[State Enforceable Only]

2. Fugitive Limit Compliance Demonstration

Compliance with the fugitive emission limits in Condition III.B shall be demonstrated as follows:

a. Each valid hour of calculated emissions from the flash furnace roofline system in Condition III.C.2.a(1) shall be compared to the limit in Condition III.B.1 to demonstrate compliance.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

b. Each valid hour of calculated emissions from the converter aisle roofline system in Condition III.C.2.a(2) shall be compared to the limit in Condition III.B.2 to demonstrate compliance.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

c. Each valid hour of calculated emissions from the anode aisle roofline system in Condition III.C.2.a(3) shall be compared to the limit in Condition III.B.3 to demonstrate compliance.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

d. Data substitution under Section R18-2-B1302(F)(2) shall not be used. Instead, the Permittee shall maintain 95% or more valid hours for each system listed in Condition III.C.2.a.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

e. The Permittee shall include periods of startup, shutdown, malfunction, or other upset condition when determining compliance with the limits in Condition III.B.

[A.A.C. R18-2-B1302.F.4 and ARS 49-426.E]
[State Enforceable Only]

3. For purposes of demonstrating compliance with the limits in A.A.C. R18-2-B1302(C) and Conditions III.A and III.B of Permit No. 96410, all CEMS listed in A.A.C. R18-2-B1302(C)(1) and Conditions III.C.1 and 2 of Permit No. 96410 shall use the following data validity requirements:

a. Except as provided under Condition III.D.3.c for a full operating hour (any clock hour with 60 minutes of unit operation), at least four valid data points are required to calculate the hourly average, i.e., one data point in each of the 15-minute quadrants of the hour.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

b. Except as provided under Condition III.D.3.c for a partial operating hour (any clock hour with less than 60 minutes of unit operation), at least one valid data point in each 15-minute quadrant of the hour in which the unit operates is required to calculate the hourly average.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

c. For any operating hour in which required maintenance or quality-assurance activities are performed:

(1) If the unit operates in two or more quadrants of the hour, a minimum of two valid data points, separated by at least 15 minutes, is required to calculate the hourly average; or

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

(2) If the unit operates in only one quadrant of the hour, at least one valid data point is required to calculate the hourly average.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

d. If a daily calibration error check is failed during any operating hour, all data for that hour shall be invalidated, unless a subsequent calibration error test is passed in the same hour and the requirements of Condition III.D.3.c are met, based solely on valid data recorded after the successful calibration.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

e. For each full or partial operating hour, all valid data points shall be used to calculate the hourly average.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

f. Data recorded during periods of continuous monitoring system breakdown, repair, maintenance, out of control periods, calibration checks, and zero and span adjustments shall not be included in the data averages computed under Condition III.D.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

g. Either arithmetic or integrated averaging of all data may be used to calculate the hourly average. The data may be recorded in reduced or non-reduced form.

[A.A.C. R18-2-306.A.3.c and ARS 49-426.E]
[State Enforceable Only]

E. Recordkeeping

1. The Permittee shall maintain the operational and training records specified in Condition II.A.3, II.A.4, II.B.2, II.B.4, II.B.5, II.C.3,and II.C.4 for five (5) years.

[A.A.C. R18-2-306.A.4.b and ARS 49-426.E]

[State Enforceable Only]

2. The Permittee shall maintain the following records for at least five (5) years:

a. All measurements from the continuous monitoring systems required by Condition III.C.1 and 2 including the date, place, and time of sampling or measurement, parameters sampled or measured, and results.
[A.A.C. R18-2-306.A.4.a and ARS 49-426.E]
[State Enforceable Only]

b. All records of all compliance calculations required by Condition III.D.
[A.A.C. R18-2-306.A.4.a and ARS 49-426.E]
[State Enforceable Only]

c. All records of quality assurance and quality control activities conducted on the continuous monitoring systems required by Conditions III.C.1 and 2.
[A.A.C. R18-2-306.A.4.a and ARS 49-426.E]
[State Enforceable Only]

d. All records of continuous monitoring system breakdowns, repairs, maintenance, out of control periods, calibration checks, and zero and span adjustments for the continuous monitoring systems required by Condition III.D.
[A.A.C. R18-2-306.A.4.a and ARS 49-426.E]
[State Enforceable Only]

e. All records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of Smelter processes; any malfunction of the associated air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device required by Condition III.C.1 or 2.
[A.A.C. R18-2-306.A.4.a and ARS 49-426.E]
[State Enforceable Only]

f. All records of all major maintenance activities conducted on emission units, capture system, air pollution control equipment, and continuous monitoring systems.
[A.A.C. R18-2-306.A.4.a and ARS 49-426.E]
[State Enforceable Only]

g. All records of reports and notifications required by Condition III.F.
[A.A.C. R18-2-306.A.4.b and ARS 49-426.E]
[State Enforceable Only]

F. Reporting

1. Within 30 days after the end of each calendar quarter, the Permittee shall submit a data assessment report to the Director in accordance with 40 CFR Part 60, Appendix F, Procedure 1 for the continuous monitoring systems required by Condition III.C.
[A.A.C. R18-2-306.A.5.a and ARS 49-426.E]
[State Enforceable Only]

2. The Permittee shall submit an excess emissions and monitoring systems performance report and/or summary report form in accordance with 40 CFR §

60.7(c) to the Director semiannually for the continuous monitoring systems required by Condition III.C.1 and 2. All reports shall be postmarked by the 30th day following the end of each six-month period.

[A.A.C. R18-2-306.A.5.b and ARS 49-426.E]
[State Enforceable Only]

3. The Permittee shall provide the following to the Director:

   a. Notification of commencement of construction of the project improvements and equipment authorized by Significant Permit Revision No. 96410 to comply with the operational or emission limits permit no later than 30 days after such date.

   [A.A.C. R18-2-306.A.5.a and ARS 49-426.E]
   [State Enforceable Only]

   b. Semiannual progress reports on construction of any such improvements and equipment on January 1 and July 1 of each calendar year until construction is complete.

   [A.A.C. R18-2-306.A.5.a and ARS 49-426.E]
   [State Enforceable Only]

   c. Notification of initial startup of any such improvements and equipment within 15 days after such date.

   [A.A.C. R18-2-306.A.5.a and ARS 49-426.E]
   [State Enforceable Only]

APPENDIX 1 OF ATTACHMENT "I"

Table 1: Uptake Improvement System Flow Conditions and Damper Positions

Converter Secondary Hood Baghouse Flow Cfm	Uptake Improvement/Slag Return Combined System Damper
>170,000	100% open

Table 2: Uptake Improvement System Interlock Timing

System Condition	Requirement
Normal Operation	Uptake Improvement Damper 100% open Slag Return N and S Dampers 0% open
Slag in Slag Return	Uptake Improvement Damper 0% open Slag Return w/Slag 100% open Other Slag Return 0% open
Slag Return Damper Timing	Upon initiating slag return Damper remains open for 10 minutes

Table 3: Anode Secondary Hood System Flow Conditions and Damper Positions

Condition	Requirement
Furnace Offline	AF SH Damper Closed
1 Furnace Processing Only	AF SH Damper 100% Open
2 Furnaces Processing	Each AF Damper 45-55% Open
1 Furnace Charging, 1 Processing	Charging AF SH Damper 75-100% Open Processing AF SH Damper 25-50% Open

Table 4: Emergency Shutdown Ventilation Flue Emissions

Event Type	SO_2 Emissions (lbs)
Unplanned Event[1]	1081
Planned Event[2]	108

[1] Based upon highest SO_2 percentages and volumes

[2] Based upon running ventilation system until SO_2 clears and accepting 10% as a conservative number

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Appendix B

Modeling Technical Support Document for the Hayden Sulfur Dioxide (SO_2) Nonattainment Area

Air Quality Division
October 3, 2023 Final Version

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ADEQ
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Appendix B

Emission Inventory for the Hayden Sulfur Dioxide Nonattainment Area

Air Quality Division
May 11, 2023 Final

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B1 Introduction

The United States Environmental Protection Agency (EPA) designated the Hayden area of Gila and Pinal Counties as not attaining the 2010 SO2 Primary National Ambient Air Quality Standard (NAAQS) on August 5, 2013. After the initial State Implementation Plan (SIP), the EPA issued another finding of "Failure to Attain" Sulfur Dioxide (SO2) emissions in the Hayden SO2 Non-Attainment Area (NAA). The Arizona Department of Environmental Quality (ADEQ) has prepared a supplemental SIP to bring the Hayden NAA into attainment by the year 2026.

B1.1 Purpose

The purpose of this Technical Support Document (TSD) is to provide an emission inventory (EI) of SO_2 emission sources within the Hayden area designated non-attainment under the 2010 SO_2 NAAQS. This document provides a detailed account of the processes ADEQ undertook to develop the emission inventory for the Hayden NAA. ADEQ will use this TSD in support of the development of a SIP revision for the Hayden planning area. ADEQ will use the EI and analyses in this TSD as a regulatory tool to determine the nature and extent of an appropriate control strategy to bring the area back into attainment with the NAAQS, and as the basis for the development of a modeling protocol for the attainment demonstration.

B1.2 Sources of SO2 Emissions

EPA designed the SO_2 NAAQS to protect against exposure to all forms of Sulfur Oxides (SO_x). Sulfur dioxide is an indicator of total gaseous SO_x and is the most abundant SO_x compound in the atmosphere. Sulfur dioxide is a precursor to other SO_x compounds, forming compounds such as Sulfur Trioxide (SO_3) through photochemical oxidation. In the presence of water or water vapor, SO_2 quickly undergoes an oxidation and subsequent hydration reaction to form Sulfuric Acid (H_2SO_4).

Sulfur dioxide emissions are often the result of combustion of a sulfur containing material. Biogenic, or natural sources, of SO_2 emissions include wildfires and volcanic activity. The majority of SO_2 emissions are the result of anthropogenic emission sources. Based on annual emission inventory reporting by Arizona permitted point sources, the Pinal and Gila County emissions from industrial sources are almost exclusively from the American Smelting and Refining Company (ASARCO) LLC Hayden copper smelter located within the bounds of the Hayden NAA. ASARCO LLC contributes 99.97% of SO_2 emissions in the NAA and 83.9% to the 50 km buffer zone in the base year 2017. The second major point source is Freeport-McMoran Miami Smelter located within the buffer zone. The largest non-point source of SO_2 comes from Non-ferrous Metals Industrial Processes.

B1.3 Emission Inventory Base Year Determination

ADEQ proposes an EI base year of 2017 as this reflects the highest and typical production rates seen by ASARCO LLC. The State and Local Air Monitoring Station (SLAMS) ADEQ installed to monitor ambient SO_2 concentrations at the Hayden Old Jail monitoring site recorded a 4th highest (99th percentile) daily maximum SO_2 concentration of 280 parts per billion (ppb) in 2017. Currently, this is the only Air Quality System (AQS) certified monitoring station in the Hayden NAA with AQS certified ambient monitoring data. Figure 1-1 below shows the annual 4th highest daily maximum 1-hour SO_2 concentration at the Hayden Old Jail SLAMS from the period 2016 through 2021, including the operating hour correlation. Figure 1-2 shows the 3-year average annual 4th highest daily maximum 1-hour SO_2 concentration at the Hayden Old Jail monitor.

Figure 1-1: Annual 4th Highest Daily Max 1-hr SO_2 Concentrations

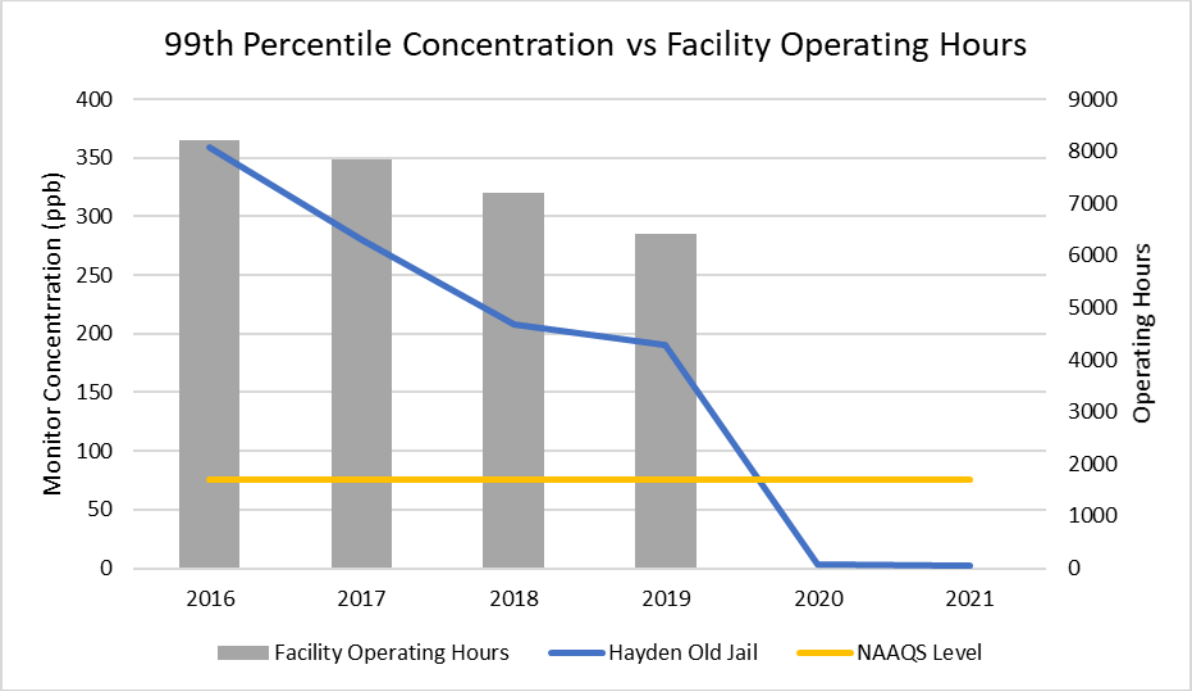
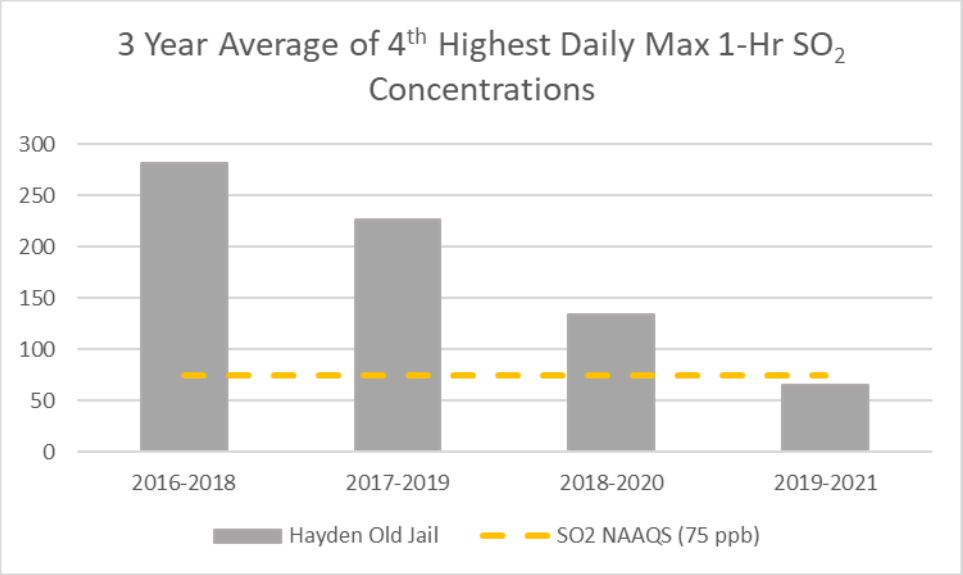


Figure 1-2: Hayden Old Jail Design Values



B2 Population and Urbanization

Star Valley and Winkelman also reside within Gila County as well as the town of San Carlos located on the San Carlos Apache Reservation. Arizona Department of Administration (ADOA) estimated the 2017 population of Gila County at 53,509 persons. Gila County had a 2020 population density of only 11.2 persons per square mile, compared to 480.4 and 62.9 persons per square mile for Maricopa County and the state respectively[1].

Pinal County is one of five interior counties in the central part of Arizona; surrounded by Maricopa and Gila Counties to the north, Graham County to the east, Pinal County to the south, and Maricopa County to the west. The county seat of Pinal County is Florence, which lies approximately 61 linear miles southeast from Phoenix. The incorporated communities of Apache Junction, Casa Grande, Coolidge, Eloy, Kearny, Mammoth, and Superior also reside within Pinal County. ADOA estimated the 2017 population of Pinal County at 400,950 persons. Pinal County had a 2020 population density of 79.3 persons per square mile, compared to 480.4 and 62.9 persons per square mile for Maricopa County and the state respectively[2].

B2.1 Hayden SO_2 Nonattainment Area

The Hayden SO_2 NAA has been codified in 40 CFR 81.303 and is comprised of the portions of Gila County and Pinal County bound by the townships and ranges listed in

[1] Note: from US Census Bureau. (June 23, 2022), *State and County QuickFacts.* U.S. Department of Commerce. Retrieved from: https://www.census.gov/quickfacts/fact/table/maricopacountyarizona,gilacountyarizona,pinalcountyarizona,AZ,US/POP060220 on September 15, 2022.

[2] Note: from US Census Bureau. (June 23, 2022), *State and County QuickFacts.* U.S. Department of Commerce. Retrieved from: https://www.census.gov/quickfacts/fact/table/maricopacountyarizona,gilacountyarizona,pinalcountyarizona,AZ,US/POP060220 on http://quickfacts.census.gov/qfd/states/04/04007.html onSeptember 15, 2022.

Table 2-1 and represented geographically in Figure 2-1. Population estimates for the entire Hayden SO_2 NAA as well as the respective proportions of Gila and Pinal Counties are also presented in

Table 2-1. The Hayden NAA encompasses the towns of Hayden, Winkelman and Kearny, for which population data has been included in

Table 2-2.

Table 2-1: Geographic Location and Population

Hayden SO_2 NAA[3,4]			
Land Area	275 square miles		
2017 Population	4,409		
2026 Projected Population	3,679		
Gila County Portion		**Pinal County Portion**	
Land Area	58 square miles	Land Area	217 square miles
2017 Population	1,176	2017 Population	3,233
2026 Projected Population	982	2026 Projected Population	2,697
Township, Range		**Township, Range**	
4S, 14E		4S, 14E	
4S, 15E		4S, 15E	
4S, 16E		4S, 16E	
5S, 15E		5S, 14E	
5S, 16E		5S, 15E	
-		5S, 16E	
-		6S, 14E	
-		6S, 15E	
-		6S, 16E	

Table 2-2: Towns within Hayden SO_2 NAA

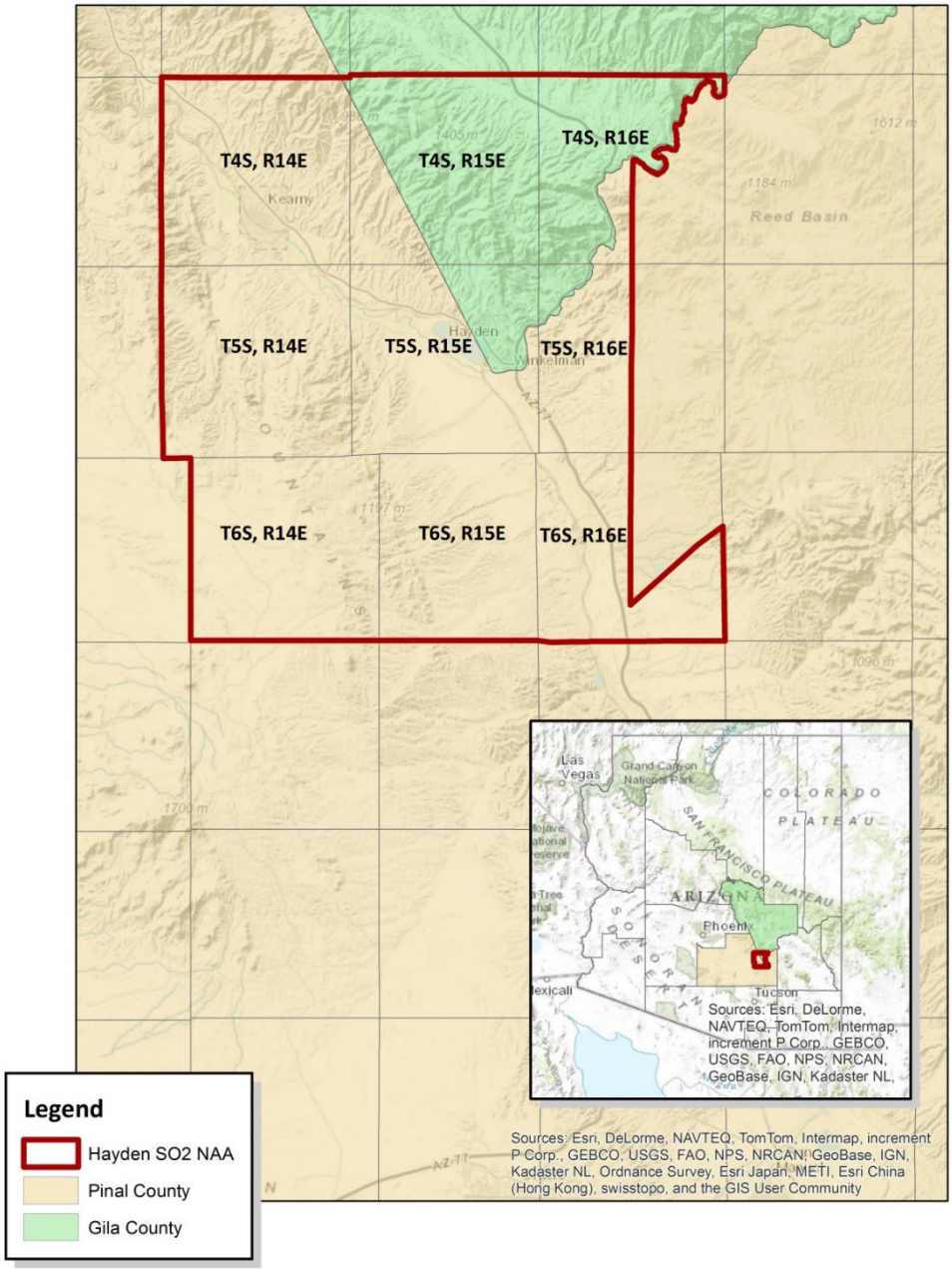
Location	2017 Population[5]
Town of Hayden	632
Town of Winkelman	347
Town of Kearny	2,100

[3] ADOA calculated the land area of Gila County and Pinal County based on 2010 department of Census TIGER/Line shapefiles.

[4] ADOA provided the population projects for both Gila County and Pinal County. ADOA's project methodologies are presented in Appendix A of this TSD.

[5] U.S. Census Bureau, Population Division (May 2020); Annual Estimates of the Resident Population for Incorporated Places in Arizona: April 1, 2010 to July 1, 2019 (SUB-IP-EST2019-ANNRES-04)

Figure 2-1: Map of the Hayden SO_2 Nonattainment Area Including Townships and Ranges



B2.2 Gila County, Pinal County and Hayden Nonattainment Area Land Use

The Hayden NAA area encompasses portions of two counties: Gila and Pinal. The Gila County portion of the NAA is approximately 58 square miles[6] while the Pinal County portion is 217 square miles[7]. The majority of the land within the NAA is owned and managed by either the Bureau of Land Management (39.1%) or the Arizona State Land Department (35.5%). The remainder of the land within the NAA is

[6] ADOA calculated the land area of the Hayden NAA based on 2010 department of Census TIGER/Line shapefiles.
[7] ADOA calculated the land area of the Hayden NAA based on 2010 department of Census TIGER/Line shapefiles.

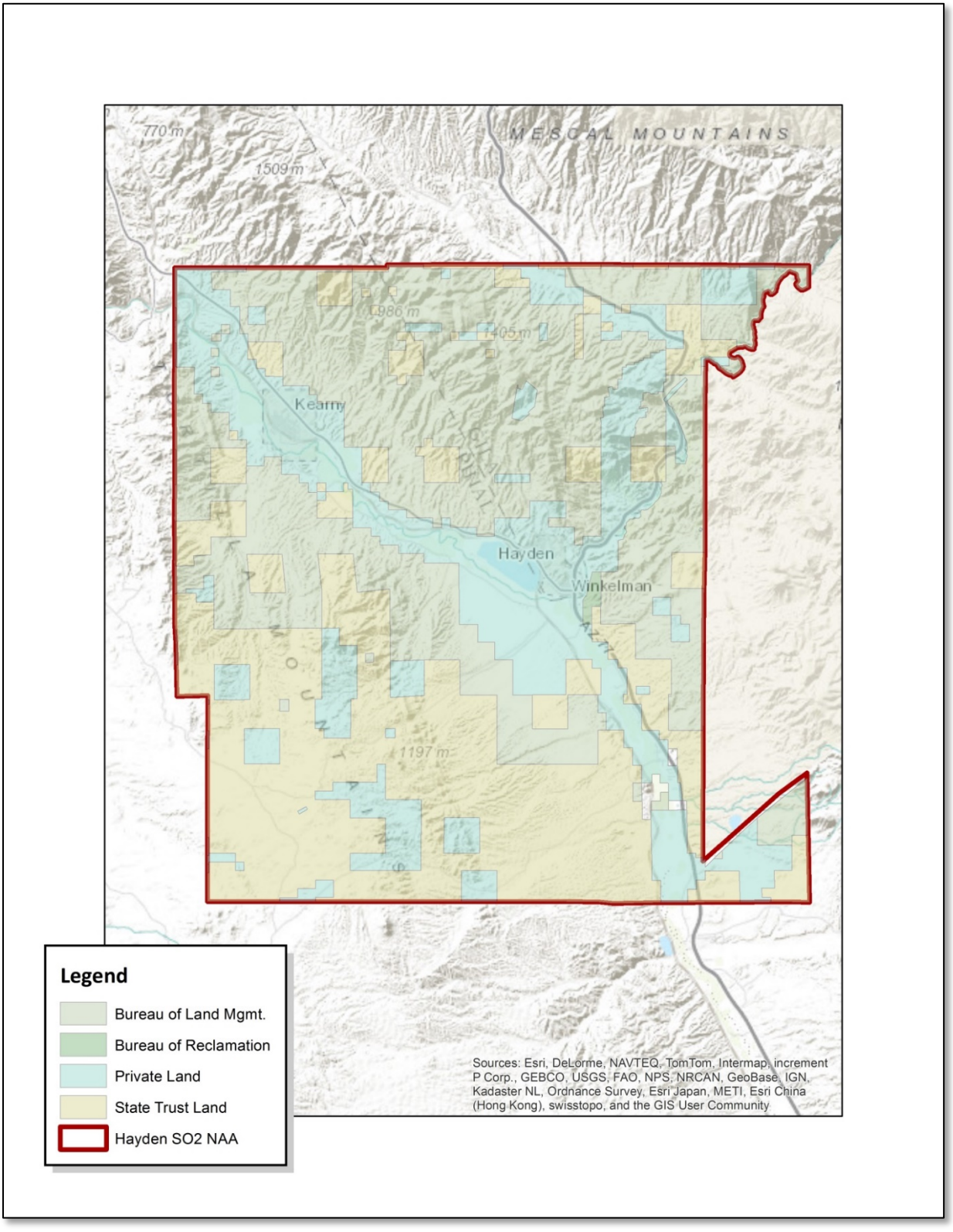
comprised of privately held land along with a small area of land located to the east of Winkelman, which the Bureau of Reclamation manages. A breakdown of the land owners in the Hayden SO_2 NAA is presented in Table 2-3 and Figure 2-2.

Table 2-3: Land Use Area

Hayden SO_2 NAA[8]		
Land Owner	**Area (square miles)**	**Percentage**
Bureau of Land Mgmt.	106.816	39.1%
State Trust Land	96.876	35.5%
Private Land	68.932	25.2%
Bureau of Reclamation	0.499	0.2%

[8] Land use information for Pinal County, Gila County, and the Hayden NA was garnered from the Arizona Land Resource Information System (ALRIS) GIS tool managed by the Arizona State Land Department.

Figure 2-2: Land Use Map



B3 Hayden Nonattainment Area Meteorology and Monitored Ambient SO_2 Concentrations

This section of the EI TSD focuses on an analysis of meteorological (MET) conditions and their potential impact on ambient SO_2 concentrations. ADEQ maintains two meteorological monitors within the Hayden SO_2 NAA. One monitor is located at Hayden Old Jail, approximately 0.66 miles to the west of the ASARCO Smelter, and the other at Globe Highway, approximately 0.59 miles to the east of the ASARCO Smelter. An additional MET monitor is maintained by ASARCO at the Camera Hill site. These monitors collect meteorological data including Standard Wind Speed (WS) and Standard Wind Direction (WD) information, at a height of ten meters above the surrounding topography.

Additionally, ADEQ operates the only AQS certified SLAMS ambient SO_2 monitor in the Hayden NAA, which is co-located with the Hayden Old Jail MET monitor. The EPA used data from the Hayden Old Jail SLAMS monitor as the basis for the Hayden area nonattainment designation, and as such, only this monitor will be utilized for ambient SO_2 analysis in this TSD. The locations of the Hayden MET and ambient SO_2 monitoring stations are shown in Table 3-1. Figure 3-2 is also provided to illustrate the monitor elevations relative to the ASARCO Smelter.

Table 3-1: Hayden MET & Ambient SO_2 Monitoring Stations

Hayden Monitoring Stations				
Site Name	Distance to Smelter (miles)	Latitude	Longitude	Elevation (feet)
ADEQ MET Monitors				
Globe Highway	0.59	33.00251	-110.76545	1,962
Hayden Old Jail	0.66	33.00621	-110.78645	2,043
ASARCO MET Monitors				
Camera Hill	0.22	33.00046	-110.775	2,292
ADEQ SO_2 Monitors				
Hayden Old Jail	0.66	33.00621	-110.78645	2,043

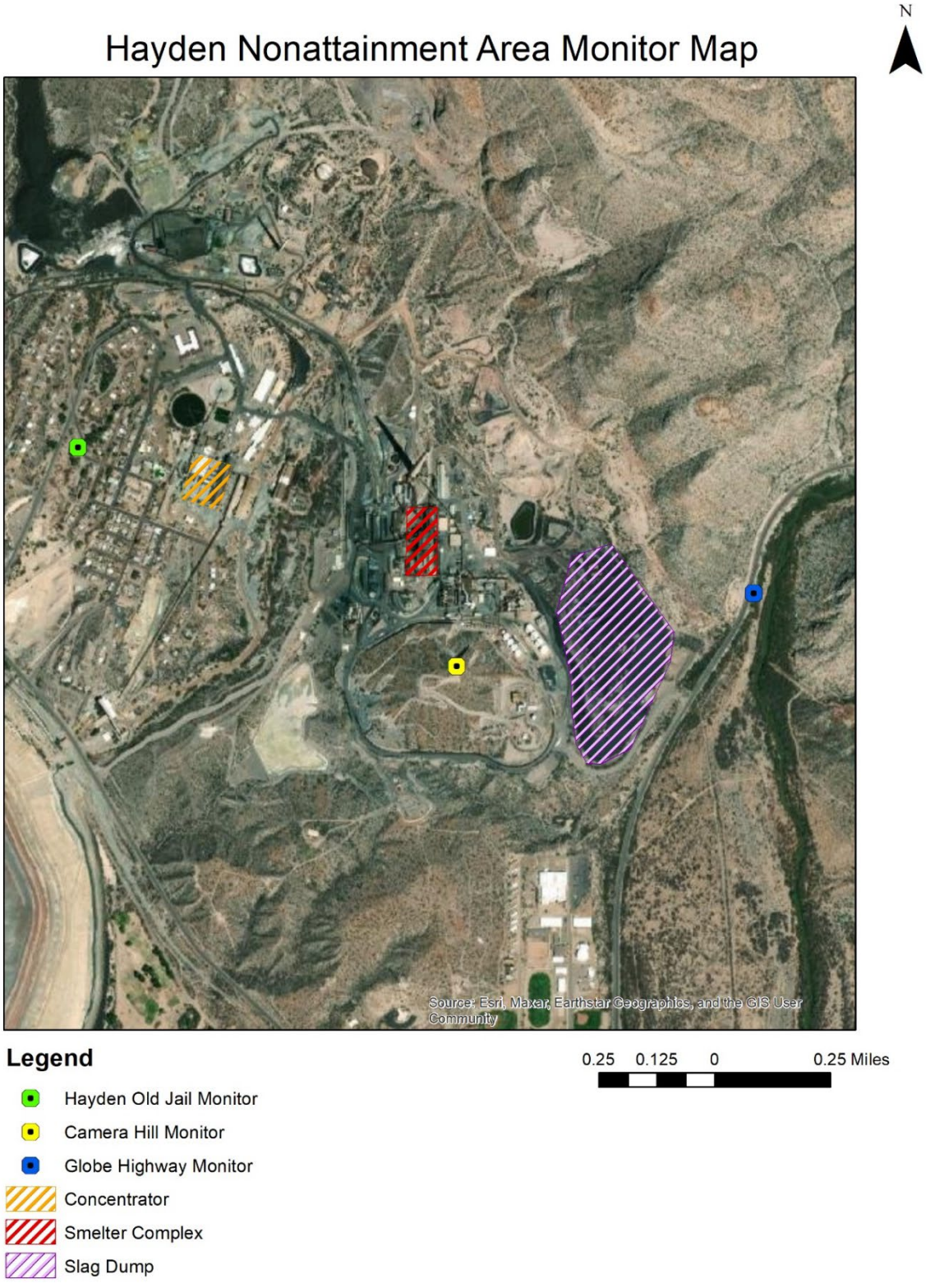

Hayden Nonattainment Area Monitor Map
N
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Legend
Hayden Old Jail Monitor
Camera Hill Monitor
Globe Highway Monitor
Concentrator
Smelter Complex
Slag Dump
0.25 0.125 0 0.25 Miles

Figure 3-1: Hayden MET & Ambient SO_2 Monitoring Stations

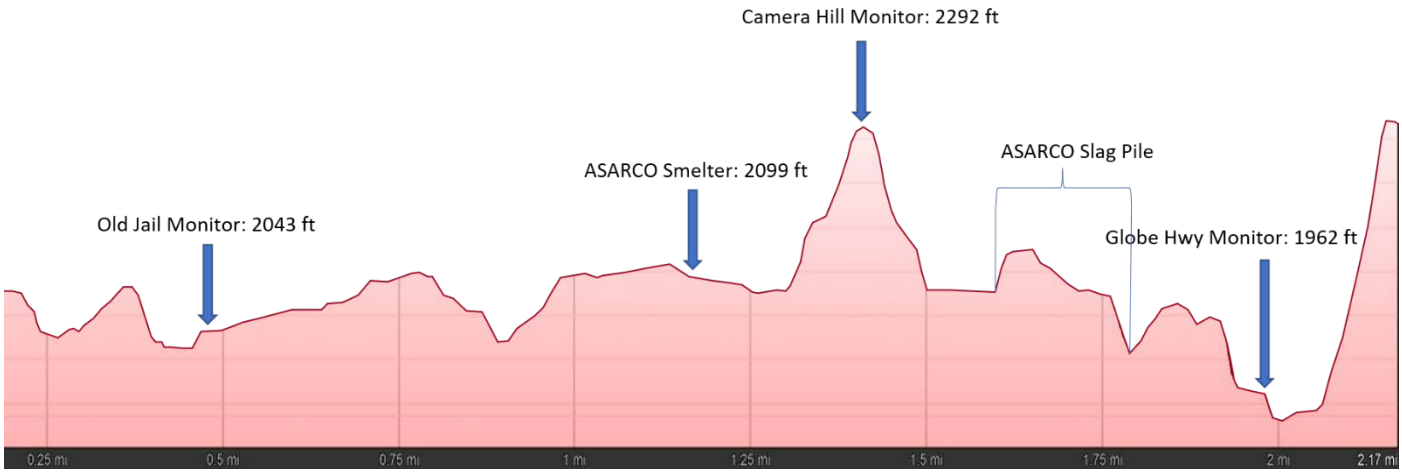


Figure 3-2: Hayden Monitoring Network Elevation Profile

For the purposes of this MET and ambient analysis, and as a basis for the attainment demonstration, ADEQ chose to look at MET data from all or part of 2017-2021. ADEQ chose this period as it covers the base year, a pre-control year (2017), and the most recent full year of quality assured data. ADEQ has included MET data from the Hayden Old Jail, Globe Highway, and Camera Hill monitors in the following section.

B3.1 Hayden Area MET & Topographic Background

Synoptic scale air flows and local topographically driven surface winds influence the speed and direction of air pollution transport throughout the Hayden area. Because the atmosphere within an airshed acts in a cohesive way with respect to the dispersion of emissions, local wind patterns and flow are most influential in affecting the impact of ground level air pollution. The complex topography in the area greatly influences local wind patterns in the Gila River Airshed. Hayden is located at the junction of two rivers, the Gila and the San Pedro. Situated in a low-lying part of a valley with mountains reaching over 4,000 feet to the north, east and southwest, Hayden is subject to a distinct mountain-valley diurnal wind pattern. Under stable atmospheric conditions, nighttime winds are typically from the southeast with speeds less than 10 miles per hour. These conditions cause air pooling in low-lying areas at night, causing pollutants within the air to settle in these areas. The up-slope air flows and convection that occurs during the day increases dispersion and flow out of the Hayden area. Under normal daytime conditions, surface winds in the Hayden area range from west-southwesterly to west-northwesterly as the atmosphere becomes less stable. This pattern is repeated throughout the complex terrain found in the Hayden area. During the wintertime, relatively strong inversions (where cold air becomes trapped at the surface by warmer air aloft) create extremely stable atmospheric conditions. Depending on the strength of the inversion and amount of daytime surface heating, the inversion may break by the early afternoon, permitting the air to mix vertically. Sometimes, however, the inversion may not break at all. Under these

conditions, vertical and horizontal movement of the air is very limited, causing pollutants in the air to accumulate up to several days with little dispersion.

B3.2 Multi-Year Wind Speed & Direction

This section of the TSD looks at the trend in meteorological conditions, specifically wind speed and direction, in the Hayden SO_2 NAA and the possible impacts these conditions may have on ambient SO_2 concentrations. To examine these trends, ADEQ analyzed MET data from the Hayden Old Jail, Camera Hill, and Globe Highway monitors. Figure 3-3 is illustrative of the wind patterns observed at the Hayden Old Jail monitor from 2017 to 2021.

B3.2.1 Hayden Old Jail (ADEQ Monitor)

The Hayden Old Jail monitor is located approximately 0.66 miles to the west of the ASARCO Smelter, at a bearing of ~286°. The wind rose in Figure 3-3 shows that winds are primarily out of the southeast and west, although they are observed to originate from all directions. This effect is due to the bowl-like topography present at the Hayden Old Jail monitor (Figure 3-2), which is situated in a low-lying area surrounded by points of higher elevation. Between 2017-2021, the maximum hourly wind speed was 23.3 mph and the average hourly wind speed was 2.8 mph.

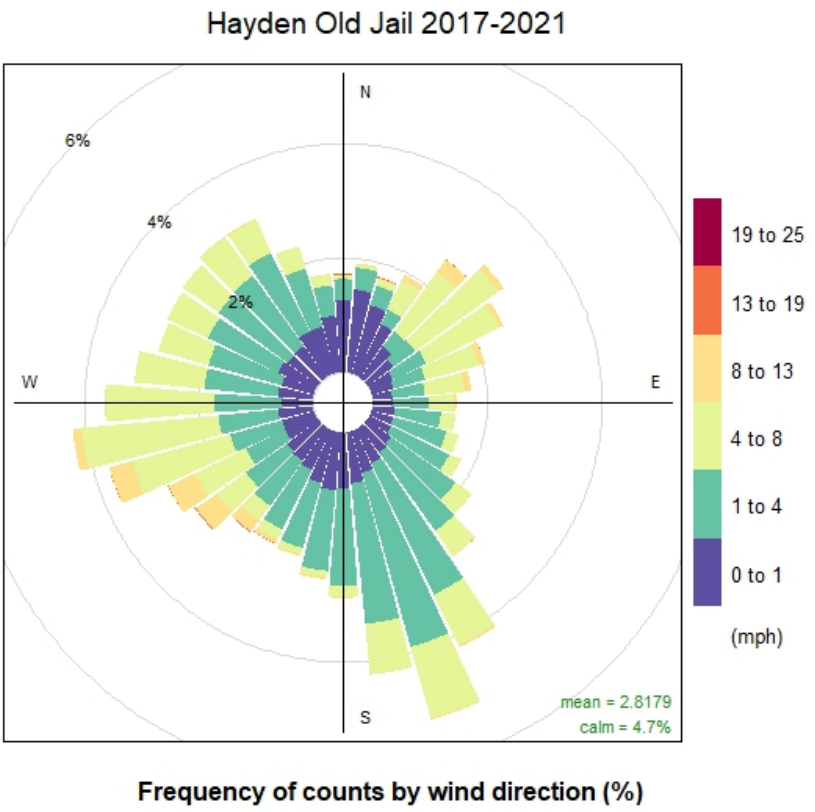


Figure 3-3: Hayden Old Jail Wind Rose 2017-2021

B3.2.2 Globe Highway (ADEQ Monitor)

The Globe Highway monitor sits a half mile northeast of the Smelter complex and is adjacent to the Gila River (Figure 3-1). The monitor is located in a river valley with the valley crest roughly 350 feet above the monitor elevation. This river valley runs northeast to southwest. Although there is some seasonal variation, the winds at this monitor follow this same general pattern (Figure 3-4). This pattern consists of winds out of the northeast in the early to mid-morning hours, and southwesterly winds in the afternoon and into the night. Wind speeds at this monitor are generally low; between 2017 to 2021, the maximum hourly wind speed reached 10.5 mph and the average hourly wind speed was 1.8 mph.

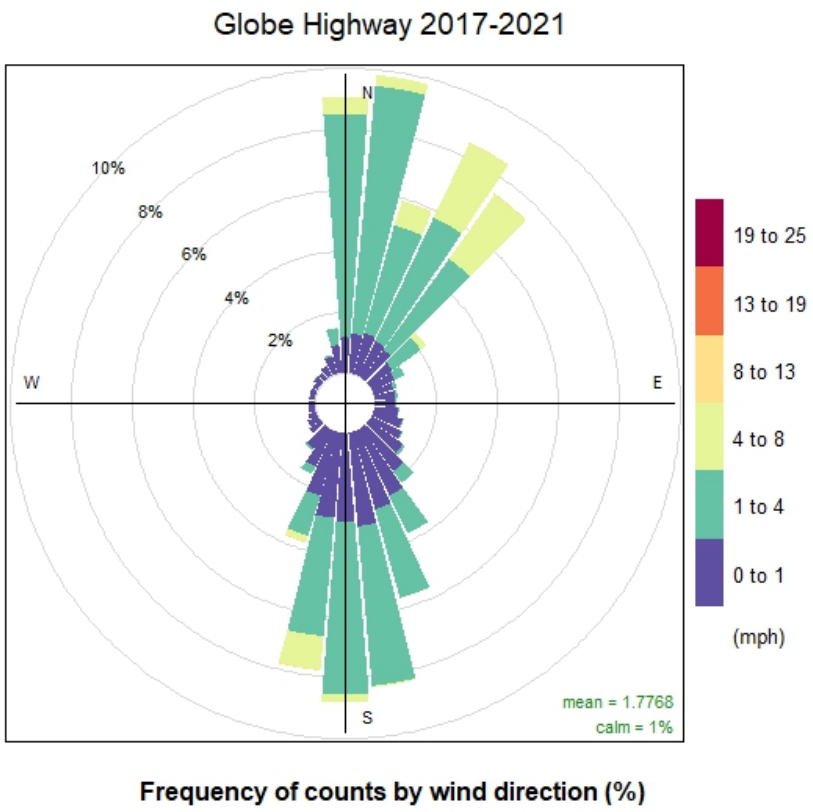


Figure 3-4: Globe Highway Wind Rose

B3.2.3 Camera Hill (ASARCO Monitor)

The Camera Hill monitor is located approximately 200 feet higher in elevation than the Smelter complex (still significantly lower than main stack) and 0.22 miles southeast of the concentrator aisle. This monitor is sited at the highest elevation of all MET monitors being analyzed and therefore reports the highest wind speeds. From 2017-2021, the max hourly wind speed reached 41.6 mph and the average hourly wind speed was 8.8 mph. The wind rose in Figure 3-5 is illustrative of the wind patterns from 2017 to 2021. In early morning hours the winds are out of the east/southeast and in the afternoon winds out of the west dominate. On average, these western winds are highest in speed. Although strong winds are also seen out of the northeast, these northeasterly winds only make up roughly 19% of the hourly wind directions seen from 2017-2021.

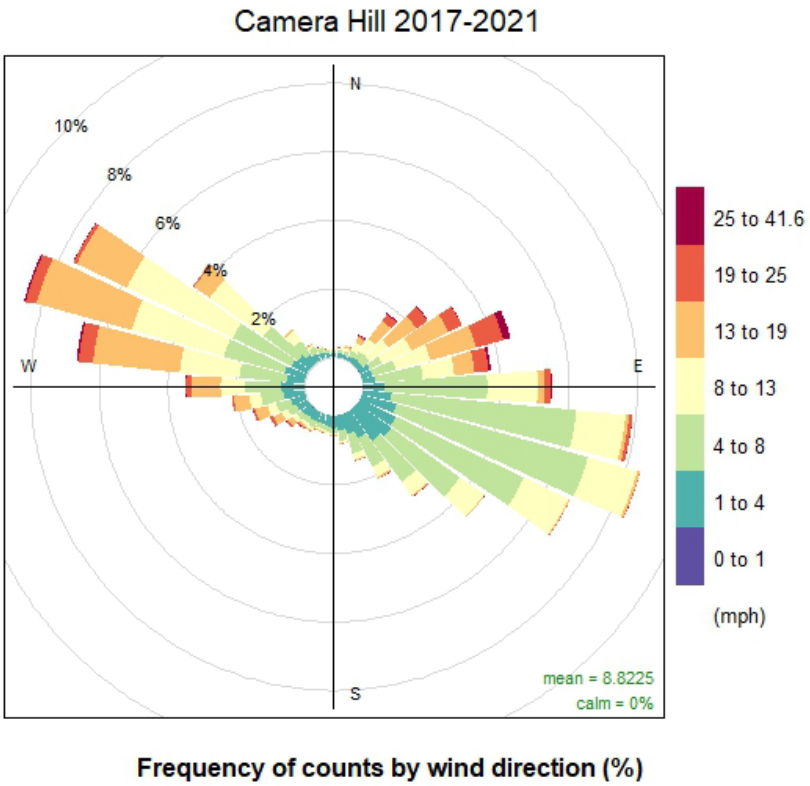


Figure 3-5: Camera Hill Wind Rose

B3.2.4 SO_2 and Wind Trends

The purpose of this section of the TSD is to provide some insight into which meteorological conditions are conducive to high SO_2 concentrations at the Hayden Old Jail SLAMS monitor. ADEQ used percentile rose plots as a multivariate analysis tool to examine the relationship between wind direction and SO_2 concentrations. The percentile roses in Figure 3-6 and Figure 3-7 show percentile levels of SO_2 by wind direction, for both pre- and post-shutdown of the facility. The pre-shutdown period is defined as January 1st 2017 to October 12th 2019, while post-shutdown includes October 13th 2019 to December 31st 2021. This analysis shows that while the ASARCO Smelter was in operation, the highest concentrations of SO_2 were dominated by easterly winds, likely reflecting the influence of Smelter roofline fugitive emissions at the monitor. SO_2 concentrations greatly receded post-shutdown, with levels never exceeding more than 11 ppb. It is important to note the difference in scale between the two figures below.

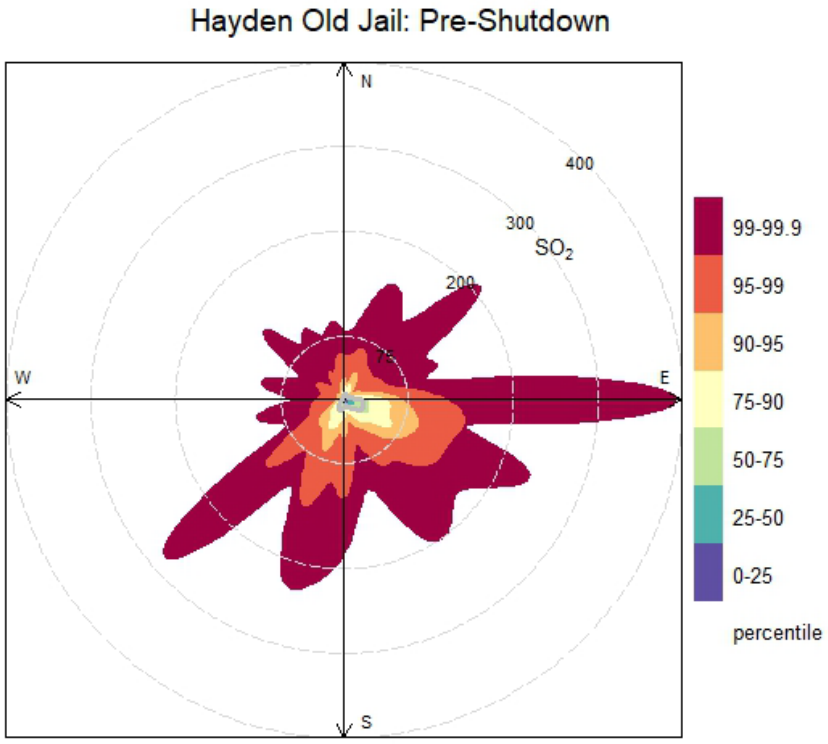


Figure 3-6: SO_2 Concentrations by Wind Direction (Pre-Shutdown)

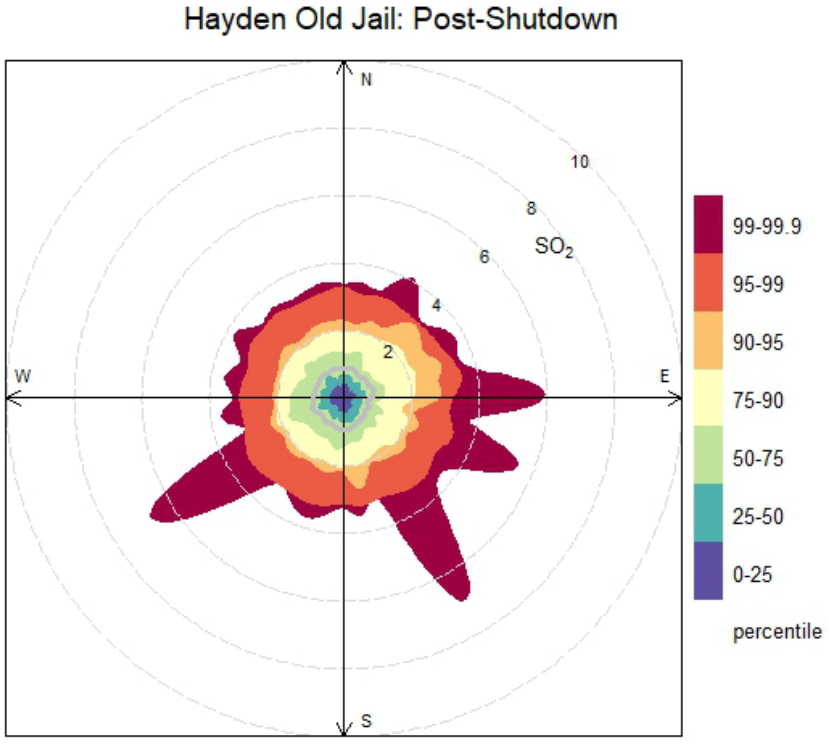


Figure 3-7: SO_2 Concentrations by Wind Direction (Post-Shutdown)

ADEQ also examined the relationship between exceedance values (1-hour SO_2 >75 ppb) and wind speed. Wind speed bins were created based on the Beaufort Wind Scale, a description of which is presented in Table 3-2 below.

Table 3-2: Beaufort Wind Scale

Beaufort Number	Wind Speed (mph)	WMO Classification	Description
0	< 1	Calm	Calm, smoke rises vertically
1	1 - 3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4 - 7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8 - 12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13 - 18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	19 - 24	Fresh Breeze	Small trees in leaf begin to sway
6+	25+	Strong Breeze +	Larger tree branches moving, whistling in wires

Table 3-3 shows that prior to the Smelter shutdown, hourly exceedances typically occurred during low winds (1-3 mph), when horizontal air movement is fairly limited. This outcome is expected given that pollutant dispersion becomes weak under low wind conditions, resulting in high ground level concentrations. No hourly exceedances were observed at the Hayden Old Jail SLAMS monitor after the Smelter ceased operation.

Table 3-3: Pre-Shutdown Exceedances by Wind Speed Bin at Hayden Old Jail

Beaufort Number	Wind Speed (mph)	1-Hr Values >75 ppb at Hayden Old Jail Monitor Pre-Shutdown of Smelter	
		Count	Percentage
0	< 1	68	22%
1	1 - 3	217	70%
2	4 - 7	27	9%
3	8 - 12	0	0%
4	13 - 18	0	0%
5	19 - 24	0	0%
6+	25+	0	0%

B3.3 Facility Operations & Ambient Air Concentrations

As previously mentioned, ADEQ submitted a SIP revision to EPA for the Hayden NAA in March of 2017, which was partially approved and partially disapproved by EPA in November of 2020. The facility

operations and ambient air concentrations are best reflected on in the context of this SIP revision, and the controls installed as a result of said SIP. These controls were designed to improve the capture and controls systems at the facility.

Figure 3-8 displays the downward trend in SO_2 measured at the Hayden Old Jail SLAMS monitor. This downward trend coincides with reductions in facility operating hours, gathered from the facility's annual point source emissions inventory reporting.

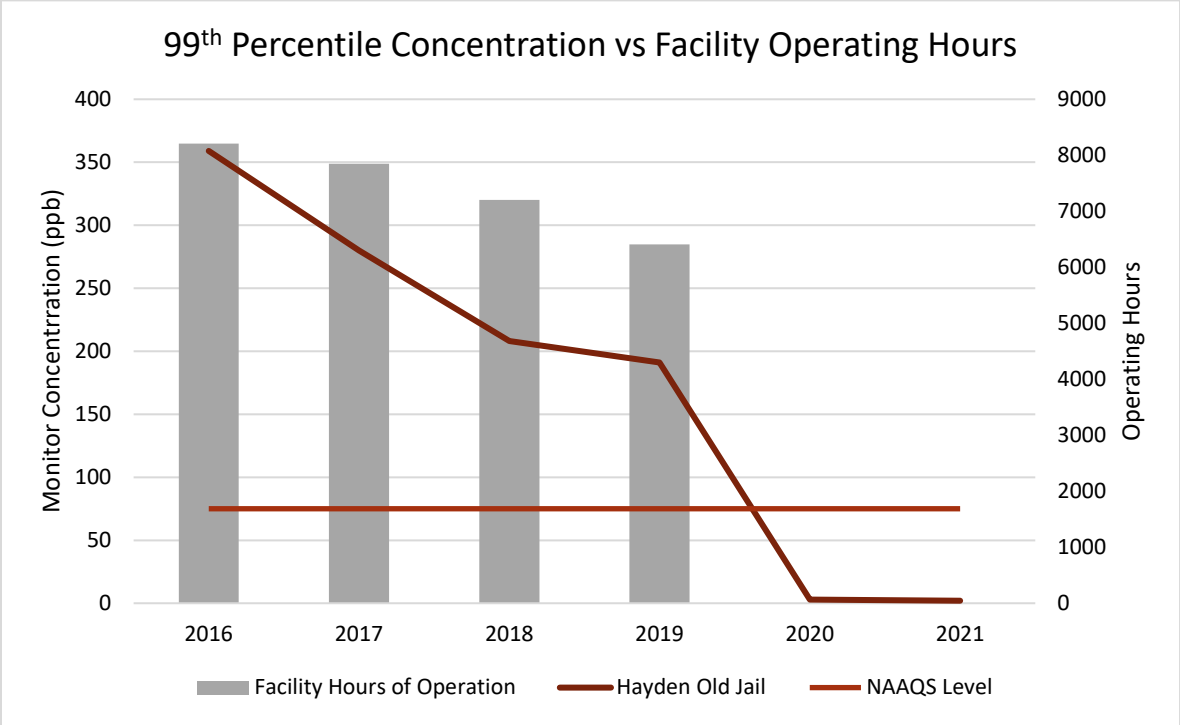


Figure 3-8: Facility Operating Hours & Ambient Air Trends

The Smelter was shut down for several prolonged periods in 2018 as ASARCO implemented the Converter Retrofit Project (CRP) and installed a new acid plant preheater. In January 2019, an inspection discovered issues with the preheater that were contributing to excess SO_2. Between February and October of 2019, the Smelter was shut down for 24 unscheduled days to allow inspection, diagnosis, and repair of the acid plant preheater. On October 13th of 2019, the Smelter was shut down due to the declaration of a work stoppage by the ASARCO bargaining unit and has not since been in operation.

B3.4 Historic Hourly Exceedances

In addition to showing the general downward trend in ambient air SO_2 (Figure 3-8), ADEQ has also included Figure 3-9 and Figure 3-10 to provide a more granular view of hourly exceedances in the NAA. These figures provide the number of hourly exceedances, summed by month, from 2017 to 2021. Figure 3-9 displays the number of hourly exceedances observed for both pre- and post-shutdown of the ASARCO Smelter. Figure 3-9 shows that the predominant number of exceedance values are

recorded between 9:00 AM and 1:00 PM. This is usually the time of day when wind speeds begin to increase in the Hayden area and are shifting from an easterly to a westerly direction.

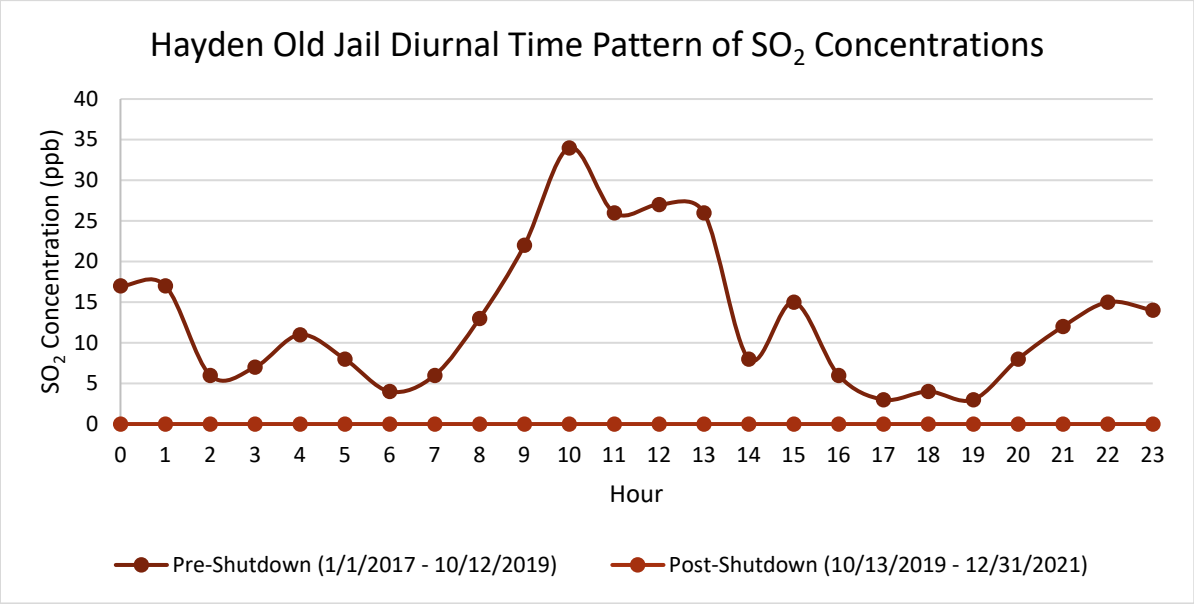


Figure 3-9: Hayden Old Jail Diurnal Time Pattern of SO_2 Concentrations

In April 2018, the CRP was implemented for the purpose of installing additional controls and improving the SO_2 and Pb capture systems at the facility. During the same month, ASARCO also installed a new acid plant preheater to facilitate conversion of SO_2 to SO_3 for acid production. As expected, hourly SO_2 exceedances were still recorded in the following months as ASARCO worked to optimize performance of the CRP equipment. However, an unexpected increase in SO_2 levels in October/November 2018 prompted ASARCO to investigate possible sources of excess SO_2 across the Smelter. ASARCO undertook work on the CRP equipment in an effort to address these issues, ultimately resulting in lower ambient SO_2 concentrations by late December 2018.

Nevertheless, twenty hourly exceedances were observed at the Hayden Old Jail SLAMS monitor in January 2019 (Figure 3-10). A facility inspection found cracks in the preheater's expansion joint and tubes, where process gas can leak into the furnace gas component of the preheater and exit into the atmosphere via the preheater stack. In early February 2019, the Smelter was shut down for seven days to install a new expansion joint in the preheater and no hourly exceedances were observed until the end of March and the beginning of April 2019. An additional inspection cited cracks in the new expansion joint and deformed/broken tubes. The Smelter was subsequently taken down for eleven days in April 2019 for extensive preheater repairs. The preheater functioned properly until late August/early September, when the Smelter was shut down for another six days to further plug and repair tubes.

The Smelter was shut down for the last time on October 13th 2019 as the result of a work stoppage by the ASARCO bargaining unit and remains inoperable. Since then, ambient SO_2 levels observed at the Hayden Old Jail monitor have significantly decreased, with an hourly maximum of 10.6 ppb and an average of 0.87 ppb. On average, hourly ambient SO_2 concentrations have been reduced by about 85% when comparing pre- and post-shutdown conditions. In view of the data, it is clear that preheater

malfunctions were typically the source of elevated SO_2 concentrations at the SLAMS monitor after the CRP controls and new preheater were installed.

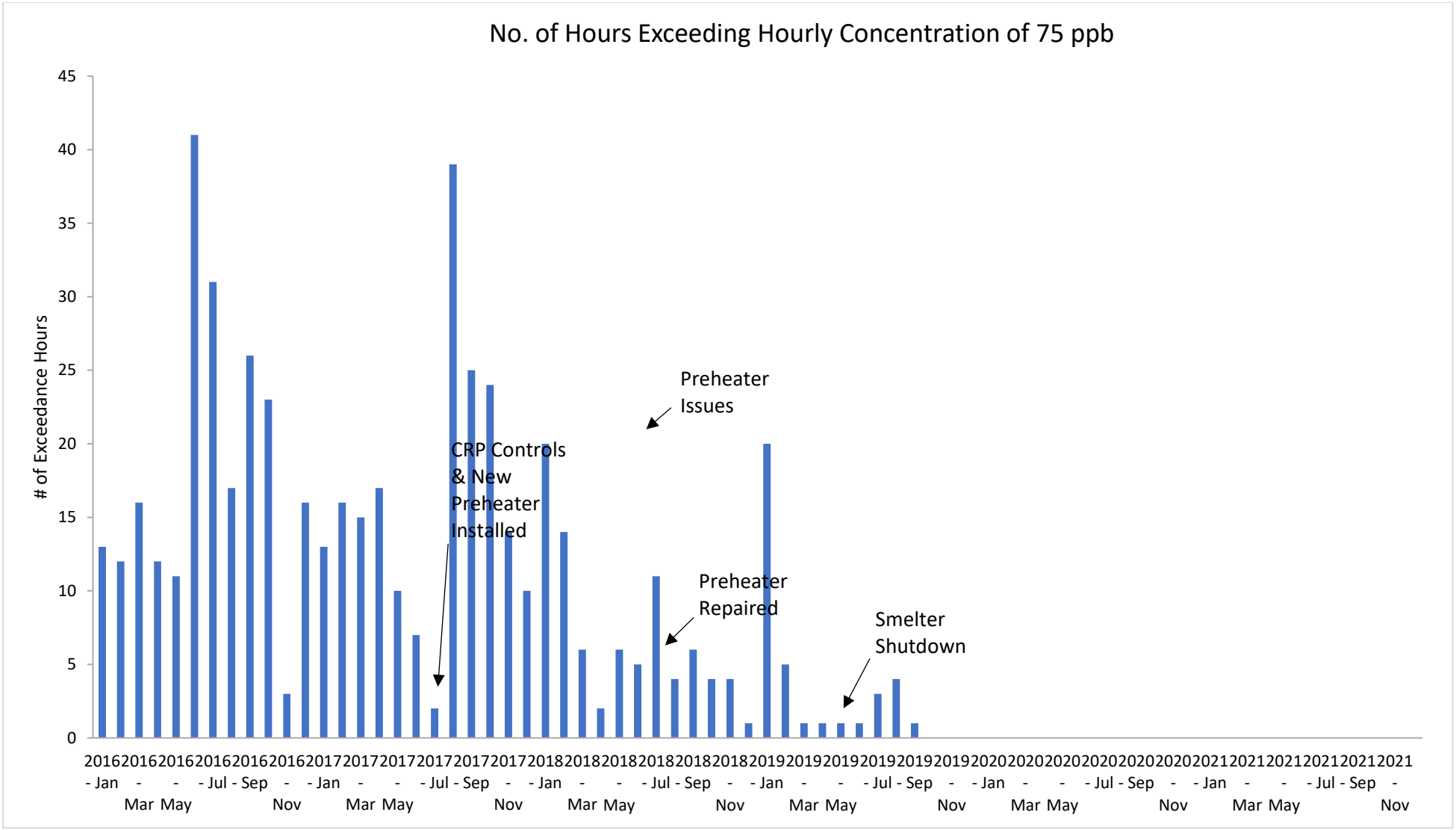


Figure 3-10: Number of Hourly Exceedances by Month at Hayden Old Jail

B4 Emission Estimation Methodology

ADEQ has employed a multi-method approach to compiling the base year and projected attainment year inventories. Table 4-1 is a summary of the broad approaches used to estimate SO_2 emissions in the Hayden NAA. ADEQ took a bottom up approach to determining point source emissions in the Hayden NAA as the Agency expected these emissions to comprise the majority of the base year inventory. ADEQ used local and state-level permit data and surveys to estimate emissions for stationary point sources in both the Hayden NAA and the 50km buffer extending from the Hayden NAA boundary. ADEQ derived the applicable non-point sources from the 2017 National Emissions Inventory (NEI). Mobile emissions, including on-road and nonroad emissions were obtained and projected using the Motor Vehicle Emissions Simulator 3 (MOVES3) model. ADEQ allocated these data to the Hayden NAA based on various methodologies explained throughout this section of the TSD.

Table 4-1: Emission Inventory Source Category, Approach and Data Source

Emission Inventory Source Category	Inventory Estimation Approach	Primary Data Sources
Point	Bottom-Up	Permit, Annual Emission Inventory Questionnaires
Nonpoint	Top-Down	2017 NEI
Mobile On-road	Top-Down	MOVES3
Mobile Nonroad	Top-Down	MOVES3

B4.1 Point Source Emission Methodology

Section 4.1 below provides a summary of the methods and sources of data used to develop the 2017 point source SO_2 inventory. Particular point sources of interest include the ASARCO smelter and smaller point sources within the 50 km buffer zone, including the Freeport-McMoran Miami Inc. (FMMI) Smelter. Table 4-2 provides a summary of the data sources used to develop the base year point source EI.

Table 4-2. Point Source Base Year Inventory Estimation Approach

Point Source Location		Inventory Estimation Approach
Nonattainment Area		SLEIS Annual Emissions Inventory Reports
50km Buffer Zone	Pinal County	County permitting Annual Emissions Inventory Reports
	Gila County	SLEIS Annual Emissions Inventory Reports
	Pima County	County permitting Annual Emissions Inventory Reports

B4.1.1 ASARCO LLC Smelter Base Year Emissions Estimate

ASARCO LLC Smelters base year emissions inventory consists of actual SO_2 emissions. ADEQ has used the annual SO_2 totals reported via the State and Local Emission Inventory System (SLEIS) to determine actual smelter emissions during the base year. The processes are calculated with various methods, including use of Compilation of Air Pollutant Emission Factors (AP-42) emission factors, sulfur-ratings, continuous emissions monitors (CEMS) and fugitive study results. ASARCO used results from the 1994-1995 fugitive study as the emission factors to calculate fugitive emissions in 2017. In emissions inventories reported from 2018-2021, ASARCO has used the AP-42 emission factors multiplied by the maximum feed and increased by a 20% safety factor.

B4.1.1.1 ASARCO Fugitive Emission Summary

After review from the previous 2017 SIP, ADEQ determined the sulfur balance method is inappropriate for developing high-resolution estimates of fugitive process emissions at facilities that process large quantities of sulfur-bearing new metal bearing material. Consent Decree CV-15-02206-PHX-DLR required ASARCO to complete the installation of a replacement vent gas baghouse and the Converter Retrofit Project. Emission limits were reduced and effective by July 1, 2018. Emissions from the Main Stack shall not exceed 1069.1 pounds per hour on a 14-operating day average unless 1,518 pounds or less is emitted during each hour of the 14-operating day period. ASARCO smelter intends to pursue a capture and control approach by which the majority of current fugitive emissions are captured and accounted for by a CEMS.

ASARCO was required to conduct a fugitive emissions study no later than 6 months after the completion of the Converter Retrofit Project for a 1-year period. The purpose of the fugitive emissions study was to confirm measured fugitive emissions were consistent with estimates used. The fugitive study included nine monitoring points over the flash furnace routed to an analyzer and six monitoring points over the anode furnaces routed to an analyzer. Two original anode furnace monitoring points were re-designated as converter monitoring points during the study. The results from the fugitive study are presented in the Table 4-3. ASARCO's consultant, Gas Cleaning Technologies LLC (GCT) analyzed the results of the fugitive study to further determine the current fugitive emission rates, PTE, and proposed limits.

Table 4-3. Fugitive Emissions Study Summary Statistics (lb/hr)

	Flash Furnace Fugitives	Converter Aisle Fugitives	Anode Furnace Fugitives
Maximum	142.1	90.6	158.7
Mean	6.5	2.8	4.8
Median	2.9	0.9	0.8
Standard Deviation	10.5	5.5	10.3
99th Percentile	47.4	24.0	50.4

ASARCO excluded one hour of flash furnace data as unrepresentative of future operations as an atypical process upset. This hour recorded values nearly four times higher than the next highest hour. ASARCO does not believe that the conditions during that hour will recur. If a similar hour were to recur, it would be covered by the emissions limits proposed herein. ASARCO is not proposing to exclude any hours from coverage under the limit.

B4.1.2 50km Buffer Zone Point Source Methodology

In order to develop the 50 km buffer zone inventory ADEQ first created a graphical information system (GIS) shapefile of the buffer zone. This shapefile was then provided to the Pinal and Pima County air permitting organizations. ADEQ's data request included both the 2017 emissions and current Potential to Emit (PTE) of all permitted sources within the buffer zone. Pinal County provided 36 sources of SO_2 emissions within the buffer zone boundaries. Pima County provided 2 sources of SO_2 emissions. There were three sources within the buffer zone in which ADEQ regulates and emissions were sourced from ADEQ's SLEIS database. Two of these three sources being the most significant sources in the buffer zone, FMMI Smelter and Pinto Valley Mine.

B4.2 Nonpoint Source Emissions Methodology

Section 4.2 below provides a summary of the methods and data sources used to develop the 2017 nonpoint SO_2 inventory. The source of these nonpoint emissions was the Pinal and Gila County portion of the latest 2017 NEI version. These county level emissions were allocated to the NAA using the factors described in this section. Since 2017 is the base year, additional projections were irrelevant.

B4.2.1 EPA 2017 National Emissions Inventory

The EPA's NEI database contains nationwide data on the emissions and sources of emissions of the criteria air pollutants, hazardous air pollutants, and greenhouse gases. The NEI includes estimates of annual air pollutants from all point, nonpoint, mobile and event sources in the United States and its territories. The NEI is a collaborative effort between the states, tribal nations and federal agencies that provide a snapshot of emissions from the county and tribal scale to a national scale.

ADEQ used the January 2021 version of the 2017 NEI as the basis for the nonpoint base year EI. Pinal and Gila County emissions estimates from the NEI were allocated based on the methodologies contained herein. ADEQ will use the county level emissions estimates from the NEI and allocate those based on the allocation methodologies contained herein. The Emission Estimation Approach for all nonpoint emissions sourced from the NEI are top-down estimations. Table 4-4 below provides the specific NEI source categories inventoried, the estimation approach, and the allocation method.

Table 4-4. Hayden NAA Nonpoint Source Category

Source	Method
Fires - Agricultural Field Burning	*Land Area*

Source	Method
Fires - Prescribed Fires	*Land Area*
Fires - Wildfires	*Land Area*
Fuel Comb - Comm/Institutional - Biomass	*Population*
Fuel Comb - Comm/Institutional - Coal	*Population*
Fuel Comb - Comm/Institutional - Natural Gas	*Population*
Fuel Comb - Comm/Institutional - Oil	*Population*
Fuel Comb - Comm/Institutional - Other	*Population*
Fuel Comb - Electric Generation - Coal	*Population*
Fuel Comb - Electric Generation - Natural Gas	*Population*
Fuel Comb - Industrial Boilers, ICEs - Biomass	*Population*
Fuel Comb - Industrial Boilers, ICEs - Coal	*Population*
Fuel Comb - Industrial Boilers, ICEs - Natural Gas	*Population*
Fuel Comb - Industrial Boilers, ICEs - Oil	*Population*
Fuel Comb - Industrial Boilers, ICEs - Other	*Population*
Fuel Comb - Residential - Natural Gas	*Population*
Fuel Comb - Residential - Oil	*Population*
Fuel Comb - Residential - Other	*Population*
Fuel Comb - Residential - Wood	*Population*
Industrial Processes - Chemical Manuf	*Population*
Industrial Processes - Mining	*Population*
Industrial Processes - NEC	*Population*
Industrial Processes - Pulp & Paper	*Population*
Miscellaneous Non-Industrial NEC	*Population*
Mobile - Aircraft	*Population*
Mobile - Locomotives	*Railroad*
Mobile - Non-Road Equipment - Diesel	*Population*
Mobile - Non-Road Equipment - Gasoline	*Population*
Mobile - Non-Road Equipment - Other	*Population*
Mobile - On-Road Diesel Heavy Duty Vehicles	*Population*
Mobile - On-Road Diesel Light Duty Vehicles	*Population*
Mobile - On-Road non-Diesel Heavy Duty Vehicles	*Population*
Mobile - On-Road non-Diesel Light Duty Vehicles	*Population*
Solvent - Industrial Surface Coating & Solvent Use	*Population*

Source	Method
Waste Disposal	*Population*

B4.2.2 Population Allocation Methodology

The ADOA provided ADEQ with population estimates for both the NAA, Pinal and Gila County. In general, the ADOA dataset showed an overall increase in population in the NAA, Pinal and Gila County. The dataset was compared to the Arizona's Office of Economic Opportunity (AOEO) population estimates last revised by the AOEO on July 1, 2020[9]. These updated estimates showed that the Gila County and Hayden population estimates have contracted and, in some years, remained the same. Pinal County is steadily increasing in population. Hayden has experienced a -2.2% population contraction, Gila County has relatively stayed the same at 0.05% increase, and Pinal has experienced a 2.1% population increase from 2016 to 2021.

ADEQ used this AOEO dataset to update the original ADOA NAA population estimates. This was done by determining the annual rate of change in the AOEO dataset and applying those rates of change to the original ADOA NAA dataset starting in 2015. ADEQ then simply used the updated AOEO data for the county level population estimates.

Finally, to determine the base year population allocation factor, ADEQ took the ratio of the NAA area population to the county level population. This factor allows for the allocation of county level emissions, tied to population, to be allocated to the NAA. ADEQ used Equation 4-1 to generate the population allocation factor.

Equation 4-1: Gila County Population Allocation Factor

$$If\ \frac{P_{na}}{P_c} = AF_p, Then\ \frac{1{,}176}{53{,}509} = \mathbf{0.022}$$

Equation 4-2: Pinal County Population Allocation Factor

$$If\ \frac{P_{na}}{P_c} = AF_p, Then\ \frac{3{,}233}{400{,}950} = \mathbf{0.008}$$

Where:

- P_{na}=*2017 population estimate of Hayden NAA*
- P_c=*2017 population estimate of County*
- AF_p=*Population allocation factor*

Using this method, ADEQ was able to develop a population allocation factor of **0.022** for Gila County and a **0.008** allocation factor for Pinal County. In other words, in 2017, **2.2%** of the population of Gila County and **0.8%** of Pinal County resided within the Hayden NAA. ADEQ multiplied this factor by county-level source category specific emission estimates where population is assumed to drive emissions.

[9] Retrieved from: https://www.azcommerce.com/media/3depfoz0/estimates1980-2021.xlsx

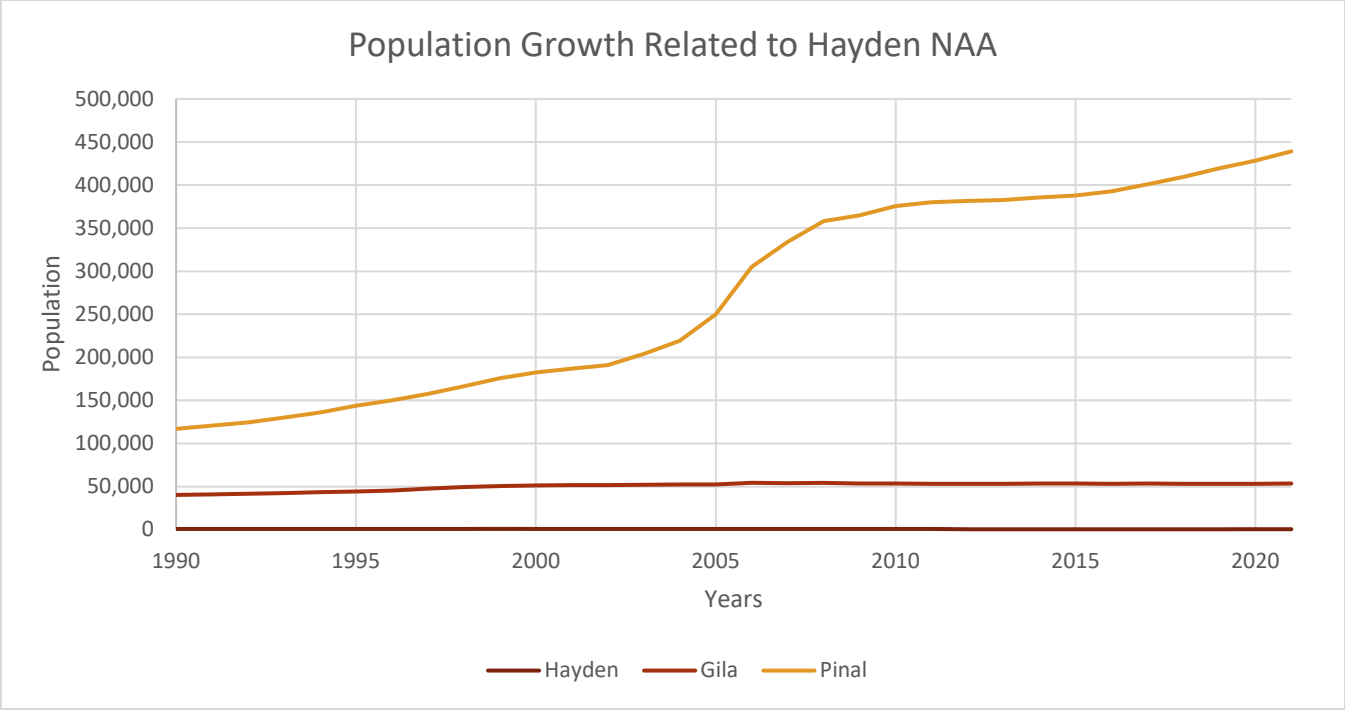


Figure 4-1. Population Growth History

B4.2.3 Land Area Allocation Methodology

Since the bounds of the NAA haven't changed since the last SIP revision, ADOA provided land area estimates in square miles for Gila and Pinal County and the land area within each county that is encompassed by the Hayden SO_2 NAA. As in the population allocation factor described previously, ADEQ used the land-area allocation formula to determine a land-area allocation factor for both the Gila and Pinal portions of the NAA.

Equation 4-3: Land Area Allocation Factor Formula

$$\frac{LA_{na}}{LA_c} = AF_{la}$$

Where:

- LA_{na}=*ADOA land area estimate county portion of Nonattainment Area*
- LA_c=*ADOA land area estimate of entire county*
- AF_{la}=*Land area allocation factor*

Equation 4-4: Gila County Land Area Allocation Factor

$$If\ \frac{LA_{na}}{LA_c} = AF_{la}, Then\ \frac{58}{4{,}796} = \mathbf{0.0121}$$

Equation 4-5: Pinal County Land Area Allocation Factor

$$If\ \frac{LA_{na}}{LA_c} = AF_{la}, Then\ \frac{217}{5{,}374} = \mathbf{0.0404}$$

Using this method, ADEQ was able to develop a land-area allocation factor for Gila County of **0.0121** and Pinal County of **0.0404**. In other words, the Hayden SO_2 NAA accounts for **1.21%** of the land area of Gila County and **4.04%** of the land area of Pinal County. ADEQ will multiply this factor by county-level source category specific emission estimates where source emissions are predicated by land area.

B4.3 Mobile Source Emission Methodology

This section provides a summary of the methods and data sources used to develop the 2017 mobile SO_2 inventory. To quantify this portion of the inventory ADEQ utilized the most recent version of EPA's MOVES3 model. Section 4.3.1 describes how onroad emissions were determined, and Section 4.3.2 covers nonroad mobile sources. As Pinal County encompasses approximately 79% of the land area and approximately 73% of the population in Hayden NAA, Pinal County was used as the designated model county.

B4.3.1 Onroad Emissions Modeling

ADEQ ran the MOVES3 model in county scale mode to determine the NAA onroad SO_2 emissions. In order to run MOVES3 in this configuration the modeler must provide local inputs. ADEQ sourced these inputs from the 2017 NEI MOVES2014b Pinal County inputs. Although MOVES3 is the updated version of MOVES2014b, MOVES2014b inputs can be converted to the MOVES3 format, which was done for this modeling.

The NEI inputs provided all the needed MOVES specific data, including speed bin data, fuel formulations, vehicle type age distribution, vehicle miles traveled (VMT) for the county, and the county vehicle population by MOVES source type. Of the inputs provided by the NEI modeling, ADEQ further refined the VMT and vehicle population data to better represent the NAA. ADEQ assumed the remaining data would be representative of the Hayden NAA.

The methodology used to allocate the MOVES2014b county level vehicle population and VMT data was the same as the nonpoint methodology. In that, the population allocation factor determined by Equation 4-1 was first applied to the County VMT and vehicle population inputs, and then added together. With the exception of these three inputs VMT, vehicle population, and age distribution, ADEQ assumed no changes to the: month/day/hour VMT fractions, hoteling inputs, road type/road type distribution, starts, average speed distribution, fuel, and meteorological inputs, from the county level to the NAA. Tables 4-5 and 4-6 below provide an overview of the VMT and population inputs.

Table 4-5. Onroad VMT Methodology Summary

Source Type	sourceTypeID	Gila VMT	Pinal VMT	NAA VMT
Motorcycle	11	4,267,057.23	23,559,506.29	283,748.26
Passenger Car	21	180,931,450.26	1,373,154,916.12	15,048,669.14
Passenger Truck	31	341,447,582.76	1,586,005,387.64	20,292,718.05
Light Commercial Truck	32	34,907,561.47	98,149,119.14	1,558,595.47
Intercity Bus	41	798,097.21	11,264,156.20	108,367.10
Transit Bus	42	741,090.27	3,032,657.44	40,740.77
School Bus	43	2,599,928.52	11,552,980.72	150,295.94
Refuse Truck	51	152,133.37	1,091,649.73	12,145.88
Single Unit Short-Haul Truck	52	14,633,638.25	37,216,379.18	621,701.09
Single Unit-Long-Haul Truck	53	15,332,426.91	115,145,185.43	1,265,426.00
Motorhome	54	3,546,944.83	9,552,715.80	154,980.26
Combination Short-Haul Truck	61	19,042,832.66	106,904,108.75	1,280,521.17
Combination Long-Haul Truck	62	11,189,109.71	192,308,623.39	1,796,561.55

Table 4-6. Onroad Vehicle Population Methodology Summary

Source Type	sourceTypeID	Gila Vehicle Population	Pinal Vehicle Population	NAA Vehicle Population
Motorcycle	11	3,406.47	33,524.00	345.18
Passenger Car	21	16,778.00	126,860.00	1,391.66
Passenger Truck	31	31,662.90	146,524.00	1,877.35
Light Commercial Truck	32	3,237.03	9,067.59	144.26
Intercity Bus	41	13.42	294.70	2.67
Transit Bus	42	8.23	138.04	1.29
School Bus	43	86.66	1,156.47	11.23
Refuse Truck	51	29.00	53.58	1.07
Single Unit Short-Haul Truck	52	1,175.00	2,700.35	47.60
Single Unit-Long-Haul Truck	53	661.71	6,103.34	63.76
Motorhome	54	712.00	4,297.61	50.30
Combination Short-Haul Truck	61	395.37	3,387.20	36.00
Combination Long-Haul Truck	62	197.26	2,248.65	22.47

B4.3.2 Nonroad Emissions Modeling

ADEQ ran the MOVES3 model in nonroad mode, with a model run year of 2017, to determine the nonroad portion of the mobile inventory. Due to a lack of local data, ADEQ conducted this modeling

using EPA's defaults for Pinal and Gila County. The population allocation factor relevant to each county was applied to the counties and added together to get the respective NAA nonroad emissions. Source categories included in the nonroad inventory can be seen in Table 4-7. The county level emissions produced by MOVES3 were allocated to the NAA using the same methodology as with nonpoint inventory. Specifically, by utilizing the population allocation factor determined by Equation 4-1 to allocate to the NAA.

Table 4-7: Included MOVES3 Nonroad Source Categories

MOVES3 Nonroad Source Categories
Agriculture
Airport Support
Commercial
Construction
Industrial
Lawn/Garden
Pleasure Craft
Railroad
Recreational

B4.3.3 Rail Length Allocation Methodology

ADEQ allocated locomotive emissions based on rail length within the Hayden SO_2 NAA as a ratio of total rail length within Gila and Pinal County. ADEQ used ArcMap along with a 'rails' shapefile obtained from the Arizona Land Resource Information System to determine rail length in each county and within the Hayden SO_2 NAA.

Equation 4-6: Rail Length Allocation Factor Formula

$$\frac{RL_{NA}}{RL_C} = AF_{RL}$$

Where:

- RL_{NA}=*Rail length in miles within county portion of NAA*
- RL_c=*Rail length in miles of entire county*
- AF_{RL}=*Rail length allocation factor*

Equation 4-7: Gila County Rail Length Allocation Factor

$$If\ \frac{RL_{NA}}{RL_C} = AF_{RL}, Then\ \frac{9.01164}{64.3990} = \mathbf{0.1399}$$

Where:

- RL_{NA} = *Rail length in miles within Gila County portion of NAA = 9.01164*

- *RL_C = Rail length in miles of entire Gila County = 64.3990*
- *AF_{RL} = Rail length allocation factor = **0.1399***

Equation 4-8: Pinal County Rail Length Allocation Factor

$$If \frac{RL_{NA}}{RL_C} = AF_{RL}, Then \frac{28.6218}{272.4190} = \mathbf{0.1051}$$

Where:

- *RL_{NA} = Rail length in miles within Pinal County portion of NAA = 28.6218*
- *RL_C = Rail length in miles of entire Pinal County = 272.4190*
- *AF_{RL} = Rail length allocation factor = **0.1051***

Using this method, ADEQ was able to develop a rail-length allocation factor for Gila County of **0.1399** and for Pinal County of **0.1051**. Thus, **13.99%** of the total rail length within Gila County and **10.51%** of the total rail length within Pinal County is contained within the bounds of the Hayden SO_2 NAA. ADEQ will multiply this factor by county level locomotive SO_2 emissions to provide an estimate of locomotive SO_2 emissions within the Hayden SO_2 NAA.

B5 Base Year Emission Inventory for the Hayden SO_2 Nonattainment Area

ADEQ will account for all anthropogenic sources of SO_2 within the Hayden SO_2 NAA. These sources will be defined as either point (Section B5.1) or nonpoint (Sections B5.2, B5.3, & **Error! Reference source not found.**). ADEQ will use the 2017 NEI as the basis for nonpoint sources as this represents the most complete and accurate data set for this information. Point source data is acquired from SLEIS and the relevant Air Quality Control county departments. For all permitted sources within the NAA and the buffer zone, ADEQ used emissions data submitted from annual emission inventory reports. In regards to Pinal County and Pima County (within buffer zone) permitted sources submit emissions inventories to the respected county Air Quality Control department inventory databases.

The primary emission source in the Hayden SO_2 NAA is the ASARCO Hayden Smelter operated by ASARCO LLC. Concentrated copper sulfide ores are refined through pyrometallurgical techniques that refine copper ore concentrates of 15 to 35% copper to anodes greater than 98.5% copper. The smelting process drives off other metal impurities in the copper ore in the form of metal fume or as a slag. SO_2 gas is the most abundant gas produced from the smelting process and the focus for this EI compilation.

B5.1 2017 Base Year Point Source Emission Inventory

ADEQ used the Annual Emission Inventory reports as the basis for the point source emission analysis. ADEQ chose to inventory the sources within the 50km buffer zone surrounding the Hayden SO_2 NAA as sources emitting more than 100 tpy might be significant enough that they to contribute to exceedances and violations of the monitor within the Hayden SO_2 NAA. The only other facility within the Hayden NAA and 50km buffer zone considered a major source is the FMMI Smelter. ADEQ will perform further analysis of the impact of these SO_2 emissions sources on the ambient monitored values within the Hayden SO_2 NAA and will discuss these impacts in the attainment and actual emissions baseline dispersion modeling demonstration protocol and TSD. This portion of the inventory will be the basis of determining what sources ADEQ should explicitly model and what sources ADEQ will model as background concentrations.

Figure 5-1: Hayden SO_2 NAA Point Source Map (2017 AEI)

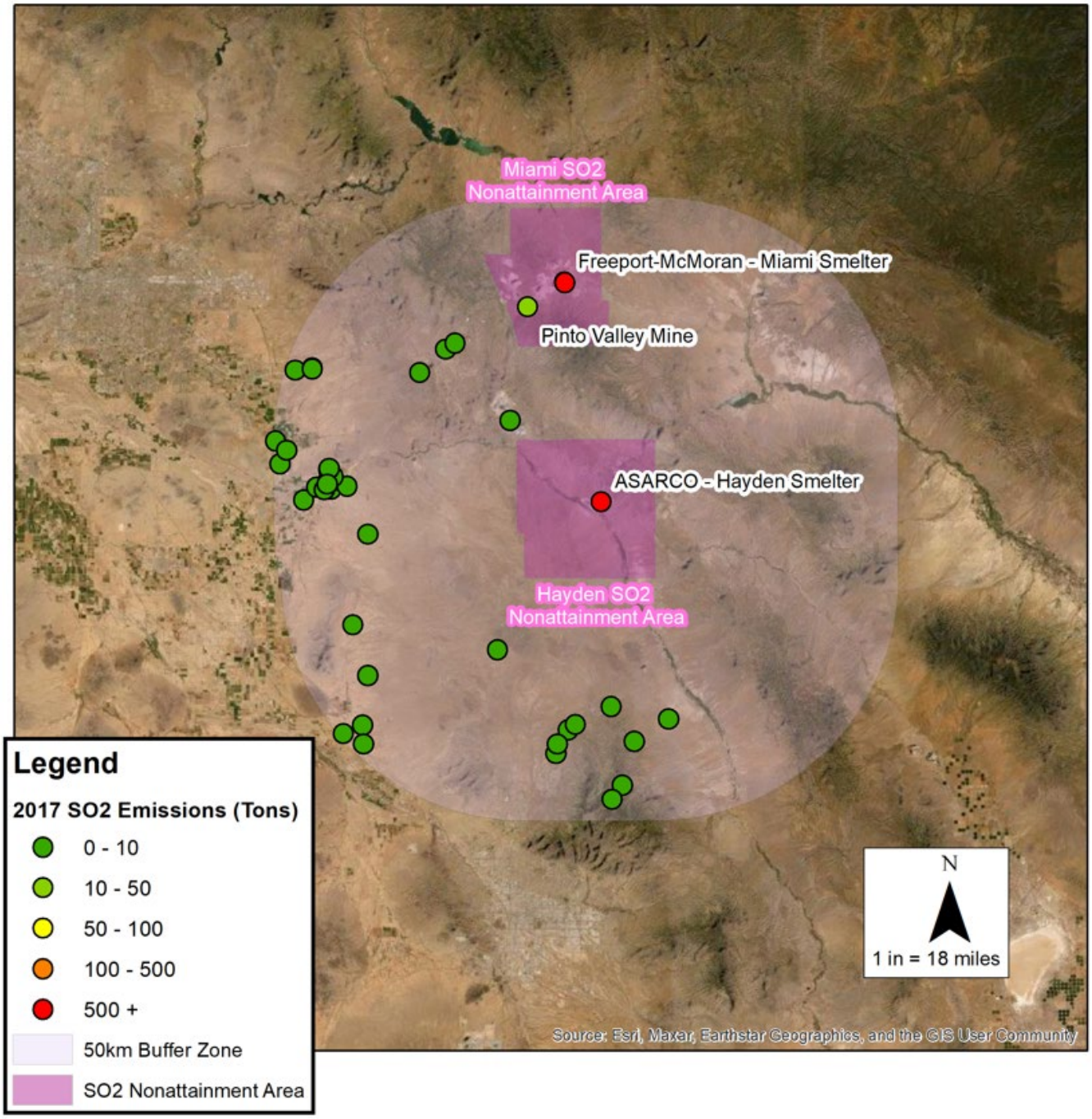


Table 5-1: Hayden SO_2 NAA Point Sources (2017 AEI)

Hayden SO_2 NAA				
Facility	**Facility Type**	**Latitude**	**Longitude**	**2017 SO2 Emissions (Tons)**
ASARCO Smelter	Copper Smelter	33.003378	-110.77632	20,498.8
50km Buffer Zone				
Facility	**Facility Type**	**Latitude**	**Longitude**	**2017 SO2 Emissions (Tons)**
Calcium Carbonate Plant	Calcium Carbonate Manufacturer	33.288	-111.121	0.007
Tom Mix Compressor Station	Compressor Station	32.728	-111.006	1.52
Arizona Correctional Industries - Florence	Correctional Facility	33.027	-111.374	0.006
Biosphere 2	Research Facility	32.57861	-110.85056	0.02
Bonito Quarry	Sand and Gravel	32.55759	-110.70561	2.23
Cactus Landfill	Landfill	32.774	-111.324	0.69
Central Arizona Florence Correctional Complex	Correctional Facility	33.043	-111.371	0.09
Central Arizona Florence Correctional Complex	Correctional Facility	33.04417	-111.37916	0.12
Central AZ Correctional Fac. and ASP Florence West	Correctional Facility	33.03847	-111.37654	0.299
Cox Communications Pinal STC	Telecommunication	33.11643	-111.49666	0.00
Decorative Rock Sales L.L.C.	Sand and Gravel	32.589	-110.834	0.003
Durham Regional Landfill	Landfill	32.67992	-111.29127	0.56
EPCOR San Tan District - Anthem WRF	Wastewater Treatment Plant	32.94345	-111.29231	0.004
Eyman Complex	Prison	33.033	-111.338	0.25
Florence Hospital	Hospital	33.07368	-111.48685	0.197
Florence Plant	Asphalt Plant	33.05	-111.37	8.49
Freeport-McMoran - Miami Mine	Mine	33.413889	-110.856944	0.27
Freeport-McMoran - Miami Smelter	Copper Smelter	33.412655	-110.856538	648.69
Gft 2	Asphalt Plant	33.24795	-111.45364	Permitted in 2021
ICE - Florence Detention Center	Detention Facility	33.06385	-111.37891	0.4
Ironwood MSW Landfill	Landfill	33.007	-111.434	0.011
Oracle Compressor Station	Compressor Station	32.6228	-110.756	1.20
Oracle Ridge Mine	Mine	32.475599	-110.73166	0.06
Pinto Valley Mine	Mine	33.367223	-110.938611	15.79
Queen Creek Aggregate Processing & Hot Mix Asphalt	Asphalt Plant	33.09873	-111.47251	2.73
Queen Creek Pit	Sand and Gravel	33.25333	-111.41613	0.13
Queen Creek Plant	Asphalt Plant	33.251	-111.416	8.31
Ray Complex	Copper Mine	33.0018	-110.778	7.57
Red Rock Pumping Plant	Emergency Generator	32.5877	-111.30290	0.0
Red Rock Water Reclamation Facility	Wastewater Treatment Plant	32.57178	-111.34410	0.01
Resolution Copper Mining	Copper Mine	33.29989	-111.09928	0.65
SaddleBrooke One	Country Club	32.53425	-110.87770	0.002
Saddlebrooke Wastewater Treatment Plant	Wastewater Treatment Plant	32.55227	-110.87450	0.004
Saguaro Power Plant	Power Plant	32.5517	-111.3	0.22
San Manuel Schools	School	32.59861	-110.62944	0.001
Sarita Aerial Contractors	Airport	32.9356	-111.485	N/A
South Plant	Emergency Generator	33.03041	-111.40492	0.07
Superior Transfer Station	Transfer Station	33.24456	-111.17783	0.095
Trico Electric Cooperative	Electricity	32.449229	-110.754186	2.19
Town of Florence Well Site #1	Emergency Generator	33.06523	-111.37860	0.008
Town of Florence Well Site #5	Emergency Generator	33.02674	-111.38868	0.017
Town of Florence Well Site 3B	Emergency Generator	33.03594	-111.38259	0.004

Once a baseline list of point sources was established based on annual emission inventory questionnaires required under A.A.C R18-2-327, ADEQ further analyzed the major sources of SO_2 within the Hayden SO_2 NAA and 50 km buffer zone. These major sources are listed in Table 5-2

below. In addition to providing the actual emissions, the permitted sources either provided the appropriate permits and permit TSDs, permitted SO_2 emission limits or PTE calculations for each of the sources presented in the following table.

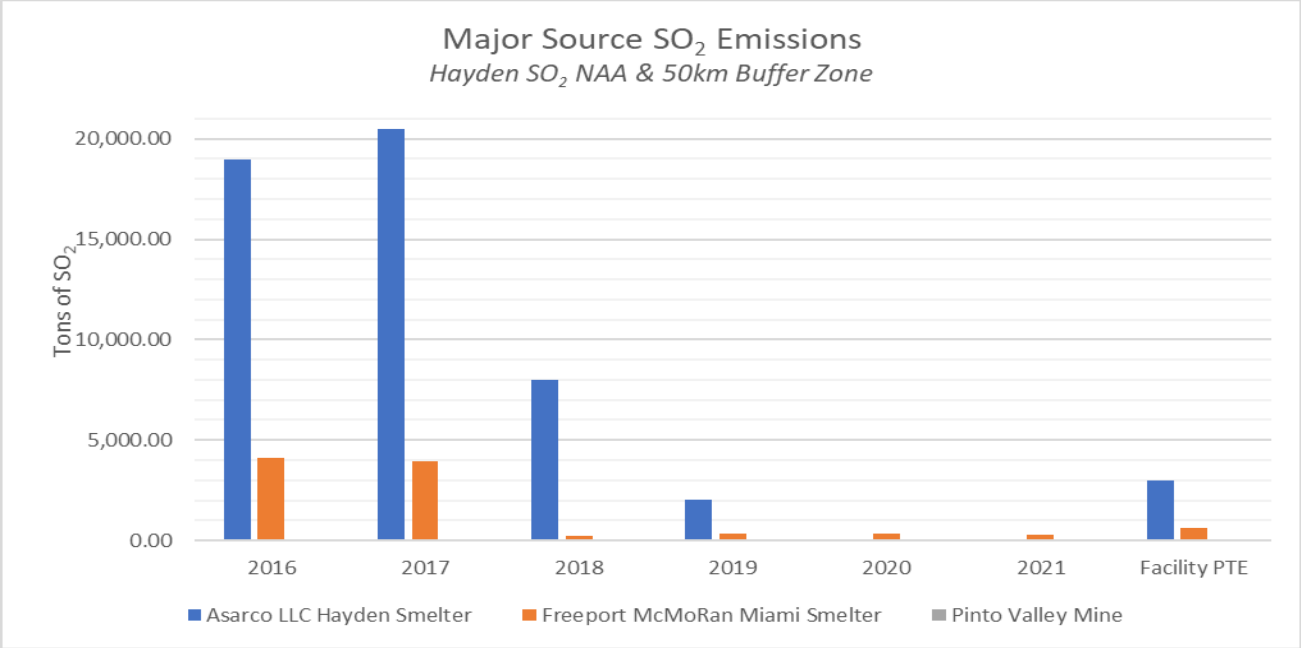
Table 5-2: Major Point Source Inventory - NAA & 50km Buffer Zone

Major Point Source Emission Inventory							
Source	Actual SO2 Emissions (Tons)						Facility SO_2 PTE[10] (TPY)
	2016	2017	2018	2019	2020	2021	
Hayden SO_2 NAA							
ASARCO LLC Hayden Smelter	18,987.9	20,498.8	7,999.7	2,018.9	0.03	0.02	3,006.84
50km Buffer Zone							
Freeport McMoRan Miami Smelter	4,121.7	3,930.3	232.5	337.9	329.1	266.1	648.7
Pinto Valley Mine	15.6	15.8	23.3	7.8	14.7	18.3	53.11

Of the two major point sources located within the Hayden SO_2 NAA Buffer Zone, the ASARCO smelter accounted for the majority of actual and potential SO_2 emissions. Of the three largest point sources located within both the Hayden SO_2 NAA and 50km buffer zone, the ASARCO smelter accounted for 83.7% of actual and 76.8% of potential SO_2 emissions. Figure 5-2 illustrates the relative emissions from the point sources in the Hayden SO_2 NAA and 50km buffer zone.

[10] Facility PTE is the maximum capacity of a stationary source to emit under its physical and operational design, including control devices or limits. 40 CFR 63.2 "Potential to emit".

Figure 5-2: Major Source SO2 Emissions



B5.2 2017 Base Year Nonpoint Source Emission Inventory

ADEQ based the Hayden SO_2 NAA nonpoint EI on data pulled from the 2017 NEI by Sector category. Table 5-3 provides the 2017 NEI SO_2 emission estimates for each nonpoint source category identified within Gila and Pinal Counties. The table also provides the allocation factors used to adjust the county level emissions down to the Hayden SO_2 NAA. The last column of Table 5-3 contains the total nonpoint SO_2 emission estimates for the Hayden SO_2 NAA. Nonpoint emissions account for 0.025% of the total NAA SO_2 emissions.

Table 5-3: 2017 Nonpoint Inventory

Row Labels	Method	Pinal Emissions	Pinal NA[1]	Gila Emissions	Gila NA[2]	Hayden NA
Fires - Agricultural Field Burning	Land Area	3.26400	0.13180	0.05170	0.00063	0.13242
Fires - Prescribed Fires	Land Area	1.39188	0.05620	44.61339	0.53953	0.59573
Fires - Wildfires	Land Area	2.69973	0.10901	257.62608	3.11558	3.22459
Fuel Comb - Comm/Institutional - Biomass	Population	4.36453	0.03519	0.02435	0.00054	0.03573
Fuel Comb - Comm/Institutional - Coal	Population	0.00000	0.00000	0.00000	0.00000	0.00000
Fuel Comb - Comm/Institutional - Natural Gas	Population	1.44493	0.01165	0.03604	0.00079	0.01244
Fuel Comb - Comm/Institutional - Oil	Population	0.00000	0.00000	0.00000	0.00000	0.00000
Fuel Comb - Comm/Institutional - Other	Population	0.01404	0.00011	0.00307	0.00007	0.00018
Fuel Comb - Electric Generation - Coal	Population	0.00010	0.00000	0.30000	0.00659	0.00659
Fuel Comb - Electric Generation - Natural Gas	Population	4.46300	0.03599	-	-	0.03599

Row Labels	Method	Pinal Emissions	Pinal NA[1]	Gila Emissions	Gila NA[2]	Hayden NA
Fuel Comb - Industrial Boilers, ICEs - Biomass	Population	0.07540	0.00061	0.02546	0.00056	0.00117
Fuel Comb - Industrial Boilers, ICEs - Coal	Population	0.00000	0.00000	0.00000	0.00000	0.00000
Fuel Comb - Industrial Boilers, ICEs - Natural Gas	Population	1.71371	0.01382	0.00160	0.00004	0.01385
Fuel Comb - Industrial Boilers, ICEs - Oil	Population	4.19605	0.03383	2.69959	0.05933	0.09316
Fuel Comb - Industrial Boilers, ICEs - Other	Population	0.01243	0.00010	0.00420	0.00009	0.00019
Fuel Comb - Residential - Natural Gas	Population	0.52436	0.00423	0.09839	0.00216	0.00639
Fuel Comb - Residential - Oil	Population	0.01015	0.00008	0.00406	0.00009	0.00017
Fuel Comb - Residential - Other	Population	0.04804	0.00039	0.03068	0.00067	0.00106
Fuel Comb - Residential - Wood	Population	1.95295	0.01575	0.50754	0.01115	0.02690
Industrial Processes - Chemical Manuf	Population	-	-	0.01000	0.00022	0.00022
Industrial Processes - Mining	Population	23.54000	0.18981	-	-	0.18981
Industrial Processes - NEC	Population	0.02053	0.00017	0.12120	0.00266	0.00283
Industrial Processes - Pulp & Paper	Population	0.00953	0.00008	-	-	0.00008
Miscellaneous Non-Industrial NEC	Population	0.20422	0.00165	0.04610	0.00101	0.00266
Mobile - Aircraft	Population	27.58740	0.22245	0.40199	0.00883	0.23128
Mobile - Locomotives	Railroad	0.65167	0.06849	0.01187	0.00166	0.07015
Mobile - Non-Road Equipment - Diesel	Population	1.31545	0.01061	0.11411	0.00251	0.01311
Mobile - Non-Road Equipment - Gasoline	Population	0.49253	0.00397	0.57663	0.01267	0.01664
Mobile - Non-Road Equipment - Other	Population	0.02011	0.00016	0.00916	0.00020	0.00036
Mobile - On-Road Diesel Heavy Duty Vehicles	Population	6.51489	0.05253	0.75084	0.01650	0.06903
Mobile - On-Road Diesel Light Duty Vehicles	Population	0.56242	0.00454	0.22713	0.00499	0.00953
Mobile - On-Road non-Diesel Heavy Duty Vehicles	Population	0.38265	0.00309	0.08714	0.00192	0.00500
Mobile - On-Road non-Diesel Light Duty Vehicles	Population	12.85960	0.10369	2.38108	0.05233	0.15602
Solvent - Industrial Surface Coating & Solvent Use	Population	0.02129	0.00017	-	-	0.00017
Waste Disposal	Population	11.18443	0.09018	2.06788	0.04545	0.13563
		Totals	24%		76%	5.08912
[1]Pinal County NA Allocation Factor	Land Area	4.04%	Population	0.81%	Railroad	10.51%
[2]Gila County NA Allocation Factor	Land Area	1.21%	Population	2.20%	Railroad	13.99%

The major contributing sources from both Gila and Pinal County are fires. As can be seen in Figure 5-3 and Figure 5-4, fires account for an estimated 77.7% of the nonpoint emissions in the

Hayden NAA. Fires excluded, Pinal County includes a few other sources of SO_2 emissions in the NAA, the majority of which are resultant from residential, commercial or institutional combustion of biomaterials. ADEQ removed the nonpoint category 'Industrial Processes – Non-ferrous Metals' as these emissions were already accounted for in the point source inventory. ADEQ did no other reconciliation between the point and nonpoint inventories.

Figure 5-3: Gila County Nonpoint SO_2 Emissions

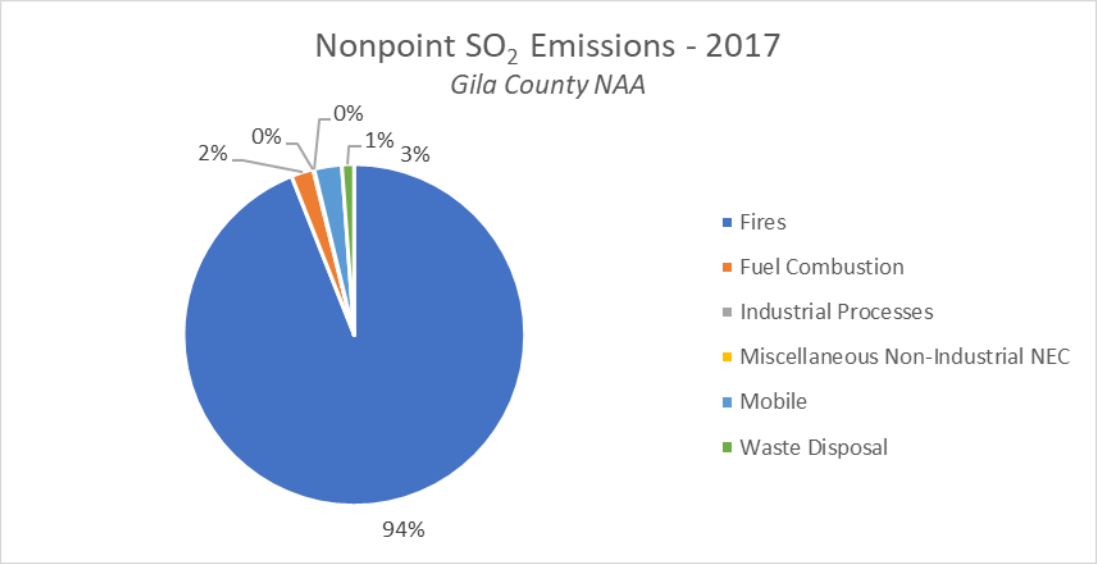


Figure 5-4: Pinal County Nonpoint SO_2 Emissions

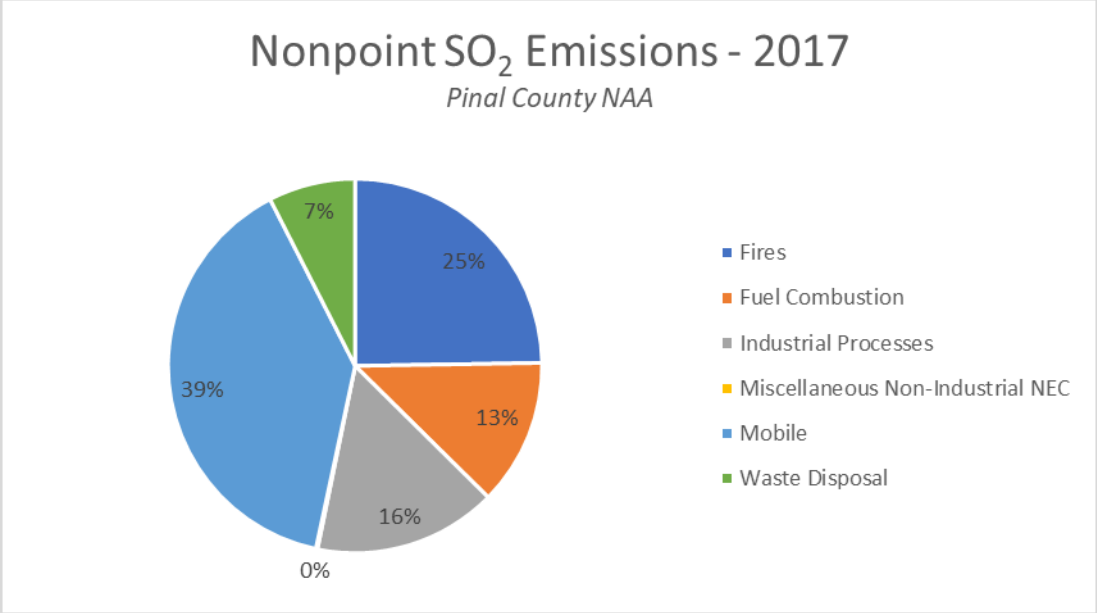
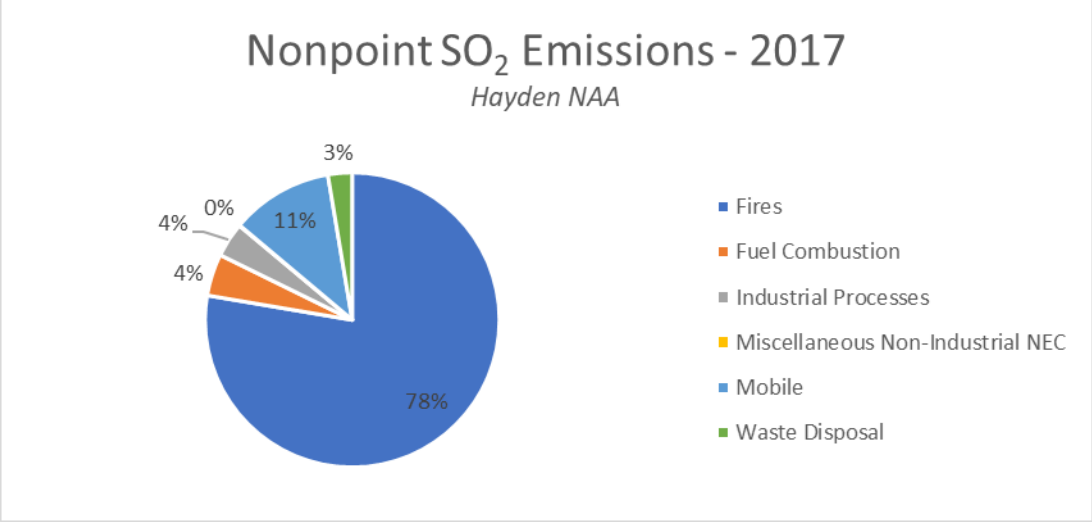


Figure 5-5: Hayden SO2 NAA Nonpoint SO_2 Emissions



It should be noted that wildfires and prescribed burns are the lowest resolution of emissions in this category as they are very localized and potentially unpredictable events, but are allocated to the NAA based on a simple land area allocation factor. It could very well be that no wildfires or prescribed burns are attributable to the Hayden SO_2 NAA, so ADEQ considers this a conservative estimate of emissions from this category.

B5.3 2017 Base Year Mobile Source Emission Inventory

Then mobile source category consists of both onroad and nonroad mobile sources. The mobile SO_2 emissions of the base year EI makes up 0.001% emissions in the NAA. ADEQ quantified mobile source category emissions using the methodologies discussed in Section 4.3. Table 5-4 provides SO2 emissions for both onroad and nonroad mobile source emissions for the base year EI.

Table 5-4: 2017 Hayden NAA Non-Road Mobile Emissions

Non-Road Mobile		
Source	**Method**	**2017 Emissions (ton)**
Agriculture	*MOVES3*	0.0000679
Airport Support	*MOVES3*	0.0000100
Commercial	*MOVES3*	0.0001025
Construction	*MOVES3*	0.0002699
Industrial	*MOVES3*	0.0000537
Lawn/Garden	*MOVES3*	0.0000763
Pleasure Craft	*MOVES3*	0.0002395
Railroad	*MOVES3*	0.0000008
Recreational	*MOVES3*	0.0003257
Non-Road		**0.0011**

Table 5-5. 2017 Hayden NAA On-Road Mobile Emissions

On-Road Mobile		
Source	**Method**	**2017 Emissions (ton)**
Combination Long-haul Truck	*MOVES3*	0.0120
Combination Short-haul Truck	*MOVES3*	0.0088
Light Commercial Truck	*MOVES3*	0.0078
Motor Home	*MOVES3*	0.0013
Motorcycle	*MOVES3*	0.0012
Other Buses	*MOVES3*	0.0008
Passenger Car	*MOVES3*	0.0559
Passenger Truck	*MOVES3*	0.1023
Refuse Truck	*MOVES3*	0.0001
School Bus	*MOVES3*	0.0007
Single Unit Long-haul Truck	*MOVES3*	0.0065
Single Unit Short-haul Truck	*MOVES3*	0.0035
Transit Bus	*MOVES3*	0.0003
On-Road		**0.2013**

B5.4 Summary of 2017 Base Year Emission Inventories

As stated earlier, the ASARCO Smelter is the primary SO_2 emission source within the Hayden SO_2 NAA, accounting for more than 99.97% of SO_2 emissions. The calculation methodology used to obtain these values is located in Section 4. As presented in Table 5-5, The most significant SO_2 emission contributor to the Hayden NAA is the point source, ASARCO Smelter. Although the point sources located in the 50km buffer zone emit significantly less than the point source within the NAA, they still have the potential to impact the Hayden SO_2 NAA.

Table 5-6. 2017 Base Year Emission Inventory Summary for the Hayden SO_2 Nonattainment Area

Emission Inventory Source Category	Tons SO_2
Point Source - ASARCO Smelter	20,498.80
50km Buffer Zone Point Source	3,982.26
Non-Point Source	5.09
Mobile Non-Road	0.001
Mobile On-Road	0.201
Total Nonattainment Emissions	**20,504.09**
Total NA & 50km Buffer Emissions	**24,486.35**

B6 Emissions Projection Methodologies

ADEQ developed a number of growth factors to project emissions to the 2026 attainment year. These projected emissions will inform planning decisions ADEQ may need to make. The remainder of this section discusses the methodology used to project emissions to the 2026 attainment year.

B6.1 Point Source Emission Projection Methodology

The approach to projecting point source maximum federally enforceable emission limits involved asking the permitting authorities of the sources included in the inventory to inform ADEQ of any anticipated permit revisions that would impact the SO_2 emissions limits or PTE between the base year and the attainment year. For sources ADEQ anticipates to change emissions limits or facility PTE for SO_2 before the attainment date, ADEQ used the new or expected permits emission limits or PTE calculations for SO_2 in lieu of federally enforceable limits on SO_2 emissions.

Table 6-1: Point Source Attainment Year Inventory Estimation Approach

Point Source Location	Inventory Estimation Approach
Nonattainment Area	PTE provided by ADEQ Permitting
50 km Buffer Zone – Pinal County	PTE provided by Pinal County Permitting
50 km Buffer Zone – Gila County	PTE provided by ADEQ Permitting
50 km Buffer Zone – Pima County	PTE provided by Pima County Permitting

ASARCO intends to further improve capture of fugitive emissions to attain the SO_2 NAAQS limit. Control projects used to reduce fugitive emissions include the Uptake Improvement Project, Fuming Ladle Capture Project, and the Anode Furnace Secondary Hood System Project. The Uptake Improvement Project involves the installation and ventilation of a partial enclosure around the flash furnace uptake shaft to further control fugitive emissions during matte tapping and slag skimming activities. The Fuming Ladle Capture Project includes the installation of a hood and retaining walls to collect fugitive emissions from “fuming” ladles, which occurs once the ladle is emptied, however the residual revert is fuming. This project is expected to reduce the converter area emissions and substantially reduce peak emissions observed in the fugitive study. The Anode Furnace Secondary Hood System Project is similar to the previous two projects in that is will construct a secondary hood around the anode furnace to increase capture of emissions during operation.

B6.1.1 ASARCO’s Potential to Emit Calculation Methodology

GCT and ASARCO in conjunction utilized the fugitive emissions study results and emission factors from the AP-42 to project emission rates at the facilities maximum throughput. The facility’s maximum throughput is 693,500 tons of concentrate per year.

Main Stack

The Main Stack emissions are cumulation of all captured emissions from the Acid Plant, Ven Gas Baghouse, Converter Secondary Hood Baghouse, Anode Furnace Baghouse, Anode Secondary Hood Baghouse, and Tertiary Ventilation. The calculations utilize the burner rates and the available SO_2 combined with the measured or estimated capture efficiencies.

Uptake Improvement Project

The emission reduction from the Uptake Improvement Project was calculated by determining the total available fugitive SO_2 emissions from the Flash Furnace and taking account the loss due to slag pouring. The emissions are then reduced post capture system by 96% (based on the 2019 Fugitive Study for the roofline). The emissions are then directed to the Vent Gas Baghouse (VGBH) and the Converter Secondary Hood Baghouse. The VGBH results in a 50% reduction from lime injection treatment.

Anode Furnaces Secondary Hood

The emission reduction from the Anode Furnaces Secondary Hood Project was calculated by determining the total available fugitive SO_2 emissions from the Converters and Anode Furnaces. Then the anode furnace SO_2 emissions were determined using the anode tons per day (there is also an existing baghouse with 85% capture). Then an additional 80% reduction from the Anode Secondary Hood Baghouse. In addition, the SO_2 emission from the Anode Furnace Burners were considered, but were not significant.

Fuming Ladle Control

The emission reduction from the Fuming Ladle Control Project was calculated by determining the total available fugitive SO_2 emission from the Converter Secondary Operations. Then an existing baghouse with 90% capture results in further reductions. The Fuming Ladle Control System captures 90% of the emissions and directs them through the Converter Secondary Hood Baghouse and its lime injection system.

GCT and ASARCO have proposed the following emission limits based on the calculations above.

Table 6-2. Proposed Emission Limits

	Proposed Emission Limit (lb/hr)
Main Stack	1,069.1 (14-operating day) Or 1,518 (1-hour)
Flash Furnace	38.5
Converter Aisle	10
Anode Aisle	9.0

These limits will apply when the underlying processes are in operation, including periods of startup, shutdown and malfunction. Additionally, these limits are contingent on the existing roofline monitoring system continuing to monitor for fugitive emissions. The emissions rates used in the final attainment demonstration will be established as enforceable one-hour emissions limits in ASARCO's permit and submitted for SIP approval, thus establishing the potential to emit for each of these sources.

B6.2 Nonpoint Source Emission Projection Methodology

ADEQ developed growth factors to project emissions to the 2026 attainment year. Table 6-1 outlines the specific methods used to project a given sector. The majority of source sectors were projected based on population growth. However, the fire source categories were held constant between the base and attainment year.

Table 6-3. Future Year Nonpoint Emissions Projection Methodologies

Source	Method
Fires - Agricultural Field Burning	*Held Constant*
Fires - Prescribed Fires	*Held Constant*
Fires - Wildfires	*Held Constant*
Fuel Comb - Comm/Institutional - Biomass	*Population*
Fuel Comb - Comm/Institutional - Coal	*Population*
Fuel Comb - Comm/Institutional - Natural Gas	*Population*
Fuel Comb - Comm/Institutional - Oil	*Population*
Fuel Comb - Comm/Institutional - Other	*Population*
Fuel Comb - Electric Generation - Coal	*Population*
Fuel Comb - Electric Generation - Natural Gas	*Population*
Fuel Comb - Industrial Boilers, ICEs - Biomass	*Population*
Fuel Comb - Industrial Boilers, ICEs - Coal	*Population*
Fuel Comb - Industrial Boilers, ICEs - Natural Gas	*Population*
Fuel Comb - Industrial Boilers, ICEs - Oil	*Population*
Fuel Comb - Industrial Boilers, ICEs - Other	*Population*
Fuel Comb - Residential - Natural Gas	*Population*
Fuel Comb - Residential - Oil	*Population*
Fuel Comb - Residential - Other	*Population*
Fuel Comb - Residential - Wood	*Population*
Industrial Processes - Chemical Manuf	*Population*
Industrial Processes - Mining	*Population*
Industrial Processes - NEC	*Population*
Industrial Processes - Pulp & Paper	*Population*
Miscellaneous Non-Industrial NEC	*Population*
Mobile - Aircraft	*Population*
Mobile - Locomotives	*Population*
Mobile - Non-Road Equipment - Diesel	*Population*
Mobile - Non-Road Equipment - Gasoline	*Population*
Mobile - Non-Road Equipment - Other	*Population*
Mobile - On-Road Diesel Heavy Duty Vehicles	*Population*

Source	Method
Mobile - On-Road Diesel Light Duty Vehicles	*Population*
Mobile - On-Road non-Diesel Heavy Duty Vehicles	*Population*
Mobile - On-Road non-Diesel Light Duty Vehicles	*Population*
Solvent - Industrial Surface Coating & Solvent Use	*Population*
Waste Disposal	*Population*

B6.2.1 Attainment Year Population Projection Factor

The population projection factor, PF_P, outlined in equation 6-1 utilizes a ratio approach to project emissions from 2017 to 2026. The ADOA population estimate for the Hayden SO_2 NAA at the end of 2011 was 4,645 people. ADOA projected the population in the Hayden SO_2 NAA would increase to 5,353 by the end of the attainment year 2026 The percent increase in population in the Hayden SO_2 NAA is equal to the G_p minus one factored by 100.

Equation 6-1: Population Growth Factor for Projecting Attainment Year Emissions Formula

$$If\ \frac{P_{2026}}{P_{2017}} = PF_P, Then \frac{3{,}676}{4{,}409} = \mathbf{0.834}$$

Where:

- $PF_P = Population\ Projection\ Factor$
- $P_{2026} = NAA\ 2026\ Population\ Projection$
- $P_{2017} = NAA\ 2017\ Population\ Estimate$

ADEQ will apply the population projection factor of **0.834** to project emissions tied to population change in the 2026 attainment year. Subtracting the PF_p from one, gives **0.166**. This means, based on current trends, the Hayden NAA population is projected to decline by **16.6%** between 2017 and 2026. With the exception of the Fires source categories, which were held constant, ADEQ applied this factor to the 2017 NAA emissions to obtain the 2026 nonpoint EI. Table 6-3 below provides and overview of emissions at the various stages of the above allocation and projection methodologies.

Table 6-4. Attainment Year Nonpoint Emissions Methodology Summary

Row Labels	Hayden NA 2017	Hayden NA 2026
Fires - Agricultural Field Burning	0.13242	0.132
Fires - Prescribed Fires	0.59573	0.596
Fires - Wildfires	3.22459	3.225
Fuel Comb - Comm/Institutional - Biomass	0.03573	0.030
Fuel Comb - Comm/Institutional - Coal	0.00000	0.000
Fuel Comb - Comm/Institutional - Natural Gas	0.01244	0.010
Fuel Comb - Comm/Institutional - Oil	0.00000	0.000
Fuel Comb - Comm/Institutional - Other	0.00018	0.000

Row Labels	Hayden NA 2017	Hayden NA 2026
Fuel Comb - Electric Generation - Coal	0.00659	0.005
Fuel Comb - Electric Generation - Natural Gas	0.03599	0.030
Fuel Comb - Industrial Boilers, ICEs - Biomass	0.00117	0.001
Fuel Comb - Industrial Boilers, ICEs - Coal	0.00000	0.000
Fuel Comb - Industrial Boilers, ICEs - Natural Gas	0.01385	0.012
Fuel Comb - Industrial Boilers, ICEs - Oil	0.09316	0.078
Fuel Comb - Industrial Boilers, ICEs - Other	0.00019	0.000
Fuel Comb - Residential - Natural Gas	0.00639	0.005
Fuel Comb - Residential - Oil	0.00017	0.000
Fuel Comb - Residential - Other	0.00106	0.001
Fuel Comb - Residential - Wood	0.02690	0.022
Industrial Processes - Chemical Manuf	0.00022	0.000
Industrial Processes - Mining	0.18981	0.158
Industrial Processes - NEC	0.00283	0.002
Industrial Processes - Pulp & Paper	0.00008	0.000
Miscellaneous Non-Industrial NEC	0.00266	0.002
Mobile - Aircraft	0.23128	0.193
Mobile - Locomotives	0.07015	0.059
Mobile - Non-Road Equipment - Diesel	0.01311	0.011
Mobile - Non-Road Equipment - Gasoline	0.01664	0.014
Mobile - Non-Road Equipment - Other	0.00036	0.000
Mobile - On-Road Diesel Heavy Duty Vehicles	0.06903	0.058
Mobile - On-Road Diesel Light Duty Vehicles	0.00953	0.008
Mobile - On-Road non-Diesel Heavy Duty Vehicles	0.00500	0.004
Mobile - On-Road non-Diesel Light Duty Vehicles	0.15602	0.130
Solvent - Industrial Surface Coating & Solvent Use	0.00017	0.000
Waste Disposal	0.13563	0.113

B6.3 Mobile On-road Source Emission Projection Methodology Using MOVES

Sections 6.3.1 and 6.3.2 below discuss the methodology ADEQ applied to quantify attainment year mobile source SO_2 emissions. As with the base year, MOVES3 was used to quantify these emissions for the attainment year EI. See Section 4.3 for more information on how the base year inputs were derived.

Beyond maintaining consistency with the NEI method for calculating on-road emissions, performing a MOVES run rather than simply projecting emissions based on ADOA population projections accounts for fleet changes and other variables that may affect future on-road emissions. The EPA MOVES run performed for the NEI used population data provided by the federal government. ADEQ will use ADOA data, as mandated in executive order 2011-04, for population estimates and projections[11]. Additionally, the population data has been updated using AOEO population estimates. These data may be different from the population data used by EPA.

B6.3.1 On-road Mobile Projection Methodology

Projecting onroad mobile emissions involved updating the runspec and relevant local inputs. The runspec is updated by changing the model run year to 2026. As with the base year local inputs, ADEQ projected the NAA vehicle population, annual VMT, and the vehicle age distribution. The vehicle age distribution was projected to 2026 using EPA's age distribution projection tool[12]. For the VMT and population inputs ADEQ assumed changes in the NAA population would be a suitable proxy for changes in these inputs. Therefore, the inputs were projected to the attainment year using the population projection factor discussed in Section 6.2.1. Tables 6-4 and 6-5 below provide an overview of the VMT and population inputs.

[11] Section 10 of Executive Order 2011-04 states: "Population estimates and population projections produced by ADOA in accordance with this Executive Order shall be used by all State agencies for all purposes, including those required by federal law, which necessitate the development of population estimates or population projections". ADEQ has retained this Executive Order and shall furnish it upon request.

[12] Retrieved from: https://www.epa.gov/sites/default/files/2021-05/moves3-age-distribution-projection-tool-20210405.xltm

Table 6-5. Onroad VMT Methodology Summary

Source Type	2017 NAA VMT	2026 NAA VMT
Motorcycle	283,748	236,759
Passenger Car	15,048,669	12,556,595
Passenger Truck	20,292,718	16,932,225
Light Commercial Truck	1,558,595	1,300,491
Intercity Bus	108,367	90,421
Transit Bus	40,741	33,994
School Bus	150,296	125,407
Refuse Truck	12,146	10,135
Single Unit Short-Haul Truck	621,701	518,747
Single Unit-Long-Haul Truck	1,265,426	1,055,870
Motorhome	154,980	129,315
Combination Short-Haul Truck	1,280,521	1,068,466
Combination Long-Haul Truck	1,796,562	1,499,049

Table 6-6. Onroad Vehicle Population Methodology Summary

Source Type	2017 NAA Vehicle Population	2026 NAA Vehicle Population
Motorcycle	345.1818	288.0194
Passenger Car	1,391.6569	1,161.1972
Passenger Truck	1,877.3491	1,566.4583
Light Commercial Truck	144.2573	120.3682
Intercity Bus	2.6712	2.2289
Transit Bus	1.2940	1.0797
School Bus	11.2297	9.3700
Refuse Truck	1.0694	0.8923
Single Unit Short-Haul Truck	47.5976	39.7154
Single Unit-Long-Haul Truck	63.7561	53.1980
Motorhome	50.3012	41.9713
Combination Short-Haul Truck	36.0014	30.0396
Combination Long-Haul Truck	22.4669	18.7464

B6.3.2 Nonroad Mobile Projection Methodology

Because EPA defaults for both Pinal and Gila County were utilized for the nonroad MOVES3 model run, to quantify attainment year nonroad emissions, ADEQ updated the run year in the nonroad runspec to 2026. These 2026 emissions were then allocated to the NAA using the

allocation factor derived from Equation 6-2 below. This allocation factor is a ratio of the 2026 projected NAA population to the 2026 Pinal County projected population.

Equation 6-2: Population Allocation Factor Formula

$$If\ \frac{P_{na}}{P_c} = AF_{Pinal}, Then\ \frac{2{,}695}{486{,}874} = \mathbf{0.0055}$$

Where:

- P_{na}= *2026 projected population estimate of Hayden NAA in Pinal County*
- P_c=*2026 projected population estimate of Pinal County*
- AF_{Pinal}=*2026 population allocation factor*

$$If\ \frac{P_{na}}{P_c} = AF_{Gila}, Then\ \frac{981}{53{,}651} = \mathbf{0.018}$$

Where:

- P_{na}= *2026 projected population estimate of Hayden NAA in Gila County*
- P_c=*2026 projected population estimate of Gila County*
- AF_{Gila}=*2026 population allocation factor*

Using this method, ADEQ was able to develop a population allocation factor of **0.0055** for Pinal County and **0.018** for Gila County. In other words, the NAA population accounts for **0.55%** of Pinal County projected population and 1.8% in Gila County in the year 2026. ADEQ multiplied this factor by county-level nonroad results to obtain the 2026 nonroad EI.

B7 Projected Attainment Year Emission Inventory for the Hayden SO_2 Nonattainment Area

The following series of tables contain ADEQ's projections of SO_2 emissions within the NAA for the year 2026, specifically emissions from the following categories: point sources within the Hayden NAA and a 50 km buffer, nonpoint, mobile onroad, and mobile nonroad emissions. ADEQ made attainment year projections using the methodologies outlined in Section 6 of this document.

B7.1 2026 Attainment Year Projected Point Source Emission Inventory

The Hayden NAA point source category (excluding the 50 km buffer zone) makes up 99.83% of SO_2 in the attainment year. The methods used to project point source emissions to the attainment year can be found in Section 6.1. Table 7-1 below includes point source emissions for both the NAA and the 50 km buffer zone.

Table 7-1. 2026 Projected Point Source Emission Inventory for Hayden SO_2 NAA

Source	PTE (ton)
ASARCO Smelter	*3,006.84*
NAA Point Source	**3,006.84**
Buffer Zone Point Sources	
Pinto Valley Mine	*53.11*
Freeport-McMoran - Miami Mine	*0.27*
Freeport-McMoran - Miami Smelter	*648.69*
Calcium Carbonate Plant	*0.10*
Tom Mix Compressor Station	*2.60*
Arizona Correctional Industries - Florence	*0.01*
Biosphere 2	*0.80*
Bonito Quarry	*9.10*
Cactus Landfill	*5.30*
Central Arizona Florence Correctional Complex	*0.20*
Central Arizona Florence Correctional Complex	*0.20*
Central AZ Correctional Fac. and ASP Florence West	*0.60*
Cox Communications Pinal STC	*0.40*
Decorative Rock Sales L.L.C.	*0.70*
Durham Regional Landfill	*6.50*
EPCOR San Tan District - Anthem WRF	*0.30*
Eyman Complex	*1.59*
Florence Hospital	*0.60*
Florence Plant	*42.00*
Gft 2	*3.00*

Source	PTE (ton)
ICE - Florence Detention Center	*0.70*
Ironwood MSW Landfill	*0.10*
Oracle Compressor Station	*1.90*
Queen Creek Aggregate Processing & Hot Mix Asphalt	*26.40*
Queen Creek Pit	*0.80*
Queen Creek Plant	*53.00*
Ray Complex	*34.00*
Red Rock Pumping Plant	*0.10*
Red Rock Water Reclamation Facility	*0.20*
Resolution Copper Mining	*4.90*
SaddleBrooke One	*0.01*
Saddlebrooke Wastewater Treatment Plant	*0.50*
Saguaro Power Plant	*7.50*
San Manuel Schools	*0.03*
South Plant	*0.10*
Superior Transfer Station	*0.36*
Well Site #1	*0.10*
Well Site #5	*0.10*
Well Site 3B	*0.10*
BHP Miami Unit (Mine or Mill Site)	*0.38*
Oracle Ridge Mine	*0.06*
Trico Electric Cooperative	*2.19*
50km Buffer Zone - Point Source	**909.61**
Total Point Source Emissions	**3,916.45**

ADEQ projects point source emissions in the buffer zone will decrease considerably from the inventory base year as the FMMI Smelter adds pollution controls to come into compliance with the 1-hour NAAQS in the Miami SO_2 NAA.

B7.2 2026 Attainment Year Projected Nonpoint Source Emission Inventory

The nonpoint source category makes up 0.16% of NAA SO_2 emissions in the attainment year. See Section 6.2 for the nonpoint projection methodologies. As the population contracts, ADEQ anticipates a contraction in nonpoint emissions as well. Table 7-2 below provides the NAA nonpoint SO_2 emissions for the attainment year.

Table 7-2: 2026 Hayden NAA Projected Nonpoint Source Emission Inventory

Source	Annual Total (ton)
Fires - Agricultural Field Burning	0.1324
Fires - Prescribed Fires	0.5957
Fires - Wildfires	3.2246
Fuel Comb - Comm/Institutional - Biomass	0.0298
Fuel Comb - Comm/Institutional - Coal	0.0000
Fuel Comb - Comm/Institutional - Natural Gas	0.0104
Fuel Comb - Comm/Institutional - Oil	0.0000
Fuel Comb - Comm/Institutional - Other	0.0002
Fuel Comb - Electric Generation - Coal	0.0055
Fuel Comb - Electric Generation - Natural Gas	0.0300
Fuel Comb - Industrial Boilers, ICEs - Biomass	0.0010
Fuel Comb - Industrial Boilers, ICEs - Coal	0.0000
Fuel Comb - Industrial Boilers, ICEs - Natural Gas	0.0116
Fuel Comb - Industrial Boilers, ICEs - Oil	0.0777
Fuel Comb - Industrial Boilers, ICEs - Other	0.0002
Fuel Comb - Residential - Natural Gas	0.0053
Fuel Comb - Residential - Oil	0.0001
Fuel Comb - Residential - Other	0.0009
Fuel Comb - Residential - Wood	0.0224
Industrial Processes - Chemical Manuf	0.0002
Industrial Processes - Mining	0.1583
Industrial Processes - NEC	*0.0024*
Industrial Processes - Pulp & Paper	*0.0001*
Miscellaneous Non-Industrial NEC	*0.0022*
Mobile - Aircraft	*0.1929*
Mobile - Locomotives	*0.0585*
Mobile - Non-Road Equipment - Diesel	*0.0109*
Mobile - Non-Road Equipment - Gasoline	*0.0139*
Mobile - Non-Road Equipment - Other	*0.0003*
Mobile - On-Road Diesel Heavy Duty Vehicles	*0.0576*
Mobile - On-Road Diesel Light Duty Vehicles	*0.0079*
Mobile - On-Road non-Diesel Heavy Duty Vehicles	*0.0042*
Mobile - On-Road non-Diesel Light Duty Vehicles	*0.1301*

Source	Annual Total (ton)
Solvent - Industrial Surface Coating & Solvent Use	*0.0001*
Waste Disposal	*0.1131*
Non-Point	**4.90**

B7.3 2026 Attainment Year Projected Mobile Source Emission Inventory

The mobile source category in the attainment year accounts for roughly 0.003% of SO_2 in the NAA. The methods used to project mobile source emissions to the attainment year are available in Section 6.3. Table 7-3 below provides both the onroad and nonroad SO_2 emissions for the 2026 attainment year.

Table 7-3. 2026 Hayden NAA Non-Road Mobile Emissions

Non-Road Mobile	
Source	**Annual Total (ton)**
Agriculture	*0.000047*
Airport Support	*0.000009*
Commercial	*0.000079*
Construction	*0.000197*
Industrial	*0.000034*
Lawn/Garden	*0.000052*
Pleasure Craft	*0.000165*
Railroad	*0.000001*
Recreational	*0.000213*
Non-Road	**0.0008**

Table 7-4. 2026 Hayden NAA On-Road Mobile Emissions

On-Road Mobile	
Source	**Annual Total (ton)**
Combination Long-haul Truck	*0.008656*
Combination Short-haul Truck	*0.006037*
Light Commercial Truck	*0.003711*
Motor Home	*0.000792*
Motorcycle	*0.000686*
Other Buses	*0.000623*
Passenger Car	*0.025813*
Passenger Truck	*0.045906*
Refuse Truck	*0.000070*
School Bus	*0.000565*
Single Unit Long-haul Truck	*0.004242*
Single Unit Short-haul Truck	*0.002233*
Transit Bus	*0.000230*
On-Road	**0.0996**

The mobile on-road source category represents the second smallest portion of the Hayden NAA EI, but is driven by a number of factors other than population. ADEQ chose to use a MOVES model scaling method to account for variables such as fleet turnover rather than a population-based growth factor to determine 2026 emissions estimates. Changes in population drive most of the non-road emissions from these sources, and thus ADEQ projected them by the projected population allocation factors. Overall, mobile nonroad sources represent the smallest source category of the inventory.

B7.4 2026 Attainment Year Projected Emission Inventory Summary

As the ASARCO smelter accounts for 99.82% of the SO_2 emissions in the Hayden SO_2 NAA, 2026 projections will be predominately determined by the emission limits set in place for that facility. Likewise, the emissions in the 50km buffer zone are dominated by SO_2 emissions from the FMMI Smelter and 2026 projections depend on their SO_2 emission limits. The proposed emission limits for FMMI are shown in the following table and are currently in the draft limits.

Table 7-5. FMMI Smelter SO_2 Proposed Emission Limits

Emission Unit	Emission Limit
Combined Smelter Operations	145.25 pounds per hour on a 30-day rolling average basis
Copper Converter Department	99.7% reduction based on a rolling 365-day average
Acid Plant Tail Gas Stack	0.065% by volume

Emission Unit	Emission Limit
Vent Fume Stack	0.065% by volume
Rod Plant	600 ppm
Engines Not Subject to New Source Performance Standards	1.0 lb/MMBtu

Table 7-6: 2026 Projected Emission Inventory Summary for the Hayden SO_2 Nonattainment Area

Emission Inventory Source Category	Tons SO_2
Point Source - ASARCO Smelter	3,006.84
50km Buffer Zone Point Source	905.79
Non-Point Source	4.90
Mobile Non-Road	0.0008
Mobile On-Road	0.0996
Total Nonattainment Emissions	**3,011.84**
Total NA & 50km Buffer Emissions	**3,921.45**

The SO_2 emissions in the Hayden SO_2 NAA are projected to decrease by approximately 85.3% by 2026. These reductions are due primarily to the implementation of the three projects implemented to target fugitive emissions, the Uptake Improvement Project, the Fuming Ladle Capture Project, and the Anode Furnace Secondary Hood System Project.

B8 Closing Remarks

To recap, EPA designated the Hayden area of Gila and Pinal Counties in Central Arizona as not attaining the 2010 SO_2 NAAQS on August 5, 2013. Effective March 2, 2022, EPA determined that the Hayden SO2 NAA failed to attain the 2010 1-hour SO2 primary NAAQS by the applicable attainment date of Oct. 4, 2018. ADEQ developed this TSD as a supplement to the SIP to assist in bringing the Hayden planning area back into attainment, and eventually showing compliance with the 2010 SO_2 NAAQS. The TSD outlined the following:

- The local geography in the Hayden SO_2 NAA
- The meteorological conditions in the Hayden SO_2 NAA
- The ambient air quality issues in the Hayden SO_2 NAA
- The affect meteorology has on ambient air quality
- The sources within the NAA and a 50 km buffer that may contribute to ambient air quality issues in the Hayden SO_2 NAA

The Hayden SO_2 NAA is located in portions of Gila and Pinal County Arizona due east of Phoenix Arizona. The ASARCO Smelter, a primary metal processing industrial facility, is located at the center of the Hayden SO_2 NAA and is the largest emitter of SO_2 in the NAA. To the north of the Hayden SO_2 NAA, over the Pinal Mountains, lies the Miami SO_2 NAA. The main source of SO_2 emissions in this area and within the 50 km buffer zone is the FMMI Smelter.

ADEQ will perform modeling in support of the attainment demonstration that illustrates the contribution of the sources in the inventory to the ambient air quality issues in the Hayden NAA. With the ASARCO smelter as the source of 99.97% of SO2 emissions in the base year 2017, air quality issues in the NAA should focus the control strategy in the attainment demonstration on point source control. The projected emission inventory for the Hayden SO_2 NAA shows that SO_2 emissions are expected to decrease approximately 85.3% by 2026. This dramatic decrease is due primarily to the three fugitive emission reduction projects implemented at the ASARCO smelter. Additionally, the modeling analysis performed in support of this SIP revision also shows that the proposed controls will result in the Hayden area attaining the SO_2 NAAQS.

ADOA Population Estimation Methodology

Shapefiles:

- Hayden SO_2 nonattainment boundary shapefile
- Pinal County & Gila County 2010 block/population shapefile

Population Data Source:

- ADOA Internal Population Report
- AOEO

ADOA Method:

The ADOA methodology determines population from an internal population report that contains census population figures from 1990 through 2010 as well as ADOA interscensal population estimates and projections.

1. ADOA uses ArcGIS Geoprocessing tools to calculate the population of the incorporated places and unincorporated areas (including CDP and Non-CDP areas) within the Hayden NAA. ADOA used the following method to calculate the total population inside of the Hayden NAA:
    a. Calculate the area of the census block using the calculate "areas" tool
    b. Merge the two shapefiles using the "union" tool
    c. Determine the proportion of each census block within the Hayden NAA using the "calculate areas" tool.
    d. Calculate the area weighted population for each census block
    e. Aggregate the population for each incorporated and unincorporated place within the Hayden NAA using the Dissolve Tool
2. In step 1, ADOA derived their population for all incorporated places (or their respective parts), Census Designated Places (CDP) and unincorporated non-CDP areas in the Hayden area from the 2010 Census. ADOA used the following steps to estimate population figures for all areas of each year from 1990-2018:
    a. Apply the Constant-Share ratio of the population for each year for Gila and Pinal Counties
    b. Apply the ratio to each year for the total population in the CDPs and unincorporated non-CDPs in Hayden NAA
    c. Multiply the population of the CDPs and unincorporated non-CDPs in the Hayden NAA by the 2010 Census population ratio for each year

AOEO Method:

Arizona July 1, 2021 Population Estimates – Methodology
County Estimates

Group Quarters (GQ) population is estimated in the following steps:

1. Establish the total GQ population in each place (incorporated place or unincorporated balance of county) as of Census 2020;
2. Track the GQ population of major facilities annually starting April 2020 and for each subsequent July;
3. Find the change in GQ population in these facilities between April 2020 and the estimate year (2021). If data is missing for either April 2020 or for the estimate year, then that record is not used in calculating the change;
4. Estimate GQ population of each place by adding numbers from Step 1 and Step 3;
5. The sum of GQ populations of all places within a county is the GQ population estimate for that county.

Two separate methods are used to produce estimates of household population for counties.

1. Forecast method:
    a. Using intercensal estimates between 1980 and 2019 and the revised estimates for 2020 as input, SPSS forecasting models are run to produce short-term projections for July 1, 2021 for each county. SPSS has a built-in "Expert Modeler" that analyzes the input data and automatically determines what model (among several forecasting models) is best suited for the data. The Expert Modeler is enabled.
    b. The group quarters (GQ) population of each county is subtracted from the estimated total population to obtain the estimated household population.
2. Housing unit method (HUM):
    a. Start with the Census 2020 housing units, household population, persons per housing unit, and Group Quarters population, for each sub-county jurisdiction.
    b. Determine the July 1, 2021 housing unit stock by adding cumulative completions or building permits between Q2 2020 and Q2 2021 to the Census 2020 housing stock. For permits, a six-month lag is assumed for single-family units and 2-to-4-unit buildings; a 12-month lag is assumed for 5-plus-unit buildings. It is assumed that 98% of permits are built. Mobile homes are assumed to be in place the same quarter they are permitted with a 100% placement rate. Find the number of demolitions for the entire period and subtract them from the housing stock.
    c. Pre-annexation household population is calculated by multiplying the new housing unit stock by census persons per housing unit.
    d. For annexations that contain housing units, the actual number of occupants is determined from field information. If that is not possible, census block-level information is used. The corresponding numbers of housing units and persons are subtracted from the jurisdiction that de-annexed the housing units. Because the 2020 Census uses the boundary as of January 1, 2020, it is determined that Q1 2020 annexations need to be included in this calculation.
    e. Adding up the numbers from steps c and d results in the unconstrained household population for each jurisdiction; this is summed up at the county level.

A hybrid method is used to determine the estimated household population. For most counties, the two methods produce very close estimates of household population. The greater estimate between the two methods is chosen as the household population control at the county level.

Sub-county Estimates

The county's HUM household population is then divided into the household population control obtained from the step above to yield a "control factor" for each county. The control factor is multiplied by the unconstrained household population estimate of each sub-county jurisdiction to get the "controlled" household population estimate. Sub-county estimates are then finalized by adding the GQ population at the jurisdiction level.

ADEQ
Arizona Department
of Environmental Quality

Appendix C
Modeling Technical Support Document for the Hayden Sulfur Dioxide (SO_2) Nonattainment Area

Air Quality Division
October 3, 2023 Final Version

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Appendix C - Modeling Technical Support Document for the Hayden Sulfur Dioxide (SO_2) Nonattainment Area

Submitted To:

Environmental Protection Agency

Region 9

Prepared By:

Arizona Department of Environmental Quality
Air Quality Division

&

ASARCO LLC

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1.0 Introduction

ASARCO LLC (Asarco) concentrates and smelts copper ores at its operations in Hayden, Arizona, approximately 80 miles east-southeast of Phoenix and 60 miles north of Tucson. Sulfur dioxide (SO_2) is generated in the smelting process and is released as emissions to the atmosphere.

On June 2, 2010, the United States Environmental Protection Agency (EPA) established a new 1-hour National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO_2) of 75 parts per billion (ppb). EPA designated the Hayden area of Gila and Pinal Counties as a nonattainment area (NAA) for the 2010 SO_2 NAAQS on August 5, 2013, effective as of October 4, 2013. Due to failure of attaining the 2010 SO_2 Primary NAAQS by the October 4, 2018 attainment date, the Arizona Department of Environmental Quality (ADEQ) must develop a State Implementation Plan (SIP) revision to demonstrate future attainment of the NAAQS within five years of the effective date of designation. An attainment demonstration using an EPA approved air quality dispersion model is a core piece of SO2 NAA SIP submittals.

As described in this Technical Support Document (TSD), modeling to support the Hayden SO_2 NAA SIP was performed in accordance with the EPA's Guideline on Air Quality Models (GAQM) (40 CFR 51, Appendix W) (U.S. EPA, 2005) and Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions - Appendix A Modeling Guidance for Nonattainment Areas (U.S. EPA, 2014). Additional Clarification Regarding Application of Appendix W from Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard (U.S. EPA, 2011) [1] was employed when necessary.

The EPA's Modeling Guidance for Non-Attainment Areas (U.S. EPA, 2014) also states:

> "*While this guidance explains the expected general application of dispersion models, there will be applications of dispersion models unique to specific areas where it is necessary to model unique specific sources or types of sources. In such cases, there should be consultation between the state or appropriate air agency and the appropriate EPA Regional Office modeling contact to discuss how best to model a particular source*."

This TSD presents the modeling methodologies ADEQ and ASARCO LLC (Asarco) followed in completing the ambient air quality analysis of the Hayden planning area. Due to resource constraints, ADEQ appointed Asarco as the lead modeler for the attainment demonstration, while ADEQ used its expertise in an oversight and review capacity. The TSD is organized as follows:

- Section 2 provides an overview of the general regional characteristics of the Hayden SO_2 NAA, including topography, land use, and climate;
- Section 3 provides a discussion on the determination of the modeling domain, sources to explicitly model and the receptor grid;
- Section 4 provides a discussion on the model selection;
- Section 5 provides detailed source inputs, including source configuration, source emissions, source release parameters, emissions variability, forecast emissions description, Good Engineering Practice (GEP) stack height, and urban/rural determination;
- Section 6 provides a discussion on the selection and processing of meteorological data;
- Section 7 provides a discussion on the determination of background concentrations;

[1] Although this guidance is for NO_2 modeling, the common 1-hour averaging time and similar form of both the NO_2 and SO_2 standards makes this modeling guidance applicable to the 1-hour SO_2 NAAQS.

- Section 8 provides a discussion on the averaging time for SO_2 emission limit; emission limits, and modeling results.

In addition to the above sections, ADEQ is also providing (Appendix F) the modeling report created by ASARCO's modeling contractor. This modeling reports describes much of the material covered in this TSD, but also includes the following appendices:

- Appendix A: Modeling Protocol for the Hayden Sulfur Dioxide Nonattainment Area
- Appendix B: Hayden SO_2 SIP Modeling Letter Report (July 12, 2022)
- Appendix C: ADEQ Comments on ASARCO SO_2 SIP Modeling (July 22, 2022)
- Appendix D: Response to ADEQ Comments on ASARCO SO_2 SIP Modeling (August 12, 2022)
- Appendix E: ADEQ Comments on Modeling (Email from Feng Mao (ADEQ) to Bill Jones (BSM), August 22, 2022)
- Appendix F: Response No. 2 to ADEQ Comments on ASARCO SO_2 SIP Modeling (August 25, 2022)
- Appendix G: Response to EPA Comments on Hayden SO_2 SIP Modeling Protocol (September 15, 2022)
- Appendix H: Response No. 3 to ADEQ Comments on ASARCO SO_2 SIP Modeling (September 29, 2022)

2.0 Overview of Hayden Nonattainment Area (NAA) for 1-hour SO_2

The Hayden SO_2 NAA is comprised of the portions of Gila County bound by the townships and ranges as presented in Table 2-1. The towns of Hayden, Winkelman and Kearny lie within the Hayden SO_2 NAA. ADEQ has concluded that the Asarco Smelter is the only source in the NAA that needs to be explicitly modeled. Section 3 of this TSD contains ADEQ's findings that support this conclusion from an emissions inventory perspective. However, ADEQ believes the ambient air monitoring data collected at the Hayden Old Jail (HOJ) monitor, the only Air Quality System (AQS) certified monitor in the NAA, also supports this conclusion. The figure on the following page illustrates how hourly exceedances of the 75 ppb SO_2 NAAQS at the HOJ monitor went to zero after the Asarco Smelter shutdown in late 2019. This alignment between NAAQS hourly exceedances and smelter operations is additional support for only modeling the Asarco Smelter.

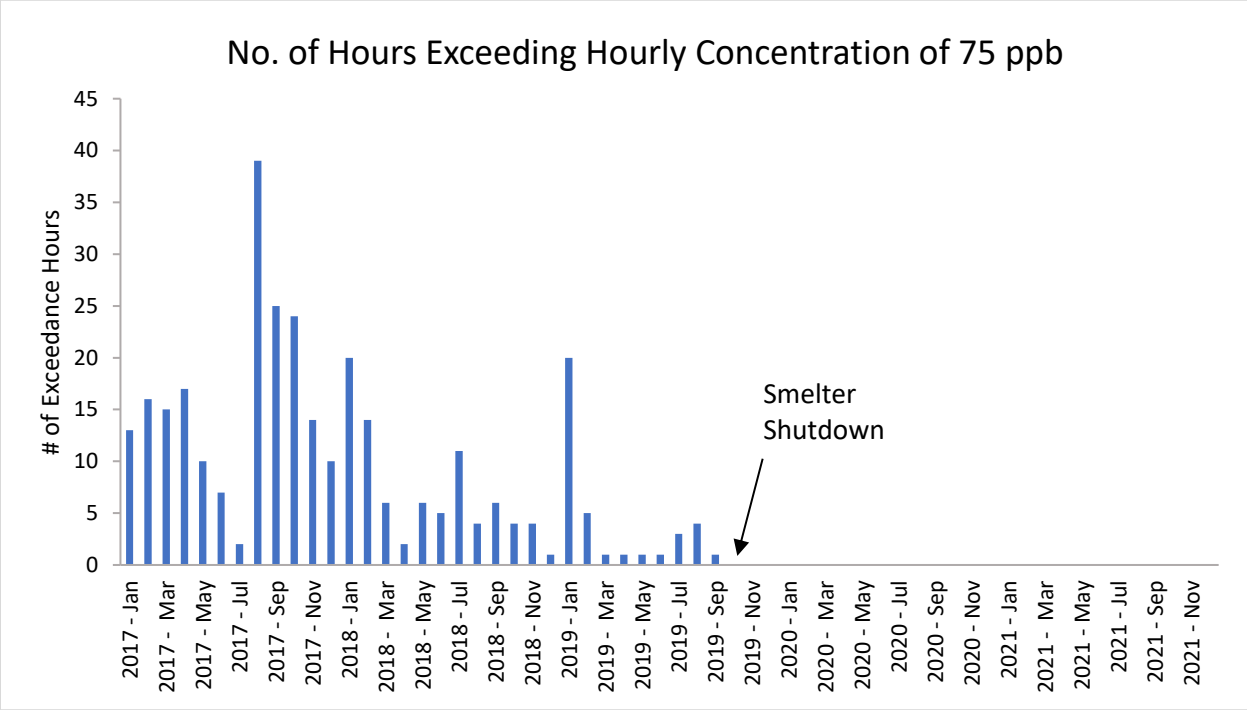


Figure 2-1: Hourly Exceedances Jan 2017 – Nov 2021

ADEQ has also conducted a review of the meteorological conditions in the area, and the potential impact meteorology has on ambient air SO_2 concentrations. As part of this review, the following percentile rose plots were created as a multivariate analysis tool to examine the relationship between wind direction and SO_2 concentrations. The percentile roses in Figures 2-2 and 2-3 show percentile levels of SO_2 by wind direction, for both pre- and post-shutdown of the facility. The pre-shutdown period is defined as January 1st 2017 to October 12th 2019, while post-shutdown includes October 13th 2019 to December 31st 2021.

This analysis shows that while the ASARCO Smelter was in operation, the highest concentrations of SO_2 were dominated by easterly winds. SO_2 concentrations greatly receded post-shutdown, with levels never exceeding more than 11 ppb. It is important to note the difference in scale between the two figures below. For more on ADEQ's meteorological and ambient air review see Section 3 of the Emissions Inventory TSD, which is an appendix to the SIP submittal.

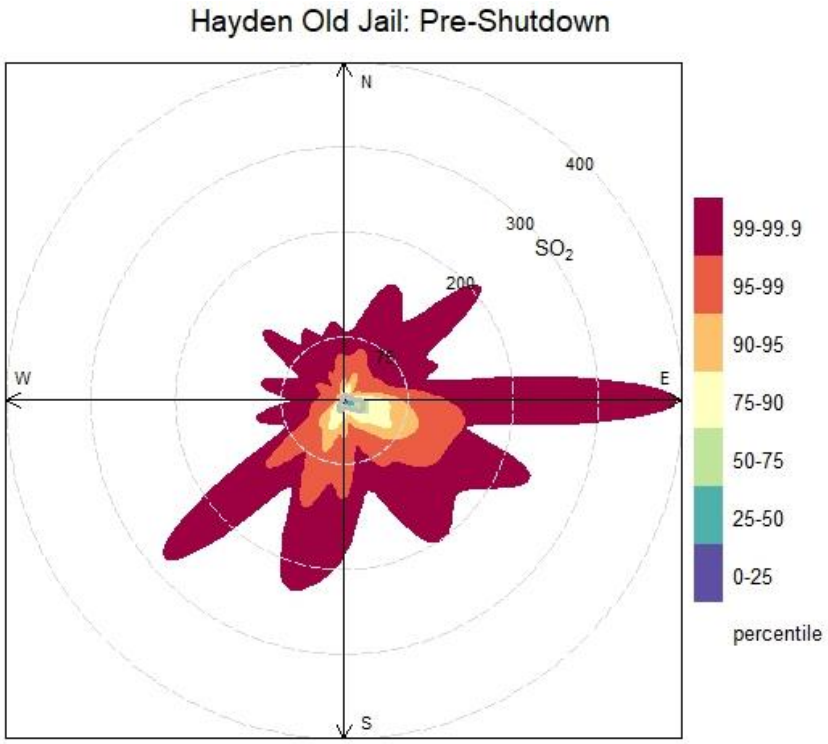


Figure 2-2: SO_2 Concentrations by Wind Direction (Pre-Shutdown)

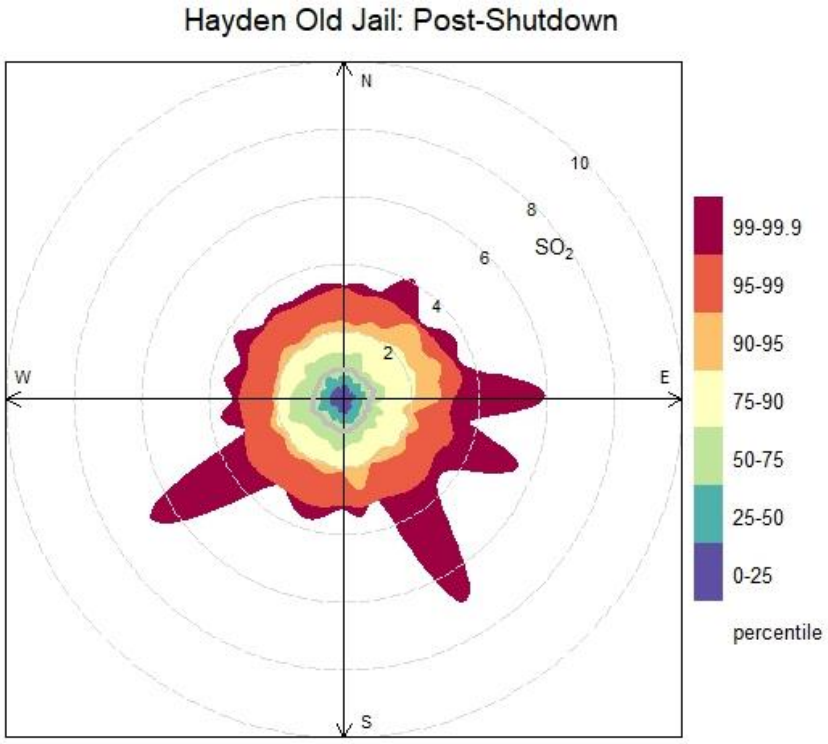


Figure 2-3: SO_2 Concentrations by Wind Direction (Post-Shutdown)

2.1 Population

The Hayden SO_2 NAA has been codified in 40 CFR 81.303 and is comprised of the portions of Gila County and Pinal County bound by the townships and ranges listed in Table 2-1 and represented geographically in Figure 2-3. Population estimates for the entire Hayden SO_2 NAA as well as the respective proportions of Gila and Pinal Counties are also presented in Table 2-1. The Hayden NAA encompasses the towns of Hayden, Winkelman and Kearny, for which population data has been included in Table 2-2.

Table 2-1: Geographic Location and Population

Hayden SO_2 NAA[2,3]			
Land Area	275 square miles		
2017 Population	4,409		
2026 Projected Population	3,679		
Gila County Portion		**Pinal County Portion**	
Land Area	58 square miles	Land Area	217 square miles
2017 Population	1,176	2017 Population	3,233
2026 Projected Population	982	2026 Projected Population	2,697
Township, Range		**Township, Range**	
4S, 14E		4S, 14E	
4S, 15E		4S, 15E	
4S, 16E		4S, 16E	
5S, 15E		5S, 14E	
5S, 16E		5S, 15E	
-		5S, 16E	
-		6S, 14E	
-		6S, 15E	
-		6S, 16E	

Table 2-2: Towns within Hayden SO_2 NAA

Location	2017 Population[4]
Town of Hayden	632
Town of Winkelman	347
Town of Kearny	2,100

[2] ADOA calculated the land area of Gila County and Pinal County based on 2010 department of Census TIGER/Line shapefiles.

[3] ADOA provided the population projections for both Gila County and Pinal County. ADOA's projection methodologies are presented in Appendix A.

[4] U.S. Census Bureau, Population Division (May 2020); Annual Estimates of the Resident Population for Incorporated Places in Arizona: April 1, 2010 to July 1, 2019 (SUB-IP-EST2019-ANNRES-04)

2.2 Land use

The Hayden NAA area encompasses portions of two counties: Gila and Pinal. The Gila County portion of the NAA is approximately 58 square miles[5] while the Pinal County portion is approximately 217 square miles[6]. The majority of the land within the NAA is owned and managed by either the Bureau of Land Management (39.1%) or the Arizona State Land Department (35.5%). The remainder of the land within the NAA is comprised of privately held land along with a small area of land located to the east of Winkelman, which the Bureau of Reclamation manages. A breakdown of the land owners in the Hayden SO_2 NAA are presented in Table 2-3.

Table 2-3: Land Use Area

Hayden SO_2 NAA[7]		
Land Owner	**Area (square miles)**	**Percentage**
Bureau of Land Mgmt.	106.816	39.1%
State Trust Land	96.876	35.5%
Private Land	68.932	25.2%
Bureau of Reclamation	0.499	0.2%

Industrial sources within the Hayden SO_2 NAA are provided in Section 3.1.1 of this TSD. Further discussion of land use, as it pertains to dispersion modeling and meteorological processing inputs, are provided in Sections 5.5 and 6.1.3 of this TSD.

2.3 Topography

Asarco operations in Hayden, Arizona are located on the southwestern flank of the Dripping Spring Mountains, a range rising rapidly just to the north and east of Asarco. Bisected by numerous northeast-southwest oriented arroyos, this terrain in the immediate vicinity of the Asarco Hayden operations is rugged and variable in elevation. To the south of Asarco the terrain is smoother, dominated by the northwest-southeast aligned valley of the Gila and San Pedro Rivers. The Tortilla Mountains, which form the western border of the Gila River Valley, are located several miles to the west of Asarco. The topography of the local area, along with the location of Asarco's Hayden processes and operations, is depicted in Figure 2-4.

[5] ADOA calculated the land area of the Miami NA based on 2010 department of Census TIGER/Line shapefiles.
[6] ADOA calculated the land area of the Miami NA based on 2010 department of Census TIGER/Line shapefiles.
[7] Land use information for both Gila County and the Miami NA was garnered from the Arizona Land Resource Information System (ALRIS) GIS tool managed by the Arizona State Land Department.

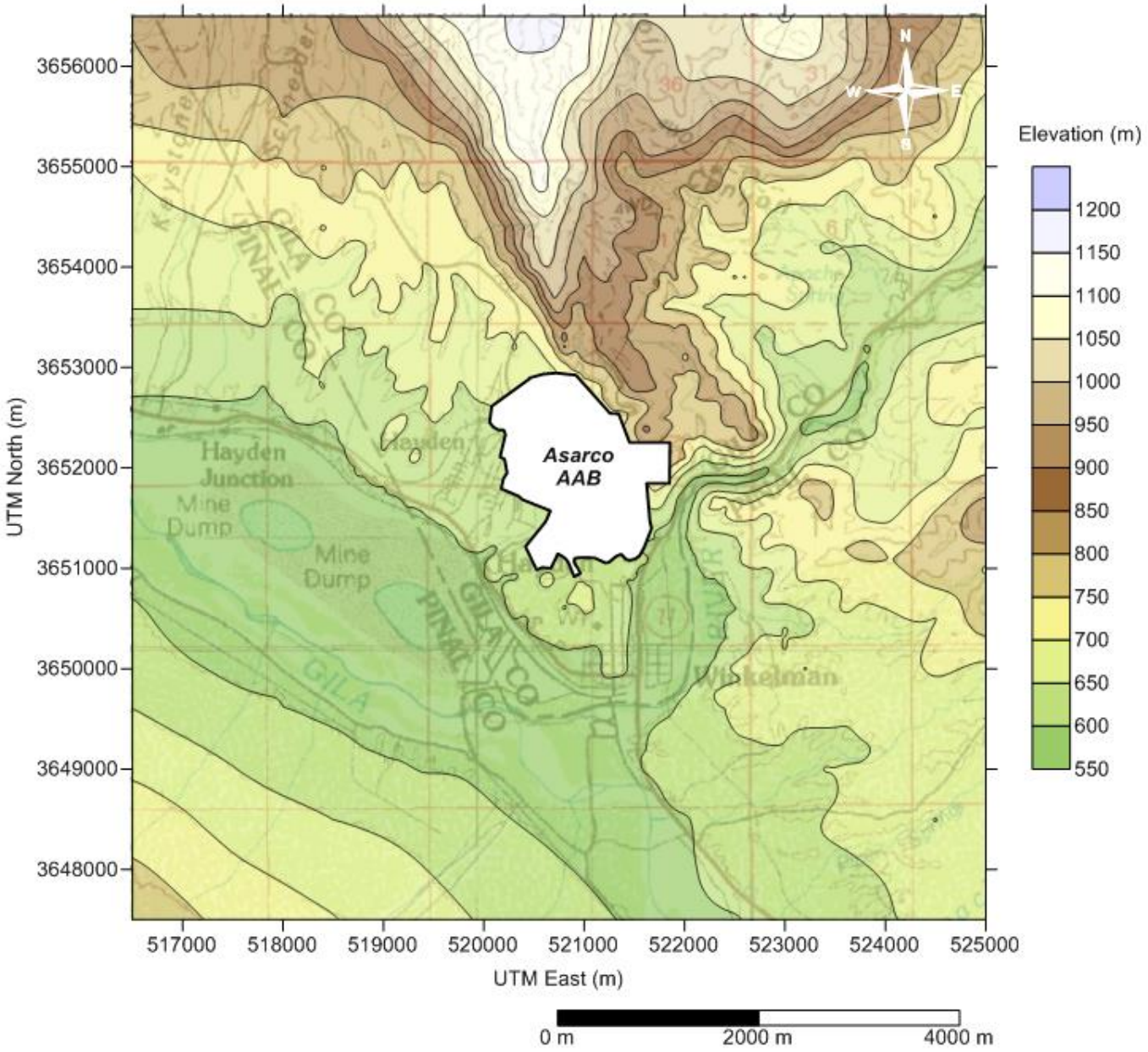


Figure 2-4: Topography of Area Surrounding Asarco

2.4 Climate

Both desert terrain and mountain ranges are found across the southern Gila County and eastern Pinal County landscape. Elevations range from near 1,800 feet to more than 4,400 feet above sea level in the NAA with the town of Hayden situated at an elevation near 2,050 feet. This unique environment experiences both warm desert and cool alpine climates. The climate of the area is arid, with annual average precipitation of about 14 inches. Temperatures range from an average low in the winter of 31°F to an average high of 99°F in the summer. Wind directions in the area generally conform to the river valley orientations, with westerly and southeasterly winds predominating in Hayden.

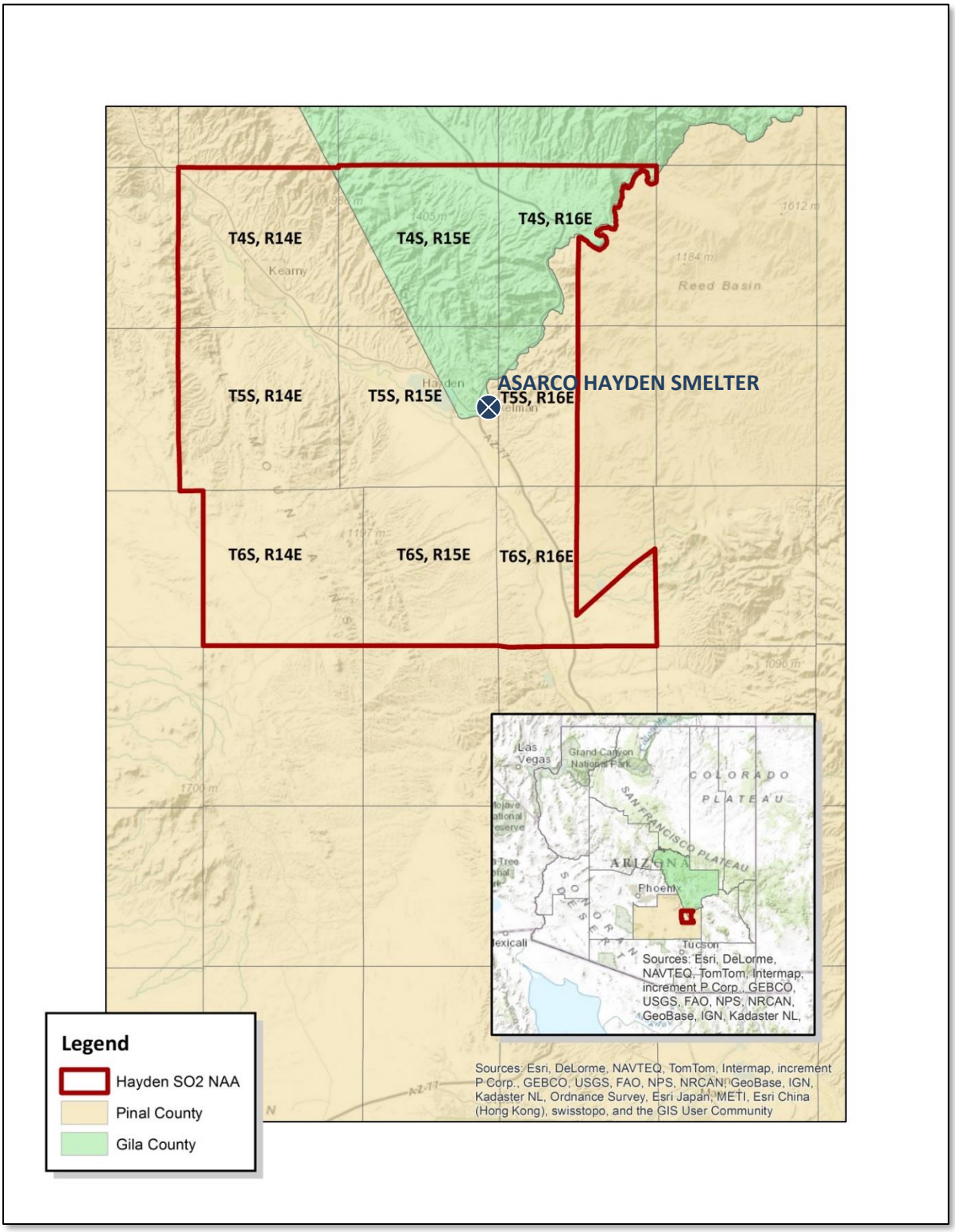


Figure 2-5: Map of the Hayden SO_2 Nonattainment Area Including Townships and Ranges

3.0 Modeling Domain

The first step of the SIP modeling exercise is to determine the size of the modeling domain, which depends on the number of sources to explicitly model and size of the receptor network in order to account for the areas of impact (U.S. EPA, 2014a). The modeling domain should at a minimum encompass the nonattainment area and include the sources thought most likely to cause or contribute to NAAQS violations in and around the nonattainment area. In the modeling exercise, all modeled receptors should exhibit modeled attainment of the NAAQS.

3.1 Determining Sources to explicitly model

Per EPA's guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions, Appendix A, there are two key criteria for the determination of sources to explicitly model: whether sources could cause or contribute to a NAAQS violation, and whether the ambient impacts from sources could be represented via a background concentration (U.S. EPA, 2014a).

3.1.1 Sources that Could Cause or Contribute to a NAAQS Violation in the Hayden NAA

ADEQ has identified SO_2 sources within the Hayden SO_2 NAA and a 50-km buffer zone extending from the boundaries of the NAA. Figure 3-1 is a geographical representation of these sources. Table 3-1 and Table 3-2 are an inventory of the individual sources within the Hayden SO_2 NAA and 50 km buffer zone surrounding the NAA, respectively. As shown in Table 3-1 and Table 3-2, the primary smelting of copper concentrate is the most significant source category in contributing to SO_2 emissions in Hayden SO_2 NAA and the surrounding 50 km buffer zone. The SO_2 emissions from the Asarco smelter represent more than 99.9 % of actual SO_2 emissions in the 2017 base year emissions inventory (EI). Similarly, the FMMI Miami smelter accounts for a similar proportion of actual SO_2 emissions in the 50 km buffer zone in the base year EI. Excluding the two smelters, there are no sources that emitted more than 25 tons per year (TPY) of SO_2 during the 2017 base year. Due to their insignificant emissions, it is very unlikely that these minor sources could cause or contribute to a NAAQS violation in the Hayden SO_2 NAA.

One question is whether the FMMI Miami Smelter could cause or contribute to a NAAQS violation in the Hayden SO_2 NAA or not. As mountains surround Hayden in all directions, ADEQ does not expect sources outside Hayden to contribute to exceedances at monitors in the Hayden planning area. ADEQ expects the FMMI Miami Smelter, located around 45 km north of the Hayden Smelter, to have negligible ambient impacts in the Hayden SO_2 NAA because the 7,850-foot Pinal Mountain topographically separates the Miami Smelter from the Hayden SO_2 NAA. For this reason, ADEQ proposed two separate 1-hour SO_2 nonattainment areas for Miami and Hayden and concluded that the Miami and Hayden smelters are the sources causing the violation in their respective proposed nonattainment areas. EPA concurred with ADEQ's proposal and conclusions. In the *Draft Technical Arizona Area Designations for the 2010 SO_2 Primary National Ambient Air Quality Standard* (US EPA, 2013b), EPA concludes:

> "EPA concludes that the state's recommended boundary contains the area violating the standard as well as areas causing or contributing to the monitored violation, as assessed using our five-factor methodology. The monitor is source-oriented, and is located in the southernmost tip of Gila County. Due to constraints imposed by the complex terrain in the Hayden area (see Geography/Topography discussion above), it is expected that the extent of the area exceeding the SO_2 standard is confined to a relatively small area around the main source of SO_2 emissions, the ASARCO, LLC - Hayden smelter."

As discussed above, Asarco is the only meaningful source of SO_2 emissions in the Hayden NAA. Any other sources which may be contributing to SO_2 levels in the Hayden SO_2 NAA are accounted for in the background SO_2 concentration.

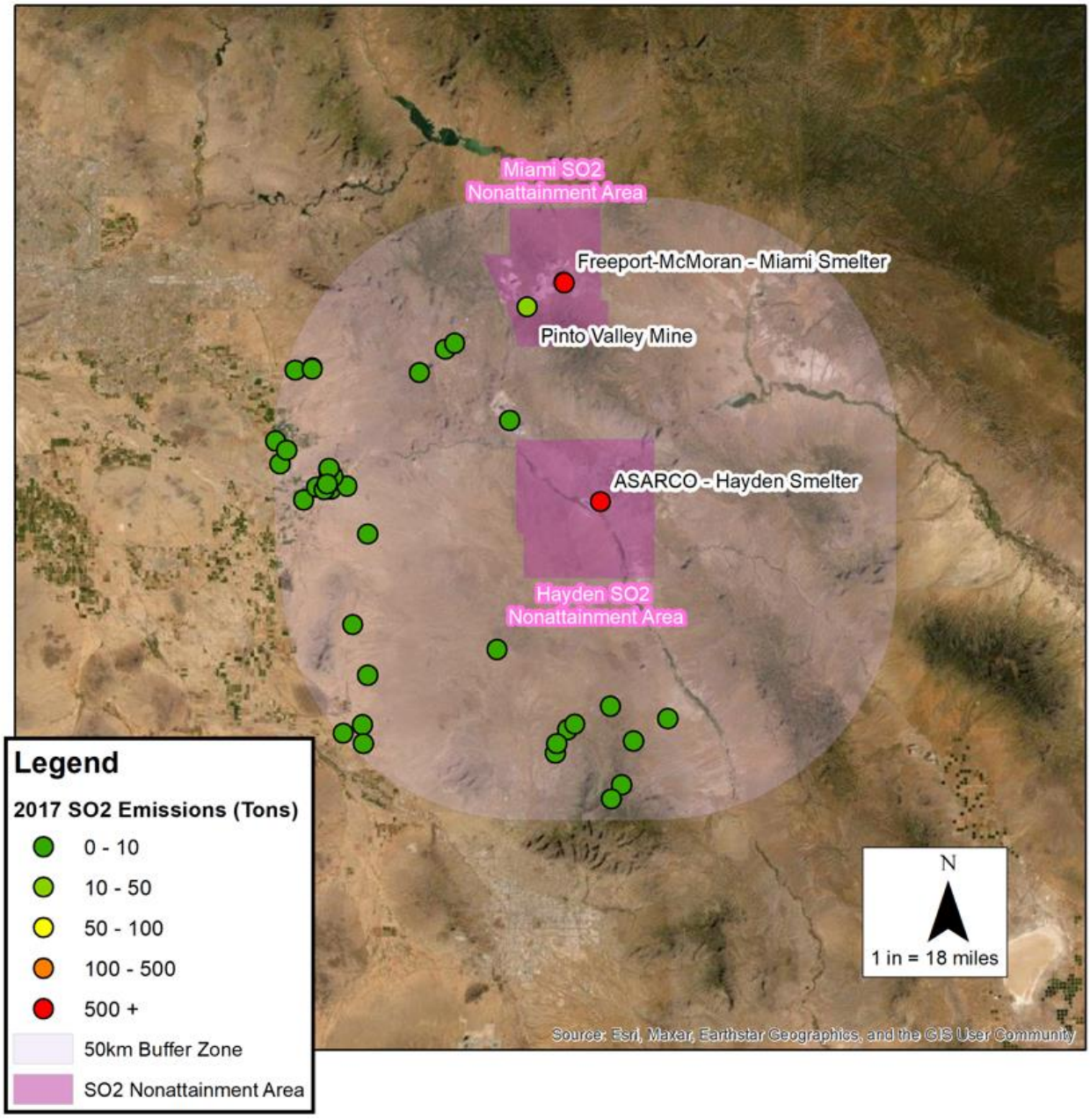


Figure 3-1: Hayden SO_2 NAA Point Source Map (2017 ADEQ Annual Emissions Inventory Database)

Table 3-1: Hayden SO_2 NAA Point Sources (2011 NEIv1)

Hayden SO_2 NAA				
Facility	**Facility Type**	**Latitude**	**Longitude**	**2017 SO2 Emissions (Tons)**
ASARCO Smelter	Copper Smelter	33.003378	-110.77632	20,498.8
50km Buffer Zone				
Facility	**Facility Type**	**Latitude**	**Longitude**	**2017 SO2 Emissions (Tons)**
Calcium Carbonate Plant	Calcium Carbonate Manufacturer	33.288	-111.121	0.007
Tom Mix Compressor Station	Compressor Station	32.728	-111.006	1.52
Arizona Correctional Industries - Florence	Correctional Facility	33.027	-111.374	0.006
Biosphere 2	Research Facility	32.57861	-110.85056	0.02
Bonito Quarry	Sand and Gravel	32.55759	-110.70561	2.23
Cactus Landfill	Landfill	32.774	-111.324	0.69
Central Arizona Florence Correctional Complex	Correctional Facility	33.043	-111.371	0.09
Central Arizona Florence Correctional Complex	Correctional Facility	33.04417	-111.37916	0.12
Central AZ Correctional Fac. and ASP Florence West	Correctional Facility	33.03847	-111.37654	0.299
Cox Communications Pinal STC	Telecommunication	33.11643	-111.49666	0.00
Decorative Rock Sales L.L.C.	Sand and Gravel	32.589	-110.834	0.003
Durham Regional Landfill	Landfill	32.67992	-111.29127	0.56
EPCOR San Tan District - Anthem WRF	Wastewater Treatment Plant	32.94345	-111.29231	0.004
Eyman Complex	Prison	33.033	-111.338	0.25
Florence Hospital	Hospital	33.07368	-111.48685	0.197
Florence Plant	Asphalt Plant	33.05	-111.37	8.49
Freeport-McMoran - Miami Mine	Mine	33.413889	-110.856944	0.27
Freeport-McMoran - Miami Smelter	Copper Smelter	33.412655	-110.856538	648.69
Gft 2	Asphalt Plant	33.24795	-111.45364	Permitted in 2021
ICE - Florence Detention Center	Detention Facility	33.06385	-111.37891	0.4
Ironwood MSW Landfill	Landfill	33.007	-111.434	0.011
Oracle Compressor Station	Compressor Station	32.6228	-110.756	1.20
Oracle Ridge Mine	Mine	32.475599	-110.73166	0.06
Pinto Valley Mine	Mine	33.367223	-110.938611	15.79
Queen Creek Aggregate Processing & Hot Mix Asphalt	Asphalt Plant	33.09873	-111.47251	2.73
Queen Creek Pit	Sand and Gravel	33.25333	-111.41613	0.13
Queen Creek Plant	Asphalt Plant	33.251	-111.416	8.31
Ray Complex	Copper Mine	33.0018	-110.778	7.57
Red Rock Pumping Plant	Emergency Generator	32.5877	-111.30290	0.0
Red Rock Water Reclamation Facility	Wastewater Treatment Plant	32.57178	-111.34410	0.01
Resolution Copper Mining	Copper Mine	33.29989	-111.09928	0.65
SaddleBrooke One	Country Club	32.53425	-110.87770	0.002
Saddlebrooke Wastewater Treatment Plant	Wastewater Treatment Plant	32.55227	-110.87450	0.004
Saguaro Power Plant	Power Plant	32.5517	-111.3	0.22
San Manuel Schools	School	32.59861	-110.62944	0.001
Sarita Aerial Contractors	Airport	32.9356	-111.485	N/A
South Plant	Emergency Generator	33.03041	-111.40492	0.07
Superior Transfer Station	Transfer Station	33.24456	-111.17783	0.095
Trico Electric Cooperative	Electricity	32.449229	-110.754186	2.19
Town of Florence Well Site #1	Emergency Generator	33.06523	-111.37860	0.008
Town of Florence Well Site #5	Emergency Generator	33.02674	-111.38868	0.017
Town of Florence Well Site 3B	Emergency Generator	33.03594	-111.38259	0.004

Table 3-2: Major Point Sources within Hayden SO_2 NAA & 5okm Buffer Zone

Major Point Source Emission Inventory							
Source	Actual SO2 Emissions (Tons)						Facility SO_2 PTE[8] (TPY)
	2016	2017	2018	2019	2020	2021	
Hayden SO_2 NAA							
ASARCO LLC Hayden Smelter	18,987.9	20,498.8	7,999.7	2,018.9	0.03	0.02	3006.84
50km Buffer Zone							
Freeport McMoRan Miami Smelter	4,121.7	3,930.3	232.5	337.9	329.1	266.1	648.7
Pinto Valley Mine	15.6	15.8	23.3	7.8	14.7	18.3	53.11

3.2 Ambient Air Boundary and Receptor Grid

The land owned by Asarco contiguous to and including Asarco's Hayden Operations covers an area in excess of 15 square miles. This area extends along and on either side of the Gila River Valley approximately 4-1/2 miles to the west of the plant and extends into the Dripping Spring Mountains to the north and northwest. In addition, much of the area is inaccessible to the general public, either because it is fenced or because of the steep and rugged nature of the terrain. Consequently, much of Asarco's property is not considered ambient air. The area encompassing the actual processes and industrial activities associated with the Asarco Hayden Operations is considerably smaller and is located immediately to the north and east of the town of Hayden.

Asarco followed guidance in Section 3.4.3 of the ADEQ's Air Dispersion Modeling Guidelines (ADMG) about how to identify, for permitting modeling purposes, the Ambient Air Boundary (AAB), outside of which modeling receptors are to be placed. This perimeter consists of fencing, steep/rugged terrain, and what ADEQ designates as the "process area boundary" or PAB.

In defining the PAB, Asarco included only areas where processes, operations, and activities associated with and supporting Asarco's concentrating and smelting operations occur. As such, the PAB included the locations of equipment and operations where the handling, processing, movement, and management of feed materials, products, and byproducts are conducted. Asarco properties connected to the Hayden Operations but not part of the PAB - for example, the administration building, grounds, and associated parking lot - were not included in the PAB. Asarco's AAB is shown in Figure 3-2. Appendix A includes additional information on how the Ambient Air Boundary for Asarco's smelter was defined.

In January 2017, Asarco informed ADEQ that they had purchased land to the east of the smelter, which was previously excluded from the AAB. ADEQ included this land to Asarco's AAB and updated the

[8] Facility PTE is the maximum capacity of a stationary source to emit under its physical and operational design, including control devices or limits. 40 CFR 63.2 "Potential to emit".

modeling information. However, it did not change the final calculated CEV for the main stack, as it can be seen in section 8. Figure 3-3 shows the updated AAB.

Additionally, ADEQ personnel performed an on-site tour of the ambient air boundary (AAB) used for the Hayden SO_2 and Pb nonattainment plans. During this tour ADEQ personnel traveled and documented the portions of the AAB that were reasonably accessible. In general, upon visiting the site and inspecting the AAB, ADEQ concurs with the AAB assessment provided by Asarco[9] and agrees that the boundary represents a practical ability to preclude public access. More details and photographs of the survey are provided in Appendix D of this TSD.



Figure 3-2: Asarco's Previous Ambient Air Boundary

[9] See Hayden SO_2 Modeling Technical Support Document Appendix A.



Figure 3-3: Asarco's Updated Ambient Air Boundary

Asarco developed a modeling domain with a total coverage of approximately 33 kilometers by 34 kilometers, centered on the Asarco Smelter facility. The modeling domain covers portions of Gila and Pinal Counties and encompasses the entire Hayden NAA. Figure 3-4 presents the modeled receptors superimposed on a map of the Hayden NAA, with Figure 3-5 providing a focused view of receptors near ASARCO.

Asarco placed 2,858 receptors in the modeling domain, spaced as follows:

- Receptors along AAB at a spacing of 25 m
- Receptors between AAB 500 m and ~1500 m at a spacing of 100 m (including in area of elevated terrain to the north)
- Receptors between ~1500 m and ~5500 m at a spacing of 500 m
- Receptors between ~5500 m and Hayden NAA boundary at a spacing of 1000 m
- Receptors along the Hayden NAA boundary at a spacing of 2500 m

Asarco used EPA's AERMAP software tool (version 18081) to estimate receptor elevations and hill heights.

Four 1/3 arc-second USGS GeoTiff files were used as inputs to AERMAP. The datum for this AERMOD processing was 1983 North American Datum (NAD83).

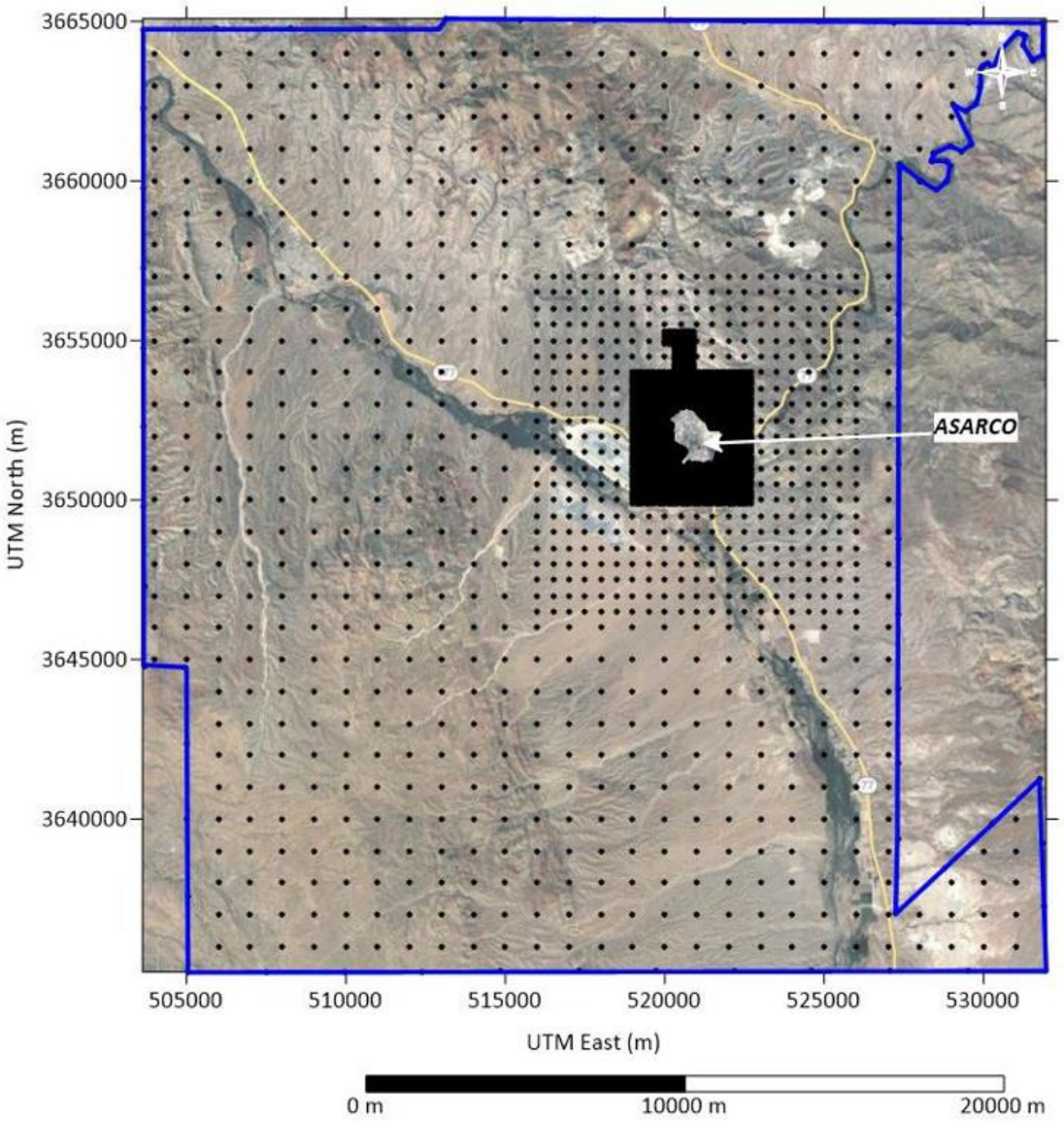


Figure 3-4: NAA Modeled Receptors

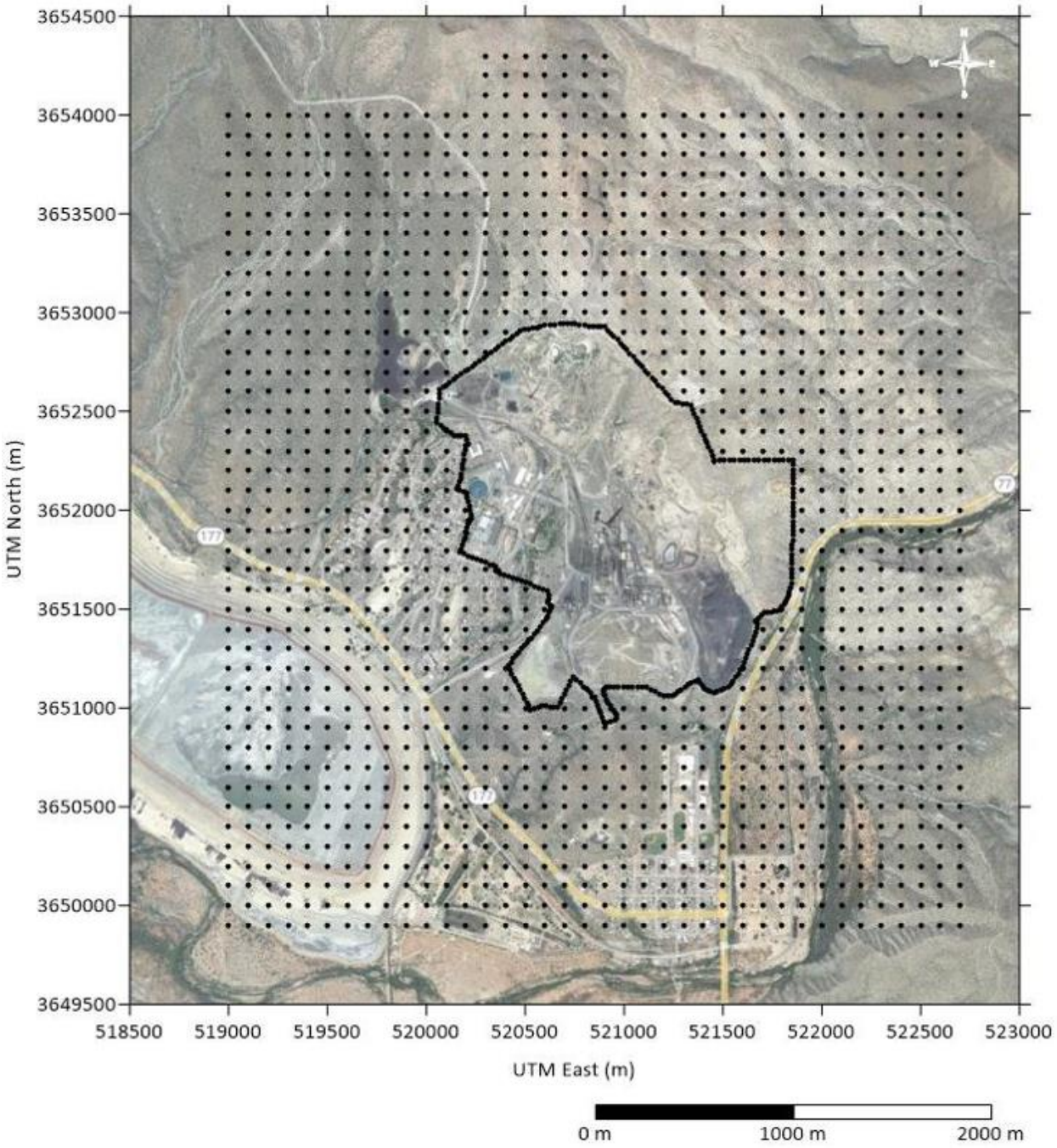


Figure 3-5: Hayden Modeled Receptors

4.0 Model Selection

As outlined in the EPA's Modeling Guidance for Nonattainment Areas (U.S. EPA, 2014a), for SIP development under the 2010 primary SO_2 NAAQS, the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), or one of the other preferred models in Appendix W, should be used for near-field dispersion unless use of an alternative model can be justified.

4.1 AERMOD

Asarco used the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) (version 22112) to predict ambient concentrations in simple, complex and intermediate terrain. AERMOD is the recommended sequential model in EPA's GAQM (40 CFR 51, Appendix W) (U.S. EPA, 2017) for near-field analysis.

There are two input data processors that are regulatory components of the AERMOD modeling system: AERMET (version 22112), a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, and AERMAP (version 18081), a terrain data preprocessor that incorporates complex terrain using USGS Digital Elevation Data. Other non-regulatory components of this system include: AERSURFACE (Version 20060), a surface characteristics preprocessor, and BPIPPRIM (version 04274), a multi-building dimensions program incorporating the Good Engineering Practice technical procedures for PRIME applications.

Asarco used the regulatory default option. This option commands AERMOD to:

- Use the elevated terrain algorithms requiring input of terrain height data for receptors and emission sources;
- Use stack tip downwash (building downwash automatically overrides);
- Use the calms processing routines;
- Use buoyancy-induced dispersion;
- Use the missing meteorological data processing routines.

5.0 Source Inputs

This section discusses source characterization to develop appropriate source inputs for dispersion modeling system. Section 5.1 provides an overview of Asarco Smelter operations and proposed smelter upgrade project (control strategies), section 5.2 provides details on source configuration, source types and source release parameters, and section 5.3 discusses modeling methodologies to handle variable emissions of sources. Good Engineering Practice (GEP) stack heights and urban/rural determination of the sources are also discussed in this section.

5.1 Asarco Smelter Operations and SO_2 Controls

On June 24th, 2014 Asarco submitted a Class I Significant Permit Application to ADEQ, proposing upgrades to enhance emission capture and control systems at its Hayden Smelter facility (hereafter referred to as the "Converter Retrofit Project"). The following list summarizes the enhancements Asarco completed as part of the Converter Retrofit Project (CRP):

- Replacing the five existing small converters with three larger converters to optimize blowing emissions with double contact acid plant capacity;
- Rerouting secondary hood emissions during blowing from the converter secondary hood baghouse to the double contact acid plant to significantly reduce SO_2 emissions;
- Installing a tertiary capture system over the converter aisle to substantially capture secondary operation fugitives and spillover from the secondary hoods and route them to the main stack;
- Adding high surface area lime in the converter secondary hood baghouse to reduce SO_2 emissions;
- Adding high surface area lime in the vent gas baghouse to reduce SO_2 emissions.

The enhancements listed above were incorporated into the 2017 SIP attainment demonstration. On November 22nd, 2022 Asarco submitted a Class I significant Permit Application to ADEQ, which proposed additional emission capture and control systems at the Hayden Smelter facility. The following list summarizes the enhancements found in this 2022 permit application:

- Replacement of the existing preheater at the double contact acid plant with a redesigned unit;
- Addition of secondary hoods to the three existing anode furnaces, exhaust from which will be routed to a baghouse and then the main stack;
- Addition of secondary ventilation around the flash furnace uptake to capture fugitive emissions from the flash furnace, matte tapping and slag skimming areas and route them to the converter secondary hood baghouse;
- Addition of a hood to be used to capture fuming ladle emissions and route them to the converter secondary hood baghouse and its lime injection system.

The additional controls found in the 2022 permit application are foundational to the latest attainment demonstration. The remainder of this section covers how these controls were incorporated into the model.

5.2 Source Configuration, Types and Release Parameters

SO_2 emissions will be released to the atmosphere from five primary locations at ASARCO's Hayden operations: the Main Smelter Stack, the Anode Furnace roof monitors, the Converter Aisle roof monitors, the Flash Furnace building roof monitors, and Outdoor Slag Pouring. In addition, very small amounts of SO_2 are emitted from three pieces of non-trivial equipment: the Acid Plant Preheater, the Anode Boiler, and the Oxygen Plant Boiler. The locations of these sources are depicted in Figure 5- 1.

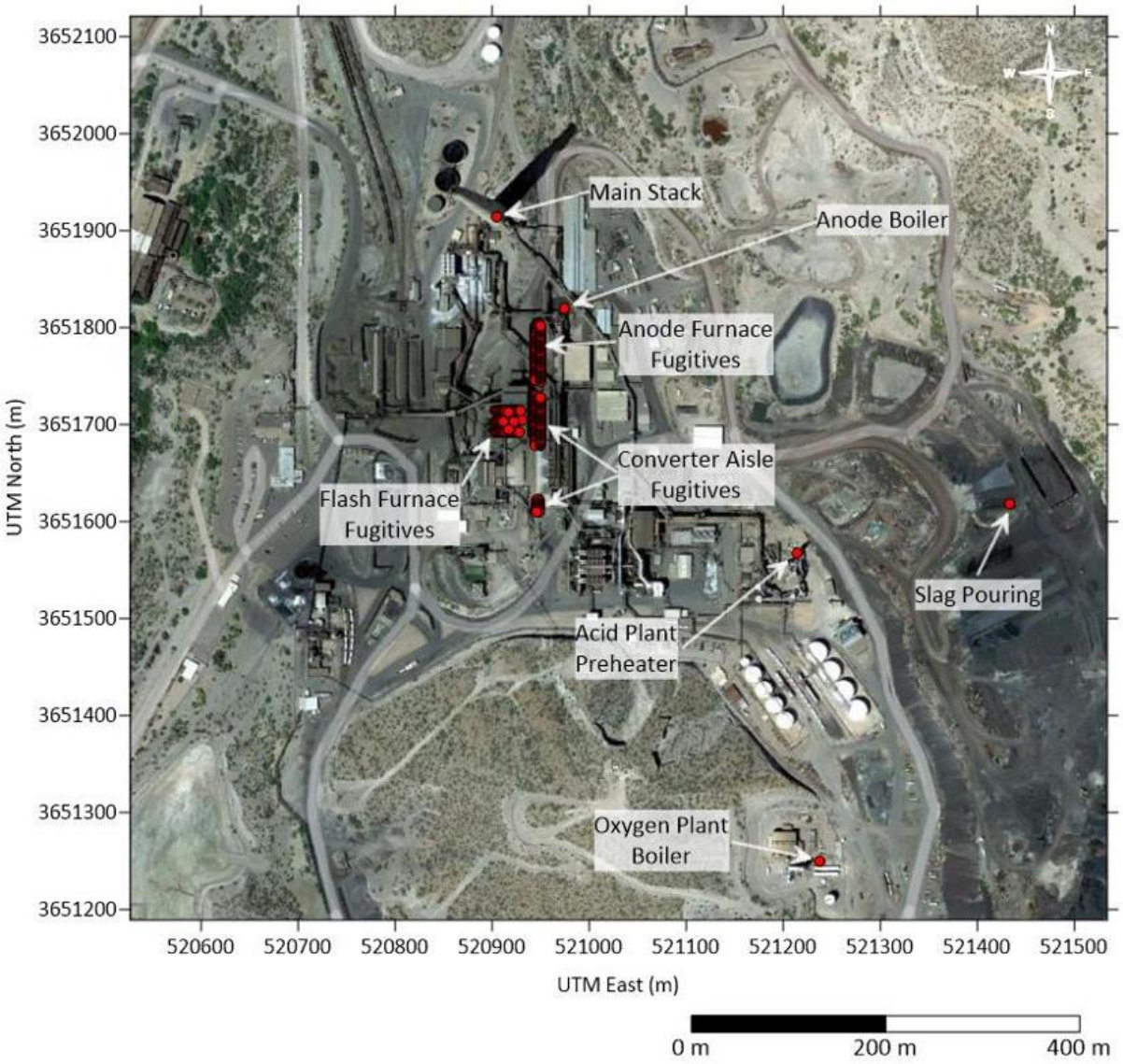


Figure 5-1: Modeled Emission Sources

5.2.1 Point Sources

The largest emission source at the facility, by mass, is the main stack. However, like in the 2017 SIP submission, slag pouring was also considered in the attainment model. Additionally, smaller fixed sources were also included in the model. The three pieces of non-trivial auxiliary equipment included in the modeling are as follows:

1. Acid Plant Preheater;
2. Anode Boiler;
3. Oxygen Plant Boiler.

Each of the above sources emits a very small amount of SO_2, and have little impact on the over predicted concentrations. However, for the sake of conservatism, Asarco has included these sources in the attainment demonstration.

5.2.1.1 Main Stack

The main smelter stack, which is comprised of an inner stack and an outer annulus, exhausts almost all emissions from the smelting processes at Hayden. To properly account for the main stack plume rise in the dispersion modeling, a combined exhaust stream was defined for the stack's two emissions streams. The calculation of this combined stream's parameters, presented in Appendix B, is based on conservation of the total stack flow rate and release area, and calculation of an equivalent exhaust temperature, stack diameter, and exit velocity. As a note, the main stack parameters seen in Appendix B account for the new controls listed in Section 5.1.

As discussed in the ADEQ's March 2017 "Modeling Technical Support Document for the Hayden Sulfur Dioxide (SO_2) Nonattainment Area"[10], the GEP height for Asarco's main stack was assessed in a fluid modeling study jointly conducted by North American Weather Consultants and Colorado State University, with that study concluding that the stack's 1,000-foot height meets GEP stack height requirements. EPA subsequently approved Arizona's SIP determination of GEP stack height. No structures have since been constructed at Asarco that would affect this determination. Asarco's main stack was modeled at its true height of 1,000 feet. More details on GEP stack height is provided in section 5.5.

5.2.1.2 Slag Pouring

Slag pouring at the Smelter takes place in designated area's east of the main smelter building. SO_2 from this emissions process is released to the atmosphere as molten slag is poured on the ground outdoors. Due to the high temperature of the molten slag at the point of pouring (about 2000^oF), the gas rises rapidly into the air. Recognizing that such heat results in a rising buoyant plume, regulatory agencies have approved methods for calculating equivalent stack parameters for the purposes of the dispersion modeling of slag pouring gases.

In particular, the Texas Air Control Board, a predecessor agency to the Texas Commission on Environmental Quality, approved such an approach, involving the use of equivalent exhaust parameters, to account for plume rise in the modeling of slag pouring at Asarco's El Paso Smelter in 1992 and 2006 air quality permit reviews. Similarly, the ADEQ has described in Section 3.3.6 of its ADMG the calculation and use of equivalent release parameters for modeling flares, a category of non-standard sources with heat release that cannot be treated in a straightforward way in dispersion models.

[10] "Modeling Technical Support Document for the Hayden Sulfur Dioxide (SO_2) Nonattainment Area," ADEQ, March, 2017

The underlying assumptions used to determine the slag pouring emission rate is as follows:

1. Assume 693,500 tons concentrate per year
2. 5 lb SO_2 per ton of concentrate (conservative values, as AP-42 Table 12.3-11 (Smelting Furnace fugitives adjusted for matte grade) recommends 4 lb/ton)
3. 0.41 Flash/Reverberatory factor (from ASARCO El Paso Smelter study)
4. 0.1 slag skim/total SO_2 (from AP-42 matte/slag ratio)
5. 0.25 factor (engineering judgment)

The equation to calculate the emission rate is presented below.

$$Slag\ Pouring\ = 693{,}500 \frac{tons\ concentrate}{year} \times 5 \frac{lb\ SO2}{ton\ concentrate} \times 0.41 \times 0.1 \times 0.25$$

$$Slag\ Pouring = 35{,}541.9 \frac{lb\ SO2}{year} \times \frac{year}{8760\ hrs} = 4.057\ \frac{lb}{hr}$$

The diameter of the slag dump point source is derived from the surface area of the poured slag, which is estimated to be 1500 ft^2. The exit temperature of the slag dump point source is average of the temperature at the start and end of a slag pour (provided by ASARCO). Slag dumping is essentially continuous throughout a 24-hr period, with roughly 30 dumps per day. Given this frequency, the methodology takes the entire amount dumped in a year and determines an hourly emission rate.

The exit velocity is derived using the Stefan Boltzman Law, which states that the total radian heat power emitted from a surface is proportional to the fourth power of its absolute temperature. Based on information provided by ASARCO (e.g., temperature of slag at the start and end of a pour), the net heat release rate was calculated. This net heat release rate was used in conjunction with the theory that the plume rise of a non-stack release can be estimated by calculating equivalent stack parameters when the buoyancy flux is known.

The supporting calculations are presented in Appendix B.

5.2.1.3 Acid Plant Preheater

As part of Asarco's 2022 permit application, the facility will be reengineering and replacing the damaged acid plant preheater at the Hayden smelter. In past analyses it has been shown that the preheater leak corresponded to some, but not all, of exceedances observed in the area. In the modeling demonstration presented in this document the preheater stack will be represented using the parameters seen in Table 5-1.

5.2.1.4 Boilers

Finally, the Anode and Oxygen Plant boilers are the remaining point sources considered in the model. The stack and exhaust parameters for these sources are given in Table 5-1 below.

5.2.2 Point Source Release Parameters

Table 5-1 presents the stack and exhaust parameters modeled for the stacks associated with the 2022 controls. Asarco identified coordinates for the stacks by mapping the site plan to rectified aerial

photographs of the site. ADEQ and Asarco projected UTM coordinates of each stack to UTM Zone 12. These coordinates are based on the NAD83.

Table 5-1: Stack and Exhaust Parameters - Post-Control

Stack	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Exit Diameter (m)	Exit Velocity (m/s)	Exhaust Temp.[11] (ºK)	SO_2 Emission Rate (lb/hr)
Main Stack	520929	3651932	650.76	304.8	8.9	10.7	346.5	1518
Slag Pouring	521458	3651636	626.9	0	13.3	1.5	1333	4.05
Acid Plant Preheater	521237.7	3651585.4	634.0	26.9	1.0	0.001	616.5	0.12
Anode Boiler	520998.7	3651837.0	638.9	3.4	0.5	1.8	447.6	0.002
Oxygen Plant Boiler	521261.7	3651267.3	640.4	9.1	0.5	1.8	447.6	0.01

[11] Negative temperature indicates temperature above ambient, zero temperature indicates ambient temperature

5.2.3 Roofline Vents (Fugitive Emissions)

5.2.3.1 Roofline Vent Configurations

ADEQ and Asarco identified coordinates for the roofline vents by mapping the site plan to rectified aerial photographs of the site and adjusting the building footprint to site Computer Assisted Drafting (CAD) drawings. ADEQ and Asarco projected the Universal Transverse Mercator (UTM) coordinates of each vent to UTM Zone 12, 1983 North American Datum (NAD83). Figures 5-2 shows each vent location on the simplified plot plan and the representative volume sources used in AERMOD. Table 5-2 lists the coordinates of each vent as well as vent-specific parameters for the post-CRP configurations of the ridge vents. Additionally, the following sections describe how modeled emission levels were determined and how they relate to the 2019 fugitive study and assumed level of control.

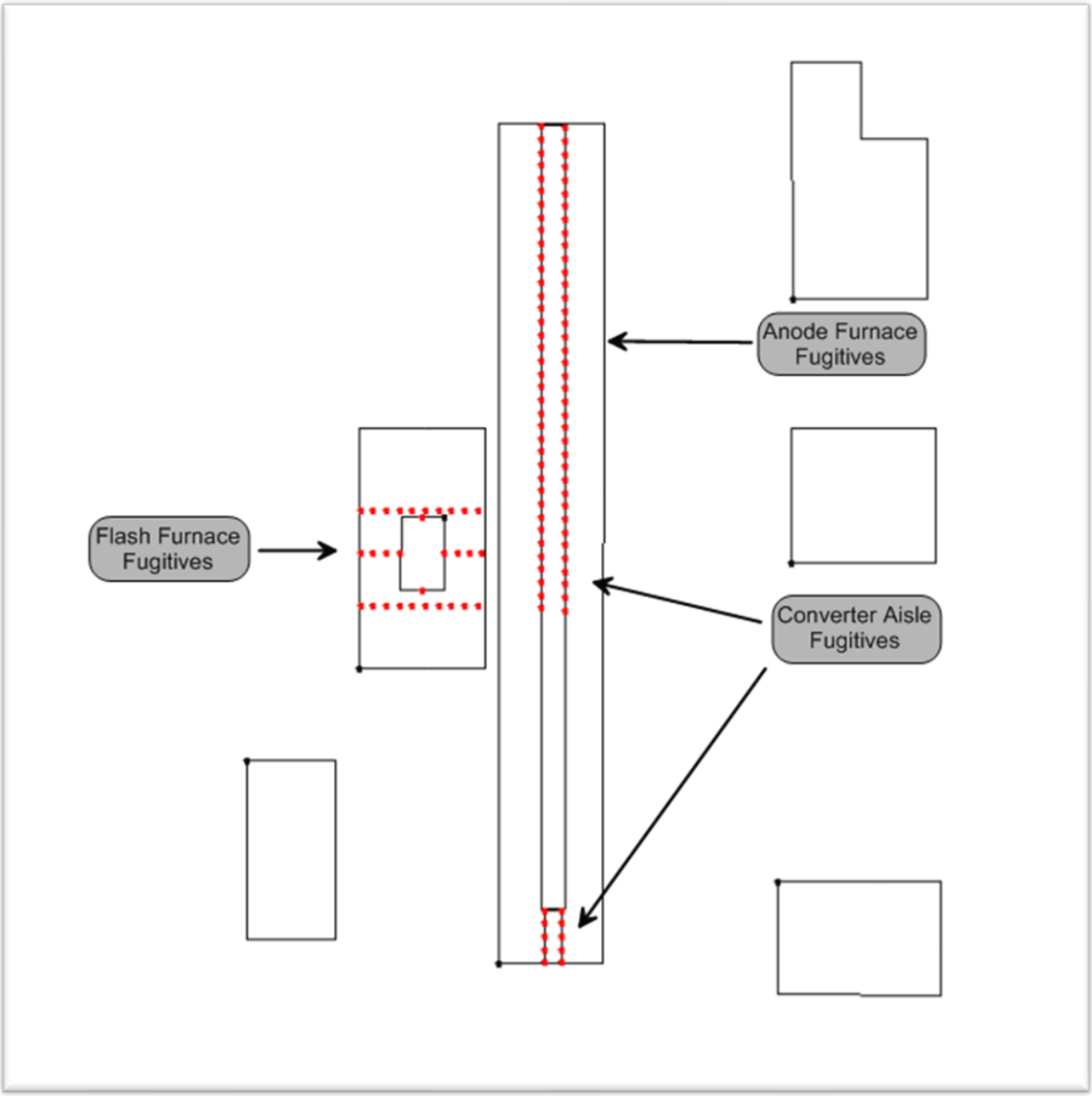


Figure 5-2: Modeled Volume Sources

5.2.3.2 Flash Furnace Fugitive Emissions

The flash furnace roofline encompasses the INCO flash furnace fugitives, matte tapping and slag skimming emissions and minor fugitive emissions from the concentrate dryers. The INCO flash furnace is hard piped to the double contact acid plant. At the time of the 2019 fugitive study, the other sources were collected by local hooding at approximately 96% capture. This is anticipated to give approximately 15.67 lb/hr fugitives at the roofline. The 2019 fugitive study showed mean emissions of 7.45 lb/hr but 99th percentile emissions of 62.38 lb/hr. Accordingly, ASARCO and Gas Cleaning Technologies (GCT) devised the Uptake Improvement Project which is aimed at enhancing capture of peak emissions by adding canopy hooding and additional containment. This is anticipated to reduce peak emissions by 30% to greater than 50% and mean emissions by approximately 0.5 lb/hr, or a 10-15% reduction in mean emissions. Peak 62.38 lb/hr * (1-0.5) = 31.19 lb/hr; mean 3.33 lb/hr * (1-0.15) = 2.83 lb/hr. ASARCO then modeled these rates iteratively to set a safety margin while still attaining the NAAQS.

5.2.3.3 Converter Aisle Fugitive Emissions

The converter aisle roofline encompasses the three converters, the south end entrance and the north end material transfer area. The converters are controlled by primary hoods ducted to the double contact acid plant, secondary hoods ducted to the double contact acid plant during converter blowing and to the converter secondary hood baghouse while otherwise processing, and tertiary canopy hooding. The secondary hoods and tertiary canopy hoods also capture converter secondary operations, such as ladle movement.

At the time of the 2019 fugitive study, the primary and secondary hoods were estimated at 93% capture each for converter operations, the secondary hoods at 90% capture for secondary operations, and the tertiary hoods at 95% capture. This is anticipated to give approximately 10.43 lb/hr fugitives at the roofline, although GCT expected closer to 3.5 lb/hr. The 2019 fugitive study showed mean emissions of 3.97 lb/hr and 99th percentile emissions of 33.74 lb/hr. Accordingly, ASARCO and GCT devised the Uptake Improvement Project (discussed above) to reduce blow through from the flash furnace, matte tapping and slag skimming operations and the Fuming Ladle Capture Project, which is designed to capture peak emissions that occur when a ladle “fumes” (e.g., emits visible plume of SO_2 and particulate) after pouring. This project is aimed at 90% control of peak emissions, between both the uptake improvement and fuming ladle projects. ASARCO and GCT estimate that peaks will come down substantially and the mean by perhaps 50%. Peak 33.74 lb/hr * (1-0.9) = 3.37 lb/hr; mean 3.97 lb/hr * (1-0.5) = 1.99 lb/hr. ASARCO then modeled these values iteratively to set a safety margin while still attaining the NAAQS.

5.2.3.4 Anode Furnace Fugitive Emissions

The anode furnace roofline encompasses the three anode furnaces and anode casting operations. At the time of the 2019 fugitive study, the anode furnaces were controlled by primary hoods and estimated at 97% capture ducted to the anode furnace baghouse and the other emissions were fugitive. This is anticipated to result in approximately 0.55 lb/hr fugitives at the roofline. The 2019 fugitive study showed mean emissions of 5.86 lb/hr and 99th percentile at 55.50 lb/hr. This was higher than anticipated. Accordingly, ASARCO and GCT designed a secondary hooding system similar to that on the converters to capture emissions during the charging and processing operations and route them to a new anode secondary hood baghouse. GCT estimates that this system should reduce average fugitive emissions by at least 80% and peak fugitive emissions by at least 85%. Peak 55.50 lb/hr * (1-0.85) = 8.33 lb/hr; mean

5.86 lb/hr * (1-0.80) = 1.17 lb/hr. ASARCO then modeled these values iteratively to set a safety margin while still attaining the NAAQS.

For all three roofline fugitives, ASARCO and GCT developed controls that are preferentially designed to work better at peak emissions to reduce such emissions disproportionately more than under typical conditions. Accordingly, peaks may be reduced by more than the general efficiencies presented herein. For more information on the derivation on the values in Table 5-2, see Appendix C. Initial lateral and horizontal dimensions are calculated based on Table 3-2 of the AERMOD User's Guide[12], with the initial lateral dimension being calculated assuming the roofline monitors are represented by adjacent volume sources and the initial vertical dimension being calculated assuming an elevated source on or adjacent to a building.

Table 5-2: Roofline Vent Parameters- Post-Control

Source ID	Description	Base Elev. (m)	Release Height (m)	Init. Horizontal Dimension (m)	Init. Vertical Dimension (m)	Emission Rate per Source (g/s)
AFW* AFE*	Anode Furnace: West, East	640.08	31.35[e]	0.7[a]	11.34[f]	0.0118
CES* CWS* CEN* CWN*	Converter Aisle: East South, West South, East North, West North	634.11	25.4 / 31.35[e]	0.7[a]	10.63 / 11.34[f]	0.01432
FFS* FMW* FME* FFN*	Flash Furnace: South, Middle West, Middle East, North	635.86	43.67	0.7[a]	19.85[b]	0.0990
FFPH*	Flash Furnace: Penthouse	635.86	43.59	7.44[c]	20.7[d]	0.0990

A. Line source represented by adjacent volume sources; length of side 1.5 m
B. Elevated source on or adjacent to building; building height 42.67 m
C. Line source represented by adjacent volume sources; length of side 16 m
D. Elevated source on or adjacent to building; building height 44.5 m
E. Release height of 25.5 m for southern portion of Converter Aisle, 31.35 m for northern portion of Converter Aisle (including above Anode Furnace)
F. Elevated source on or adjacent to building; southern portion of Converter Aisle building height 22.86 m, northern portion of Converter Aisle (including above Anode Furnace) building height 24.38 m

[12] https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_userguide.pdf

5.3 Good Engineering Practice (GEP) Stack Height

There are two definitions of Good Engineering Practice (GEP) stack height: (i) formula GEP stack height and (ii) regulatory GEP stack height. EPA requires sources to evaluate building downwash effects when a stack is less than formula GEP stack height. Regulatory GEP stack height is either 65 meters or formula GEP stack height, whichever is greater. The EPA does not allow sources to take credit for ambient air concentrations that result from stacks that are higher than regulatory GEP stack height unless they meet the formula stack height criteria.

As discussed in ADEQ's March 2017 "Arizona State Implementation Plan Revision: Hayden Sulfur Dioxide Nonattainment Area for the 2010 SO_2 NAAQS", the GEP height for Asarco's main stack was assessed in a fluid modeling study jointly conducted by North American Weather Consultants and Colorado State University, with that study concluding that the stack's 1,000-foot height meets GEP stack height requirements. EPA subsequently approved Arizona's SIP determination of GEP stack height. No structures have since been constructed at Asarco that would affect this determination.

At EPA's request in mid-2022, ADEQ re-assessed the GEP stack height determination with respect to current GEP regulations. This re-assessment confirmed that the original GEP stack height determination is consistent with the 1985 regulations and that the 1,000-foot stack remains an appropriate GEP determination. Therefore, Asarco's main stack was modeled at its true height of 1,000 feet. A white paper summarizing the re-assessment conducted for the 2017 SIP, which ADEQ believes applies to the current SIP revision, is provided in Appendix C.

5.4 Urban/Rural Determination

Dispersion coefficients for air quality modeling are selected based on the land use classification technique suggested by Auer (Auer, 1978), which is EPA's preferred method. The classification determination involves assessing land use by Auer's categories within a 3-kilometer radius of the proposed site. A source should select urban dispersion coefficients if greater than 50 percent of the area consists of urban land use types; otherwise, rural coefficients apply.

Following Section 3.7 of the ADEQ Modeling Guidelines, Asarco classified the land use of the area using the land-use procedure set forth in EPA's "Guideline on Air Quality Models" (GAQM). This approach requires determining the amount of specific types of land use categories within a 3-km radius circle centered on the source; if the total land use (as defined by Auer6) is classified as 50% or more "urban" then the area is designated as urban; otherwise it is designated as rural.

Land use (taken from the U.S. Geological Survey (USGS) National Land Cover Data (NLCD) 1992 archives) was examined for the 3-km radius circle, and totals of each land use category were calculated. These land use categories were then correlated to the categories as established by Auer, and the amount of urban and rural land use within 3 km of Asarco was calculated. The area near Asarco that was examined is depicted in Figure 5-3, while the results of the analysis are presented in Table 5-3.

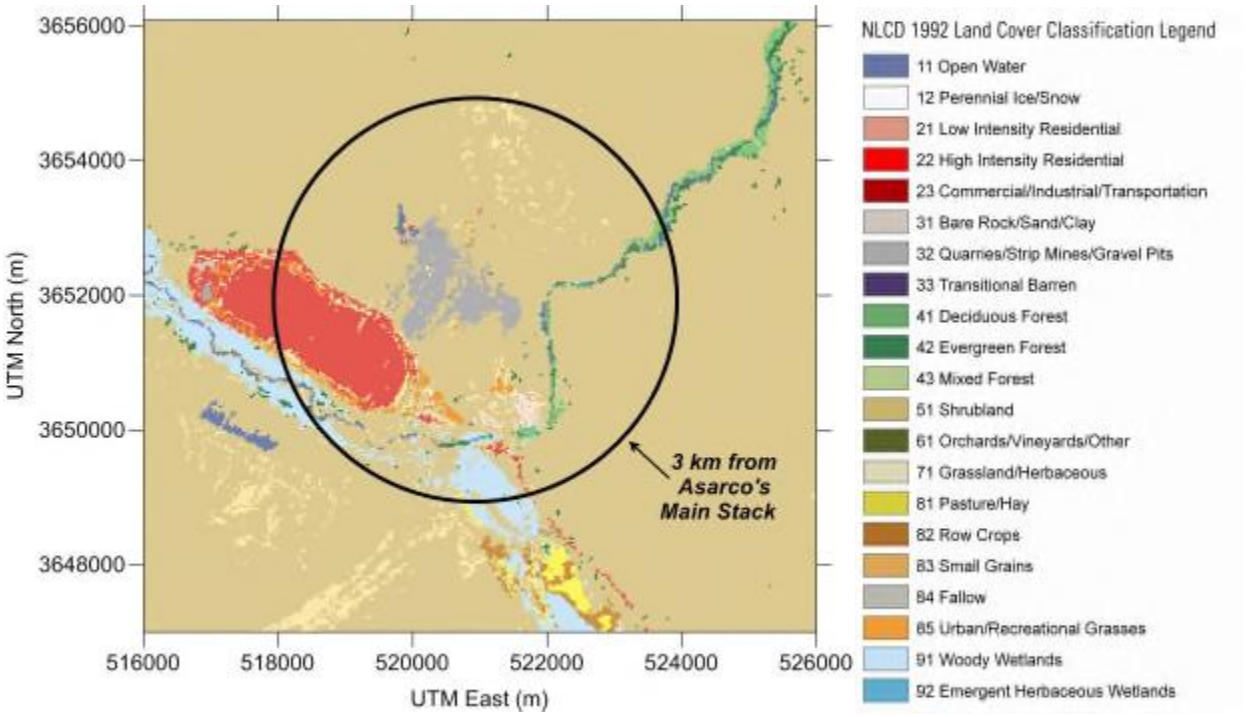


Figure 5-3: Land Use near Asarco

Table 5-3: Land Use within 3 km of Asarco Smelter

2016 NLCD Land Use Category	Percent of Area within 3 km of ASARCO	Rural/Urban
Open Water	0.0%	Rural
Perennial Ice/Snow	1.0%	Rural
Developed, Open Space	0.0%	Rural
Developed, Low Intensity	2.2%	Urban
Developed, Medium Intensity	3.3%	Urban
Developed, High Intensity	4.7%	Urban
Barren Land (Rock/Sand/Clay)	2.6%	Rural
Unconsolidated Shore	9.9%	Rural
Deciduous Forest	0.0%	Rural
Evergreen Forest	0.0%	Rural
Mixed Forest	0.0%	Rural
Dwarf Scrub	0.0%	Rural
Shrub/Scrub	0.0%	Rural
Grasslands/Herbaceous	67.6%	Rural
Sedge/Herbaceous	0.0%	Rural
Lichens	0.0%	Rural
Moss	0.0%	Rural
Pasture/Hay	0.0%	Rural
Cultivated Crops	0.0%	Rural
Woody Wetlands	0.0%	Rural
Palustrine Forested Wetland	8.2%	Rural
Palustrine Scrub/Shrub Wetland	0.0%	Rural
Estuarine Forested Wetland	0.0%	Rural
Estuarine Scrub/Shrub Wetland	0.0%	Rural
Emergent Herbaceous Wetland	0.0%	Rural
Palustrine Emergent Wetland (Pe	0.4%	Rural
Estuarine Emergent Wetland	0.0%	Rural
Palustrine Aquatic Bed	0.0%	Rural
Estuarine Aquatic Bed	0.0%	Rural

For the purposes pf the Auer Method, the following 2016 NLCD land use categories were assumed to be "urban":

1. Developed, Low Intensity
2. Developed, Medium Intensity
3. Developed, High Intensity

As shown in Table 5-3, these three land use categories comprise 10.2% of the land use within 3 km of ASARCO; accordingly the sum of the “rural” categories is 89.8%. Therefore, the area within 3 km of ASARCO is defines as “rural” and identified as such in the AERMOD input.

6.0 Meteorological Data

6.1 AERMET

EPA's AERMET tool (version 22112) was used to process meteorological data for use with AERMOD. AERMET merges National Weather Service (NWS) surface observations with NWS upper air observations and performs calculations of meteorological parameters required by AERMOD. In addition to the meteorological observations, AERMET further requires the inclusion of the characteristics of land use surfaces that Asarco calculated using EPA's AERSURFACE tool.

6.1.1 Surface Observations

EPA recommends that AERMOD be run with a minimum of 5 years of NWS data or 1 year of on-site meteorological data. The meteorological data used in the sequential modeling consists of on-site hourly surface observations collected by Asarco from a 10-meter tower located approximately 0.35 kilometers south of the smelter building, on Camera Hill. Figure 6-1 shows the location of the tower site relative to the proposed project.

The meteorological data used in the modeling consist of the five most recent years of data available, specifically 2015-2016 and 2018-2020. During 2017 the anemometer failed an audit and was replaced, while during 2021 the solar radiation sensor failed an audit and was replaced. As a result, neither of these years met the minimum 90% data completeness requirement for regulatory modeling purposes. Table 6-1 on the following page provides the percent of missing data by variable for all years of modeled data.



Figure 6-1: Onsite Meteorological Station

Table 6-1: Camera Hill Data Completeness Analysis

Year	Quarter	Percentage of Missing Data by Variable				
		Wind Direction	Wind Speed	Temperature (2 m)	Temperature (10 m)	Sigma Theta
2015	1	0.3%	0.3%	0.3%	0.0%	0.3%
	2	0.3%	0.3%	0.3%	0.0%	0.3%
	3	0.0%	0.0%	0.0%	0.0%	0.0%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2016	1	0.0%	0.0%	0.0%	0.0%	0.0%
	2	0.2%	0.2%	0.2%	0.2%	0.2%
	3	6.4%	6.4%	6.4%	6.4%	6.4%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2018	1	0.3%	0.3%	0.3%	0.3%	0.3%
	2	0.2%	0.2%	0.2%	0.2%	0.2%
	3	3.5%	3.5%	3.5%	3.5%	3.5%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2019	1	0.2%	0.2%	0.2%	0.2%	0.2%
	2	0.7%	0.7%	0.7%	0.7%	0.7%
	3	0.9%	0.9%	0.9%	0.9%	0.9%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2020	1	0.1%	0.1%	0.1%	0.1%	0.1%
	2	0.0%	0.0%	0.0%	0.0%	0.0%
	3	0.1%	0.1%	0.1%	0.1%	0.1%
	4	0.0%	0.0%	0.0%	0.0%	0.0%

The Camera Hill monitoring station is equipped with the following instrumentation:

- Wind speed, wind direction, standard deviation of horizontal wind, and ambient temperature at 10 meters;
- Ambient temperature at 2 meters;
- Atmospheric pressure;
- Relative humidity;
- Solar radiation; and
- Precipitation.

The Camera Hill monitoring station is operated pursuant to the requirements of the consent decree in the matter of United States of America v. ASARCO LLC, No. CV-15-02206-PHX. Appendix B 31-32 of the consent decree and §§ 5.1-5.2 of the fugitive dust plan, that EPA approved pursuant to the decree, make the Camera Hill monitoring station's operation subject to the applicable quality assurance requirements of:

- 40 C.F.R. Part 58 Appendix A;
- EPA's Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV, Meteorological Measurements, Version 2.0;

- The Quality Assurance Project Plan that was initially developed by EPA under the administrative settlement agreement and order on consent in the matter of the Asarco Hayden Plant Site, Docket No. CERCLA 2008-13 (AOC).

ADEQ has included the data validation reports for the Camera Hill monitor as Appendix G of this TSD. These reports are for the years 2015, 2016, 2018, 2019 and 2020, which encompass the meteorological data used in the attainment modeling.

6.1.2 Upper Air Observations

Upper air data were taken from the Tucson International Airport (WBAN 23160) in Tucson, Arizona.

6.1.3 AERSURFACE

ASARCO used EPA's AERSURFACE tool (version 20060) to calculate the surface roughness length, albedo and Bowen ratio inputs required by AERMET. EPA developed AERSURFACE to identify these parameters within a defined radius from a specified point. In this case, ASARCO input the UTM coordinates of the on-site meteorological tower to AERSURFACE along with a 1-kilometer radius per EPA guidance. ASARCO acquired land cover, tree canopy, and impervious surface information for the year 2016 as inputs to AERSURFACE. ASARCO calculated the parameters for twelve compass sectors of 30° each, and by month. ASARCO assigned the seasonal categories as follows per ADEQ guidance:

- Late autumn after frost and harvest, or winter with no snow: December, January, February, March;
- Winter with continuous snow on the ground: none;
- Transitional spring (partial green coverage, short annuals): April, May, June;
- Midsummer with lush vegetation: July, August, September; and
- Autumn with un-harvested cropland: October, November.

Per an August 16, 2022 email from Feng Mao (ADEQ) to Bill Jones (BSM), ASARCO assumed the following moisture conditions for each of the modeled years:

- 2015: wet surface moisture
- 2016: wet surface moisture
- 2018: average surface moisture
- 2019: wet surface moisture
- 2020: dry surface moisture

6.1.4 Determination of Representativeness

Section 8.3 of GAQM stipulates that the representativeness of a meteorological dataset depends on four criteria:

- Spatial proximity
- Complexity of terrain
- Exposure of the meteorological monitoring site
- Period of time during which data are collected

These four criteria are examined below:

Spatial Proximity

The Camera Hill meteorological station is located on Asarco's property. As such, there is not a large distance between the location of meteorological data and either the sources of emissions or receptors being modeled. Therefore, these data satisfy the spatial proximity requirements of Section 8.3 of 40 CFR 51 Appendix W.

Complexity of Terrain

Because the Camera Hill meteorological station is located on Asarco's property (and therefore close to Asarco emission sources), the meteorological conditions at that location are influenced by the complexity of the terrain in a similar manner as are the sources of emissions being modeled. Therefore, these data satisfy the complexity of terrain requirements of Section 8.3 of 40 CFR 51 Appendix W.

Exposure of the Meteorological Monitoring Site

The Camera Hill meteorological monitoring tower is located at the top of Camera Hill, with no structures or significant vegetation in the area. Therefore, these data satisfy the exposure requirements of Section 8.3 of 40 CFR 51 Appendix W.

Period of time during which data are collected

The first full year of data available at Camera Hill were used in this analysis. Therefore, these data satisfy the temporal requirements of Section 8.3 of 40 CFR 51 Appendix W.

6.1.5 AERMET Processing

The Camera Hill surface data and the Tucson upper air data were processed using AERMET (Version 15181). Note that because cloud cover was not measured at Camera Hill, the Bulk Richardson method was used to estimate the heat flux under stable conditions, based on the low-level delta-temperature measurement.

7.0 Background Air Quality

Historically the background concentration used in ASARCO modeling has been based on periods when the smelter was shut down. Because the smelter has been temporarily shut down since October 2019 because of a work stoppage, there are two calendar years of data available that correspond to when the smelter was not operating.

Accordingly, the background concentration in the attainment demonstration utilizes data from the HOJ monitor for the years 2020 and 2021. The location of the HOJ monitor is shown in Figure 7-1.

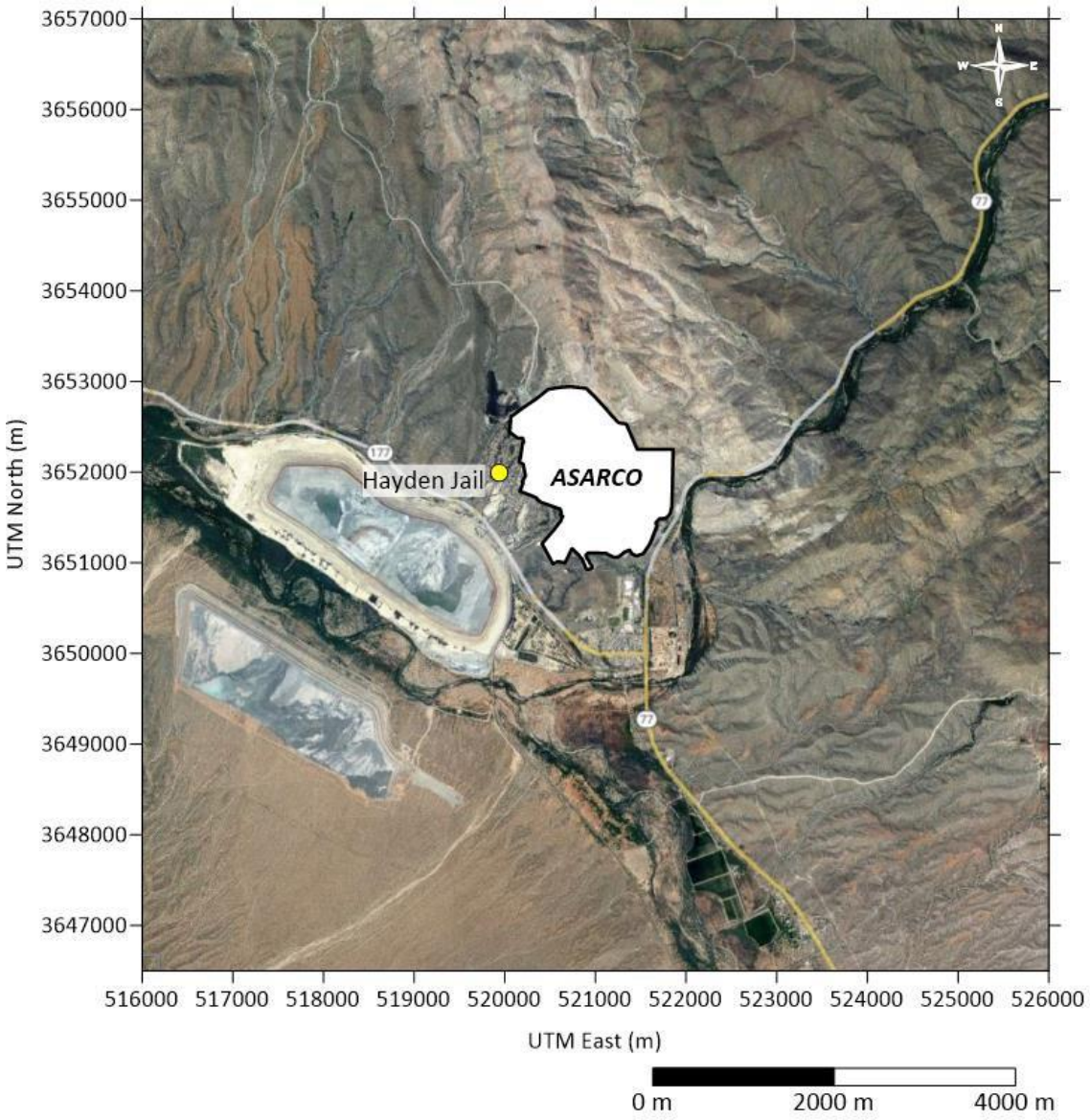


Figure 7-1: Hayden Old Jail Monitor Location

Because such a long period of shutdown data is available for use, the modeling utilizes guidance put forth by EPA in its "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard" (the concepts of which also apply to 1-hour SO_2).

In that guidance EPA discusses how meteorological factors associated with the dispersion of pollutants is a key consideration when developing a background concentration. Because there are some areas of complicated topography in and around the Hayden SO_2 SIP modeling domain (e.g., hills, arroyos, etc.), it is reasonable to expect some diurnal variability in SO_2 background concentrations as the atmosphere warms during the day/cools at night and accordingly affects the flow in and around ASARCO.

Because of this, the background concentration methodology follows EPA's recommendation that "…an appropriate methodology for incorporating background concentrations in the cumulative impact assessment for the 1-hour (SO_2) standard would be to use multiyear averages of the (99^{th})-percentile of the available background concentrations by season and hour-of-day…" Specifically, ASARCO is implementing the methodology put forth in ADEQ's "Air Quality Modeling Guidelines for Arizona Air Quality Permits" (November 2019), as specified by ADEQ in its August 22, 2022 email from Feng Mao to Bill Jones (BSM):

> **99^{th} percentile of the Seasonal Hour-Of-Day (2^{nd} Highest):** For each of the two years under review (2020 and 2021), Seasonal Hour-Of-Day is determined by organizing all of the SO_2 concentrations by hour of day (1AM, 2AM, 3AM, etc.) for each season of the year in descending order and selecting the 2^{nd} highest SO_2 concentrations for each hour of the day. The background concentrations are then determined as the two-year average of the 2^{nd} highest-concentrations for each hour of the day and season.

The resulting revised SEASHR values are presented in Table 7-1 below

Table 7-1: SEASHR Values for SO_2 Background in AERMOD

Hour	SO_2 Background Concentration (ppb) by Season			
	Winter	Spring	Summer	Fall
Hr. 1	1.3	1.3	1.6	1.6
Hr. 2	1.35	1.3	1.5	1.55
Hr. 3	1.35	1.25	1.5	1.6
Hr. 4	1.3	1.25	1.45	1.6
Hr. 5	1.35	1.4	1.5	1.6
Hr. 6	1.35	1.35	1.55	1.6
Hr. 7	1.25	1.25	1.5	1.6
Hr. 8	1.25	1.3	1.5	1.65
Hr. 9	1.35	1.4	1.45	1.6
Hr. 10	1.35	1.3	1.45	1.6
Hr. 11	1.35	1.3	1.45	1.6
Hr. 12	1.3	1.3	1.55	1.6

Hour	Winter	Spring	Summer	Fall
Hr. 13	1.4	2	1.6	1.75
Hr. 14	1.4	1.35	1.55	1.75
Hr. 15	1.4	1.35	1.5	1.7
Hr. 16	1.4	1.4	1.6	1.7
Hr. 17	1.5	1.35	1.55	1.7
Hr. 18	1.4	1.35	1.55	1.7
Hr. 19	1.35	1.4	2	1.55
Hr. 20	1.35	1.35	1.6	1.65
Hr. 21	1.4	1.35	1.55	1.65
Hr. 22	1.35	1.4	1.6	1.7
Hr. 23	1.35	1.45	1.65	1.7
Hr. 24	1.3	1.4	1.6	1.65

8.0 Air Quality Modeling Results and Emission Limits

This section provides a discussion on the air quality modeling and emission limits for the Asarco Smelter. Modeling was performed for different purposes as part of this analysis:

- Demonstrate that the proposed engineering/operational controls, combined with the reengineering and replacement of the damaged acid plant preheater at the Hayden smelter, will bring the Hayden SO_2 NAA into attainment with the 2010 SO_2 NAAQS.

- Determination of numeric process-stack and process-fugitive emission rate limits.

8.1 1-HR SO_2 NAAQS

The results of the 1-hr SO_2 NAAQS modeling are summarized in Table 8-1 below.

Highest 99th Percentile of Controlling 1-hr Concentrations (µg/m³)[a]	NAAQS (µg/m³)
195.97[b]	196.0
a. Includes background through the application of SEASHR in AERMOD b. Highest 99th Percentile of Controlling 1-hr Concentrations predicted to occur at (521851.1 m, 3651825.4 m)	

Figure 8-1: Modeling Results, 1-hr SO_2 NAAQS

Figure 8-1 on the following page illustrates the controlling 1-hr concentrations (including the background).

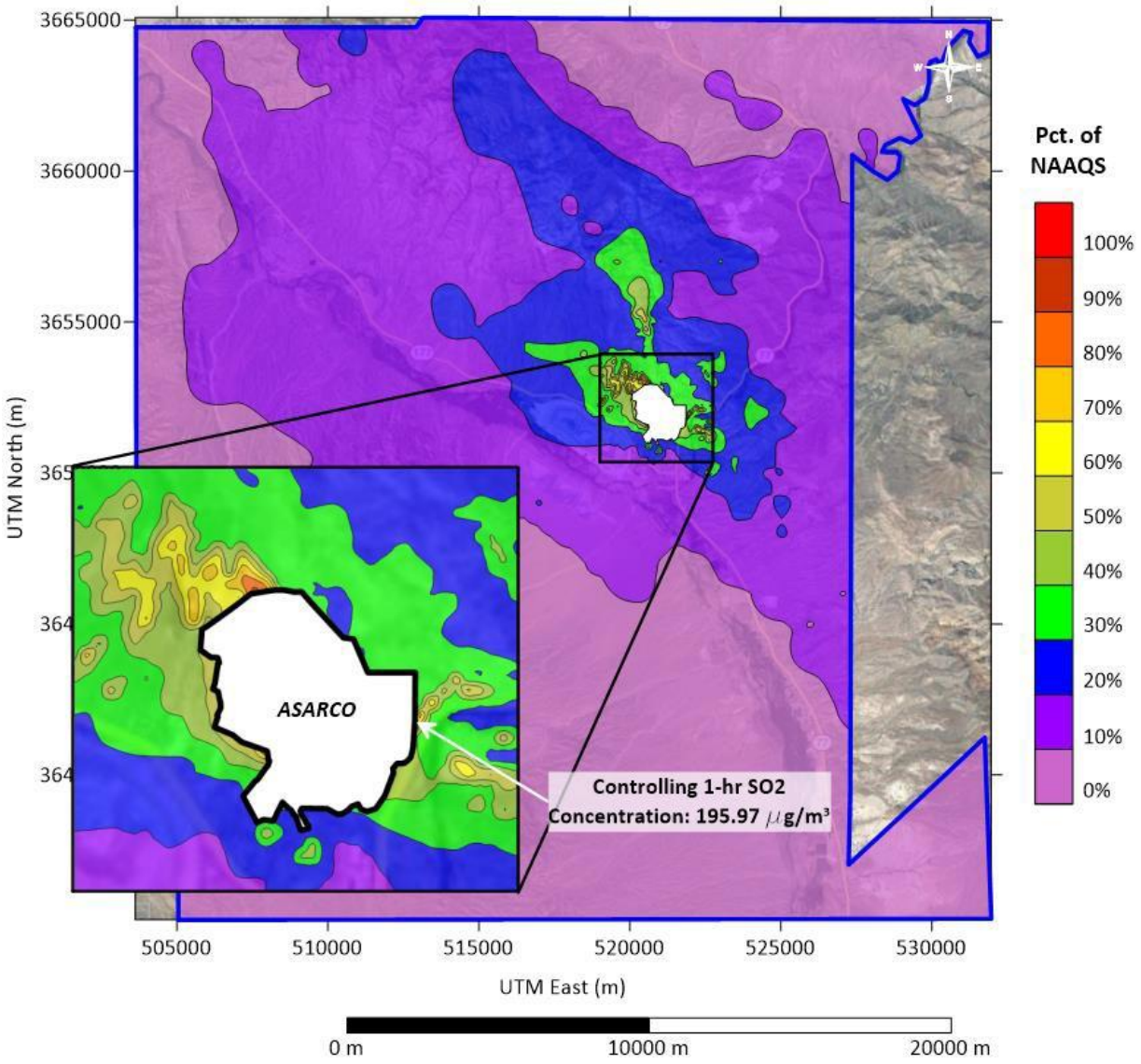


Figure 8-1: Controlling 1-HR SO_2 Concentration

As shown above, the controlling 1-hr SO_2 concentration is below the 1-hr SO_2 NAAQS of 196 µg/m^3. It is predicted to occur along the eastern side of the ASARCO AAB. Modeled 1-hr SO_2 concentrations generally decrease very rapidly with distance from ASARCO.

Additionally, Figures 8-2 to 8-9 provide the fourth highest modeled values for all significant SO_2 sources individually.

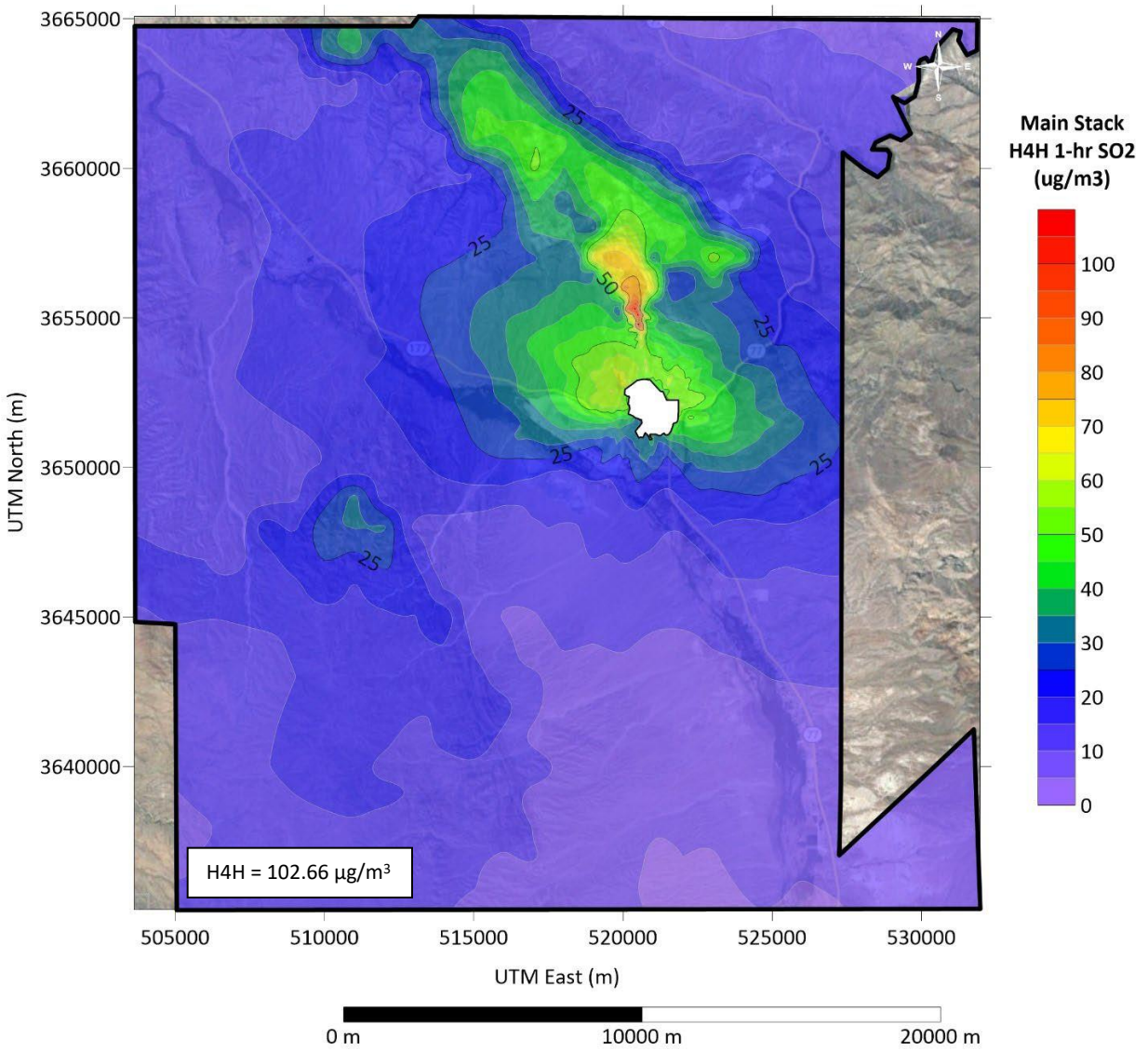


Figure 8-2: Main Stack 4th Highest

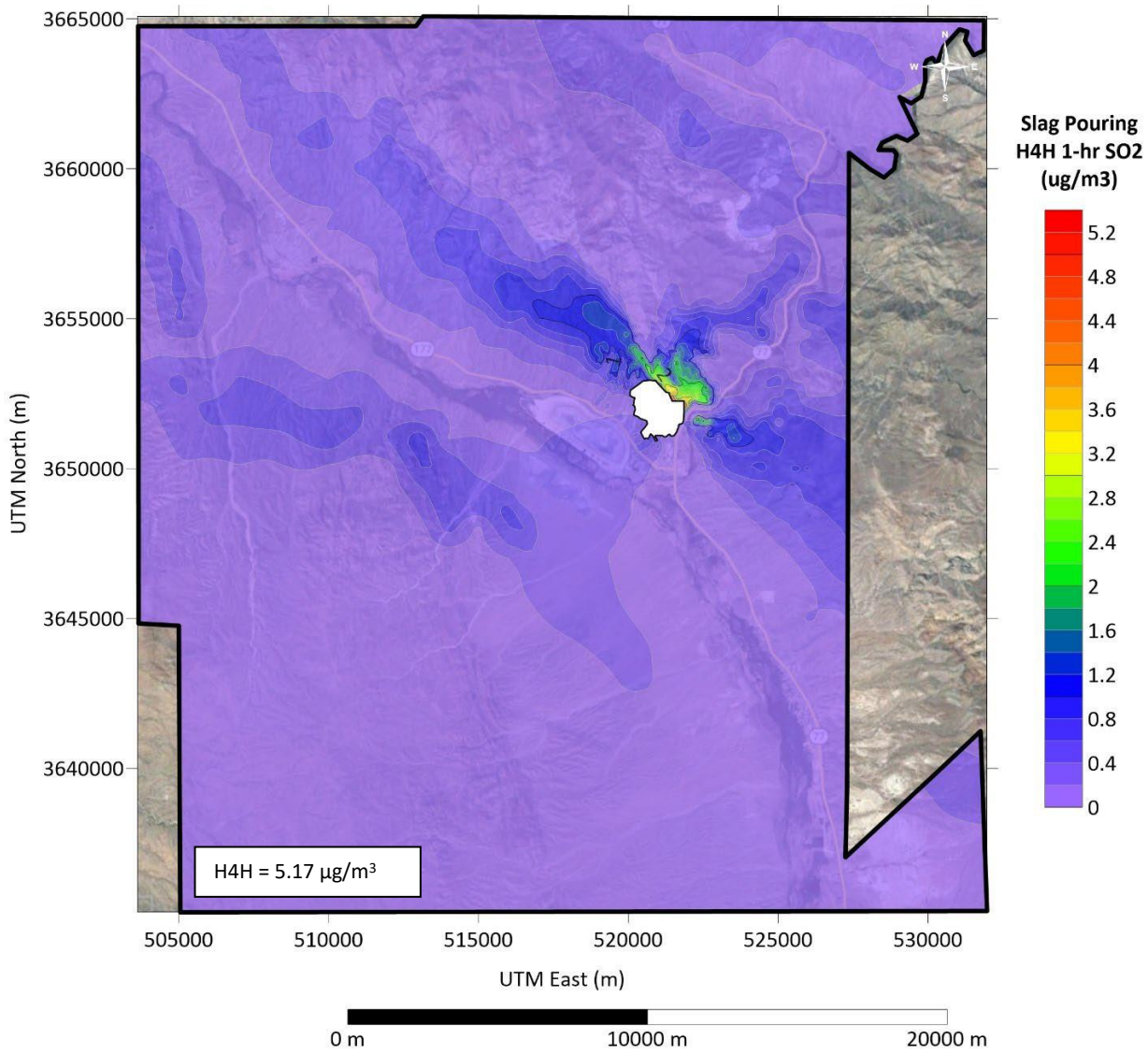


Figure 8-3: Slag Pouring 4th Highest

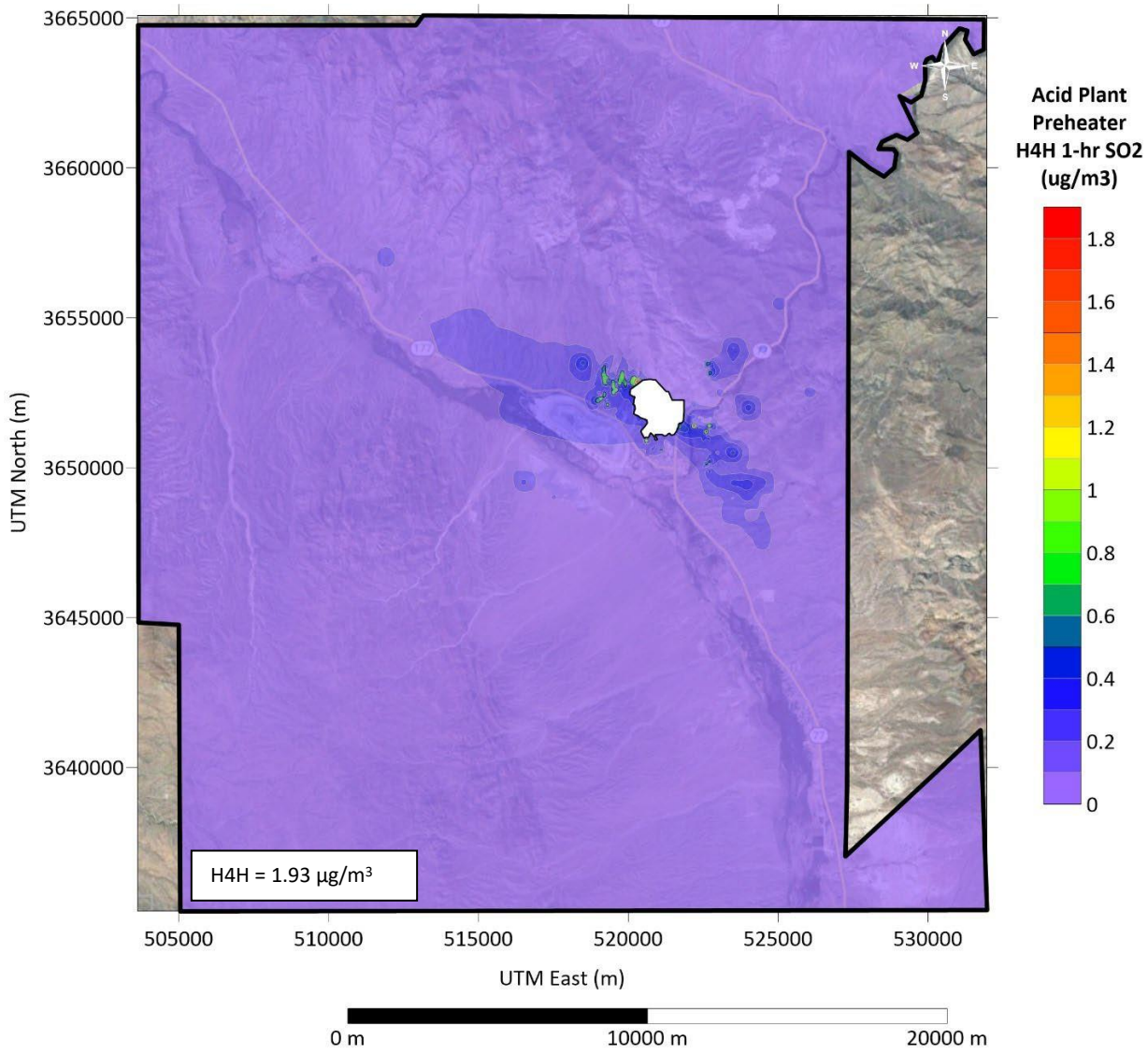


Figure 8-4: Acid Plant Preheater 4th Highest

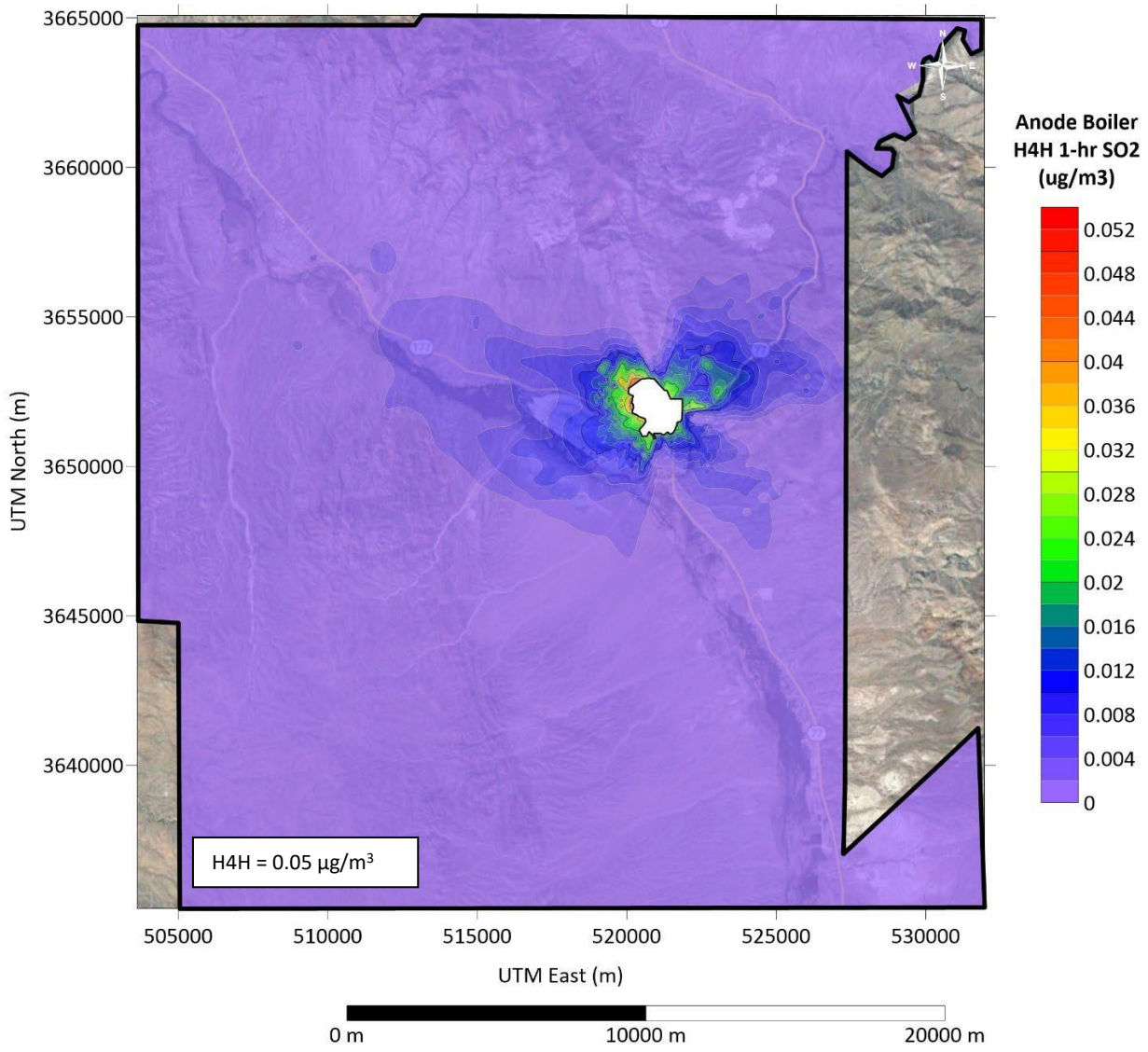


Figure 8-5: Anode Boiler 4th Highest

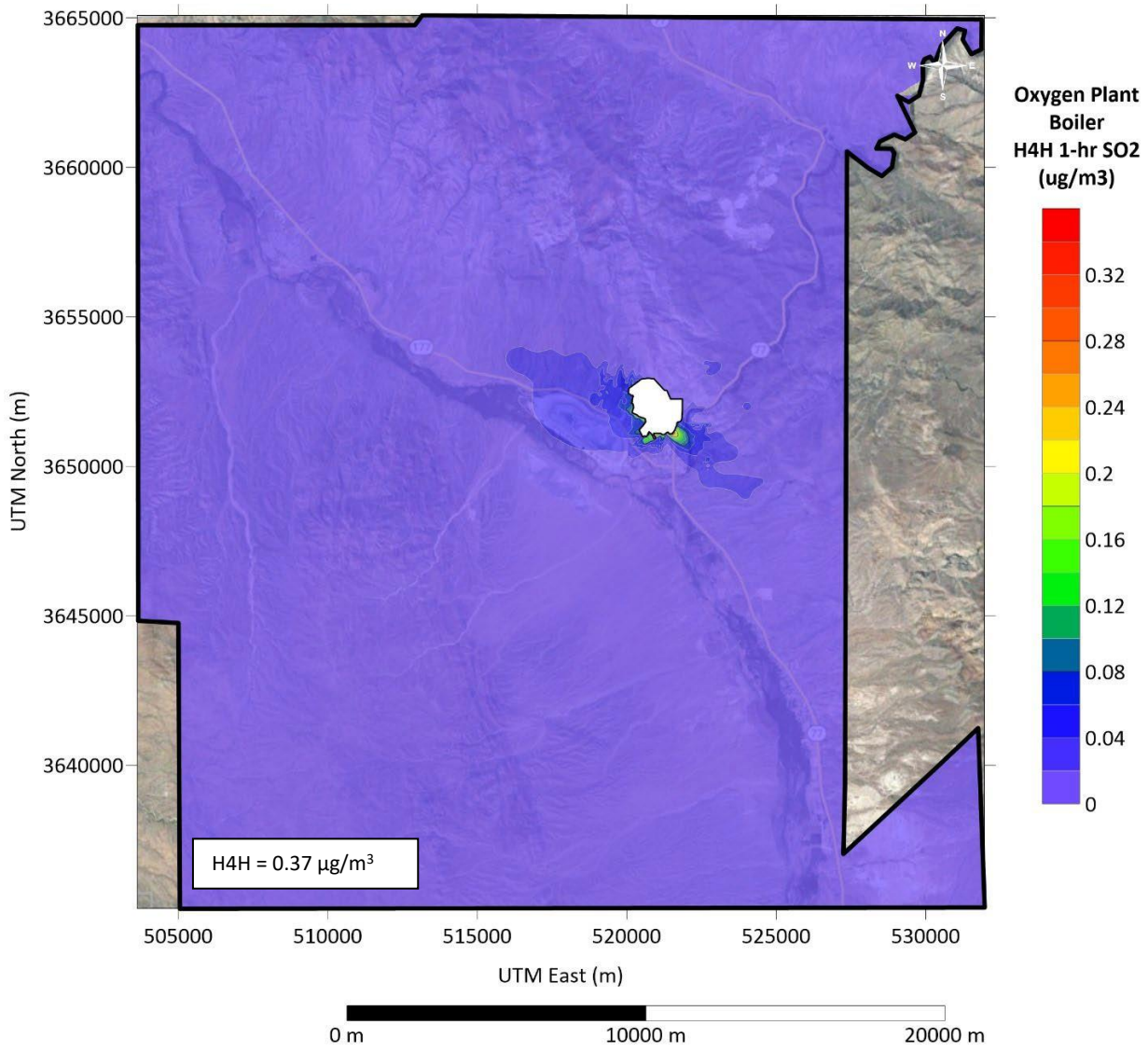


Figure 8-6: Oxygen Plant Boiler 4th Highest

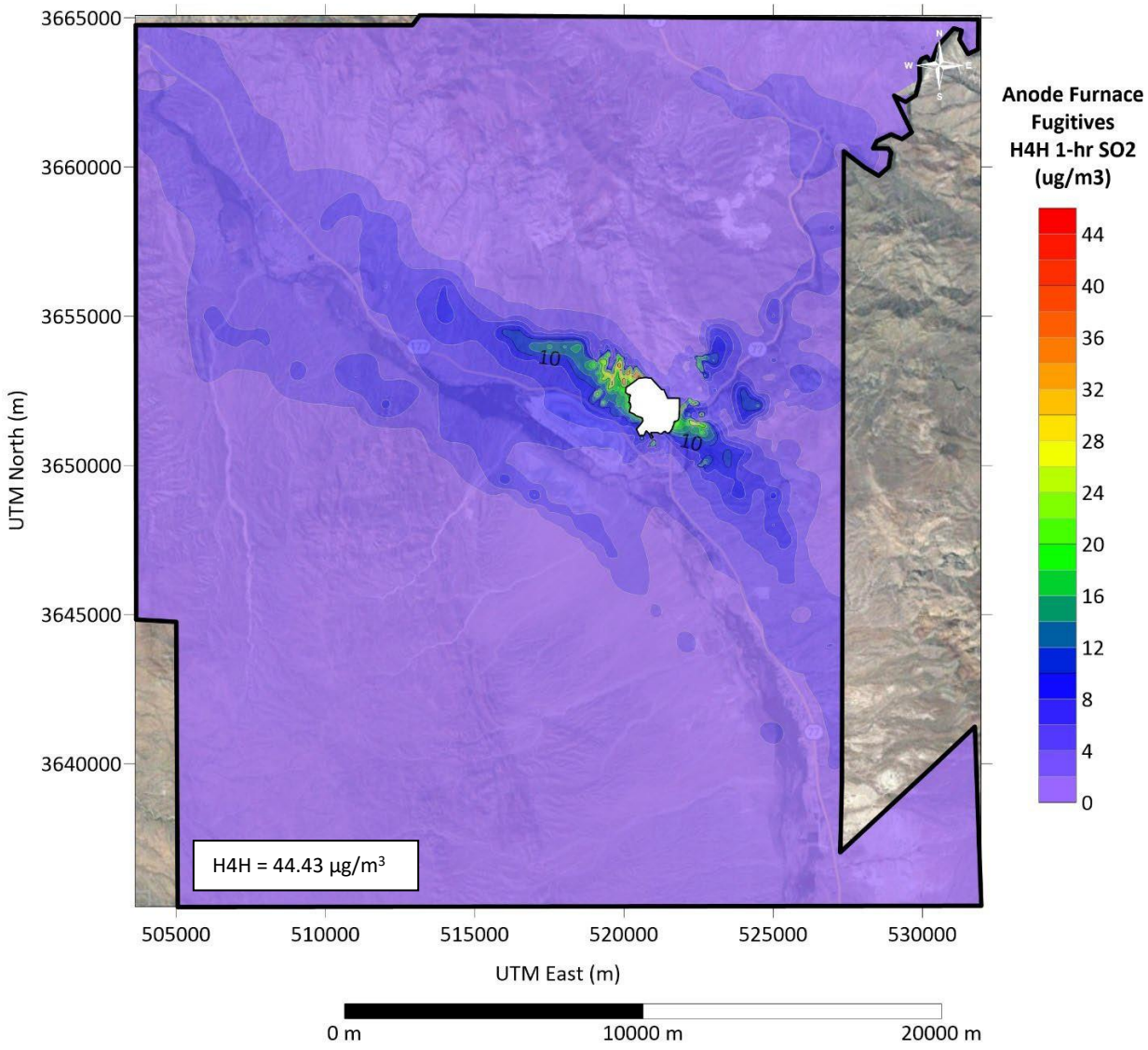


Figure 8-7: Anode Furnace Fugitives 4th Highest

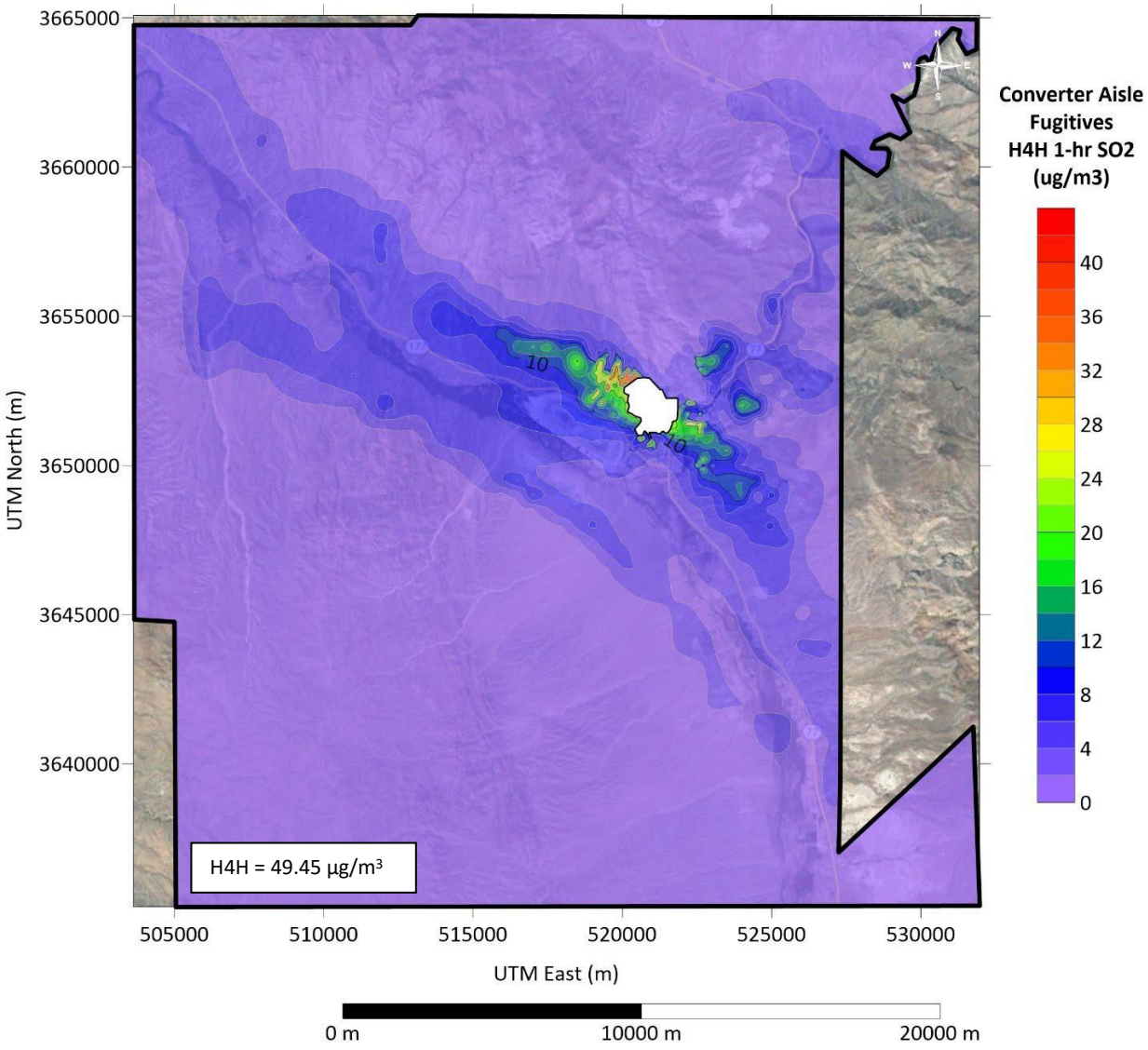


Figure 8-8: Converter Aisle Fugitives 4th Highest

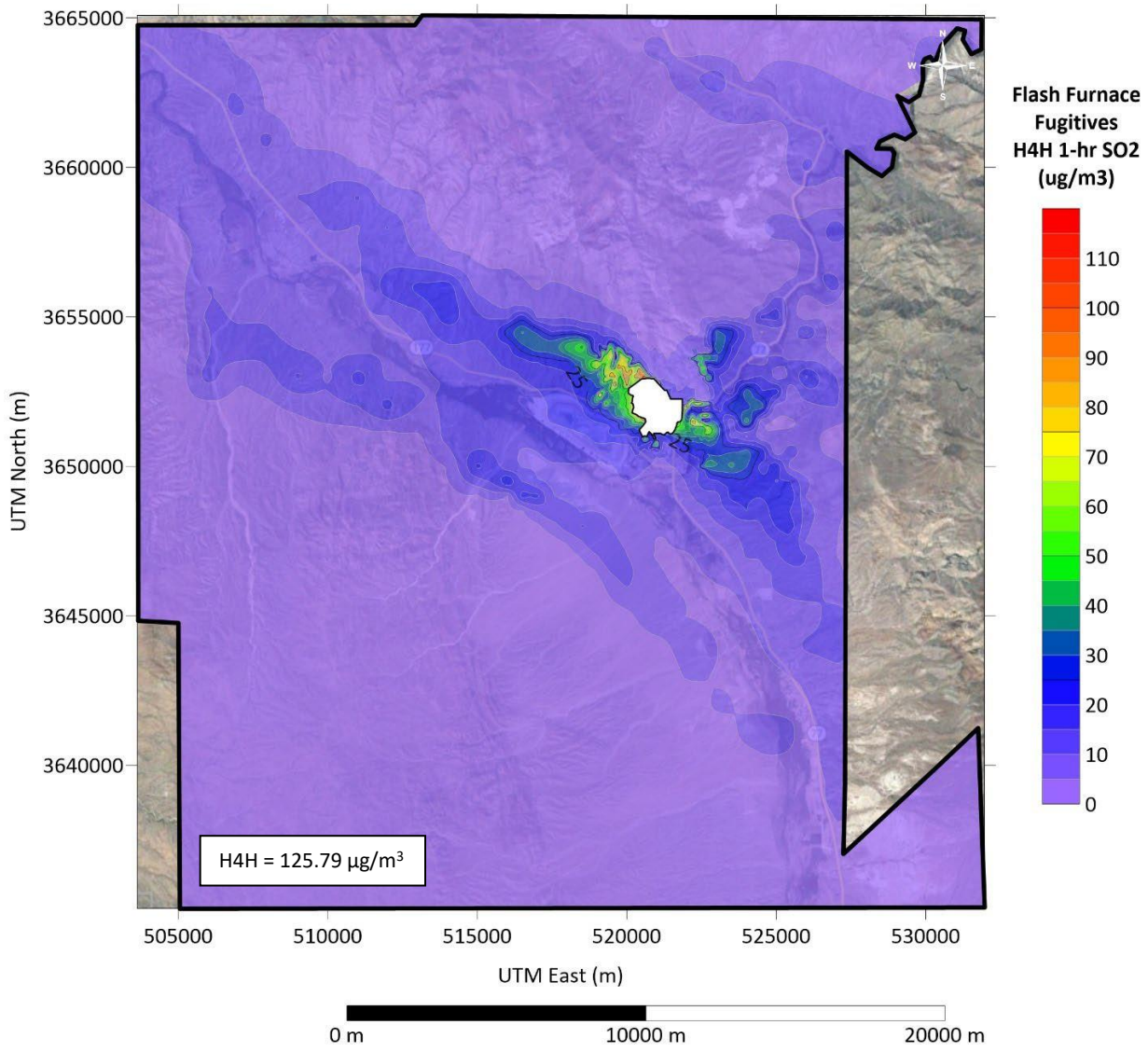


Figure 8-9: Flash Furnace Fugitives 4th Highest

8.2 Modeling Results for Former SO_2 NAAQS (3-hr, 24-hr, and Annual)

Modeling results for the former SO_2 NAAQS are summarized in Table 8-2.

Table 8-2: Modeling Results for Former SO_2 NAAQS

Averaging Period	Predicted Controlling Concentration ($\mu g/m^3$)[a]	NAAQS ($\mu g/m^3$)
3-hr	170.8 [b]	1300
24-hr	51.7 [c]	512
Annual	11.9 [d]	80
• Includes background through the application of SEASHR in AERMOD • Highest second-high 3-hr concentration predicted to occur at (520537.1 m, 3652922.9 m) • Highest second-high 24-hr concentration predicted to occur at (520615.8 m, 3651570.0 m) • Highest Annual concentration predicted to occur at (520611.7 m, 3651593.3 m)		

Plots of the controlling 3-hr, 24-hr, and annual impacts are depicted in Figures 8-10 through 8-12 on the following pages.

These plits show the controlling 3-hr, 24-hr, and Annual SO_2 concentration are below their respective NAAQS. The controlling 3-hr concentration is predicted to occur along the northern side of the ASARCO AAB, while the controlling 24-hr and Annual concentrations are predicted to occur along the western side of the ASARCO AAB. All modeled 3-hr, 24-hr, and Annual SO_2 concentrations are far below each of their NAAQS across all the receptors.

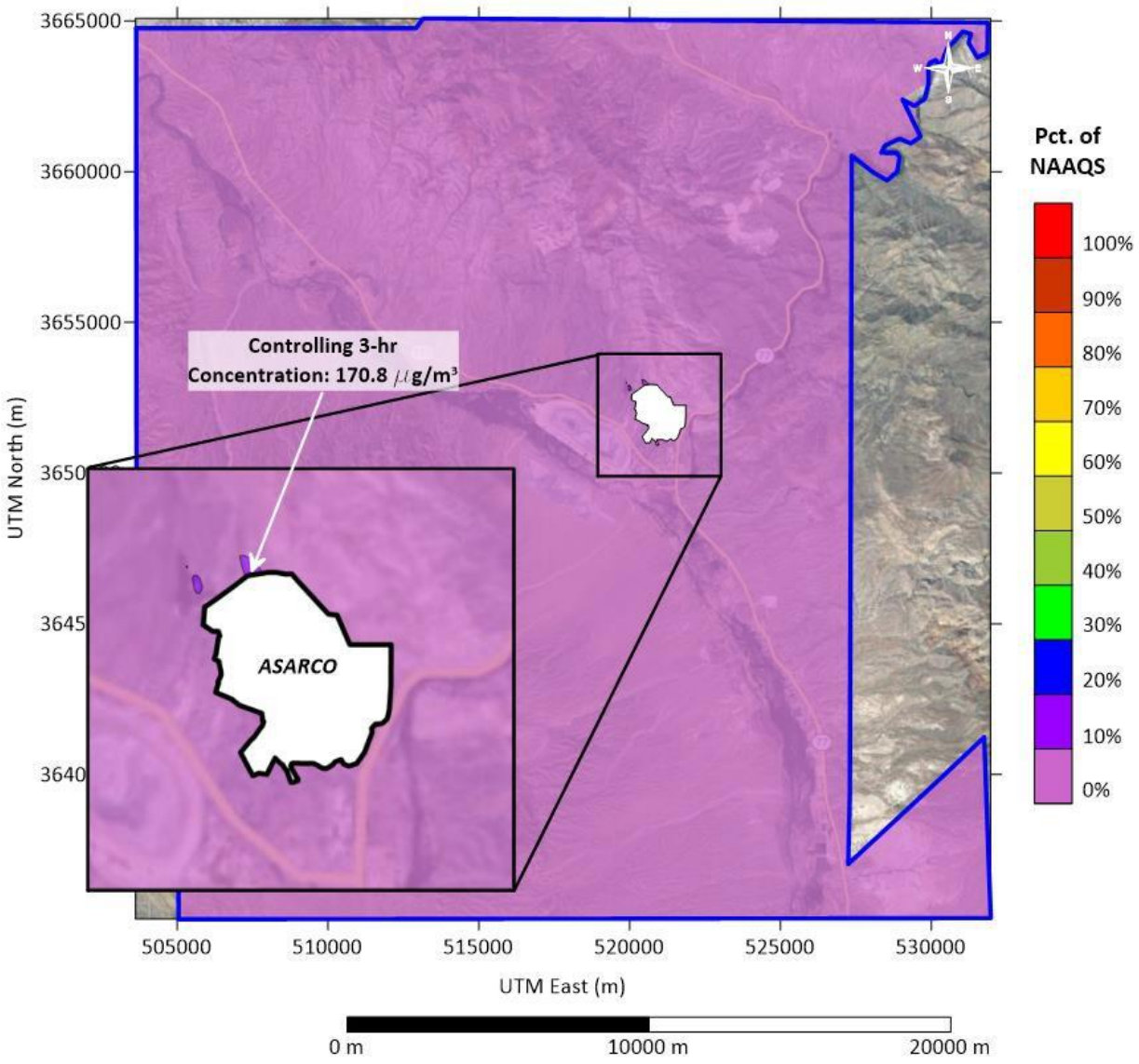


Figure 8-10: Controlling 3-hr SO_2 Concentrations

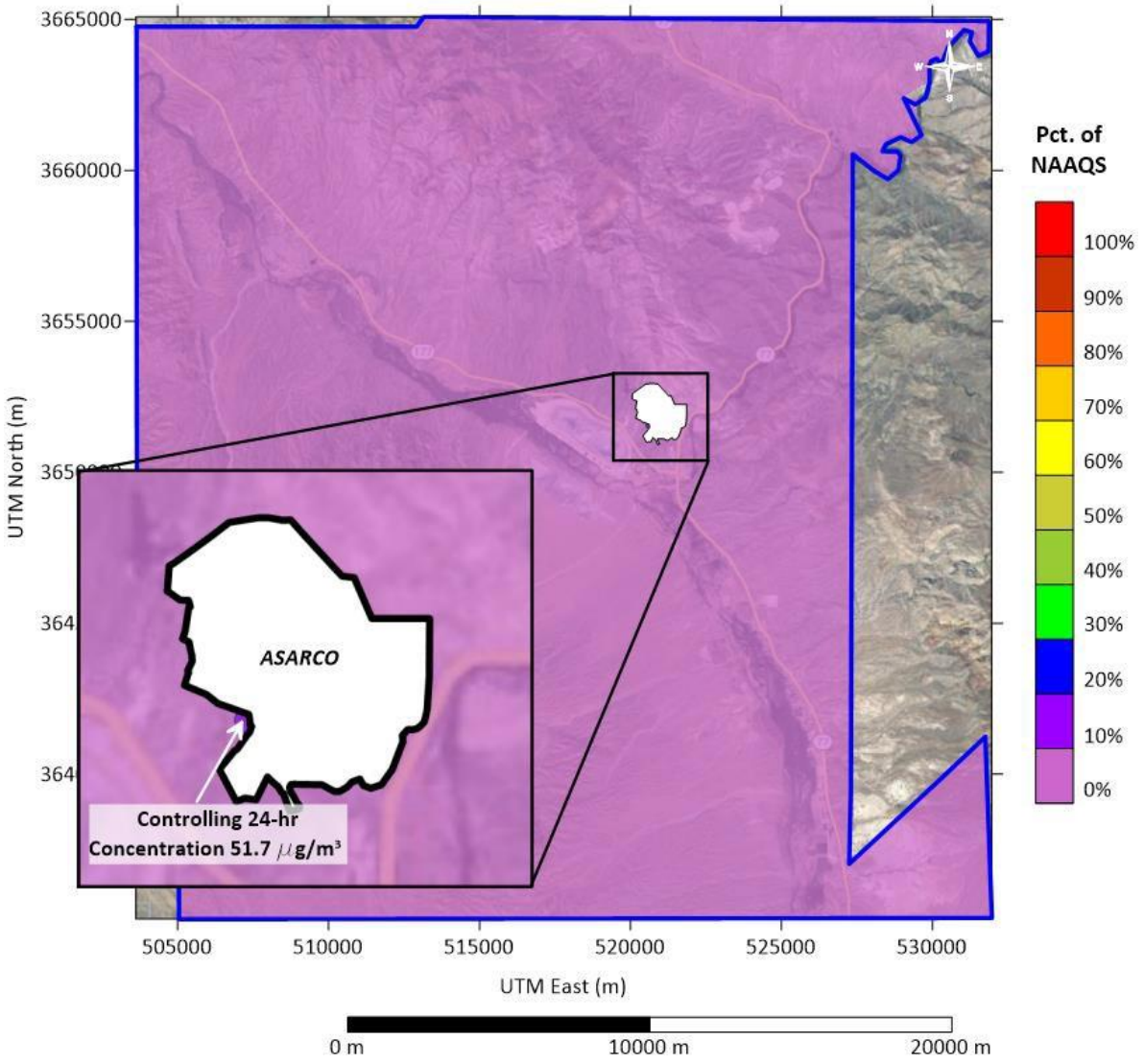


Figure 8-11: Controlling 24-hr SO_2 Concentrations

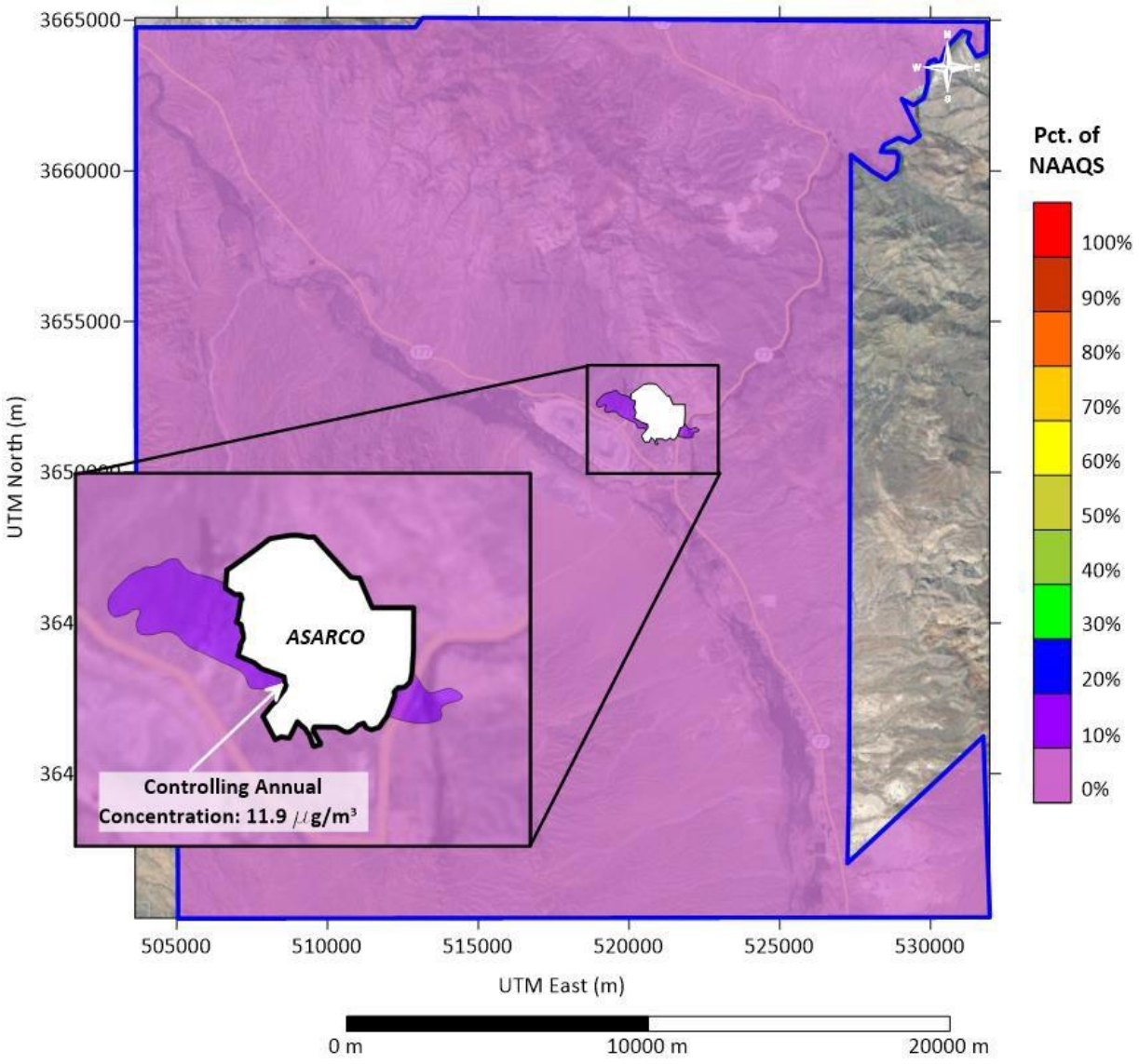


Figure 8-12: Controlling Annual SO_2 Concentrations

8.3 Emission Limits

Table 8-3 contains an inclusive but not an exhaustive list of the monitoring, recordkeeping and reporting requirements prescribed by the air quality permit. The table below is intended to provide insight to the public for how the Permittee is required to demonstrate compliance with the emission limits in the permit.

Table 8-3: Permit Revision No. 96410 Summary

<table>
<tr><th>Emission Unit</th><th>Pollutant</th><th>Emission Limit</th><th>Monitoring Requirements</th><th>Recordkeeping Requirements</th><th>Reporting Requirements</th></tr>
<tr><td>Main Stack</td><td>SO_2</td><td>1069.1 lbs/hr, 14-operating day rolling average</td><td>SO_2 Continuous Emissions Monitoring System (CEMS) - exit of the Anode Secondary Hood Baghouse</td><td rowspan="4">Maintain all measurements from the continuous monitoring systems (CMS) including the date, place, and time of sampling or measurement, parameters sampled or measured, and results

Records of all compliance calculations

Records of quality assurance and quality control activities conducted on the CMS

Records of CMS breakdowns, repairs, maintenance, out of control periods, calibration checks, and zero and span adjustments

Records of all major maintenance activities conducted on emission units, capture system, air pollution control equipment, and CMS</td><td rowspan="4">Quarterly data assessment report in accordance with 40 CFR Part 60, Appendix F, Procedure 1

Semiannual excess emissions and monitoring systems performance report for the CMS</td></tr>
<tr><td>INCO Flash Furnace, Matte Tapping and Slag Skimming Areas</td><td>SO_2</td><td>38.5 lbs/hr</td><td rowspan="3">SO_2 CEMS – corresponding roofline areas</td></tr>
<tr><td>Converter Aisle</td><td>SO_2</td><td>10 lbs/hr</td></tr>
<tr><td>Anode Furnaces</td><td>SO_2</td><td>9 lbs/hr</td></tr>
</table>

8.3.1 Roofline Fugitive Emission Limits

Based upon the planned installation of the redesigned acid plant preheater and the three projects outlined in Section 5.1, ASARCO and its engineering and modeling consultants have determined that the following process fugitive SO_2 roofline monitoring system limits are appropriate and protective of the 1- hour SO_2 NAAQS based upon the modeling described in this TSD. These limits would be in effect at all times the underlying process unit(s) or operations are operating.

Flash Furnace area:	38.5 lb/hr
Converter aisle area:	10.0 lb/hr
Anode aisle area:	9.0 lb/hr

Table 8-3 connects the modeled emission rates to the new roofline fugitive emission limits. The per volume source emission rates in the table below are the same values from Table 5-2, but converted to lb/hr. Multiplying the per volume source emission rate by the number of volume sources gives the total emissions, which Asarco will adopt as the new limit for the given source.

Table 8-4: Modeled Emission Rates & Limits

Roofline Source	Number of Volume Sources	Per Volume Source Emission Rate (lb/hr)	Total Emissions (lb/hr)
Flash Furnace	49	0.7857	38.5
Converter	88	0.1135	10.0
Anode	96	0.0937	9.0

The fugitive roofline monitoring system uses a manifold system to take samples along the roofline of each area of the Hayden smelter. The sample is then routed past a CEMS that provides a minimum of four samples per hour (1 for each 15-minute segment). Each roofline segment (flash furnace, converter aisle, and anode furnace area) has a separate system to measure emissions performance on an hourly basis and is directly comparable to the limit.

Monitoring requirements for the fugitive emission limits are described in Condition III.B of the Smelter's new Title V permit, and are as follows:

a. The Permittee shall install, calibrate, maintain and operate a CEMS for continuously monitoring and recording SO2 emissions and volumetric flows at the roofline of the following areas when the underlying process units are operating:
    i. Flash furnace roofline system, located on the penthouse and roof of the flash furnace building;
    ii. Converter aisle roofline system, located at the north and south ends of the converter aisle; and

iii. Anode aisle roofline system, located over the anode furnaces

b. These systems shall be installed and a RATA successfully completed within 180 days of the effective date of this section under Conditionn I.B.

c. The CEMS shall meet the requirements of Section R18-2-B1302(E)(2), (3), and (5), except that everywhere those provisions reference "subsection (E)(1)" it shall mean "Condition III.C.2.a of permit number 39948."

d. The Permittee may petition the Director for approval of a major maintenance period should the collection lines of one or more of the roofline fugitive monitoring systems require replacement, repair or refurbishment. The petition shall state the repair needed and the time required. System downtime shall be held to the minimum possible. Upon finding that the repair is justified, the Director shall issue a letter approving the period and specifying the time the system may be offline to implement the repair. Failure to monitor during an approved major maintenance period is not a violation of this section.

8.3.2 Main Stack Emission Limit

The previous Hayden SO_2 SIP revision established a Main Stack dual limit in R18-2-B1302(c). This limit stated that emissions from the Main Stack shall not exceed 1069.1 lb/hr on a 14-operating day average unless 1518 pounds or less is emitted during each hour of the 14-operating day period. For the current SIP revision, the Asarco Main Stack limit will consist of only the 1069.1 lb/hr limit. The 1518 lb/hr rate in the previous "dual limit" will not be part of the Main Stack limit found in the latest permit revision.

The 1069.1 lb/hr 14-day limit was derived using the EPA's 2014 "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions", specifically Appendices B and C. The basis of this limit is the 1518 lb/hr CEV modeled for the Main Stack, and a forecasted future (post-CRP controls) emissions profile. This future emissions profile was used to determine the longer-term emission averages.

As part of the latest SIP effort, ADEQ has reviewed the assumptions used to develop the 14-day averages used to derive the final limit. A comparison of the actual (post-CRP) and forecasted main stack data can be seen in the table below. This review of the data shows the forecasted emissions profile aligns closely with the post-CRP main stack data. Figures 8-13 and 8-14 have also been provided to illustrate the agreement between the forecasted emissions used to calculate the 14-day limit and post-control Main Stack data. Looking at Figure 8-14, the forecasted values over-predicted the actual data. This suggests the relative number of higher emission values is lower in the actual dataset than in the forecasted data. ADEQ feels the results of the attainment modeling, which rely on the 1518 lb/hr CEV, and the agreement between the actual and forecasted data provide sufficient support for the 1069.1 lb/hr 14-day average limit.

Table 8-5: Main Stack Actual vs Forecasted Emissions

Statistic	Forecast 14-Day (lb)	Actual 14-Day (lb)
Max	1131.9	804.9
Mean	564.8	539.5
Median	545.1	530.6
Min	22.1	333.4
Std Dev	139.5	82.3

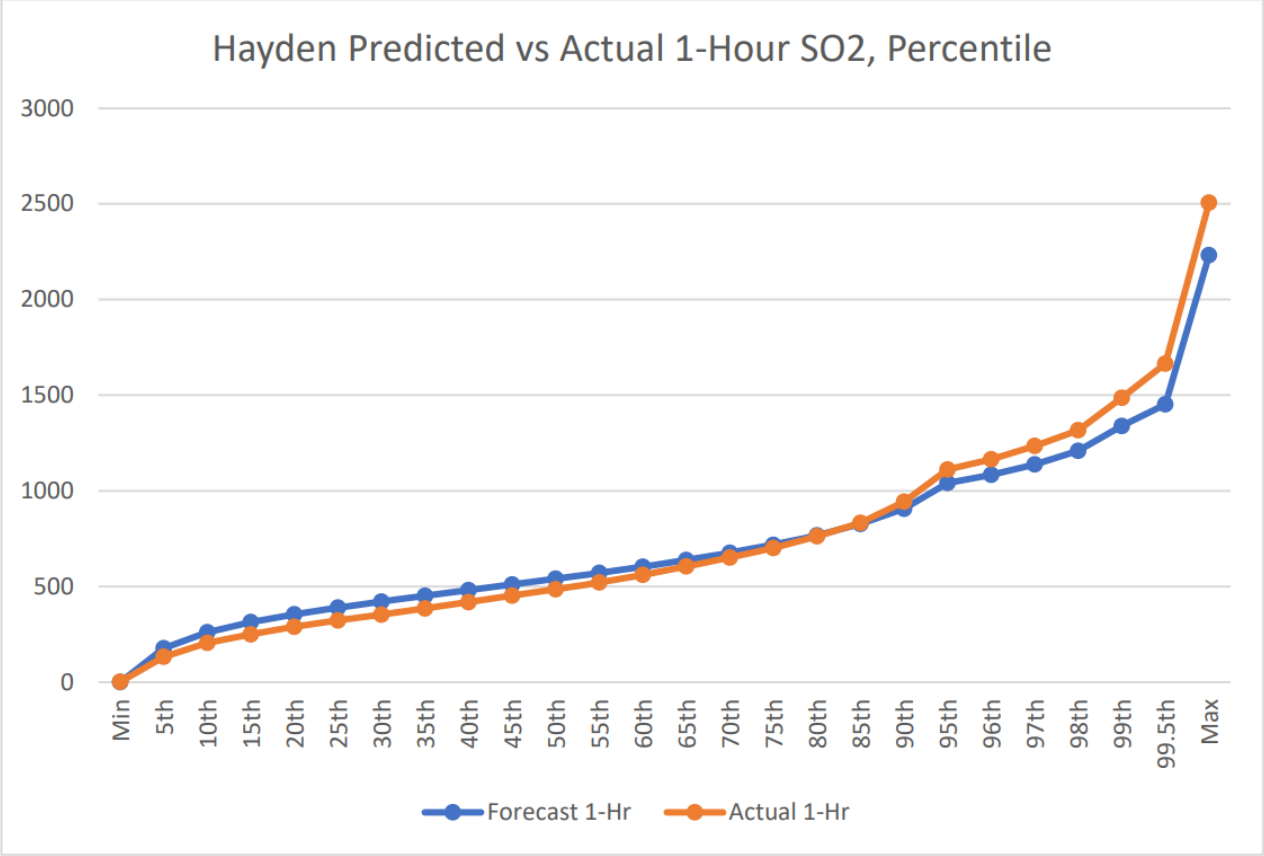


Figure 8-13: Main Stack 1-Hr Actual vs Forecasted Percentile Comparison

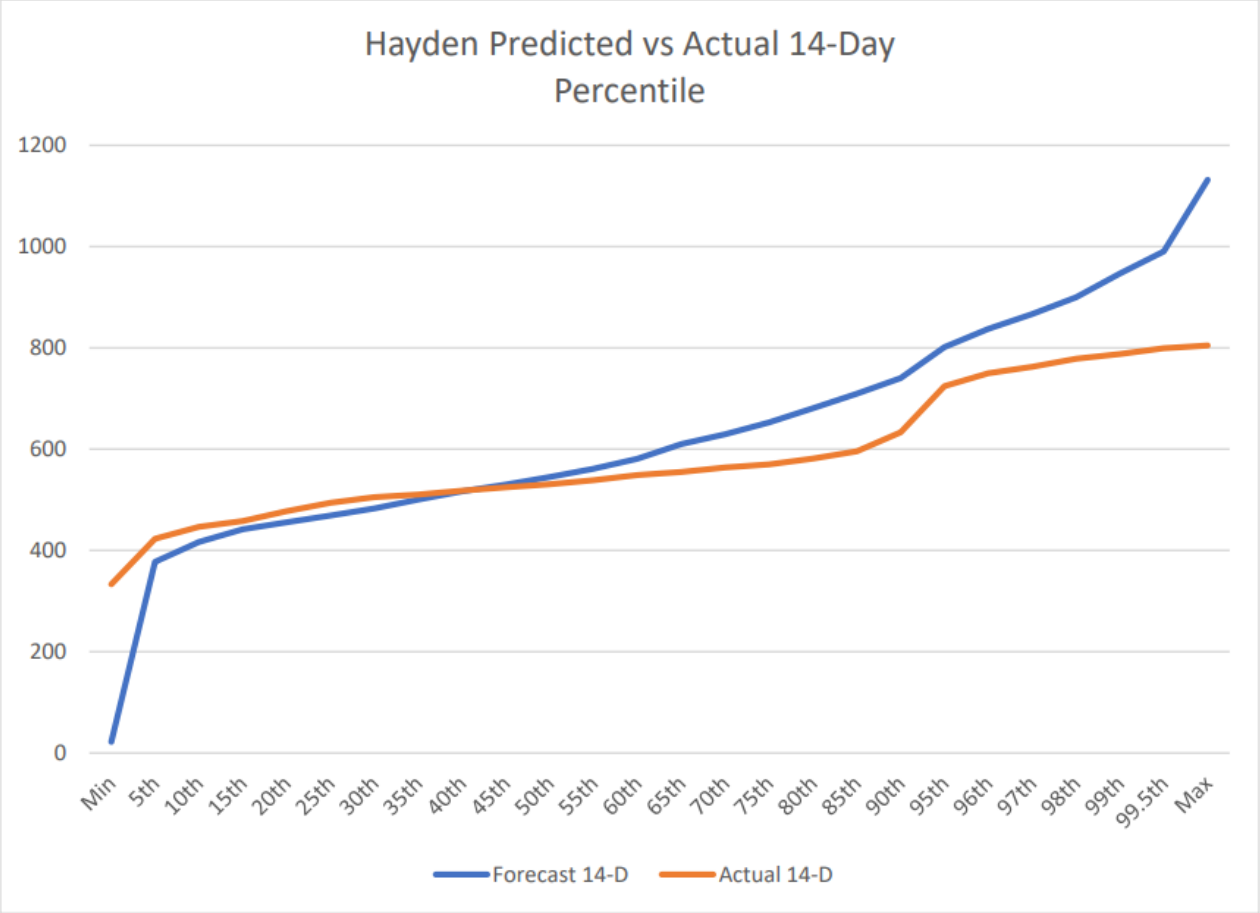


Figure 8-14: Main Stack 14-Day Actual vs Forecasted Percentile Comparison

9.0 References

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9.1 Appendix A: Asarco's Updated Ambient Air Boundary

LAW OFFICES
JORDEN HISER
& JOY, P.L.C.

5080 N. 40TH STREET, SUITE 245
PHOENIX, ARIZONA 85018
TELEPHONE: 480-505-3900
FACSIMILE: 480-505-3901

ERIC L. HISER

DIRECT LINE: 480-505-3927
e-mail: ehiser@JHJLawyers.com

MEMORANDUM

TO: ADEQ SIP Group; U.S. EPA Region 9 SIP Group

FROM: Eric L. Hiser

DATE: September 16, 2016

SUBJECT: Justification of Asarco Hayden ambient air boundary

As requested by ADEQ and EPA, Asarco is providing the following more refined ambient air boundary around its facility, including the following explanation of why this boundary represents a practical ability to preclude entrance from the general public. Asarco is following precedent established by EPA for the Kennecott smelter in Utah.

As EPA observed regard to the Kennecott smelter when a similar question was raised: "the cumulative effect of Kennecott's property holdings, property exchanges, installation of fences, posts, and no trespassing signs, and security patrolling supports the Company's claim to control and exclusive use of the relevant Property." 50 Fed. Reg. 7056, 7057 (Feb. 20, 1985). EPA guidance is also clear that "'Preclude' does not necessarily imply that public access is absolutely impossible, but rather that the likelihood of such access is small." EPA, June 22, 2007, "Interpretation of 'Ambient Air' in Situations Involving Leased Land Under the Regulations for Prevention of Significant Deterioration (PSD)." As in the Kennecott case, Asarco believes that the cumulative effect of the rugged terrain, its fencing, physical barriers, and active patrolling of the smelter and concentrator sites, combine to ensure that the likelihood of public access is small.

The attached contour map shows the Hayden smelter and surrounding area. Asarco has set forth the proposed ambient air boundary (AAB) in light blue, with other colors on the outside representing the type of barrier used to exclude the public. The following explanation follows the contour map and proposed AAB clockwise, starting at the top with "A".

A. **Northeast section of smelter site.** In this area, the smelter backs up against the Dripping Springs mountains. These mountains are extremely rugged, on a high slope, and cannot easily be accessed from the sides or rear. These areas are identified by orange cross hatching. Asarco has defined the AAB at the north along its quarry access road; then along a section of cliff, and then along another access road, and finally along a section of very steep terrain adjoining the slag pile. In much of this area, Asarco security patrols either patrol the roads or can see the terrain from areas where they patrol. The combination of impassable terrain and security patrols creates a practical ability to exclude the general public.

- **Photo A.1.** Photograph of Dripping Springs Mountains looking east behind smelter site.

B. Southeast section of smelter at slag pile and contractor gate. In this area, the smelter site opens up into the Gila River Valley. Asarco has defined the AAB at the north end and to the contractor gate as the edge of the slag pile. The slag pile is nearly vertical and the rock is both loose in places and jagged (slag is glass-like), making access to the smelter over the slag pile essentially impassable. This area is defined by the orange cross hatching. Asarco security patrols the road areas on top of the slag pile. The combination of impassable terrain and security patrols creates a practical ability to exclude the general public.

- **Photo B.1.** Photograph of slag area at exit from Highway 77.
- **Photo B.2.** Photograph of slag area and signage at exit from Highway 77.
- **Photo B.3.** Photograph showing height of slag in area.

C. Contractor gate area. In this area, which is located in the south-southeast, Asarco has its contractor gate. The AAB follows the fence line in this area. The fence is a 6 foot chain link topped by barbed wire. The fence is marked by the yellow shading. The contractor gate is manned by Asarco security 24 hours a day. The area is also patrolled by Asarco security. The combination of the gate, security and security goals creates a practical ability to exclude the general public.

D. South smelter loop road way. In this area, the smelter is situated above a steep valley. There is also a partial fence near the property boundary considerably south of the proposed AAB. Asarco has drawn the AAB to follow the south side of the smelter loop road, which is the primary access between the contractor gate and the smelter proper. This area is heavily traveled, patrolled by Asarco security and access requires crossing a fence close to the highway and climbing a steep valley side (indicated with orange cross hatching) to reach the loop road, all exposed to view from the road. The combination of rugged terrain, partial fencing, and security patrols creates a practical ability to exclude the general public.

- **Photo D.1.** Photo looking down from edge of smelter loop road.
- **Photo D.2.** Photo looking across at smelter loop road.

E. Former Smithco revert crushing area. This is an elevated ridge upon which Smithco, an Asarco contractor, formerly operated a revert crushing area. It extends to the west back along the loop road. Asarco has drawn the AAB along the fence line in this area. The fence is a 6 foot chain link fence surmounted by razor wire (indicated with the dark black line; regular 6 foot fence with barbed wire is shown in yellow). Asarco will maintain at least the 6 foot chain link fence in this area; it is also considering placing receptors to the south of the smelter loop road to allow the possibility of pulling the fence line back to the loop road in the future without affecting the attainment demonstration. The area is patrolled by Asarco security. The combination of the fence and security patrols creates a practical ability to exclude the general public from this area.

- **Photo E.1.** Photo showing typical fence with razor wire.

F. Calcium sulfate pond. This area is a fenced calcium sulfate pond that will be closed and remediated in the future. Asarco has drawn the AAB along the fence line. The fence is a 6 foot chain link fence topped with barbed wire (indicated with yellow shading). The

area is easily viewed by security patrols along the smelter loop road. The combination of fence and security patrols creates the practical ability to exclude the general public.

G. Powerhouse Canyon area. Powerhouse Canyon is a geographic feature in the central part of the smelter area and divides the concentrator from the smelter. The smelter main gate road goes up the right side of the canyon on the top; the concentrator haul road runs at the bottom. The left side is characterized by steep cliffs (shown by the orange hatching). The bottom of Powerhouse Canyon is the Asarco secondary/tertiary crusher and is controlled by a gate and fencing (shown with yellow shading). The AAB is shown with two possibilities: Option A follows the existing fence line to around the health clinic and then new fencing and a gate will be added at the health clinic and fencing will extend to the start of the steep canyon wall, the canyon itself would not be fenced; Option B pushes further down the smelter main gate access road below the bunk house and then new fencing and a gate will be added below the bunk house and the fencing will extend to the start of the steep canyon wall, the canyon itself would not be fenced. This area is patrolled by Asarco security and subject to observation from the health clinic as well. The combination of fence, rugged terrain, employee observation and security patrols creates the practical ability to exclude the general public.

H. Town of Hayden area. Inside the Town of Hayden, Asarco has a six foot chain link or masonry fence, topped with barbed wire (shown with yellow shading), extending up from Powerhouse Canyon along the property boundary and continuing west and north all the way to the railroad tracks on the northeast side of the smelter. Asarco has drawn the AAB along this fence line. The combination of the fence line and Asarco security patrols creates the practical ability to exclude the general public from this area.

I. Northwest area. The railroad tracks are located on a steep, difficult to access embankment; further west, the Kennecott slag pile creates a steep, jagged impassable physical barrier; north of the Kennecott slag pile are steep ravines with cholla and other cactus that preclude casual travel. These areas are marked by the orange hatching. Asarco drawn the AAB following the quarry access road, which is patrolled by Asarco security. The combination of the rugged terrain, slag piles, steep slopes, and security patrols creates the practical ability to exclude the general public from this area.

- **Photo I.1.** This photo shows Dripping Springs Mountains behind plant.
- **Photo I.2.** This photo shows Dripping Springs Mountains central area behind plant.
- **Photo I.3.** This photo shows the rugged terrain north of the plant.
- **Photo I.4.** This photo shows concrete barriers, gate and no trespassing sign on road approaching plant site from north.

Asarco hopes that this information is helpful. Please call Jack Garrity, Amy Veek or Eric Hiser if you have any questions.

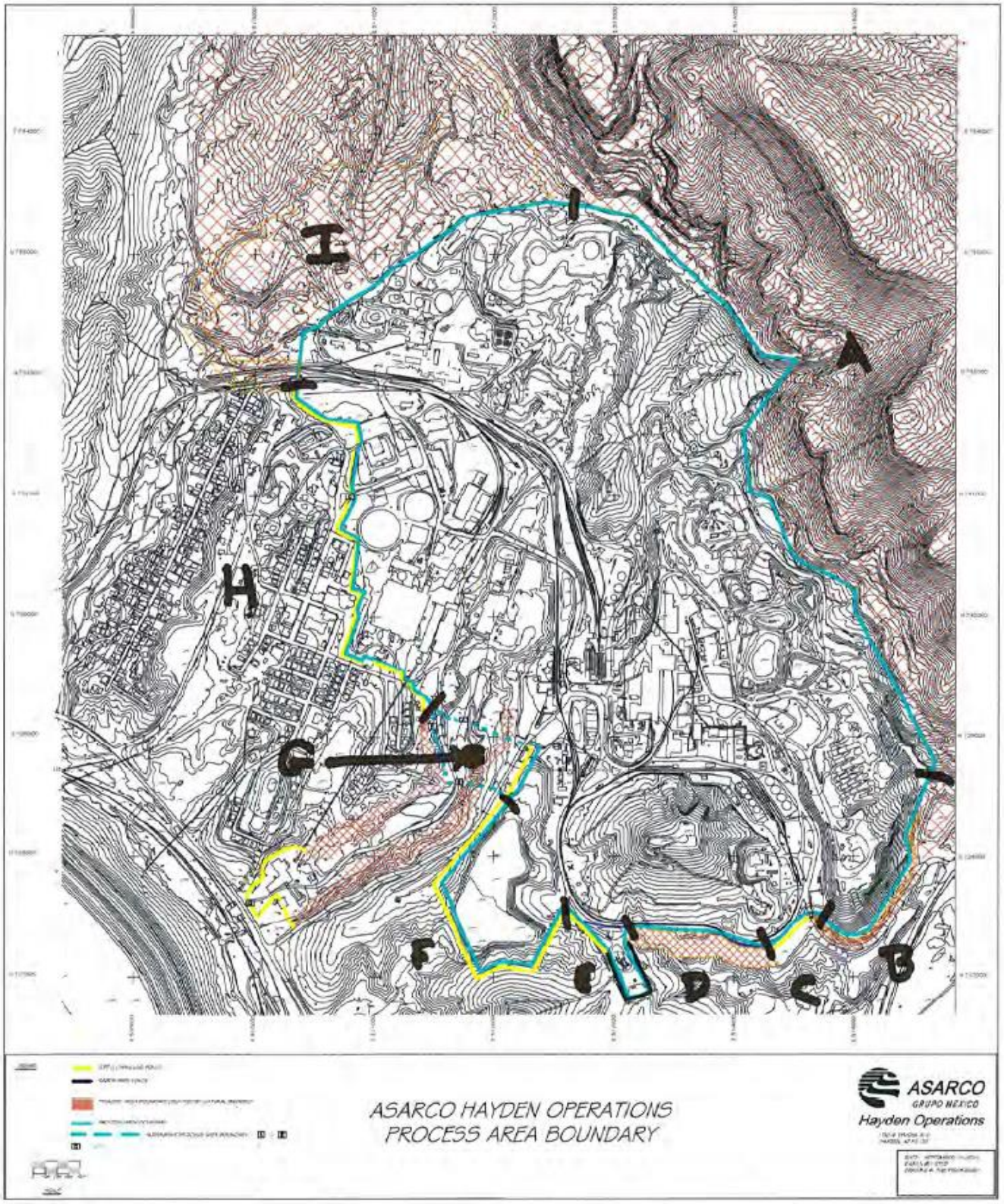

I
A
H
G
F
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D
C
B
ASARCO HAYDEN OPERATIONS
PROCESS AREA BOUNDARY
ASARCO
GRUPO MEXICO
Hayden Operations

Photo A.1- Dripping Spring East



Photo B.1-Slag



Photo B.2-Slag



Photo B.3- Slag



Photo D.1- Looking Down from Loop Road



Photo D.2- Looking Across at Loop Road



Photo E.1- SmithCo. Razor Wire Fence



Photo I.1- Dripping Springs West



Photo I.2- Dripping Springs Central



Photo I.3- Rough Terrain to North



Photo I.4- Barricade on Road in North



9.2 Appendix B: Calculation of Sources Parameters

Main Stack Source Parameters – Anode Furnace Primary to Center and Anode Furnace Secondary to Annulus

Stack Center	
Flow (scfm)	163,800
Temp (F)	380
Diameter (ft)	17.0
Area (ft2)	227
Stack Annulus	
Flow (scfm)	1,038,100
Temp (F)	140
Diameter (ft)	23.9
Area (ft2)	449
For Combined Annulus and Center	
Flow (SCFM)	1,201,900
Flow Rated-Weighted Temperature (F)	173
Equivalent Diameter (ft)	29.3
Area (ft2)	676
Total Flow (ACFM)	1,653,627
Equivalent Velocity (ft/s)	40.8

Volume Source Characteristics

Flash Furnace Fugitives

Roof Monitors

Assumptions

Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources

Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	1.5 m
Building height:	42.67 m
Sigma Y:	0.70 m
Sigma Z:	19.85 m
Release Height:	43.67 m

Penthouse, East and West vents

Assumptions

Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	16	m
Building height:	44.5	m
Sigma Y:	7.44	m
Sigma Z:	20.70	m
Release Height:	43.59	m

Penthouse, North and South vents

Assumptions

Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	7	m
Building height:	44.5	m
Sigma Y:	3.26	m
Sigma Z:	20.70	m
Release Height:	44.50	m

Converter Aisle Fugitives

Assumptions

Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	1.5	m
Building height, Monitor N:	24.38	m
Building height, Monitor S:	22.86	m
Sigma Y:	0.70	m
Sigma Z, Monitor N:	11.34	m
Sigma Z, Monitor S:	10.63	m
Release Height, Monitor N:	31.35	m
Release Height, Monitor S:	25.40	m

Anode Furnace Fugitives

Assumptions
Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	1.5 m	Estimate from field observations and photographs
Building height, Monitor N:	24.38 m	Estimate from field observations and photographs
Sigma Y:	0.70 m	
Sigma Z, Monitor N:	11.34 m	
Release Height, Monitor N:	31.35 m	Height of monitor vents is estimated to be 9/7 height of Converter Aisle Building on northern end (e.g., above Anode Furnace)

SLAG POURING HEAT RELEASE CALCULATIONS

Assumptions/Inputs

Ambient temperature (Ta)	308	^{o}K
Acceleration of gravity (g)	9.807	m/s
Density of slag (ρ)	132	lb/ft^3
Surface area of poured slag (A)	1500	ft^2
Volume of poured slag (V)	600	ft^3
Thickness of poured slag (d)	0.4	ft
Temp of slag at start of pour (T_i)	2120	^{o}F
Temp of slag at end of pour (T_f)	1760	^{o}F
Average temp of slag during pour (T)	2400	^{o}R
Specific heat of slag (c_p)	0.239	$Btu/lb\text{-}^{o}F$
Time for slag to crust (ΔT)	0.025	hr
Stefan/Boltzmann constant (σ)	1.713E-09	$Btu/ft^2\text{-}hr\text{-}^{o}R^4$

Radiative Heat Loss Calculations

Assuming that slag radiates as a black body and that the radiative heat loss can be defined by the Stefan Boltzman Law, as follows:

Radiative heat loss (Q_R) =	$\sigma T^4 A \Delta T$	Btu
Radiative heat loss (Q_R) =	2.13E+06	Btu

Calculation of Total Heat Release Rate

Total heat release (Q_T) =	$\rho V c_p (T_i - T_f)$	Btu
Total heat release (Q_T) =	6.81E+06	Btu

Calculation of Net Heat Release Rate

Net heat release after radiative heat loss (Q_N) =	$Q_T - Q_R$	Btu
Net heat release after radiative heat loss (Q_N) =	4.68E+06	Btu
Net heat release after radiative heat loss (Q_N) =	1.18E+09	cal
Net heat release rate (Q_N/sec) =	1.31E+07	cal/sec

SLAG POURING EFFECTIVE STACK PARAMETER CALCULATIONS

Assumptions/Inputs

Ambient temperature (T_a)	308	^oK
Average Temp of slag and pour gases during pour (T)	1333	^oK
Acceleration of gravity (g)	9.807	m/s
Effective diameter of the poured slag area (D)	13.3	m
Net heat release rate (Q_N/sec)	1.31E+07	cal/sec

Methodology

According to Briggs (1969), the plume rise of a non-stack release can be estimated by calculating equivalent stack parameters when the buoyancy flux is know. The buoyancy flux can be described by the following equations

EQN1: F = $(gvd^2_a)/4[(T-T)/T]$

EQN2: F = 3.7 x 10-5 Q_N/sec

where

v = the effecrtive upward velocity of the release (m/s)

Setting Equations 1 and 2 equal:

Effective upward velocity (v) = (3.7×10^{-5}) (4) (T) (Q_N) / ($gd^2(T-T_a)$) Effective upward velocity (v) = 1.45

9.3 Appendix C: Memo, Documentation of GEP Stack Height at Asarco Smelter in Hayden, Arizona

WHITE PAPER

DOCUMENTION OF GEP STACK HEIGHT AT ASARCO SMELTER IN HAYDEN, ARIZONA

by
Ron Petersen, PhD, CCM, FASHRAE
CPP, Inc.
2400 Midpoint Drive, Fort Collins, CO, 80525
August 25, 2015

Abstract

In 1983, EPA approved a good engineering practice ("GEP") stack height demonstration for the 1000 foot (305 m) stack at the ASARCO LLC smelter located in Hayden, Arizona based upon a wind tunnel study conducted by Petersen and Cermak (1979). In 1985, EPA revised the GEP stack height regulations that included new definitions for "nearby" terrain and "excessive concentrations." This white paper examines the changes in the 1985 regulations, evaluates the 1979 wind tunnel study results in light of the change in regulations and guidance, and concludes, based on information in the 1979 wind tunnel study and available through current dispersion modeling, that the 1983 GEP stack height determination is consistent with the 1985 regulations and that the 1000 foot (305 m) stack remains an appropriate GEP determination.

Background

Petersen and Cermak (1979) conducted a wind tunnel modeling study to determine whether the 1000 foot (305 m) stack at the ASARCO Hayden smelter is above or below the "good engineering practice" (GEP) stack height established by Congress in Section 123 of the Clean Air Act. The study found that the 1000 foot (305 m) stack is below the GEP stack height and hence, can be used an input for compliance modeling purposes. At the time of the study, the procedures for conducting these wind tunnel modeling studies were in draft form and the 1979 wind tunnel study closely followed the EPA (1979) Draft Guideline.

Based on the results of the 1979 wind tunnel study, EPA proposed that the ASARCO 1000 foot stack be approved as GEP on November 30, 1981 (46 FR 58098-01) after the Arizona Department of Environmental Quality's review and approval in September 1979. EPA then approved the 1000 foot stack as meeting the GEP stack height requirement on January 14, 1983 (48 FR 1717-01). This GEP stack height has been used for all subsequent modeling and compliance purposes through the present date.

This white paper examines the 1979 wind tunnel study that addressed the 1000 foot stack in the context of changes to the GEP regulations in 1985, and demonstrates that the conclusion of that study remains valid today.

Definition of GEP Stack Height According the 1985 Final Rule

In the final (1985) stack height regulation (40 CFR 51.100 (ii)), GEP stack height is defined to be the *greater* of:

"(1) 65 meters, measured from the ground level elevation at the base of the stack;

(2) (i) for stacks in existence on January 12, 1979, and for which the owner or operator had obtained all applicable permits or approvals required under 40 CFR Parts 51 and 52,

$$H_g = 2.5H \quad (1)$$

provided that the owner or operator produces evidence that this equation was actually relied on in establishing an emission limitation:

(ii) for all other stacks,

$$H_g = H + 1.5L \quad (2)$$

where;

H_g = good engineering practice stack height, measured from the ground-level elevation at the base of the stack,

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack,

L = lesser dimension, height or projected width, of nearby structure(s),

provided that the EPA, State, or local control agency may require the use of a field study or fluid model to verify GEP stack height for the source; or

(3) The height demonstrated by a fluid model or a field study approved by the EPA, State, or local control agency, which ensures that the emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures or nearby terrain features."

The ASARCO Hayden smelter is located in the potential downwash zone of a ridge located to the north and east of the smelter. Based on (3), physical modeling is required to determine the GEP stack height for complex terrain situations, such as for the ASARCO Hayden smelter. The demonstration needs to show that excessive concentrations result due to upwind terrain wakes and eddies based on the definition of nearby terrain and excessive concentration.

For the final rule (FR, Vol. 50, No. 130, July 8, 1985), excessive concentration was defined as follows:

> "A maximum concentration due to emissions from a stack due in whole or part to downwash, wakes or eddy effects produced by nearby structures or nearby terrain features which individually is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effect and which contributes to a total concentration due to emissions from all sources that is greater than an ambient air quality standard."

For conducting demonstrations under 51.1 (ii) (3) "nearby" means:

> "not greater than 0.8 km (1/2 mile), except that the portion of a terrain feature may be considered to be nearby which falls within a distance of up to 10 times the maximum height (H_t) of the feature, not to exceed 2 miles if such feature achieves a height (H_t) 0.8 km from the stack that is a least 40 percent of the GEP stack height determined by the formula...."

Based on the definition of excessive concentration, the maximum ground-level concentration from wind-tunnel testing with the terrain present is first compared to NAAQS. For this comparison, the background concentration and impact due to other sources must be added to the impact due to the stack being evaluated. If the total concentration is below NAAQS, a shorter stack must be considered. Once a stack height is found such that a lower stack would result in an exceedance of NAAQS, it is considered GEP if the concentration without nearby terrain present is at least 40 percent less than that with the terrain present (referred to as the 40 percent test). Key in the 40 percent excess concentration demonstration is the method used to model the "terrain-out" test configuration.

The following sections will show that the Petersen and Cermak (1979) study, while conducted following a combination of the 1979 EPA Draft Guideline and 1982 GEP stack height rule (FR, Vol 47, No. 26, 1982), provide results that meet the requirements for demonstrating that the 1000 foot stack is GEP according the final rule (EPA, 1985). The main areas to consider are the definition of an excessive concentration and the definition of "nearby" terrain.

Impact of EPA Guideline Changes Regarding the Definition of an Excessive Concentration

Petersen and Cermak (1979) conducted a wind tunnel modeling study that demonstrated that the 1000 foot stack met the excessive concentration requirements due to adverse upwind terrain wake effects as outlined in the EPA Guideline (1979). The excessive concentration requirement in the 1979 EPA Guideline was:

> "Concentrations in the wake of the structure or terrain obstacle are considered excessive if the ground-level concentrations exceed an ambient air quality standard or PSD increment and are at least 40 percent greater than the maximum in the absence of their influences."

This excessive concentration definition is the same as the final 1985 rule definition and both criteria were demonstrated by Petersen and Cermak (1979). Based on that demonstration, EPA approved the 1000 foot stack as GEP and that height was used for all subsequent compliance modeling

studies. That alone should be sufficient justification for allowing the 1000 foot stack to be classified as GEP for future modeling applications.

The EPA 1979 Draft Guideline was finalized in 1981 followed by the first stack height rule that was published in 1982. The 1981 EPA guideline and 1982 rule relaxed the definition of excessive concentration so that only a 40 percent concentration increase due to upwind terrain wake and eddy effects needed to be demonstrated. This change had no effect on the results of the Petersen and Cermak (1979) study.

The conclusion is that the changes to the definition of excessive concentration have no impact on the Petersen and Cermak (1979) study and their determination that the 1000 foot stack is GEP.

Impact of EPA Guideline and Rule Changes Regarding the Definition of Nearby Terrain

The methodology for determining the GEP stack height is to first conduct testing with all relevant upwind and downwind terrain present in the model. The results from this testing are then first used to determine whether a NAAQS exceedance can be demonstrated.

According to EPA (1985), nearby terrain can be considered for determining the GEP stack height with certain constraints. First, for terrain to be considered nearby, the terrain within 0.8 km (0.5 miles) of the stack must rise to at least 40 percent of the formula GEP stack height for the wind directions being evaluated. The formula GEP stack height for the ASARCO Smelter is 65 m which means the terrain must rise by at least 26 m within 0.8 km of the stack. Figure 1 shows that the height of the terrain, H_t, at 0.8 km is 137 m which is well above the 26 m threshold. Hence, the elevation of the nearby terrain is sufficiently high to qualify for a wind tunnel demonstration study and this part of the 1985 "nearby" definition has no impact on the 1979 wind tunnel study results.

The next step for determining the GEP stack height is to conduct testing without the upwind terrain. The maximum concentration from this testing is then compared to the maximum concentration from testing with all terrain present and if the maximum concentration with terrain present is a least 40% greater than that without the upwind terrain present, the stack is creditable as GEP. For this comparison, Petersen and Cermak (1979) removed all of the upwind terrain as illustrated in Figure 2 which was consistent with EPA 1979 and 1981 Guidance and the 1982 rule.

According to the final rule (1985) and EPA Guidance (1985), the amount of terrain that can be considered nearby for fluid modeling purposes extends out to 10 times the maximum height (H_T) of the terrain feature (10 H_T), not to exceed 3.2 km. For this case, the maximum terrain height is 242 m, which means that the maximum distance that can be considered nearby is 2.4 km (242 m * 10). Beyond that distance, the terrain is not nearby and cannot be removed for wind tunnel modeling purposes.

Figure 3 shows the upwind terrain that should be modeled for the "terrain-out" configuration according EPA (1985) guidance. The figure shows that only the nearby terrain is removed while the terrain that is not nearby remains in the model. This configuration is different than the one used by

Petersen and Cermak (1979) where all upwind terrain was removed (Figure 2). If the study had been conducted using EPA (1985) guidance, the concentrations with upwind terrain removed could increase by some factor due to the terrain that remains in the model.

Petersen and Cermak (1979) found that at the 1000 foot stack height the ratio of maximum concentration with and without the upwind terrain present was 1.68 (68% increase due terrain). For that ratio to decrease to 1.4 (40% increase due terrain), the wind tunnel test results for the "terrain-out" configuration using the EPA (1985) procedure would have to increase by 20% or more.

Figure 3 shows that the highest terrain feature remaining for the EPA (1985) "terrain-out" configuration is about 5200 m upwind with a maximum height of 228 m above stack base. A representative hill height is approximately 200 m or less. Thompson and Snyder (1985) found that a source that is 1.5 hill heights tall positioned 20 hill heights downwind of a steep triangular ridge has maximum concentrations with and without the ridge present that are essentially the same (see Figure 4). Since the Main Stack is ~1.5 hill heights tall and is 23 hill heights, or more, downwind of the terrain feature, this research confirms that the EPA (1985) "terrain-out" procedure will have an insignificant impact on the 68% excessive concentration demonstrated by Petersen and Cermak (1979).

In conclusion, the impact of the change in the definition of "nearby" terrain has no impact on the results in Petersen and Cermak (1979) or the 1000 foot GEP stack height determination.

Impact of the New 1-Hr SO_2 NAAQS

At the time the study was carried out, the NAAQS exceedance requirement for an excessive concentration was demonstrated using the 3-hr SO_2 NAAQS of 1300 ug/m^3. In 2010, a new 1-hr SO_2 NAAQS of 75 ppb (196 µg/m^3) was promulgated. Since the new 1-hr NAAQS is lower than the 3-hr NAAQS, an exceedance of the 1-hr NAAQS is also demonstrated based on the emission rate used in Petersen and Cermak (1979).

Existing SO_2 Emission Rates and NAAQS Exceedance

Even though there is no logical reason why ASARCO should continue justifying the GEP stack height based on the NAAQS exceedance criteria as ASARCO continues to reduce emissions, this section will assess whether an 1-hr NAAQS exceedance can be demonstrated using NSPS emission rates for NSPS sources, as set forth in the 1985 rule, and current emission rates for other contributing sources. To make this demonstration, the results of the past study were re-analyzed. Table 1 shows the relevant stack operating parameters that were simulated in the wind tunnel and the existing operating parameters.

The past wind tunnel results were converted to a normalized concentration of the form CU_{ref}/Q which is related to the maximum ground level concentration as follows based on the Gaussian dispersion equation that is used in the AERMOD:

$$\frac{CU_{ref}}{Q} = \frac{1}{2\pi\sigma_y\sigma_z}\, exp\left[-0.5\left(\frac{h_p}{\sigma_z}\right)^2\right] x\ 10^6$$

where

C	=	SO_2 concentration (ug/m3),
U_{ref}	=	Reference wind speed (m/s) at the reference height of 585.6 m,
Q	=	SO_2 emission rate (g/s),
σ_y, σ_z	=	Horizontal and vertical dispersion coefficients, and
h_p	=	Plume height above ground level (m).

The equation shows that CU_{ref}/Q will only change with plume height (h_p) for a given meteorological condition (i.e., σ_y and σ_z fixed).

Table 2 shows that the ratio of stack exit velocity to wind speed is about 1.5 (R), or less, for the cases simulated in the wind tunnel and the existing configuration. When R is 1.5 or less, the plume will level off close to stack top for all cases shown in Table 2. With constant plume rise, CU_{ref}/Q is a constant value which is best indicated by the average CU_{ref}/Q over all cases observed in the wind tunnel. The average observed value is provided in Table 2 which was also used for the existing configuration. Next, the 1-hr SO_2 concentration was determined by dividing CU_{ref}/Q by U_{ref} and multiplying by Q.

In addition to the Main Stack there are several other sources of SO_2 emissions at the ASARCO smelter: Converter Aisle fugitives, Flash Furnace fugitives, Anode Furnace fugitives, the Anode Furnace baghouse stack, and Slag Pouring. To obtain the impact from these sources an air dispersion modeling analysis was conducted in a manner very similar to that which is described in the recent Hayden SIP Modeling Report entitled "SO_2 Air Dispersion Modeling Analysis for ASARCO, LLC; Hayden, Arizona" (July 2015). Because these additional sources are not NSPS sources, and therefore do not have an NSPS rate unlike the Main Stack, for the purposes of this analysis nearly all of the emissions modeled were conservatively assumed to be actual emissions (as opposed to allowables).

Key aspects of this analysis are as follows:

- Modeling was conducted using AERMOD
- Meteorological data used were taken from the on-site Camera Hill meteorological station (August 16, 2013 through August 15, 2014)
- Emissions for the scenario were modeled as follows:
    - Flash Furnace fugitives: based on fugitive emissions study (same procedure used for annual emissions inventory)
    - Converter Aisle fugitives: based on fugitive emissions study (same procedure used for annual emissions inventory)

- Anode Furnace fugitives: based on anode furnace baghouse permit revision estimated maximum
- Anode Furnace Baghouse Stack: anode furnace baghouse permit revision allowable rate
- Slag Pouring: maximum hourly emission rate, ratioed by monthly slag pouring

Model receptors were placed at a distance of 2895 m from the Main Stack (the distance at which the maximum Main Stack concentrations were calculated from the Wind Tunnel Study), along and very near the 51 degree radial (i.e., to the southwest of the Main Stack).

Because the maximum Main Stack concentration was calculated for a tower wind speed of 4.3 m/s at a wind direction of 51 degrees, the predicted 1-hr SO_2 concentrations from the other sources were examined to identify those which occurred with both a wind speed and wind direction close to these values. While there were many concentrations predicted to occur under conditions very close to those, the concentration that nearly perfectly matched the meteorological conditions associated with the maximum Main Stack concentration was 28.1 ug/m3, which was predicted to occur with a wind speed of 4.4 m/s and a wind direction of 51 degrees.

Therefore, the total 1-hr SO_2 concentration is the sum of these values:

- 171.8 ug/m3 from the Main Stack,
- 28.1 ug/m3 from other sources at the ASARCO smelter, and
- 6.3 ug/m3 for Background (see Section 5.7 of "SO_2 Air Dispersion Modeling Analysis for ASARCO, LLC; Hayden, Arizona" (July 2015).

The total 1-hr SO_2 concentration for the worst case condition is 206.2 ug/m3, which is greater than the 1-hr SO2 NAAQS of 196 ug/m3.

Table 2 shows the calculated 1-hr SO_2 concentrations and supporting information based on the 1979 wind tunnel study. The above discussion and Table 2 show that even using the NSPS emission rates contemplated under the 1985 rule, an exceedance of NAAQS is demonstrated for the 1000 foot stack under the criteria established by the 1985 rule.

Summary

In summary, the 1000 foot stack at the ASARCO Hayden Smelter is GEP for the following reasons:

- It is the taller of 65 m, the formula height or the height determined through physical modeling as prescribed by the 1985 final stack height rule;
- It was approved by EPA as the GEP stack height in 1983;
- It meets the excessive concentration requirements due to upwind terrain wake effects as defined in EPA (1979, 1981 and 1985) based on NAAQS at the time of the wind tunnel study;
- The EPA (1985) change in the definition of "nearby" and how upwind terrain is modeled has no significant effect on the 40% excess concentration demonstration; and
- An exceedance of the 1-hr SO_2 NAAQS can be demonstrated based on emission rates used in Petersen and Cermak (1979) or using the NSPS rates specified in the 1985 rule.

References

EPA, "Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulation) Revised," USEPA Office of Air Quality, Planning and Standards, Research Triangle Park, North Carolina, EPA–45014–80–023R, 1985.

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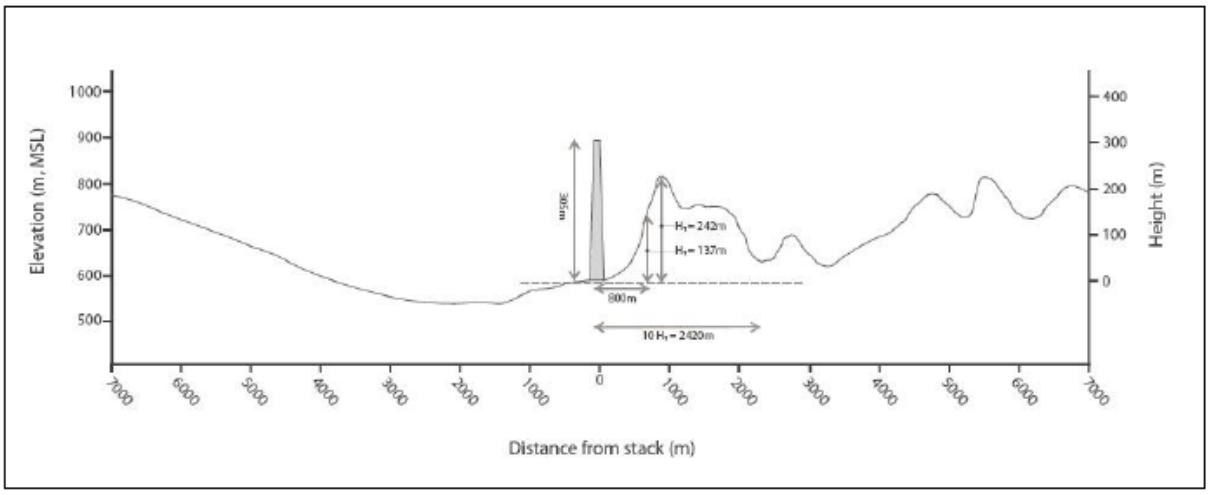


Figure 1. Terrain cross-section (reproduced from Taylor, 1979) for the wind tunnel configuration used for modeling the downwash effect of the upwind hill. Note: a transition ramp was used upwind of the terrain to match the wind tunnel floor to ensure a smooth transition flow.

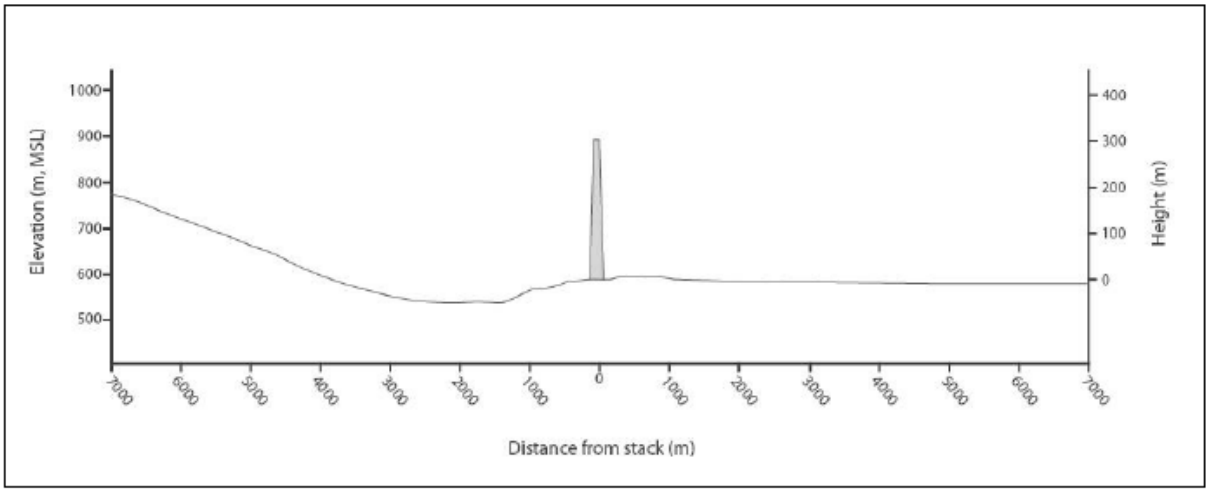


Figure 2. Terrain cross-section (reproduced from Taylor, 1979) for the wind tunnel configuration used for "terrain-out" configuration as defined in the 1979 EPA Guideline document.

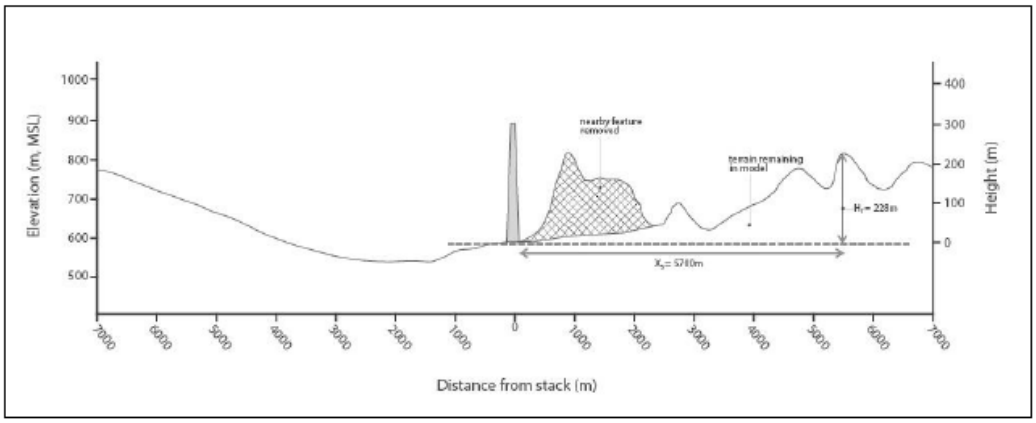


Figure 3. Terrain cross-section (based on Taylor, 1979) for the wind tunnel configuration used for the "terrain-out" configuration as defined in the 1985 EPA Guideline document.

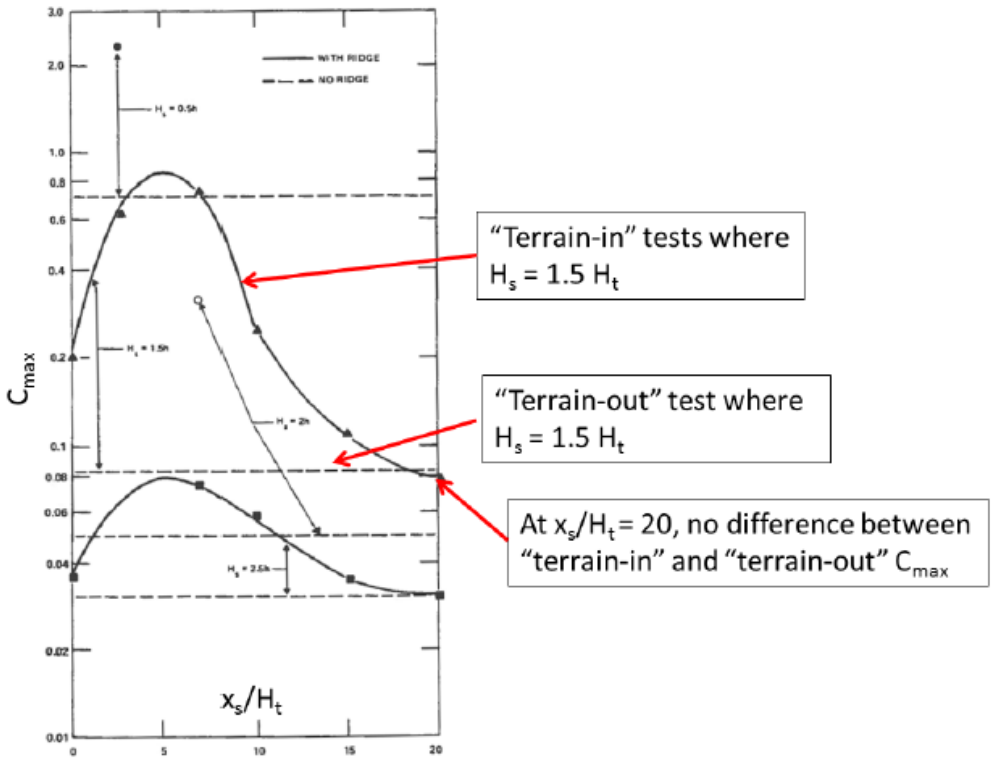


Figure 4. Maximum ground-level concentrations (C_{max}) as a function of source position (x_s) downwind of steep triangular ridge of height H_t (figure copied from Thompson and Snyder, 1985).

Table 1. Source Parameters

Case	Stack Diameter (m)	Stack Temp Ts (K)	Std Volume Flow (m3/s)	Act Volume Flow (m3/s)	Exit Velocity Ve (m/s)	SO_2 Emission Rate Q (g/s)	SO_2 Emission Rate (lbs/hr)	SO_2 Source Concentration Co (ppm)
Wind Tunnel Study	5.18	380.7	252.1	319.9	15.18	7348.0	58318	8834
NSPS Configuration	8.94	374	309.9	448.1	7.14	458.4	3638	551.1

Zref =	585.6 m	Reference Height
HT =	242 m	Terrain Height
n	0.32	Wind power law exponent as measured in wind tunnel
Ta =	300 K	Ambient Temperature

Table 2. Summary of Calculations Documenting a NAAQS Exceedance

1979 Wind Tunnel Study

WD	Xmax/HT	X_{max} (m)	U_{ref} (m/s)	R V_e/U_{ref}	Tower Speed (51.76m) (m/s)	C_{max} (ppm	$C_{max} U_{ref}/Q$ (ug/g/m^2)	**Max 1 hr- SO_2 C_{max} (ug/m3)**
NE (51°)	15	3630	9.30	1.63	4.28	1.01	3.32	**2626**
NE (51°)	15	3630	15.60	0.97	7.18	0.57	3.15	**1482**
NE (51°)	15	3630	22.10	0.69	10.17	0.51	3.99	**1326**
						Average	3.49	

NSPS Configuration

WD	Xmax/HT	X_{max} (m)	U_{ref} (m/s)	R V_e/U_{ref}	Tower Speed (51.76m) (m/s)	$C_{max} U_{ref}/Q$ (ug/g/m^2)	**1000 ft Stack Max 1 hr- SO2 C_{max} (ug/m3)**	**Other Sources+BG Max 1 hr- SO2 C_{max} (ug/m3)**	**Total Max 1 hr- SO2 C_{max} (ug/m3)**
NE (51°)	15	3630	9.30	0.77	4.28	3.49	**171.8**	**34.4**	**206.2**
NE (51°)	15	3630	15.60	0.46	7.18	3.49	**102.4**	**23.3**	**125.7**
NE (51°)	15	3630	22.10	0.32	10.17	3.49	**72.3**	**24.9**	**97.2**

9.4 Appendix D: Ambient Air Boundary Investigation

Overview

On Thursday, February 23rd Arizona Department of Environmental Quality (ADEQ) personnel performed an on-site tour of the ambient air boundary (AAB) used for the Hayden SO_2 and Pb nonattainment plans. During this tour ADEQ personnel traveled and documented the portions of the AAB that were reasonably accessible. Figure 1-1 details the approximate locations along the AAB that were visited. Section 2 provides some of the photographs taken during this visit along with descriptive annotations. The location numbers correspond to the locations displayed in Figure 1-1 and indicate the approximate location where the photos were taken. Area A in Figure 1-1 highlights the land purchased by Asarco discussed in Section 3.2 of the TSD. Also, where appropriate ADEQ has included drawings on the photos to indicate the approximate location of the AAB where no fencing is present.

In general, upon visiting the site and inspecting the AAB, ADEQ concurs with the AAB assessment provided by Asarco[13] and agrees that the boundary represents a practical ability to preclude public access. The portions of the AAB that are nearest to the town of Hayden are fenced, and the portions of the AAB that are not fenced are remote and far from any publicly accessed road.

In evaluating the AAB, ADEQ considered the definition of "ambient air" as "that portion of the atmosphere, external to buildings, to which the general public has access[14]". ADEQ believes that the combination of fencing, terrain, and remoteness is appropriate for delineating the AAB as it precludes access by the general public. Additionally, any individual attempting to gain access would have to scale fences or traverse difficult terrain and open desert. Furthermore, such individual would be intercepted by Asarco security and removed from the site immediately.

[13] See Hayden SO_2 Modeling Technical Support Document Appendix C.
[14] A.A.C. R18-2-101(14)

Figure 1-1: Approximate Locations along the AAB that Were Visited



Annotated Photos

Figure 2-1: Location #1

	Looking north-northeast. Shows general location where fencing ends. Fence continues down slope and terminates at a set of railroad tracks. AAB runs along fence line.
	Looking north. View from location where fencing ends showing railroad tracks and current concentrate storage area in background. Yellow dotted line added to indicate approximate location of AAB.

	Looking south. Typical fencing used along AAB through the town of Hayden. AAB runs along fence line.

Figure 2-2: Location #2

	Looking north. Located just east of Hayden Post Office. Typical fencing used along AAB through the town of Hayden. AAB runs along fence line.

Figure 2-3: Location #3



Looking east. Fencing runs from left side of image (obscured by bush) and continues downslope into thick vegetation.

Yellow dotted line added to indicate approximate location of fence and AAB.

Figure 2-4: Location #4

	Looking west. Fencing and gate leading to secondary crusher. AAB not visible in this view, as boundary is located further north (right side of image). The AAB runs across a ravine and this location represented the nearest ingress point.
	Looking east. Main entrance to the secondary crusher. AAB not visible in this view, as boundary is located further north (left side of image). The AAB runs across a ravine and this location represented the nearest ingress point.

Figure 2-5: Location #5



Looking northeast. Fencing ends at drainage pipe located at bottom of ravine.

AAB not visible in this view, as boundary is located further north (left side of image). The AAB runs across a ravine and this location represented the nearest ingress point.

Figure 2-6: Location #6



Looking west. View across ravine which runs north-south along road to smelter employee parking lot.

AAB not visible in this view, as boundary is located further north (right side of image).

Figure 2-7: Location #7



Looking south. Fencing along south side of smelter parking lot. In background, fencing can be seen that runs around water retention basin.

AAB runs along fence line.

Figure 2-8: Location #8

	Looking south. Looking through barbed wire topped fence. In background fence which runs around water retention basin. AAB runs along fence line.
	Looking east. Barbed wire topped fence continues to location #9. AAB runs along fence line.

Figure 2-9: Location #9

	Looking east. This location is near terminus of barbed wire topped fencing shown at location #8. Steep slope and berm provides significant impedance to access. Yellow dotted line added to indicate approximate location of AAB.

Figure 2-10: Location #10

	Looking southwest. View of contractor access road with slag dump to the right. Yellow dotted line added to indicate approximate location of AAB.

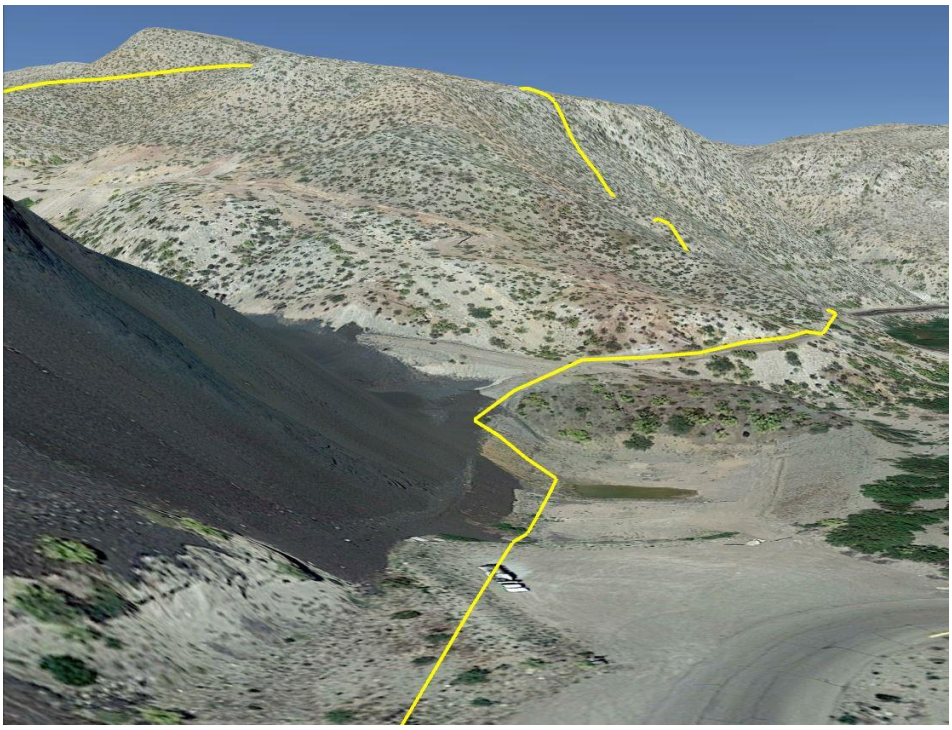
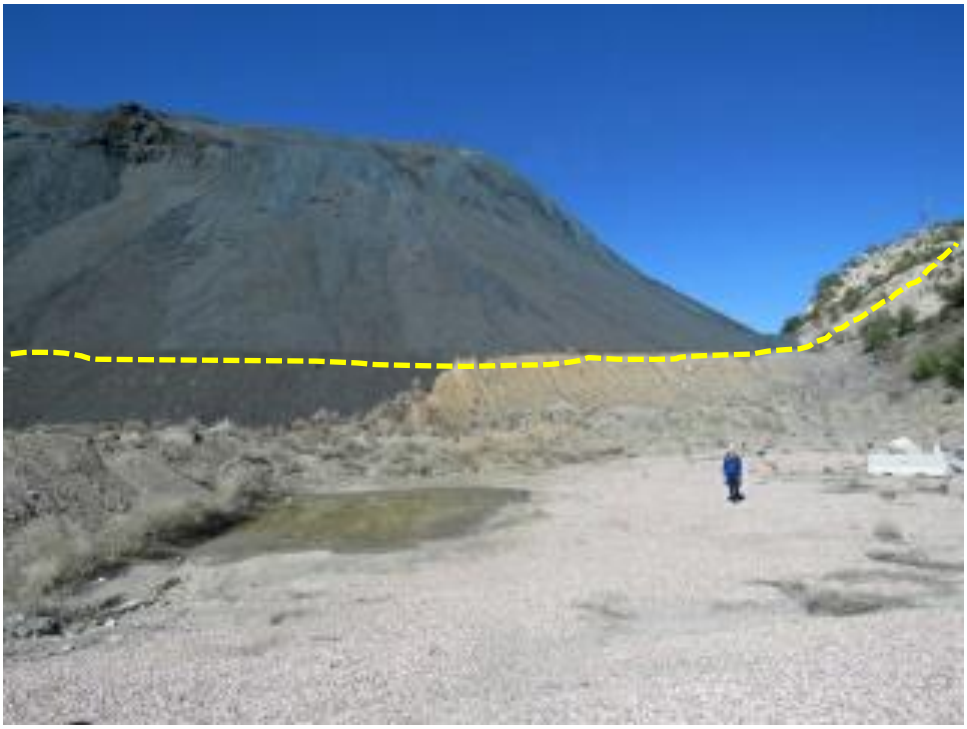
	Looking northeast near the contractor parking area. Slag dump and water retention basin in background. The yellow line has been added to indicate approximate location of AAB. This google earth image shows the updated AAB with the newly purchased land.
	Looking west. Image taken from water retention basin with view of slag dump. Asarco employee in background for perspective. Yellow dotted line added to indicate approximate location of AAB.

Figure 2-11: Location #11

	Looking east. This view captures the general area that was added to AAB due to Asarco's land purchase. AAB lies beyond the hills in this image.
	Looking north. This view captures the general area that was added to AAB due to Asarco's land purchase. AAB lies beyond the hills in this image.

Figure 2-12: Location #12

	Looking south. View from concentrate storage area towards location #1 where fencing ends. Ravine with train tracks visible. Yellow dotted line added to indicate approximate location of AAB. Line starts where fencing ends.
	Looking north. View of concentrate and lime (white substance) storage area. Yellow dotted line added to indicate approximate location of AAB. AAB runs north from location #1 to approximate location of lime storage then follows roadway (not visible).

Figure 2-13: Location #13

	Looking northeast. View of mountain ridge which runs along the northeast and eastern side of AAB. Yellow dotted line added to indicate approximate location of AAB.
	Looking southwest. View of roadway that is used to demarcate the northwestern edge of AAB. Yellow dotted line added to indicate approximate location of AAB.

9.5 Appendix E: Dual Limit Analysis

ADEQ Arizona Department of Environmental Quality

Dual Limit Analysis

Air Quality Division

March 2, 2017

Introduction

ADEQ has proposed the following emission limit for the Asarco smelter:

> *Emissions from the Main Stack shall not exceed 1069.1 pounds per hour on a 14-operating day average unless 1518 pounds or less is emitted during each hour of the 14-operating day period.*

This "dual limit" has been pursued by Asarco for the operational flexibility it extends, especially considering some uncertainties regarding control efficiencies for Converter Retrofit Project (CRP) controls that haven't been installed. ADEQ proposed this dual limit and after review EPA expressed concerns with it and stated that "[t]his combination does not provide the protection against violations of the NAAQS that either limit by itself provides, nor does this combination provide the protection against NAAQS violations contemplated in EPA's guidance."[15]

ADEQ has previously released an analysis of the expected exceedance risk posed by the Asarco smelter under the proposed control strategy and emissions limit[16]. This exceedance risk analysis examined the probability of a NAAQS violation using a forecasted emission dataset based on historical emissions data. The results showed a 1.66% probability (1 in 62.5 years) of a NAAQS violation. These results provided an indication that the controls put forth in the Hayden SO_2 SIP provided reasonable assurance of NAAQS compliance. The methodology used in the exceedance risk analysis to calculate expected NAAQS violations differs from the methodology presented in this document. While the results of the two analysis are not in complete agreement, they nonetheless both offer insights into the possible risks of NAAQS violations based on the proposed limits and forecasted emissions distribution.

This document serves to further document and analyze the dual SO_2 limits and their impact on the Hayden Nonattainment Area. Specifically, this document will compare the dual limit proposed by ADEQ with EPA's guidance approach as described in the April 2014 memo "Guidance for 1-Hour SO2 Nonattainment Area SIP Submissions". This comparison is based on the analysis described in EPA's SO_2 Guidance Appendix B and involves the use of randomly created datasets and modeling outputs to predict ambient SO_2 impacts. The results of the simulations described in this document show that there is functionally no difference between the expected ambient impacts of the dual limit and the 14-day guidance limit.

[15] 2/6/2017 Feedback from EPA to ADEQ regarding hybrid limit
[16] Exceedance Risk Analysis, Hayden SO2 Modeling TSD, Appendix I

Simulator Overview

ADEQ used a Monte Carlo simulator to aide in the comparison of the dual limit and 14-day guidance limit. To perform this comparison, ADEQ used Microsoft Excel to create a simulator to test various emissions scenarios and calculate and record their predicted concentrations and design values. An overview of the steps involved in setting up this simulator are provided below.

Forecast Emission Rates

Asarco provided historical and forecast SO_2 emission rates for the smelter, including the main stack and fugitive estimates from the flash furnace, converter aisle, and anode furnace. These forecast emissions are the emission rates expected to be achieved under the Converter Retrofit Project (CRP) and were generated by applying the CRP control assumptions to historical CEMS emissions data. Sections 5.3 and 5.4 of the Hayden SO_2 Modeling Technical Support Document details the methodology and assumptions used to create this forecast dataset.

The simulator only considered main stack emission rates when determining compliance with the limits, since the dual limit explicitly applies to those emissions but not fugitives. However, the simulator also accounted for fugitive emissions when estimating ambient concentrations as described in Section A2.3.

Unit Concentrations

Similar to the methodology used in the Exceedance Risk Analysis, ADEQ ran AERMOD for the Hayden smelter using the modeling parameters from the attainment demonstration, one year of actual MET data (8/16/2013 to 8/15/2014), and unit emission rates for each of the SO_2 sources. Since there are multiple SO_2 sources, ADEQ apportioned the unit emission rate (1 g/s) to the various sources based on the rates for each source in the attainment demonstration.

Table 6 - Modeled Unit Emission Rates

Emission Source	Attainment Demonstration Emission Rate (lbs/hr)	Unit Emission Rate (g/s)
Main Stack	1518	0.947891
Flash Furnace Fugitives	28.7	0.017921
Converter Aisle Fugitives	10.6	0.006619
Anode Furnace Fugitives	40.1	0.02504
Slag Pouring Fugitives	4.05	0.002529

The resulting AERMOD POST file was processed to extract each hour's highest observed unit concentration.

Simulator Runs

The simulator is populated with hourly emission rates and unit concentration values, which when multiplied together produce an expected ambient concentration. The main stack emission rate is also recorded for each hour to determine compliance/non-compliance with the limits. Each run of the simulator is populated with three years' worth of randomly selected emission rate and unit concentration values. A design value is calculated for each run by taking the average of the 99th percentile daily maximum concentration for these three years. ADEQ ran the simulator for 50,000 runs (which corresponds to 150,000 years' worth of data).

Simulator Set-Up

In order to compare the relative protectiveness of the various emission limit schemes, ADEQ established the bins listed in Table 7. Each bin describes one of the four possible combinations of both meeting and exceeding the 1-hr and 14-day guidance limits. While the EPA's guidance allows for the calculation of emission limits up to 30-days, this analysis only looks at a 14-day limit. Each three-year run of the simulator lives in a single bin.

Table 7 - Simulator Bins

Scenario Bin	Description
A	Meeting 1-hr limit, meeting 14-day guidance limit
B	Meeting 1-hr limit, exceeding 14-day guidance limit
C	Exceeding 1-hr limit, meeting 14-day guidance limit
D	Exceeding 1-hr limit, exceeding 14-day guidance limit

ADEQ used these bins to address two objective functions:

What are the chances of a NAAQS violation under the various emission limit schemes

Under what conditions would the dual limit be less protective than the 14-day guidance limit

ADEQ used the simulator described in Section 0 to address these two questions. The simulator was set to perform 50,000 runs with the results of each run categorized by scenario bin. For example, if the main stack emission rate exceeded 1518 lbs/hr for one or more hours during a 3-year run, but every 14-day rolling average emission rate was at or below 1069.1 lbs/hr throughout that same run, then it would be counted under bin C." If the design value for that run was above 196 µg/m^3 then it was counted as a violation also under bin C. The frequencies of violations in these bins were used to calculate the probability of a violation under each scenario.

While scenarios A-D describe the four possible compliance results with both the 1-hr and guidance limits, they don't explicitly address the question of how the dual limit compares to both the 1-hr and 14-day guidance limits. To answer this question, the four bins can be grouped

to provide information on violation probabilities for the dual limit, 1-hr limit, and guidance limit. This grouping is described below.

$A,B,C,D_{occurance}$ = number of simulations that were categorized as A, B, C, or D bins.

$A,B,C,D_{violation}$ = number of violations that occurred for simulations that were categorized as A, B, C, or D bins.

Probability of Violating NAAQS while Complying with 1-Hr Limit

$$\frac{A_{exceedance} + B_{exceedance}}{A_{occurence} + B_{occurence}}$$

Probability of Violating NAAQS while Complying with 14-Day Limit

$$\frac{A_{exceedance} + C_{exceedance}}{A_{occurence} + C_{occurence}}$$

Probability of Violating NAAQS while Complying with Dual Limit

$$\frac{A_{exceedance} + B_{exceedance} + C_{exceedance}}{A_{occurence} + B_{occurence} + C_{occurance}}$$

Results

The first objective function ADEQ examined was "What are the chances of a NAAQS violation under the various emission limit schemes?" To answer this question ADEQ performed 50,000 runs of the simulator, in effect simulating 150,000 years' worth of data. The results observed from this simulation are provided below in Table 8.

Table 8 – Real-World Emission Scenario - Violation Probability

Scenario Bin	# Occurrences	# Violations
A	0	0
B	0	0
C	50,000	19
D	0	0

The formulas listed in Section 0 were used to derive meaningful comparisons between the various limits and the NAAQS violation probabilities each allows. Table 9 lists the violation probabilities observed during the simulation for the three emission limit schemes; 1-hr (i.e. CEV), 14-day (i.e. guidance limit), and the dual limit proposed by ADEQ.

Table 9 – Real-World Emission Scenario - Limit Violation Probability

Limit	Probability of Violating NAAQS while Complying with Limit	90% Confidence Interval		
1-hr	N/A	N/A	to	N/A
14-day	0.038%	0.024%	to	0.052%
Dual	0.038%	0.024%	to	0.052%

The results of this simulation show that with the real-world emissions distributions there is a 0.0035% chance of violating the NAAQS when complying with either the 14-day or dual limit. With this probability we could say that a violation would be expected once every ~2,600 years. In addition, these results show that there is no difference between the probabilities of violating the NAAQS when the facility is complying with the 14-day limit as compared to complying with the dual limit. The reason these probabilities are identical is that Scenario B (meeting 1-hr limit but exceeding the 14-day limit) did not occur once during the entire simulation. Also, no results are provided for the 1-hr limit as there were no simulation runs during which the 1-hr limit was continuously complied with.

The second objective function was "Under what conditions would the dual limit be less protective than the 14-day guidance limit?" To answer this question ADEQ used the same 50,000 runs of the simulator, however for each run also recorded the results with emissions increased by 40% and decreased by 20%. These simulation results are provided in the following two tables.

Table 10 – 40% Emissions Increase

40% Emissions Increase				
Scenario Bin	**Occurrences**	**Violations**		
A	0	0		
B	0	0		
C	49,708	49,569		
D	292	292		
Limit	**Probability of Violating NAAQS while Complying with Limit**	**90% Confidence Interval**		
1-hr	N/A	N/A	to	N/A
14-day	99.72%	99.68%	to	99.76%
Dual	99.72%	99.68%	to	99.76%

These results align with the results observed with the "real-world" emissions data. In this scenario where the smelter's emissions are increased by 40%, both the dual limit and 14-day limit provide equal protection of the NAAQS. As with the "normal" emissions simulations, the reason both limits provide for identical protection is because the scenario that the dual limit allows which the 14-day limit precludes was never observed. Even though there is a higher likelihood of a violation, the takeaway from this analysis is that both violation probabilities for the 14-day limit and dual limit are identical.

Table 11 - 20% Emissions Decrease

20% Emissions Decrease				
Scenario Bin	**Occurrences**	**Violations**		
A	2,041	0		
B	0	0		
C	47,959	0		
D	0	0		
Limit	**Probability of Violating NAAQS while Complying with Limit**	**90% Confidence Interval**		
1-hr	0.00	0.00	to	0.00
14-day	0.00	0.00	to	0.00
Dual	0.00	0.00	to	0.00

These results align with the results observed with the "real-world" emissions data. In this scenario where the smelter's emissions are decreased by 20%, both the dual limit and 14-day limit provide equal protection of the NAAQS. There were no observed NAAQS violations from this scenario, therefore all emission limit schemes have the same NAAQS violation probability of zero.

Discussion

The results of ADEQ's analysis of the expected NAAQS violation probabilities for each of the emission limit schemes shows that for the Hayden smelter there is no functional difference between the 14-day limit prescribed by EPA guidance and the dual limit. In essence, both provide the same level of protection of the NAAQS.

One of the key reasons for this equivalence is the fact that not a single occurrence of Scenario B or D was observed in the simulations based on the expected emissions profile. These two scenarios describe noncompliance with the 14-day limit. In the 150,000 years' worth of simulated data not a single occurrence of the Hayden smelter violating the 14-day average was observed. This suggests that such a scenario is extremely implausible.

Even though the simulator showed the 1-hour limit (i.e. the CEV) would be violated based on the expected emissions profile, the chance of a NAAQS violation is approximately 1 every ~2,600 years. ADEQ believes that this probability is small enough to be considered negligible and that all three limits (1-hour, 14-day, and dual) are sufficiently protective of the NAAQS.

The results of the "what if" simulations where the emission rates were artificially increased and decreased also supports the idea that the dual limit is comparably protective of the NAAQS as the 14-day limit. These simulations provide evidence that both the 14-day limit and dual limit would provide identical protection of the NAAQS.

9.6 Appendix F: Modeling Contractor Report

MODELING REPORT
FOR THE
HAYDEN SULFUR DIOXIDE NONATTAINMENT AREA

Submitted To:

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
1110 W. WASHINGTON STREET
PHOENIX, AZ 85007

On Behalf of:

ASARCO LLC
1365 WEST PIMA MINE ROAD
SAHUARITA, AZ 85629

Prepared By:

BLUE SKY MODELING, LLC
7251 LAKE HILLS COURT
MARRIOTTSVILLE, MD 21104

OCTOBER 3, 2022

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Appendix F: Response No. 2 to ADEQ Comments on ASARCO SO_2 SIP Modeling (August 25, 2022)
Appendix G: Response to EPA Comments on Hayden SO_2 SIP Modeling Protocol (September 15, 2022)
Appendix H: Response No. 3 to ADEQ Comments on ASARCO SO_2 SIP Modeling (September 29, 2022)

1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) established a new 1-hour National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO_2) of 75 parts per billion (ppb) on June 2, 2010. EPA designated the Hayden area of Gila and Pinal Counties as a nonattainment area (NAA) for the 2010 SO_2 NAAQS on August 5, 2013, effective as of October 4, 2013. Because of this designation, the Arizona Department of Environmental Quality (ADEQ) must develop a State Implementation Plan (SIP) revision to demonstrate future attainment of the NAAQS within five years of the effective date of designation. An attainment demonstration using an EPA approved air quality dispersion model is a core piece of SO_2 NAA SIP submittals.

ASARCO LLC (ASARCO) operates the Hayden smelter, a copper smelting facility, which is the largest source of SO_2 emissions in the Hayden NAA. As part of the Converter Retrofit Project installed in 2017-2018, ASARCO made several improvements to the existing air pollution controls to further reduce SO_2 emissions, including: (1) replacing the five existing small converters with three larger converters to optimize blowing emissions with double contact acid plant capacity; (2) rerouting secondary hood emissions during blowing from the converter secondary hood baghouse to the double contact acid plant to significantly reduce SO_2 emissions; (3) installing a tertiary capture system over the converter aisle to substantially capture secondary operation fugitives and spillover from the secondary hoods and route them to the main stack; (4) adding high surface area lime in the secondary hood baghouse to reduce SO_2 emissions; and (5) adding high surface area lime in the vent gas baghouse to reduce SO_2 emissions. ASARCO conducted a fugitive emissions study on the roof line emissions during 2019 until the Hayden smelter suspended operations due to a labor action. Based in part on that study and a known malfunction at the double contact acid plant preheater, ASARCO has proposed additional controls to be put in place on the Hayden smelter: (1) replacement of the existing double contact acid plant preheater with a redesigned unit; (2) addition of secondary hoods to the three existing anode furnaces, which will be routed to a baghouse and then the main stack; (3) addition of secondary ventilation around the flash furnace uptake to capture fugitive emissions from the flash furnace, matte tapping and slag skimming areas and route them to the converter secondary hood baghouse and its associated lime injection system; and (4) addition of a fuming ladle hood to be used to capture fuming ladle emissions and route them to the converter secondary hood baghouse and its associated lime injection system.

ASARCO has retained Blue Sky Modeling, LLC (BSM) to conduct an air dispersion modeling analysis to demonstrate that these controls will result in the attainment of the SO_2 NAAQS in the Hayden area.

On June 23, 2022, ASARCO submitted to the ADEQ a Modeling Protocol describing ASARCO's proposed methodology to conduct the SO_2 modeling in support of the Hayden NAA SIP (see Appendix A).

On July 12, 2022, BSM, on behalf of ASARCO, submitted to the ADEQ a letter report which summarized ASARCO's air dispersion modeling for the Hayden NAA SO_2 SIP at that time, along with various electronic input/output files that supported that analysis (see Appendix B).

On July 22, 2022, ADEQ submitted to BSM its comments on the Modeling Protocol and modeling analysis (see Appendix C).

On August 12, 2022 BSM, on behalf of ASARCO, responded to the majority of ADEQ's July 22, 2022 comments (see Appendix D).

On August 22, 2022, ADEQ submitted to BSM me comments on ASARCO's August 12, 2022 response (see Appendix E).

On August 25, 2022, BSM, on behalf of ASARCO, responded to the remainder of ADEQ's July 22, 2022 comments (see Appendix F).

On August 29, 2022, ADEQ forwarded to BSM comments received from EPA on the Modeling Protocol. On

September 15, 2022, BSM, on behalf of ASARCO, sent ADEQ its response to EPA's August 29, 2022 comments (see Appendix G).

On September 29, 2022, BSM, on behalf of ASARCO, sent ADEQ a response to points raised by ADEQ during a virtual meeting held on September 20, 2022 (see Appendix H).

This document serves as the Modeling Report for that modeling analysis, reflecting the comments/responses between ASARCO, ADEQ, and EPA as listed above. The Modeling Report is organized in a manner very similar to that of the June 23 Modeling Protocol. Specifically:

- Section 2 provides an overview of the general regional characteristics of the Hayden SO_2 NAA, including topography, land use, and climate;
- Section 3 provides a discussion on the determination of the modeling domain, sources to explicitly model and the receptor grid;
- Section 4 provides a discussion on the model selection;
- Section 5 provides detailed source inputs, including source configuration, source emissions, source release parameters, Good Engineering Practice (GEP) stack height, and urban/rural determination;
- Section 6 provides a discussion on the selection and processing of meteorological data;
- Section 7 provides a discussion on the determination of background concentrations; and
- Section 8 provides a discussion of the modeling results.

2.0 OVERVIEW OF HAYDEN NONATTAINMENT AREA (NAA) FOR 1-HR SO_2

The Hayden SO_2 NAA is comprised of the portions of Gila County bound by the townships and ranges as presented in Figure 2-1. The towns of Hayden, Winkelman and Kearny lie within the Hayden SO_2 NAA. Figure 2-1 also depicts the location of the ASARCO Smelter.

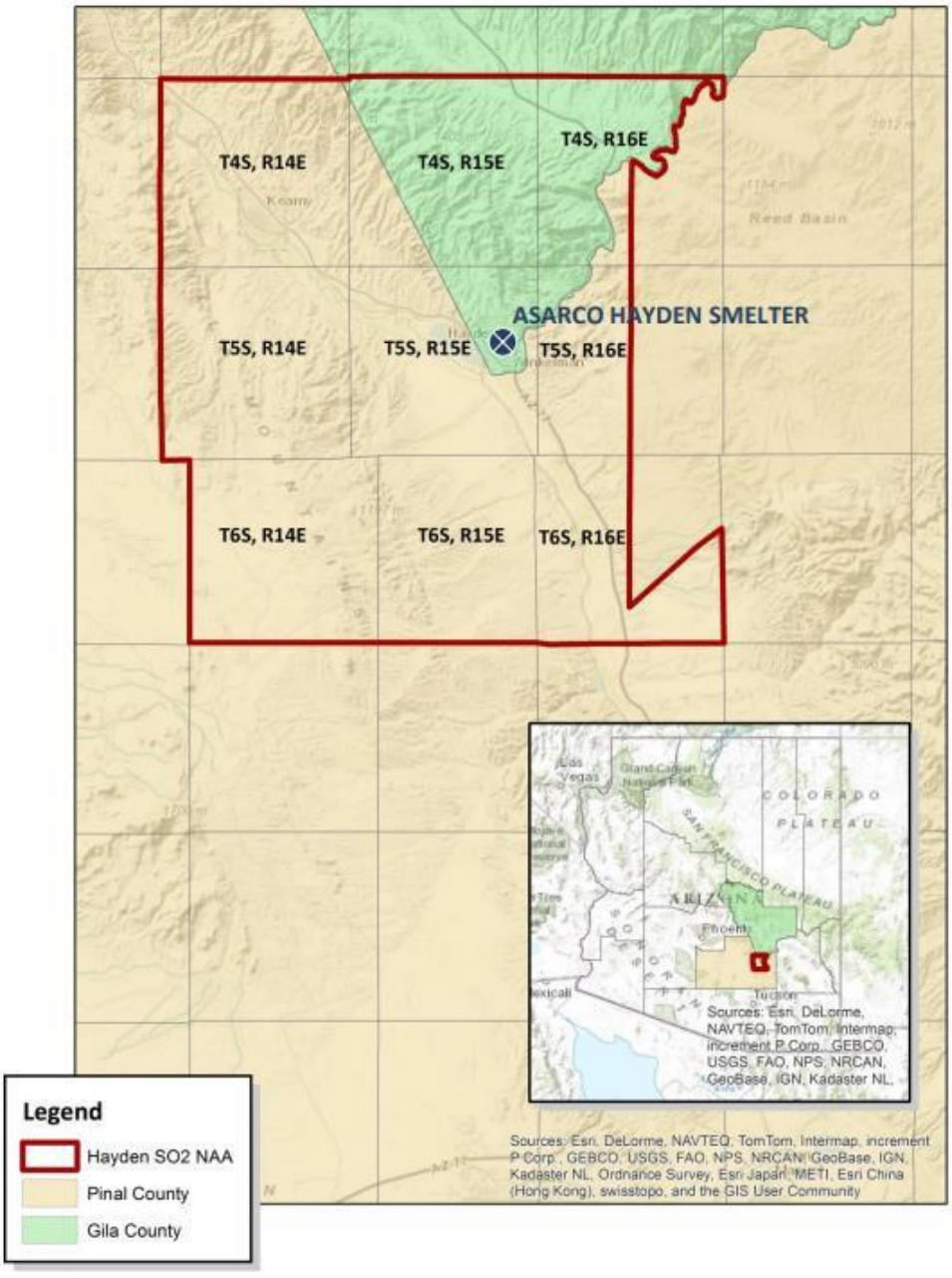


Figure 2-1
Hayden SO_2 NAA including Townships and Ranges

2.1 LAND USE

The Hayden NAA area encompasses portions of two counties: Gila and Pinal. The Gila County portion of the NAA is approximately 58 square miles while the Pinal County portion is approximately 217 square miles. The majority of the land within the NAA is owned and managed by the either the Bureau of Land Management (39.1%) or the Arizona State Land Department (35.5%). The remainder of the land within the NAA is comprised of privately held land along with a small area of land located to the east of Winkelman, which the Bureau of Reclamation manages. A breakdown of the land owners in the Hayden SO_2 NAA are presented in Table 2-1.

Table 2-1. Land Use Area

Land Owner	Area (sq miles)	Percentage
Bureau of Land Management	106.816	39.1%
State Trust Land	96.876	35.5%
Private Land	68.932	25.2%
Bureau of Reclamation	0.499	0.2%

Further discussion of land use, as it pertains to dispersion modeling and meteorological processing inputs, is provided in Sections 5.4 and 6.4 of this document.

2.2 TOPOGRAPHY

ASARCO operations in Hayden, Arizona are located on the southwestern flank of the Dripping Spring Mountains, a range rising rapidly just to the north and east of ASARCO. Bisected by numerous northeast-southwest oriented arroyos, this terrain in the immediate vicinity of the ASARCO Hayden operations is rugged and variable in elevation. To the south of ASARCO, the terrain is smoother, dominated by the northwest-southeast aligned valley of the Gila and San Pedro Rivers. The Tortilla Mountains, which form the western border of the Gila River Valley, are located several miles to the west of ASARCO. The topography of the local area, along with the location of ASARCO's Hayden processes and operations, is depicted in Figure 2-2.

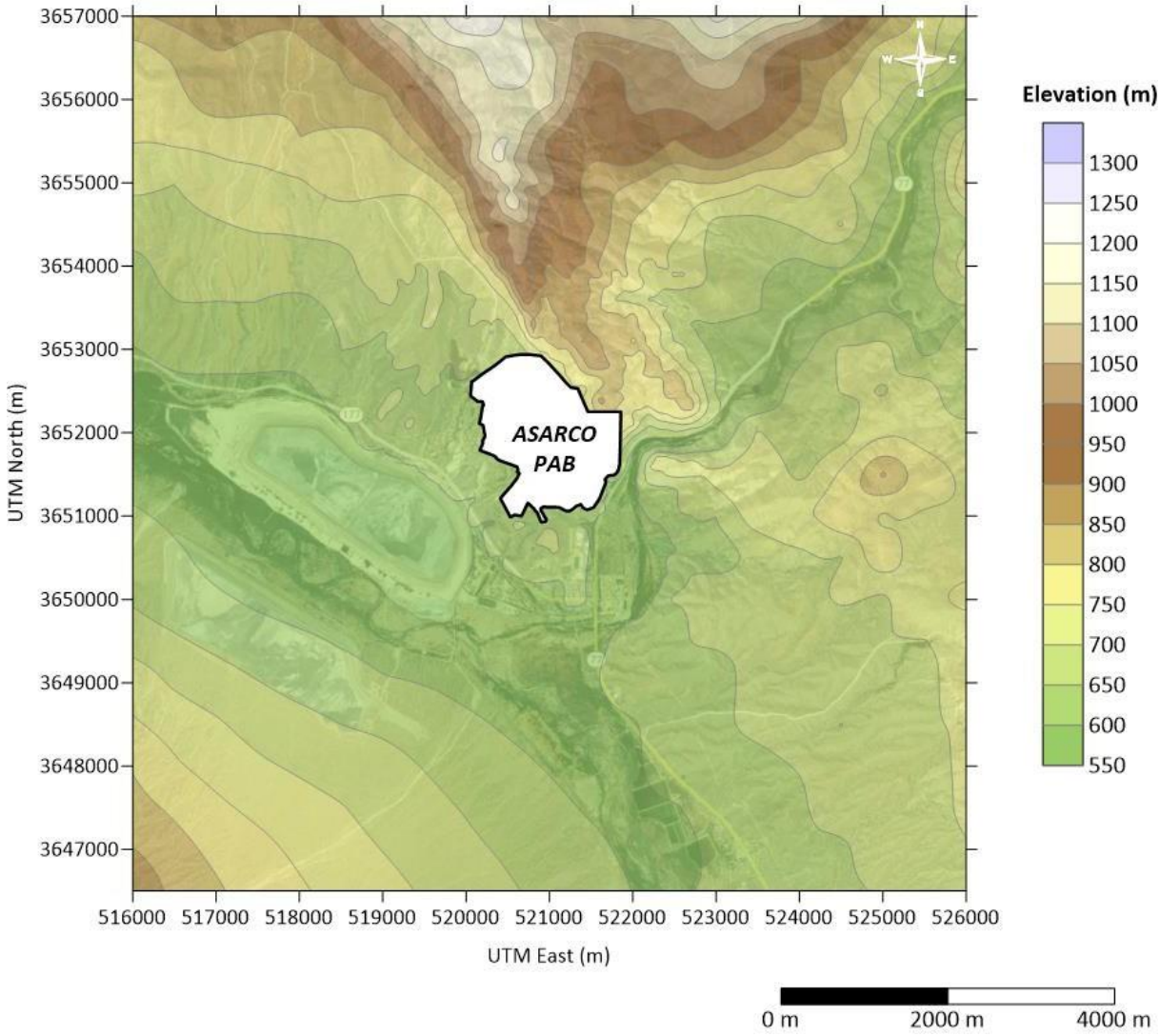


Figure 2-2
Topography of Area Surrounding ASARCO

2.3 CLIMATE

Both desert terrain and mountain ranges are found across the southern Gila County and eastern Pinal County landscape. Elevations range from near 1,800 feet to more than 4,400 feet above sea level in the NAA with the town of Hayden situated at an elevation near 2,050 feet. This unique environment experiences both warm desert and cool alpine climates. The climate of the area is arid, with annual average precipitation of about 14 inches. Temperatures range from an average low in the winter of 31°F to an average high of 99°F in the summer. Wind directions in the area generally conform to the river valley orientations, with westerly and southeasterly winds predominating in Hayden.

Synoptic scale air flows and local topographically driven surface winds influence the speed and direction of air pollution transport throughout the Hayden area. Local wind patterns in the Gila River Airshed are

greatly influenced by the complex local topography. Hayden is located at the junction of two rivers, the Gila and the San Pedro. Situated in a low-lying part of a valley with mountains reaching over 4,000 feet to the north, east and southwest, Hayden is subject to a distinct mountain-valley diurnal wind pattern. Under stable atmospheric conditions, nighttime winds are typically from the southeast with speeds less than 10 miles per hour (4.47 meters per second). These conditions can cause air pooling in low-lying areas at night, allowing for pollutants to settle in these areas. The up-slope air flows and convection that occurs during the day increases dispersion and flow out of the Hayden area. Under normal daytime conditions, surface winds in the Hayden area range from west-southwesterly to west-northwesterly as the atmosphere becomes less stable. This pattern is repeated throughout the complex terrain found in the Hayden area.

During the wintertime, relatively strong inversions (where cold air becomes trapped at the surface by warmer air aloft) create extremely stable atmospheric conditions. Depending on the strength of the inversion and amount of daytime surface heating, the inversion may break by the early afternoon, permitting the air to mix vertically. Sometimes, however, the inversion may not break at all. Under these conditions, vertical and horizontal movement of the air is very limited, causing pollutants in the air to accumulate up to several days with little dispersion.

2.4 SUMMARY OF ATTAINMENT STATUS FOR CRITERIA POLLUTANTS

Gila County is designated as "unclassified" or in "attainment" for the 8-hour ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$) NAAQS.

The EPA designated a portion of Gila County as "nonattainment" for the PM_{10} NAAQS, specifically the Miami and Hayden planning areas. The ASARCO Smelter is in the Hayden planning area. In July 2006, ADEQ requested the EPA split the Hayden/Miami PM10 NAA into separate nonattainment areas. EPA concurred with this request in January 2007.

The EPA designated the Hayden planning area as nonattainment for the 2010 SO_2 NAAQS, effective October 4, 2013. The Hayden SO_2 NAA is shown in Figure 2-1.

3.0 MODELING DOMAIN

The first step of the SIP modeling exercise is to determine the size of the modeling domain, which depends on the number of sources to explicitly model and size of the receptor network to account for the areas of impact. The modeling domain should at a minimum encompass the NAA and include the sources thought most likely to cause or contribute to NAAQS violations in and around the nonattainment area. In the modeling exercise, all modeled receptors should exhibit modeled attainment of the NAAQS.

3.1 DETERMINING SOURCES TO EXPLICITLY MODEL

Per EPA's guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions, Appendix A[1], there are two key criteria for the determination of sources to explicitly model: whether sources could cause or contribute to a NAAQS violation, and whether the ambient impacts from sources could be represented via background concentrations.

Previous modeling efforts for the Hayden NAA have established that ASARCO is the only meaningful source of SO_2 emissions in the Hayden NAA. Therefore, any other sources which may contribute to SO_2 levels in the Hayden SO_2 NAA are accounted for in the background SO_2 concentration (see Section 7.0).

3.2 RECEPTOR GRID

ASARCO developed a modeling domain with a total coverage of approximately 33 kilometers by 34 kilometers, centered on the ASARCO Smelter facility. The modeling domain covers portions of Gila, Maricopa, Pinal and Graham Counties and encompasses the entire Hayden NAA. Figure 3-1 presents the modeled receptors superimposed on a map of the Hayden NAA, with Figure 3-2 providing a focused view of receptors near ASARCO.

[1] Guidance for 1-Hour Sulfur Dioxide (SO_2) Nonattainment Area State Implementation Plan (SIP) Submissions, U.S. EPA. April 23, 2014.

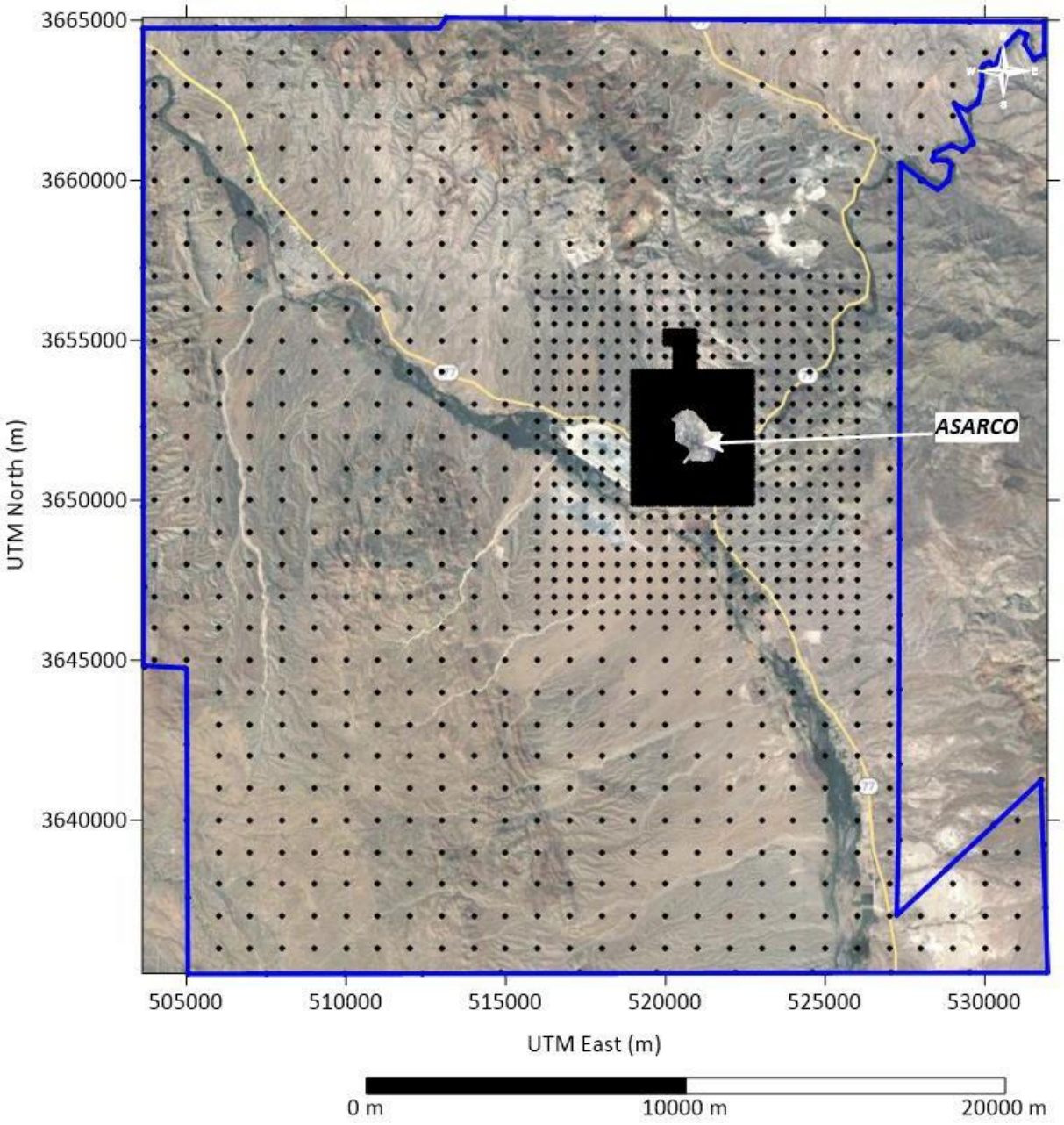


Figure 3-1
Modeled Receptors, Full Grid

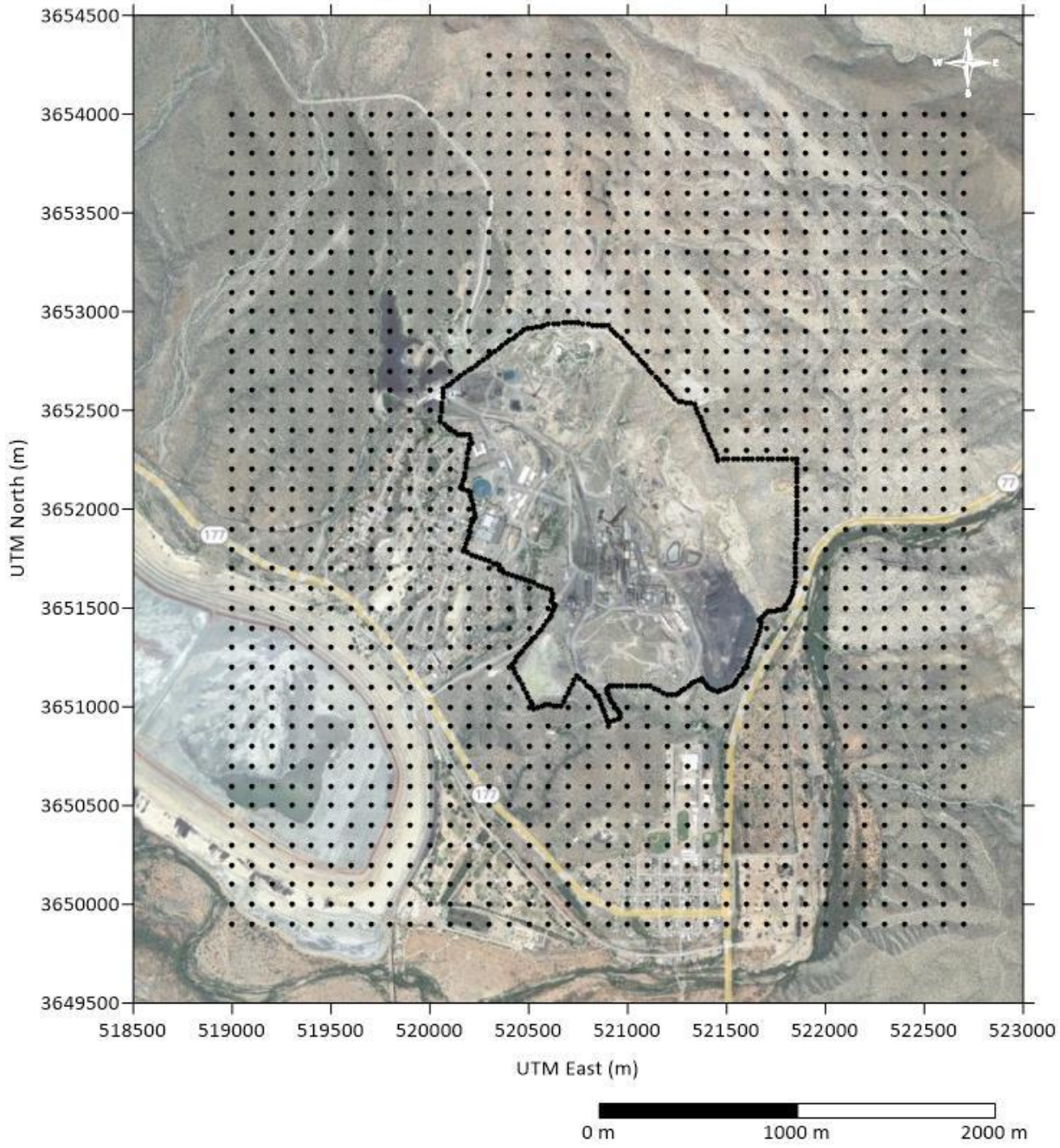


Figure 3-2
Modeled Receptors, Focused on ASARCO

Additional information concerning ASARCO's Ambient Air Boundary (AAB) is presented in Appendix G.

The receptor grid consists of 2,858 receptors, spaced as follows:

- Receptors along AAB at a spacing of 25 m

- Receptors between AAB 500 m and ~1500 m at a spacing of 100 m (including in area of elevated terrain to the north)
- Receptors between ~1500 m and ~5500 m at a spacing of 500 m
- Receptors between ~5500 m and Hayden NAA boundary at a spacing of 1000 m
- Receptors along the Hayden NAA boundary at a spacing of 2500 m

ASARCO used EPA's AERMAP software tool (version 18081) to estimate receptor elevations and hill heights. Four 1/3 arc-second USGS GeoTiff files were used as inputs to AERMAP. The datum for this AERMAP processing was 1983 North American Datum (NAD83).

4.0 MODEL SELECTION

As outlined in the EPA's Modeling Guidance for Nonattainment Areas, for SIP development under the 2010 primary SO_2 NAAQS, the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), or one of the other preferred models in Appendix W, should be used for near-field dispersion unless use of an alternative model can be justified.

ASARCO used the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) (version 22112) to predict ambient concentrations in simple, complex and intermediate terrain. AERMOD is the recommended sequential model in EPA's GAQM (40 CFR 51, Appendix W) for near-field analysis.

There are two input data processors that are regulatory components of the AERMOD modeling system: AERMET (version 22112), a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, and AERMAP (version 18081), a terrain data preprocessor that incorporates complex terrain using USGS Digital Elevation Data. Other non-regulatory components of this system include: AERSURFACE (Version 20060), a surface characteristics preprocessor, and BPIPPRIM (version 04274), a multi-building dimensions program incorporating the Good Engineering Practice technical procedures for PRIME applications.

ASARCO used the regulatory default option. This option commands AERMOD to:

- Use the elevated terrain algorithms requiring input of terrain height data for receptors and emission sources;
- Use stack tip downwash (building downwash automatically overrides);
- Use the calms processing routines;
- Use buoyancy-induced dispersion;
- Use the missing meteorological data processing routines.

5.0 SOURCE INPUTS

This section discusses source characterization to develop appropriate source inputs for dispersion modeling. Section 5.1 provides an overview of ASARCO Smelter operations and SO_2 controls, Section 5.2 provides details on source configuration, source types and source release parameters, Section 5.3 discusses Good Engineering Practice (GEP) stack heights, and Section 5.4 provides details on urban/rural determination of the sources.

5.1 ASARCO SMELTER OPERATIONS AND SO_2 CONTROLS

During the Converter Retrofit Project installed in 2017-2018, ASARCO made several improvements to the existing air pollution controls at the Hayden smelter to further reduce SO_2 emissions, including: (1) replacing the five existing small converters with three larger converters to optimize blowing emissions with double contact acid plant capacity; (2) rerouting secondary hood emissions during blowing from the converter secondary hood baghouse to the double contact acid plant to significantly reduce SO_2 emissions; (3) installing a tertiary capture system over the converter aisle to substantially capture secondary operation fugitives and spillover from the secondary hoods and route them to the main stack; (4) adding high surface area lime in the converter secondary hood baghouse to reduce SO_2 emissions; and (5) adding high surface area lime in the vent gas baghouse to reduce SO_2 emissions. In addition to the Converter Retrofit Project controls, ASARCO has proposed additional controls to be put in place on the Hayden smelter: (1) replacement of the existing preheater at the double contact acid plant with a redesigned unit; (2) addition of secondary hoods to the three existing anode furnaces, exhaust from which will be routed to a baghouse and then the main stack; (3) addition of secondary ventilation around the flash furnace uptake to capture fugitive emissions from the flash furnace, matte tapping and slag skimming areas and routed to the converter secondary hood baghouse; and (4) addition of a hood to be used to capture fuming ladle emissions and route them to the converter secondary hood baghouse and its lime injection system.

5.2 SOURCE CONFIGURATION, TYPES, AND RELEASE PARAMETERS

SO_2 emissions will be released to the atmosphere from five primary locations at ASARCO's Hayden operations: the Main Smelter Stack, the Anode Furnace roof monitors, the Converter Aisle roof monitors, the Flash Furnace building roof monitors, and Outdoor Slag Pouring. In addition, very small amounts of SO_2 are emitted from three pieces of non-trivial equipment: the Acid Plant Preheater, the Anode Boiler, and the Oxygen Plant Boiler. The locations of these sources are depicted in Figure 5- 1.

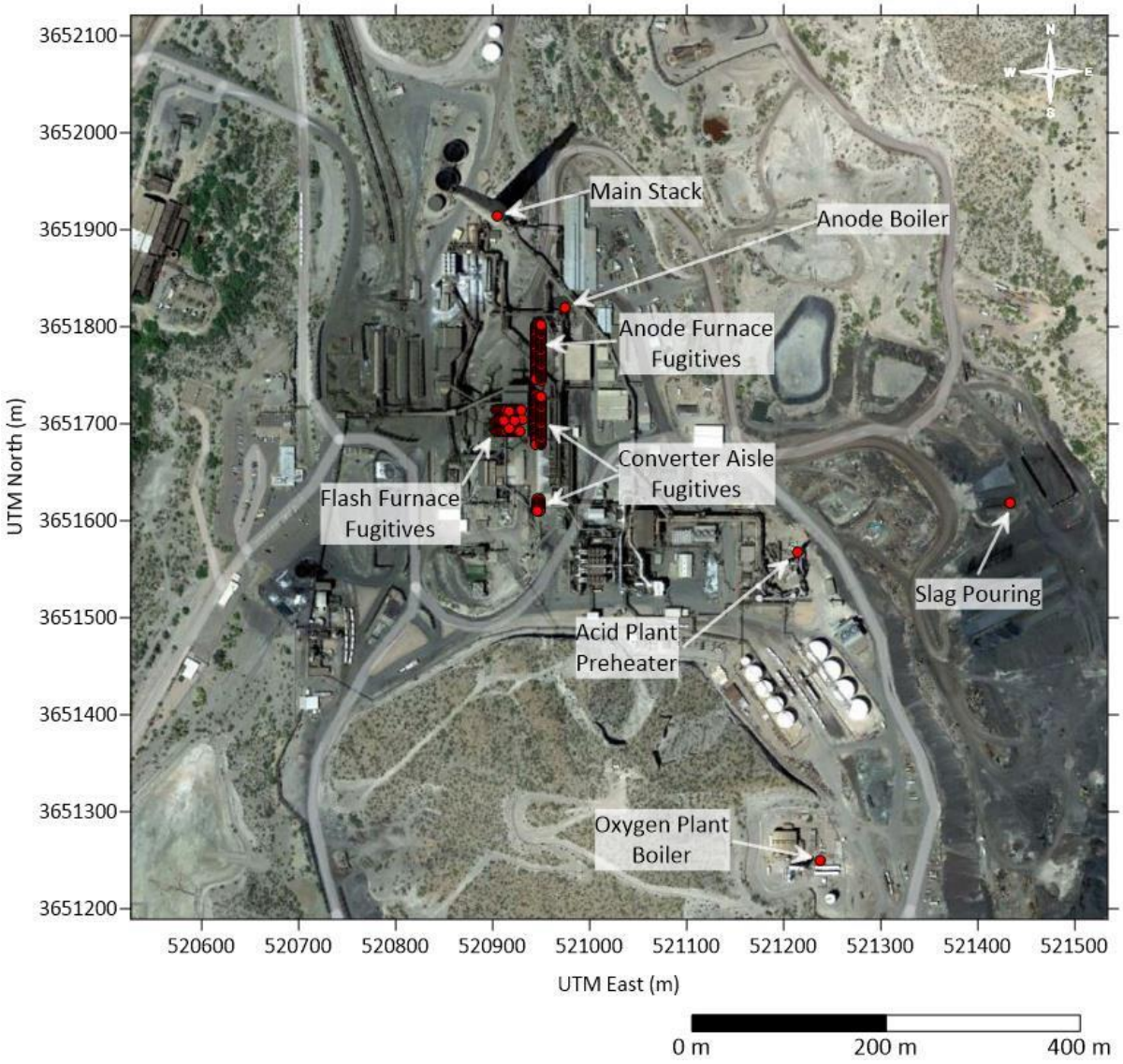


Figure 5-1
Modeled Emission Sources

5.2.1 Point Sources

Point sources will be used in the modeling to represent emissions from the Main Stack, Slag Pouring, Acid Plant Preheater, Anode Boiler, and the Oxygen Plant Boiler.

Table 5-1 presents the modeled point source characteristics

Table 5-1 Modeled Point Source Characteristics

Source	UTM Coordinate (m)		Base Elev. (m)	Stack Height (m)	Exit Diam. (m)	Exit Vel. (m/s)	Exit Temp. (K)
	East	North					
Main Stack	520929.0	3651932.0	650.75	304.8	8.9	10.7	346.5
Slag Pouring	521458.0	3651636.0	626.9	0.0	13.3	1.5	1333.0
Acid Plant Preheater	521237.7	3651585.4	634.0	26.9	1.0	0.001	616.5
Anode Boiler	520998.7	3651837.0	638.9	3.4	0.5	1.8	447.6
Oxygen Plant Boiler	521261.7	3651267.3	640.4	9.1	0.5	1.8	447.6

The modeled emission rates for these are as follows:

- Main Stack: 1518 lb/hr
- Slag Pouring: 4.05 lb/hr
- Acid Plant Preheater: 0.12 lb/hr
- Anode Boiler: 0.002 lb/hr
- Oxygen Plant Boiler: 0.01 lb/hr

5.2.2 Volume Sources

Fugitive emissions from the Anode Furnace, Converter Aisle, and Flash Furnace Building were represented in the modeling by volume sources. The emissions for the Anode Furnace fugitives (9 lb/hr), the Converter Aisle fugitives (10 lb/hr), and the Flash Furnace fugitives (38.5 lb/hr) and were evenly distributed amongst all volume sources.

Table 5-3 presents the modeled volume source characteristics.

Table 5-3 Modeled Volume Source Characteristics

Source ID	Description	Base Elev. (m)	Release Height (m)	Init. Horizontal Dimension (m)	Init. Vertical Dimension (m)	Emission Rate per Source (g/s)
AFW* AFE*	Anode Furnace: West, East	640.08	31.35[e]	0.7[a]	11.34[f]	0.0118
CES* CWS* CEN* CWN*	Converter Aisle: East South, West South, East North, West North	634.11	25.4 / 31.35[e]	0.7[a]	10.63 / 11.34[f]	0.01432
FFS* FMW* FME* FFN*	Flash Furnace: South, Middle West, Middle East, North	635.86	43.67	0.7[a]	19.85[b]	0.08774
FFPH*	Flash Furnace: Penthouse	635.86	43.59	7.44[c]	20.7[d]	0.0990

a. Line source represented by adjacent volume sources; length of side 1.5 m
b. Elevated source on or adjacent to building; building height 42.67 m
c. Line source represented by adjacent volume sources; length of side 16 m
d. Elevated source on or adjacent to building; building height 44.5 m
e. Release height of 25.5 m for southern portion of Converter Aisle, 31.35 m for northern portion of Converter Aisle (including above Anode Furnace)
f. Elevated source on or adjacent to building; southern portion of Converter Aisle building height 22.86 m, northern portion of Converter Aisle (including above Anode Furnace) building height 24.38 m

Supporting information regarding the derivation of these volume source characteristics is presented in Appendix H.

5.3 GOOD ENGINEERING PRACTICE (GEP) STACK HEIGHT

There are two definitions of Good Engineering Practice (GEP) stack height: (i) formula GEP stack height and (ii) regulatory GEP stack height. EPA requires sources to evaluate building downwash effects when a stack is less than formula GEP stack height (see Equation 5-1 below). Regulatory GEP stack height is either 65 meters or formula GEP stack height, whichever is greater. The EPA does not allow sources to take credit for ambient air concentrations that result from stacks that are higher than regulatory GEP stack height.

As discussed in the ADEQ's June 2002 "Final Hayden Sulfur Dioxide Assessment Nonattainment Area State Implementation and Maintenance Plan"14, the GEP height for ASARCO's Main Stack was assessed in a fluid modeling study jointly conducted by North American Weather Consultants and Colorado State University, with that study concluding that the stack's 1,000-foot height meets GEP stack height requirements. EPA subsequently approved Arizona's SIP determination of GEP stack height. No structures

have since been constructed at ASARCO that would affect this determination. ASARCO's main stack was modeled at its true height of 1,000 feet.

ASARCO conducted an analysis of the other point sources, with respect to GEP, in accordance with EPA's guidelines for air quality impact modeling. ASARCO used EPA's Building Profile Input Program for PRIME (BPIPPRM, version 04274; U.S. EPA, 2004a) to compute the formula GEP stack height and to generate wind-direction specific building profiles for each stack for the purpose of sequential modeling. For stacks constructed after January 12, 1979, EPA defined the Formula GEP stack height as:

$$H_{GEP} = H_B + 1.5L_B$$

Where:

H_{GEP} = GEP stack height;
H_B = Building height above stack base; and
L_B = Lesser of building's height or maximum projected width

Figure 5-2 presents a simplified layout of ASARCO buildings and the modeled stacks.

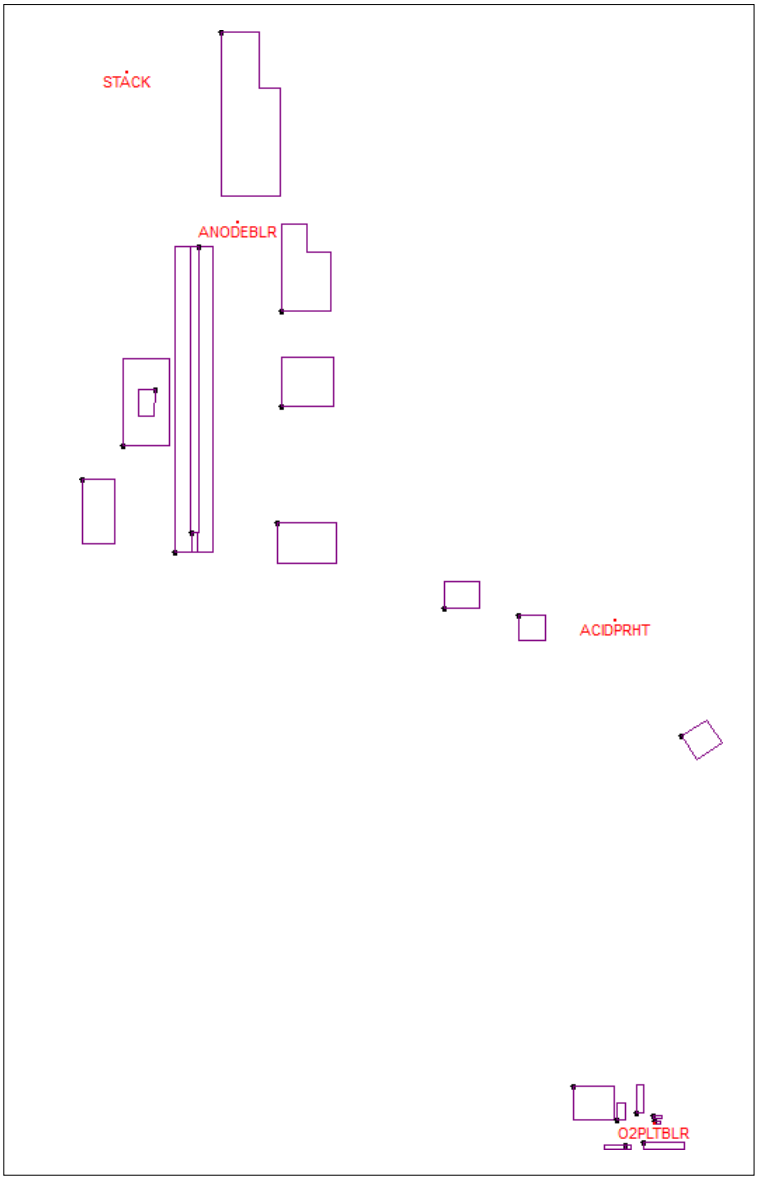


Figure 5-2
Simplified Facility Layout

Pertinent input/output files for the BPIPPRIM analysis are being forwarded to ADEQ concurrent with the submission of this Modeling Report.

5.4 URBAN/RURAL DETERMINATION

Dispersion coefficients for air quality modeling are selected based on the land use classification technique suggested by Auer, which is EPA's preferred method. The classification determination involves assessing land use by Auer's categories within a 3-kilometer radius of the proposed site. A source should select urban dispersion coefficients if greater than 50 percent of the area consists of urban land use types; otherwise, rural coefficients apply.

Following Section 3.7 of the ADEQ Modeling Guidelines, ASARCO classified the land use of the area using the land-use procedure set forth in EPA's "Guideline on Air Quality Models" (GAQM). This approach requires determining the amount of specific types of land use categories within a 3-km radius circle centered on the source; if the total land use (as defined by Auer) is classified as 50% or more "urban" then the area is designated as urban; otherwise it is designated as rural.

Land use (taken from the U.S. Geological Survey (USGS) National Land Cover Data (NLCD) 2016 archives) was examined for the 3-km radius circle, and totals of each land use category were calculated. These land use categories were then correlated to the categories as established by Auer, and the amount of urban and rural land use within 3 km of ASARCO was calculated. The area near ASARCO that was examined is depicted in Figure 5-3, while the results of the analysis are presented in Table 5-4.

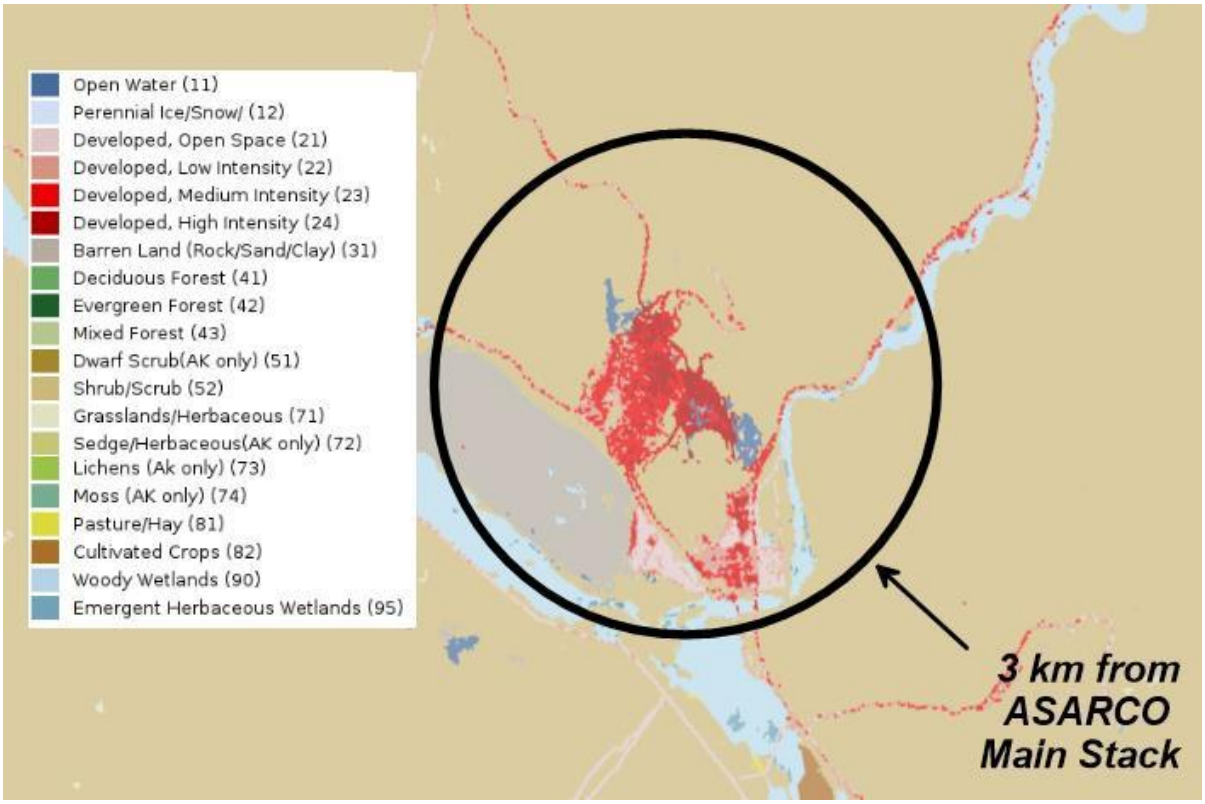


Figure 5-3
Land Use Near ASARCO Smelter

Table 5-4 Land Use Analysis within 3 km of ASARCO Smelter

2016 NLCD Land Use Category	Percent of Area within 3 km of ASARCO	Rural/Urban
Open Water	0.0%	Rural
Perennial Ice/Snow	1.0%	Rural
Developed, Open Space	0.0%	Rural
Developed, Low Intensity	2.2%	Urban
Developed, Medium Intensity	3.3%	Urban
Developed, High Intensity	4.7%	Urban
Barren Land (Rock/Sand/Clay)	2.6%	Rural
Unconsolidated Shore	9.9%	Rural
Deciduous Forest	0.0%	Rural
Evergreen Forest	0.0%	Rural
Mixed Forest	0.0%	Rural
Dwarf Scrub	0.0%	Rural
Shrub/Scrub	0.0%	Rural
Grasslands/Herbaceous	67.6%	Rural
Sedge/Herbaceous	0.0%	Rural
Lichens	0.0%	Rural
Moss	0.0%	Rural
Pasture/Hay	0.0%	Rural
Cultivated Crops	0.0%	Rural
Woody Wetlands	0.0%	Rural
Palustrine Forested Wetland	8.2%	Rural
Palustrine Scrub/Shrub Wetland	0.0%	Rural
Estuarine Forested Wetland	0.0%	Rural
Estuarine Scrub/Shrub Wetland	0.0%	Rural
Emergent Herbaceous Wetland	0.0%	Rural
Palustrine Emergent Wetland (Pe	0.4%	Rural
Estuarine Emergent Wetland	0.0%	Rural
Palustrine Aquatic Bed	0.0%	Rural
Estuarine Aquatic Bed	0.0%	Rural

For the purposes of the Auer Method, the following 2016 NLCD land use categories were assumed to be "urban":

- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity

As shown in Table 5-4, these three land use categories comprise 10.2% of the land use within 3 km of ASARCO; accordingly the sum of the "rural" categories is 89.8%. Therefore, the area within 3 km of ASARCO is defined as "rural" and identified as such in the AERMOD input.

Pertinent input/output files for the AERSURFACE analysis used in the urban/rural determination are being forwarded to ADEQ concurrent with the submission of this Modeling Report.

6.0 METEOROLOGICAL DATA

6.1 AERMET

EPA's AERMET tool (version 22112) was used to process meteorological data for use with AERMOD. AERMET merges National Weather Service (NWS) surface observations with NWS upper air observations and performs calculations of meteorological parameters required by AERMOD. Surface observations from on-site instruments can optionally be included. The latter can be useful because the data are more relevant to the site being modeled and in cases where on-site data are collected at multiple elevations above ground, AERMET can construct a more accurate vertical profile of meteorological data. In addition to the meteorological observations, AERMET further requires the inclusion of the characteristics of land use surfaces that ASARCO calculated using EPA's AERSURFACE tool.

The data inputs to AERMET are described below. AERMET input/output files are being forwarded to ADEQ concurrent with the submission of this Modeling Report

6.2 SURFACE OBSERVATIONS

EPA recommends that AERMOD be run with a minimum of 5 years of NWS data or 1 year of on-site meteorological data. The meteorological data used in the sequential modeling consists of on-site hourly surface observations collected by ASARCO from a 10-meter tower located approximately 0.35 kilometers south of the smelter building, on Camera Hill. Figure 6-1 shows the location of the tower site relative to the proposed project.

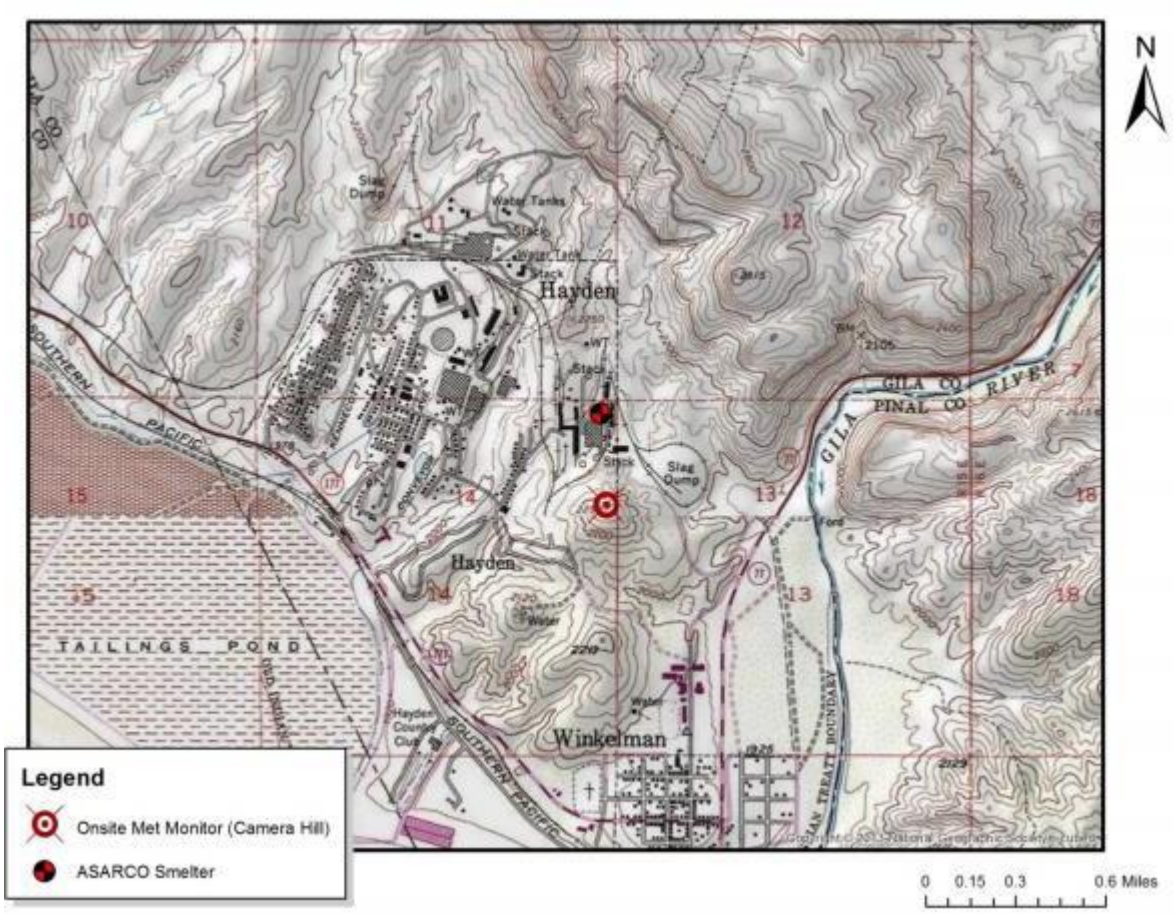


Figure 6-1
Camera Hill Onsite Meteorological Station

The meteorological data used in the modeling consist of the five most recent years of data available, specifically 2015-2016 and 2018-2020. During 2017 the anemometer failed an audit and was replaced, while during 2021 the solar radiation sensor failed an audit and was replaced. As a result, neither of these years met the minimum 90% data completeness requirement for regulatory modeling purposes.

6.3 UPPER AIR OBSERVATIONS

Upper air data were taken from the Tucson International Airport (WBAN 23160) in Tucson, Arizona.

6.4 AERSURFACE

ASARCO used EPA's AERSURFACE tool (version 20060) to calculate the surface roughness length, albedo and Bowen ratio inputs required by AERMET. EPA developed AERSURFACE to identify these parameters within a defined radius from a specified point. In this case, ASARCO input the UTM coordinates of the on-site meteorological tower to AERSURFACE along with a 1-kilometer radius per EPA guidance. ASARCO acquired land cover, tree canopy, and impervious surface information for the year 2016 as inputs to

AERSURFACE. ASARCO calculated the parameters for twelve compass sectors of 30° each, and by month. ASARCO assigned the seasonal categories as follows per ADEQ guidance:

- Late autumn after frost and harvest, or winter with no snow: December, January, February, March;
- Winter with continuous snow on the ground: none;
- Transitional spring (partial green coverage, short annuals): April, May, June;
- Midsummer with lush vegetation: July, August, September; and
- Autumn with un-harvested cropland: October, November.

Per an August 16, 2022 email from Feng Mao (ADEQ) to Bill Jones (BSM), ASARCO assumed the following moisture conditions for each of the modeled years:

- 2015: wet surface moisture
- 2016: wet surface moisture
- 2018: average surface moisture
- 2019: wet surface moisture
- 2020: dry surface moisture

Pertinent input/output files for the AERSURFACE analysis used in the determination of moisture conditions for each of the modeled years are being forwarded to ADEQ concurrent with the submission of this Modeling Report.

6.5 PROCESSED DATA COMPLETENESS

ASARCO reviewed the most recent years of data from the Camera Hill station to determine which were eligible for use in regulatory modeling. Table 6-1 presents the results of this analysis for the years of data proposed for use in the modeling.

Table 6-1 Camera Hill Data Completeness Analysis

Year	Quarter	Percentage of Missing Data by Variable				
		Wind Direction	Wind Speed	Temperature (2 m)	Temperature (10 m)	Sigma Theta
2015	1	0.3%	0.3%	0.3%	0.0%	0.3%
	2	0.3%	0.3%	0.3%	0.0%	0.3%
	3	0.0%	0.0%	0.0%	0.0%	0.0%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2016	1	0.0%	0.0%	0.0%	0.0%	0.0%
	2	0.2%	0.2%	0.2%	0.2%	0.2%
	3	6.4%	6.4%	6.4%	6.4%	6.4%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2018	1	0.3%	0.3%	0.3%	0.3%	0.3%
	2	0.2%	0.2%	0.2%	0.2%	0.2%
	3	3.5%	3.5%	3.5%	3.5%	3.5%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2019	1	0.2%	0.2%	0.2%	0.2%	0.2%
	2	0.7%	0.7%	0.7%	0.7%	0.7%
	3	0.9%	0.9%	0.9%	0.9%	0.9%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2020	1	0.1%	0.1%	0.1%	0.1%	0.1%
	2	0.0%	0.0%	0.0%	0.0%	0.0%
	3	0.1%	0.1%	0.1%	0.1%	0.1%
	4	0.0%	0.0%	0.0%	0.0%	0.0%

As can be seen, the meteorological data used in this analysis meet the completeness requirement as stipulated in Section 5.3.2 of EPA's "Meteorological Monitoring Guidance for Regulatory Applications."[2]

[2] Meteorological Monitoring Guidance for Regulatory Applications. United States Environmental Protection Agency. EPA-454/R-99-005. February 2000.

7.0 BACKGROUND AIR QUALITY

Historically the background concentration used in ASARCO modeling has been based on periods when the smelter was shut down. Because the smelter has been temporarily shut down since October 2019 because of a work stoppage, there are two calendar years of data available that correspond to when the smelter was not operating.

Accordingly, ASARCO has revised its proposed background concentration to use data from the Hayden Jail for the years 2020 and 2021. The location of the Hayden Jail monitor is shown in Figure 7-1.

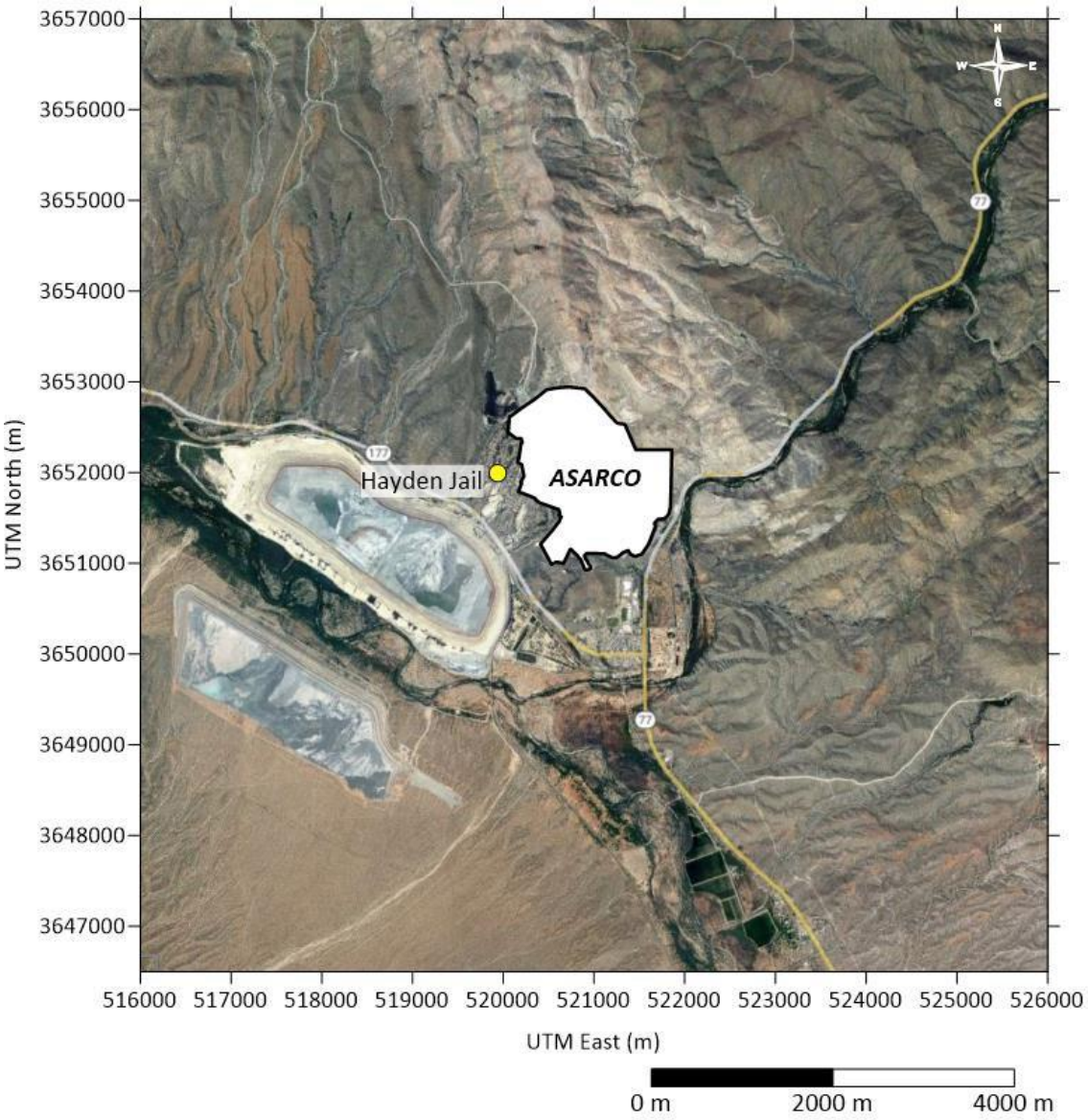


Figure 7-1
Hayden Jail monitor

Because such a long period is now available for use, ASARCO is using guidance put forth by EPA in its "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard"[3] (the concepts of which also apply to 1-hour SO_2).

In that guidance EPA discusses how meteorological factors associated with the dispersion of pollutants is a key consideration when developing a background concentration. Because there are some areas of complicated topography in and around the Hayden SO_2 SIP modeling domain (e.g., hills, arroyos, etc.), it is reasonable to expect some diurnal variability in SO_2 background concentrations as the atmosphere warms during the day/cools at night and accordingly affects the flow in and around ASARCO.

Because of this, ASARCO has chosen to follow EPA's recommendation that "…an appropriate methodology for incorporating background concentrations in the cumulative impact assessment for the 1-hour (SO_2) standard would be to use multiyear averages of the (99^{th})-percentile of the available background concentrations by season and hour-of-day…" Specifically, ASARCO is implementing the methodology put forth in ADEQ's "Air Quality Modeling Guidelines for Arizona Air Quality Permits" (November 2019)[4], as specified by ADEQ in its August 22, 2022 email from Feng Mao to Bill Jones (BSM):

> **99^{th} percentile of the Seasonal Hour-Of-Day (2^{nd} Highest):** For each of the two years under review (2020 and 2021), Seasonal Hour-Of-Day is determined by organizing all of the SO_2 concentrations by hour of day (1AM, 2AM, 3AM, etc.) for each season of the year in descending order and selecting the 2^{nd} highest SO_2 concentrations for each hour of the day. The background concentrations are then determined as the two-year average of the 2^{nd} highest-concentrations for each hour of the day and season.

The resulting revised SEASHR values are presented in Table 7-1 below

[3] Memorandum. Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard, Tyler Fox (EPA) to Regional Air Division Directors. March 1, 2011.
[4] https://static.azdeq.gov/aqd/modeling_guidance_2019.pdf

Table 7-1. SEASHR values for SO_2 Background in AERMOD

Hour	SO_2 Background Concentration (ppb) by Season			
	Winter	Spring	Summer	Fall
Hr. 1	1.3	1.3	1.6	1.6
Hr. 2	1.35	1.3	1.5	1.55
Hr. 3	1.35	1.25	1.5	1.6
Hr. 4	1.3	1.25	1.45	1.6
Hr. 5	1.35	1.4	1.5	1.6
Hr. 6	1.35	1.35	1.55	1.6
Hr. 7	1.25	1.25	1.5	1.6
Hr. 8	1.25	1.3	1.5	1.65
Hr. 9	1.35	1.4	1.45	1.6
Hr. 10	1.35	1.3	1.45	1.6
Hr. 11	1.35	1.3	1.45	1.6
Hr. 12	1.3	1.3	1.55	1.6
Hr. 13	1.4	2	1.6	1.75
Hr. 14	1.4	1.35	1.55	1.75
Hr. 15	1.4	1.35	1.5	1.7
Hr. 16	1.4	1.4	1.6	1.7
Hr. 17	1.5	1.35	1.55	1.7
Hr. 18	1.4	1.35	1.55	1.7
Hr. 19	1.35	1.4	2	1.55
Hr. 20	1.35	1.35	1.6	1.65
Hr. 21	1.4	1.35	1.55	1.65
Hr. 22	1.35	1.4	1.6	1.7
Hr. 23	1.35	1.45	1.65	1.7
Hr. 24	1.3	1.4	1.6	1.65

8.0 MODELING RESULTS

The results of the modeling analyses are presented below for the 1-hr SO_2 NAAQS as well as the former SO_2 NAAQS.

8.1 1-HR SO_2 NAAQS

The results of the 1-hr SO_2 NAAQS modeling are summarized in Table 8-1 below.

Table 8-1. Modeling Results, 1-hr SO_2 NAAQS

Highest 99th Percentile of Controlling 1-hr Concentrations (µg/m³)[a]	NAAQS (µg/m³)
195.97[b]	196.0
a. Includes background through the application of SEASHR in AERMOD b. Highest 99th Percentile of Controlling 1-hr Concentrations predicted to occur at (521851.1 m, 3651825.4 m)	

Figure 8-1 below illustrates the controlling 1-hr concentrations (including the background).

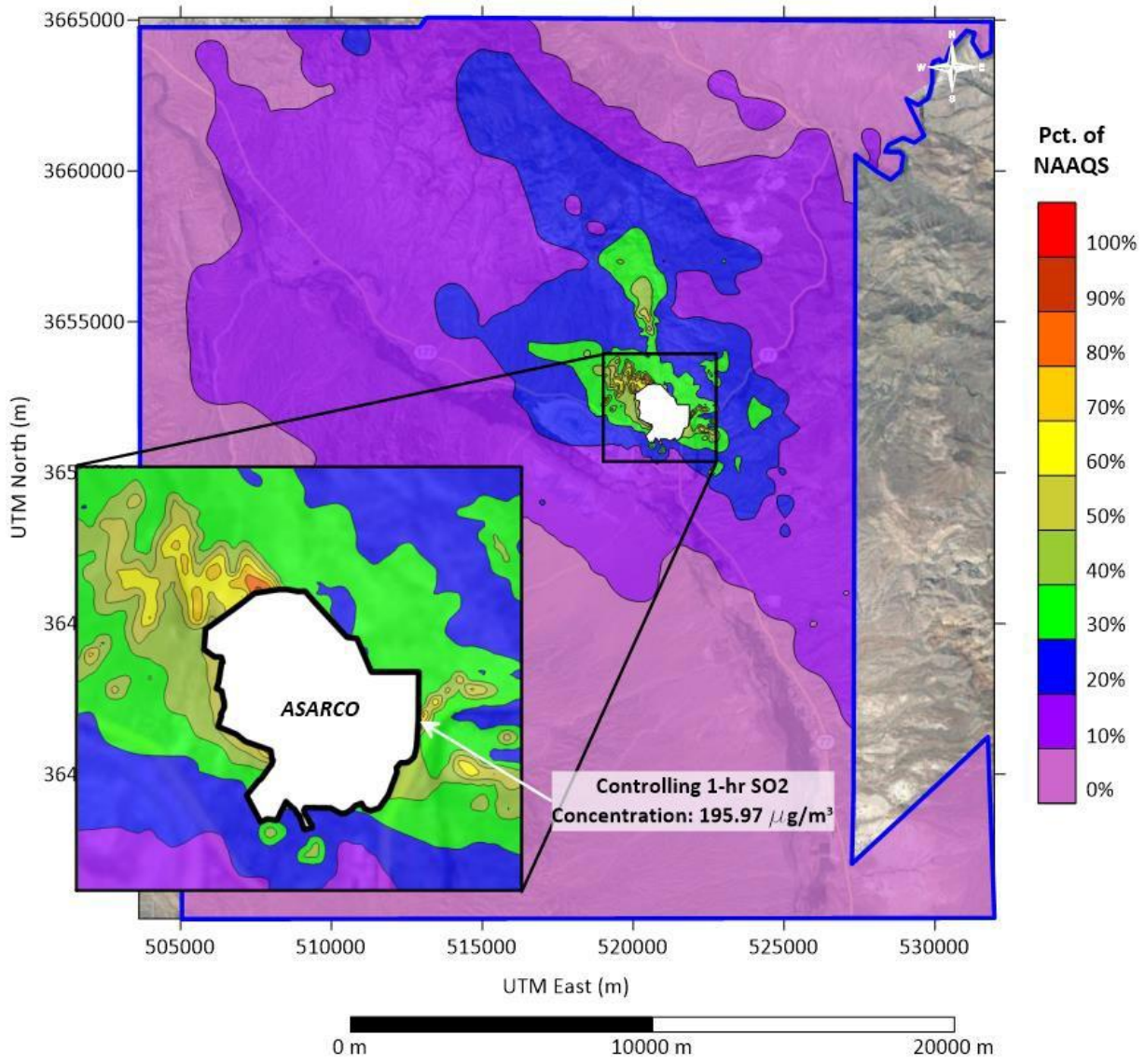


Figure 8-1
Controlling 1-hr SO_2 Concentrations

As shown above, the controlling 1-hr SO_2 concentration is below the 1-hr SO_2 NAAQS of 196 µg/m^3. It is predicted to occur along the eastern side of the ASARCO AAB. Modeled 1-hr SO_2 concentrations generally decrease very rapidly with distance from ASARCO.

AERMOD input/output files for the 1-hr SO_2 NAAQS modeling are being forwarded to ADEQ concurrent with the submission of this Modeling Report

8.2 FORMER SO_2 NAAQS

The results of the former SO_2 NAAQS modeling are summarized in Table 8-2 below.

Table 8-2. Modeling Results, Former SO_2 NAAQS

Averaging Period	Controlling Concentration ($\mu g/m^3$)[a]	NAAQS ($\mu g/m^3$)
3-hr	170.8[b]	1300
24-hr	51.7[c]	512
Annual	11.9[d]	80

a. Includes background through the application of SEASHR in AERMOD
b. Highest second-high 3-hr concentration predicted to occur at (520537.1 m, 3652922.9 m)
c. Highest second-high 24-hr concentration predicted to occur at (520615.8 m, 3651570.0 m)
d. Highest Annual concentration predicted to occur at (520611.7 m, 3651593.3 m)

Figures 8-2 through 8-4 below illustrate the controlling 3-hr, 24-hr, and Annual concentrations (including the background), respectively.

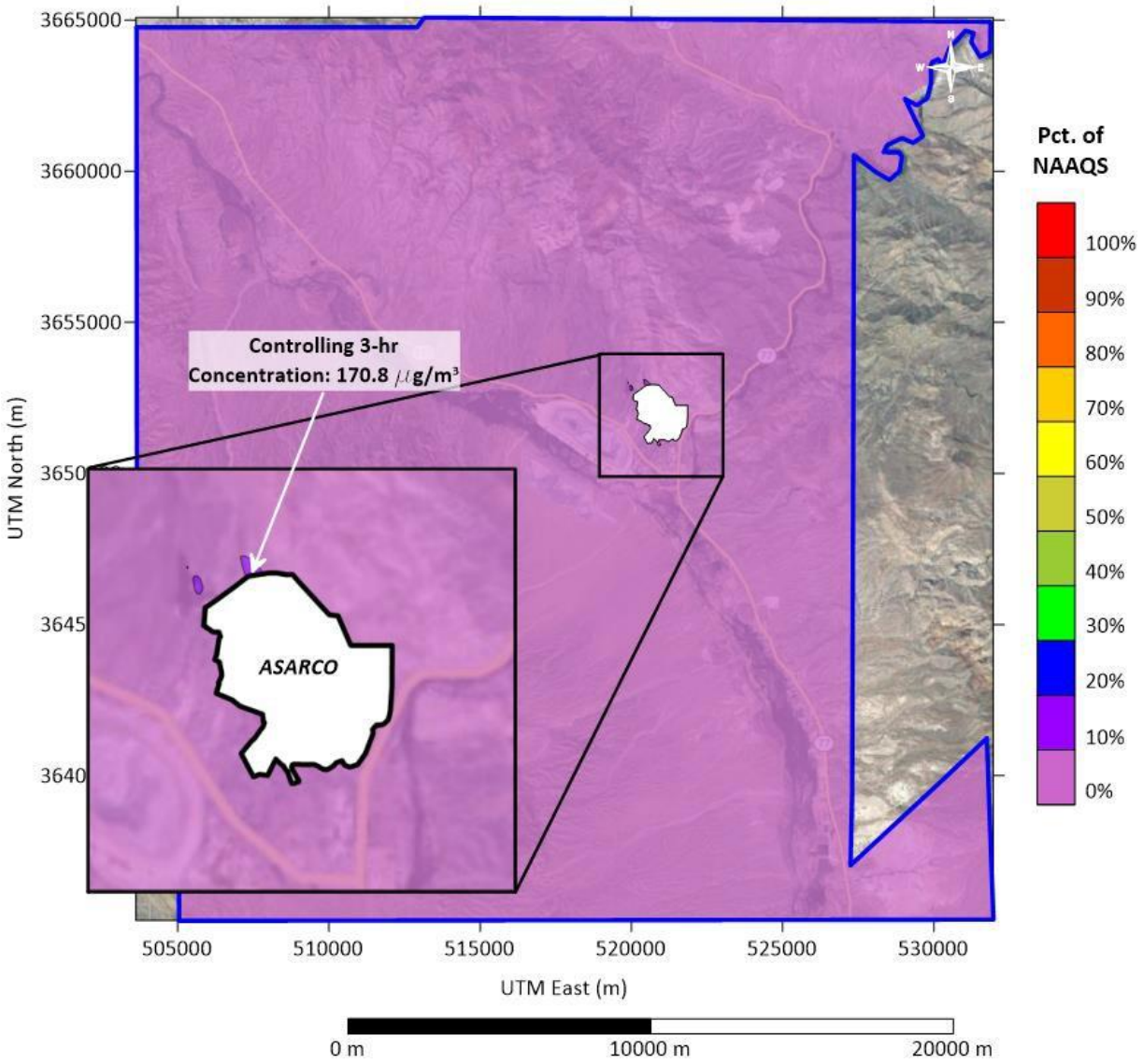


Figure 8-2
Controlling 3-hr SO_2 Concentrations

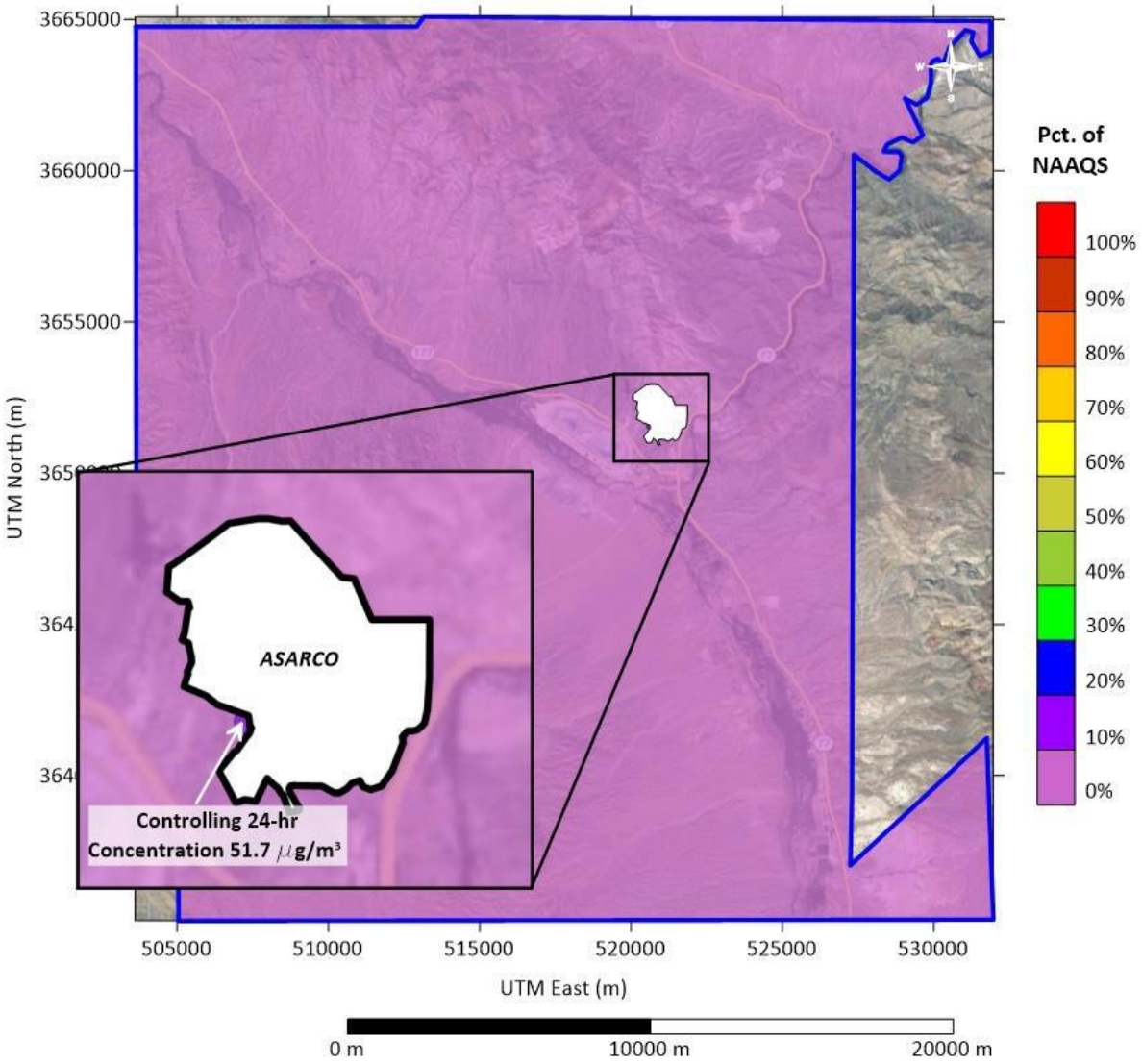


Figure 8-3
Controlling 24-hr SO_2 Concentrations

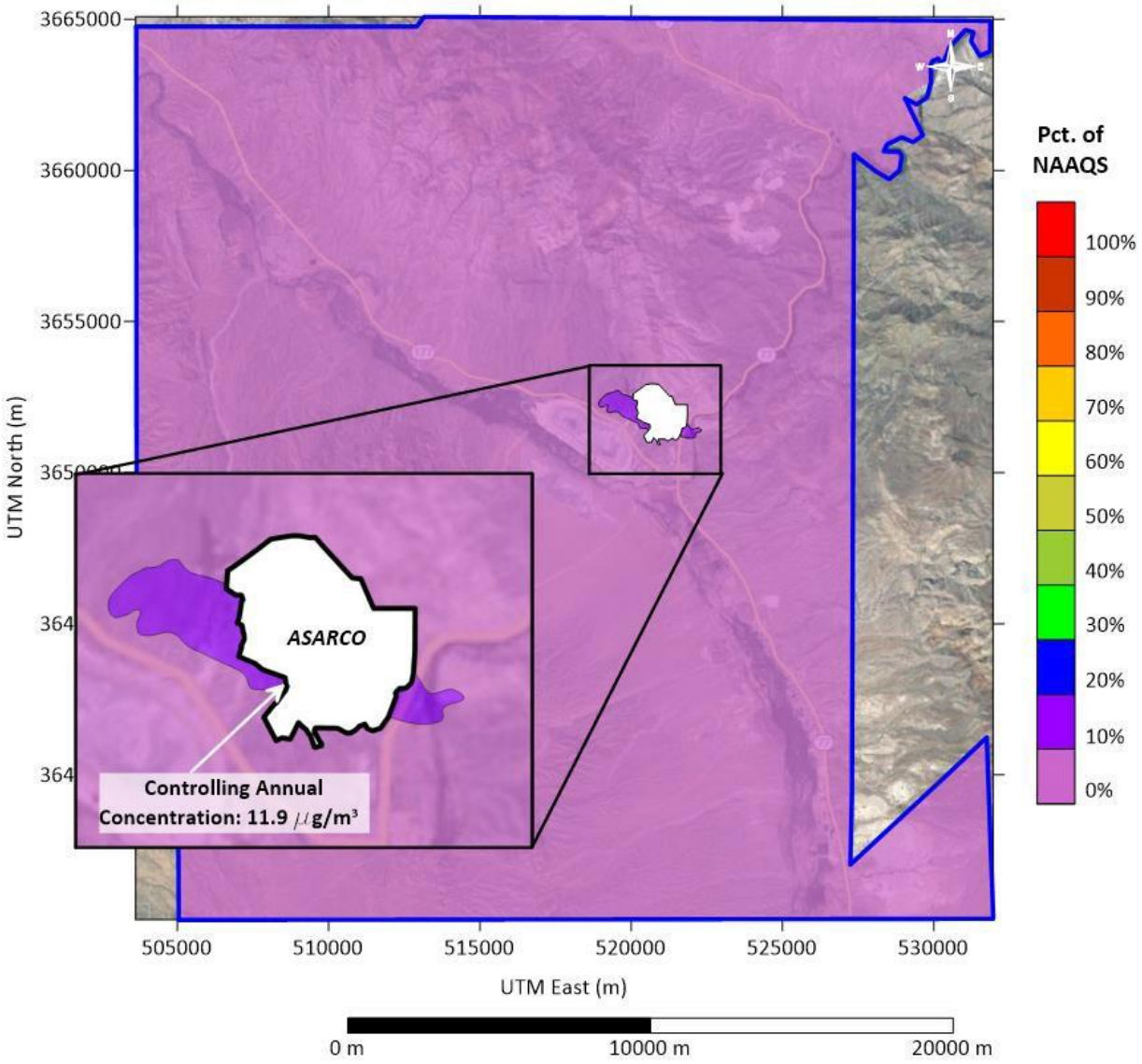


Figure 8-4
Controlling Annual SO_2 Concentrations

As shown above, the controlling 3-hr, 24-hr, and Annual SO_2 concentration are below their respective NAAQS. The controlling 3-hr concentration is predicted to occur along the northern side of the ASARCO AAB, while the controlling 24-hr and Annual concentrations are predicted to occur along the western side of the ASARCO AAB. All modeled 3-hr, 24-hr, and Annual SO_2 concentrations are far below each of their NAAQS across all the receptors.

AERMOD input/output files for the former SO_2 NAAQS modeling are being forwarded to ADEQ concurrent with the submission of this Modeling Report

Appendix A
Modeling Protocol for the Hayden Sulfur Dioxide Nonattainment Area

MODELING PROTOCOL
FOR THE
HAYDEN SULFUR DIOXIDE NONATTAINMENT AREA

Submitted To:

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
1110 W. WASHINGTON STREET
PHOENIX, AZ 85007

On Behalf of:

ASARCO, LLC
5285 EAST WILLIAMS CIRCLE, SUITE 2000
TUCSON, ARIZONA 85711-7711

Prepared By:

BLUE SKY MODELING, LLC
7251 LAKE HILLS COURT
MARRIOTTSVILLE, MD 21104

JUNE 23, 2022

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1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) established a new 1-hour National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO_2) of 75 parts per billion (ppb) on June 2, 2010. EPA designated the Hayden area of Gila and Pinal Counties as a nonattainment area (NAA) for the 2010 SO_2 NAAQS on August 5, 2013, effective as of October 4, 2013. Because of this designation, the Arizona Department of Environmental Quality (ADEQ) must develop a State Implementation Plan (SIP) revision to demonstrate future attainment of the NAAQS within five years of the effective date of designation. An attainment demonstration using an EPA approved air quality dispersion model is a core piece of SO_2 NAA SIP submittals.

ASARCO LLC (ASARCO) operates the Hayden smelter, a copper smelting facility, which is the largest source of SO_2 emissions in the Hayden NAA. As part of the Converter Retrofit Project installed in 2017-2018, ASARCO made several improvements to the existing air pollution controls to further reduce SO_2 emissions, including: (1) replacing the five existing small converters with three larger converters to optimize blowing emissions with double contact acid plant capacity; (2) rerouting secondary hood emissions during blowing from the secondary hood baghouse to the double contact acid plant to significantly reduce SO_2 emissions; (3) installing a tertiary capture system over the converter aisle to substantially capture secondary operation fugitives and spillover from the secondary hoods and route them to the main stack; (4) adding high surface area lime in the secondary hood baghouse to reduce SO_2 emissions; and (5) adding high surface area lime in the vent gas baghouse to reduce SO_2 emissions. ASARCO conducted a fugitive emissions study on the roof line emissions during 2019 until the Hayden smelter suspended operations due to a labor action. Based in part on that study and a known malfunction at the double contact acid plant preheater, ASARCO has proposed additional controls to be put in place on the Hayden smelter: (1) replacement of the existing double contact acid plant preheater with a redesigned unit; (2) addition of secondary hoods to the three existing anode furnaces, which will be routed to a baghouse and then the main stack; (3) addition of secondary ventilation around the flash furnace uptake to capture fugitive emissions from the flash furnace, matte tapping and slag skimming areas and route them to the secondary hood baghouse and it associated lime injection system; and (4) addition of a fuming ladle hood to be used to capture fuming ladle emissions and route them to the secondary hood baghouse and its associated lime injection system.

ASARCO has retained Blue Sky Modeling, LLC (BSM) to conduct an air dispersion modeling analysis to demonstrate that these controls will result in the attainment of the SO_2 NAAQS in the Hayden area.

This document serves as the Modeling Protocol for that modeling analysis. The document is organized in a manner very similar to that of the November 3, 2014 Modeling Protocol[1]. Specifically:

- Section 2 provides an overview of the general regional characteristics of the Hayden SO_2 NAA, including topography, land use, and climate;

[1] Modeling Protocol for the Hayden Sulfur Dioxide Nonattainment Area, Submitted to Environmental Protection Agency Region 9. November 3, 2014.

- Section 3 provides a discussion on the determination of the modeling domain, sources to explicitly model and the receptor grid;
- Section 4 provides a discussion on the model selection;
- Section 5 provides detailed source inputs, including source configuration, source emissions, source release parameters, Good Engineering Practice (GEP) stack height, and urban/rural determination;
- Section 6 provides a discussion on the selection and processing of meteorological data;
- Section 7 provides a discussion on the determination of background concentrations; and
- Section 8 provides a discussion on the presentation of the modeling results.

2.0 OVERVIEW OF HAYDEN NONATTAINMENT AREA (NAA) FOR 1-HR SO_2

The Hayden SO_2 NAA is comprised of the portions of Gila County bound by the townships and ranges as presented in Figure 2-1. The towns of Hayden, Winkelman and Kearny lie within the Hayden SO_2 NAA. Figure 2-1 also depicts the location of the ASARCO Smelter.

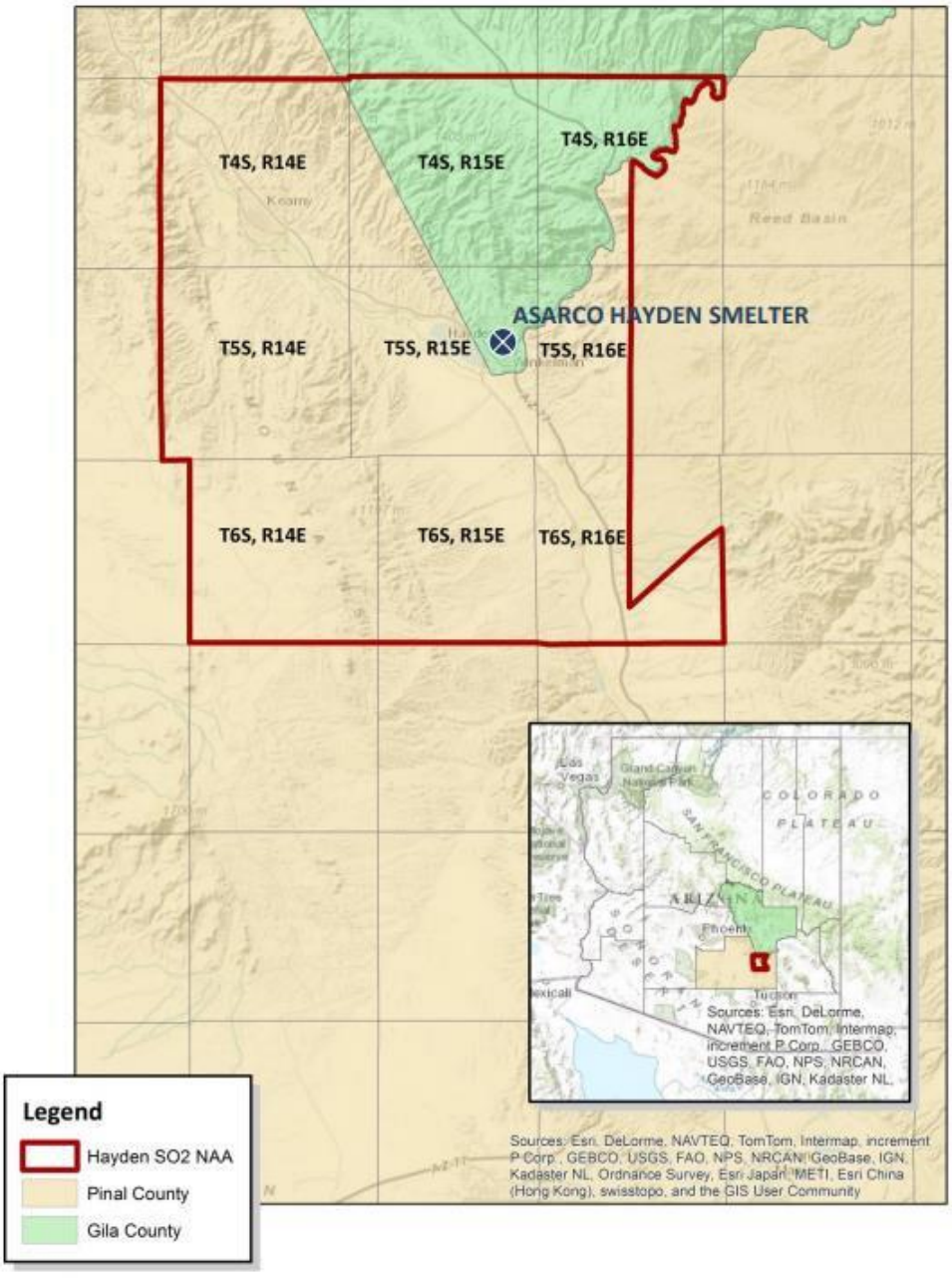


Figure 2-1
Hayden SO_2 NAA including Townships and Ranges

2.1 LAND USE

The Hayden NAA area encompasses portions of two counties: Gila and Pinal. The Gila County portion of the NAA is approximately 58 square miles while the Pinal County portion is approximately 217 square miles. The majority of the land within the NAA is owned and managed by the either the Bureau of Land Management (39.1%) or the Arizona State Land Department (35.5%). The remainder of the land within the NAA is comprised of privately held land along with a small area of land located to the east of Winkelman, which the Bureau of Reclamation manages. A breakdown of the land owners in the Hayden SO_2 NAA are presented in Table 2-1.

Table 2-1. Land Use Area

Land Owner	Area (sq miles)	Percentage
Bureau of Land Management	106.816	39.1%
State Trust Land	96.876	35.5%
Private Land	68.932	25.2%
Bureau of Reclamation	0.499	0.2%

Further discussion of land use, as it pertains to dispersion modeling and meteorological processing inputs, is provided in Sections 5.4 and 6.4 of this document.

2.2 TOPOGRAPHY

ASARCO operations in Hayden, Arizona are located on the southwestern flank of the Dripping Spring Mountains, a range rising rapidly just to the north and east of ASARCO. Bisected by numerous northeast-southwest oriented arroyos, this terrain in the immediate vicinity of the ASARCO Hayden operations is rugged and variable in elevation. To the south of ASARCO, the terrain is smoother, dominated by the northwest-southeast aligned valley of the Gila and San Pedro Rivers. The Tortilla Mountains, which form the western border of the Gila River Valley, are located several miles to the west of ASARCO. The topography of the local area, along with the location of ASARCO's Hayden processes and operations, is depicted in Figure 2-2.

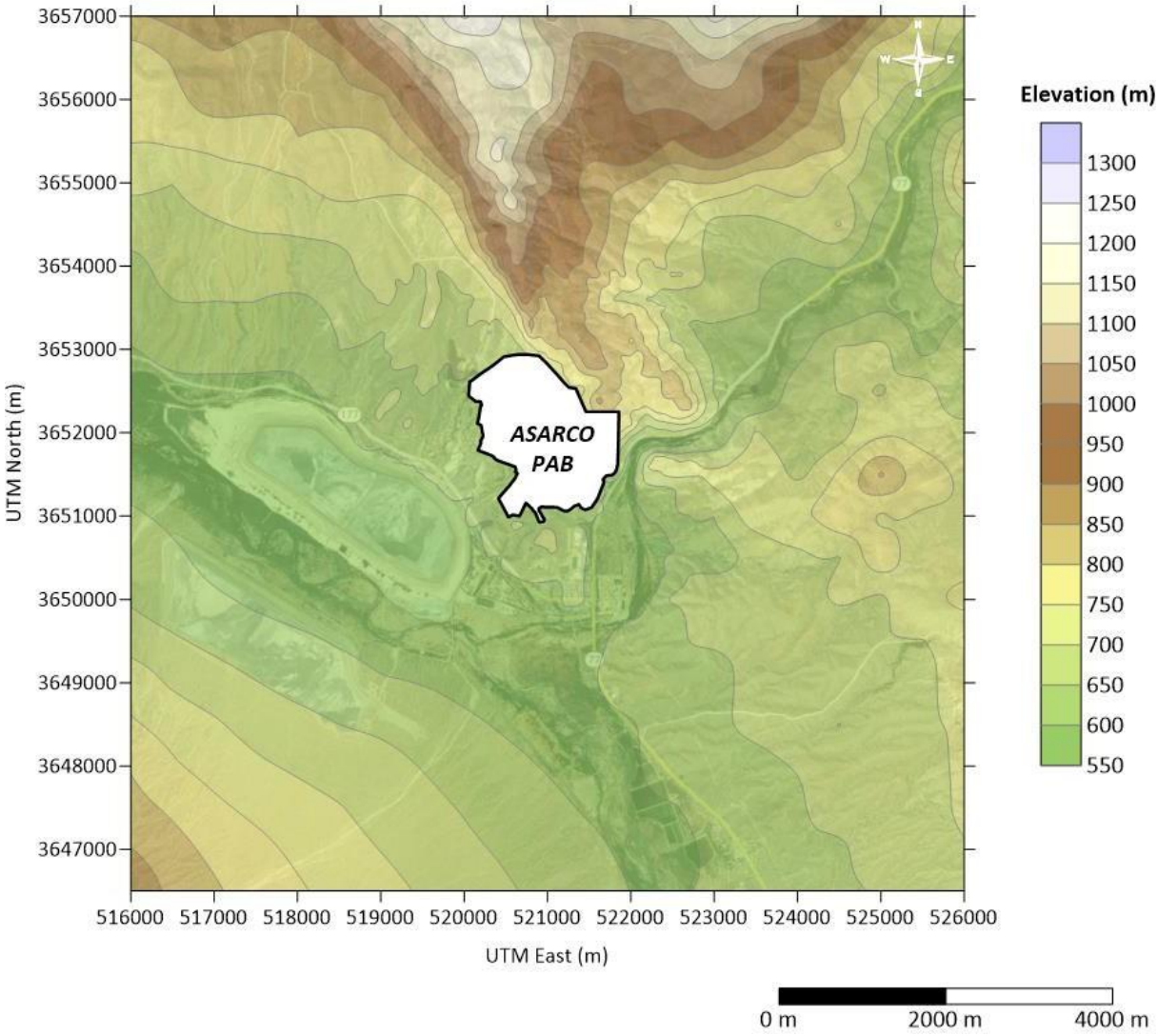


Figure 2-2
Topography of Area Surrounding ASARCO

2.3 CLIMATE

Both desert terrain and mountain ranges are found across the southern Gila County and eastern Pinal County landscape. Elevations range from near 1,800 feet to more than 4,400 feet above sea level in the NAA with the town of Hayden situated at an elevation near 2,050 feet. This unique environment experiences both warm desert and cool alpine climates. The climate of the area is arid, with annual average precipitation of about 14 inches. Temperatures range from an average low in the winter of 31°F to an average high of 99°F in the summer. Wind directions in the area generally conform to the river valley orientations, with westerly and southeasterly winds predominating in Hayden.

Synoptic scale air flows and local topographically driven surface winds influence the speed and direction of air pollution transport throughout the Hayden area. Local wind patterns in the Gila River Airshed are

greatly influenced by the complex local topography. Hayden is located at the junction of two rivers, the Gila and the San Pedro. Situated in a low-lying part of a valley with mountains reaching over 4,000 feet to the north, east and southwest, Hayden is subject to a distinct mountain-valley diurnal wind pattern. Under stable atmospheric conditions, nighttime winds are typically from the southeast with speeds less than 10 miles per hour (4.47 meters per second). These conditions can cause air pooling in low-lying areas at night, allowing for pollutants to settle in these areas. The up-slope air flows and convection that occurs during the day increases dispersion and flow out of the Hayden area. Under normal daytime conditions, surface winds in the Hayden area range from west-southwesterly to west-northwesterly as the atmosphere becomes less stable. This pattern is repeated throughout the complex terrain found in the Hayden area.

During the wintertime, relatively strong inversions (where cold air becomes trapped at the surface by warmer air aloft) create extremely stable atmospheric conditions. Depending on the strength of the inversion and amount of daytime surface heating, the inversion may break by the early afternoon, permitting the air to mix vertically. Sometimes, however, the inversion may not break at all. Under these conditions, vertical and horizontal movement of the air is very limited, causing pollutants in the air to accumulate up to several days with little dispersion.

2.4 SUMMARY OF ATTAINMENT STATUS FOR CRITERIA POLLUTANTS

Gila County is designated as "unclassified" or in "attainment" for the 8-hour ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$) NAAQS.

The EPA designated a portion of Gila County as "nonattainment" for the PM_{10} NAAQS, specifically the Miami and Hayden planning areas. The ASARCO Smelter is in the Hayden planning area. In July 2006, ADEQ requested the EPA split the Hayden/Miami PM10 NAA into separate nonattainment areas. EPA concurred with this request in January 2007.

The EPA designated the Hayden planning area as nonattainment for the 2010 SO_2 NAAQS, effective October 4, 2013. The Hayden SO_2 NAA is shown in Figure 2-1.

3.0 MODELING DOMAIN

The first step of the SIP modeling exercise is to determine the size of the modeling domain, which depends on the number of sources to explicitly model and size of the receptor network to account for the areas of impact. The modeling domain should at a minimum encompass the NAA and include the sources thought most likely to cause or contribute to NAAQS violations in and around the nonattainment area. In the modeling exercise, all modeled receptors should exhibit modeled attainment of the NAAQS.

3.1 DETERMINING SOURCES TO EXPLICITLY MODEL

Per EPA's guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions, Appendix A[2], there are two key criteria for the determination of sources to explicitly model: whether sources could cause or contribute to a NAAQS violation, and whether the ambient impacts from sources could be represented via background concentrations.

Previous modeling efforts for the Hayden NAA have established that ASARCO is the only meaningful source of SO_2 emissions in the Hayden NAA. Therefore, any other sources which may contribute to SO_2 levels in the Hayden SO_2 NAA are accounted for in the background SO_2 concentration (see Section 7.0).

3.2 RECEPTOR GRID

ASARCO developed a modeling domain with a total coverage of approximately 33 kilometers by 34 kilometers, centered on the ASARCO Smelter facility. The modeling domain covers portions of Gila, Maricopa, Pinal and Graham Counties and encompasses the entire Hayden NAA. Figure 3-1 presents the modeled receptors superimposed on a map of the Hayden NAA, with Figure 3-2 providing a focused view of receptors near ASARCO.

[2] Guidance for 1-Hour Sulfur Dioxide (SO_2) Nonattainment Area State Implementation Plan (SIP) Submissions, U.S. EPA. April 23, 2014.

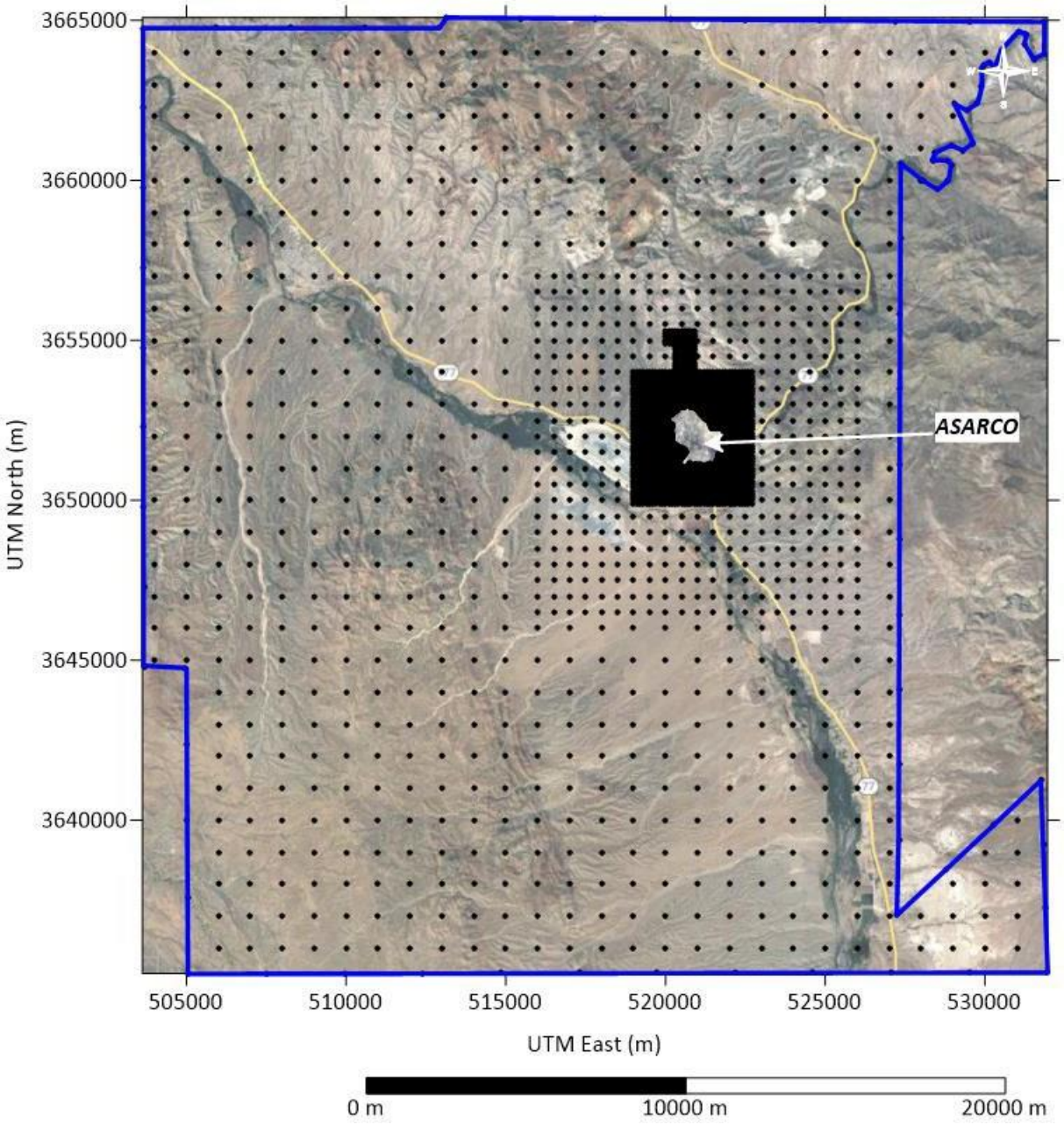


Figure 3-1
Modeled Receptors, Full Grid

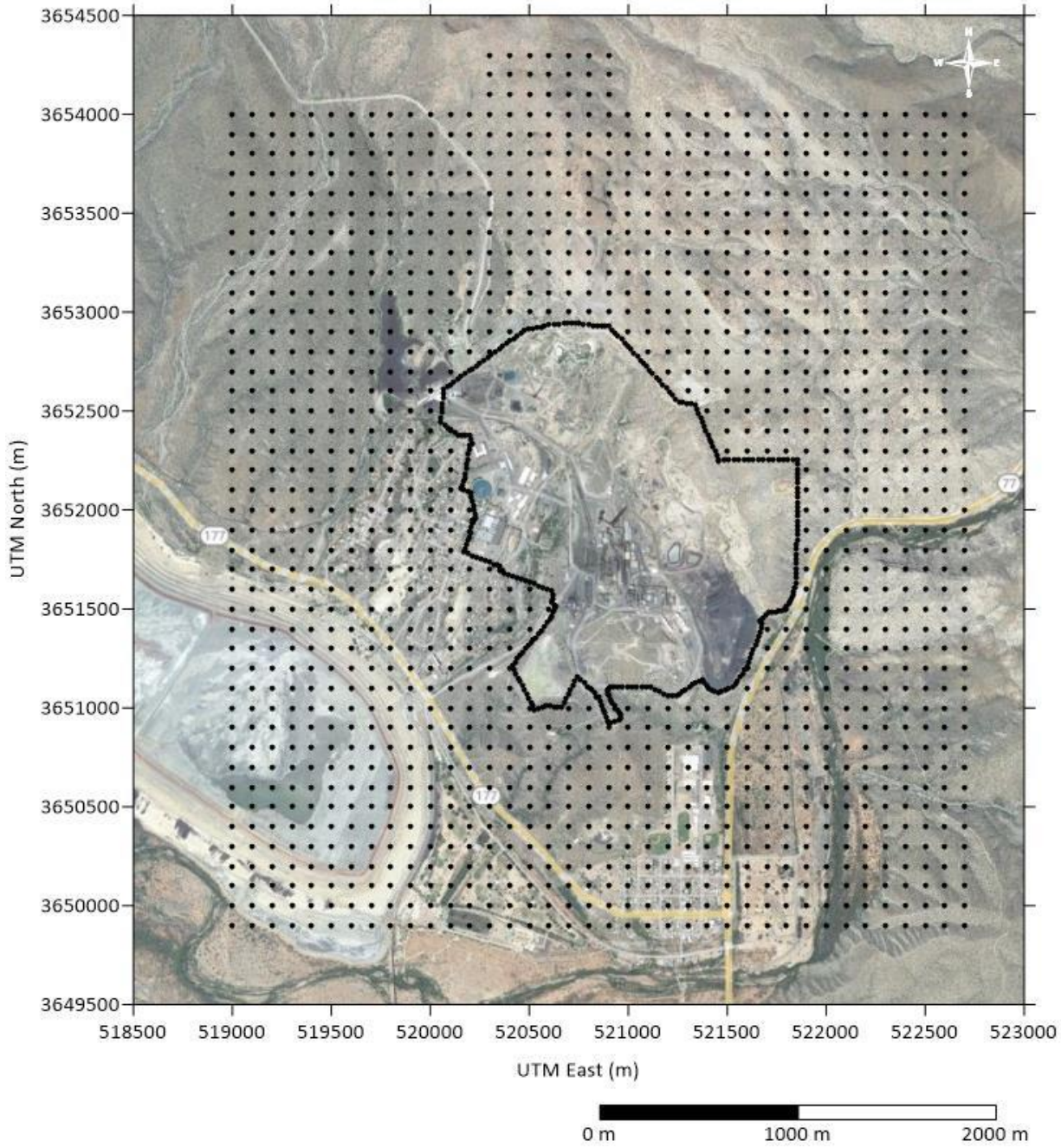


Figure 3-2
Modeled Receptors, Focused on ASARCO

The receptor grid consists of 2,858 receptors, spaced as follows:

- Receptors along PAB at a spacing of 25 m
- Receptors between PAB and ~1500 m at a spacing of 100 m (including in area of elevated terrain to the north)

- Receptors between ~1500 m and ~5500 m at a spacing of 500 m
- Receptors between ~5500 m and Hayden NAA boundary at a spacing of 1000 m
- Receptors along the Hayden NAA boundary at a spacing of 2500 m

ASARCO used EPA's AERMAP software tool (version 18081) to estimate receptor elevations and hill heights. Four 1/3 arc-second USGS GeoTiff files were used as inputs to AERMAP. The datum for this AERMAP processing was 1983 North American Datum (NAD83).

4.0 MODEL SELECTION

As outlined in the EPA's Modeling Guidance for Nonattainment Areas, for SIP development under the 2010 primary SO_2 NAAQS, the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), or one of the other preferred models in Appendix W, should be used for near-field dispersion unless use of an alternative model can be justified.

ASARCO will use the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) (version 21112) to predict ambient concentrations in simple, complex and intermediate terrain. AERMOD is the recommended sequential model in EPA's GAQM (40 CFR 51, Appendix W) for near-field analysis.

There are two input data processors that are regulatory components of the AERMOD modeling system: AERMET (version 21112), a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, and AERMAP (version 18081), a terrain data preprocessor that incorporates complex terrain using USGS Digital Elevation Data. Other non-regulatory components of this system include: AERSURFACE (Version 20060), a surface characteristics preprocessor, and BPIPPRIM (version 04274), a multi-building dimensions program incorporating the Good Engineering Practice technical procedures for PRIME applications.

ASARCO will use the regulatory default option. This option commands AERMOD to:

- Use the elevated terrain algorithms requiring input of terrain height data for receptors and emission sources;
- Use stack tip downwash (building downwash automatically overrides);
- Use the calms processing routines;
- Use buoyancy-induced dispersion;
- Use the missing meteorological data processing routines.

5.0 SOURCE INPUTS

This section discusses source characterization to develop appropriate source inputs for dispersion modeling. Section 5.1 provides an overview of ASARCO Smelter operations and SO_2 controls, Section 5.2 provides details on source configuration, source types and source release parameters, Section 5.3 discusses Good Engineering Practice (GEP) stack heights, and Section 5.4 provides details on urban/rural determination of the sources.

5.1 ASARCO SMELTER OPERATIONS AND SO_2 CONTROLS

During the Converter Retrofit Project installed in 2017-2018, ASARCO made several improvements to the existing air pollution controls at the Hayden smelter to further reduce SO_2 emissions, including: (1) replacing the five existing small converters with three larger converters to optimize blowing emissions with double contact acid plant capacity; (2) rerouting secondary hood emissions during blowing from the secondary hood baghouse to the double contact acid plant to significantly reduce SO_2 emissions; (3) installing a tertiary capture system over the converter aisle to substantially capture secondary operation fugitives and spillover from the secondary hoods and route them to the main stack; (4) adding high surface area lime in the secondary hood baghouse to reduce SO_2 emissions; and (5) adding high surface area lime in the vent gas baghouse to reduce SO_2 emissions. In addition to the Converter Retrofit Project controls, ASARCO has proposed additional controls to be put in place on the Hayden smelter: (1) replacement of the existing preheater at the double contact acid plant with a redesigned unit; (2) addition of secondary hoods to the three existing anode furnaces, exhaust from which will be routed to a baghouse and then the main stack; (3) addition of secondary ventilation around the flash furnace uptake to capture fugitive emissions from the flash furnace, matte tapping and slag skimming areas and routed to the secondary hood baghouse; and (4) addition of a hood to be used to capture fuming ladle emissions and route them to the secondary hood baghouse and its lime injection system.

5.2 SOURCE CONFIGURATION, TYPES, AND RELEASE PARAMETERS

SO_2 emissions will be released to the atmosphere from five locations at ASARCO's Hayden operations: the main smelter stack, the anode furnace roof monitors, the converter aisle roof monitors, the flash furnace building roof monitors, and outdoor slag pouring. The locations of these sources are depicted in Figure 5-1.

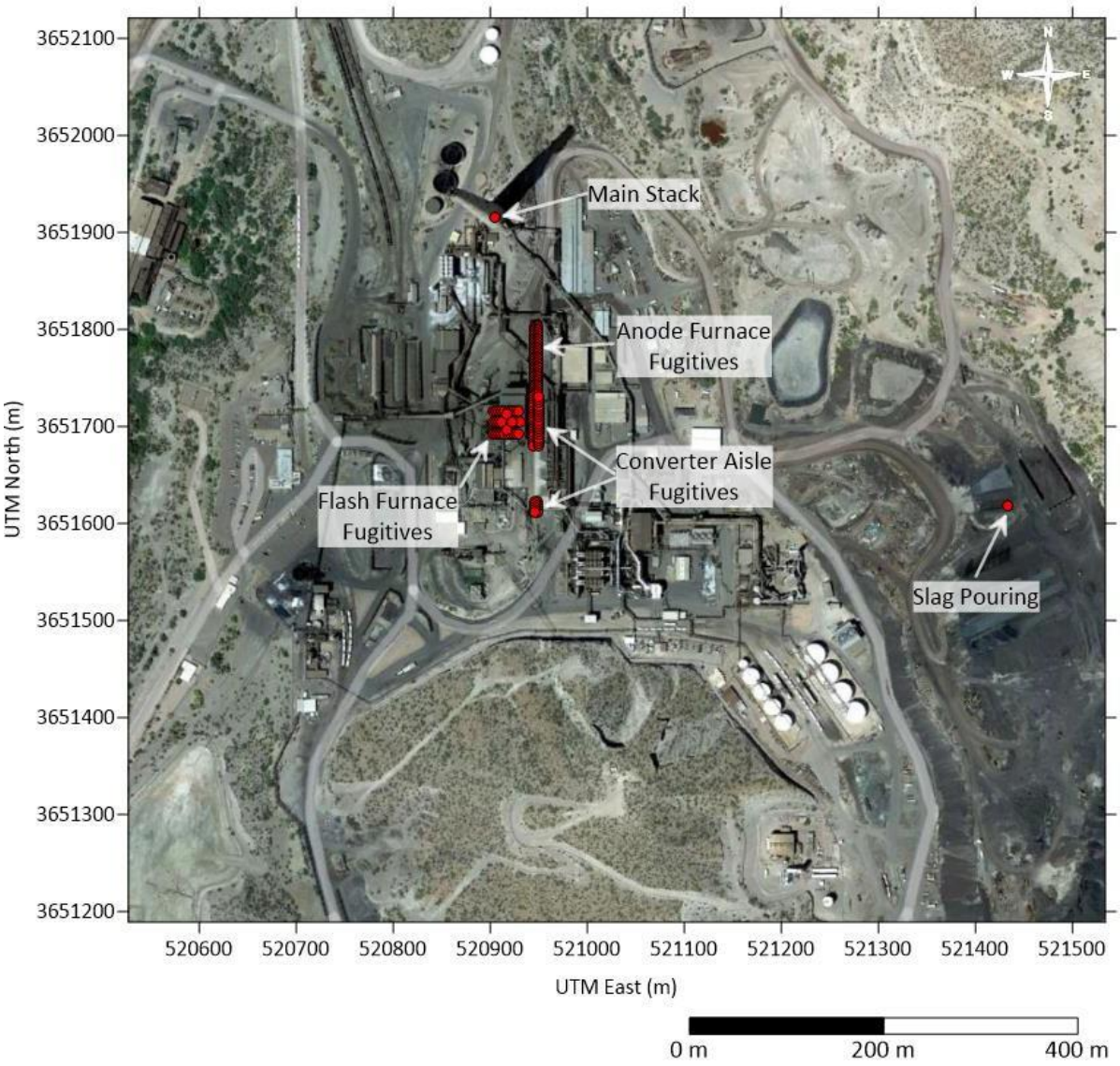


Figure 5-1
Modeled Emission Sources

5.2.1 Point Sources

Point sources will be used in the modeling to represent emissions from the Main Stack, Slag Pouring, and fugitive emissions from the Anode Furnace roofline monitor.

Table 5-1 presents the modeled point source characteristics for the Main Stack and Slag Pouring.

Table 5-1 Modeled Point Source Characteristics

Source	UTM Coordinate (m)		Base Elev. (m)	Stack Height (m)	Exit Diam. (m)	Exit Vel. (m/s)	Exit Temp. (K)
	East	North					
Main Stack	520929.0	3651932.0	650.75	304.8	8.9	10.7	346.5
Slag Pouring	521458.0	3651636.0	626.9	0.0	13.3	1.45	1333.0

The Main Stack will be modeled with an emission rate of 1518 lb/hr, while the Slag Pouring will be modeled with an emission rate of 4.05 lb/hr.

Examination of the temperature above the anode furnace indicated a roofline vent temperature of 120 F was appropriate. Based on this hot temperature, in conjunction with the 177,000 acfm from the Anode Furnace aisle, and the fact that the Anode Furnace roof vent discharges vertically, the fugitive emissions from the Anode Furnace will be represented in the modeling as a series of 60 point sources, evenly spaced across the Anode Furnace roofline vent.

The point source characteristics used in the modeling for the Anode Furnace (AF) fugitives are presented in Table 5-2.

Table 5-2 Modeled Point Source Characteristics, Anode Furnace Fugitives

Source ID	Base Elev. (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)	Emission Rate per Source (g/s)
AFF_1 through AFF_60	634.11	31.35	322.04	Varies	2.18	Varies

The Anode Furnace fugitives will be modeled with a total emission rate of 10 lb/hr.

Details concerning the representation of the AF fugitive emissions in the modeling is presented below.

Description of Anode Furnace Roofline Monitors

Figures 5-2 and 5-3 show the AF cells from above and below.



Figure 5-2
Anode Furnace Roofline Monitor Cells from Above

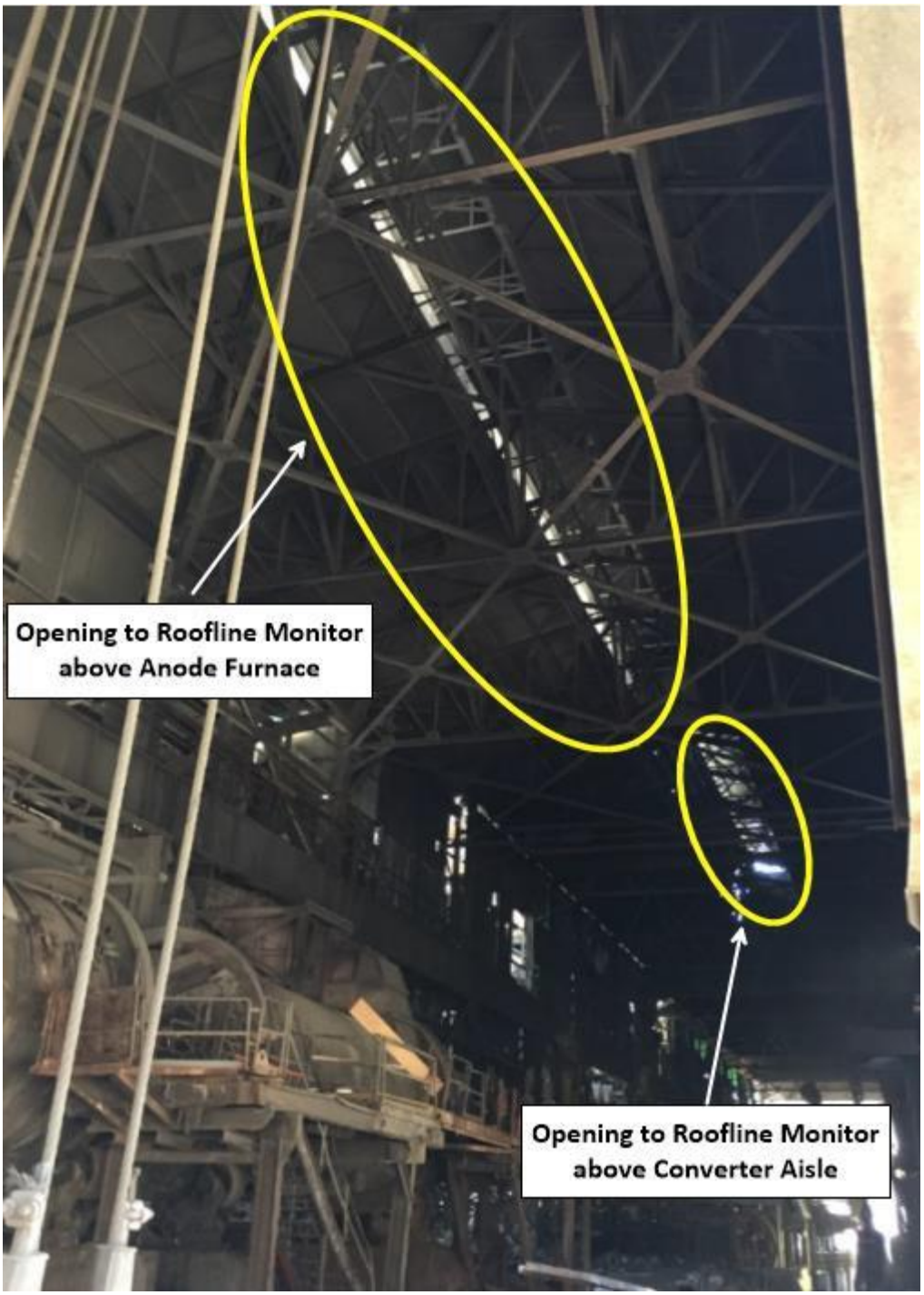


Figure 5-3
Anode Furnace Roofline Monitor from Below

AF fugitive emissions discharge vertically over each AF through a roofline monitor. The roof of the Anode Furnace/Converter Aisle building has a gap at the top, through which fugitive emissions vent into a roofline monitor. The roofline monitor over the AFs consists of curved windband panels on each side and

angled panels that extend partially down into the roofline monitor itself which, in conjunction with gutters/downspouts, prevents rain from falling directly into the AF building.

However, unlike a rain cap commonly found on stacks, these angled panels do not force the exhausted air to discharge horizontally; because the panels only extend part-way down into the roofline monitor, the emissions travel up around the edges of these angled panels (between the panels and the windband panels on the sides) and then vent vertically into the atmosphere above those angled panels.

The orientation of the AF roofline monitor and how AF fugitive are vented to the atmosphere is best illustrated through several plots/pictures. First, Figure 5-4 shows a cross-section of the AF roofline monitor. For illustrative purposes, it has been highlighted/colored, with explanations to follow.

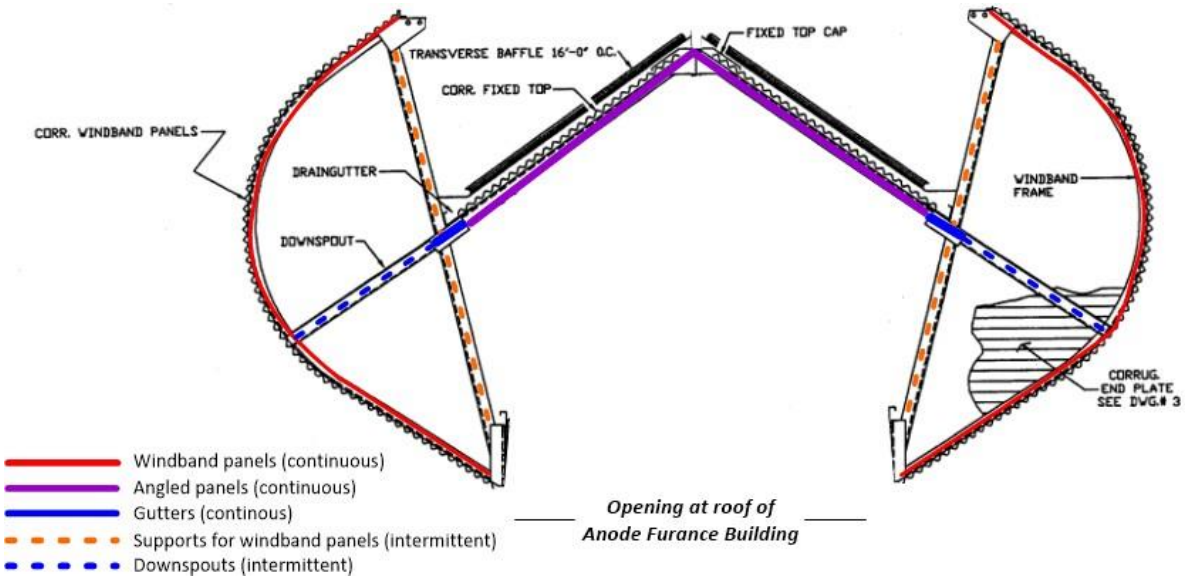


Figure 5-4
Cross-Section of Anode Furnace Roofline Monitor

The windband panels (red lines in Figure 5-4) run continuously along the entire roofline monitor, and are shown in Figure 5-5. Note that this is one of the two windband panels—the one on the other side of the roofline monitor is not visible in this perspective.



Figure 5-5
Windband Panel

The angled panels (purple line in Figure 5-4) run continuously along the entire roofline monitor, and are shown in Figure 5-6. Note that these are just some of the angled panels—not all are visible from this perspective.

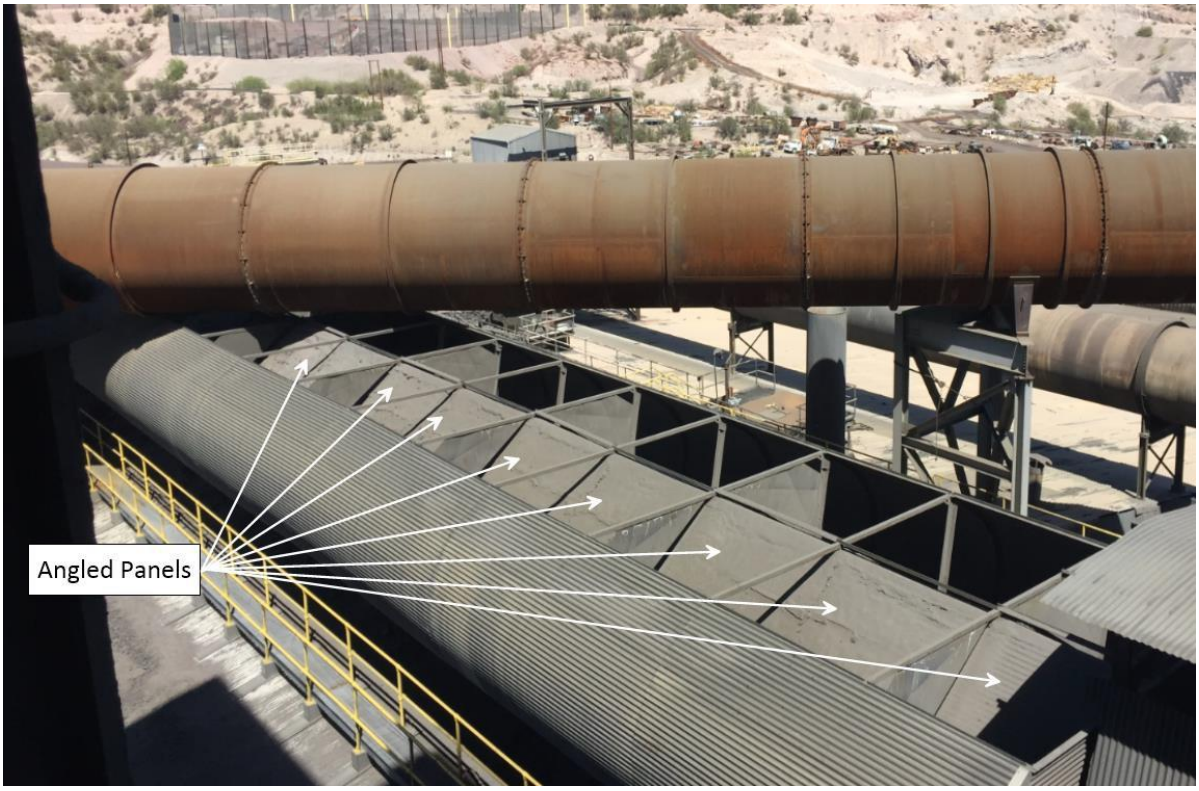


Figure 5-6
Angled Panels

The gutters (blue lines in Figure 5-4) run continuously along the entire roofline monitor, at the bottom of the angled panels. They are not visible from the overhead picture because they are down inside the roofline monitor.

The supports (dashed orange lines in Figure 5-4) for the windband panels extend from the top of the windband panel to the bottom intermittently at various points along the roofline monitor. They are shown in Figure 5-7 (note that these are just some of the windband panel supports—not all are visible in this perspective).

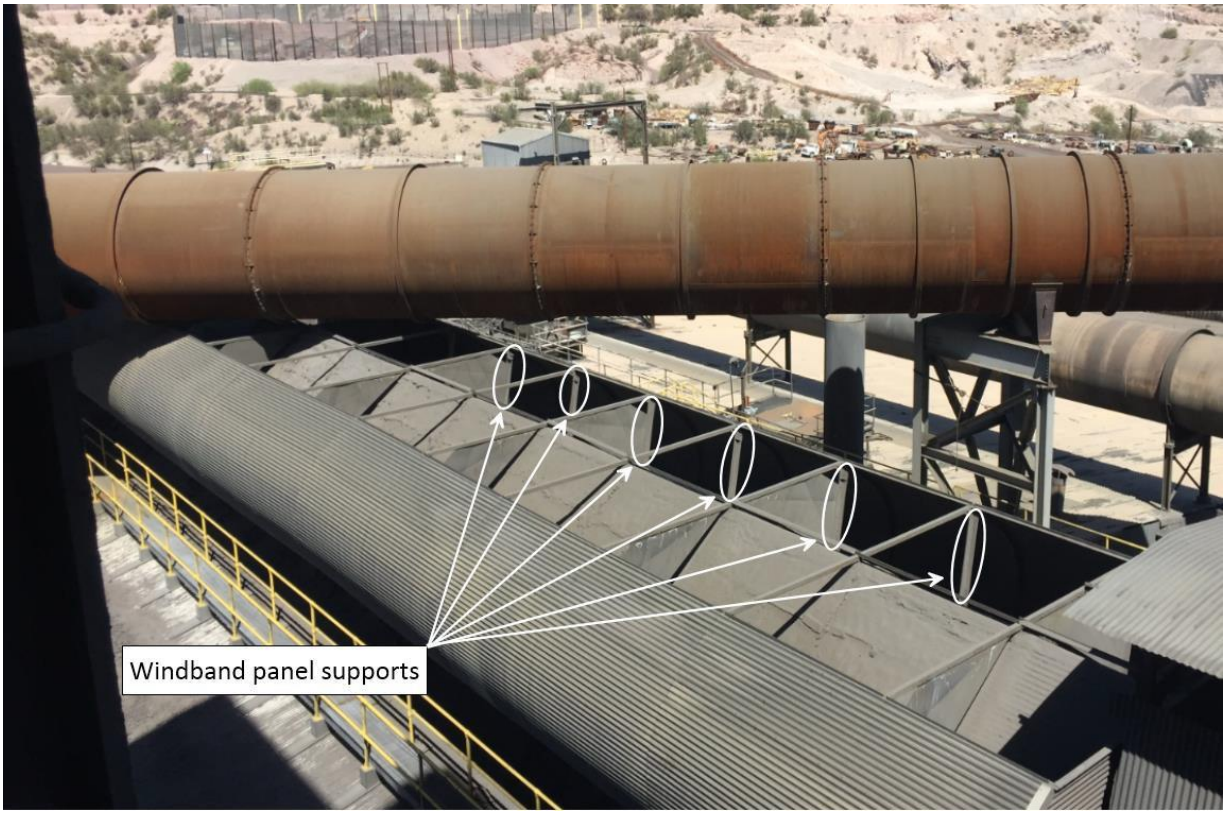


Figure 5-7
Windband Panel Supports (circled for reference)

The downspouts (dashed blue lines in Figure 5-4) extend down from the gutter at various points along the roofline monitor, and are 9" wide. They are not visible from the overhead picture because they are down inside the roofline monitor.

Because the windband panel supports and the downspouts do not extend continuously along the entire roofline monitor, AF fugitive emissions are able to pass between the bottom edge of the (continuous) angled panels and the (continuous) windband panels. This is best illustrated in Figure 5-8, which shows the path of the AF fugitives as they vent through the roofline monitor.

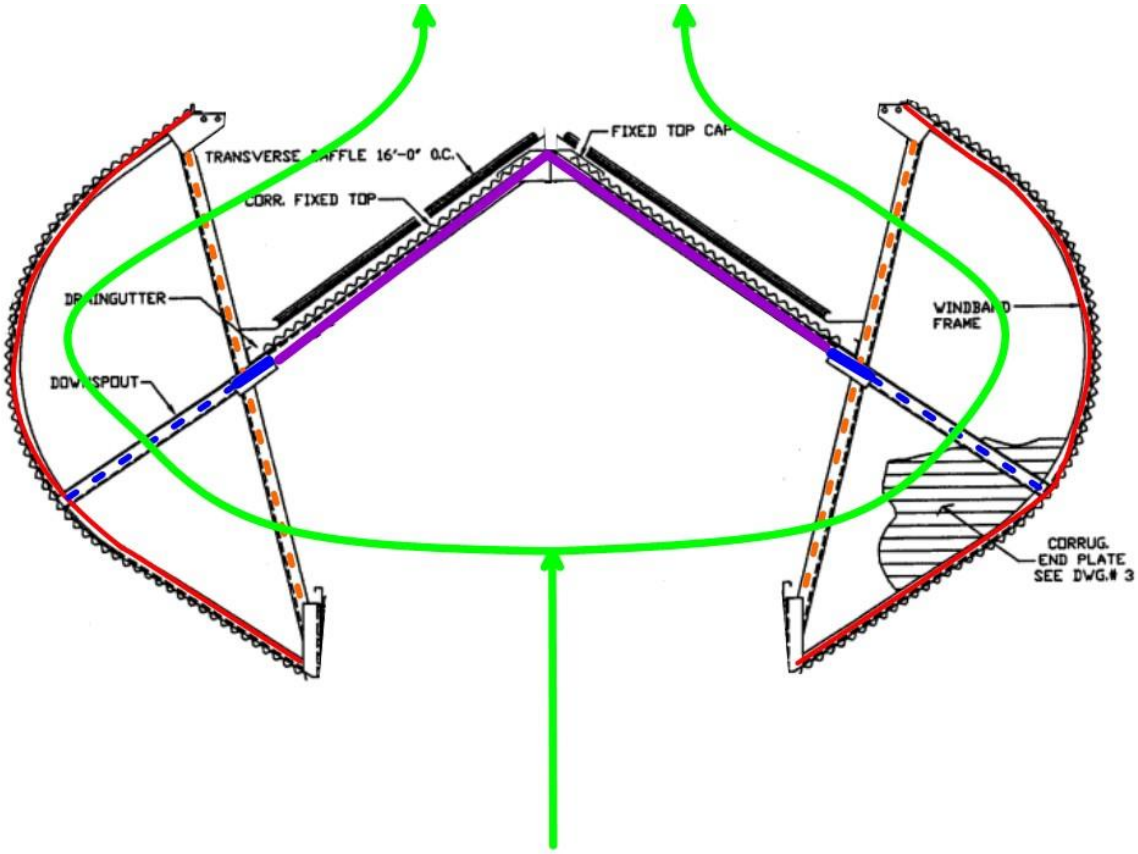


Figure 5-8
Path of AF Fugitive Emissions through AF Roofline Monitor

The intermittent/non-continuous nature of the downspouts is illustrated in Figure 5-9 below, which depicts the AF roofline monitor from above (i.e., a "bird's eye" view).

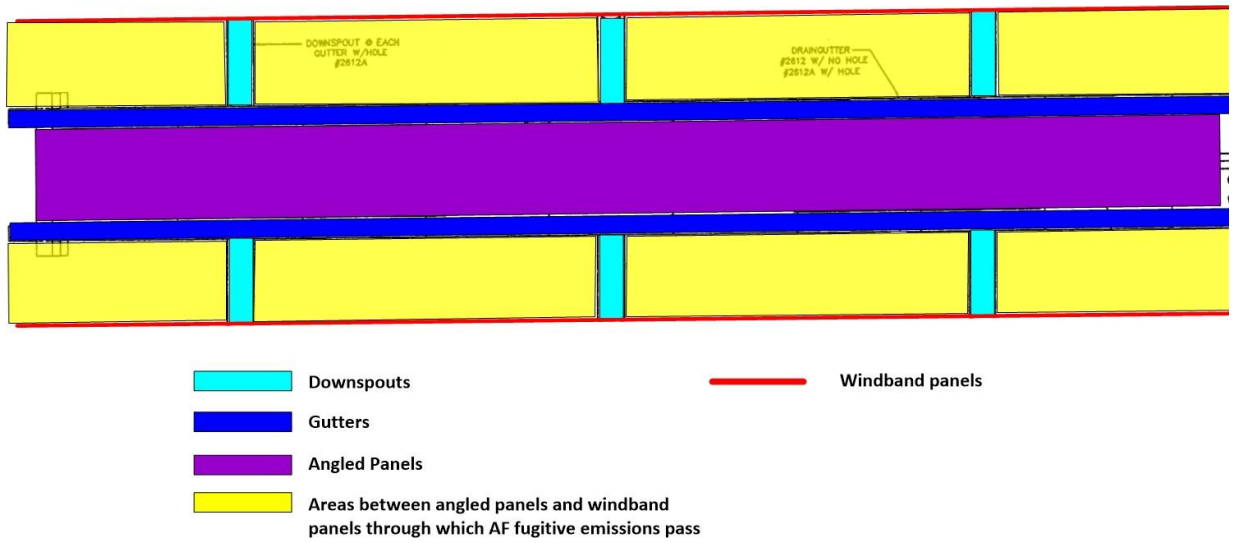


Figure 5-9
Bird's Eye View of AF Roofline Monitor

Emission Rate

Based on engineering tests and experience, in addition to the area of the roof monitor directly above the operating Anode Furnace, SO_2 emissions occur from the roof monitor immediately to north/south (i.e., not directly above the operating Anode Furnace). Considering its engineering tests and experience, ASARCO's engineering design firm, Gas Cleaning Technologies (GCT), estimates that 80% of the SO_2 emissions pass through the roofline monitor directly above the operating Anode Furnace, while the remaining 20% is split between the areas of the roofline monitor immediately to the north/south.

Exit Velocity

Based on engineering tests and experience, the area of the roof monitor directly above the operating Anode Furnace experiences the highest exit velocity; however, some exit velocity occurs from the roof monitor immediately to north/south (i.e., not directly above the operating Anode Furnace). Considering its engineering tests and experience, ASARCO's engineering firm, GCT, estimates that the exit velocity through the roofline monitor directly above the operating Anode Furnace is 50% higher than areas of the roofline monitor immediately to the north/south.

Diameter

An individual cell is 3.8 m^2, which equates to a circular area with a diameter of 2.2 m. Figure 5-10 illustrates the opening of the Roofline Monitor.

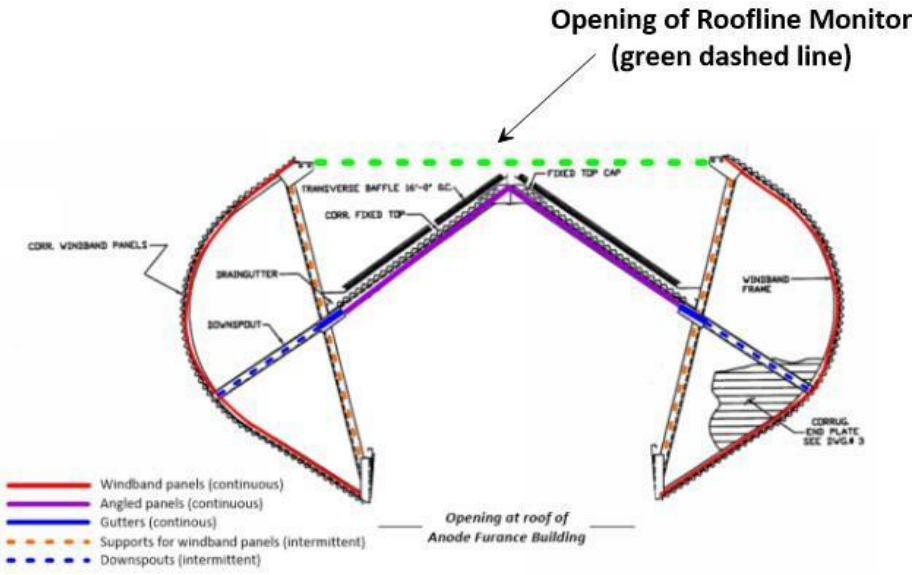


Figure 5-10
Cross-Section of Anode Furnace Roofline Monitor,
Opening Indicated

Modeled AF Configurations

ASARCO has three AFs, but never operates more than two of them at the same time. Therefore, three sets of modeling will be conducted, one for each of the following AF configurations:

- AF0 and AF1 operating,
- AF1 and AF2 operating, and
- AF0 and AF2 operating.

These configurations are illustrated in Figures 5-11 through 5-13.

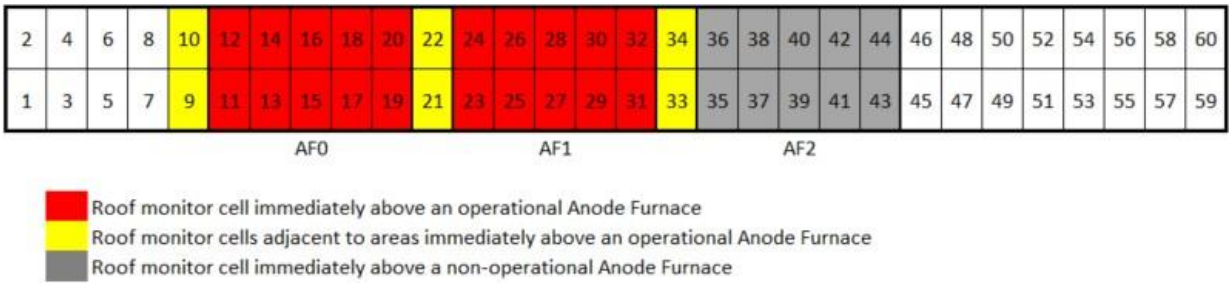


Figure 5-11
Example of AF0 and AF1 in Operation

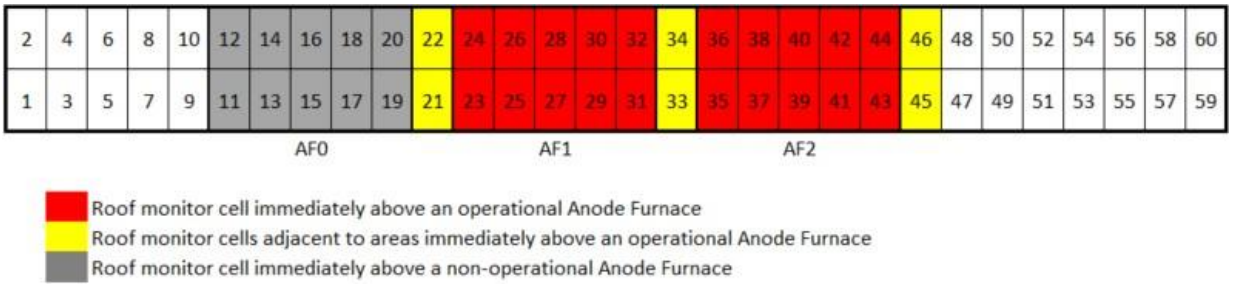


Figure 5-12
Example of AF1 and AF2 in Operation

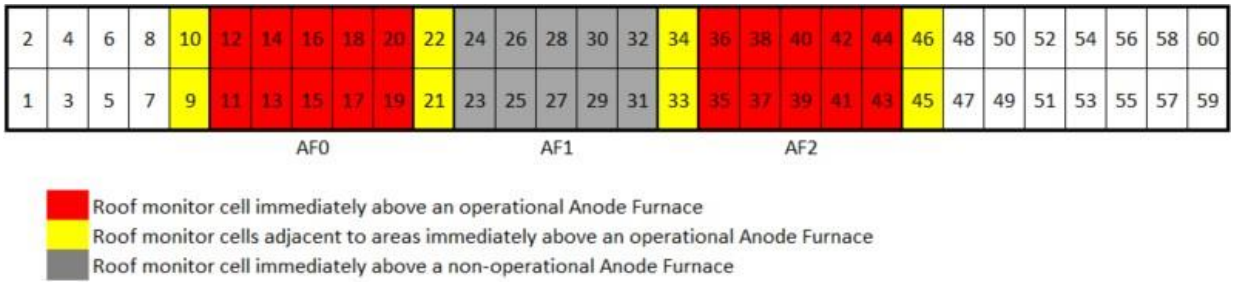


Figure 5-13
Example of AF0 and AF2 in Operation

To provide an explanation concerning the previous three figures, consider Figure 5-11, which corresponds to the AF0 and AF1 operating/emitting scenario. Accordingly, cells 11-20 and 23-32 collectively have 80% of the total Anode Furnace fugitive emissions allocated to them, while cells 9-10, 21-22, and 33-34 collectively have 20% of the Anode Furnace fugitive emissions allocated to them (because those cells are immediately adjacent to either AF0 or AF1). Note that, because both AF0 and AF1 have some emissions that vent through cells 21 and 22, the emission rate for those cells is double the emission rate of cells 9-10 and cells 33-34.

Similarly, 67% of the velocity is allocated to the grey cells and 33% of the velocity is allocated to the yellow cells.

5.2.2 Volume Sources

Fugitive emissions from the Flash Furnace Building and the Converter Aisle will be represented in the modeling by volume sources. The emissions for the Flash Furnace fugitives (39.4 lb/hr) and the Converter Aisle fugitives (11 lb/hr) will be evenly distributed amongst all volume sources.

Table 5-3 presents the modeled volume source characteristics.

Table 5-3 Modeled Volume Source Characteristics

Source ID	Description	Base Elev. (m)	Release Height (m)	Init. Horizontal Dimension (m)	Init. Vertical Dimension (m)	Emission Rate per Source (g/s)
FFS* FMW* FME* FFN*	Flash Furnace: South, Middle West, Middle East, North	635.86	43.67	0.7[a]	19.85[b]	0.16
FFPH*	Flash Furnace: Penthouse	635.86	43.59	7.44[c]	20.7[d]	0.16
CES* CWS* CEN* CWN*	Converter Aisle: East South, West South, East North, West North	634.11	25.4 / 31.35[e]	0.7[a]	10.63 / 11.34[f]	0.03

a. Line source represented by adjacent volume sources; length of side 1.5 m
b. Elevated source on or adjacent to building; building height 42.67 m
c. Line source represented by adjacent volume sources; length of side 16 m
d. Elevated source on or adjacent to building; building height 44.5 m
e. Release height of 25.5 m for southern portion of Converter Aisle, 31.35 m for northern portion of Converter Aisle
f. Elevated source on or adjacent to building; southern portion of Converter Aisle building height 22.86 m, northern portion of Converter Aisle building height 24.38 m

5.3 GOOD ENGINEERING PRACTICE (GEP) STACK HEIGHT

There are two definitions of Good Engineering Practice (GEP) stack height: (i) formula GEP stack height and (ii) regulatory GEP stack height. EPA requires sources to evaluate building downwash effects when a stack is less than formula GEP stack height (see Equation 5-1 below). Regulatory GEP stack height is either 65 meters or formula GEP stack height, whichever is greater. The EPA does not allow sources to take credit for ambient air concentrations that result from stacks that are higher than regulatory GEP stack height.

As discussed in the ADEQ's June 2002 "Final Hayden Sulfur Dioxide Assessment Nonattainment Area State Implementation and Maintenance Plan"14, the GEP height for ASARCO's Main Stack was assessed in a fluid modeling study jointly conducted by North American Weather Consultants and Colorado State University, with that study concluding that the stack's 1,000-foot height meets GEP stack height requirements. EPA subsequently approved Arizona's SIP determination of GEP stack height. No structures have since been constructed at ASARCO that would affect this determination. ASARCO's main stack was modeled at its true height of 1,000 feet.

ASARCO conducted an analysis of the anode stack height, with respect to GEP, in accordance with EPA's guidelines for air quality impact modeling. ASARCO used EPA's Building Profile Input Program for PRIME (BPIPPRM, version 04274; U.S. EPA, 2004a) to compute the formula GEP stack height and to generate

wind-direction specific building profiles for each stack for the purpose of sequential modeling. For stacks constructed after January 12, 1979, EPA defined the Formula GEP stack height as:

$$H_{GEP} = H_B + 1.5L_B$$

Where:

H_{GEP} = GEP stack height;
H_B = Building height above stack base; and
L_B = Lesser of building's height or maximum projected width

Figure 5-14 presents a simplified layout of ASARCO buildings and the Main Stack.

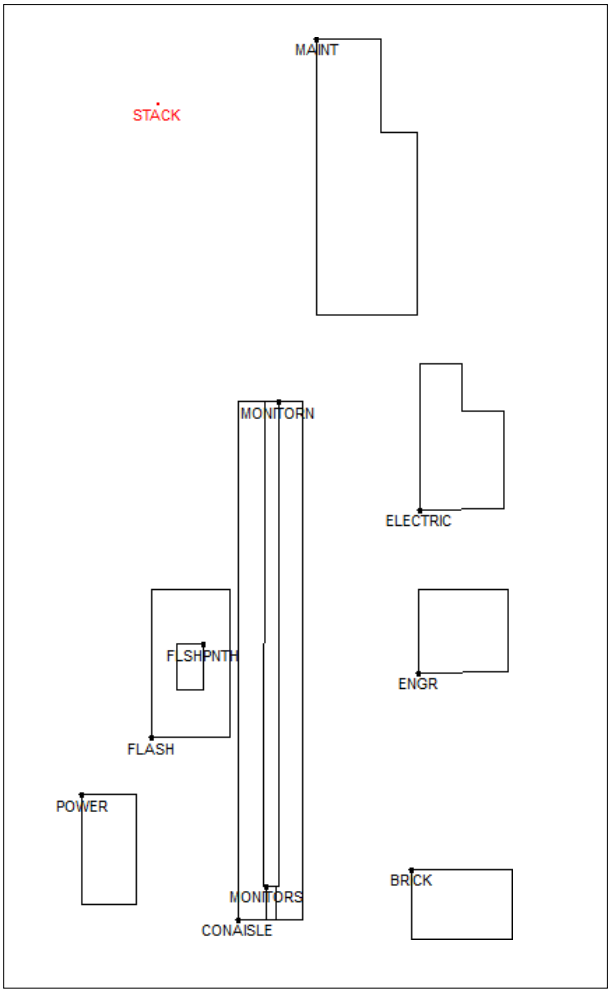


Figure 5-14
Simplified Facility Layout

Pertinent input/output files for the BPIPPRIM analysis are being forwarded to ADEQ concurrent with the submission of this Modeling Protocol.

5.4 URBAN/RURAL DETERMINATION

Dispersion coefficients for air quality modeling are selected based on the land use classification technique suggested by Auer, which is EPA's preferred method. The classification determination involves assessing land use by Auer's categories within a 3-kilometer radius of the proposed site. A source should select urban dispersion coefficients if greater than 50 percent of the area consists of urban land use types; otherwise, rural coefficients apply.

Following Section 3.7 of the ADEQ Modeling Guidelines, ASARCO classified the land use of the area using the land-use procedure set forth in EPA's "Guideline on Air Quality Models" (GAQM). This approach requires determining the amount of specific types of land use categories within a 3-km radius circle centered on the source; if the total land use (as defined by Auer) is classified as 50% or more "urban" then the area is designated as urban; otherwise it is designated as rural.

Land use (taken from the U.S. Geological Survey (USGS) National Land Cover Data (NLCD) 2016 archives) was examined for the 3-km radius circle, and totals of each land use category were calculated. These land use categories were then correlated to the categories as established by Auer, and the amount of urban and rural land use within 3 km of ASARCO was calculated. The area near ASARCO that was examined is depicted in Figure 5-15, while the results of the analysis are presented in Table 5-4.

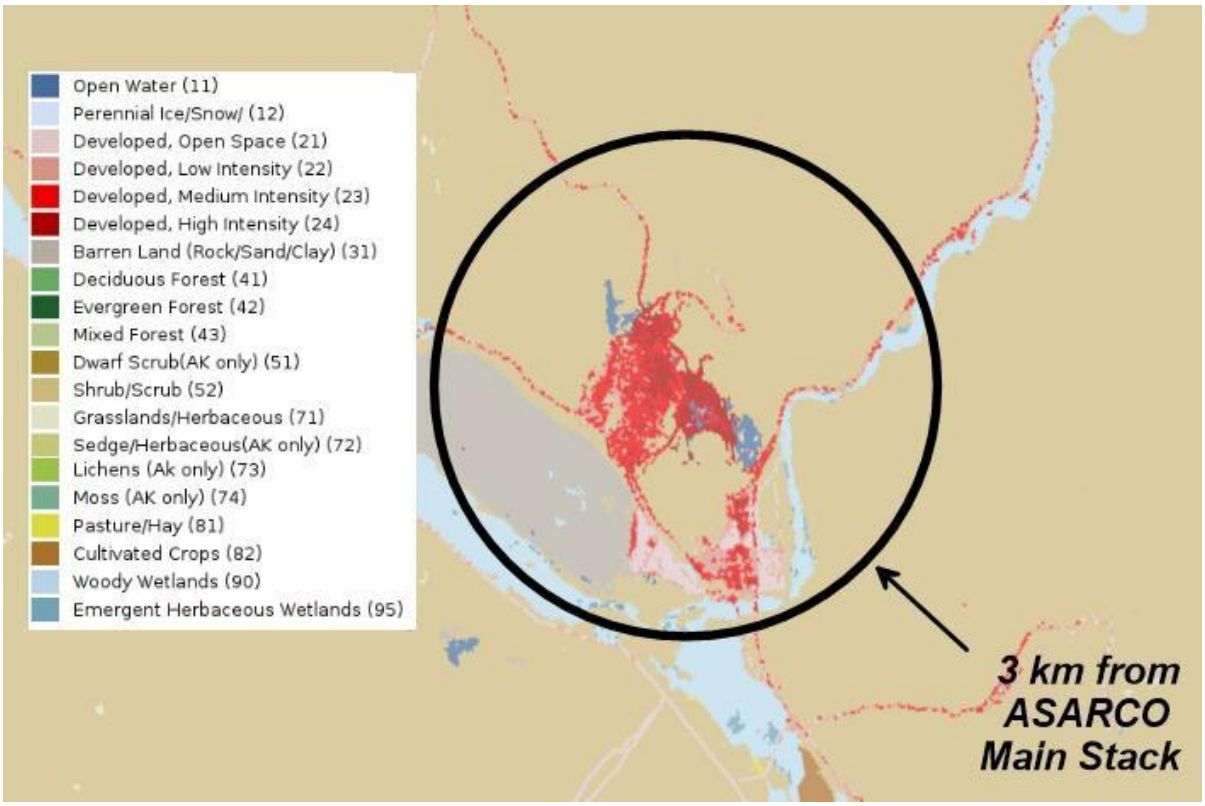


Figure 5-15
Land Use Near ASARCO Smelter

Table 5-4 Land Use Analysis within 3 km of ASARCO Smelter

2016 NLCD Land Use Category	Percent of Area within 3 km of ASARCO	Rural/Urban
Open Water	0.0%	Rural
Perennial Ice/Snow	1.0%	Rural
Developed, Open Space	0.0%	Rural
Developed, Low Intensity	2.2%	Urban
Developed, Medium Intensity	3.3%	Urban
Developed, High Intensity	4.7%	Urban
Barren Land (Rock/Sand/Clay)	2.6%	Rural
Unconsolidated Shore	9.9%	Rural
Deciduous Forest	0.0%	Rural
Evergreen Forest	0.0%	Rural
Mixed Forest	0.0%	Rural
Dwarf Scrub	0.0%	Rural
Shrub/Scrub	0.0%	Rural
Grasslands/Herbaceous	67.6%	Rural
Sedge/Herbaceous	0.0%	Rural
Lichens	0.0%	Rural
Moss	0.0%	Rural
Pasture/Hay	0.0%	Rural
Cultivated Crops	0.0%	Rural
Woody Wetlands	0.0%	Rural
Palustrine Forested Wetland	8.2%	Rural
Palustrine Scrub/Shrub Wetland	0.0%	Rural
Estuarine Forested Wetland	0.0%	Rural
Estuarine Scrub/Shrub Wetland	0.0%	Rural
Emergent Herbaceous Wetland	0.0%	Rural
Palustrine Emergent Wetland (Pe	0.4%	Rural
Estuarine Emergent Wetland	0.0%	Rural
Palustrine Aquatic Bed	0.0%	Rural
Estuarine Aquatic Bed	0.0%	Rural

For the purposes of the Auer Method, the following 2016 NLCD land use categories were assumed to be "urban":

- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity

As shown in Table 5-4, these three land use categories comprise 10.2% of the land use within 3 km of ASARCO; accordingly the sum of the "rural" categories is 89.8%. Therefore, the area within 3 km of ASARCO is defined as "rural" and identified as such in the AERMOD input.

Pertinent input/output files for the AERSURFACE analysis used in the urban/rural determination are being forwarded to ADEQ concurrent with the submission of this Modeling Protocol.

6.0 METEOROLOGICAL DATA

6.1 AERMET

EPA's AERMET tool (version 21112) was used to process meteorological data for use with AERMOD. AERMET merges National Weather Service (NWS) surface observations with NWS upper air observations and performs calculations of meteorological parameters required by AERMOD. Surface observations from on-site instruments can optionally be included. The latter can be useful because the data are more relevant to the site being modeled and in cases where on-site data are collected at multiple elevations above ground, AERMET can construct a more accurate vertical profile of meteorological data. In addition to the meteorological observations, AERMET further requires the inclusion of the characteristics of land use surfaces that ASARCO calculated using EPA's AERSURFACE tool.

ASARCO's proposed data inputs to AERMET are described below. Pertinent input/output files for the AERMET analysis are being forwarded to ADEQ concurrent with the submission of this Modeling Protocol.

6.2 SURFACE OBSERVATIONS

EPA recommends that AERMOD be run with a minimum of 5 years of NWS data or 1 year of on-site meteorological data. The meteorological data used in the sequential modeling consists of on-site hourly surface observations collected by ASARCO from a 10-meter tower located approximately 0.35 kilometers south of the smelter building, on Camera Hill. Figure 6-1 shows the location of the tower site relative to the proposed project.

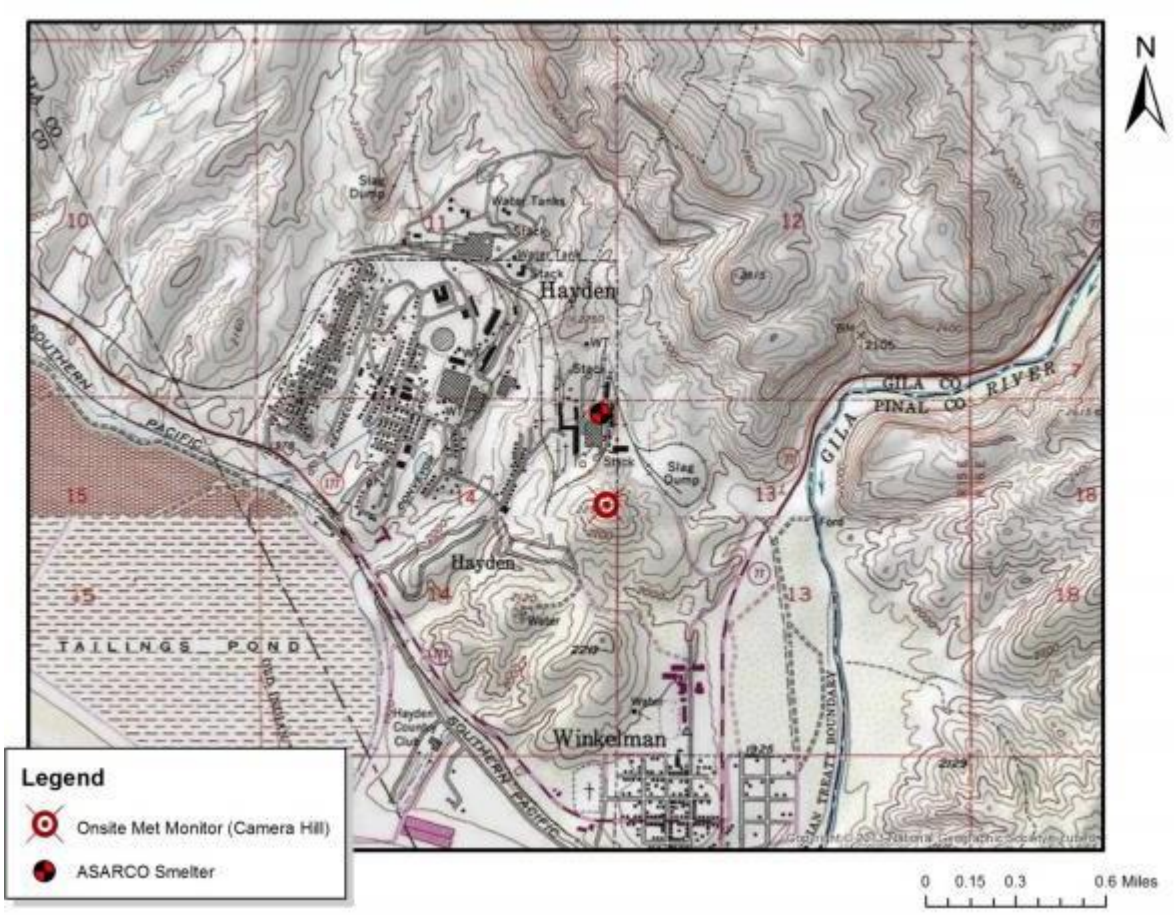


Figure 6-1
Camera Hill Onsite Meteorological Station

The meteorological data proposed for use in the modeling consist of the five most recent years of data available, specifically 2015-2016 and 2018-2020. During 2017 the anemometer failed an audit and was replaced, while during 2021 the solar radiation sensor failed an audit and was replaced. As a result, neither of these years met the minimum 90% data completeness requirement for regulatory modeling purposes.

6.3 UPPER AIR OBSERVATIONS

Upper air data were taken from the Tucson International Airport (WBAN 23160) in Tucson, Arizona.

6.4 AERSURFACE

ASARCO used EPA's AERSURFACE tool (version 20060) to calculate the surface roughness length, albedo and Bowen ratio inputs required by AERMET. EPA developed AERSURFACE to identify these parameters within a defined radius from a specified point. In this case, ASARCO input the UTM coordinates of the on-site meteorological tower to AERSURFACE along with a 1-kilometer radius per EPA guidance. ASARCO acquired land cover, tree canopy, and impervious surface information for the year 2016 as inputs to

AERSURFACE. ASARCO calculated the parameters for twelve compass sectors of 30° each, and by month. ASARCO assigned the seasonal categories as follows per ADEQ guidance:

- Late autumn after frost and harvest, or winter with no snow: December, January, February, March;
- Winter with continuous snow on the ground: none;
- Transitional spring (partial green coverage, short annuals): April, May, June;
- Midsummer with lush vegetation: July, August, September; and
- Autumn with un-harvested cropland: October, November.

ASARCO compared precipitation measured at Camera Hill for the modeled meteorological data period against the 30-year average value from the Safford Regional Airport in Safford, AZ. The average precipitation at the Camera Hill station for the years 2016, 2018-2020 was 8.57", which is 89 of the 1981-2010 average precipitation amount of 9.67" from Safford. Because the average precipitation at Camera Hill is within 50% of the average precipitation at Safford, ASARCO selected "average" surface moisture characteristics for the AERSURFACE processing. Pertinent input/output files for the AERSURFACE analysis used in the processing of the meteorological data are being forwarded to ADEQ concurrent with the submission of this Modeling Protocol.

6.5 PROCESSED DATA COMPLETENESS

ASARCO reviewed the most recent years of data from the Camera Hill station to determine which were eligible for use in regulatory modeling. Table 6-1 presents the results of this analysis for the years of data proposed for use in the modeling.

Table 6-1 Camera Hill Data Completeness Analysis

Year	Quarter	Percentage of Missing Data by Variable				
		Wind Direction	Wind Speed	Temperature (2 m)	Temperature (10 m)	Sigma Theta
2015	1	0.3%	0.3%	0.3%	0.0%	0.3%
	2	0.3%	0.3%	0.3%	0.0%	0.3%
	3	0.0%	0.0%	0.0%	0.0%	0.0%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2016	1	0.0%	0.0%	0.0%	0.0%	0.0%
	2	0.2%	0.2%	0.2%	0.2%	0.2%
	3	6.4%	6.4%	6.4%	6.4%	6.4%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2018	1	0.3%	0.3%	0.3%	0.3%	0.3%
	2	0.2%	0.2%	0.2%	0.2%	0.2%
	3	3.5%	3.5%	3.5%	3.5%	3.5%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2019	1	0.2%	0.2%	0.2%	0.2%	0.2%
	2	0.7%	0.7%	0.7%	0.7%	0.7%
	3	0.9%	0.9%	0.9%	0.9%	0.9%
	4	0.0%	0.0%	0.0%	0.0%	0.0%
2020	1	0.1%	0.1%	0.1%	0.1%	0.1%
	2	0.0%	0.0%	0.0%	0.0%	0.0%
	3	0.1%	0.1%	0.1%	0.1%	0.1%
	4	0.0%	0.0%	0.0%	0.0%	0.0%

As can be seen, the meteorological data used in this analysis meet the completeness requirement as stipulated in Section 5.3.2 of EPA's "Meteorological Monitoring Guidance for Regulatory Applications."[3]

[3] Meteorological Monitoring Guidance for Regulatory Applications. United States Environmental Protection Agency. EPA-454/R-99-005. February 2000.

7.0 BACKGROUND AIR QUALITY

EPA requires background air quality estimates be added to modeling results for comparison to the NAAQS. ASARCO based estimates of the background air quality estimates of SO_2 proposed for the dispersion modeling analysis on measured data collected from five ambient air monitoring sites located in the Hayden area. ASARCO used data measured after the smelter went on strike in 2019, specifically for the approximately four-and-a-half-month period of October 13, 2019 through March 5, 2020.

For isolated single sources such as the Hayden Smelter, the GAQM specifically states, "Determine the mean background concentration at each monitor by excluding values when the source in question is impacting the monitor." Based on an initial analysis of the ambient air quality data, contributions from Hayden smelter operations dominate the vast majority of the measured SO_2 in the Hayden area. ASARCO confirmed this by evaluating data measured only during hours of smelter operation shutdowns, during which ASARCO recorded substantially smaller ambient air concentrations than when the smelter was operating. EPA's GAQM defines background air quality as "pollutant concentrations due to: (1) natural sources; (2) nearby sources other than the one(s) currently under consideration; and (3) unidentified sources."

The nearby monitors considered are depicted in Figure 7-1, while Table 7-1 summarizes the SO_2 concentrations from these monitors. The derived 1-hr SO_2 background concentration, based on these five monitors, is 3.2 $\mu g/m^3$.

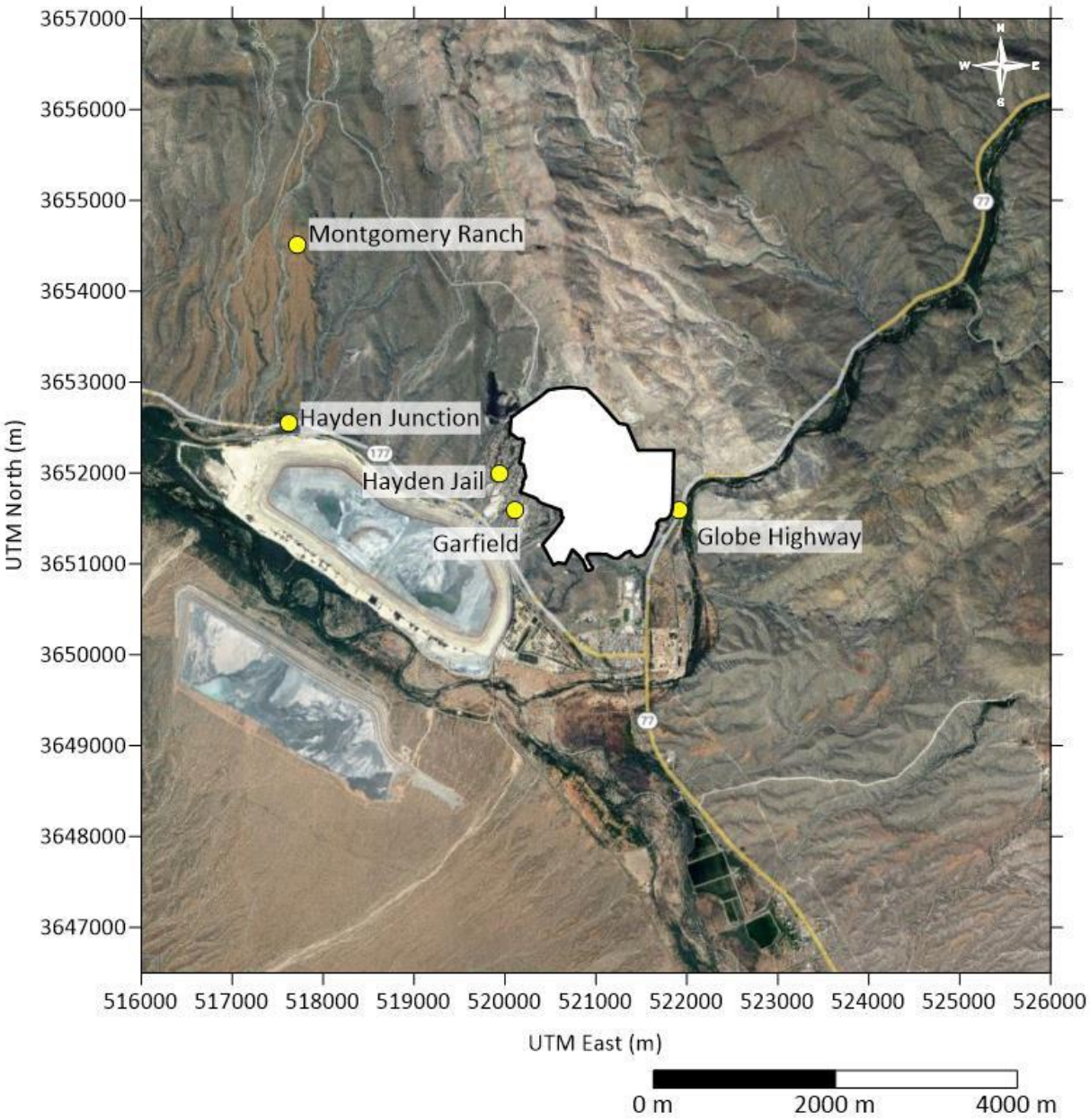


Figure 7-1
SO_2 Monitors near ASARCO

Table 7-1 Derivation of 1-hr SO_2 Background Concentration

Monitor	Average Maximum Daily 1-hr (µg/m^3)
Garfield	4.2
Globe Highway	1.8
Hayden Jail	3.8
Hayden Junction	0.9
Montgomery Ranch	5.2
Average:	**3.2**

Based on the above discussions, the ASARCO Hayden Smelter facility is the only source of concern within the Hayden NAA. ASARCO proposes modeling the Hayden Smelter exclusively and accounting for impacts from other sources using the representative background concentration as calculated above.

Pertinent files for the determination of the background concentration are being forwarded to ADEQ concurrent with the submission of this Modeling Protocol.

8.0 PRESENTATION OF RESULTS

This air quality analysis will address 1-hr impacts of SO_2. Predicted impacts of SO_2 from modeled sources will be combined with the representative background concentration (see Section 7.0) for comparison against the 1-hr SO_2 NAAQS of 196 $\mu g/m^3$. Ultimately, the total concentration compared against the NAAQS will be the sum of the following:

- The 4^{th}-highest maximum of the daily predicted 1-hr concentrations, and
- A representative background concentration.

The modeling results will be presented with tables and plots.

Appendix B
Hayden SO_2 SIP Modeling Letter Report
(July 12, 2022)

BLUE SKY MODELING.LLC

William B. Jones
President

Direct Line: +1.410.499.9918
Email: bjones@blueskymodeling.com

July 12, 2022

Feng Mao
Air Quality Division
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Re: Hayden SO_2 SIP Modeling Letter Report

Dear Feng:

ASARCO LLC (ASARCO) has retained Blue Sky Modeling, LLC (BSM) to conduct air dispersion modeling for sulfur dioxide (SO_2) in support of the State Implementation Plan (SIP) for the Hayden Nonattainment Area (NAA). This modeling, which reflects the improvements that ASARCO proposes to make to its facility in Hayden, AZ to reduce SO_2 emissions, demonstrates compliance with the 1-hr SO_2 National Ambient Air Quality Standards (NAAQS) for the Hayden NAA.

This letter summarizes the modeling analysis, beginning with a brief summary of ASARCO's proposed SO_2 controls, the Modeling Protocol that has been submitted for this effort, and the modeling results.

ASARCO Smelter Operations and SO_2 Controls

During the Converter Retrofit Project installed in 2017-2018, ASARCO made several improvements to the existing air pollution controls at the Hayden smelter to further reduce SO_2 emissions, including:

- replacing the five existing small converters with three larger converters to optimize blowing emissions with double contact acid plant capacity;
- rerouting secondary hood emissions during blowing from the secondary hood baghouse to the double contact acid plant to significantly reduce SO_2 emissions;
- installing a tertiary capture system over the converter aisle to substantially capture secondary operation fugitives and spillover from the secondary hoods and route them to the main stack;
- adding high surface area lime injection in the secondary hood baghouse to reduce SO_2 emissions; and
- adding high surface area lime injection in the vent gas baghouse to reduce SO_2 emissions.

In addition to the Converter Retrofit Project controls, ASARCO has proposed additional controls to be put in place on the Hayden smelter:

- replacement of the existing preheater at the double contact acid plant with a redesigned unit;

- addition of secondary hoods to the three existing anode furnaces, exhaust from which will be routed to a baghouse and then the main stack;
- addition of improved secondary ventilation hooding around the flash furnace uptake to capture fugitive emissions from the flash furnace, matte tapping and slag skimming areas and routed to the secondary hood baghouse with its lime injection system; and
- addition of a hood to be used to capture fuming ladle emissions and route them to the secondary hood baghouse and its lime injection system.

This modeling accounts for all those improvements.

Modeling Protocol

BSM prepared a Modeling Protocol which provides details on the modeling that was conducted, including source characteristics and emission rates, updated meteorological data from ASARCO's onsite Camera Hill station, and an updated background concentration. That Modeling Protocol, along with pertinent electronic files (e.g., AERSURFACE, AERMET, AERMAP, structure downwash, and background concentration calculation files) was submitted to the Arizona Department of Environmental Quality (ADEQ) on June 23, 2022[1]. For details concerning the setup of this modeling, please see that Modeling Protocol.

Modeling Results

As discussed in the Modeling Protocol, ASARCO has three Anode Furnaces (AFs), but never operates more than two of them at the same time. Therefore, three sets of modeling were conducted, one for each of the following AF configurations:

- AF0 and AF1 operating,
- AF1 and AF2 operating, and
- AF0 and AF2 operating.

The scenario of AF1 and AF2 operating produced the controlling 1-hr SO_2 concentration. The results of this modeling are summarized in Table 1.

Table 1. Modeling Results, 1-hr SO_2 NAAQS

Highest 99th Percentile of Controlling 1-hr Concentrations (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)[a]	NAAQS (µg/m³)
192.58[a]	3.2	195.78	196.0
a. Highest 99th Percentile of Controlling 1-hr Concentrations predicted to occur at (521851.1 m, 3651825.4 m)			

As can be seen in Table 1, the 4th-highest of the maximum daily predicted 1-hr SO_2 concentrations is less than the 1-hr SO_2 NAAQS. Furthermore, when the background concentration is added the total concentration is still less than the 1-hr SO_2 NAAQS. The controlling concentration is predicted to occur

[1] Email from James Stewart (ASARCO) to Daniel Czecholinski (ADEQ), June 23, 2022.

approximately 910 m east of the Main Stack, along the Ambient Air Boundary (AAB). Figure 1 depicts the predicted 1-hr SO_2 concentrations.

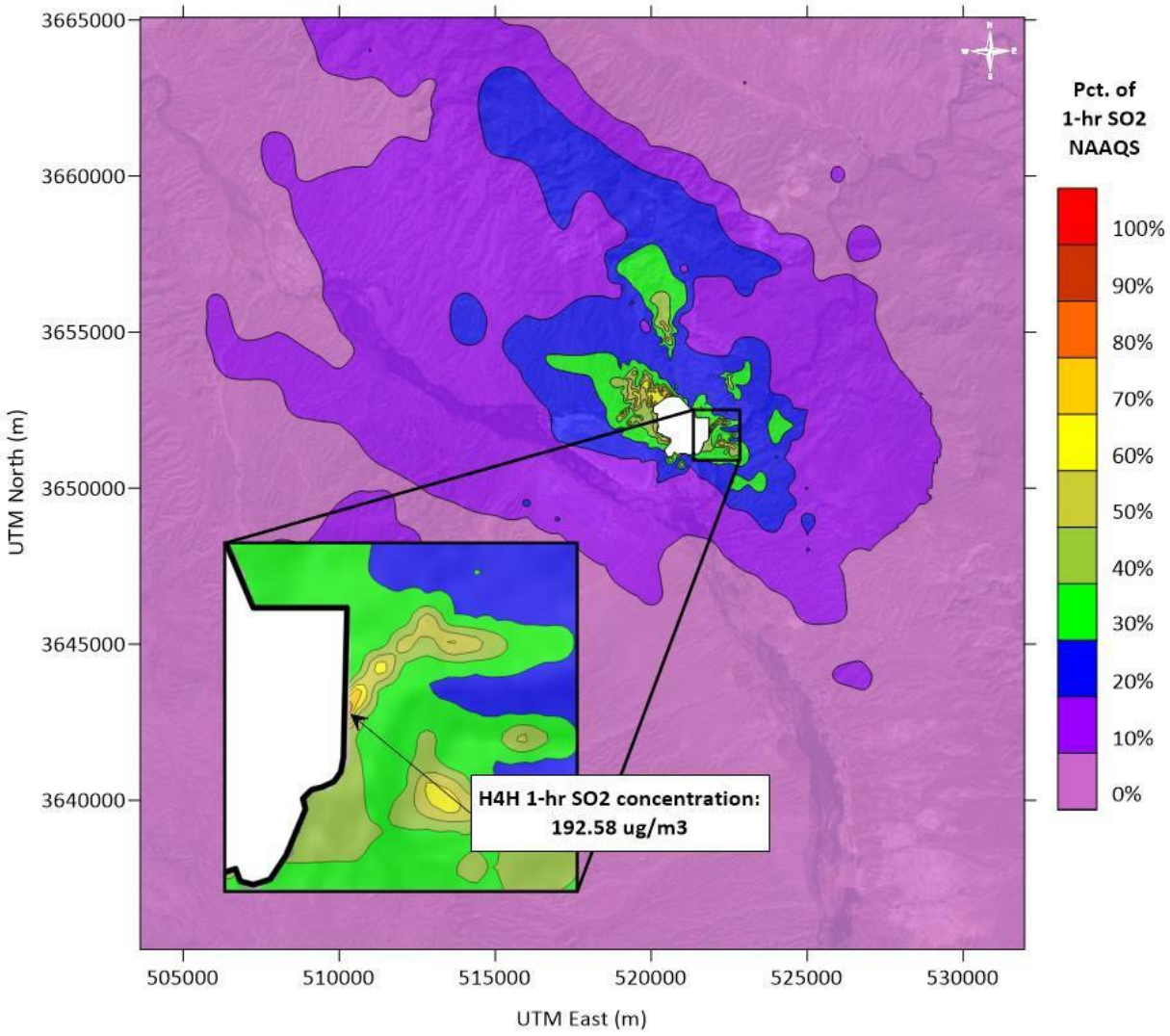


Figure 1
Predicted H4H 1-hr SO_2 Concentrations

Similar to the 1-hr modeling, the scenario of AF1 and AF2 operating produced the controlling concentrations for the former SO_2 NAAQS. Modeling results for the former SO_2 NAAQS are summarized in Table 2.

Table 2. Modeling Results, Former SO_2 NAAQS

Averaging Period	Predicted Controlling Concentration (µg/m³)	1-hr Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)
3-hr	155.2[a]	3.2	158.4	1300
24-hr	51.5[b]		54.7	365
Annual	9.4[c]		12.6	80

a. H2H 3-hr concentration predicted to occur at (520611.7 m, 3651593.3 m)
b. H2H 24-hr concentration predicted to occur at (520615.8 m, 3651570.0 m)
c. Highest annual concentration predicted to occur at (520227.2 m, 3651960.6 m)

All controlling concentrations were predicted to be below the former NAAQS. Details on the results for each averaging period are given below:

- The highest second-high (H2H) 3-hr and 24-hr concentrations were predicted to occur approximately 470 m to the southwest of the Main Stack, along the AAB.

- The highest annual concentration was predicted to occur approximately 720 m west of the Main Stack, along the AAB.

It should be noted that these results are conservative, as they are all based on a worst-case hourly emission rate. Furthermore, as shown in the preceding table, when one conservatively adds the 1-hr background concentration of 3.2 µg/m³ to the predicted controlling concentrations, all total concentrations are still far below each of the former SO_2 NAAQS.

Finally, we acknowledge that EPA released a new version of AERMOD and AERMET (version 22112) on June 27, 2022. We have run the new version of AERMOD for the model run that produced the controlling 1-hr concentration and have confirmed that the new version of AERMOD produced the identical controlling 1-hr concentration as the previous version. ASARCO will re-process the Camera Hill meteorological data and then re-run all of the AERMOD runs using version 22112 of the AERMOD modeling system in the near future, but in the interest of time wanted to submit this modeling to ADEQ to facilitate a prompt review.

BSM is submitting the associated AERMOD input/output files via email in conjunction with this letter.

Thanks very much for your assistance. If you have any questions or need anything else, please contact me at bjones@blueskymodeling.com or at 410.499.9918.

Best regards,

William B. Jones
President

Attachments

Appendix C
ADEQ Comments on ASARCO SO_2 SIP Modeling
(July 22, 2022)

The Arizona Department of Environmental Quality (ADEQ) has reviewed the modeling protocol, the modeling letter report and the modeling files submitted by Blue Sky Modeling, LLC (BSM) on behalf of ASARCO LLC (ASARCO) in support of the State Implementation Plan (SIP) for the Hayden Nonattainment Area (NAA). The Department's comments are listed as follows. Please provide a response letter addressing all the comments. If needed, please submit a revised modeling report to the Department for additional review.

1. Source Inputs

ASARCO is proposing to place additional controls on the Hayden smelter in additional to the Converter Retrofit Project (CRP) installed in 2017-2018. However, the modeling protocol does not provide descriptions on how these additional controls would affect the estimates of emission rates and dispersion parameters for emission sources. Please describe the methodology on how these source inputs are derived based on engineering design or judgement. In particular, as stated in the modeling letter report, ASARCO modeled the worst-case hourly emission rates for all emission sources to demonstrate the compliance with the NAAQS. ASARCO must clearly present how to estimate these worst-case hourly emission rates. If any assumptions are made, please provide justification and supporting documents.

a) Main Stack

Under the additional controls proposed, additional fugitive emissions will be captured and routed to the main stack. It is not clear why the modeled emission rate and the stack parameters as presented in the modeling protocol are identical to those in the 2018 SIP submittal that was based on the CRP project. Would the additional controls result in a higher hourly emission rate from the main stack and also affect the stack parameters such as gas flow rate, gas exit velocity and gas temperature? Please clarify.

b) Anode Furnace Fugitives

i) The Department understands that the proposed additional controls will reduce the anode furnace fugitive emissions as well as the roofline flow rate. However, it is not clear how ASARCO obtained an emission rate of 10 lb/hr, a flow rate of 177,000 acfm, and a roofline vent temperature of 120 F for anode furnace fugitives (see the modeling protocol Page 5-3). Please discuss the methodology for calculating these source parameters. If needed, please provide the supporting documents from Gas Cleaning Technologies (GCT).

ii) Figures 5-11, 5-12 and 5-13 in the modeling protocol illustrate that there are 4 yellow cells adjacent to areas immediately above an operational anode furnace (2 cells on either side). However, the modeling files indicate that ASARCO actually modeled 8 adjacent cells (4 cells on either side). For example, under the AF0/AF1 operational scenario, the modeling protocol shows that cells 9-10, 21-22, and 33-34 are adjacent cells. However, ASARCO modeled cells 7-10, 21-22, 33-36 as adjacent cells. Please clarify the inconsistency.

iii) The modeling protocol Page 5-11 states, "the exit velocity through the roofline monitor directly above the operating Anode Furnace is 50% higher than areas of the roofline monitor immediately to the north/south". The protocol Page 5-13 further states, "67% of the velocity is allocated to the grey cells and 33% of the velocity is allocated to the yellow cells." It appears that "grey" is a typo and it should be replaced with "red". Moreover, the two statements

above appear conflicted. If the exit velocity through red cells is 50% higher than the yellow cells, it would be incorrect to allocate 67% of the velocity to the red cells and 33% of the velocity to the yellow cells. The statement about the velocity allocation (67% or 33%) is also misleading. It would be more appropriate to state that 67% of the total plume flow at the roofline would exit from the red cells while 33% of the plume flow would exit from yellow cells.

iv) As indicated in the modeling files, the exit velocities for red cells and yellow cells are 0.736 m/s and 0.453 m/s, respectively. However, some cells are located immediately above an operational flash furnace but also are adjacent to the other operational flash furnace. Therefore, these overlapping cells are expected to have a higher plume flow and thus a higher exit velocity. For example, the following table lists the exit velocities and SO_2 emissions retrieved from the modeling files under the AF0/AF1 operational scenario:

	Exit Velocity (m/s)	SO_2 Emissions (lb/hr)	Note
Cells 7-10	0.453	0.125	Adjacent to AF0
Cells 11-18	0.736	0.4	Above AF0
Cells 19-20	0.736	0.525	Above AF0 and Adjacent to AF1
Cells 21-22	0.453	0.25	Adjacent to both AF0 and AF1
Cells 23-24	0.736	0.525	Above AF1 and Adjacent to AF0
Cells 25-32	0.736	0.4	Above AF1
Cells 33-36	0.453	0.125	Adjacent to AF1

The overlapping cells (Cells 19-20 and Cell 23-24) are expected to have a higher emission rate and a higher flow rate compared to Cells 11-18 and Cells 25-32. Similarly, Cells 21-22 are expected to have a higher emission rate and a higher flow rate compared to Cells 7-10 and Cells 33-36. ASARCO made an adjustment to the emission rates considering the overlapping effects but no adjustment was made to the exit velocities. Please clarify.

v) Based on the modeling files, for the AF0/AF1 and AF1/AF2 scenarios, the total plume flow at the roofline is approximately 152,000 acfm, which is lower than the flow rate of 177,000 acfm as stated in the modeling protocol. This was due to the fact that ASARCO did not make adjustment to the exit velocities for the overlapping cells as discussed above. Please check the modeling files.

c) Flash Furnace Fugitives and Converter Aisle Fugitives

i) Please discuss the methodology for calculating the fugitive emissions for flash furnace (39.4 lb/hr) and converter aisle (11 lb/hr). Since the proposed controls will capture additional fugitive emissions from the flash furnace, matte tapping and slag skimming areas, it is not clear why the modeled fugitive emission rate for flash furnace (39.4 lb/hr) is significantly higher than the previous modeled emission rate in the 2018 SIP submittal (28.7 lb/hr). Please clarify.

ii) As shown in the modeling protocol Table 5-3, the fugitive emissions from the flash furnace penthouse are modeled as 4 adjacent volume sources, each having a length side of 16 m.

Please describe how fugitive emissions emit out from the penthouse and how to determine the base for the volume sources (16 m by 16 m). Additionally, as the volume sources for the penthouse have a larger footprint compared to the remaining volume sources for flash furnace (South, Middle West, Middle East, North), would it be appropriate to distribute the total fugitive emission rate from the flash furnace building evenly among the 32 individual volume sources (including 4 sources for the penthouse)? Please clarify.

2. Meteorological Data

To determine the surface moisture input in AERSURFACE, ASARCO compared the five-year average precipitation measured at the Camera Hill station against the 30-year average value from the Safford Regional Airport. ASARCO selected "average" surface moisture characteristics for the AERSURFACE processing.

a) The Department recommends determining the surface moisture condition for each year separately. The precipitation and the surface moisture conditions may vary significantly across the period of meteorological data. The "average" condition over five-years does not necessarily indicate that the surface moisture condition for individual years would be "average". For example, in Arizona, year 2020 ranked as the second driest year on record.

b) Per U.S. EPA guidance for AERSURFACE, "Dry" surface moisture values are applied if the precipitation is below the 30th percentile of the 30-year climate record, "Wet" values are applied if the precipitation is above the 70th percentile of the 30-year climate record, and "Average" values are used if the precipitation is between the 30th and 70th percentiles. The Department recommends calculating the 30th and 70th percentile of the 30-year climate record and then comparing the annual precipitation value for each year against the calculated values.

c) ASARCO used the 1981-2010 climatological record. The Department recommends using the latest 30-year (1991-2020) record. In 2021, NOAA updated climate normals, reflecting observed data for the 1991-2020 period.

d) The SFC files indicate that the annual precipitation totals at the Camera Hill station were unreasonably high. For example, the SFC file for Year 2020 shows an annual precipitation of 1,481 mm (58.3 inch). Please check the raw data files for AERMET processing. Note that the unit for precipitation amount (PAMT) in AERMET input is centimeter (cm).

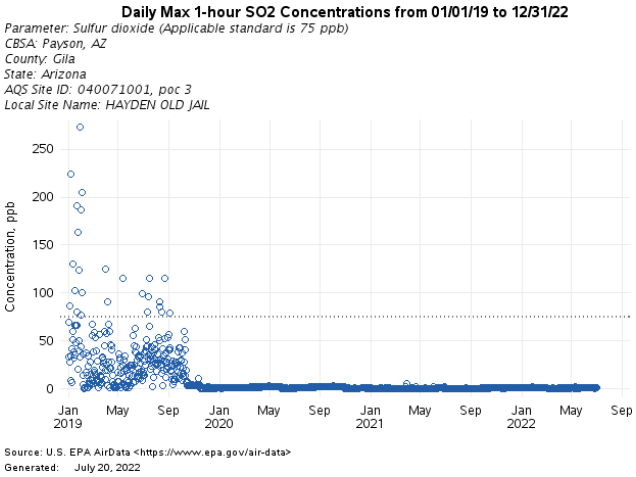
3. Background Concentration

ASARCO estimated the 1-hour SO_2 background concentration based on the monitoring data collected from five ambient air monitoring sites located in the Hayden area during a shutdown period (10/13/2019 – 3/5/2020). For each monitor, ASARCO calculated the maximum daily 1-hour SO_2 concentrations and averaged the maximum daily 1-hour concentrations over the shutdown period. The obtained five concentrations were then averaged to derive the background concentration for modeling purposes. While the Department acknowledges that this methodology was used in the 2018 submittal, the Department is providing the following comments to ASARCO for further consideration.

a) According to Appendix W, "The monitoring network used for developing background concentrations is expected to conform to the same quality assurance and other requirements as those networks established for PSD purposes". It is not clear if ASARCO follows any QA/QC procedures to operate their ambient air monitoring network. It is not clear if the air quality monitoring data from the ASARCO's monitors are of sufficient completeness and follow appropriate data validation procedures. If there are some QA/AC concerns on the ASARCO's monitors, the Department recommends using the data collected from the state's Hayden Old Jail monitor only.

b) According to Appendix W, "the best starting point would be use of the current design value for the applicable NAAQS as a uniform monitored background contribution across the project area." For 1-hour SO_2, the design value is calculated based on the 99th percentile of annual distribution of daily maximum 1-hour concentrations. ASARCO used the average of daily maximum 1-hour concentrations as the background, which indicates that the maximum 1-hour concentrations for a number of days could be higher than the average value. If ASARCO believes that the use of average of daily maximum 1-hour concentrations is appropriate and defensible, please provide justification.

c) It is not clear why ASARCO selected a four-and-a-half-month shutdown period (10/13/2019 – 3/5/2020) for the background determination. As shown the chart from the EPA's website, there are more than two years of monitoring data available. If possible, the Department prefers to use the two complete years of data (2020 and 2021) for the background determination.



4. Version of AERMOD Modeling System

The Department understands that ASARCO will update the modeling with the latest version of AERMOD/AERMET (version 22112). Please proceed it.

Appendix D
Response to ADEQ Comments on ASARCO SO_2 SIP Modeling (August 12, 2022)

7251 Lake Hills Court
Marriottsville, MD 21104 USA

William B. Jones
President

Direct Line: +1.410.499.9918
Email: bjones@blueskymodeling.com

August 12, 2022

Feng Mao
Air Quality Division
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Re: Response to ADEQ comments on ASARCO SO_2 SIP Modeling

Dear Feng:

On June 23, 2022, Blue Sky Modeling, LLC (BSM), on behalf of ASARCO LLC (ASARCO), submitted to the Arizona Department of Environmental Quality (ADEQ) a Modeling Protocol describing ASARCO's proposed methodology to conduct sulfur dioxide (SO_2) modeling in support of the State Implementation Plan (SIP for the Hayden Nonattainment Area (NAA).

On July 12, 2022, BSM, on behalf of ASARCO, submitted to the ADEQ a letter report which summarized ASARCO's air dispersion modeling for the Hayden NAA SO_2 SIP, along with various electronic input/output files that supported that analysis.

On July 22, 2022, you emailed me the ADEQ's comments on the Modeling Protocol, modeling analysis. This letter responds to each of the comments individually.

ADEQ Comment No. 1

Source Inputs

ASARCO is proposing to place additional controls on the Hayden smelter in additional to the Converter Retrofit Project (CRP) installed in 2017-2018. However, the modeling protocol does not provide descriptions on how these additional controls would affect the estimates of emission rates and dispersion parameters for emission sources. Please describe the methodology on how these source inputs are derived based on engineering design or judgement. In particular, as stated in the modeling letter report, ASARCO modeled the worst-case hourly emission rates for all emission sources to demonstrate the compliance with the NAAQS. ASARCO must clearly present how to estimate these worst-case hourly emission rates. If any assumptions are made, please provide justification and supporting documents.

Response to Comment No. 1

As outlined in its proposal to ADEQ on April 11, 2022, ASARCO is proposing three additional sets of engineering controls as part of the proposed SIP revision. Each control and how it was handled for

emissions estimation and modeling is set forth briefly here and then addressed in more detail, as needed, in the individual sections.

Uptake Improvement Project. The Uptake Improvement Project involves the installation and ventilation of a partial enclosure around the INCO flash furnace uptake shaft to improve capture of any fugitives from the flash furnace and emissions generated during matte tapping and slag skimming activities. These emissions are ducted to the converter secondary hood baghouse, treated, and released to the main stack. The uptake enclosure will be ventilated at all times except during brief periods where slag is returned to the furnace. As a result, the secondary baghouse system can handle the added ventilation point without an increase in system flow capacity.

In the fugitive study, it appears that there were episodes where emissions from the matte tapping/slag skimming area may have migrated into the converter aisle, anode aisle or material transfer area. Based upon engineering judgment and review of the fugitive study data, GCT estimates that this project will improve capture in the flash furnace area on average around 10-15% and will substantially reduce (e.g., 30% to greater than 50%) peak emissions observed during the fugitive study at both the flash furnace roofline and converter roofline monitoring systems.

Fuming Ladle Capture Project: The Fuming Ladle Capture Project will construct a hood and retaining walls to collect emissions from "fuming" ladles, which sometimes occurs after a ladle is poured. The hood is ducted to the converter secondary hood baghouse, treated, and released to the main stack. As outlined below, GCT believes that fuming ladles contribute substantially to the peak concentrations seen during the fugitive study and this control should substantially reduce, if not mostly eliminate, that excess contribution. The new hood will only operate for the brief periods where a fuming ladle is present in the enclosure. It is anticipated that fuming ladles will be vented for 15-minute periods occurring 0 to 5 times per day. As a result, the secondary baghouse system can handle the added ventilation point without an increase in system flow capacity.

Anode Furnace Secondary Hood System*:* The Anode Furnace Secondary Hood System Project will construct secondary hoods, similar to those found on the converters, around the anode furnaces, allowing improved capture during operations. The hoods will then be ducted to a new anode secondary hood baghouse and released to the main stack. GCT estimates that ASARCO should see SO_2 reductions of approximately 80%, possibly more during peak emissions periods.

In designing these projects, GCT and ASARCO considered the results of the fugitive study and observations of the smelter while it was operating. The controls are designed preferentially to address peak emissions periods. Control efficiencies are thus expected to be higher for high emissions periods than for normal running, when the existing controls work well, as demonstrated by the fugitive study. The fugitive study showed that mean emissions are well below the proposed limits even without the additional controls contemplated in this proposal.

In proposing limits, GCT and ASARCO selected values within the capabilities of the capture and control systems when operating as designed. Then, because ADEQ and EPA have stated that the proposed limits must be met "at all times, including startup, shutdown and malfunction," ASARCO and GCT made reasonable upper bound estimates of emissions in those circumstances. These estimates will be proposed for adoption as limits if they also achieve the relevant NAAQS.

The effects of the new controls on the parameters of modeled sources are discussed in the following sections and summarized in Attachment "A".

ADEQ Comment No. 1(a)

Main Stack

Under the additional controls proposed, additional fugitive emissions will be captured and routed to the main stack. It is not clear why the modeled emission rate and the stack parameters as presented in the modeling protocol are identical to those in the 2018 SIP submittal that was based on the CRP project. Would the additional controls result in a higher hourly emission rate from the main stack and also affect the stack parameters such as gas flow rate, gas exit velocity and gas temperature? Please clarify.

Response to Comment No. 1(a)

The stack parameters of flow, velocity, and temperature are impacted by the proposed additional controls. The estimated stack parameters with the proposed controls are summarized in Appendix A of this memo.

ADEQ Comment No. 1(b)(i)

Anode Furnace Fugitives

The Department understands that the proposed additional controls will reduce the anode furnace fugitive emissions as well as the roofline flow rate. However, it is not clear how ASARCO obtained an emission rate of 10 lb/hr, a flow rate of 177,000 acfm, and a roofline vent temperature of 120 F for anode furnace fugitives (see the modeling protocol Page 5-3). Please discuss the methodology for calculating these source parameters. If needed, please provide the supporting documents from Gas Cleaning Technologies (GCT).

Response to Comment No. 1(b)(i)

For the anode roofline flow and temperature, GCT used flow and temperature data collected during the 2019 roofline fugitive study. That data indicated a flow rate of 177,000 ACFM at 120°F. The roofline ventilation rate is primarily a factor of wind conditions as well as building temperature relative to outside temperature. The addition of the anode secondary hoods will not significantly impact wind flow into the building or building temperatures. Therefore, it is reasonable to assume the roofline vent flow rate and temperature after the installation of the secondary hoods will be similar to pre-installation conditions.

The 2019 roofline fugitive study indicated that the 99th percentile highest hourly emissions rate for the anode roofline was 55.9 lb/hr for the intensive portion and 50.1 lb/hr for the September 2019 data. Since the vast majority of anode area SO_2 fugitive emissions escape the anode charging mouth, GCT conservatively estimates that the new proposed secondary hoods that will cover the charging mouth will capture at least 80% of the current fugitive emissions and have higher efficiency under peak emissions conditions (when a higher proportion of the fugitive emissions will escape from the charging mouth). GCT

therefore preliminarily assumed that the anode area roofline emissions would be reduced down to 10 lb/hr as a worst-case hourly emissions rate for the modeling. Since that time, EPA has released a new version of AERMOD. Blue Sky Modeling will remodel to verify that the previously proposed limits achieve the NAAQS under the revised model. ASARCO will then propose final values within the capability of the capture and control systems while accounting for the need to address startup, shutdown and malfunction to the extent possible.

ADEQ Comment No. 1(b)(ii)

Anode Furnace Fugitives

Figures 5-11, 5-12 and 5-13 in the modeling protocol illustrate that there are 4 yellow cells adjacent to areas immediately above an operational anode furnace (2 cells on either side). However, the modeling files indicate that ASARCO actually modeled 8 adjacent cells (4 cells on either side). For example, under the AF0/AF1 operational scenario, the modeling protocol shows that cells 9-10, 21-22, and 33-34 are adjacent cells. However, ASARCO modeled cells 7- 10, 21-22, 33-36 as adjacent cells. Please clarify the inconsistency.

Response to Comment No. 1(b)(ii)

This comment will be addressed with the revised modeling.

ADEQ Comment No. 1(b)(iii)

Anode Furnace Fugitives

The modeling protocol Page 5-11 states, “the exit velocity through the roofline monitor directly above the operating Anode Furnace is 50% higher than areas of the roofline monitor immediately to the north/south”. The protocol Page 5-13 further states, “67% of the velocity is allocated to the grey cells and 33% of the velocity is allocated to the yellow cells.” It appears that “grey” is a typo and it should be replaced with “red”. Moreover, the two statements above appear conflicted. If the exit velocity through red cells is 50% higher than the yellow cells, it would be incorrect to allocate 67% of the velocity to the red cells and 33% of the velocity to the yellow cells. The statement about the velocity allocation (67% or 33%) is also misleading. It would be more appropriate to state that 67% of the total plume flow at the roofline would exit from the red cells while 33% of the plume flow would exit from yellow cells.

Response to Comment No. 1(b)(iii)

This comment will be addressed with the revised modeling.

ADEQ Comment No. 1(b)(iv)

Anode Furnace Fugitives

As indicated in the modeling files, the exit velocities for red cells and yellow cells are 0.736 m/s and 0.453 m/s, respectively. However, some cells are located immediately above an operational flash furnace but

also are adjacent to the other operational flash furnace. Therefore, these overlapping cells are expected to have a higher plume flow and thus a higher exit velocity. For example, the following table lists the exit velocities and SO_2 emissions retrieved from the modeling files under the AF0/AF1 operational scenario:

	Exit Velocity (m/s)	SO_2 Emissions (lb/hr)	Note
Cells 7-10	0.453	0.125	Adjacent to AF0
Cells 11-18	0.736	0.4	Above AF0
Cells 19-20	0.736	0.525	Above AF0 and Adjacent to AF1
Cells 21-22	0.453	0.25	Adjacent to both AF0 and AF1
Cells 23-24	0.736	0.525	Above AF1 and Adjacent to AF0
Cells 25-32	0.736	0.4	Above AF1
Cells 33-36	0.453	0.125	Adjacent to AF1

The overlapping cells (Cells 19-20 and Cell 23-24) are expected to have a higher emission rate and a higher flow rate compared to Cells 11-18 and Cells 25-32. Similarly, Cells 21-22 are expected to have a higher emission rate and a higher flow rate compared to Cells 7-10 and Cells 33-36. ASARCO made an adjustment to the emission rates considering the overlapping effects but no adjustment was made to the exit velocities. Please clarify.

Response to Comment No. 1(b)(iv)

This comment will be addressed with the revised modeling.

ADEQ Comment No. 1(b)(v)

Anode Furnace Fugitives

Based on the modeling files, for the AF0/AF1 and AF1/AF2 scenarios, the total plume flow at the roofline is approximately 152,000 acfm, which is lower than the flow rate of 177,000 acfm as stated in the modeling protocol. This was due to the fact that ASARCO did not make adjustment to the exit velocities for the overlapping cells as discussed above. Please check the modeling files.

Response to Comment No. 1(b)(v)

This comment will be addressed with the revised modeling.

ADEQ Comment No. 1(c)(i)

Flash Furnace Fugitives and Converter Aisle Fugitives

Please discuss the methodology for calculating the fugitive emissions for flash furnace (39.4 lb/hr) and converter aisle (11 lb/hr). Since the proposed controls will capture additional fugitive emissions from the flash furnace, matte tapping and slag skimming areas, it is not clear why the modeled fugitive emission

rate for flash furnace (39.4 lb/hr) is significantly higher than the previous modeled emission rate in the 2018 SIP submittal (28.7 lb/hr). Please clarify.

Response to Comment No. 1(c)(i)

GCT again reviewed the 2019 fugitive study data to assist with developing the estimated emissions rates for modeling. For the flash furnace area, GCT calculated the 99th percentile highest hourly SO_2 emissions rate of 65.2 lb/hr for the intensive study portion and 33.5 lb/hr for September 2019 (after the uptake ventilation modification was installed). Average emissions rates were 8.0 lb/hr for the intensive period and 6.9 lb/hr for the September 2019 period.

From the data, the uptake ventilation modification significantly reduced peak hourly SO_2 emissions. However, as discussed above, ADEQ and EPA have stated that the proposed limits must be met "at all times, including startup, shutdown and malfunction." Based upon review of past emissions performance and the potential sulfur dioxide generation, ASARCO and GCT have elected to increase the limit for this area to provide a more adequate margin of safety. Blue Sky Modeling conducted modeling and determined that the higher rate of 39.4 lb/hr could still achieve compliance with the SO_2 NAAQS. GCT finds this to be appropriate given the limited amount of emissions data available after the modification was installed. As indicated above, because EPA has updated AERMOD in the interim, Blue Sky Modeling will rerun the new model to ensure that the NAAQS are still maintained and the margin may be adjusted slightly.

For the converter area, GCT calculated the 99th percentile highest hourly SO_2 emissions rate of 10.5 lb/hr for the intensive study portion and 21.1 lb/hr for September 2019. Average hourly emissions were 1.0 lb/hr for the intensive study portion and 1.9 lb/hr for September 2019.

The vast majority of the SO_2 emissions from the converter area were released from the material transfer area. Based on GCT's experience, fuming ladles in the area are a major cause of peak SO_2 fugitive emissions. GCT expects the combination of the proposed fuming ladle hood modification and improved internal baffling will significantly reduce peak hourly SO_2 fugitive emissions at the converter aisle roofline monitors. Therefore, an hourly emissions rate of 11 lb/hr was assumed for the modeling effort.

ADEQ Comment No. 1(c)(ii)

Flash Furnace Fugitives and Converter Aisle Fugitives

As shown in the modeling protocol Table 5-3, the fugitive emissions from the flash furnace penthouse are modeled as 4 adjacent volume sources, each having a length side of 16 m.

Please describe how fugitive emissions emit out from the penthouse and how to determine the base for the volume sources (16 m by 16 m). Additionally, as the volume sources for the penthouse have a larger footprint compared to the remaining volume sources for flash furnace (South, Middle West, Middle East, North), would it be appropriate to distribute the total fugitive emission rate from the flash furnace building evenly among the 32 individual volume sources (including 4 sources for the penthouse)? Please clarify.

Response to Comment No. 1(c)(ii)

This comment will be addressed with the revised modeling.

ADEQ Comment No. 2(a) through 2(c)

Meteorological Data

To determine the surface moisture input in AERSURFACE, ASARCO compared the five-year average precipitation measured at the Camera Hill station against the 30-year average value from the Safford Regional Airport. ASARCO selected "average" surface moisture characteristics for the AERSURFACE processing.

a) The Department recommends determining the surface moisture condition for each year separately. The precipitation and the surface moisture conditions may vary significantly across the period of meteorological data. The "average" condition over five-years does not necessarily indicate that the surface moisture condition for individual years would be "average". For example, in Arizona, year 2020 ranked as the second driest year on record.
b) Per U.S. EPA guidance for AERSURFACE, "Dry" surface moisture values are applied if the precipitation is below the 30th percentile of the 30-year climate record, "Wet" values are applied if the precipitation is above the 70th percentile of the 30-year climate record, and "Average" values are used if the precipitation is between the 30th and 70th percentiles. The Department recommends calculating the 30th and 70th percentile of the 30-year climate record and then comparing the annual precipitation value for each year against the calculated values.
c) ASARCO used the 1981-2010 climatological record. The Department recommends using the latest 30-year (1991-2020) record. In 2021, NOAA updated climate normals, reflecting observed data for the 1991-2020 period.

Response to Comment No. 2(a) through 2(c)

ASARCO has re-examined the precipitation amounts observed at the Camera Hill station for the years 2016, 2018, 2019, and 2020 (no precipitation data are available from Camera Hill for the year 2015) relative to 30-year climatological norms (1991-2020) at the Safford Regional Airport (Safford). For the purposes of AERSURFACE processing, the determination of whether a given year's data were "wet," "average," or "dry" relative to climatological norms was made per ADEQ's comment 2(b) in that

- If the annual precipitation at Camera Hill for a given year was greater than the 70th percentile of the climatological norm at Safford, that year's meteorological data were processed using "wet" surface moisture values in AERSURFACE
- If the annual precipitation at Camera Hill for a given year was between the 30th and 70th percentiles of the climatological norm at Safford, that year's meteorological data were processed using "average" surface moisture values in AERSURFACE
- If the annual precipitation at Camera Hill for a given year was less than the 30th percentile of the climatological norm at Safford, that year's meteorological data were processed using "dry" surface moisture values in AERSURFACE

The climatological norm for rainfall at Safford for the period 1991-2020 was 7.87" per year. Accordingly, the 70th percentile is 5.51" and the 30th percentile is 2.36".

Table 1 summarizes this analysis.

Table 1. Surface Moisture Analysis for Camera Hill Station

Year	Camera Hill Precipitation (in)	Comparison to Safford climatological norm for annual rainfall	Surface Moisture value assumed in AERSURFACE processing
2016	9.99	Greater than 70th percentile	Wet
2018	8.62	Greater than 70th percentile	Wet
2019	9.93	Greater than 70th percentile	Wet
2020	5.74	Greater than 70th percentile	Wet

Accordingly, AERMET was re-run for the years 2016, 2018, 2019, and 2020 using AERSURFACE output that assumed "wet" surface moisture values.

As mentioned earlier, no precipitation data are available from the Camera Hill station for the year 2015. Per an email exchange you and I had on August 8[1], because the precipitation for the year 2015 at both Safford and the Tucson International Airport is "wet" relative to their respective climatological norms, the 2015 Camera Hill data were re-processed using "wet" surface moisture values in AERSURFACE.

ADEQ Comment No. 2(d)

Meteorological Data

The SFC files indicate that the annual precipitation totals at the Camera Hill station were unreasonably high. For example, the SFC file for Year 2020 shows an annual precipitation of 1,481 mm (58.3 inch). Please check the raw data files for AERMET processing. Note that the unit for precipitation amount (PAMT) in AERMET input is centimeter (cm).

Response to Comment No. 2(d)

The units of the precipitation data for the Camera Hill onsite data were corrected and were included in the re-running of AERMET for the years 2016, 2018, 2019, and 2020 (as noted earlier, there were no precipitation data for 2015).

ADEQ Comment No. 3(a) through 3(c)

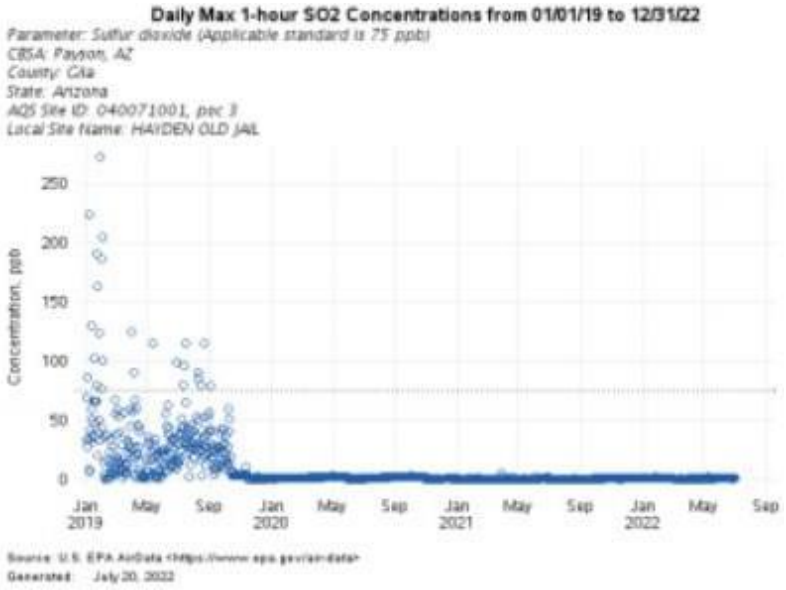
Background Concentration

ASARCO estimated the 1-hour SO2 background concentration based on the monitoring data collected from five ambient air monitoring sites located in the Hayden area during a shutdown period (10/13/2019

[1] Email from Feng Mao, ADEQ, to William Jones, Blue Sky Modeling, August 8, 2022.

– 3/5/2020). For each monitor, ASARCO calculated the maximum daily 1-hour SO2 concentrations and averaged the maximum daily 1-hour concentrations over the shutdown period. The obtained five concentrations were then averaged to derive the background concentration for modeling purposes. While the Department acknowledges that this methodology was used in the 2018 submittal, the Department is providing the following comments to ASARCO for further consideration.

a) According to Appendix W, "The monitoring network used for developing background concentrations is expected to conform to the same quality assurance and other requirements as those networks established for PSD purposes". It is not clear if ASARCO follows any QA/QC procedures to operate their ambient air monitoring network. It is not clear if the air quality monitoring data from the ASARCO's monitors are of sufficient completeness and follow appropriate data validation procedures. If there are some QA/AC concerns on the ASARCO's monitors, the Department recommends using the data collected from the state's Hayden Old Jail monitor only.
b) According to Appendix W, "the best starting point would be use of the current design value for the applicable NAAQS as a uniform monitored background contribution across the project area." For 1-hour SO2, the design value is calculated based on the 99th percentile of annual distribution of daily maximum 1-hour concentrations. ASARCO used the average of daily maximum 1-hour concentrations as the background, which indicates that the maximum 1-hour concentrations for a number of days could be higher than the average value. If ASARCO believes that the use of average of daily maximum 1-hour concentrations is appropriate and defensible, please provide justification.
c) It is not clear why ASARCO selected a four-and-a-half-month shutdown period (10/13/2019 – 3/5/2020) for the background determination. As shown the chart from the EPA's website, there are more than two years of monitoring data available. If possible, the Department prefers to use the two complete years of data (2020 and 2021) for the background determination.



Response to Comment No. 3(a) through 3(c)

Historically the background concentration used in ASARCO modeling has been based on periods when the smelter was shut down. Because the smelter has been shut down since October 2019, there are two calendar years of data available that correspond to ASARCO not operating.

Accordingly, ASARCO has revised its proposed background concentration to use data from the Hayden Jail for the years 2020 and 2021. Because such a long period is now available for use, ASARCO is proposing to use guidance put forth by EPA in its "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard"[2] (the concepts of which also apply to 1-hour SO_2).

In that guidance EPA discusses how meteorological factors associated with the dispersion of pollutants is a key consideration when developing a background concentration. Because there are some areas of complicated topography in and around the Hayden SO_2 SIP modeling domain (e.g., hills, arroyos, etc.), it is reasonable to expect some diurnal variability in SO_2 background concentrations as the atmosphere warms during the day/cools at night and accordingly affects the flow in and around ASARCO.

Because of this, ASARCO has chosen to follow EPA's recommendation that "…an appropriate methodology for incorporating background concentrations in the cumulative impact assessment for the 1-hour (SO_2) standard would be to use multiyear averages of the (99^{th})-percentile of the available background concentrations by season and hour-of-day…" Specifically, ASARCO proposes the following approach for the 1-hr SO_2 concentrations from the Hayden Jail:

- Download the raw hourly SO_2 concentrations from EPA (https://aqs.epa.gov/aqsweb/airdata/download_files.html#Raw) and select data from the Hayden Jail monitor (EPA ID 04-07-1001)
- For each year individually, sort data by season, as defined in AERMOD guidance:
    - Winter: December, January, February
    - Spring: March, April, May
    - Summer: June, July, August
    - Fall: September, October, November
- Sort each season's data by hour of the day, resulting in 24 groups of concentrations per season
- Within each hour's set of data, rank concentrations from largest to smallest
- Eliminate the highest concentration (the 99^{th} percentile of the approximate 90 concentrations per hour's set of data is roughly 89, so eliminating the highest concentration from consideration is consistent with EPA's guidance)
- Remove all negative concentrations, which would bias the calculated background concentration down
- Calculate the average of the remaining concentrations

[2] Memorandum. Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour

NO_2 National Ambient Air Quality Standard, Tyler Fox (EPA) to Regional Air Division Directors. March 1, 2011.

This approach produced an average 1-hr SO_2 concentration for each hour of the day for the four seasons for both 2020 and 2021. The corresponding seasonal/hourly concentrations for each year of data were averaged to develop a single, multiyear average of seasonal/hourly concentrations.

Those data will be input to AERMOD using the SEASHR flag on the SO Pathway. These data are presented in Table 2 below.

Table 2. SEASHR values for SO_2 Background in AERMOD

Hour	SO_2 Background Concentration (ppb) by Season			
	Winter	Spring	Summer	Fall
Hr. 1	0.681318	0.838956	0.671896	0.971111
Hr. 2	0.681795	0.831933	0.642463	0.968333
Hr. 3	0.680601	0.841467	0.637123	0.975556
Hr. 4	0.662879	0.825914	0.633563	0.963889
Hr. 5	0.667837	0.823924	0.620742	0.952846
Hr. 6	0.673458	0.832715	0.627767	0.961835
Hr. 7	0.662879	0.832751	0.612963	0.951376
Hr. 8	0.652544	0.82295	0.603893	0.973021
Hr. 9	0.677668	0.824704	0.620203	0.977873
Hr. 10	0.672443	0.834722	0.644605	0.980337
Hr. 11	0.663429	0.868267	0.674864	0.987795
Hr. 12	0.711866	0.862539	0.706917	1.022614
Hr. 13	0.752841	0.896889	0.708867	1.059376
Hr. 14	0.730858	0.88223	0.705723	1.054168
Hr. 15	0.717812	0.869322	0.685951	1.04927
Hr. 16	0.684911	0.861159	0.699231	1.026966
Hr. 17	0.681248	0.858577	0.719659	1.028333
Hr. 18	0.661021	0.859132	0.709737	1.019856
Hr. 19	0.651634	0.864735	0.689141	1.013504
Hr. 20	0.661653	0.840804	0.669894	0.997222
Hr. 21	0.64881	0.838953	0.669608	0.995556
Hr. 22	0.664567	0.86222	0.673876	1.022222
Hr. 23	0.666324	0.856861	0.694486	0.981667
Hr. 24	0.667719	0.847002	0.688254	0.992222

A spreadsheet containing the full derivation of these background concentrations is included with the electronic submittal of this letter.

ADEQ Comment No. 4

Version of AERMOD Modeling System

The Department understands that ASARCO will update the modeling with the latest version of AERMOD/AERMET (version 22112). Please proceed it.

Response to Comment No. 4

ASARCO is in the process of re-running the modeling using version 22112 of AERMET and AERMOD, and will forward those files to ADEQ as quickly as possible.

Thanks very much for your assistance. If you have any questions or need anything else, please contact me at bjones@blueskymodeling.com or at 410.499.9918.

Best regards,



William B. Jones
President

Attachments

Attachment A

Stack Conditions - Anode Furnace Primary to Center and Anode Furnace Secondary to Annulus

Stack Center	
Flow (SCFM)	163,800
Temperature (F)	380
Diameter (ft)	17
Area (ft2)	227
Stack Annulus	
Flow (SCFM)	1,038,100
Temperature (F)	140
Equivalent Diameter (ft)	23.9
Area (ft2)	449
Combined Center and Annulus	
Flow (SCFM)	1,201,900
Flowrate-Weigthed Temperature (F)	173
Equivalent Diameter (ft)	29.3
Area (ft2)	676
Total Flow (ACFM)	1,653,627
Equivalent Velocity (ft/s)	40.8

Appendix E
ADEQ Comments on Modeling
(Email from Feng Mao (ADEQ) to Bill Jones (BSM)
(August 22, 2022)

From: Feng Mao <mao.feng@azdeq.gov>
Sent: Monday, August 22, 2022 11:49 AM
To: Bill Jones
Cc: Kevin McPeak; Manuel Hallivis Perez; Paulina Orozco Duck; Julián Jorge Lazalde Psihas; Sam Reidhead; Michelle Lammers; James Stewart; Eric Hiser; czecholinski.daniel@azdeq.gov; Mike Sonenberg; Kamran Khan; Balaji Vaidyanathan
Subject: Re: Response to ADEQ comments on Hayden SO2 SIP Modeling
Attachments: ASARCO AERSURFACE Moisture Conditions.pdf

Hi Bill,

Thank you for the response to our comments on Asarco 1-hr SO2 modeling protocol. We have reviewed the response and would like to make comments as follows.

* Source Inputs

We agree with the methodology of estimating the peak emissions for sources considering the 2019 roofline fugitive study and capture/control efficiencies from additional controls. We understand that the proposed emission limits are not finalized yet. We also understand that Asarco will address some of the Department's comments with revised modeling. We do not have any comments at this time. However, we would like to have a copy of a GCT engineering document regarding the additional controls and associated capture/control efficiencies if this document is available.

* Surface Moisture in AERMET

Please see the email ADEQ sent to Blue Sky Modeling on 8/16/20220. A copy is attached.

* Background Concentration

We agree that Asarco may determine the background concentrations by season and hour-of-day, following the EPA’s Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hr NO2 NAAQS (the same concepts will apply to 1-hr SO2). However, we disprove of the proposed background concentrations because Asarco's methodology is inconsistent with the EPA’s Guidance. In particular, we disapprove of the last step of Asarco's calculations (i.e., “Calculate the average of the remaining concentrations”).

As discussed in the EPA's Guidance (Pg. 19), the number of days per season will range from 90 to 92 (if the data are complete). For 1-hour NO2 (98th-percentile), EPA recommends that “background values by season and hour-of-day used in this context should be based on the 3rd-

highest value for each season and hour-of-day combination". Similarly, for 1-hour SO2 (99th-percentile), the background values by season and hourly-of-day should be based on the 2nd-highest values for each season and hour-of-day combination. In contrast, Asarco removed the highest value for each hour's set of data and calculated the average of the remaining concentrations as the background concentration, which significantly deviates from the EPA's Guidance.

To be consistent with the EPA's Guidance, ADEQ recommends the following methodology (see ADEQ's Guidance https://static.azdeq.gov/aqd/modeling_guidance_2019.pdf Section 7.2.3 Pg. 68):

99th percentile of the Seasonal Hour-Of-Day (2nd Highest): For each of the two years under review (2020 and 2021), Seasonal Hour-Of-Day is determined by organizing all of the SO2 concentrations by hour of day (1AM, 2AM, 3AM, etc) for each season of the year in descending order and selecting the 2nd highest SO2 concentrations for each hour of the day. The background concentrations are then determined as the two-year average of the 2nd highest concentrations for each hour of the day and season.

If you have any questions, please let me know.

Thanks

Feng Mao, PhD, PE
Air Quality Facilities Emission Control
Ph: 520-628-6719

azdeq.gov

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On Fri, Aug 12, 2022 at 11:21 AM Bill Jones <BJones@blueskymodeling.com> wrote:
Hi Feng

Attached please find our response to your comments concerning the Hayden SO2 SIP Modeling

Protocol/Report, along with a spreadsheet that develops the new background values using the SEASHR
flag in AERMOD.

You'll see there are still a few details remaining to be ironed out as we re-model with the new version
of AERMOD/AERMET—we're working on those now and will get that to you as soon as possible.

Thanks for your continued assistance, and hope you have a nice weekend.

Bill

William B. Jones
President
M (410) 499-9918
E bjones@BlueSkyModeling.com
Blue Sky Modeling, LLC
www.blueskymodeling.com

From: Feng Mao <mao.feng@azdeq.gov>
Sent: Friday, July 22, 2022 4:57 PM
To: Bill Jones <BJones@blueskymodeling.com>
Cc: Kevin McPeak <KMcPeak@asarco.com>; Manuel Hallivis Perez <manuel.hallivis@americasmining.com>; Paulina Orozco Duck <paulina.orozco@americasmining.com>;
Julián Jorge Lazalde Psihas <jorge.lazalde@americasmining.com>; Sam Reidhead
<sreidhead@asarco.com>; Michelle Lammers <MLammers@asarco.com>; James Stewart
<JaStewart@asarco.com>; Eric Hiser <ehiser@hiserjoy.com>; czecholinski.daniel@azdeq.gov; Mike
Sonenberg <sonenberg.mike@azdeq.gov>; Kamran Khan <khan.kamran@azdeq.gov>; Balaji
Vaidyanathan <vaidyanathan.balaji@azdeq.gov>
Subject: Re: Hayden SO2 SIP Modeling Letter Report and Modeling Files

Hi Bill,

Attached please find ADEQ's comments on the modeling protocol/ report you submitted. If you have
any questions, please let me know.

Thank you!

Feng Mao, PhD, PE

Air Quality Facilities Emission Control
Ph: 520-628-6719

azdeq.gov

Your feedback matters to ADEQ. Visit azdeq.gov/feedback

On Tue, Jul 12, 2022 at 8:14 AM Bill Jones <BJones@blueskymodeling.com> wrote:
Dear Feng

Please find attached a letter report summarizing the modeling conducted for the Hayden SO2 SIP,
along with the modeling input/output files. As you will see, the modeling demonstrates compliance
with the 1-hr SO2 NAAQS for the Hayden Nonattainment area (as well as the old SO2 NAAQS).

As noted in the letter, we know that EPA recently released a new version of the AERMOD modeling
system. We are working on updating the modeling analysis to reflect this new version, but some quick
modeling we've done to test whether the new version will change any of the conclusions of this
analysis produced the identical controlling 1-hr SO2 concentration as we got with the modeling we're
submitting here. In the interest of facilitating your review we wanted to get this to you as soon as
possible, but be aware we'll be submitting another set of modeling to reflect the new version of the
AERMOD modeling system soon.

Thanks for your help, and please let me know if you have any questions.

Bill

William B. Jones
President
M (410) 499-9918
E bjones@BlueSkyModeling.com
Blue Sky Modeling, LLC
www.blueskymodeling.com

Gmail

Feng Mao <mao.feng@azdeq.gov>

ASARCO/Camera Hill precip data for 2015

Feng Mao <mao.feng@azdeq.gov> Tue, Aug 16, 2022 at 9:46 AM
To: Bill Jones <BJones@blueskymodeling.com>
Cc: Kamran Khan <khan.kamran@azdeq.gov>

Hi Bill,

Thank you for the response to ADEQ's comments. While ADEQ is reviewing the response, I just wanted to make a quick comment on the moisture condition determination.

I understand the EPA's guidance may be confusing. Per U.S. EPA guidance for AERSURFACE, “Dry” surface moisture values are applied if the precipitation is below the 30th percentile of the 30-year climate record, “Wet” values are applied if the precipitation is above the 70th percentile of the 30-year climate record, and “Average” values are used if the precipitation is between the 30th and 70th percentiles. The 30th percentile and 70th percentile values are based on the 30-year climate record rather than 30-year normal.
Since the 30-year normal is the average value across 30-years, the determination based on the 30-year normal likely results in "wet".

I just reviewed the precipitation data collected from Safford Airport. It appears that the airport only has 23 years of precipitation data from 1999 to 2021. I calculated 30th and 70th percentile values based on the 23-year record and then determined the moisture conditions for years 2015, 2016, 2018, 2019, and 2020. My calculation is attached.

		30-percentile		6.238
		70-percentile		8.876
Year	Camera Hill Precipiation (in)	Moisture condition	Note	
2015		wet	see last email discussion	
2016	9.99	wet	> 70th percentile	
2018	8.62	average	between 30-70th percentile	
2019	9.93	wet	> 70th percentile	
2020	5.74	dry	< 30th percentile	

If you have any questions, please let me know.
[Quoted text hidden]
[Quoted text hidden]

Safford AP PRCP Data.xlsx
13K

STATION	NAME	LATITUDE	LONGITUDE	ELEVATION	DATE	PRCP
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	1998	
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	1999	6.81
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2000	8.82
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2001	7.67
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2002	4.91
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2003	4.13
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2004	8.79
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2005	6.07
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2006	6.35
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2007	9.02
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2008	4.85
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2009	3.36
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2010	5.59
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2011	6.65
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2012	6.91
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2013	7.47
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2014	10.58
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2015	10.16
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2016	12.67
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2017	8.53
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2018	8.96
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2019	9.15
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2020	3.81
USW00093	SAFFORD MUNICIPAL A	32.85654	-109.63603	967.8	2021	9.78

30-percentile	6.238
70-percentile	8.876

Year	Camera Hill Precipiation (in)	Moisture condition	Note
2015		wet	see last email discussion
2016	9.99	wet	> 70th percentile
2018	8.62	average	between 30-70th percentile
2019	9.93	wet	> 70th percentile
2020	5.74	dry	< 30th percentile

Appendix F
Response No. 2 to ADEQ Comments on ASARCO SO_2 SIP Modeling
(August 25, 2022)

7251 Lake Hills Court
Marriottsville, MD 21104 USA

William B. Jones
President

Direct Line: +1.410.499.9918
Email: bjones@blueskymodeling.com

August 25, 2022

Feng Mao
Air Quality Division
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Re: Response No. 2 to ADEQ comments on ASARCO SO_2 SIP Modeling

Dear Feng:

On June 23, 2022, Blue Sky Modeling, LLC (BSM), on behalf of ASARCO LLC (ASARCO), submitted to the Arizona Department of Environmental Quality (ADEQ) a Modeling Protocol describing ASARCO's proposed methodology to conduct sulfur dioxide (SO_2) modeling in support of the State Implementation Plan (SIP for the Hayden Nonattainment Area (NAA).

On July 12, 2022, BSM, on behalf of ASARCO, submitted to the ADEQ a letter report which summarized ASARCO's air dispersion modeling for the Hayden NAA SO_2 SIP, along with various electronic input/output files that supported that analysis.

On July 22, 2022, you emailed me the ADEQ's comments on the Modeling Protocol, modeling analysis.

On August 12, 2022 BSM, on behalf of ASARCO, responded to the majority of your July 22, 2022 comments[1].

On August 22, 2022, you emailed me comments on ASARCO's August 12 response.

This letter responds to the remaining comments of your July 22, 2022 letter, as well as your comments on August 22. Therefore, this letter, in conjunction with our response on August 12, includes all of our responses to ADEQ's July 22, 2022 letter and your additional comments on August 22. At the end of this letter a summary of the latest modeling results (reflecting changes to the analysis based on our responses to your comments) is presented.

ADEQ Comment No. 1(b)(ii)

Anode Furnace Fugitives

Figures 5-11, 5-12 and 5-13 in the modeling protocol illustrate that there are 4 yellow cells adjacent to areas immediately above an operational anode furnace (2 cells on either side). However, the modeling

[1] Email from Bill Jones, Blue Sky Modeling, to Feng Mao, ADEQ. August 12, 2022.

files indicate that ASARCO actually modeled 8 adjacent cells (4 cells on either side). For example, under the AF0/AF1 operational scenario, the modeling protocol shows that cells 9-10, 21-22, and 33-34 are adjacent cells. However, ASARCO modeled cells 7-10, 21-22, 33-36 as adjacent cells. Please clarify the inconsistency.

Response to Comment No. 1(b)(ii)

The addition of the proposed new anode furnace secondary hoods has changed the manner in which the Anode Furnace fugitive emissions were modeled, rendering what was in the July 12 submittal obsolete (therefore this question is no longer relevant).

Based on the attached memo from Gas Cleaning Technologies (GCT) (see Attachment A), with the addition of the proposed new Anode Furnace secondary hoods, both the emissions and the exit velocity will be evenly distributed across the entirety of the Anode Furnace roofline vent under all operating scenarios.

ADEQ Comment No. 1(b)(iii)

Anode Furnace Fugitives

The modeling protocol Page 5-11 states, "the exit velocity through the roofline monitor directly above the operating Anode Furnace is 50% higher than areas of the roofline monitor immediately to the north/south". The protocol Page 5-13 further states, "67% of the velocity is allocated to the grey cells and 33% of the velocity is allocated to the yellow cells." It appears that "grey" is a typo and it should be replaced with "red". Moreover, the two statements above appear conflicted. If the exit velocity through red cells is 50% higher than the yellow cells, it would be incorrect to allocate 67% of the velocity to the red cells and 33% of the velocity to the yellow cells. The statement about the velocity allocation (67% or 33%) is also misleading. It would be more appropriate to state that 67% of the total plume flow at the roofline would exit from the red cells while 33% of the plume flow would exit from yellow cells.

Response to Comment No. 1(b)(iii)

The addition of the proposed new anode furnace secondary hoods has changed the manner in which the Anode Furnace fugitive emissions were modeled, rendering what was in the July 12 submittal obsolete (therefore this question is no longer relevant).

Based on the attached memo from Gas Cleaning Technologies (GCT) (see Attachment A), with the addition of the proposed new Anode Furnace secondary hoods, both the emissions and the exit velocity will be evenly distributed across the entirety of the Anode Furnace roofline vent under all operating scenarios. The derivation of the exit velocity is presented in Attachment B.

ADEQ Comment No. 1(b)(iv)

Anode Furnace Fugitives

As indicated in the modeling files, the exit velocities for red cells and yellow cells are 0.736 m/s and 0.453 m/s, respectively. However, some cells are located immediately above an operational flash furnace but

also are adjacent to the other operational flash furnace. Therefore, these overlapping cells are expected to have a higher plume flow and thus a higher exit velocity. For example, the following table lists the exit velocities and SO_2 emissions retrieved from the modeling files under the AF0/AF1 operational scenario:

	Exit Velocity (m/s)	SO_2 Emissions (lb/hr)	Note
Cells 7-10	0.453	0.125	Adjacent to AF0
Cells 11-18	0.736	0.4	Above AF0
Cells 19-20	0.736	0.525	Above AF0 and Adjacent to AF1
Cells 21-22	0.453	0.25	Adjacent to both AF0 and AF1
Cells 23-24	0.736	0.525	Above AF1 and Adjacent to AF0
Cells 25-32	0.736	0.4	Above AF1
Cells 33-36	0.453	0.125	Adjacent to AF1

The overlapping cells (Cells 19-20 and Cell 23-24) are expected to have a higher emission rate and a higher flow rate compared to Cells 11-18 and Cells 25-32. Similarly, Cells 21-22 are expected to have a higher emission rate and a higher flow rate compared to Cells 7-10 and Cells 33-36. ASARCO made an adjustment to the emission rates considering the overlapping effects but no adjustment was made to the exit velocities. Please clarify.

Response to Comment No. 1(b)(iv)

The addition of the proposed new anode furnace secondary hoods has changed the manner in which the Anode Furnace fugitive emissions were modeled, rendering what was in the July 12 submittal obsolete (therefore this question is no longer relevant).

Based on the attached memo from Gas Cleaning Technologies (GCT) (see Attachment A), with the addition of the proposed new Anode Furnace secondary hoods, both the emissions and the exit velocity will be evenly distributed across the entirety of the Anode Furnace roofline vent under all operating scenarios. The derivation of the exit velocity is presented in Attachment B.

ADEQ Comment No. 1(b)(v)

Anode Furnace Fugitives

Based on the modeling files, for the AF0/AF1 and AF1/AF2 scenarios, the total plume flow at the roofline is approximately 152,000 acfm, which is lower than the flow rate of 177,000 acfm as stated in the modeling protocol. This was due to the fact that ASARCO did not make adjustment to the exit velocities for the overlapping cells as discussed above. Please check the modeling files.

Response to Comment No. 1(b)(v)

The addition of the proposed new anode furnace secondary hoods has changed the manner in which the Anode Furnace fugitive emissions were modeled, rendering what was in the July 12 submittal obsolete (therefore this question is no longer relevant).

Based on the attached memo from Gas Cleaning Technologies (GCT) (see Attachment A), with the addition of the proposed new Anode Furnace secondary hoods, both the emissions and the exit velocity will be

evenly distributed across the entirety of the Anode Furnace roofline vent under all operating scenarios. The derivation of the exit velocity is presented in Attachment B.

ADEQ Comment No. 1(c)(ii)

Flash Furnace Fugitives and Converter Aisle Fugitives

As shown in the modeling protocol Table 5-3, the fugitive emissions from the flash furnace penthouse are modeled as 4 adjacent volume sources, each having a length side of 16 m.

Please describe how fugitive emissions emit out from the penthouse and how to determine the base for the volume sources (16 m by 16 m). Additionally, as the volume sources for the penthouse have a larger footprint compared to the remaining volume sources for flash furnace (South, Middle West, Middle East, North), would it be appropriate to distribute the total fugitive emission rate from the flash furnace building evenly among the 32 individual volume sources (including 4 sources for the penthouse)? Please clarify.

Response to Comment No. 1(c)(ii)

The Flash Furnace building consists of several floors, with the tapping operations occurring at a lower floor and the uptake shaft located in the middle floors. Fumes and particulate escaping the furnace and tapping vent hoods rise to the underside of each floor above and then tend to spread out until finding an opening in the floor above, such as a flooring gap or a stairway. As the fume and particulate rises up through several floors, they become fairly well across the building area and would therefore be expected to have fairly even distribution among the monovents and penthouse vents at the roofline. In addition, the new update enclosure ventilation further reduces emissions that might rise up through the center of the building and discharge from the penthouse vents.

The penthouse on top of the Flash Furnace building is a 16 m x 7 m structure, with horizontally-discharging vents on all four sides. Figure 1 shows the Flash Furnace building, with the penthouse indicated.

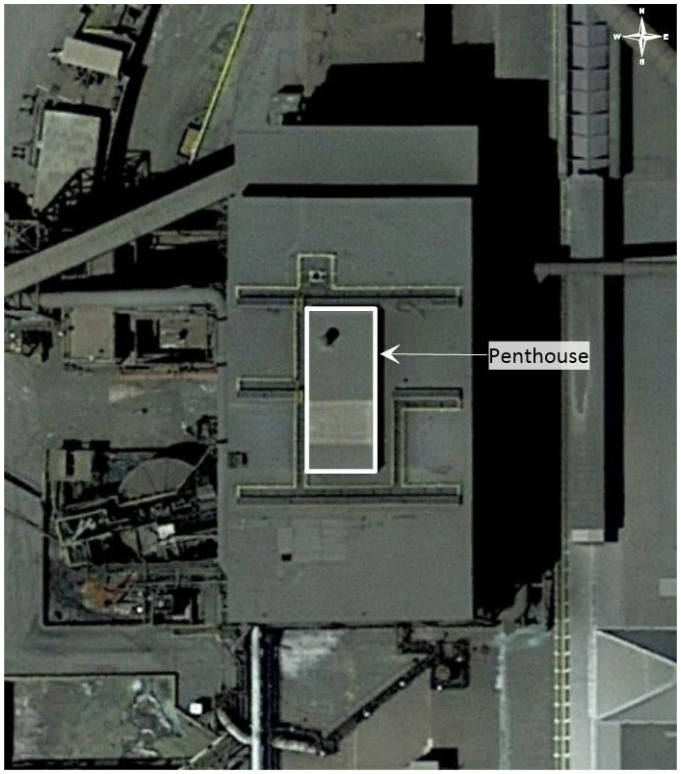


Figure 1
Flash Furnace Building with Penthouse

Figure 2 below shows the top of the Flash Furnace building, with monovents visible on the roof and the penthouse, with one of its horizontally-discharging vents, visible on the right.



Figure 2
Roof of Flash Furnace Building
(Penthouse shown on right)

The modeling has been adjusted to reflect volume sources on the western and eastern-facing sides with a length of 16 m and volume sources on the northern and southern-facing sides with a length of 7 m. Those lengths were used in the derivation of the Sigma Y values for the volume sources in the modeling, as shown in Attachment C.

ADEQ Comment No. 2(a) through 2(c)

ASARCO responded to ADEQ's initial comment regarding the determination of the surface moisture content in AERSURFACE. On August 22 your email to me referenced an email exchange we had had on August 16 concerning our response to the determination of the surface moisture content.

Response to ADEQ's August 22 comment regarding surface moisture content in AERSURFACE

ASARCO has revised its derivation of the surface moisture content in AERSURFACE per your email to me of August 16. Specifically, the following surface moisture contents were assumed for each year of processed meteorological data:

- 2015: wet surface moisture
- 2016: wet surface moisture
- 2018: average surface moisture

- 2019: wet surface moisture
- 2020: dry surface moisture

These revised AERSURFACE files are included in the modeling files included with this response.

ADEQ Comment No. 3(a) through 3(c)

ASARCO responded to ADEQ's initial comment regarding the derivation of the background concentration in its August 12 response. On August 22 you emailed me the following comment concerning our response to the background concentration calculation:

> We agree that Asarco may determine the background concentrations by season and hour-of-day, following the EPA's Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hr NO2 NAAQS (the same concepts will apply to 1-hr SO2). However, we disprove of the proposed background concentrations because Asarco's methodology is inconsistent with the EPA's Guidance. In particular, we disapprove of the last step of Asarco's calculations (i.e., "Calculate the average of the remaining concentrations").
>
> As discussed in the EPA's Guidance (Pg. 19), the number of days per season will range from 90 to 92 (if the data are complete). For 1-hour NO2 (98th-percentile), EPA recommends that "background values by season and hour-of-day used in this context should be based on the 3rd-highest value for each season and hour-of-day combination". Similarly, for 1-hour SO2 (99th-percentile), the background values by season and hourly-of-day should be based on the 2nd-highest values for each season and hour-of-day combination. In contrast, Asarco removed the highest value for each hour's set of data and calculated the average of the remaining concentrations as the background concentration, which significantly deviates from the EPA's Guidance.
>
> To be consistent with the EPA's Guidance, ADEQ recommends the following methodology (see ADEQ's Guidance https://static.azdeq.gov/aqd/modeling_guidance_2019.pdf Section 7.2.3 Pg. 68):
>
> **99th percentile of the Seasonal Hour-Of-Day (2nd Highest):** For each of the two years under review (2020 and 2021), Seasonal Hour-Of-Day is determined by organizing all of the SO2 concentrations by hour of day (1AM, 2AM, 3AM, etc) for each season of the year in descending order and selecting the 2nd highest SO2 concentrations for each hour of the day. The background concentrations are then determined as the two-year average of the 2nd highest concentrations for each hour of the day and season.

Response to ADEQ's August 22 comment regarding background concentration

ASARCO has revised the SEASHR background concentrations calculation per ADEQ's comments from its August 22 email, specifically by organizing the SO_2 concentrations by hour of day for each season of the year in descending order and selecting the 2^{nd} highest concentration for each hour of the day. The background concentration was then then determined by the two-year average of the 2^{nd} highest concentrations for each hour of the day and season.

The resulting revised SEASHR values are presented in Table 1 below

Table 1. Revised SEASHR values for SO_2 Background in AERMOD

Hour	SO_2 Background Concentration (ppb) by Season			
	Winter	**Spring**	**Summer**	**Fall**
Hr. 1	1.3	1.3	1.6	1.6
Hr. 2	1.35	1.3	1.5	1.55
Hr. 3	1.35	1.25	1.5	1.6
Hr. 4	1.3	1.25	1.45	1.6
Hr. 5	1.35	1.4	1.5	1.6
Hr. 6	1.35	1.35	1.55	1.6
Hr. 7	1.25	1.25	1.5	1.6
Hr. 8	1.25	1.3	1.5	1.65
Hr. 9	1.35	1.4	1.45	1.6
Hr. 10	1.35	1.3	1.45	1.6
Hr. 11	1.35	1.3	1.45	1.6
Hr. 12	1.3	1.3	1.55	1.6
Hr. 13	1.4	2	1.6	1.75
Hr. 14	1.4	1.35	1.55	1.75
Hr. 15	1.4	1.35	1.5	1.7
Hr. 16	1.4	1.4	1.6	1.7
Hr. 17	1.5	1.35	1.55	1.7
Hr. 18	1.4	1.35	1.55	1.7
Hr. 19	1.35	1.4	2	1.55
Hr. 20	1.35	1.35	1.6	1.65
Hr. 21	1.4	1.35	1.55	1.65
Hr. 22	1.35	1.4	1.6	1.7
Hr. 23	1.35	1.45	1.65	1.7
Hr. 24	1.3	1.4	1.6	1.65

A spreadsheet containing the full derivation of these background concentrations is included with the electronic submittal of this letter.

ADEQ Comment No. 4

Version of AERMOD Modeling System

The Department understands that ASARCO will update the modeling with the latest version of AERMOD/AERMET (version 22112). Please proceed it.

Response to Comment No. 4

The modeling has been re-run using version 22112 of both AERMET and AERMOD, and the modeling results for the 1-hr SO_2 NAAQS are presented below.

Table 1. Modeling Results, 1-hr SO_2 NAAQS

Highest 99th Percentile of Controlling 1-hr Concentrations (µg/m³)[a]	NAAQS (µg/m³)
195.986[b]	196.0

a. Includes background through the application of SEASHR in AERMOD
b. Highest 99th Percentile of Controlling 1-hr Concentrations predicted to occur at (521851.1 m, 3651825.4 m)

The CEVs for this modeling were as follows:

- Anode Furnace Fugitives: 9 lb/hr
- Converter Aisle Fugitives: 10 lb/hr
- Flash Furnace Fugitives: 38.6 lb/hr

A complete modeling report, which will also summarize the modeling results for the former SO_2 NAAQS (3-hr, 24-hr, and annual) will be submitted in the very near future.

Thanks very much for your assistance. If you have any questions or need anything else, please contact me at bjones@blueskymodeling.com or at 410.499.9918.

Best regards,



William B. Jones
President

Attachments

August 19, 2022

Bill Jones
President
Blue Sky Modeling, LLC

Cc: Eric Hiser, James Stewart, Kevin McPeak

Re: Anode Furnace Roofline Modeling SO_2 and Velocity Profiles

Dear Bill,

Gas Cleaning Technologies, LLC (GCT) was asked to provide input on the SO_2 and velocity profile of the anode furnace roofline at the Asarco Hayden smelter for updated emissions dispersion modeling based on our technical expertise and experience. GCT has extensive experience in this area, having evaluated, modeled, and measured roofline emissions and velocity profiles for numerous copper smelters, steel mills, and other heavy industrial facilities with roof vents above hot process vessels.

The anode furnace aisle is a typical natural ventilation design where the building is naturally ventilated due to the heat generated within the building. The heated air and any fume from the hot anode furnaces, ladles, and casting operations naturally rises to the roofline due to its higher buoyancy. Absent of any significant wind cross-drafts, the hot plume rises up to the roofline and out of the monovent. As it rises through the building, it mixes with and heats the air it passes through. This creates a stack effect within the building, and outside air is naturally pulled in through openings near grade on the sides of the building to replace this discharged flow. The taller the building, the greater the stack effect. As a result, any fume released from the anode furnace operations into the building rises to the roofline and discharges through the monovent and not out of any of the side building openings.

On behalf of Asarco, SLR completed the 60-day intensive monitoring portion of the post-CRP Retrofit roofline fugitive emissions study in July 2019 and continued performing the remainder of the fugitive dust study until the smelter stoppage in October 2019. As part of that study, SLR measured flow rates and temperatures from several sections of the anode area roofline monovent. Based on the data from the intensive monitoring portion, GCT defined a representative anode area roofline exhaust conditions of 177,000 ACFM at 120°F for use in the dispersion modeling.

This measured flow rate and temperature is significantly lower than the conservative estimate that GCT had provided for modeling purposes in 2018 based on benchmarked data from other smelters. The lower roofline flow rate and temperature are mostly due to the effectiveness of the anode furnace primary gas system and the anode charging mouth covers in minimizing the escape of process gases and heat from the anode furnaces that would otherwise be discharged from the roofline. As a result, the primary source of heat release from the anode roofline is now radiative heat from the vessel shells and from ladles transporting blister copper and anode slag to and from the anode furnaces.

The addition of the proposed new anode furnace secondary hoods will significantly reduce fume and heat currently discharged from the charging mouth during charging operations and processing.

However, GCT does not believe this will impact the average roofline ventilation rate or temperature given that current temperatures are already relatively close to ambient conditions. Therefore, GCT recommends using the representative flow conditions of 177,000 ACFM at 120°F as indicated by the fugitive emissions study measurements.

2018 Dispersion Modeling Flow and SO_2 Distribution

In the previous dispersion modeling effort in 2018, the vast majority of anode roofline emissions would be generated from fumes escaping the anode furnace charging mouths during charging and processing. Therefore, GCT had recommended the assumption that 80% of SO_2 emissions from a given operating furnace would be discharged within a 40 ft section directly above the anode furnace, and the remaining 20% of SO_2 emissions would be discharged from the 16 ft sections adjacent to either end of the 40 ft section (10% each), as illustrated in Figure 1 below (each cell is 8 ft wide). Similarly, GCT had recommended the assumption that 67% of the roofline flow rate would be discharged within the 40 ft section directly above the anode furnace, and the remaining 33% of flow would be discharged from the 16 ft sections adjacent to either end of the 40 ft section.

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
							AF0						**AF1**						**AF2**										

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
							AF0						**AF1**						**AF2**										

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
							AF0						**AF1**						**AF2**										

Figure 1 – Flow and SO_2 Distribution for Each Anode Furnace for 2018 Dispersion Modeling

2022 Dispersion Modeling Flow and SO_2 Distribution for Post-Anode Secondary Hood Installation

The addition of the proposed new anode furnace secondary hoods will significantly reduce fume and heat currently discharged from the charging mouth during charging operations and processing. As a result, a much higher percentage of future roofline emissions will come from ladle movements through the anode aisle as well as any drift in from the material transfer area between the converters and anode aisle.

Also, the much-reduced fume and heat that might escape the charging mouths and the new secondary hoods would create much less thermal buoyancy that might otherwise cause the fume and heat to rise straight up above the anode furnace and out the monovent. As a result, SO_2 and heat escaping the secondary hoods would be expected to diffuse much more widely from the anode furnace centerlines.

Therefore, GCT recommends going forward that both the monovent discharge flow rate and SO_2 emissions be assumed to be distributed evenly across the entire length and width of the anode area

roofline monovent for post-Anode Secondary Hood operations. For clarity, GCT presents the recommended distribution for future modeling in Figure 2 below.

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
							AF0						**AF1**						**AF2**										

Figure 2 – Flow and SO_2 Distribution for 2018 Dispersion Modeling Post-Anode Secondary Hoods

As indicated in Figure 2 above, each cell would have an equal $1/60^{th}$ of the total monovent flow rate and SO_2 emissions.

Sincerely,

Matt Russell
Senior Process Engineer
GCT

Appendix G
Response to EPA Comments on Hayden SO_2 SIP Modeling (September 15, 2022)

BLUE SKY MODELING.LLC

William B. Jones
President

Direct Line: +1.410.499.9918
Email: bjones@blueskymodeling.com

September 15, 2022

Kamran Khan
Air Quality Division
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Re: Response to EPA Comments on Hayden SO_2 SIP Modeling Protocol

Dear Kamran:

On August 29, 2022 you forwarded to me comments from Rynda Kay of EPA concerning the SO_2 Modeling Protocol for the Hayden Nonattainment Area. EPA's comments were presented in six categories. ASARCO's response to each of EPA's comments is presented below.

EPA Comment No. 1: Background Concentration

The approach outlined in Section 8 of the Modeling Protocol used to calculate background concentrations is not consistent with the latest version of 40 CFR Part 51, Appendix W, Section 8.3 and applicable guidance documents for SO_2 model applications. The 2014 SO_2 guidance (Guidance for 1-Hour Sulfur Dioxide (SO2) Nonattainment Area State Implementation Plans (SIP) Submissions (April 23, 2014), available at https://www.epa.gov/so2-pollution/guidance-1-hour-sulfur-dioxide-so2-nonattainment- area-state-implementation-plans-sip), Section 8, beginning at A-22 offers two approaches for characterizing background concentrations of SO_2 that are ultimately added to the modeled design values:

1) a "tier 1" approach, based on a monitored design value, or 2) a temporally varying "tier 2" approach, based on the 99th percentile monitored concentrations by hour of day and season or month. Also see U.S. EPA, SO_2 National Ambient Air Quality Standards Designations Modeling Technical Assistance Document, 2013, Section 8, p30 and for example, our proposed action on the Miami, AZ SO_2 SIP 83 FR 27938, June 15, 2018 at 27944 (Section E).

ASARCO Response No. 1: Background Concentration

ASARCO has revised the background concentration per ADEQ's comments to be consistent with 40 CFR Part 51, Appendix W, Section 8.3, and applicable guidance documents for SO_2 model applications. This revised background concentration was submitted to ADEQ on August 25, 2022 in an email from Eric Hiser (Hiser Joy) to Feng Mao (ADEQ).

EPA Comment No. 2(a): Source Characterization/Auxiliary Equipment

Please describe whether the facility emissions include any additional auxiliary equipment (*e.g.*, emergency generators, fire pumps, etc.) or other fixed sources (e.g., preheater emissions, building leaks, other small equipment) and discuss whether these sources should be considered in the modeling.

ASARCO Response No. 2(a): Source Characterization/Auxiliary Equipment

There are three pieces of non-trivial auxiliary equipment at ASARCO that emit SO_2:

- Acid Plant Preheater
- Anode Boiler
- Oxygen Plant Boiler

Each of these sources emits a very small amount of SO_2, and have very little effect on overall predicted concentrations. For the sake of conservatism ASARCO will include them in the modeling analysis.

EPA Comment No. 2(b): Roofline Emissions

Describe how modeled roofline emission levels were determined and how they relate to the 2019 fugitive emission study and assumed level of control.

ASARCO Response No. 2(b): Roofline Emissions

The modeled roofline values are based on engineering estimates of the current and planned control performance as informed by the results of the 2019 fugitive emissions study.

Flash Furnace Roofline

The flash furnace roofline encompasses the INCO flash furnace fugitives, matte tapping and slag skimming emissions and minor fugitive emissions from the concentrate dryers. The INCO flash furnace is hard piped to the double contact acid plant. At the time of the 2019 fugitive study, the other sources were collected by local hooding at approximately 96% capture. This is anticipated to give approximately 15.67 lb/hr fugitives at the roofline. The 2019 fugitive study showed mean emissions of 7.45 lb/hr but 99th percentile emissions of 62.38 lb/hr. Accordingly, ASARCO and Gas Cleaning Technologies (GCT) devised the Uptake Improvement Project which is aimed at enhancing capture of peak emissions by adding canopy hooding and additional containment. This is anticipated to reduce peak emissions by 60-70% and mean emissions by perhaps 0.5 lb/hr. Peak 62.38 lb/hr * (1-0.6) = 24.95 lb/hr. ASARCO then modeled these rates iteratively to set a safety margin while still attaining the NAAQS.

Converter Aisle Roofline

The converter aisle roofline encompasses the three converters, the south end entrance and the north end material transfer area. The converters are controlled by primary hoods ducted to the double contact acid plant, secondary hoods ducted to the double contact acid plant during converter blowing and to the converter secondary hood baghouse while otherwise processing, and tertiary canopy hooding. The secondary hoods and tertiary canopy hoods also capture converter secondary operations, such as ladle

movement. At the time of the 2019 fugitive study, the primary and secondary hoods were estimated at 93% capture each for converter operations, the secondary hoods at 90% capture for secondary operations, and the tertiary hoods at 95% capture. This is anticipated to give approximately 10.43 lb/hr fugitives at the roofline, although GCT expected closer to 3.5 lb/hr. The 2019 fugitive study showed mean emissions of 3.97 lb/hr and 99th percentile emissions of 33.74 lb/hr. Accordingly, ASARCO and GCT devised the Uptake Improvement Project (discussed above) to reduce blow through from the flash furnace, matte tapping and slag skimming operations and the Fuming Ladle Capture Project, which is designed to capture peak emissions that occur when a ladle "fumes" (e.g., emits visible plume of SO_2 and particulate) after pouring. This project is aimed at 90% control of peak emissions between the two projects. ASARCO and GCT estimate that peaks will come down substantially and the mean by perhaps 50%. Peak 33.74 lb/hr * (1-0.9) = 3.37 lb/hr, mean 3.97 lb/hr * (1-0.5) = 1.99 lb/hr. ASARCO then modeled these values iteratively to set a safety margin while still attaining the NAAQS.

Anode Furnace Roofline

The anode furnace roofline encompasses the three anode furnaces and anode casting operations. At the time of the 2019 fugitive study, the anode furnaces were controlled by primary hoods and estimated at 97% capture ducted to the anode furnace baghouse and the other emissions were fugitive. This is anticipated to result in approximately 0.55 lb/hr fugitives at the roofline. The 2019 fugitive study showed mean emissions of 5.86 lb/hr and 99th percentile at 55.50 lb/hr. This was higher than anticipated. Accordingly, ASARCO and GCT designed a secondary hooding system similar to that on the converters to capture emissions during the charging and processing operations and route them to a new anode secondary hood baghouse. GCT estimates that this system should reduce average fugitive emissions by at least 80% and peak fugitive emissions by at least 85%. Peak 55.50 lb/hr * (1-0.85) = 8.33 lb/hr; mean 5.86 lb/hr * (1-0.80) = 1.17 lb/hr. ASARCO then modeled these values iteratively to set a safety margin while still attaining the NAAQS.

For all three roofline fugitives, ASARCO and GCT developed controls that are preferentially designed to work better at peak emissions to reduce such emissions disproportionately more than under typical conditions. Accordingly, peaks may be reduced by more than the general efficiencies presented herein.

EPA Comment No. 2(c): Characterization of Roofline Fugitive Emissions in Modeling Analysis

Our previous evaluation of the source characterization for the anode roofline involved several iterations to provide justification for the final approach chosen. Please include a more detailed discussion supporting the approach consistent with those comments and responses (I'll gather the comment/responses and send them in a separate email to make sure you have them).

Our previous review of the anode roofline approach cited a measured roofline temperature of 219°F and a flowrate of 480,000 acfm. The Modeling Protocol lists a temperature over the anode roofline of 120°F and flow rate 177, 000 acfm. Please explain this difference and any implications for the modeling approach. More generally, please describe any changes to the approach/source characterization from our previous review, including how emissions, velocity, and temperature data collected during the 2019 fugitive emissions study were considered. A 120°F temperature can be relatively close to ambient conditions at some times of the year. Please describe why this stacks approach is preferred over characterizing the anode roofline as volume sources as was done with the other roof monitors.

Similarly, please provide information for why converter aisle roof monitors and flash furnace roof monitors are treated as volume sources, while anode furnace roof monitors are treated as point sources (e.g., vent horizontally vs. vertically). Also, describe how the initial characterization of the other roof monitor volume sources was determined (including size, number, and location of volume, release height, sigma values) and point to relevant guidance that supports those selections.

ASARCO Response No. 2(c): Characterization of Roofline Fugitive Emissions in Modeling Analysis

The addition of the proposed new Anode Furnace secondary hoods has changed the source characteristics of the Anode Furnace roofline emissions, namely from the previous 219 F/480,000 acfm to the updated 120 F/177,000 acfm. This is described in more detail in the attached memo from Gas Cleaning Technologies (see Attachment A).

The Anode Furnace fugitive emissions are represented in the modeling by a series of point sources because they are hot relative to ambient temperatures in Hayden. In fact, the exit temperature of the Anode Furnace fugitive sources (120 F) is greater than every hour of the five years of meteorological data modeled in this analysis. On the other hand, the Converter Aisle and Flash Furnace fugitive sources are cooler and are not always hotter than ambient temperatures in Hayden.

The supporting information for and derivation of the modeled source characteristics for the Anode Furnace fugitives, the Converter Aisle fugitives, and the Flash Furnace fugitives are presented in Attachments B-D, respectively.

EPA Comment No. 2(d): Slag Pouring Parameters

Please provide a description and justification for the slag pouring parameters used in the modeling and emission rates assumed.

ASARCO Response No. 2(d): Slag Pouring Parameters

Emissions from slag pouring are modeled as a ground-level (i.e., 0 m stack height) point source. A point source is appropriate because the temperature of the molten slag when poured is extremely hot, and therefore buoyant.

The emission rate was calculated as follows:

- Assume 693,500 tons concentrate per year
- 5 lb SO_2 per ton of concentrate (conservative values, as AP-42 Table 12.3-11 (Smelting Furnace fugitives adjusted for matte grade) recommends 4 lb/ton)
- 0.41 Flash/Reverberatory factor (from ASARCO El Paso Smelter study)
- 0.1 slag skim/total SO_2 (from AP-42 matte/slag ratio)
- 0.25 factor (engineering judgment)

The equation to calculate the emission rate is presented below.

$$693500 \frac{tons\ concentrate}{year} \times 5 \frac{lb\ SO2}{ton\ concentrate} \times 0.41 \times 0.1 \times 0.25$$

$$= 35541.9 \frac{lb\ SO2}{year} \times \frac{year}{8760\ hrs} = 4.057 \frac{lb}{hr}$$

The diameter of the slag dump point source is derived from the surface area of the poured slag, which is estimated to be 1500 ft^2.

The exit temperature of the slag dump point source is average of the temperature at the start and end of a slag pour (provided by ASARCO).

The exit velocity is derived using the Stefan Boltzman Law, which states that the total radian heat power emitted from a surface is proportional to the fourth power of its absolute temperature. Based on information provided by ASARCO (e.g., temperature of slag at the start and end of a pour), the net heat release rate was calculated. This net heat release rate was used in conjunction with the theory that the plume rise of a non-stack release can be estimated by calculating equivalent stack parameters when the buoyancy flux is known.

The supporting calculations are presented in Attachment E, and the corresponding spreadsheet is included with this submittal.

EPA Comment No. 2(e): Nearby sources

Nearby sources: Previous modeling efforts for the Hayden Nonattainment Area have established that ASARCO is the only meaningful source of SO_2 emissions in the area, which we agree is supported. Please include the results from previous analyses that support this determination in your final modeling TSD.

ASARCO Response No. 2(e): Nearby sources

ASARCO anticipates that ADEQ will respond to this.

EPA Comment No. 3: GEP Stack Height

As described in ADEQ's March 8, 2017 Modeling TSD for the Hayden SO_2 Nonattainment Area:

> At EPA's request in mid-2015, Asarco re-assessed the GEP stack height determination with respect to current GEP regulations. This re-assessment confirmed that the original GEP stack height determination is consistent with the 1985 regulations and that the 1,000-foot stack remains an appropriate GEP determination. Therefore, Asarco's main stack was modeled at its true height of 1,000 feet. A memo summarizing the re-assessment of the GEP stack height determination is provided in Appendix F.

In order to satisfy the requirements for above-formula stack height credit, ADEQ must evaluate the re-assessment and the associated 1979 wind tunnel study under the current requirements in

40 CFR 51.100(ii)(3), (jj) and (kk), and, if appropriate, approve them as demonstrating that 1000 feet is the GEP stack height. In addition, ADEQ must provide public notice and an opportunity for

hearing on the original study and re-assessment, either as part of its SIP revision for the Hayden Nonattainment area, or through a separate process (40 CFR 51.118(a)).

ASARCO Response No. 3: GEP Stack Height

ASARCO anticipates that ADEQ will respond to this.

EPA Comment No. 4(a): Meteorological Input Data: QA/QC documentation

QA/QC of data: Please include QA/QC documents supporting the met data used during the time period modeled in a revised protocol or in your final submittal.

ASARCO Response No. 4(a): Meteorological Input Data: QA/QC documentation

If ADEQ needs additional QA/QC documentation regarding the Camera Hill meteorological station please let ASARCO know.

EPA Comment No. 4(b): Meteorological Input Data: Onsite data processing options

What options were used for onsite data processing (e.g., Bulk Richardson Method, missing data substituted with nearby NWS surface site, number of obs/hour, instrument thresholds, options to fill missing NWS temperature and cloud cover)?

ASARCO Response No. 4(b): Meteorological Input Data: Onsite data processing options

The following options were used for the onsite data processing:

- Bulk Richardson Method algorithm
- Missing data were not substituted with National Weather Service surface data
- Number of observations per hour: 1
- Threshold wind speed: 0.5 m/s
- Wind directions were not randomized

EPA Comment No. 4(c): Meteorological Input Data: Wind roses

Please include a wind rose of the winds at Camera Hill and a wind rose during exceedance conditions.

ASARCO Response No. 4(c): Meteorological Input Data: Wind roses

ASARCO anticipates that ADEQ will respond to this.

EPA Comment No. 4(d): Meteorological Input Data: Adjusted surface friction velocity

Was the adjusted surface friction velocity (u*) option used? If so, was it used appropriately, i.e., no turbulence parameters passed to AERMOD?

ASARCO Response No. 4(d): Meteorological Input Data: Adjusted surface friction velocity

Adjusted surface friction velocity (u*) was not used.

EPA Comment No. 5: Modeling Domain and Receptors

Your submittal should include a demonstration that public access is precluded, and receptor placement appropriately corresponds to ambient air. We previously reviewed an earlier version of this demonstration; please provide that information along with any necessary updates.

ASARCO Response No. 5: Modeling Domain and Receptors

In 2015 ASARCO purchased additional land on the eastern side of the plant, near the slag dump. This area is quite inaccessible to the public because of the steepness of the terrain, and therefore this area was included within ASARCO's ambient air boundary (AAB) and the modeled receptors were modified accordingly. The updated AAB is shown in Figure 1 below.



Figure 1
Revised Asarco Ambient Air Boundary

This AAB is identical to the one presented in ADEQ's supporting document for the previous TSD on March 2, 2017, with the exception of the southeastern corner as indicated by the letter "A" in Figure 1. This area of the AAB is shown in Figure 2 below.



Figure 2
View of AAB from "A" in Figure 1

The red line in Figure 2 depicts the AAB. As can be seen, in this area of the AAB there is a steep slope and substantial terrain elevation changes that provide a significant impedance to public access.

EPA Comment No. 6: Presentation of Results

In addition to controlling concentration values, please include concentration contour plots for all sources taken together and as individual source groups to show relative contribution.

Please also include 24-hour and annual modeling results to demonstrate attainment of the 1971 SO_2 NAAQS.

ASARCO Response No. 6: Presentation of Results

ASARCO will provide concentration contour plots of cumulative as well as source-specific 1-hr SO_2 impacts.

ASARCO will provide modeling results to demonstrate compliance with the 1971 SO_2 NAAQS.

Thanks very much for your assistance. If you have any questions or need anything else, please contact me at bjones@blueskymodeling.com or at 410.499.9918.

Best regards,



William B. Jones
President

Attachments

3 Attachment A

August 19, 2022

Bill Jones
President
Blue Sky Modeling, LLC

Cc: Eric Hiser, James Stewart, Kevin McPeak

Re: Anode Furnace Roofline Modeling SO_2 and Velocity Profiles

Dear Bill,

Gas Cleaning Technologies, LLC (GCT) was asked to provide input on the SO_2 and velocity profile of the anode furnace roofline at the Asarco Hayden smelter for updated emissions dispersion modeling based on our technical expertise and experience. GCT has extensive experience in this area, having evaluated, modeled, and measured roofline emissions and velocity profiles for numerous copper smelters, steel mills, and other heavy industrial facilities with roof vents above hot process vessels.

The anode furnace aisle is a typical natural ventilation design where the building is naturally ventilated due to the heat generated within the building. The heated air and any fume from the hot anode furnaces, ladles, and casting operations naturally rises to the roofline due to its higher buoyancy. Absent of any significant wind cross-drafts, the hot plume rises up to the roofline and out of the monovent. As it rises through the building, it mixes with and heats the air it passes through. This creates a stack effect within the building, and outside air is naturally pulled in through openings near grade on the sides of the building to replace this discharged flow. The taller the building, the greater the stack effect. As a result, any fume released from the anode furnace operations into the building rises to the roofline and discharges through the monovent and not out of any of the side building openings.

On behalf of Asarco, SLR completed the 60-day intensive monitoring portion of the post-CRP Retrofit roofline fugitive emissions study in July 2019 and continued performing the remainder of the fugitive dust study until the smelter stoppage in October 2019. As part of that study, SLR measured flow rates and temperatures from several sections of the anode area roofline monovent. Based on the data from the intensive monitoring portion, GCT defined a representative anode area roofline exhaust conditions of 177,000 ACFM at 120°F for use in the dispersion modeling.

This measured flow rate and temperature is significantly lower than the conservative estimate that GCT had provided for modeling purposes in 2018 based on benchmarked data from other smelters. The lower roofline flow rate and temperature are mostly due to the effectiveness of the anode furnace primary gas system and the anode charging mouth covers in minimizing the escape of process gases and heat from the anode furnaces that would otherwise be discharged from the roofline. As a result, the primary source of heat release from the anode roofline is now radiative heat from the vessel shells and from ladles transporting blister copper and anode slag to and from the anode furnaces.

The addition of the proposed new anode furnace secondary hoods will significantly reduce fume and heat currently discharged from the charging mouth during charging operations and processing.

However, GCT does not believe this will impact the average roofline ventilation rate or temperature given that current temperatures are already relatively close to ambient conditions. Therefore, GCT recommends using the representative flow conditions of 177,000 ACFM at 120°F as indicated by the fugitive emissions study measurements.

2018 Dispersion Modeling Flow and SO_2 Distribution

In the previous dispersion modeling effort in 2018, the vast majority of anode roofline emissions would be generated from fumes escaping the anode furnace charging mouths during charging and processing. Therefore, GCT had recommended the assumption that 80% of SO_2 emissions from a given operating furnace would be discharged within a 40 ft section directly above the anode furnace, and the remaining 20% of SO_2 emissions would be discharged from the 16 ft sections adjacent to either end of the 40 ft section (10% each), as illustrated in Figure 1 below (each cell is 8 ft wide). Similarly, GCT had recommended the assumption that 67% of the roofline flow rate would be discharged within the 40 ft section directly above the anode furnace, and the remaining 33% of flow would be discharged from the 16 ft sections adjacent to either end of the 40 ft section.

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
							AF0						**AF1**						**AF2**										

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
							AF0						**AF1**						**AF2**										

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
							AF0						**AF1**						**AF2**										

Figure 1 – Flow and SO_2 Distribution for Each Anode Furnace for 2018 Dispersion Modeling

2022 Dispersion Modeling Flow and SO_2 Distribution for Post-Anode Secondary Hood Installation

The addition of the proposed new anode furnace secondary hoods will significantly reduce fume and heat currently discharged from the charging mouth during charging operations and processing. As a result, a much higher percentage of future roofline emissions will come from ladle movements through the anode aisle as well as any drift in from the material transfer area between the converters and anode aisle.

Also, the much-reduced fume and heat that might escape the charging mouths and the new secondary hoods would create much less thermal buoyancy that might otherwise cause the fume and heat to rise straight up above the anode furnace and out the monovent. As a result, SO_2 and heat escaping the secondary hoods would be expected to diffuse much more widely from the anode furnace centerlines.

Therefore, GCT recommends going forward that both the monovent discharge flow rate and SO_2 emissions be assumed to be distributed evenly across the entire length and width of the anode area

roofline monovent for post-Anode Secondary Hood operations. For clarity, GCT presents the recommended distribution for future modeling in Figure 2 below.

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
							AF0						**AF1**						**AF2**										

Figure 2 – Flow and SO_2 Distribution for 2018 Dispersion Modeling Post-Anode Secondary Hoods

As indicated in Figure 2 above, each cell would have an equal $1/60^{th}$ of the total monovent flow rate and SO_2 emissions.

Sincerely,

Matt Russell
Senior Process Engineer
GCT

4 Attachment B

Point Source Characteristics
Anode Furnace Fugitives

Velocity calculation

Total flow of AF roofline:	177,000	acfm
AF Roofline vent area:	2380	ft2
Velocity of AF roofline:	74.37	ft/min
	1.24	ft/sec
	0.38	m/s

Virtual Diameter calculation

AF Roofline vent area:	2380	ft2
Area of one of 60 single cells:	39.67	ft2
Virtual radius:	3.55	ft
Virtual diameter:	7.11	ft

5 Attachment C

Converter Aisle Fugitives

Assumptions

Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	1.5	m
Building height, Monitor N:	24.38	m
Building height, Monitor S:	22.86	m
Sigma Y:	0.70	m
Sigma Z, Monitor N:	11.34	m
Sigma Z, Monitor S:	10.63	m
Release Height, Monitor N:	31.35	m
Release Height, Monitor S:	25.40	m

6 Attachment D

Flash Furnace Fugitives

Roof Monitors

Assumptions
Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	1.5 m
Building height:	42.67 m
Sigma Y:	0.70 m
Sigma Z:	19.85 m
Release Height:	43.67 m

Penthouse, East and West vents

Assumptions
Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	16 m
Building height:	44.5 m
Sigma Y:	7.44 m
Sigma Z:	20.70 m
Release Height:	43.59 m

Penthouse, North and South vents

Assumptions
Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	7 m
Building height:	44.5 m
Sigma Y:	3.26 m
Sigma Z:	20.70 m
Release Height:	44.50 m

7 Attachment E

SLAG POURING HEAT RELEASE CALCULATIONS

Assumptions/Inputs

Ambient temperature (Ta)	308	^{o}K
Acceleration of gravity (g)	9.807	m/s
Density of slag (ρ)	132	lb/ft^3
Surface area of poured slag (A)	1500	ft^2
Volume of poured slag (V)	600	ft^3
Thickness of poured slag (d)	0.4	ft
Temp of slag at start of pour (T_i)	2120	^{o}F
Temp of slag at end of pour (T_f)	1760	^{o}F
Average temp of slag during pour (T)	2400	^{o}R
Specific heat of slag (c_p)	0.239	$Btu/lb\text{-}^{o}F$
Time for slag to crust (ΔT)	0.025	hr
Stefan/Boltzmann constant (σ)	1.713E-09	$Btu/ft^2\text{-}hr\text{-}^{o}R^4$

Radiative Heat Loss Calculations

Assuming that slag radiates as a black body and that the radiative heat loss can be defined by the Stefan Boltzman Law, as follows:

Radiative heat loss (Q_R) =	$\sigma T^4 A \Delta T$	Btu
Radiative heat loss (Q_R) =	2.13E+06	Btu

Calculation of Total Heat Release Rate

Total heat release (Q_T) =	$\rho V c_p (T_i - T_f)$	Btu
Total heat release (Q_T) =	6.81E+06	Btu

Calculation of Net Heat Release Rate

Net heat release after radiative heat loss (Q_N) =	$Q_T - Q_R$	Btu
Net heat release after radiative heat loss (Q_N) =	4.68E+06	Btu
Net heat release after radiative heat loss (Q_N) =	1.18E+09	cal
Net heat release rate (Q_N/sec) =	1.31E+07	cal/sec

SLAG POURING EFFECTIVE STACK PARAMETER CALCULATIONS

Assumptions/Inputs

Ambient temperature (T_a)	308	^oK
Average Temp of slag and pour gases during pour (T)	1333	^oK
Acceleration of gravity (g)	9.807	m/s
Effective diameter of the poured slag area (D)	13.3	m
Net heat release rate (Q_N/sec)	1.31E+07	cal/sec

Methodology

According to Briggs (1969), the plume rise of a non-stack release can be estimated by calculating equivalent stack parameters when the buoyancy flux is know. The buoyancy flux can be described by the following equations"

EQN1: F = $(gvd^2)/4[(T-T_a)/T]$

EQN2: F = 3.7 x 10-5 Q_N/sec

where

v = the effecrtive upward velocity of the release (m/s)

Setting Equations 1 and 2 equal:

Effective upward velocity (v) = $(3.7 \times 10^{-5})\ (4)\ (T)\ (Q_N) / (gd^2(T-T_a))$

Effective upward velocity (v) = 1.45

Appendix H
Response No. 3 to ADEQ Comments on ASARCO SO_2 SIP Modeling
(September 29, 2022)

7251 Lake Hills Court
Marriottsville, MD 21104 USA

William B. Jones
President

Direct Line: +1.410.499.9918
Email: bjones@blueskymodeling.com

September 29, 2022

Feng Mao
Air Quality Division
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Re: Response No. 3 to ADEQ comments on ASARCO SO_2 SIP Modeling

Dear Feng:

On June 23, 2022, Blue Sky Modeling, LLC (BSM), on behalf of ASARCO LLC (ASARCO), submitted to the Arizona Department of Environmental Quality (ADEQ) a Modeling Protocol describing ASARCO's proposed methodology to conduct sulfur dioxide (SO_2) modeling in support of the State Implementation Plan (SIP for the Hayden Nonattainment Area (NAA).

On July 12, 2022, BSM, on behalf of ASARCO, submitted to the ADEQ a letter report which summarized ASARCO's air dispersion modeling for the Hayden NAA SO_2 SIP, along with various electronic input/output files that supported that analysis.

On July 22, 2022, you emailed me the ADEQ's comments on the Modeling Protocol, modeling analysis.

On August 12, 2022 BSM, on behalf of ASARCO, responded to the majority of your July 22, 2022 comments.

On August 22, 2022, you emailed me comments on ASARCO's August 12 response.

On August 25, 2022, BSM, on behalf of ASARCO, responded to the remaining comments of your July 22, 2022 letter, as well as your comments on August 22.

On September 20, 2022, ADEQ held a virtual meeting with BSM and Eric Hiser of Hiser Joy to discuss a few additional points you had concerning the modeling. (The slides you used in that presentation are included with this letter as Attachment A.) This letter responds to your points and presents a summary of the latest modeling results (reflecting changes to the analysis based on our responses to your comments).

ADEQ Point No. 1

The first five slides of your presentation discussed ADEQ's opinion that the Anode Furnace fugitives were now better represented as volume sources in the modeling as opposed to point sources.

Response to Point No. 1

In response to ADEQ's point concerning the representation of the Anode Furnace fugitives, ASARCO has revised the modeling to now represent the Anode Furnace fugitives as volume sources. Details on the characterization of those volume sources are presented in Attachment B.

ADEQ Point No. 2

The sixth slide of your presentation noted a discrepancy between the Modeling Protocol/Report and the modeling files concerning the dimensions/layout of the Converter Aisle and Flash Furnace fugitive volume sources.

Response to Point No. 2

In response to ADEQ's point concerning the discrepancy between the Modeling Protocol/Report and the modeling files with regards to the dimensions/layout of the Converter Aisle and Flash Furnace fugitive volume sources, ASARCO has revised the model inputs to be consistent with the Modeling Protocol/Report. Specifically, the volume sources for the Converter Aisle fugitives, the Flash Furnace fugitives, and the Anode Furnace fugitives are now 1.5 m apart (as opposed to the previous 3 m distance). This essentially doubled the number of Converter Aisle fugitive and Flash Furnace fugitive volume sources, as suggested by you during the meeting. The total emissions for each of those specific fugitive sources continue to be evenly distributed across all volume sources.

ADEQ Point No. 3

The seventh slide of your presentation requested additional information concerning the heights of the Converter Aisle fugitive sources and associated structures.

Response to Point No. 3

The various heights used in the modeling/derivation of volume source characteristics are based upon field observations/photographs that were taken approximately 10 years ago and have been used in the modeling since that time. This fact has been more clearly documented in Attachment A (for the Anode Furnace fugitive volume sources) as well as Attachments B and C for the Converter Aisle and Flash Furnace fugitive sources, respectively.

ADEQ Point No. 4

The seventh slide of your presentation requested clarification on a question ADEQ had raised on July 22, 2022 concerning the Main Stack's modeled emissions/source parameters.

Response to Point No. 4

The Modeling Protocol erroneously included the source characteristics for the Main Stack from the 2018 submittal; in fact, they have changed very slightly per the additional controls proposed, as noted in Appendix A of BSM's August 12, 2022 response to ADEQ.

The modeled CEV emission rate for the Main Stack has not changed from the 2018 submittal, as this emission rate can still accommodate the small additional SO_2 emissions now being routed to the Main Stack.

ADEQ Point No. 5

The eighth slide of your presentation noted that ADEQ had not yet seen any modeling that included the three pieces of non-trivial auxiliary equipment.

Response to Point No. 5

The modeling being submitted with this letter includes those three pieces of non-trivial auxiliary equipment. The modeled stack parameters are summarized in Table 1.

Table 1. Modeled Stack Parameters and Emissions for Non-Trivial Auxiliary Equipment

Source ID	Description	UTM Coordinate (m)		Base Elev. (m)	Stack Height (m)	Temp. (K)	Exit Vel. (m/s)	Stack Diam. (m)	SO_2 Emission Rate (g/s)
		East	North						
ACIDPRHT	Acid Plant Preheater	521237.6	3651585.4	634.0	26.9	616.5	0.001	0.97	0.01512
ANODEBLR	Anode Boiler	520998.7	3651837.0	638.9	3.4	447.6	1.8	0.51	2.52E-04
O2PLTBLR	Oxygen Plant Boiler	521261.7	3651267.3	640.4	9.1	447.6	1.8	0.51	0.00126

Revised Modeling Results

The revised 1-hr modeling results, per the adjustments described in this letter, are summarized below.

Table 2. Modeling Results, 1-hr SO_2 NAAQS

Highest 99th Percentile of Controlling 1-hr Concentrations (µg/m³)[a]	NAAQS (µg/m³)
195.8[b]	196.0
a. Includes background through the application of SEASHR in AERMOD b. Highest 99th Percentile of Controlling 1-hr Concentrations predicted to occur at (521851.1 m, 3651825.4 m)	

The revised CEVs for this modeling are as follows:

- Anode Furnace Fugitives: 9.0 lb/hr
- Converter Aisle Fugitives: 10.0 lb/hr
- Flash Furnace Fugitives: 38.5 lb/hr

The modeling input/output files are being included with the electronic submittal of this letter.

A complete modeling report, which will also summarize the modeling results for the former SO_2 NAAQS (3-hr, 24-hr, and annual) will be submitted in the very near future.

Thanks very much for your assistance. If you have any questions or need anything else, please contact me at bjones@blueskymodeling.com or at 410.499.9918.

Best regards,



William B. Jones
President

Attachments

Attachment A

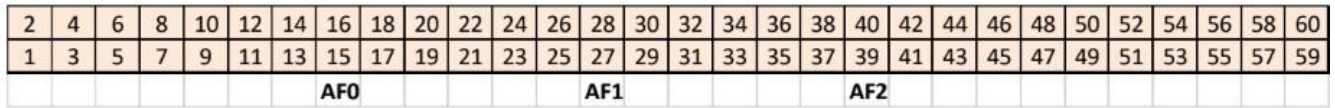
Anode Furnace Fugitive Emissions

2018 SIP Submittal



80% of emissions are emitted from cells directly above AF and 20% of emissions are emitted from cells adjacent to A

2022 Modeling - Post-Anode Secondary Hood Installation:



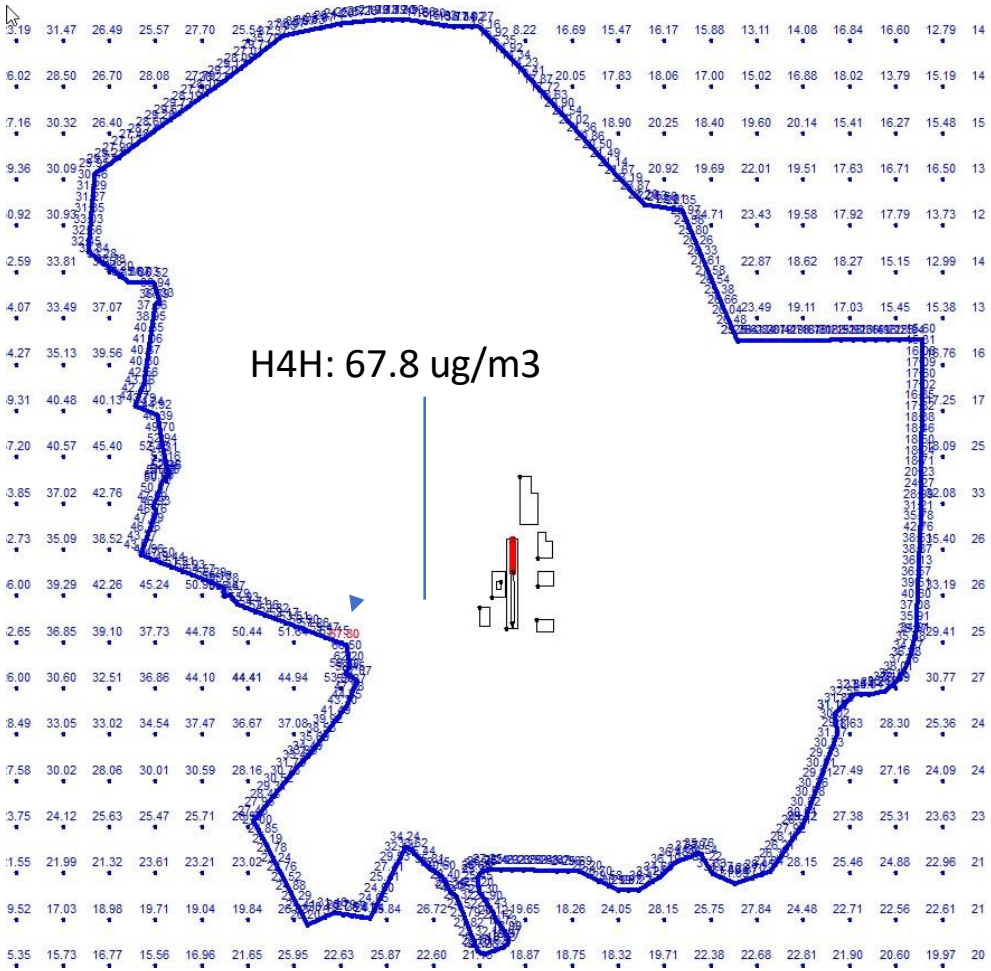
Emissions are evenly distributed across the entirety of the AF roofline vent

GCT Memo 8/19/2022

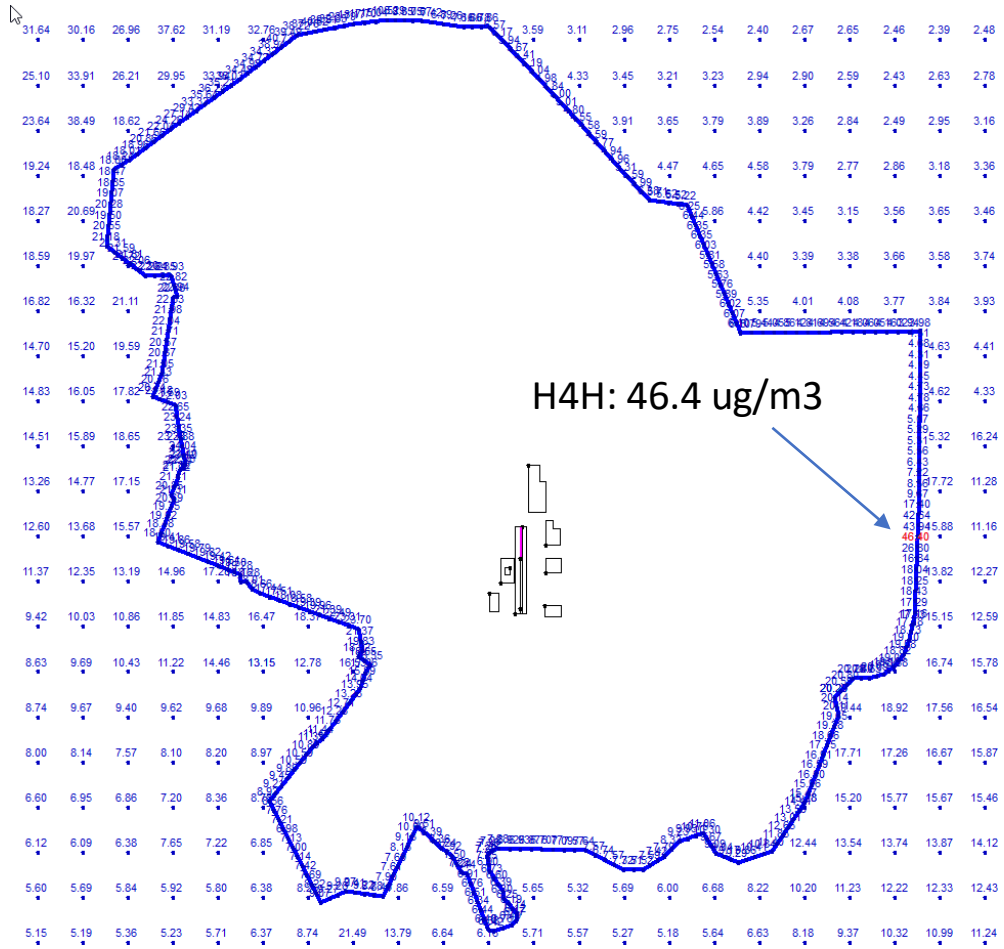
Anode Furnace Fugitive Emissions – Point Source Approach

	2018 SIP Submittal	2022 Modeling	Notes for 2022 Modeling
Release Characteristics	hot plume rises straight up to the roofline and out of the monovent (stack-like)	A much higher percentage of roofline emissions will come from ladle movements through the anode aisle and any drift in from the material transfer area between the converter and anode Aisle (diffuse very widely)	• Release characteristics are closer to those of converter aisle fugitive emissions than stacks?
Gas Temperature	219 F	120 F	• Plume-rise height due to buoyancy would be significantly lower compared to 2018 SIP submittal
Exit Velocity	1.3-3.3 m/s (480,000 acfm)	0.38 m/s (177, 000 acfm)	• Plume-rise height due to momentum can be ignored • Subject to significant stack-tip downwash (stack exit velocity is so small compared to the wind speed, causing the plume to be drawn downward behind the stack)

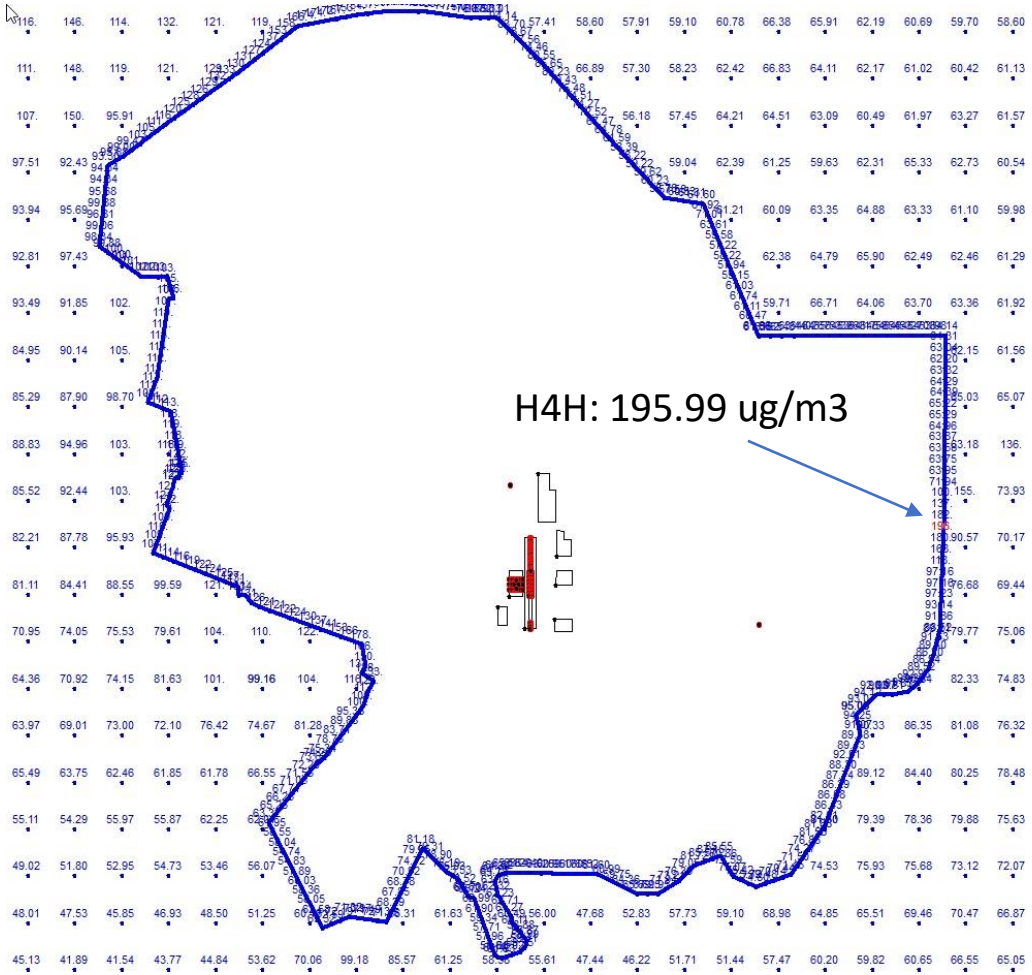
AF ONLY – Point Source Approach



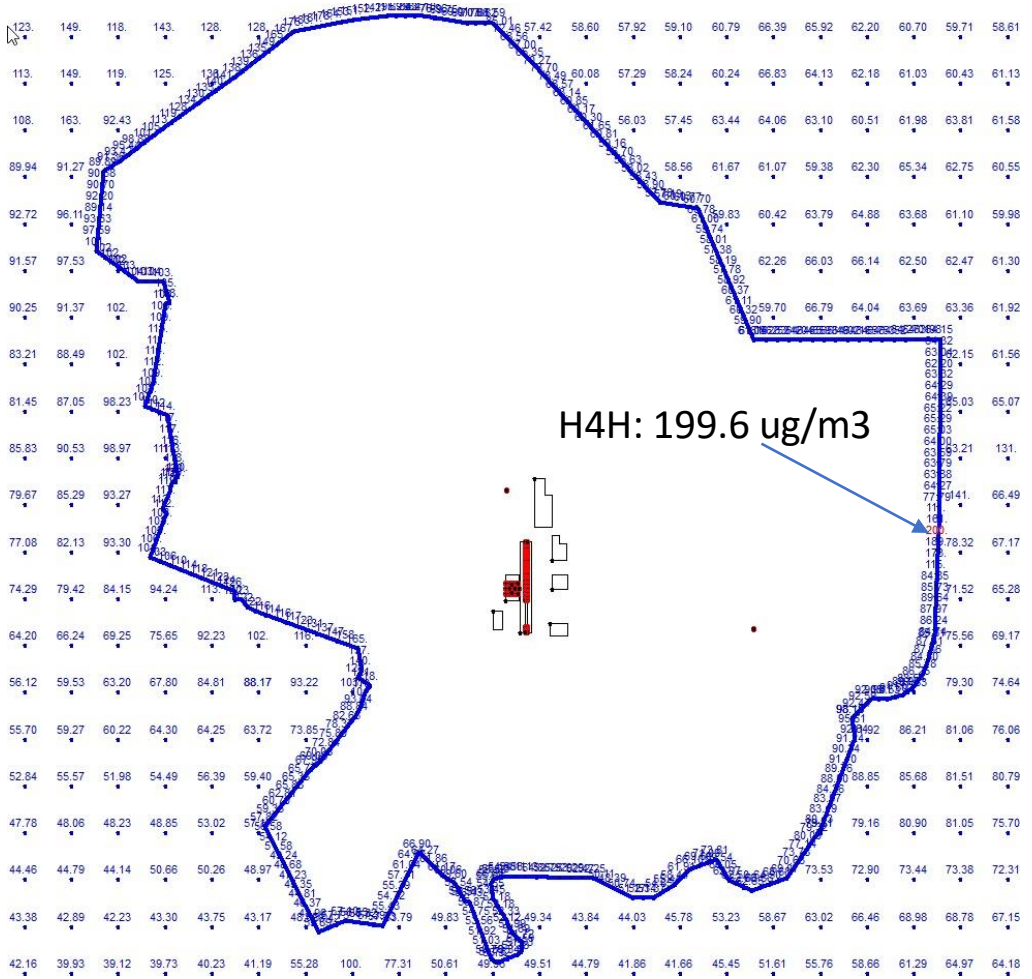
AF ONLY- Volume Source Approach



Facility Wide – AF is modeled as point sources



Facility Wide – AF is modeled as volume sources

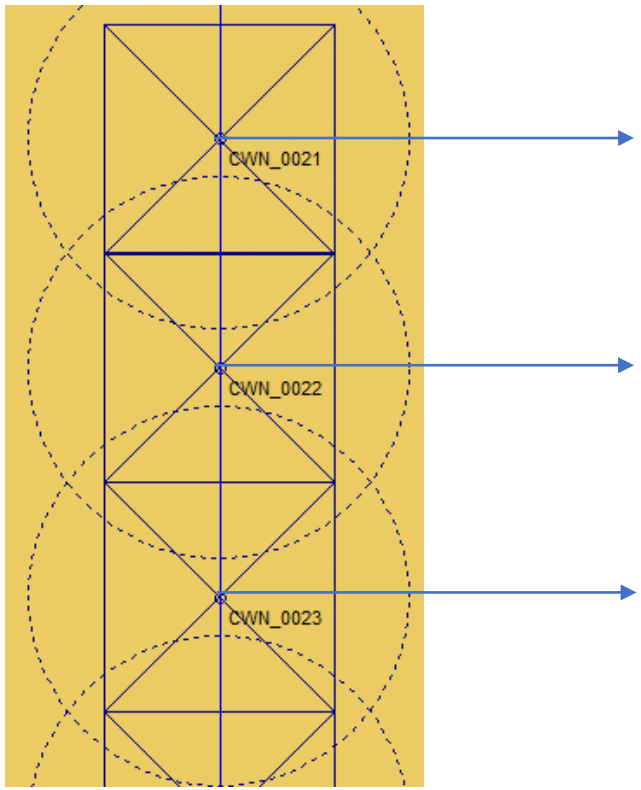


Scenarios	Modeled Emission Rates	Modeling Approach	Modeled Concentration (including background)
ASARCO Submittal	AF: 9 lb/hr CA: 10 lb/hr FF: 38.6 lb/hr	Point sources for AF and volume sources for CA & FF	195.99
ADEQ Test 1	AF: 9 lb/hr CA: 10 lb/hr FF: 38.6 lb/hr	Volume sources for all three rooflines	199.6
ADEQ Test 2	AF: 9 lb/hr CA: 10 lb/hr FF: 37 lb/hr	Volume Sources for all three rooflines	195.1
ADEQ Test 3	AF: 9 lb/hr CA: 9.5 lb/hr FF: 37.6 lb/hr	Volume Sources for all three rooflines	194.5

	Peak Emission Rates in 2019 Roofline Study (lb/hr)	Control Efficiency (%)	Peak Emission Rates after Additional controls (lb/hr)	Modeled Emission Rates (lb/hr)
AF	55.50	85	8.33	9
CA	33.74	90	3.37	10
FF	62.38	60	24.95	38.6

CA & FF – Volume Sources

- Modeling Protocol & Report: Length of side = 1.5 meters
- Modeling Files: Length of side = 3 meters



X = 520968.53
Y = 3651748.13

X = 520968.53
Y = 3651745.13

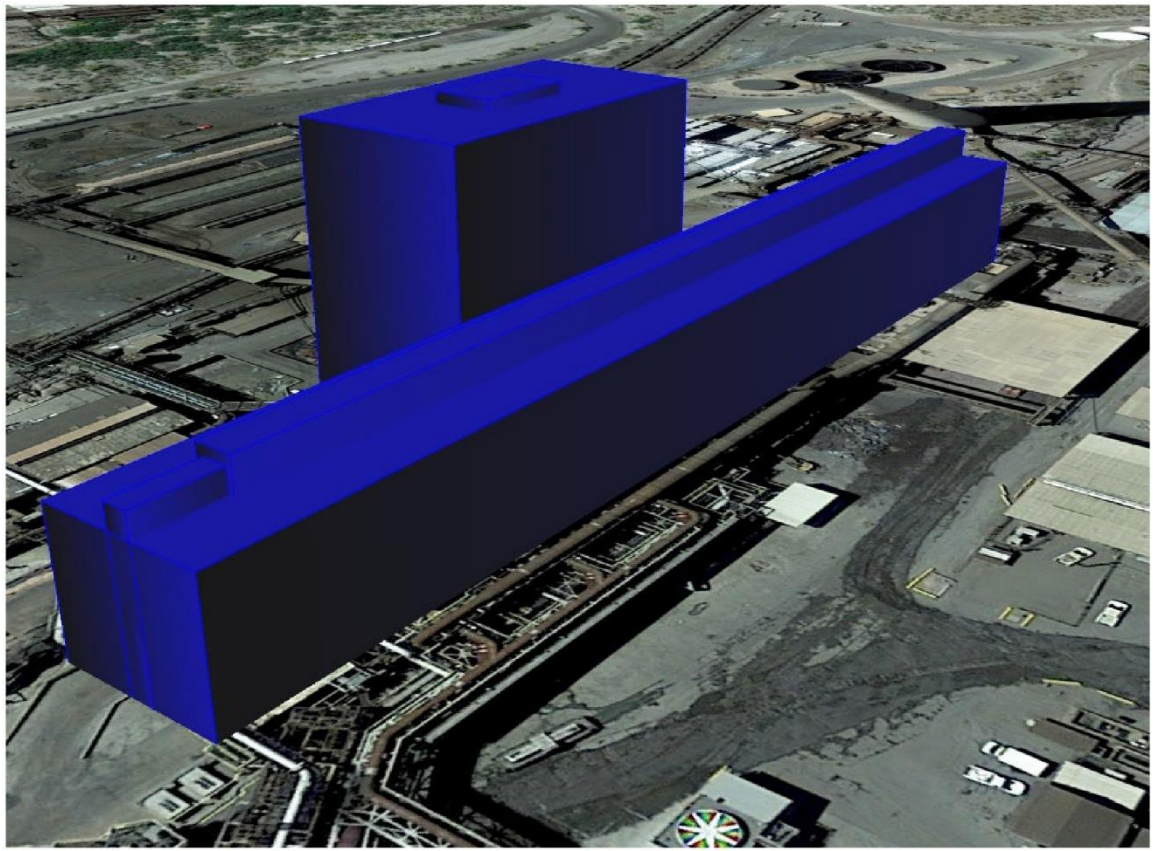
X = 520968.53
Y = 3651742.13

Volume Source Chara,cteristics
Converter Aisle Fugitives

Assumptions

Initial lateral Dimesion (Yo),: Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side.:	1.5 m
Building height, Monitor N:	2.4.38m
Building height, Monitor S:	22.86 m
Sigma Y:	0.70 m
Sigma Z, Monitor N:	11.34 m
Sigma Z, Monitor 5:	1.0.63 m
Release Height, Monitor N:	31.35 m
Release Height, Monitor 5:	25.40 m



CEV of Main Stack

ADEQ Comments:

“Under the additional controls proposed, additional fugitive emissions will be captured and routed to the main stack. It is not clear why the modeled emission rate and the stack parameters as presented in the modeling protocol are identical to those in the 2018 SIP submittal that was based on the CRP project. Would the additional controls result in a higher hourly emission rate from the main stack and also affect the stack parameters such as gas flow rate, gas exit velocity and gas temperature? Please clarify.”

ASARCO Response:

“The stack parameters of flow, velocity, and temperature are impacted by the proposed additional controls.”

Auxiliary Equipment

H. There are three pieces of non-trivial auxiliary equipment at ASARCO that emit SO2:

- Acid Plant Preheater
- Anode Boiler
- Oxygen Plant Boiler

Each of these sources emits a very small amount of SO2, and have very little effect on overall predicted concentrations. For the sake of conservatism ASARCO will include them in the modeling analysis.

Attachment B

Anode Furnace Fugitives

Anode Furnace Fugitives (Roof Monitors)

Assumptions
Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	1.5	m	Estimate from field observations and photographs
Building height, Monitor N:	24.38	m	Estimate from field observations and photographs
Sigma Y:	0.70	m	
Sigma Z, Monitor N:	11.34	m	
Release Height, Monitor N:	31.35	m	Height of monitor vents is estimated to be 9/7 height of Converter Aisle Building on northern end (e.g., above Anode Furnace)

Attachment C

Converter Aisle Fugitives

Assumptions

Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	1.5 m	Estimate from field observations and photographs
Building height, Monitor N:	24.38 m	Estimate from field observations and photographs
Building height, Monitor S:	22.86 m	Estimate from field observations and photographs
Release Height, Monitor N:	1.35 m	Height is estimated to be 9/7 height of Converter Aisle (northern end)
Release Height, Monitor S:	25.4 m	Height is estimated to be 20/18 height of Converter Aisle (southern end)

Sigma Y:	0.70 m
Sigma Z, Monitor N:	11.34 m
Sigma Z, Monitor S:	10.63 m

Attachment D

Flash Furnace

Roof Monitors

Assumptions
Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	1.5	m	Estimate from field observations and photographs
Building height:	42.67	m	Estimate from field observations and photographs
Sigma Y:	0.70	m	
Sigma Z:	19.85	m	
Release Height:	43.67	m	1 m above roofline (based on photographs)

Penthouse, East and West vents

Assumptions
Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	16	m	Estimate from field observations and photographs
Building height:	44.5	m	Estimate from field observations and photographs
Sigma Y:	7.44	m	
Sigma Z:	20.70	m	
Release Height:	43.59	m	Estimate from field observations and photographs

Penthouse, North and South vents

Assumptions
Initial lateral Dimesion (Yo): Line Source Represented by Adjacent Volume Sources
Initial Vertical Dimension (Zo): Elevated Sources (h > 0) on or Adjacent to a Building

Length of side:	7	m	Estimate from field observations and photographs
Building height:	44.5	m	Estimate from field observations and photographs
Sigma Y:	3.26	m	
Sigma Z:	20.70	m	
Release Height:	43.59	m	Estimate from field observations and photographs

9.7 Appendix G: Camera Hill Data Validation Reports

SODAR AND 10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

DECEMBER 2014 THROUGH FEBRUARY 2015

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
2027 Broadway, Suite B
Boulder, CO 80302

June, 2015

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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Appendix A – Data Screening and Validation Results
Appendix B – Monthly Data Tables

1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. The smelter air emissions are released to the atmosphere through a 1,000-foot (approximately 300 meter) tall stack. To help refine future AERMOD air dispersion modeling at the facility, ASARCO has been performing site-specific meteorological monitoring at Hayden. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

ASARCO supplemented the 10 meter meteorological tower with a Remtech PA-0 phased-array acoustic Sodar in late May 2014 that measures winds at elevations ranging from approximately 50 to 400 meters above ground level. Sodar (SOnic Detection And Ranging) systems are used to remotely measure the vertical turbulence structure and the wind profile of the lower layer of the atmosphere. Sodar systems are like radar systems except that sound waves rather than radio waves are used. Sodar systems operate by issuing an acoustic pulse and then receiving the return signal for a short period of time. Both the intensity and the Doppler (frequency) shift of the return signal are analyzed to determine the wind speed, wind direction and turbulence of the atmosphere. A profile of the atmosphere as a function of height can be obtained by analyzing the return signal at a series of times following the transmission of each pulse. Three antenna beams oriented along the U, V, and W directions allow the calculation of horizontal and vertical wind speeds and directions. Phased-array Sodar systems use a single array of speaker drivers and horns (transducers), and the three antenna beams are electronically generated and steered by phasing the transducers appropriately.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the third monitoring quarter sodar and 10-meter tower data validation report for the period December 2014 through February 2015. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the period.

2.0 CHRONOLOGICAL SUMMARY

The tower and sodar data was remotely collected and reviewed on a daily basis. The sodar data was also regularly compared to the tower wind data to ensure proper sodar operation.

3.0 OPERATION SUMMARY

3.1 Calibrations and Audits

A calibration of the ST-10 meteorological tower equipment was performed on February 17, 2015, and the calibration results are presented in Appendix A. The calibrations demonstrate that the meteorological systems were operating within the acceptable DQO ranges, as listed in the project's QAPP Table B-1, with one exception. The wind direction starting torque was slightly outside of the DQO range, corresponding to a starting threshold of 0.6 m/s instead of the nominal 0.5 m/s threshold. Therefore the wind direction bearings on the sensor were changed out, and an "as-left" calibration was performed that indicated all of the readings were within the acceptable DQO ranges. The wind direction data will not be adjusted because of the "as-found" torque measurement, because the result was only slightly outside of the DQO and because the sensor torque is measured using the RM Young 18331 vane torque gauge, which is a field assessment device and is not as accurate as the RM Young laboratory vane torque fixture.

A quality assurance performance audit was also conducted on the ST-10 meteorological tower on February 17, 2015, before any tower calibrations or adjustments were made. This audit was performed by independent personnel, using independent certified audit standards. The results from this audit are also presented in Appendix A, and indicate that the meteorological systems were operating within the acceptable DQO ranges with the exception of the wind direction starting torque discussed above.

The data collected during these calibrations and audit periods were invalidated from 11:00 to 16:00 hours and reset to the missing data code of 998.0.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA has defined four levels of data validation:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These

data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.

- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets and Level 3 manual screening are also performed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). Additional data screening is also performed on the sodar data. The internal sodar diagnostic data, including signal to noise ratios (SNRs), the FEMAX ground clutter number, the JAM internal electronic test diagnostic value, and the number of spurious signals (SPU) are screened against manufacturer recommended values. Time series data from the Sodar are screened against rates of change and persistence criteria, and the vertical profiles of the Sodar are screened against expected rate of change with altitude criteria. If the comparisons fall outside of typical ranges, the record is flagged for further inspection. The 15-minute Sodar data are averaged into hourly data using unit vector wind direction averages and scalar wind speed averages, in accordance with Section 6.2 of EPA's Met Monitoring Guidance.

Table 1 summarizes the data screening and validation criteria used for both the 10 meter meteorological tower parameters and the sodar.

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Sodar Internal Diagnostic Data	JAM > 0, FEMAX > 600, SNR % total bandwidth > 5, SPU > 7.
Sodar Time Series Rate of Change	Same range and persistence checks as listed above for wind speed and direction.
Sodar Rate of Change for Altitude Gates	WS difference more than 4.5 m/s between altitude gates, and WD difference more than 120 degrees between altitude gates.
Sodar Comparison to 10-meter Wind Data	When Wind Speed is > 2 m/s and time is between 10am and 5 pm, then: Wind Speed Average Bias < 1 m/s, WD Standard Deviation Variability < 2 m/s, Wind Direction Average Bias < 10 degrees, WD Standard Deviation Variability < 30 degrees

The ambient temperature data were Level 2 screened against monthly maximum and minimum temperatures recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to the present. The solar radiation data were Level 2 screened against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Appendix A presents the results of the computerized screening analyses. For each data point flagged, the data was manually reviewed and Level 3 validated using data plots to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, including any necessary data edits.

Quality control comparisons of the hourly average 100 meter sodar wind speed and direction data to the hourly average 10 meter meteorological measurements are also performed for the quarter. These tests are performed only when the atmosphere is well mixed and the 10 meter surface winds should be coupled to the Sodar height winds, which occurs during daytime periods (between 10 am and 5 pm) with moderate wind speeds (greater than 2 m/s). The average difference and standard deviation of differences for wind speed and wind direction were computed and compared to the same DQOs EPA recommends for sodar audits against nearby meteorological towers (even though for an audit, the sodar and tower measurement heights are at the same height, and therefore should agree better than 10 and 100 meter data). Table 2 presents the results of this quality control comparison, and demonstrate that the sodar agrees with the 10-

meter tower within the EPA recommended DQO criteria. Note that the 100 meter minus 10 meter wind speed average difference is 0.3 m/s, indicating that on average the wind speeds at the sodar 100 meter level are higher than 10 meter wind speeds.

Table 2 – Sodar QC Comparisons to 10m Tower Wind Data

Parameter	EPA DQOs	System Performance
Wind Speed Average Difference (m/s)	< 1	0.3
Wind Speed Std Dev Difference (m/s)	< 2	0.9
Wind Direction Average Difference (degrees)	< 10	-2.7
Wind Direction Std Dev Difference (degrees)	< 30	24.5

Note: The 100m level of hourly averaged sodar wind data was compared to 10m tower wind data.

3.3 Data Capture Statistics

Based on the review of data from calibrations, audits, and the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 3 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis, and the quarterly data capture rates are well above 90% for each month for all parameters except the 400 m level sodar winds and 300m and 400m sigma W data. This is not unexpected, as sodars have difficulty collecting data at altitudes greater than approximately 300 meters, especially in hot and dry locations such as the ST-10 site. EPA also notes in Section 9.8 of the Met Monitoring Guidance that "data capture for wind direction and wind speed from a sodar is defined somewhat differently than for more conventional instruments", and " an averaging period (e.g., hourly) is considered valid if there are at least three valid levels of data for the period (independent of height)". The data capture rates for all sodar levels equal to and below 300 meters in height all meet the data completeness DQO, and therefore the sodar data capture rates meet EPA requirements.

In summary, all meteorological data collected during the quarter meets the DQO completeness goal for all parameters.

Table 3 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp Delta T	Solar Rad	100m WS/WD	300m WS/WD	400m WS/WD	100m SW	300m SW	400m SW
Jun-14	100.0	100.0	100.0	100.0	95.3	95.3	78.2	93.3	82.6	35.7
Jul-14	100.0	100.0	100.0	100.0	98.8	98.8	92.5	98.1	94.0	76.2
Aug-14	99.3	99.3	99.3	99.3	98.7	98.5	94.5	98.1	95.0	84.0
Sep-14	100.0	100.0	100.0	100.0	96.8	96.8	90.3	96.0	92.1	80.6
Oct-14	100.0	100.0	100.0	100.0	99.2	99.1	87.4	98.4	93.0	72.7
Nov-14	100.0	100.0	100.0	100.0	98.2	98.2	81.5	97.4	92.2	52.5
Dec-14	100.0	100.0	100.0	100.0	95.8	96.0	85.3	94.1	89.8	64.7
Jan-15	100.0	100.0	100.0	100.0	92.1	92.1	68.4	89.7	82.0	44.1
Feb-15	99.1	99.1	99.1	99.1	98.7	98.7	81.2	98.2	93.0	62.2
Mar-15										
Apr-15										
May-15										
Quarter 1	99.8	99.8	99.8	99.8	97.6	97.6	88.5	96.5	90.6	65.6
Quarter 2	100.0	100.0	100.0	100.0	98.1	98.0	86.4	97.3	92.4	68.6
Quarter 3	99.7	99.7	99.7	99.7	95.4	95.5	78.2	93.9	88.1	56.8
Quarter 4										
Year to date	99.8	99.8	99.8	99.8	97.1	97.0	84.4	95.9	90.4	63.7

Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and year to date.

4.0 DATA RESULTS

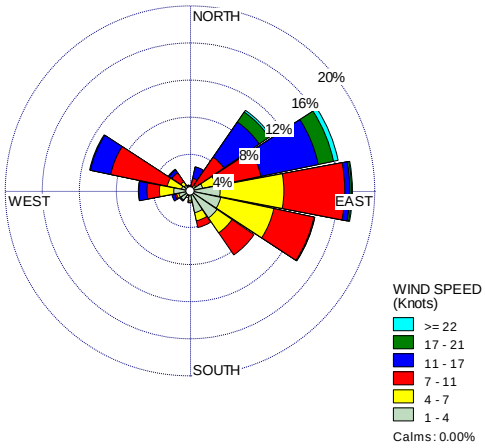
Appendix B presents plots of various monthly data summaries and data tables for the reporting period (these tables include sodar data for the 100, 300, and 400 meter levels). Also submitted with this report are 15-minute and hourly data files in a format designed for AERMET data processing (all sodar altitude levels are included in these data files).

Figure 1 presents plots of the quarterly wind speed and wind direction data at selected heights of 10, 100, and 300 meters above ground, in a format called a "wind rose" plot. These wind roses indicated that there are two predominate wind directions at the site; one from the east (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours). As expected, the wind speeds at 100 and 300 meter levels are typically higher than the 10 meter winds, with fewer hourly observations in the lower wind speed ranges (gray and yellow bars in the wind roses).

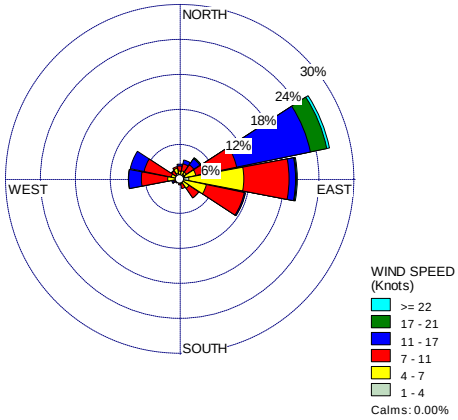
The review of the wind data indicates that there is a diurnal flow pattern at the site, with winds frequently from the east and southeast directions in the morning and evening hours with light to moderate speeds, followed by afternoons with moderate to strong winds. This pattern is evident in the wind roses, and can also be seen in an example of the daily wind data profiles shown in Figure 2 with light easterly and southeasterly flows in the morning followed by stronger westerly wind flows during the afternoon hours. This pattern repeats itself for the majority of the days, and results in the observed bi-modal wind rose distributions.

Figure 1 –Wind Rose Plots

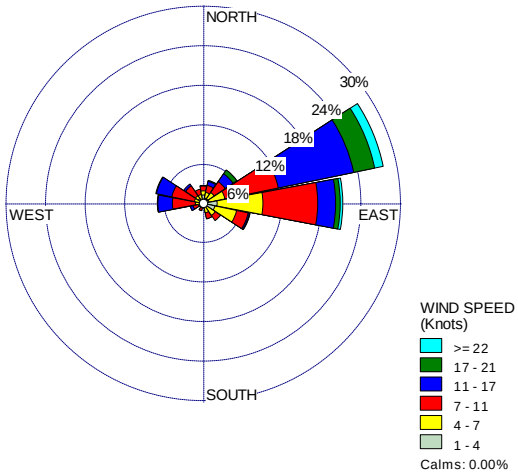
10-Meter Wind Rose



100-Meter Wind Rose

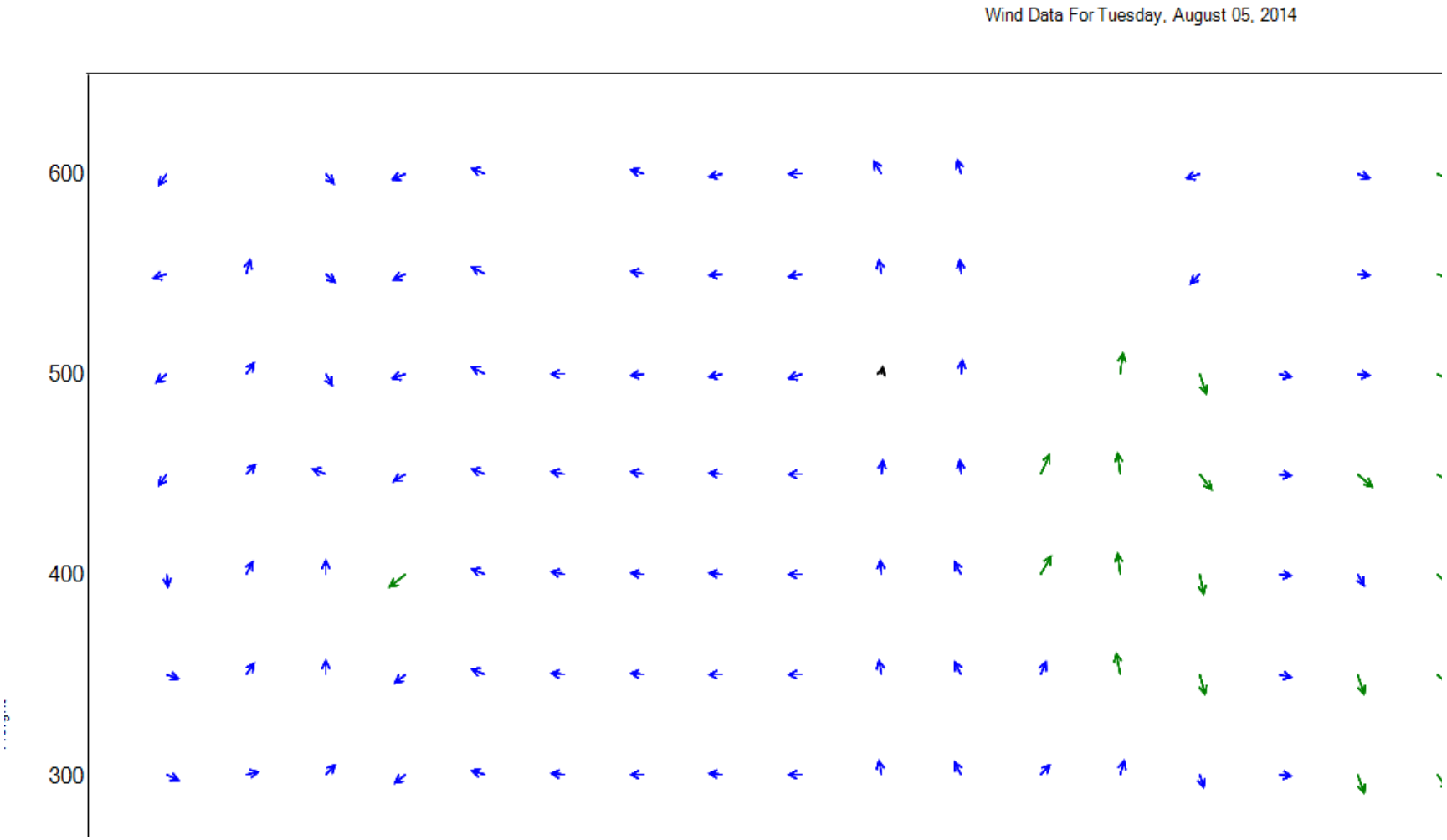


300-Meter Wind Rose



Wind directions are the direction the wind is blowing FROM.

Figure 2 – Example of Typical Diurnal Wind Flow Patterns



Note: Arrows are wind flow vectors and point to the direction the wind is blowing to.

APPENDIX A

Data Screening and Validation Results

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 2/17/2015 By: Rebecca Moore

RM Young Wind Monitor AQ Sensor SN :	126168
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Met One 083 SN N3538
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN 4015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Streamline Pro SN CU06012, temp. probe T060102
Relative Humidity Standard	Extech RH390 SN 130327978

WIND SPEED SENSOR DATA - AS FOUND

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.2	0.2	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater
Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.5 gr/cm

WIND DIRECTION SENSOR DATA - AS FOUND

Target Direction	Logger Output	Difference (degrees)
7	7	0
47	47	0
92	92	0
137	137	0
182	182	0
227	226	-1
272	271	-1
317	315	-2

Note: Readings adjusted for alignment and data logger offset

Magnetic Deviation (east is positive) =	10
Vane alignment rod (magnetic) =	352
Alignment (true) =	2
Data Logger Offset =	-4

Acceptable Tolerance is 3 degrees linearity, 5 degrees total
Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 16 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	0.07	-0.03	0.09	-0.01	0.05
15.2	15.10	-0.10	15.30	0.10	0.03
31.5	31.50	0.00	31.40	-0.10	0.06

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.77	0.73	-0.04	-2%

Solar Radiation Standard is LiCor 200 SN 68334, fluke volt meter SN 48210750
Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
10.2	9.1	-1.1

For RH the DQO limit is ± 7%

BAROMETRIC PRESSURE SENSOR

Standard (mm Hg)	Logger (mm Hg)	Difference (mm Hg)
704.4	705.9	1.5

Acceptable tolerance is 2.3 mm Hg

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.20	0.19	-0.01

Note: Input 100 ml for a target of 0.20 inches (20 tips).
The water must be input over at least 5 minutes.
Acceptable tolerance is 10% of input.

Comments:
Calibration starts 11:11, is over 16:10
Changed vertical shaft bearings on sensor, new bearing readings from 5 - 7 gr/cm.
As left wind sensor calibration performed after bearing replacement. All results within DQO limits.

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 2/17/2015 Auditor: John Podrez

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 126168
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Wind Speed Audit Standard:	RM Young 18802 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton SN M100608

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.1	0.1	NA
325	3.7	3.7	-0.1	-1.6%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.45 gr/cm

WIND DIRECTION SENSOR DATA

Target Direction	Logger Output	Difference (degrees)
8	7	-1
62	60	-2
122	122	0
182	181	-1
242	240	-2
302	299	-3
352	350	-2

Magnetic Deviation (east is positive) = 10

Vane alignment rod (magnetic) = 352

Alignment (true) = 2

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 17 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.3	0.1	-0.2	0.1	-0.2	0.05
15.1	15.1	0.0	15.3	0.2	-0.07
31.7	31.5	-0.2	31.4	-0.3	-0.07

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.78	0.76	-0.02	-1%

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

Comments:

Audit starts 11:11, is over 15:30

Replacement of the RM Young vertical shaft bearings on the wind sensor and a post repair calibration was performed by site technician.

Auditor verified the new sensor torque threshold at 5 - 8 gr/cm and post repair calibrations.

As left wind sensor calibration performed after bearing replacement. All results within DQO limits.

ASARCO ST-10 10-Meter Data - QA Screen Test Results - Note that WS is in mph, Temperature and Delat T are in C, and Solar Rad is in kw/m2

Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	14120802	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	14120803	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	14121123	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15010210	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15010921	WIND SPD TOO CONSTANT 3 HR	0.1	Moderate to high wind speeds - WS is valid
4	WS	15011105	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15012904	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15013116	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15020102	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15020609	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15021409	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15021508	WIND SPD TOO CONSTANT 3 HR	0.1	Moderate to high wind speeds - WS is valid
7	WD	14120120	WIND DIR TOO CONSTANT 3 HR	0.9	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	14122003	WIND DIR TOO CONSTANT 3 HR	1.0	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15010516	WIND DIR TOO CONSTANT 3 HR	0.8	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15010804	WIND DIR TOO CONSTANT 3 HR	0.8	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15010814	WIND DIR TOO CONSTANT 3 HR	0.8	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15010818	WIND DIR TOO CONSTANT 3 HR	1.0	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15010912	WIND DIR TOO CONSTANT 3 HR	1.0	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15010921	WIND DIR TOO CONSTANT 3 HR	0.8	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15013017	WIND DIR TOO CONSTANT 3 HR	0.9	Moderate to high wind speeds and low sigma theta - WD is valid
11	TP	15012510	HIGH RATE OF C CHANGE	5.0	Wind Gusts and Shift during early morning heating - Data is Valid
11	TP	15021111	HIGH RATE OF C CHANGE	5.1	Wind Gusts and Shift during early morning heating - Data is Valid
16	D1	14120612	DT + During Daytime	0.2	Just outside of Screening Limit - Moderate Winds and low solar - Data is valid
16	D1	14120613	DT + During Daytime	0.1	Just outside of Screening Limit - Moderate Winds and low solar - Data is valid
16	D1	14120615	DT + During Daytime	0.2	Just outside of Screening Limit - Moderate Winds and low solar - Data is valid
16	D1	14121915	DT + During Daytime	0.1	Just outside of Screening Limit - Moderate Winds and low solar - Data is valid
16	D1	15010415	DT + During Daytime	0.1	Just outside of Screening Limit - Moderate Winds and low solar - Data is valid
17	D1	14123122	DT - During Nighttime	-0.1	Just outside of Screening Limit - Moderate Winds and recent rainfall (overcast) - Data is valid
17	D1	15010101	DT - During Nighttime	-0.2	Just outside of Screening Limit - Moderate Winds and recent rainfall (overcast) - Data is valid
17	D1	15010103	DT - During Nighttime	-0.1	Just outside of Screening Limit - Moderate Winds and recent rainfall (overcast) - Data is valid

ASARCO Dec2014-Feb2015 Sodar QC Screening Report - Hourly Data

date/time	QCCODE	Test Condition	at Gate Ht	Comment
12/28/2014 16:00	Hour to Hour WS	> 9.0 m/s at gate	100	Unreasonable WS, do not see jump in 10m WS, hour 17 invalidated
12/28/2014 16:00	Hour to Hour WS	> 9.0 m/s at gate	150	Unreasonable WS, do not see jump in 10m WS, hour 17 invalidated
12/28/2014 16:00	Hour to Hour WS	> 9.0 m/s at gate	200	Unreasonable WS, do not see jump in 10m WS, hour 17 invalidated
1/24/2015 17:00	Hour to Hour WS	> 9.0 m/s at gate	400	Data is reasonable and valid
1/30/2015 11:00	Hour to Hour WS	> 9.0 m/s at gate	350	Data is reasonable and valid
12/6/2014 1:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	150	Data is reasonable and valid
12/6/2014 14:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	300	Data is reasonable and valid
12/7/2014 22:00	Hourly WD difference	< 10.0 for >= 18 hours at gate	50	Data is reasonable and valid, 10m WD is also relatively constant
12/7/2014 22:00	Hourly WD difference	< 10.0 for >= 18 hours at gate	100	Data is reasonable and valid, 10m WD is also relatively constant
12/8/2014 6:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	100	Data is reasonable and valid
12/8/2014 13:00	Hourly WD difference	< 10.0 for >= 18 hours at gate	200	Data is reasonable and valid, 10m WD is also relatively constant
12/8/2014 17:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	50	Data is reasonable and valid
12/9/2014 2:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	300	Data is reasonable and valid
12/22/2014 7:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	250	Data is reasonable and valid
1/5/2015 0:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	300	Data is reasonable and valid
1/5/2015 4:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	250	Data is reasonable and valid
1/6/2015 2:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	100	Data is reasonable and valid
1/9/2015 9:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	350	Data is reasonable and valid
1/18/2015 12:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	100	Data is reasonable and valid
1/25/2015 15:00	Hourly WD difference	< 10.0 for >= 18 hours at gate	100	Data is reasonable and valid, 10m WD is also relatively constant
1/26/2015 3:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	100	Data is reasonable and valid
2/6/2015 2:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	250	Data is reasonable and valid
12/3/2014 6:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	300	Data is reasonable and valid
12/5/2014 9:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200	Data is reasonable and valid
12/12/2014 0:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50	Data is reasonable and valid
12/12/2014 0:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	100	Data is reasonable and valid
12/19/2014 7:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200	Data is reasonable and valid
12/30/2014 3:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50	Data is reasonable and valid
1/14/2015 11:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	100	Data is reasonable and valid
1/18/2015 13:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200	Data is reasonable and valid
1/18/2015 19:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	350	Data is reasonable and valid
2/1/2015 10:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	400	Data is reasonable and valid
2/11/2015 5:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200	Data is reasonable and valid
2/18/2015 0:00	Hourly WS difference	< 0.5 for >= 12 hours at gate	150	Data is reasonable and valid
2/19/2015 23:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50	Data is reasonable and valid
2/20/2015 7:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200	Data is reasonable and valid
2/20/2015 8:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	100	Data is reasonable and valid
2/20/2015 8:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	150	Data is reasonable and valid
2/20/2015 8:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250	Data is reasonable and valid
2/22/2015 6:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	150	Data is reasonable and valid
2/26/2015 9:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250	Data is reasonable and valid
12/3/2014 17:00	WD ROC > 90	155	350	Data is valid, occurs during transitional period and/or lower speeds
12/3/2014 18:00	WD ROC > 90	139	300	Data is valid, occurs during transitional period and/or lower speeds
12/3/2014 19:00	WD ROC > 90	91	400	Data is valid, occurs during transitional period and/or lower speeds
12/4/2014 20:00	WD ROC > 90	95	250	Data is valid, occurs during transitional period and/or lower speeds
12/5/2014 2:00	WD ROC > 90	175	400	Data is valid, occurs during transitional period and/or lower speeds
12/10/2014 23:00	WD ROC > 90	170	350	Data is valid, occurs during transitional period and/or lower speeds
12/12/2014 17:00	WD ROC > 90	97	150	Data is valid, occurs during transitional period and/or lower speeds
12/14/2014 12:00	WD ROC > 90	94	350	Data is valid, occurs during transitional period and/or lower speeds
12/16/2014 15:00	WD ROC > 90	143	350	Data is valid, occurs during transitional period and/or lower speeds
12/17/2014 1:00	WD ROC > 90	110	350	Data is valid, occurs during transitional period and/or lower speeds
12/18/2014 12:00	WD ROC > 90	106	400	Data is valid, occurs during transitional period and/or lower speeds
12/20/2014 22:00	WD ROC > 90	153	300	Data is valid, occurs during transitional period and/or lower speeds
12/21/2014 21:00	WD ROC > 90	151	350	Data is valid, occurs during transitional period and/or lower speeds
12/23/2014 16:00	WD ROC > 90	177	200	Unreasonable WD, 10m WD not similar, sodar hour invalidated
12/23/2014 22:00	WD ROC > 90	100	100	Unreasonable WD, 10m WD not similar, sodar hour invalidated
12/25/2014 10:00	WD ROC > 90	179	100	Data is valid, occurs during transitional period and/or lower speeds
12/26/2014 9:00	WD ROC > 90	97	400	Data is valid, occurs during transitional period and/or lower speeds
12/29/2014 5:00	WD ROC > 90	102	400	Unreasonable WD, 10m WD not similar, sodar hour >=400m invalidated
12/30/2014 12:00	WD ROC > 90	144	400	Data is valid, occurs during transitional period and/or lower speeds
12/31/2014 2:00	WD ROC > 90	105	400	Data is valid, occurs during transitional period and/or lower speeds
1/12/2015 15:00	WD ROC > 90	127	300	Data is valid, occurs during transitional period and/or lower speeds
1/19/2015 22:00	WD ROC > 90	129	250	Data is valid, occurs during transitional period and/or lower speeds
1/20/2015 14:00	WD ROC > 90	179	250	Data is valid, occurs during transitional period and/or lower speeds
1/26/2015 22:00	WD ROC > 90	171	200	Data is valid, occurs during transitional period and/or lower speeds
1/28/2015 14:00	WD ROC > 90	106	300	Data is valid, occurs during transitional period and/or lower speeds
2/6/2015 14:00	WD ROC > 90	96	250	Data is valid, occurs during transitional period and/or lower speeds
2/6/2015 15:00	WD ROC > 90	163	400	Data is valid, occurs during transitional period and/or lower speeds
2/7/2015 22:00	WD ROC > 90	111	250	Data is valid, occurs during transitional period and/or lower speeds
2/8/2015 12:00	WD ROC > 90	152	300	Data is valid, occurs during transitional period and/or lower speeds
2/8/2015 21:00	WD ROC > 90	148	250	Data is valid, occurs during transitional period and/or lower speeds

ASARCO Dec2014-Feb 2015 Sodar QC Screening Report - 15-Minute Data

Date/Time	QCCODE	SNR1	SNR2	SNR3	Comment
1/6/2015 18:00	SNR < 5	4	8	9	Noise bandwidth flag - sodar automatically invalidated this data
12/4/2014 7:15	NOISE > 8750	8504	8604	8802	Noise flag - sodar automatically invalidated data
12/4/2014 7:30	NOISE > 8750	8904	8904	9202	Noise flag - sodar automatically invalidated data
12/4/2014 7:45	NOISE > 8750	8504	8504	8902	Noise flag - sodar automatically invalidated data
12/4/2014 8:00	NOISE > 8750	8404	8504	8802	Noise flag - sodar automatically invalidated data
12/4/2014 8:15	NOISE > 8750	8604	8704	8902	Noise flag - sodar automatically invalidated data
12/4/2014 8:30	NOISE > 8750	8704	8704	9002	Noise flag - sodar automatically invalidated data
12/4/2014 8:45	NOISE > 8750	8604	8704	9002	Noise flag - sodar automatically invalidated data
12/4/2014 9:00	NOISE > 8750	8504	8504	8902	Noise flag - sodar automatically invalidated data
12/4/2014 9:15	NOISE > 8750	8604	8604	9002	Noise flag - sodar automatically invalidated data
12/4/2014 9:30	NOISE > 8750	8704	8704	9002	Noise flag - sodar automatically invalidated data
12/4/2014 10:00	NOISE > 8750	8604	8704	9002	Noise flag - sodar automatically invalidated data
12/4/2014 10:15	NOISE > 8750	8804	8804	9202	Noise flag - sodar automatically invalidated data
12/18/2014 10:30	NOISE > 8750	8504	8404	8802	Noise flag - sodar automatically invalidated upper level data
12/18/2014 10:45	NOISE > 8750	8804	8704	9102	Noise flag - sodar automatically invalidated upper level data
1/30/2015 16:15	NOISE > 8750	8504	8404	8802	Noise flag - sodar automatically invalidated data
1/30/2015 18:00	NOISE > 8750	8704	8604	8902	Noise flag - sodar automatically invalidated data
1/30/2015 18:15	NOISE > 8750	8604	8504	8802	Noise flag - sodar automatically invalidated data
1/30/2015 18:30	NOISE > 8750	9104	9104	9402	Noise flag - sodar automatically invalidated data
1/30/2015 18:45	NOISE > 8750	8704	8704	8902	Noise flag - sodar automatically invalidated data
1/30/2015 19:00	NOISE > 8750	8404	8504	8802	Noise flag - sodar automatically invalidated data
1/30/2015 21:15	NOISE > 8750	8704	8604	8902	Noise flag - sodar automatically invalidated data

Date/Time	QCCODE	Value	Comment
12/4/2014 13:00	FEMAX > 600	705	Elevated ground clutter but data is valid and reasonable
12/4/2014 13:15	FEMAX > 600	705	Elevated ground clutter, data is auto invalidated
12/9/2014 10:00	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/9/2014 10:15	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/9/2014 10:30	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/9/2014 10:45	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/10/2014 10:00	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/10/2014 10:15	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/10/2014 10:30	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/10/2014 10:45	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/11/2014 10:00	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/11/2014 10:15	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/11/2014 10:30	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/11/2014 10:45	FEMAX > 600	1219	Elevated ground clutter but data is valid and reasonable
12/11/2014 11:30	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/11/2014 11:45	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/12/2014 11:45	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/12/2014 12:00	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/13/2014 8:45	FEMAX > 600	898	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 9:00	FEMAX > 600	898	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 9:15	FEMAX > 600	898	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 9:30	FEMAX > 600	898	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 9:45	FEMAX > 600	792	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 10:00	FEMAX > 600	792	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 10:15	FEMAX > 600	792	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 10:30	FEMAX > 600	792	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 11:15	FEMAX > 600	1210	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 11:30	FEMAX > 600	1210	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 11:45	FEMAX > 600	1210	Elevated ground clutter, high winds, sodar has invalidated some data
12/13/2014 12:00	FEMAX > 600	1210	Elevated ground clutter, high winds, sodar has invalidated some data
12/14/2014 8:45	FEMAX > 600	898	Elevated ground clutter but data is valid and reasonable
12/14/2014 9:00	FEMAX > 600	898	Elevated ground clutter but data is valid and reasonable
12/14/2014 9:15	FEMAX > 600	898	Elevated ground clutter but data is valid and reasonable
12/14/2014 9:30	FEMAX > 600	898	Elevated ground clutter but data is valid and reasonable
12/14/2014 9:45	FEMAX > 600	792	Elevated ground clutter but data is valid and reasonable
12/14/2014 10:00	FEMAX > 600	792	Elevated ground clutter but data is valid and reasonable
12/14/2014 10:15	FEMAX > 600	928	Elevated ground clutter but data is valid and reasonable
12/14/2014 10:30	FEMAX > 600	928	Elevated ground clutter but data is valid and reasonable
12/14/2014 11:15	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/14/2014 11:30	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/15/2014 9:00	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
12/15/2014 9:15	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable

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12/15/2014 9:30	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
12/15/2014 9:45	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
12/15/2014 10:30	FEMAX > 600	928	Elevated ground clutter but data is valid and reasonable
12/15/2014 10:45	FEMAX > 600	928	Elevated ground clutter but data is valid and reasonable
12/15/2014 11:30	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/15/2014 11:45	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/16/2014 10:30	FEMAX > 600	928	Elevated ground clutter but data is valid and reasonable
12/16/2014 10:45	FEMAX > 600	928	Elevated ground clutter but data is valid and reasonable
12/16/2014 11:30	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/16/2014 11:45	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/17/2014 11:30	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/17/2014 11:45	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/18/2014 11:45	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/18/2014 12:00	FEMAX > 600	1210	Elevated ground clutter but data is valid and reasonable
12/19/2014 11:15	FEMAX > 600	1076	Elevated ground clutter but data is valid and reasonable
12/19/2014 11:30	FEMAX > 600	1076	Elevated ground clutter but data is valid and reasonable
12/19/2014 11:45	FEMAX > 600	960	Elevated ground clutter but data is valid and reasonable
12/19/2014 12:00	FEMAX > 600	960	Elevated ground clutter but data is valid and reasonable
12/21/2014 10:00	FEMAX > 600	615	Elevated ground clutter but data is valid and reasonable
12/21/2014 10:15	FEMAX > 600	615	Elevated ground clutter but data is valid and reasonable
12/21/2014 10:30	FEMAX > 600	615	Elevated ground clutter but data is valid and reasonable
12/21/2014 10:45	FEMAX > 600	615	Elevated ground clutter but data is valid and reasonable
12/21/2014 11:00	FEMAX > 600	615	Elevated ground clutter but data is valid and reasonable
12/21/2014 11:15	FEMAX > 600	615	Elevated ground clutter but data is valid and reasonable
12/21/2014 11:30	FEMAX > 600	615	Elevated ground clutter but data is valid and reasonable
12/21/2014 11:45	FEMAX > 600	615	Elevated ground clutter but data is valid and reasonable
12/23/2014 11:30	FEMAX > 600	960	Elevated ground clutter, high winds, sodar has invalidated some data
12/23/2014 11:45	FEMAX > 600	960	Elevated ground clutter, high winds, sodar has invalidated some data
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12/23/2014 13:15	FEMAX > 600	971	Elevated ground clutter, high winds, sodar has invalidated some data
12/23/2014 13:30	FEMAX > 600	971	Elevated ground clutter, high winds, sodar has invalidated some data
12/23/2014 13:45	FEMAX > 600	971	Elevated ground clutter, high winds, sodar has invalidated some data
12/24/2014 11:45	FEMAX > 600	960	Elevated ground clutter, high winds, sodar has invalidated some data
12/24/2014 12:00	FEMAX > 600	960	Elevated ground clutter, high winds, sodar has invalidated some data
12/24/2014 13:15	FEMAX > 600	971	Elevated ground clutter, high winds, sodar has invalidated some data
12/24/2014 13:30	FEMAX > 600	971	Elevated ground clutter, high winds, sodar has invalidated some data
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12/25/2014 12:00	FEMAX > 600	960	Elevated ground clutter but data is valid and reasonable
1/11/2015 22:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/11/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/11/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/11/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/12/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/12/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/12/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/12/2015 23:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/13/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/13/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/13/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/13/2015 23:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/14/2015 22:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/14/2015 22:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/14/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/14/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
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1/15/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/15/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/16/2015 21:45	FEMAX > 600	913	Elevated ground clutter but data is valid and reasonable
1/16/2015 22:00	FEMAX > 600	913	Elevated ground clutter but data is valid and reasonable
1/16/2015 22:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/16/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/16/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/16/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/17/2015 22:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable

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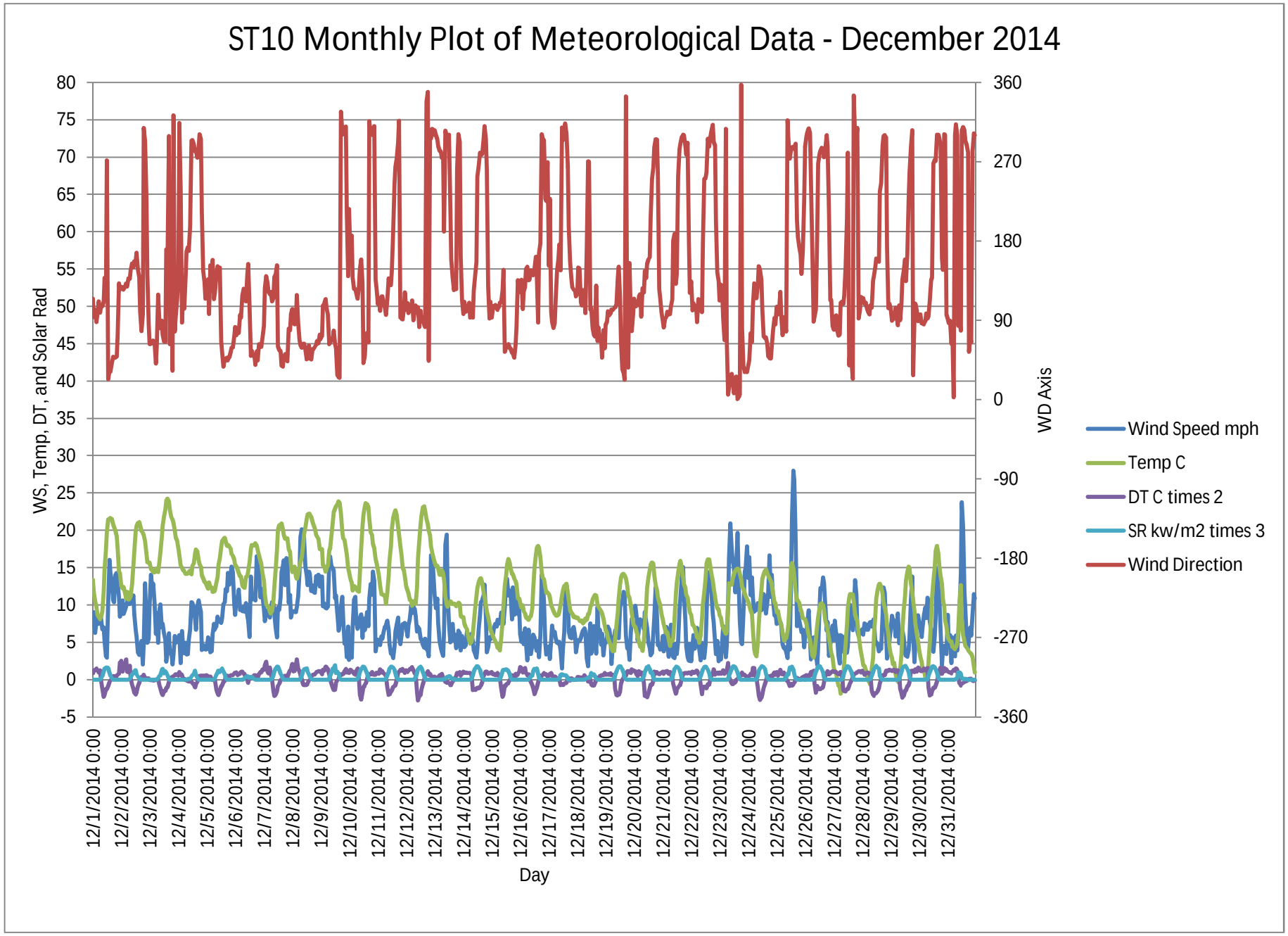
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1/17/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/17/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/18/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
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1/18/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/18/2015 23:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
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1/19/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/19/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/19/2015 23:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/20/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/20/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/20/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
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1/21/2015 7:45	FEMAX > 600	692	Elevated ground clutter but data is valid and reasonable
1/21/2015 8:00	FEMAX > 600	692	Elevated ground clutter but data is valid and reasonable
1/21/2015 8:15	FEMAX > 600	692	Elevated ground clutter but data is valid and reasonable
1/21/2015 8:30	FEMAX > 600	621	Elevated ground clutter but data is valid and reasonable
1/21/2015 8:45	FEMAX > 600	621	Elevated ground clutter but data is valid and reasonable
1/21/2015 9:00	FEMAX > 600	621	Elevated ground clutter but data is valid and reasonable
1/21/2015 9:15	FEMAX > 600	621	Elevated ground clutter but data is valid and reasonable
1/21/2015 22:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/21/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/21/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/21/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/22/2015 22:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/22/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/22/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/22/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/23/2015 22:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/23/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/23/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/23/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/24/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/24/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/24/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/24/2015 23:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/25/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/25/2015 23:15	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/25/2015 23:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
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1/26/2015 22:30	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
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1/26/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
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1/27/2015 22:45	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/27/2015 23:00	FEMAX > 600	1364	Elevated ground clutter but data is valid and reasonable
1/27/2015 23:15	FEMAX > 600	1198	Elevated ground clutter but data is valid and reasonable
1/27/2015 23:30	FEMAX > 600	1198	Elevated ground clutter but data is valid and reasonable
2/15/2015 5:15	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/15/2015 5:30	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/15/2015 5:45	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/15/2015 6:00	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/15/2015 6:15	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/15/2015 6:30	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/16/2015 5:15	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/16/2015 5:30	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/16/2015 5:45	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/16/2015 6:00	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/17/2015 5:15	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/17/2015 5:30	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/17/2015 5:45	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/17/2015 6:00	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/18/2015 5:30	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/18/2015 5:45	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable

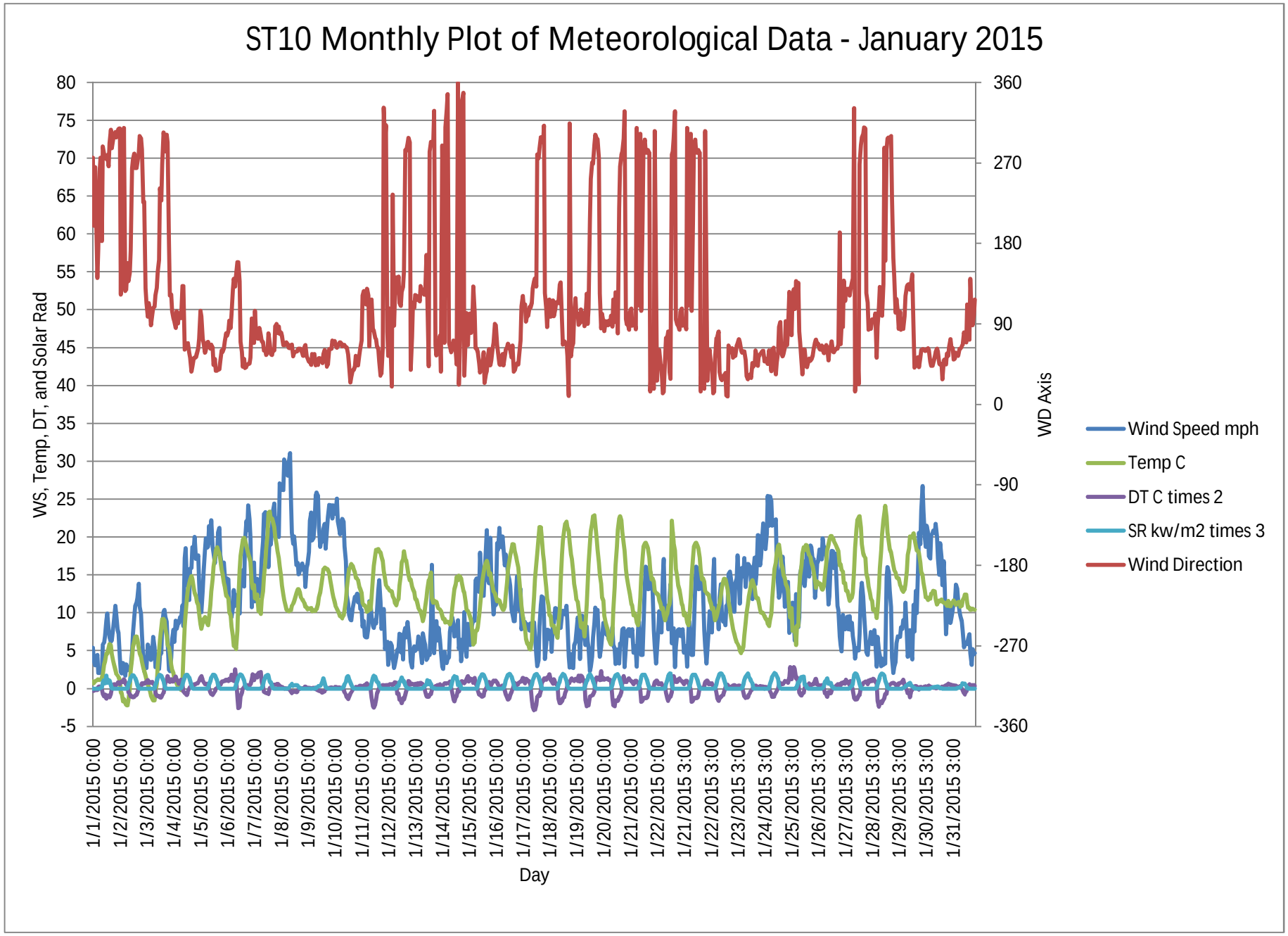
ASARCO Dec2014-Feb 2015 Sodar QC Screening Report - 15-Minute Data

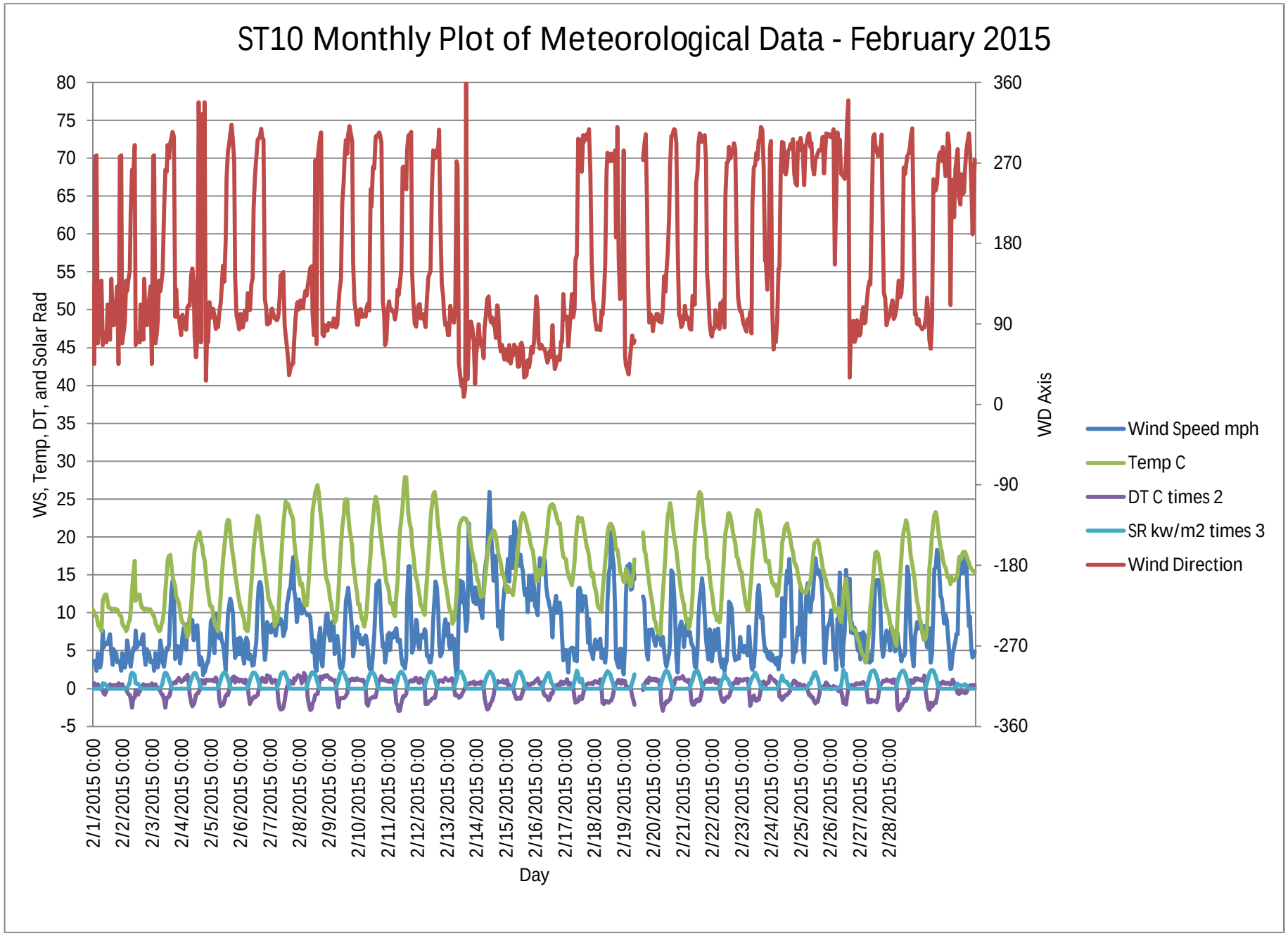
2/18/2015 6:00	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/18/2015 6:15	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
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2/18/2015 21:45	FEMAX > 600	647	Elevated ground clutter but data is valid and reasonable
2/18/2015 22:00	FEMAX > 600	647	Elevated ground clutter but data is valid and reasonable
2/18/2015 22:15	FEMAX > 600	647	Elevated ground clutter but data is valid and reasonable
2/18/2015 22:30	FEMAX > 600	647	Elevated ground clutter but data is valid and reasonable
2/18/2015 22:45	FEMAX > 600	647	Elevated ground clutter but data is valid and reasonable
2/19/2015 5:30	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/19/2015 5:45	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/19/2015 6:00	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/19/2015 6:15	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/20/2015 5:00	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/20/2015 5:15	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/20/2015 5:30	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/20/2015 5:45	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/20/2015 6:00	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/20/2015 6:15	FEMAX > 600	896	Elevated ground clutter but data is valid and reasonable
2/23/2015 8:15	FEMAX > 600	1449	Elevated ground clutter but data is valid and reasonable
2/23/2015 8:30	FEMAX > 600	1449	Elevated ground clutter but data is valid and reasonable
2/23/2015 8:45	FEMAX > 600	1449	Elevated ground clutter but data is valid and reasonable
2/23/2015 9:00	FEMAX > 600	1449	Elevated ground clutter but data is valid and reasonable

APPENDIX B

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - December 2014
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
12/1/2014 0:00
12/2/2014 0:00
12/3/2014 0:00
12/4/2014 0:00
12/5/2014 0:00
12/6/2014 0:00
12/7/2014 0:00
12/8/2014 0:00
12/9/2014 0:00
12/10/2014 0:00
12/11/2014 0:00
12/12/2014 0:00
12/13/2014 0:00
12/14/2014 0:00
12/15/2014 0:00
12/16/2014 0:00
12/17/2014 0:00
12/18/2014 0:00
12/19/2014 0:00
12/20/2014 0:00
12/21/2014 0:00
12/22/2014 0:00
12/23/2014 0:00
12/24/2014 0:00
12/25/2014 0:00
12/26/2014 0:00
12/27/2014 0:00
12/28/2014 0:00
12/29/2014 0:00
12/30/2014 0:00
12/31/2014 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - January 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
1/1/2015 0:00
1/2/2015 0:00
1/3/2015 0:00
1/4/2015 0:00
1/5/2015 0:00
1/6/2015 0:00
1/7/2015 0:00
1/8/2015 0:00
1/9/2015 0:00
1/10/2015 0:00
1/11/2015 0:00
1/12/2015 0:00
1/13/2015 0:00
1/14/2015 0:00
1/15/2015 0:00
1/16/2015 0:00
1/17/2015 0:00
1/18/2015 0:00
1/19/2015 0:00
1/20/2015 0:00
1/21/2015 0:00
1/22/2015 0:00
1/21/2015 3:00
1/22/2015 3:00
1/23/2015 3:00
1/24/2015 3:00
1/25/2015 3:00
1/26/2015 3:00
1/27/2015 3:00
1/28/2015 3:00
1/29/2015 3:00
1/30/2015 3:00
1/31/2015 3:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - February 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
2/1/2015 0:00
2/2/2015 0:00
2/3/2015 0:00
2/4/2015 0:00
2/5/2015 0:00
2/6/2015 0:00
2/7/2015 0:00
2/8/2015 0:00
2/9/2015 0:00
2/10/2015 0:00
2/11/2015 0:00
2/12/2015 0:00
2/13/2015 0:00
2/14/2015 0:00
2/15/2015 0:00
2/16/2015 0:00
2/17/2015 0:00
2/18/2015 0:00
2/19/2015 0:00
2/20/2015 0:00
2/21/2015 0:00
2/22/2015 0:00
2/23/2015 0:00
2/24/2015 0:00
2/25/2015 0:00
2/26/2015 0:00
2/27/2015 0:00
2/28/2015 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	7.2	9.0	6.3	7.8	8.7	7.4	8.2	8.2	6.7	7.0	5.2	3.1	2.9	10.3	16.1	14.3	13.2	10.6	10.4	13.9	14.3	13.0	11.0	8.4	9.3
2	9.1	10.6	8.8	9.3	9.9	10.3	11.6	10.1	11.1	10.8	11.3	8.7	6.8	5.8	3.7	3.3	3.6	5.2	2.0	4.8	12.9	7.4	4.9	5.5	7.8
3	9.9	14.1	12.3	12.9	10.3	6.1	8.9	4.9	9.4	10.1	7.1	7.4	6.2	5.3	2.4	3.7	6.2	3.5	3.8	2.0	3.3	5.8	4.9	5.5	6.9
4	5.5	6.0	2.2	6.5	4.8	3.5	4.9	3.3	3.4	5.3	6.8	10.3	10.2	9.6	8.1	6.7	9.8	10.6	9.9	9.1	4.0	4.5	4.6	4.1	6.4
5	4.1	5.6	5.1	3.6	3.8	6.1	7.5	6.7	7.1	8.4	7.8	8.0	7.6	8.2	10.1	10.3	12.1	11.9	14.3	12.7	14.1	15.1	14.3	10.1	8.9
6	8.7	10.7	10.9	12.1	9.3	9.5	9.1	9.8	9.1	10.2	8.6	7.9	5.7	13.8	10.7	10.9	11.0	10.6	16.5	15.8	14.6	11.0	12.1	11.1	10.8
7	9.4	7.8	8.9	9.2	9.5	8.3	9.5	10.4	10.1	8.9	6.9	5.6	9.6	9.3	11.0	14.3	15.1	16.0	12.6	16.3	16.0	10.3	11.3	8.3	10.6
8	9.1	9.1	9.1	9.1	9.7	11.2	14.5	19.1	20.1	19.3	19.0	15.2	13.9	12.6	14.5	14.1	11.9	12.6	11.8	11.6	13.9	13.1	14.0	12.4	13.4
9	13.8	13.8	9.8	10.1	9.6	9.5	9.8	15.6	16.5	15.2	14.9	14.5	10.9	11.3	8.9	6.6	7.3	9.7	11.1	8.1	4.8	4.9	3.0	7.1	10.3
10	2.7	5.4	2.9	6.9	10.7	11.1	7.9	6.8	7.6	8.2	8.7	5.6	8.2	6.6	7.2	9.1	7.2	10.8	12.8	11.4	14.4	13.3	3.8	4.5	8.1
11	5.3	5.2	4.6	5.8	5.5	6.4	7.1	7.3	7.9	6.7	4.8	3.5	3.7	2.9	4.4	6.4	7.4	8.3	5.7	4.7	6.1	7.4	7.5	7.6	5.9
12	6.9	5.8	7.3	8.1	9.8	8.9	9.8	9.5	8.5	6.5	7.1	6.8	5.5	5.3	4.7	4.3	5.5	4.1	3.8	3.1	9.3	16.6	16.7	13.4	7.8
13	11.4	9.6	10.8	7.6	5.2	4.2	3.8	3.2	6.4	18.1	19.4	11.6	7.5	5.0	5.8	7.5	5.3	6.0	4.2	4.6	6.6	6.3	3.9	5.8	7.5
14	4.4	4.3	4.6	6.5	5.4	5.3	6.0	6.2	5.2	4.0	3.5	3.0	4.2	6.7	8.7	10.4	10.7	11.3	12.7	8.4	3.7	4.4	5.6	5.4	6.3
15	5.9	6.1	6.9	7.4	7.1	8.0	7.5	7.5	9.0	8.5	7.4	9.7	13.1	13.5	11.2	11.9	11.4	8.1	12.3	8.7	10.4	12.2	8.8	9.5	9.3
16	6.1	5.0	6.2	4.7	6.9	4.9	2.6	6.7	3.5	3.4	4.6	6.0	5.6	4.3	3.8	5.2	3.0	5.9	14.0	13.6	10.4	4.8	3.3	3.6	5.8
17	4.5	2.7	5.3	7.2	6.1	6.4	5.5	4.9	4.8	5.1	3.9	1.5	4.0	6.3	10.2	12.7	11.4	6.4	5.7	5.5	6.6	7.0	5.9	3.7	6.0
18	4.8	5.3	5.2	5.6	6.1	6.6	6.9	6.4	2.8	1.8	5.1	7.5	3.5	4.8	7.2	6.1	3.5	9.8	5.6	6.7	4.7	6.2	3.3	4.9	5.4
19	4.9	5.8	7.1	6.8	5.6	2.1	4.8	5.6	6.6	6.7	5.8	5.5	9.7	10.3	10.4	11.8	11.4	5.9	4.2	4.7	2.7	6.4	8.1	8.4	6.7
20	9.0	9.9	8.3	5.3	6.8	8.1	7.9	7.7	6.8	9.0	7.8	7.0	5.0	4.3	3.2	3.5	6.2	8.2	12.4	8.3	4.6	4.6	4.0	4.2	6.8
21	5.8	3.8	5.4	7.0	5.0	3.0	6.2	7.3	4.2	3.0	2.9	4.8	3.4	5.2	9.3	10.9	13.7	15.1	11.4	8.0	4.4	3.1	2.5	4.8	6.3
22	2.5	4.6	5.9	4.1	5.9	6.9	5.4	4.0	2.6	4.9	3.2	2.9	4.7	8.6	14.4	12.8	13.2	11.6	8.7	7.6	5.1	3.4	5.2	2.5	6.3
23	3.5	2.7	5.3	7.1	5.1	3.0	4.5	10.1	16.3	20.9	17.4	16.1	15.0	11.7	15.2	19.6	11.9	7.8	5.0	4.8	8.9	14.4	14.9	17.9	10.8
24	13.6	16.4	11.3	13.7	11.0	9.1	9.5	9.3	10.2	9.8	9.6	9.3	9.4	11.4	9.9	8.8	10.3	11.6	16.6	11.1	14.1	10.6	8.6	9.0	11.0
25	7.4	8.9	7.9	7.7	7.2	4.7	4.2	4.3	3.8	2.9	5.9	4.0	14.7	22.0	28.0	26.7	18.8	7.1	8.9	7.9	7.0	6.4	6.7	4.3	9.5
26	5.7	6.4	7.7	9.3	5.4	2.7	3.0	5.7	3.0	3.5	2.0	4.3	9.5	12.2	12.1	13.6	12.9	9.8	6.6	7.7	3.2	4.5	6.0	7.2	6.8
27	5.3	7.9	6.1	6.0	3.2	2.2	5.9	5.8	5.3	3.6	4.1	3.6	4.5	9.1	10.0	7.8	6.6	8.4	13.3	11.4	6.6	5.8	6.4	6.3	6.5
28	6.7	6.0	7.5	7.4	6.7	6.7	7.5	7.7	7.1	7.8	8.1	4.8	5.1	4.8	3.8	4.1	4.2	8.4	12.3	11.5	6.0	2.8	4.2	5.0	6.5
29	6.6	8.6	8.0	7.8	5.7	6.6	8.9	4.9	5.6	5.3	6.6	5.7	3.5	3.2	3.0	3.9	5.8	10.6	13.8	5.9	2.3	4.9	8.4	8.6	6.4
30	7.9	6.8	5.7	7.0	8.7	9.7	8.2	11.0	9.4	7.8	6.7	4.9	3.7	5.8	8.2	14.9	12.1	11.2	6.6	1.9	3.8	4.5	3.9	3.4	7.2
31	8.6	4.7	5.9	2.2	5.7	3.3	3.1	5.9	3.9	5.8	8.8	14.2	23.8	20.4	11.7	9.3	5.3	4.1	5.6	7.0	5.9	8.8	11.4	10.9	8.2
HRAVE	7.0	7.4	7.1	7.5	7.1	6.5	7.1	7.6	7.5	8.0	7.8	7.2	7.8	8.7	9.3	9.9	9.3	9.1	9.5	8.3	7.9	7.9	7.4	7.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.3	7.8	6.9	6.4	8.9	10.8	10.6	13.4	10.3	8.1	5.9	7.8	7.5	6.3	9.3	5.8	6.0	5.4	6.7	6.8	6.3	6.3	10.8	11.0	9.5
MAX	16.1	12.9	14.1	10.6	15.1	16.5	16.3	20.1	16.5	14.4	8.3	16.7	19.4	12.7	13.5	14.0	12.7	9.8	11.8	12.4	15.1	14.4	20.9	16.6	28.0
MIN	2.9	2.0	2.0	2.2	3.6	5.7	5.6	9.1	3.0	2.7	2.9	3.1	3.2	3.0	5.9	2.6	1.5	1.8	2.1	3.2	2.5	2.5	2.7	8.6	2.9

DAY	26	27	28	29	30	31
AVE	6.8	6.5	6.5	6.4	7.2	8.2
MAX	13.6	13.3	12.3	13.8	14.9	23.8
MIN	2.0	2.2	2.8	2.3	1.9	2.2

MONTHLY AVERAGE = 7.9 MONTHLY MAXIMUM = 28.0 MONTHLY MINIMUM = 1.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	115	94	102	88	97	112	99	106	106	111	138	120	272	23	32	32	41	49	48	48	48	72	132	125	113
2	128	128	125	128	132	128	138	137	147	155	150	157	156	167	148	139	100	78	97	308	293	229	142	86	46
3	63	63	65	67	65	41	62	119	84	81	90	74	66	66	171	168	299	63	161	33	323	77	95	112	324
4	138	314	239	87	116	103	140	168	173	169	196	294	295	290	282	283	274	287	301	295	213	146	133	115	160
5	121	136	97	153	145	158	114	121	139	151	150	150	67	54	37	46	44	48	44	47	54	59	59	72	290
6	82	73	80	76	96	93	118	126	124	112	142	154	106	50	55	50	49	39	55	45	63	63	60	71	125
7	84	126	140	133	122	120	122	111	116	139	142	152	60	57	55	38	37	49	52	45	43	80	79	97	248
8	103	88	85	91	119	87	68	62	59	63	63	57	46	46	62	51	46	57	57	60	62	66	64	74	205
9	69	71	107	109	114	105	97	63	65	70	68	79	63	58	28	25	25	327	304	301	309	310	214	140	232
10	216	165	186	138	126	125	121	115	128	148	159	132	41	49	70	76	65	316	301	308	300	310	136	127	250
11	108	115	101	117	117	110	104	96	113	138	131	130	146	191	245	264	274	292	317	94	92	91	104	122	352
12	102	110	98	105	102	112	90	101	107	99	105	83	101	89	93	85	82	338	349	44	306	296	308	301	155
13	306	300	295	288	283	281	274	276	191	305	299	296	301	219	159	139	125	129	125	262	301	292	163	113	117
14	97	111	100	101	104	110	93	95	93	124	140	156	253	266	280	277	279	297	311	296	262	128	92	111	357
15	93	105	107	107	104	102	105	110	111	124	147	54	60	61	63	58	58	53	53	48	63	83	135	127	29
16	122	136	103	123	128	148	151	135	137	147	145	141	149	162	143	88	166	177	301	297	294	229	225	269	34
17	152	228	99	88	81	88	114	146	159	176	147	309	295	300	313	302	264	196	156	137	128	125	124	117	186
18	120	150	148	111	107	124	116	98	170	270	270	102	104	81	73	71	130	67	82	67	68	48	79	58	74
19	85	89	101	96	98	103	102	104	104	108	139	151	115	67	35	30	22	344	68	36	155	92	78	97	7
20	115	106	106	107	117	120	94	127	122	146	138	154	159	162	208	251	264	286	296	295	256	125	116	99	169
21	89	82	92	94	100	97	97	106	114	181	188	131	143	254	284	290	298	301	300	289	278	291	177	121	217
22	134	101	110	106	105	88	114	102	103	99	178	250	252	258	296	287	297	305	312	293	288	203	144	135	218
23	112	131	120	93	68	307	68	6	13	24	29	24	7	18	26	1	3	6	357	81	39	31	33	31	151
24	39	45	75	65	105	132	131	115	130	151	147	136	102	72	70	71	63	49	47	47	60	80	92	86	1
25	106	97	100	123	95	73	94	88	77	317	295	274	285	286	287	285	291	203	185	174	165	143	169	227	327
26	287	299	303	308	302	249	170	88	94	102	192	268	279	282	286	285	275	285	300	287	215	113	113	84	284
27	79	90	96	79	73	74	110	111	109	119	151	205	280	39	61	44	24	345	300	298	308	92	102	116	37
28	116	115	108	110	104	100	97	107	105	135	141	151	160	159	157	236	246	287	299	300	298	174	104	109	350
29	104	89	93	92	104	96	85	107	90	108	136	146	159	135	164	227	258	286	306	28	94	109	102	89	287
30	96	97	87	87	85	88	98	92	95	112	136	139	268	272	271	301	300	297	289	161	147	301	300	97	107
31	92	87	89	64	81	3	300	312	300	84	89	78	305	309	305	293	289	281	54	71	65	282	302	300	54

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
DECEMBER - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	9	8	10	7	9	8	10	9	10	13	20	30	30	34	14	14	13	13	13	12	11	21	10	9	14
2	18	11	15	19	14	11	7	8	8	7	8	6	17	14	12	17	15	13	51	13	7	14	12	18	14
3	13	7	6	6	9	36	15	51	13	13	20	12	12	14	41	37	13	47	53	41	21	16	14	14	22
4	18	35	55	47	51	18	11	21	17	10	20	8	13	11	14	16	9	6	6	18	23	9	10	9	19
5	11	8	12	20	20	8	9	12	9	10	12	12	29	25	19	17	13	12	12	13	12	12	10	15	14
6	13	11	11	8	18	18	17	11	20	17	23	9	38	17	18	17	13	15	12	11	10	11	11	5	15
7	14	15	7	5	5	5	6	6	9	10	10	25	15	20	11	13	15	12	13	11	16	13	8	16	12
8	14	21	15	17	17	12	8	7	9	9	9	14	20	20	11	12	12	11	13	11	7	8	9	7	12
9	8	10	19	15	20	22	18	10	7	10	10	14	14	12	19	20	14	19	6	6	10	11	39	25	15
10	27	43	29	8	6	4	6	6	9	7	9	34	28	25	17	7	14	32	5	4	5	6	54	39	18
11	10	13	41	16	10	9	7	11	8	12	18	26	29	38	25	12	6	5	22	12	11	8	8	8	15
12	8	9	7	9	9	10	7	7	8	11	13	14	31	24	30	27	37	43	32	65	16	7	8	7	18
13	10	10	7	11	20	30	25	46	50	9	8	11	14	19	10	11	19	10	24	22	7	5	26	9	17
14	14	14	16	8	12	10	8	7	12	17	24	37	32	24	16	18	9	6	5	6	39	8	9	10	15
15	10	8	8	8	9	7	8	8	7	10	21	28	15	12	12	12	10	18	12	20	17	9	6	13	12
16	13	28	20	25	17	11	33	9	39	31	14	14	15	17	24	26	44	26	6	5	7	33	27	28	21
17	26	34	14	9	10	12	14	11	15	20	21	47	16	18	13	13	11	22	10	10	9	9	24	16	17
18	8	8	13	11	16	13	10	11	35	19	15	28	29	17	8	10	34	9	17	25	27	19	51	22	19
19	16	12	11	11	11	15	12	10	9	13	19	18	13	16	20	15	12	45	26	42	55	24	9	17	19
20	10	6	8	10	16	8	6	12	10	8	14	15	22	20	23	19	8	7	5	5	26	13	15	10	12
21	10	21	13	8	13	19	9	9	18	41	43	24	33	28	15	13	11	6	6	16	16	34	40	17	19
22	19	10	9	14	10	9	10	16	40	15	26	26	18	17	13	11	10	9	8	6	27	19	14	38	16
23	41	41	13	7	15	38	24	31	20	19	21	24	23	26	21	19	22	25	43	33	25	13	23	16	24
24	18	15	14	13	14	15	13	8	8	9	16	19	15	10	12	8	10	13	10	17	11	13	12	13	13
25	13	12	14	12	11	26	36	15	32	41	10	18	12	12	9	8	10	29	11	13	8	12	9	22	17
26	10	9	9	10	16	17	37	11	23	19	47	27	21	13	17	12	9	6	7	5	50	35	12	8	18
27	13	7	9	9	34	26	9	8	11	20	17	25	48	31	24	29	29	19	5	5	10	38	9	10	19
28	10	11	9	7	7	8	7	8	8	11	11	26	30	28	24	30	9	8	6	6	14	35	10	10	14
29	9	6	7	8	8	8	6	9	10	14	15	19	34	26	49	29	12	5	5	44	40	17	10	7	16
30	8	8	13	6	5	6	6	6	9	11	15	23	43	15	17	10	8	5	17	49	39	49	30	44	18
31	8	27	28	51	35	78	49	15	40	50	39	19	19	10	10	7	11	36	24	9	22	16	10	9	26
HRAVE	14	15	15	13	15	17	14	13	17	16	18	21	24	20	18	16	15	17	16	18	19	17	17	16	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	14	14	22	19	14	15	12	12	15	18	15	18	17	15	12	21	17	19	19	12	19	16	24	13	17
MAX	34	51	53	55	29	38	25	21	39	54	41	65	50	39	28	44	47	51	55	26	43	40	43	19	41
MIN	7	6	6	6	8	5	5	7	6	4	5	7	5	5	6	5	9	8	9	5	6	6	7	8	8

DAY	26	27	28	29	30	31
AVE	18	19	14	16	18	26
MAX	50	48	35	49	49	78
MIN	5	5	6	5	5	7

MONTHLY AVERAGE = 16.8 MONTHLY MAXIMUM = 77.7 MONTHLY MINIMUM = 3.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
DECEMBER - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	13.4	11.8	10.6	9.7	8.7	8.4	8.1	8.3	9.1	11.7	14.8	17.3	19.7	21.5	21.4	21.6	21.5	20.8	20.5	19.9	19.1	17.6	14.5	14.3	15.2
2	12.6	12.2	12.4	11.7	10.8	11.7	10.8	10.9	11.2	12.7	15.3	17.1	19.8	20.6	21.0	21.1	20.6	19.9	19.6	19.3	18.5	16.9	15.8	15.7	15.8
3	15.6	14.8	14.7	14.4	14.4	14.8	14.9	14.4	15.9	17.1	19.0	20.6	21.8	22.8	23.9	24.2	23.9	22.7	21.8	21.5	21.0	19.9	19.1	18.6	18.8
4	17.5	16.7	15.3	15.0	14.7	14.5	14.1	14.1	14.2	14.4	14.6	14.1	15.1	15.5	16.9	17.4	17.2	16.0	15.5	15.1	14.0	13.5	13.1	13.0	15.1
5	12.6	12.2	13.0	12.3	12.3	11.8	11.8	11.9	12.9	13.7	15.4	16.3	17.8	18.5	18.8	19.0	18.5	17.9	18.0	17.9	17.6	16.8	16.6	16.1	15.4
6	15.3	15.1	14.7	14.3	13.8	13.8	12.6	12.4	12.3	13.8	13.8	14.5	15.7	17.5	18.0	18.0	18.0	18.3	18.0	17.4	16.6	15.9	15.5	14.2	15.4
7	13.2	11.4	10.1	9.8	9.7	9.2	8.9	9.2	10.6	12.3	14.7	17.4	20.0	20.7	20.7	20.9	20.1	19.4	18.9	19.0	18.9	17.5	17.1	15.4	15.2
8	14.4	14.7	15.1	13.8	13.5	14.1	15.1	15.6	16.4	18.0	19.4	20.4	21.5	22.1	22.3	22.1	21.8	21.1	20.8	20.3	19.4	19.2	18.9	17.5	18.2
9	17.4	17.5	15.3	15.2	14.4	14.8	15.2	17.2	17.6	19.4	21.1	22.5	22.9	23.2	23.5	23.9	23.7	22.2	19.9	18.9	18.7	17.6	16.7	14.9	18.9
10	14.4	13.5	12.9	11.9	12.5	12.4	12.2	11.9	11.8	14.2	17.6	20.6	22.1	23.1	23.6	23.5	23.1	21.5	19.8	19.4	18.2	17.6	16.2	15.7	17.1
11	14.7	14.1	12.6	11.4	11.4	11.3	11.1	10.2	11.6	13.8	16.1	17.8	20.1	21.6	22.3	22.6	22.0	20.4	19.5	17.9	16.5	15.0	14.6	13.8	15.9
12	12.5	11.9	11.6	10.6	10.6	9.9	10.1	10.5	10.2	12.3	16.0	18.5	20.9	22.0	23.1	23.2	22.6	21.5	20.8	19.9	19.3	17.8	16.9	16.2	16.2
13	15.7	15.2	15.3	14.9	14.0	14.0	14.6	14.2	13.4	11.1	10.1	9.8	10.1	10.5	10.4	10.1	10.2	10.1	9.8	10.1	10.3	10.1	8.6	8.4	11.7
14	8.3	7.5	7.0	6.8	6.0	5.3	4.8	5.1	6.1	7.5	9.5	11.2	12.2	13.0	13.5	13.5	12.9	11.7	11.0	10.1	9.2	8.4	7.5	6.8	9.0
15	6.2	5.8	5.5	5.1	4.8	4.3	4.1	3.9	5.5	7.8	9.8	12.6	14.0	15.4	16.1	15.5	14.9	14.2	14.1	13.6	13.2	12.7	10.9	10.8	10.0
16	10.3	9.6	10.0	9.1	8.8	8.4	8.2	8.0	8.4	8.5	9.5	12.1	15.0	16.7	17.6	17.9	17.6	16.4	14.3	13.7	13.4	12.3	11.6	11.7	12.0
17	11.4	11.1	9.9	9.7	9.2	8.8	8.6	8.5	8.6	9.1	10.1	11.2	11.9	12.5	12.5	12.9	11.6	10.6	9.3	8.9	8.9	8.4	8.4	8.2	10.0
18	8.3	8.2	7.9	7.8	7.9	7.5	7.8	8.2	8.0	8.7	8.8	9.7	9.9	10.7	11.0	11.3	11.3	10.1	9.8	9.4	9.2	8.8	8.2	7.2	9.0
19	6.6	6.2	5.6	5.1	4.7	4.2	3.8	3.9	5.3	7.3	8.9	10.9	12.7	13.6	14.1	14.2	14.0	13.6	12.5	11.3	10.9	9.8	8.9	7.6	9.0
20	7.2	7.0	6.3	6.0	5.0	4.4	4.8	3.8	5.3	7.3	9.8	12.2	13.7	14.7	15.3	15.7	15.5	14.0	12.7	11.9	11.1	10.4	10.0	8.8	9.7
21	8.0	7.4	6.7	6.2	6.3	5.4	4.5	5.2	5.2	5.6	8.1	11.5	13.0	14.3	15.5	15.9	15.1	13.7	12.8	12.3	11.4	11.0	9.7	9.1	9.7
22	8.6	7.3	7.3	6.9	6.3	5.7	5.7	4.9	5.9	8.2	10.1	11.7	13.6	15.5	16.1	16.1	15.4	14.1	13.3	12.2	11.2	10.2	9.6	9.4	10.2
23	8.7	8.3	7.2	7.0	6.5	6.1	6.5	10.2	12.9	12.7	12.7	13.4	14.2	14.6	14.8	14.9	14.8	14.1	13.5	12.4	12.2	11.6	11.2	10.9	11.3
24	10.4	10.0	9.3	8.8	6.7	4.1	3.5	3.1	4.9	7.3	10.1	12.0	13.5	14.1	14.6	14.8	14.2	14.0	13.5	13.2	12.8	11.5	10.3	10.2	10.3
25	9.0	9.2	8.4	7.7	7.4	6.3	5.2	5.4	5.5	6.5	7.5	10.8	15.1	15.6	14.8	13.9	11.9	10.6	10.6	10.3	9.4	9.1	8.3	8.1	9.4
26	8.1	7.5	6.9	5.9	5.3	4.5	3.3	2.9	3.5	5.5	7.3	8.4	9.6	10.1	10.2	10.0	9.3	7.9	7.3	6.6	5.6	4.5	3.6	3.0	6.5
27	1.5	1.1	0.8	0.1	-0.8	-1.1	-1.9	-1.3	0.6	2.4	4.8	7.3	9.6	10.9	11.4	11.5	11.4	10.5	8.7	8.1	7.9	5.9	4.5	3.7	4.9
28	2.7	2.0	1.8	1.3	0.7	-0.2	-0.4	-0.7	1.5	2.9	5.9	8.6	10.9	12.0	12.7	12.9	12.4	11.6	10.4	9.6	8.7	7.2	6.1	4.6	6.0
29	3.5	2.9	2.1	2.2	0.7	0.1	-0.2	-0.5	1.3	3.4	6.4	9.3	11.1	13.2	14.4	15.1	14.8	12.9	11.6	10.6	9.1	7.5	6.2	5.1	6.8
30	4.1	3.0	2.3	1.4	1.3	0.3	0.4	0.4	2.3	4.9	8.1	11.0	13.2	15.1	17.2	17.9	16.9	15.3	13.9	12.8	10.9	9.8	7.9	7.1	8.2
31	5.7	5.3	5.1	5.1	4.4	4.2	4.1	4.3	4.9	6.2	10.5	12.7	8.0	6.0	5.1	4.5	4.3	4.0	3.8	3.5	3.5	3.0	1.7	0.9	5.0
HRAVE	10.3	9.7	9.2	8.6	8.1	7.7	7.5	7.6	8.5	9.9	11.8	13.7	15.1	16.0	16.5	16.7	16.2	15.2	14.4	13.8	13.1	12.2	11.2	10.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15.2	15.8	18.8	15.1	15.4	15.4	15.2	18.2	18.9	17.1	15.9	16.2	11.7	9.0	10.0	12.0	10.0	9.0	9.0	9.7	9.7	10.2	11.3	10.3	9.4
MAX	21.6	21.1	24.2	17.5	19.0	18.3	20.9	22.3	23.9	23.6	22.6	23.2	15.7	13.5	16.1	17.9	12.9	11.3	14.2	15.7	15.9	16.1	14.9	14.8	15.6
MIN	8.1	10.8	14.4	13.0	11.8	12.3	8.9	13.5	14.4	11.8	10.2	9.9	8.4	4.8	3.9	8.0	8.2	7.2	3.8	3.8	4.5	4.9	6.1	3.1	5.2

DAY	26	27	28	29	30	31
AVE	6.5	4.9	6.0	6.8	8.2	5.0
MAX	10.2	11.5	12.9	15.1	17.9	12.7
MIN	2.9	-1.9	-0.7	-0.5	0.3	0.9

MONTHLY AVERAGE = 11.8 MONTHLY MAXIMUM = 24.2 MONTHLY MINIMUM = -1.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
DECEMBER - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.4	0.6	0.6	0.7	0.6	0.5	0.6	0.0	-0.6	-1.1	-1.0	-0.6	-0.6	-0.4	-0.2	-0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	1.1	0.1
2	1.3	0.5	0.9	1.0	1.3	0.5	0.5	0.9	0.1	-0.3	-0.6	-0.9	-1.0	-0.9	-0.5	-0.2	0.0	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.2
3	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.1	-0.4	-0.6	-0.9	-1.0	-0.8	-0.8	-0.6	-0.5	-0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.3	-0.2
4	0.2	0.5	0.4	0.3	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.3	-0.5	-0.3	-0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.0
5	0.3	0.2	0.1	0.2	0.0	0.0	0.0	0.0	-0.6	-0.9	-1.0	-0.7	-0.5	-0.4	-0.2	-0.1	0.1	0.3	0.2	0.2	0.3	0.3	0.3	0.4	-0.1
6	0.4	0.5	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.1	0.0	-0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.4	0.5	0.5	0.7	0.3
7	0.6	0.9	1.2	0.5	0.4	0.8	0.5	0.0	-0.8	-1.1	-1.0	-0.8	-0.4	-0.3	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.4	0.6	0.7	0.1
8	1.1	0.6	0.6	1.0	1.3	0.7	0.5	0.3	0.0	-0.3	-0.4	-0.4	-0.3	-0.3	-0.1	0.0	0.1	0.3	0.3	0.3	0.5	0.5	0.6	0.6	0.3
9	0.5	0.4	0.7	0.6	0.9	0.8	0.7	0.3	0.1	-0.3	-0.6	-0.7	-0.7	-0.3	-0.1	0.0	0.2	0.3	0.3	0.3	0.6	0.7	0.5	0.6	0.3
10	0.4	0.6	0.6	0.5	0.4	0.3	0.6	0.8	0.0	-1.0	-1.3	-0.9	-0.5	-0.4	-0.3	0.0	0.4	0.3	0.3	0.5	0.3	0.3	0.3	0.4	0.1
11	0.4	0.4	0.7	0.5	0.6	0.4	0.4	0.2	-0.5	-1.0	-1.0	-0.8	-0.7	-0.5	-0.4	-0.4	0.0	0.5	0.5	0.7	0.6	0.7	0.6	0.4	0.1
12	0.6	0.5	0.6	0.7	0.7	0.8	0.6	0.4	0.4	-0.8	-1.4	-1.1	-1.0	-0.6	-0.3	0.0	0.3	0.4	0.6	0.3	0.4	0.2	0.1	0.2	0.1
13	0.2	0.2	0.1	0.2	0.3	0.3	0.4	0.1	0.1	-0.2	-0.2	-0.2	-0.2	-0.4	-0.4	-0.2	0.0	0.1	0.2	0.4	0.4	0.5	0.3	0.4	0.1
14	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.3	-0.7	-0.6	-0.7	-0.6	-0.6	-0.6	-0.5	-0.4	-0.2	0.3	0.3	0.5	0.5	0.4	0.4	0.4	0.1
15	0.5	0.4	0.4	0.3	0.3	0.4	0.3	0.1	-0.6	-1.2	-1.0	-0.4	-0.4	-0.3	-0.2	-0.1	0.1	0.3	0.2	0.2	0.4	0.2	0.3	0.5	0.0
16	0.8	0.7	0.5	0.5	0.8	0.4	0.3	0.3	0.1	-0.2	-0.4	-0.6	-1.0	-0.7	-0.6	-0.2	0.0	0.3	0.2	0.3	0.4	0.3	0.3	0.2	0.1
17	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.1	0.0	0.0	-0.4	-0.3	-0.4	-0.3	-0.3	-0.2	0.1	0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0
18	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.1	-0.1	-0.1	0.0	-0.3	-0.4	-0.4	-0.3	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.1
19	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	-0.6	-1.0	-1.1	-1.0	-0.8	-0.3	0.0	0.1	0.3	0.3	0.5	0.6	0.5	0.4	0.7	0.6	0.1
20	0.6	0.6	0.3	0.2	0.6	0.4	0.5	0.4	-0.2	-1.1	-1.1	-1.2	-0.9	-0.6	-0.3	-0.3	-0.1	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.0
21	0.5	0.4	0.5	0.5	0.6	0.4	0.5	0.4	0.1	-0.3	-0.6	-1.0	-0.8	-0.6	-0.4	-0.3	0.1	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.1
22	0.3	0.5	0.4	0.5	0.6	0.6	0.4	0.4	-0.3	-1.0	-0.5	-0.5	-0.5	-0.6	-0.3	-0.3	0.0	0.3	0.4	0.7	0.3	0.4	0.5	0.4	0.1
23	0.5	0.4	0.5	0.6	0.4	0.5	0.6	1.1	0.2	-0.1	-0.3	-0.3	-0.2	-0.2	0.0	0.0	0.1	0.3	0.3	0.5	0.3	0.3	0.2	0.2	0.3
24	0.2	0.2	0.4	0.3	0.8	0.8	0.3	0.1	-0.5	-1.0	-1.4	-1.2	-1.0	-0.5	-0.3	-0.1	0.2	0.2	0.1	0.3	0.2	0.3	0.5	0.3	0.0
25	0.5	0.3	0.3	0.6	0.5	0.4	0.5	0.4	0.0	-0.1	-0.2	-0.4	-0.3	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.1
26	0.2	0.3	0.3	0.3	0.3	0.5	0.5	0.6	-0.3	-0.9	-0.4	-0.5	-0.6	-0.6	-0.6	-0.5	-0.2	0.3	0.4	0.6	0.3	0.5	0.5	0.6	0.1
27	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.2	-0.7	-0.8	-0.8	-0.6	-0.6	-0.4	-0.3	-0.1	0.2	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.1
28	0.6	0.5	0.3	0.4	0.4	0.5	0.4	0.3	-0.7	-1.0	-1.1	-0.9	-0.9	-0.8	-0.6	-0.2	0.0	0.3	0.3	0.3	0.6	0.6	0.6	0.6	0.0
29	0.6	0.6	0.6	0.7	0.5	0.6	0.6	0.5	-0.6	-0.9	-1.2	-1.1	-0.8	-0.7	-0.4	-0.4	-0.2	0.6	0.6	0.6	0.5	0.7	0.5	0.8	0.1
30	0.8	0.6	0.6	0.6	0.8	0.6	0.6	0.8	-0.5	-1.1	-1.0	-0.8	-0.6	-0.5	-0.4	-0.1	0.3	0.6	0.8	0.4	0.6	0.8	0.6	0.7	0.2
31	0.6	0.5	0.5	0.4	0.5	0.6	0.6	0.8	0.7	0.1	-0.2	-0.4	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	0.1	0.0	0.1	-0.1	-0.1	-0.1	0.1
HRAVE	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.3	-0.2	-0.6	-0.7	-0.7	-0.6	-0.5	-0.3	-0.2	0.1	0.3	0.3	0.3	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.2	-0.2	0.0	-0.1	0.3	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.3	0.0	0.1
MAX	1.1	1.3	0.4	0.5	0.4	0.7	1.2	1.3	0.9	0.8	0.7	0.8	0.5	0.5	0.5	0.8	0.4	0.4	0.7	0.6	0.6	0.7	1.1	0.8	0.6
MIN	-1.1	-1.0	-1.0	-0.5	-1.0	-0.2	-1.1	-0.4	-0.7	-1.3	-1.0	-1.4	-0.4	-0.7	-1.2	-1.0	-0.4	-0.4	-1.1	-1.2	-1.0	-1.0	-0.3	-1.4	-0.4

DAY	26	27	28	29	30	31
AVE	0.1	0.1	0.0	0.1	0.2	0.1
MAX	0.6	0.6	0.6	0.8	0.8	0.8
MIN	-0.9	-0.8	-1.1	-1.2	-1.1	-0.4

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = -1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
DECEMBER - 2014

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.16	0.37	0.50	0.52	0.54	0.51	0.30	0.17	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.22	0.28	0.36	0.41	0.23	0.13	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.20	0.40	0.47	0.27	0.38	0.32	0.20	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.14	0.20	0.23	0.40	0.20	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.18	0.31	0.40	0.34	0.44	0.50	0.38	0.24	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.12	0.16	0.13	0.07	0.11	0.11	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.36	0.50	0.58	0.59	0.44	0.26	0.20	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.40	0.46	0.49	0.49	0.35	0.24	0.13	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.31	0.50	0.50	0.64	0.30	0.36	0.28	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.34	0.47	0.56	0.57	0.53	0.42	0.27	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.34	0.50	0.58	0.57	0.53	0.44	0.27	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.29	0.46	0.53	0.58	0.52	0.34	0.17	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.12	0.11	0.16	0.14	0.06	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.35	0.49	0.57	0.59	0.54	0.43	0.27	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.43	0.44	0.46	0.43	0.37	0.24	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.13	0.17	0.35	0.48	0.43	0.49	0.25	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.21	0.23	0.19	0.19	0.19	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.07	0.13	0.29	0.19	0.23	0.18	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.35	0.48	0.57	0.59	0.55	0.45	0.29	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.34	0.47	0.56	0.59	0.48	0.31	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.23	0.47	0.57	0.57	0.54	0.45	0.31	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.33	0.47	0.55	0.57	0.54	0.44	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.34	0.49	0.58	0.60	0.56	0.47	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.48	0.58	0.60	0.56	0.47	0.27	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.10	0.25	0.24	0.53	0.47	0.57	0.45	0.23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.49	0.58	0.60	0.56	0.46	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.48	0.57	0.60	0.56	0.47	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.33	0.47	0.56	0.61	0.55	0.49	0.17	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.49	0.58	0.61	0.57	0.48	0.33	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.15
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.49	0.57	0.60	0.57	0.47	0.32	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.31	0.31	0.26	0.05	0.04	0.02	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.27	0.39	0.45	0.47	0.43	0.35	0.22	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.13	0.08	0.10	0.06	0.12	0.04	0.13	0.12	0.13	0.14	0.15	0.13	0.03	0.15	0.12	0.10	0.05	0.05	0.15	0.14	0.14	0.14	0.15	0.15	0.12
MAX	0.54	0.41	0.47	0.40	0.50	0.16	0.59	0.49	0.64	0.57	0.58	0.58	0.16	0.59	0.46	0.49	0.23	0.29	0.59	0.59	0.57	0.57	0.60	0.60	0.57
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
AVE	0.15	0.15	0.14	0.15	0.15	0.05
MAX	0.60	0.60	0.61	0.61	0.60	0.31
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
JANUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.4	3.8	3.0	3.7	4.4	2.0	2.1	2.5	2.1	5.7	6.1	6.9	9.0	9.9	7.8	6.8	6.2	6.3	7.9	9.1	10.9	9.7	7.8	7.3	6.1
2	4.0	2.2	2.0	3.3	2.7	1.7	3.2	2.4	2.7	2.7	2.8	4.8	7.2	9.5	10.9	11.3	12.0	13.9	10.8	9.8	7.1	3.7	2.3	4.1	5.7
3	2.7	5.8	5.3	5.2	3.8	5.0	6.8	5.4	2.8	3.1	3.2	2.6	4.2	4.6	8.4	10.1	10.4	9.5	8.8	6.1	2.5	2.3	4.1	6.5	5.4
4	7.8	6.2	8.9	7.9	8.6	8.6	9.4	9.3	11.0	8.2	17.2	18.5	13.6	15.7	11.7	15.8	15.9	18.7	18.4	20.0	17.1	17.2	17.6	14.0	13.2
5	10.2	10.1	12.9	15.4	18.3	19.9	18.6	18.8	21.4	19.3	22.2	18.7	17.9	16.6	17.9	17.8	20.5	21.2	17.6	16.4	16.3	16.6	14.9	13.0	17.2
6	14.5	14.4	10.9	10.7	9.4	10.6	13.0	10.9	12.4	11.7	11.0	9.9	14.0	14.5	15.6	13.4	19.5	22.1	20.9	24.1	22.3	20.0	10.7	13.7	14.6
7	16.6	11.5	14.1	14.5	13.6	12.2	14.2	17.2	19.4	23.0	23.3	21.9	21.6	16.0	21.0	19.0	21.1	23.4	24.4	21.8	22.4	21.2	20.0	27.1	19.2
8	26.2	26.5	26.2	30.2	29.4	29.0	28.1	29.8	31.0	25.1	20.5	19.1	20.0	18.0	16.4	16.5	15.1	15.6	15.9	16.5	15.6	16.0	13.4	16.0	21.5
9	16.5	18.0	22.1	23.2	19.6	19.8	21.2	25.5	25.8	25.5	21.5	18.7	19.5	19.4	21.0	21.7	18.4	20.9	22.6	24.2	24.1	24.2	22.4	24.1	21.7
10	23.4	23.0	25.0	22.1	21.1	20.4	22.0	22.4	22.0	18.7	16.8	12.2	11.2	9.8	9.1	9.0	10.6	11.2	12.1	11.9	12.5	11.4	12.4	10.5	15.9
11	10.4	8.2	8.9	6.9	6.8	6.7	8.1	11.5	10.9	9.6	8.3	8.0	9.0	8.6	10.2	13.0	14.3	11.4	7.9	8.4	10.5	5.2	6.0	6.2	9.0
12	3.1	4.6	6.1	5.6	4.1	2.7	3.2	4.2	5.1	5.4	7.2	4.8	7.0	3.8	7.2	8.0	6.7	8.8	7.6	5.8	3.5	2.8	4.8	5.6	5.3
13	4.9	5.2	5.7	6.9	5.3	5.1	3.3	7.3	6.3	5.7	3.8	3.9	4.9	4.4	8.6	16.3	7.0	4.6	7.7	8.9	6.3	8.0	6.4	4.9	6.3
14	3.0	2.6	4.8	3.8	3.4	4.0	4.1	7.4	8.7	9.4	8.6	6.9	7.6	6.9	9.0	5.3	6.5	3.6	5.4	5.8	10.1	5.2	4.2	8.5	6.0
15	7.7	5.8	7.6	8.6	9.0	8.9	14.2	14.6	14.2	12.8	17.9	14.0	12.3	12.2	15.0	18.4	20.9	14.3	13.9	19.9	14.3	11.9	9.8	11.9	12.9
16	11.1	19.2	18.4	21.2	18.9	18.7	20.1	18.5	16.2	17.7	16.6	15.0	14.4	13.5	10.4	9.8	8.9	8.9	12.6	14.8	13.1	10.3	13.1	7.8	14.5
17	9.5	8.8	8.8	8.1	8.5	8.1	7.7	8.6	8.5	7.6	8.7	7.0	4.4	2.9	3.7	8.2	11.0	12.2	12.0	9.5	3.9	5.8	7.8	7.7	7.9
18	6.6	7.4	4.8	9.1	8.6	10.6	10.6	9.8	9.1	8.0	8.0	9.7	10.2	10.1	9.8	10.9	8.8	4.3	2.8	4.5	2.9	2.7	5.7	6.1	7.6
19	7.5	9.4	9.0	3.9	7.1	9.6	8.5	6.9	5.7	8.2	6.2	5.4	2.3	2.8	4.2	6.8	8.7	10.7	10.3	10.4	5.7	4.2	5.4	6.7	6.9
20	8.6	7.8	7.3	7.1	7.0	6.5	7.1	6.1	8.1	5.7	5.3	3.3	4.0	5.2	3.3	5.9	6.0	7.8	7.9	2.8	5.5	7.4	7.8	7.8	6.3
21	7.0	7.4	7.8	4.7	5.6	5.0	2.9	7.8	8.8	5.9	4.4	4.4	8.1	13.6	16.1	15.7	13.1	13.2	15.4	13.9	13.4	7.7	5.6	3.3	8.8
22	5.1	7.8	10.2	8.8	7.4	14.9	17.1	9.1	9.2	10.9	7.8	12.0	13.8	10.0	8.9	9.3	8.3	10.9	11.2	15.2	15.4	14.6	12.8	10.3	10.9
23	10.2	13.9	14.4	17.5	14.1	11.2	15.7	15.9	14.8	17.2	13.4	15.1	16.4	16.3	16.1	13.9	11.8	15.4	17.3	13.8	15.1	20.2	20.2	16.3	15.3
24	17.2	20.1	21.8	19.8	18.4	20.4	25.4	21.5	25.4	24.7	21.5	22.1	21.7	22.3	16.5	13.7	12.0	12.8	15.6	17.4	15.6	10.8	12.4	13.2	18.4
25	14.1	7.3	8.5	9.2	11.3	9.0	6.4	12.5	8.4	8.1	9.4	15.2	16.0	16.9	13.9	13.6	15.8	18.7	15.6	14.8	18.9	18.6	16.9	17.1	13.2
26	12.0	13.4	16.7	16.8	18.3	17.4	17.0	19.8	18.2	18.6	17.3	15.4	11.1	12.1	16.8	18.2	18.1	15.9	17.8	15.2	10.9	10.3	6.9	5.7	15.0
27	4.9	9.7	8.0	7.8	8.8	9.5	7.8	9.6	7.8	8.7	6.9	5.7	3.9	5.3	5.0	5.1	7.1	12.8	14.0	12.1	9.9	7.1	4.8	4.4	7.8
28	5.8	6.3	7.5	5.9	6.7	7.7	6.1	2.9	6.8	4.9	4.4	3.0	3.9	3.1	3.5	3.3	14.6	16.0	15.3	13.0	10.7	4.1	2.1	2.8	6.7
29	3.5	6.0	6.9	6.8	6.8	8.1	7.9	9.0	8.4	11.3	7.2	4.2	5.4	7.7	4.4	3.8	11.1	7.5	12.9	10.0	16.2	20.5	19.0	23.5	9.5
30	26.7	23.4	19.9	18.7	21.5	20.6	17.5	17.2	20.3	20.5	20.8	20.5	21.8	20.0	17.2	15.0	19.2	17.3	13.6	16.8	13.8	7.2	9.3	9.6	17.8
31	10.7	8.6	9.3	10.4	11.5	11.5	13.7	13.1	11.6	10.1	9.5	8.9	7.7	5.4	5.9	6.0	5.9	6.5	7.2	4.7	3.1	5.2	4.5	4.7	8.2
HRAVE	10.2	10.5	11.1	11.1	11.0	11.1	11.7	12.2	12.4	12.1	11.5	10.9	11.1	10.9	11.1	11.7	12.4	12.8	13.0	12.8	11.9	10.7	10.0	10.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.1	5.7	5.4	13.2	17.2	14.6	19.2	21.5	21.7	15.9	9.0	5.3	6.3	6.0	12.9	14.5	7.9	7.6	6.9	6.3	8.8	10.9	15.3	18.4	13.2
MAX	10.9	13.9	10.4	20.0	22.2	24.1	27.1	31.0	25.8	25.0	14.3	8.8	16.3	10.1	20.9	21.2	12.2	10.9	10.7	8.6	16.1	17.1	20.2	25.4	18.9
MIN	2.0	1.7	2.3	6.2	10.1	9.4	11.5	13.4	16.5	9.0	5.2	2.7	3.3	2.6	5.8	7.8	2.9	2.7	2.3	2.8	2.9	5.1	10.2	10.8	6.4

DAY	26	27	28	29	30	31
AVE	15.0	7.8	6.7	9.5	17.8	8.2
MAX	19.8	14.0	16.0	23.5	26.7	13.7
MIN	5.7	3.9	2.1	3.5	7.2	3.1

MONTHLY AVERAGE = 11.4 MONTHLY MAXIMUM = 31.0 MONTHLY MINIMUM = 1.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JANUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	276	200	265	216	141	174	260	276	183	289	280	279	275	279	266	292	307	286	296	303	305	299	305	308	346
2	308	123	284	130	309	127	128	158	138	147	172	264	274	280	264	264	271	281	300	298	285	226	227	130	243
3	114	98	113	104	88	101	108	109	122	131	148	162	241	228	269	304	294	283	302	293	181	122	123	104	27
4	96	93	86	104	91	102	103	97	132	132	61	63	68	69	58	52	37	42	51	52	53	57	63	73	234
5	104	99	73	68	58	62	68	70	64	62	67	64	44	51	38	38	38	39	48	60	59	63	70	80	167
6	77	82	93	86	101	128	140	132	144	159	159	138	70	59	42	51	41	42	44	45	46	52	96	77	258
7	69	105	75	74	73	85	77	71	70	60	62	55	60	79	68	57	56	61	60	87	90	80	87	79	81
8	80	76	66	66	67	69	67	63	63	65	67	54	58	58	59	60	62	62	61	58	54	64	66	54	29
9	52	48	49	44	56	54	56	44	50	44	52	51	51	46	56	61	58	42	44	62	62	62	71	68	163
10	71	67	63	66	67	69	68	65	66	66	64	64	56	44	24	31	38	38	42	54	49	44	56	63	152
11	72	121	127	121	112	129	122	65	115	117	83	82	75	73	65	62	48	32	34	64	332	294	312	81	320
12	54	107	69	20	234	88	121	142	130	143	114	110	126	132	149	284	284	291	298	292	38	75	114	108	228
13	122	121	117	121	115	133	125	128	123	123	167	118	43	282	294	291	291	328	66	55	71	63	77	37	345
14	289	216	69	310	330	347	69	65	58	63	71	67	60	45	360	22	77	80	340	348	32	75	102	66	267
15	93	101	80	98	132	104	63	62	58	46	36	43	42	59	24	33	38	55	62	43	49	63	69	90	140
16	89	66	58	45	44	46	56	44	54	60	63	68	63	61	53	66	37	38	44	46	45	56	71	109	227
17	121	110	112	93	100	99	109	108	114	130	138	141	132	279	275	286	298	299	293	311	125	107	87	115	44
18	117	98	107	116	99	106	114	114	113	134	137	94	67	70	69	68	54	10	314	54	64	69	99	119	144
19	99	102	89	91	106	93	103	88	95	124	90	107	205	252	271	270	290	301	297	296	275	124	85	101	182
20	92	82	93	92	88	93	90	99	87	117	92	126	123	79	219	266	279	283	297	328	96	90	89	84	181
21	103	107	88	95	94	84	309	111	112	302	105	205	287	296	282	281	285	282	14	54	31	17	305	134	115
22	27	55	61	45	41	13	14	51	74	75	82	36	28	27	30	33	35	11	9	66	58	60	63	52	347
23	54	54	65	68	73	69	61	58	60	60	50	32	28	33	34	30	46	42	44	61	55	43	54	56	53
24	56	59	60	48	51	49	45	60	55	37	61	63	47	34	47	59	86	92	59	54	57	63	93	66	34
25	83	126	121	77	118	129	107	138	111	136	82	69	48	34	61	61	45	41	48	51	49	50	55	62	114
26	69	72	67	68	62	61	66	61	57	64	66	64	49	61	66	70	59	59	61	63	62	67	192	67	65
27	88	87	139	116	129	124	129	122	129	136	140	331	14	66	74	23	268	290	298	302	309	308	124	114	24
28	84	91	85	95	93	95	102	52	87	109	131	114	99	135	287	161	285	297	298	298	300	231	164	143	346
29	102	118	103	84	103	84	86	85	99	121	131	134	134	129	138	145	81	41	43	44	53	42	52	61	337
30	62	62	60	60	62	63	60	48	43	43	47	53	58	62	59	46	45	45	28	48	50	44	57	54	121
31	65	73	64	63	50	52	58	57	54	62	63	65	66	80	74	69	112	98	73	140	98	89	100	117	158

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	17	23	29	16	10	26	21	51	59	10	16	14	13	11	12	17	21	16	6	5	6	6	6	7	17
2	45	31	37	49	39	32	14	47	22	24	29	17	16	15	13	13	11	6	8	7	11	24	41	10	23
3	13	6	9	11	20	12	9	8	19	19	25	49	23	26	24	16	11	4	5	9	22	13	13	9	16
4	9	10	5	8	6	8	7	6	9	28	15	9	9	8	15	13	13	11	10	8	12	9	7	9	10
5	16	20	10	9	11	10	9	8	8	11	11	17	19	18	13	13	12	11	11	8	10	8	9	10	12
6	9	9	16	16	19	20	7	14	11	9	8	16	16	15	13	15	11	10	10	9	10	10	18	10	13
7	7	18	11	9	10	13	15	13	10	10	11	13	11	17	15	13	14	10	10	12	10	8	10	10	12
8	12	12	10	8	9	8	8	8	8	8	12	16	14	16	14	11	10	9	11	13	15	11	7	11	11
9	13	13	12	12	13	13	11	12	11	10	14	16	16	17	13	11	13	13	11	9	8	9	10	10	12
10	10	9	8	8	7	9	8	8	7	8	10	14	22	24	15	16	15	14	13	10	12	16	13	10	12
11	10	16	6	14	24	17	15	11	9	12	19	15	10	8	7	7	12	13	24	23	20	49	20	20	16
12	45	33	20	29	50	57	30	36	13	13	12	27	26	46	23	11	9	7	5	3	19	30	19	10	24
13	18	15	12	10	18	20	32	15	6	13	21	33	38	33	32	7	13	21	15	16	16	14	16	49	20
14	19	18	21	40	35	41	23	10	11	11	14	23	23	31	18	48	17	41	45	25	13	20	27	12	24
15	18	15	10	25	8	15	7	12	13	21	14	16	21	17	18	14	11	10	7	10	13	8	9	9	13
16	9	7	10	10	11	13	12	11	11	11	11	12	11	12	23	17	18	15	10	12	13	14	6	17	12
17	7	8	9	7	8	8	10	9	8	10	9	15	24	41	26	18	8	8	6	7	40	12	10	10	13
18	13	7	13	6	6	7	6	7	6	7	16	21	14	9	8	7	13	32	54	41	48	35	17	13	17
19	10	7	8	18	10	6	10	8	9	10	14	18	57	40	24	12	14	6	5	5	26	11	11	9	15
20	6	8	9	11	9	9	9	8	7	10	21	29	33	17	47	20	17	4	6	52	11	7	7	6	15
21	9	10	6	18	9	30	29	22	38	31	30	22	23	16	14	11	10	7	21	18	15	20	23	57	20
22	38	24	14	18	54	42	21	25	46	26	41	32	22	26	29	27	28	13	16	12	13	11	9	15	25
23	14	12	10	7	8	9	9	11	10	11	15	15	14	14	15	13	19	12	12	10	10	11	11	11	12
24	12	13	14	13	12	13	12	12	13	13	17	14	17	15	20	18	14	12	11	14	9	10	10	8	13
25	11	29	19	14	20	15	23	6	22	20	21	11	20	12	14	7	12	11	13	12	11	11	11	9	15
26	8	10	7	7	8	10	7	7	13	10	12	13	14	14	10	12	11	14	10	8	11	11	21	44	12
27	15	19	9	8	14	20	16	18	13	14	17	30	41	15	24	39	13	8	6	6	6	23	17	11	17
28	8	8	6	12	11	7	10	28	8	13	20	35	29	45	27	58	11	8	7	6	6	28	20	17	18
29	26	9	9	8	10	7	7	7	11	9	15	29	17	22	67	21	17	39	14	18	15	11	13	11	17
30	9	9	11	12	10	9	11	13	9	10	12	14	12	10	12	14	11	12	18	12	12	49	19	16	14
31	9	8	12	10	12	13	9	9	12	9	9	9	8	13	8	6	13	10	12	19	17	15	15	13	11
HRAVE	15	14	12	14	16	17	13	15	15	14	16	20	20	20	20	17	14	13	13	14	15	17	14	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	17	23	16	10	12	13	12	11	12	12	16	24	20	24	13	12	13	17	15	15	20	25	12	13	15
MAX	59	49	49	28	20	20	18	16	17	24	49	57	49	48	25	23	41	54	57	52	57	54	19	20	29
MIN	5	6	4	5	8	7	7	7	8	7	6	3	6	10	7	6	6	6	5	4	6	9	7	8	6

DAY	26	27	28	29	30	31
AVE	12	17	18	17	14	11
MAX	44	41	58	67	49	19
MIN	7	6	6	7	9	6

MONTHLY AVERAGE = 15.5 MONTHLY MAXIMUM = 66.7 MONTHLY MINIMUM = 3.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JANUARY - 2015

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.9	0.7	0.9	1.0	1.1	1.2	1.1	1.2	1.5	1.8	3.2	3.6	4.6	4.6	5.3	5.8	5.7	4.6	3.6	3.1	2.5	1.9	1.7	1.5	2.6
2	1.1	-0.5	-0.6	-1.7	-1.4	-1.9	-2.1	-2.2	-1.5	-0.1	2.3	3.9	5.5	6.2	6.8	6.9	6.4	5.3	4.7	4.2	3.6	2.7	2.3	1.7	2.1
3	1.2	0.6	0.2	-0.3	-0.9	-1.3	-1.6	-1.6	-0.4	0.6	2.9	4.9	6.4	8.0	9.1	9.2	9.0	7.8	7.0	5.8	5.4	4.7	3.1	2.5	3.4
4	2.0	1.2	1.1	0.7	0.2	0.1	0.2	-0.2	1.0	4.2	8.2	9.8	12.0	13.1	13.9	14.3	14.8	14.4	13.3	12.6	12.1	11.4	11.1	9.9	7.6
5	8.4	7.9	8.7	9.2	9.4	9.1	8.7	8.4	9.3	11.0	12.8	14.4	16.1	17.2	18.2	18.6	18.2	17.8	17.0	15.7	15.1	14.0	13.4	12.2	13.0
6	12.1	11.9	10.1	9.7	8.1	6.9	5.6	5.8	5.2	7.6	11.5	15.6	17.5	18.8	19.5	19.9	19.6	18.8	18.3	17.8	17.2	16.7	13.9	13.2	13.4
7	13.6	11.9	11.9	12.4	10.2	10.7	9.8	11.7	12.8	14.7	16.6	18.5	20.4	23.2	23.4	22.4	22.5	22.0	21.2	20.0	19.0	18.1	17.2	16.2	16.7
8	14.8	13.6	12.4	11.7	10.9	10.4	10.2	10.2	10.3	10.3	10.9	11.2	11.5	12.1	12.5	13.1	13.1	12.6	12.0	11.8	11.6	11.3	10.8	10.7	11.7
9	10.4	10.5	10.6	10.6	10.2	10.3	10.3	10.2	10.5	11.1	12.1	12.7	13.5	14.7	15.7	16.0	15.8	15.8	15.7	15.3	14.4	13.4	12.7	12.1	12.7
10	11.4	10.9	10.6	10.3	9.9	9.6	9.4	9.2	9.6	10.4	11.6	13.2	14.8	15.8	16.0	16.4	16.2	15.8	15.3	14.7	14.5	14.3	13.4	13.1	12.8
11	12.6	11.4	11.0	11.0	10.6	10.1	10.2	11.4	10.4	12.0	14.6	16.2	17.5	18.3	18.2	18.4	18.1	18.0	17.4	16.8	15.5	14.5	13.7	13.3	14.2
12	13.2	12.9	12.9	12.8	12.2	11.9	11.3	11.0	11.5	11.8	13.6	14.9	16.6	17.0	18.1	17.1	16.9	15.8	14.9	14.3	14.4	13.4	13.1	12.7	13.9
13	11.9	11.7	11.2	10.6	10.3	10.2	9.6	8.9	9.6	10.7	12.0	13.1	14.3	14.5	15.3	12.0	11.3	11.6	11.3	11.4	10.8	10.6	10.5	10.3	11.4
14	9.6	9.2	9.2	8.7	8.8	8.8	8.8	8.5	9.1	10.4	12.1	13.1	13.8	14.7	14.3	14.9	14.8	14.5	13.8	12.9	12.6	11.5	10.4	10.3	11.5
15	10.0	9.4	9.0	7.4	5.8	6.0	7.6	7.6	8.1	9.6	10.9	12.7	14.2	15.3	16.0	16.5	16.9	16.1	15.0	15.2	14.4	13.4	12.8	12.6	11.8
16	12.2	11.5	11.7	11.6	11.2	10.8	10.5	10.4	10.9	12.3	14.0	15.7	16.8	17.6	18.3	19.0	19.0	18.2	17.4	16.8	16.0	14.5	12.3	10.9	14.1
17	9.5	8.8	7.8	6.6	5.9	5.9	5.2	5.2	6.3	9.3	12.1	14.5	16.5	17.8	20.0	21.3	21.3	20.0	17.8	16.8	15.1	13.4	11.9	10.9	12.5
18	9.7	9.6	8.4	8.3	8.3	7.3	7.3	6.7	8.3	10.3	13.9	17.7	19.6	21.0	21.8	22.0	21.2	20.8	19.3	17.7	17.1	15.4	13.9	12.7	14.1
19	11.7	11.4	10.5	9.2	8.1	8.0	8.6	6.9	8.3	11.1	13.7	16.4	19.1	20.8	21.8	22.8	22.9	21.7	19.8	18.4	16.6	15.1	13.8	12.1	14.5
20	11.5	9.6	8.7	8.3	7.6	6.5	6.0	5.8	7.2	10.4	13.4	16.3	18.7	20.9	22.4	22.7	22.1	20.7	19.1	18.2	15.8	14.7	13.6	13.0	13.9
21	12.3	11.2	10.9	9.6	9.9	9.4	8.8	8.4	9.3	12.0	14.8	17.2	18.7	19.1	19.2	18.8	18.4	17.2	15.6	14.4	14.6	14.0	12.9	12.6	13.7
22	12.5	12.4	11.7	11.2	10.5	10.6	9.8	9.0	9.5	9.9	10.7	11.2	12.2	13.3	14.1	14.4	14.4	13.9	13.1	11.5	10.5	9.6	8.5	7.8	11.3
23	7.1	6.7	6.1	5.9	5.5	5.0	4.7	4.9	5.6	7.0	8.7	9.9	11.1	12.1	13.1	13.9	14.3	13.9	13.3	12.3	11.9	11.9	11.4	10.4	9.5
24	10.0	10.0	9.9	9.6	9.3	9.0	8.6	8.2	9.0	9.9	11.9	14.2	15.8	16.6	17.9	18.8	19.0	17.7	16.5	15.8	15.0	14.6	13.9	13.4	13.1
25	12.9	10.4	9.4	10.6	7.6	7.6	8.0	5.7	8.3	8.2	13.2	14.9	16.2	17.8	18.6	18.3	19.0	18.9	18.0	17.6	17.3	16.6	16.1	15.5	13.6
26	14.3	13.3	14.1	13.9	13.9	13.8	13.2	13.0	13.6	14.9	16.5	18.3	19.0	19.6	20.1	20.1	19.8	19.5	19.1	18.9	18.4	18.1	16.2	16.4	16.6
27	15.7	15.4	13.9	13.9	13.0	12.9	12.3	11.6	11.8	12.0	12.7	15.9	18.5	20.9	22.2	22.5	22.8	21.2	19.0	17.9	17.5	17.2	15.2	14.5	16.3
28	13.4	12.7	11.9	11.6	10.4	10.3	10.4	9.3	10.5	13.2	15.8	18.2	20.4	22.3	23.2	24.1	22.6	20.6	19.3	18.4	17.9	17.3	16.2	15.7	16.1
29	15.3	14.7	14.5	14.5	13.7	13.4	13.0	12.8	13.0	13.8	15.5	17.6	18.5	20.1	20.1	20.0	20.5	19.8	18.8	18.2	18.1	17.8	16.6	15.4	16.5
30	15.0	13.9	12.9	12.0	12.0	11.7	12.0	11.9	12.5	12.7	12.9	12.8	11.8	11.1	11.5	11.6	11.5	11.7	11.4	11.3	11.3	11.1	10.9	11.5	12.0
31	10.9	10.8	11.3	11.3	11.6	11.4	11.0	11.2	11.4	11.4	10.8	10.9	11.6	11.9	12.4	12.4	11.3	10.7	10.7	10.4	10.4	10.6	10.4	10.4	11.1
HRAVE	10.6	9.9	9.4	9.1	8.5	8.3	8.0	7.8	8.5	9.8	11.8	13.5	14.9	16.0	16.7	16.9	16.8	16.0	15.1	14.4	13.8	13.0	12.1	11.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.6	2.1	3.4	7.6	13.0	13.4	16.7	11.7	12.7	12.8	14.2	13.9	11.4	11.5	11.8	14.1	12.5	14.1	14.5	13.9	13.7	11.3	9.5	13.1	13.6
MAX	5.8	6.9	9.2	14.8	18.6	19.9	23.4	14.8	16.0	16.4	18.4	18.1	15.3	14.9	16.9	19.0	21.3	22.0	22.9	22.7	19.2	14.4	14.3	19.0	19.0
MIN	0.7	-2.2	-1.6	-0.2	7.9	5.2	9.8	10.2	10.2	9.2	10.1	11.0	8.9	8.5	5.8	10.4	5.2	6.7	6.9	5.8	8.4	7.8	4.7	8.2	5.7

DAY	26	27	28	29	30	31
AVE	16.6	16.3	16.1	16.5	12.0	11.1
MAX	20.1	22.8	24.1	20.5	15.0	12.4
MIN	13.0	11.6	9.3	12.8	10.9	10.4

MONTHLY AVERAGE = 12.2 MONTHLY MAXIMUM = 24.1 MONTHLY MINIMUM = -2.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JANUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.0	-0.2	0.0	-0.1	-0.1	0.1	0.1	0.0	0.0	-0.3	-0.5	-0.4	-0.7	-0.5	-0.5	-0.6	-0.3	0.0	0.2	0.3	0.2	0.2	0.4	0.4	-0.1
2	0.3	0.4	0.5	0.4	0.6	0.4	0.3	0.2	-0.2	-0.4	-0.5	-0.5	-0.6	-0.6	-0.4	-0.4	-0.2	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.0
3	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.3	-0.3	-0.5	-0.5	-0.5	-0.6	-0.6	-0.5	-0.3	-0.1	0.4	0.6	0.8	0.5	0.4	0.6	0.5	0.1
4	0.5	0.6	0.8	0.6	0.5	0.3	0.3	0.6	0.2	-0.2	-0.3	-0.3	-0.4	-0.2	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.2
5	0.7	0.8	0.6	0.4	0.3	0.3	0.3	0.3	0.0	-0.2	-0.4	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.2	0.2	0.4	0.4	0.5	0.5	0.6	0.2
6	0.6	0.5	0.6	0.6	0.9	0.6	0.5	1.3	0.8	-0.5	-1.3	-1.2	-0.5	-0.3	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.9	0.2
7	0.6	0.8	0.9	0.7	1.0	1.0	1.1	0.5	0.2	-0.2	-0.3	-0.3	-0.3	-0.4	0.0	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3
8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	-0.1
9	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	-0.1	-0.1	-0.2	-0.1	-0.2	-0.3	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	-0.1
10	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	-0.1	-0.3	-0.4	-0.6	-0.7	-0.5	-0.3	-0.2	-0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	-0.1
11	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.1	-0.1	-0.6	-1.1	-1.3	-1.0	-0.8	-0.3	-0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	-0.1
12	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.4	-0.3	-0.3	-0.7	-0.8	-1.0	-0.6	-0.7	-0.4	-0.2	0.1	0.5	0.4	0.2	0.3	0.3	0.2	0.0
13	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.1	-0.2	-0.5	-0.6	-0.5	-0.4	-0.4	-0.1	0.0	0.1	0.2	0.1	0.2	0.2	0.3	0.1	0.0
14	0.2	0.2	0.3	0.4	0.3	0.3	0.4	0.5	0.1	-0.3	-0.7	-0.8	-0.6	-0.5	-0.1	-0.2	0.1	0.4	0.5	0.4	0.3	0.5	0.6	0.8	0.1
15	0.5	0.7	0.6	0.6	0.4	0.7	0.4	0.2	-0.1	-0.4	-0.4	-0.5	-0.6	-0.5	-0.1	0.0	0.1	0.3	0.4	0.2	0.2	0.4	0.5	0.5	0.2
16	0.5	0.4	0.2	0.1	0.1	0.1	0.2	0.1	-0.1	-0.4	-0.6	-0.7	-0.6	-0.4	-0.2	-0.1	0.2	0.4	0.3	0.2	0.3	0.4	0.5	0.5	0.1
17	0.7	0.6	0.3	0.6	0.6	0.5	0.4	0.2	-0.8	-1.2	-1.4	-1.4	-1.1	-0.6	-0.4	-0.5	-0.1	0.3	0.5	0.6	0.7	0.6	0.7	0.7	0.0
18	0.9	0.5	0.5	0.3	0.6	0.4	0.3	0.3	-0.6	-0.9	-1.0	-0.9	-0.6	-0.6	-0.3	-0.1	0.2	0.4	0.4	0.5	0.7	0.5	0.5	0.6	0.1
19	0.6	0.5	0.9	0.5	0.8	0.8	0.5	0.5	-0.8	-1.2	-1.0	-1.1	-0.6	-0.5	-0.5	-0.4	-0.2	0.4	0.7	0.7	0.7	0.6	1.1	0.6	0.2
20	0.7	0.6	0.6	0.6	0.7	0.5	0.6	0.5	-0.6	-1.1	-1.2	-0.8	-0.8	-0.8	-0.5	-0.5	-0.2	0.4	0.8	0.5	0.4	0.4	0.6	0.7	0.1
21	0.6	0.4	0.4	0.3	0.4	0.5	0.4	0.4	0.2	-0.1	-0.9	-0.8	-0.6	-0.6	-0.6	-0.6	-0.4	0.1	0.1	0.0	0.0	0.2	0.4	0.5	0.0
22	0.5	0.3	0.3	0.3	0.3	0.2	0.2	0.2	-0.3	-0.6	-0.8	-0.6	-0.5	-0.5	-0.4	-0.2	0.0	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.0
23	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	-0.3	-0.5	-0.6	-0.6	-0.6	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.2	-0.1
24	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	-0.2	-0.3	-0.6	-0.6	-0.5	-0.3	-0.2	0.0	0.3	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.1
25	0.4	0.7	1.4	0.6	1.0	1.4	1.3	0.7	0.7	0.4	-0.2	-0.4	-0.4	-0.3	-0.3	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.3	0.3	0.4
26	0.5	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.0	-0.3	-0.4	-0.6	-0.2	-0.3	-0.3	-0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.1
27	0.4	0.3	0.4	0.3	0.6	0.4	0.4	0.2	0.5	0.1	-0.1	-0.6	-0.7	-0.7	-0.7	-0.5	-0.4	0.1	0.3	0.3	0.4	0.5	0.4	0.3	0.1
28	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.4	-0.8	-1.2	-0.9	-0.9	-1.0	-0.8	-0.6	-0.4	-0.3	0.1	0.2	0.2	0.3	0.3	0.4	0.3	0.0
29	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.2	0.1	-0.1	-0.3	-0.3	-0.6	-0.2	-0.1	0.1	0.1	0.2	0.1	0.1	-0.1	0.1	0.1	0.1
30	0.0	0.0	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.1
31	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.0	-0.1	-0.3	-0.4	-0.2	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1
HRAVE	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	-0.1	-0.4	-0.6	-0.6	-0.5	-0.5	-0.3	-0.2	0.0	0.2	0.3	0.3	0.3	0.3	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	0.0	0.1	0.2	0.2	0.2	0.3	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.0	0.0	-0.1	0.1	0.4
MAX	0.4	0.6	0.8	0.8	0.8	1.3	1.1	0.1	0.1	0.2	0.3	0.5	0.4	0.8	0.7	0.5	0.7	0.9	1.1	0.8	0.6	0.5	0.2	0.5	1.4
MIN	-0.7	-0.6	-0.6	-0.4	-0.4	-1.3	-0.4	-0.3	-0.3	-0.7	-1.3	-1.0	-0.6	-0.8	-0.6	-0.7	-1.4	-1.0	-1.2	-1.2	-0.9	-0.8	-0.6	-0.6	-0.4

DAY	26	27	28	29	30	31
AVE	0.1	0.1	0.0	0.1	0.1	0.1
MAX	0.6	0.6	0.6	0.6	0.3	0.3
MIN	-0.6	-0.7	-1.2	-0.6	0.0	-0.4

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = -1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.25	0.37	0.23	0.56	0.25	0.37	0.35	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.11
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.34	0.47	0.57	0.60	0.53	0.46	0.32	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.15
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.33	0.47	0.57	0.60	0.56	0.47	0.32	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.15
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.34	0.48	0.58	0.61	0.57	0.48	0.34	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.15
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.34	0.48	0.58	0.61	0.58	0.49	0.34	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.16
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.34	0.49	0.59	0.62	0.59	0.50	0.35	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.16
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.35	0.48	0.57	0.61	0.57	0.29	0.29	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.14
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.15	0.20	0.12	0.13	0.14	0.14	0.12	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.05
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.09	0.12	0.10	0.17	0.30	0.44	0.22	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.19	0.30	0.48	0.55	0.41	0.26	0.18	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.11
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.25	0.47	0.57	0.53	0.41	0.29	0.27	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.12
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.12	0.28	0.36	0.48	0.30	0.33	0.16	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.09
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.18	0.37	0.20	0.33	0.21	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.26	0.48	0.55	0.51	0.50	0.15	0.27	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.13
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.34	0.49	0.60	0.63	0.60	0.51	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.16
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.50	0.61	0.65	0.62	0.53	0.39	0.17	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.17
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.50	0.60	0.64	0.61	0.52	0.38	0.17	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.17
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.32	0.50	0.58	0.64	0.61	0.52	0.34	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.16
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.40	0.56	0.64	0.58	0.47	0.32	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.15
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.49	0.58	0.61	0.63	0.50	0.36	0.16	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.16
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.28	0.48	0.60	0.61	0.61	0.52	0.37	0.20	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.16
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.38	0.53	0.64	0.67	0.64	0.55	0.41	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.18
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.36	0.52	0.59	0.67	0.53	0.42	0.33	0.22	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.16
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.37	0.53	0.63	0.68	0.65	0.57	0.42	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.17
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.28	0.26	0.38	0.50	0.50	0.52	0.17	0.16	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.12
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.29	0.35	0.45	0.21	0.25	0.24	0.11	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.09
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.10	0.22	0.60	0.67	0.65	0.54	0.37	0.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.14
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.37	0.50	0.62	0.66	0.63	0.56	0.35	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.17
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.10	0.14	0.18	0.17	0.24	0.11	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.05	0.06	0.06	0.08	0.09	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.05	0.14	0.22	0.19	0.20	0.12	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.26	0.38	0.47	0.51	0.47	0.40	0.28	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.11	0.15	0.15	0.15	0.16	0.16	0.14	0.05	0.06	0.11	0.12	0.09	0.06	0.13	0.16	0.17	0.17	0.16	0.15	0.16	0.16	0.18	0.16	0.17	0.12
MAX	0.56	0.60	0.60	0.61	0.61	0.62	0.61	0.20	0.44	0.55	0.57	0.48	0.37	0.55	0.63	0.65	0.64	0.64	0.64	0.63	0.61	0.67	0.67	0.68	0.52
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
AVE	0.09	0.14	0.17	0.05	0.02	0.04
MAX	0.45	0.67	0.66	0.24	0.09	0.22
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
FEBRUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	3.5	3.7	3.6	2.4	4.7	3.8	2.8	3.6	6.4	5.2	3.6	2.9	4.2	5.3	5.2	5.7	10.0	12.6	14.2	13.2	3.9	4.9	5.6	5.1	5.7
2	3.3	4.5	6.9	8.0	7.8	5.1	8.5	8.2	9.3	9.1	9.0	6.4	7.6	8.2	8.4	4.8	3.1	4.1	3.5	1.8	2.1	2.8	3.4	3.5	5.8
3	5.1	8.7	9.2	6.8	4.7	9.9	6.9	8.1	6.6	7.3	6.4	5.8	4.4	2.3	5.0	9.9	11.1	11.9	11.2	9.9	5.9	4.0	4.3	6.6	7.2
4	4.5	6.7	6.4	4.3	3.3	5.2	6.7	6.1	3.9	4.5	3.7	3.0	3.1	4.6	6.2	11.3	13.3	14.1	13.5	11.7	6.3	3.8	5.2	8.8	6.7
5	8.0	7.5	7.4	8.4	8.5	7.4	7.0	8.1	8.7	8.6	9.2	8.8	6.9	7.6	7.9	11.1	12.0	13.0	13.3	15.7	17.4	13.0	11.9	8.8	9.8
6	10.1	11.7	10.0	9.9	11.1	10.3	10.1	9.8	9.7	9.8	9.4	7.0	4.8	6.3	2.8	2.4	5.2	6.6	8.0	3.9	3.0	6.1	8.0	9.5	7.7
7	9.9	7.2	6.3	7.5	8.8	8.1	4.6	6.4	6.9	5.3	3.3	2.6	2.7	3.8	7.1	11.5	12.4	13.3	11.5	9.8	7.6	4.3	5.4	7.0	7.2
8	8.1	6.8	7.1	5.9	6.4	5.8	6.7	7.0	6.4	5.0	2.9	2.4	2.3	4.5	7.1	11.2	13.8	13.8	14.2	12.2	7.7	5.5	5.9	3.4	7.2
9	4.6	7.1	7.4	5.1	6.9	7.3	6.7	7.5	7.9	6.2	6.2	6.5	4.2	3.1	3.3	2.7	4.0	11.8	16.1	16.1	9.1	4.7	5.4	6.8	6.9
10	9.1	8.6	5.7	5.2	6.8	7.1	6.8	7.8	7.5	4.3	4.3	3.5	3.4	4.5	9.2	12.0	14.1	13.4	10.8	6.1	4.3	4.7	6.2	8.0	7.2
11	9.1	7.0	8.5	5.9	5.2	7.0	5.6	6.6	3.2	1.6	2.5	11.3	14.3	11.4	14.1	12.4	9.6	7.6	9.0	21.8	15.9	14.1	12.2	11.4	9.5
12	13.4	11.1	12.5	12.9	11.0	10.3	9.3	13.4	15.1	16.6	17.8	23.2	26.0	20.6	18.2	14.2	15.7	17.5	11.8	8.2	10.2	7.2	6.5	11.0	13.9
13	13.0	14.3	15.5	17.1	14.1	20.0	18.8	15.9	22.0	21.1	18.9	18.2	16.2	17.6	16.4	15.5	13.0	12.3	13.1	10.1	14.9	13.1	11.7	14.9	15.7
14	13.2	10.9	10.5	9.6	13.4	17.2	15.2	16.8	16.8	16.9	13.4	12.0	11.6	10.7	9.9	6.8	10.0	11.1	12.2	10.0	10.1	11.4	9.9	7.0	11.9
15	3.7	4.6	5.1	4.3	2.1	5.1	5.3	5.4	5.3	3.7	4.1	3.6	13.0	13.3	12.9	10.2	12.2	11.1	12.1	10.2	6.1	9.2	5.0	4.7	7.2
16	3.9	5.3	6.4	5.2	5.2	6.1	6.6	4.0	5.2	4.1	3.4	5.5	11.4	15.1	16.3	20.6	17.7	16.2	10.5	3.9	3.3	2.8	5.2	5.3	7.9
17	3.0	1.9	5.7	12.2	16.1	15.2	16.5	13.1	13.3	15.6	14.4	CAL	CAL	CAL	CAL	CAL	CAL	12.2	11.4	6.4	4.4	3.8	7.8	7.3	10.0
18	7.8	7.3	6.2	5.6	6.2	6.9	7.4	7.4	5.7	6.8	4.9	3.4	2.9	3.8	4.6	6.0	15.6	15.2	12.4	10.1	4.2	2.1	7.1	8.2	7.0
19	8.8	7.8	5.5	6.9	8.2	8.7	7.0	7.4	6.0	5.6	5.4	2.9	2.8	5.2	9.2	12.1	13.3	14.5	12.9	9.5	6.5	5.3	3.8	7.8	7.6
20	6.8	3.6	5.4	7.7	5.1	7.7	7.9	4.6	3.5	2.8	3.8	2.2	3.2	3.7	7.1	11.4	11.2	10.5	7.4	4.7	3.7	4.2	4.0	4.0	5.7
21	6.8	5.0	5.6	4.8	5.6	5.4	4.4	8.1	5.7	2.9	2.5	2.8	5.3	9.3	12.4	13.6	11.6	9.3	9.5	6.6	4.9	5.3	4.4	4.0	6.5
22	4.9	3.8	4.5	3.6	3.9	3.2	4.1	2.5	3.9	4.4	11.9	10.4	6.9	13.6	15.6	14.0	17.1	14.3	8.2	3.5	4.8	4.9	6.9	8.0	7.4
23	7.1	13.3	8.4	5.3	3.5	9.9	12.9	13.9	10.8	10.1	11.5	12.0	14.9	17.2	16.2	15.2	15.6	15.0	14.3	11.8	5.0	3.4	6.3	8.2	10.9
24	8.4	8.9	10.3	8.1	5.1	5.1	2.5	9.2	7.7	15.3	4.5	2.9	5.7	7.5	15.7	13.6	13.5	14.5	7.4	8.6	7.3	8.0	7.2	5.7	8.4
25	4.9	7.2	3.9	6.7	7.5	7.1	4.2	5.3	4.6	3.4	3.5	3.7	6.1	11.2	14.3	13.6	14.4	14.3	11.3	5.9	4.2	4.9	6.5	7.6	7.3
26	7.2	6.5	5.0	8.1	6.2	7.0	4.9	7.8	7.3	5.8	4.9	3.6	4.3	4.3	4.7	9.6	16.1	15.0	9.6	6.8	4.5	2.9	6.8	7.7	6.9
27	8.8	7.9	8.0	8.4	7.5	7.3	8.2	6.6	5.4	6.7	7.9	3.4	4.6	10.8	15.8	15.9	18.3	17.7	15.5	12.3	11.7	10.4	8.6	9.8	9.9
28	9.0	7.2	4.9	2.6	2.7	4.7	5.4	6.2	7.2	7.2	15.9	16.4	15.2	17.2	17.8	15.2	16.9	12.2	8.2	9.5	5.5	4.1	4.4	4.9	9.2
HRAVE	7.4	7.4	7.2	7.1	7.1	8.0	7.6	8.1	7.9	7.7	7.5	6.9	7.7	9.0	10.5	11.2	12.6	12.7	11.2	9.3	6.9	6.1	6.6	7.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.7	5.8	7.2	6.7	9.8	7.7	7.2	7.2	6.9	7.2	9.5	13.9	15.7	11.9	7.2	7.9	10.0	7.0	7.6	5.7	6.5	7.4	10.9	8.4	7.3
MAX	14.2	9.3	11.9	14.1	17.4	11.7	13.3	14.2	16.1	14.1	21.8	26.0	22.0	17.2	13.3	20.6	16.5	15.6	14.5	11.4	13.6	17.1	17.2	15.7	14.4
MIN	2.4	1.8	2.3	3.0	6.9	2.4	2.6	2.3	2.7	3.4	1.6	6.5	10.1	6.8	2.1	2.8	1.9	2.1	2.8	2.2	2.5	2.5	3.4	2.5	3.4

DAY	26	27	28	29	30	31
AVE	6.9	9.9	9.2	***	***	***
MAX	16.1	18.3	17.8	***	***	***
MIN	2.9	3.4	2.6	***	***	***

MONTHLY AVERAGE = 8.4 MONTHLY MAXIMUM = 26.0 MONTHLY MINIMUM = 1.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	132	45	278	278	69	80	92	138	127	140	149	214	262	260	290	275	292	296	305	299	98	129	98	98	1
2	85	77	100	91	94	84	108	111	110	143	152	135	77	53	73	338	257	70	325	150	338	26	82	70	275
3	114	100	97	107	99	85	97	87	103	114	129	155	137	183	253	283	293	301	313	296	271	143	99	93	135
4	84	101	101	86	95	105	95	124	117	106	134	141	218	255	275	296	296	299	308	299	296	118	108	90	125
5	90	91	104	107	100	96	96	94	99	120	144	146	148	89	78	64	48	33	40	45	46	70	95	112	245
6	115	106	116	109	108	119	127	122	131	142	152	155	101	77	273	67	273	288	300	304	79	76	89	83	291
7	82	91	90	89	87	96	95	86	90	114	128	140	225	248	274	295	281	301	311	302	293	161	115	104	295
8	89	89	105	107	98	98	100	98	108	113	105	241	222	265	264	298	301	300	304	301	292	116	99	66	64
9	72	106	115	106	107	104	105	95	104	129	122	135	151	264	266	264	241	285	301	300	305	148	114	91	349
10	87	100	111	112	96	97	101	91	87	118	142	147	149	239	284	283	276	283	288	307	201	134	121	101	168
11	89	91	77	77	110	98	99	92	110	272	267	46	32	20	28	8	17	359	28	70	86	92	85	71	326
12	23	52	70	90	76	66	66	52	86	100	118	121	103	92	97	89	92	74	111	108	71	59	66	59	339
13	50	61	59	49	66	45	51	54	67	64	63	42	43	67	69	63	30	31	32	49	42	48	64	58	137
14	71	93	121	108	69	62	67	63	63	61	53	47	51	60	53	88	63	40	45	50	54	50	71	70	221
15	123	98	95	98	65	86	98	123	98	107	161	167	297	291	296	260	301	294	296	302	302	308	260	160	16
16	117	111	93	83	85	87	83	105	101	120	157	260	281	278	272	280	279	272	284	187	310	162	118	120	16
17	121	284	54	44	39	33	45	62	77	68	71	CAL	CAL	CAL	CAL	CAL	CAL	273	290	302	221	134	92	101	253
18	96	82	97	95	101	101	93	93	92	106	143	126	148	171	210	267	300	302	308	307	292	178	100	99	156
19	87	91	98	110	96	97	96	85	84	121	121	112	248	260	291	303	300	294	297	301	272	149	125	90	315
20	79	76	86	85	105	93	88	85	113	92	116	86	233	270	271	288	275	281	280	292	285	182	121	112	80
21	104	103	93	90	85	81	95	91	103	79	224	264	268	282	274	295	297	310	307	265	161	159	128	161	10
22	287	294	106	62	77	70	94	151	152	264	294	293	261	257	267	283	285	291	286	296	258	247	245	293	179
23	284	298	288	280	245	289	291	299	303	287	292	266	257	275	276	281	284	284	286	299	258	277	303	300	307
24	302	301	298	303	308	157	228	304	275	296	258	256	255	252	273	314	340	30	85	84	93	70	75	94	183
25	90	77	80	99	109	91	92	115	130	138	135	213	298	302	290	285	278	281	285	302	182	125	119	89	239
26	95	97	102	111	116	96	100	107	119	139	120	125	142	265	258	266	278	280	287	300	308	207	101	101	186
27	90	95	89	87	84	86	86	96	119	100	72	63	92	252	245	239	246	266	279	282	273	288	273	255	207
28	266	303	288	111	211	251	210	264	273	285	232	224	257	235	237	260	284	294	303	288	251	190	247	274	6

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	14	35	13	44	20	31	22	39	10	16	24	28	24	16	22	19	11	9	6	5	55	9	10	11	21
2	19	23	12	6	9	23	11	8	9	8	10	22	15	21	14	27	41	38	19	62	53	31	38	31	23
3	16	9	7	11	15	5	7	7	10	14	16	16	27	48	18	13	12	8	6	5	22	9	10	10	13
4	13	10	10	15	13	8	8	12	11	13	21	29	32	20	17	11	11	7	6	5	16	21	10	7	14
5	8	8	9	9	7	11	10	8	9	8	11	15	20	21	10	8	10	12	12	12	10	10	10	9	11
6	10	7	10	10	9	7	5	4	5	6	8	14	25	15	50	57	18	12	7	52	38	8	6	6	16
7	6	8	8	5	5	9	12	7	6	16	23	53	36	25	23	17	12	9	6	6	5	26	13	7	14
8	6	8	8	9	8	8	9	8	10	16	32	54	55	20	15	13	9	7	6	5	36	11	9	23	16
9	19	8	7	11	8	7	9	7	10	13	14	18	52	37	27	35	21	8	7	5	7	33	9	7	16
10	5	7	10	11	7	7	8	6	6	17	23	27	31	37	18	14	8	8	8	11	22	10	7	9	13
11	9	9	7	10	9	7	10	9	34	68	56	49	21	31	26	20	24	37	47	13	8	11	12	13	23
12	10	9	7	12	8	12	18	13	11	13	12	12	10	16	15	16	15	10	10	10	13	14	12	8	12
13	11	6	10	13	12	15	11	11	9	11	13	14	21	13	10	14	15	14	11	15	11	10	16	11	12
14	9	25	18	13	8	8	8	7	8	13	17	16	20	19	17	18	17	14	13	13	14	13	9	18	14
15	41	13	11	46	57	10	7	14	8	27	18	36	21	14	15	17	10	9	7	7	17	7	14	14	18
16	11	10	7	10	8	8	6	11	13	17	30	23	17	12	14	12	12	13	8	24	29	38	11	11	15
17	44	54	29	14	14	13	15	15	13	10	11	CAL	CAL	CAL	CAL	CAL	CAL	29	6	12	32	13	8	10	19
18	10	7	8	11	9	8	7	8	13	15	22	31	49	37	25	23	12	10	7	7	12	24	7	11	15
19	6	6	8	9	7	6	7	7	12	13	16	38	48	22	20	15	14	9	7	8	12	10	9	7	13
20	14	28	10	8	10	8	7	12	12	25	18	37	30	26	19	14	13	7	9	13	16	21	9	12	16
21	10	12	18	16	10	15	10	7	13	25	32	24	22	21	14	13	13	11	8	24	8	7	15	27	16
22	20	41	36	68	43	39	40	51	41	30	14	13	29	17	16	12	9	11	8	8	16	16	17	17	26
23	9	5	6	19	25	5	6	8	12	12	12	14	17	14	15	15	12	9	9	7	13	33	5	5	12
24	6	9	9	11	12	35	54	9	14	10	65	41	30	32	18	21	21	19	37	13	14	8	13	20	22
25	32	12	21	16	15	10	23	11	12	22	30	32	24	18	17	18	14	11	7	13	24	8	9	8	17
26	7	9	17	8	7	15	11	8	9	16	24	38	29	42	39	25	14	9	6	6	15	23	11	9	17
27	9	8	8	7	7	9	9	11	16	15	9	46	49	23	20	18	15	12	7	7	9	8	17	12	15
28	12	10	22	46	25	22	22	14	17	14	12	14	15	15	14	18	10	11	10	8	16	18	20	23	17
HRAVE	14	14	13	17	14	13	13	12	13	17	21	28	29	23	19	19	15	13	11	14	19	16	12	13	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	21	23	13	14	11	16	14	16	16	13	23	12	12	14	18	15	19	15	13	16	16	26	12	22	17
MAX	55	62	48	32	21	57	53	55	52	37	68	18	21	25	57	38	54	49	48	37	32	68	33	65	32
MIN	5	6	5	5	7	4	5	5	5	5	7	7	6	7	7	6	6	7	6	7	7	8	5	6	7

DAY	26	27	28	29	30	31
AVE	17	15	17	***	***	***
MAX	42	49	46	***	***	***
MIN	6	7	8	***	***	***

MONTHLY AVERAGE = 16.2 MONTHLY MAXIMUM = 68.3 MONTHLY MINIMUM = 3.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
FEBRUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	10.4	10.1	9.6	9.6	8.7	8.2	8.1	7.6	7.8	8.6	8.9	10.3	12.9	15.2	16.9	17.5	17.6	16.4	14.8	14.0	13.4	12.1	11.8	11.3	11.7
2	10.1	9.3	8.7	8.6	8.2	7.5	6.8	7.4	9.3	10.9	13.4	16.6	18.3	19.2	19.8	20.4	20.7	19.5	18.8	17.7	17.0	15.3	13.5	12.8	13.7
3	11.3	10.8	10.8	9.7	8.7	8.2	8.3	7.6	9.8	12.2	14.5	16.9	18.7	20.4	21.5	22.3	22.1	20.7	19.0	17.6	16.5	15.1	14.0	12.6	14.6
4	11.6	11.0	10.4	9.7	9.1	7.9	7.6	7.6	8.7	11.5	13.8	16.4	18.5	20.1	21.8	22.8	22.6	21.3	19.5	18.4	17.3	15.8	14.3	13.5	14.6
5	11.9	11.4	10.8	10.8	10.1	8.3	8.8	8.8	9.9	13.1	16.0	18.7	21.7	23.4	24.6	24.5	24.3	23.9	23.2	22.8	22.2	19.7	17.9	16.7	16.8
6	15.3	14.8	13.6	13.9	13.0	11.4	11.0	11.0	12.2	14.9	17.8	20.9	23.4	24.7	25.9	26.4	26.8	25.8	23.4	22.5	20.6	17.9	15.9	14.7	18.2
7	14.1	13.3	11.7	11.5	10.0	10.0	8.6	9.0	10.7	13.3	15.8	18.9	21.3	22.7	24.4	25.0	24.9	23.1	21.0	20.0	18.7	16.5	15.2	13.7	16.4
8	12.6	11.1	11.1	9.9	9.1	8.9	8.2	9.1	10.3	13.0	15.6	17.9	20.5	22.1	24.2	25.3	25.1	23.9	22.1	20.7	19.6	17.9	16.9	15.4	16.3
9	14.0	13.5	12.7	11.4	11.1	11.3	9.8	9.5	12.2	14.3	17.5	20.7	22.3	24.1	26.0	27.9	27.9	25.8	22.9	21.7	21.0	18.9	17.6	15.8	17.9
10	14.6	14.3	13.1	12.1	11.0	10.8	10.2	9.7	12.0	14.4	17.0	19.8	22.4	24.1	25.5	25.9	25.2	23.7	21.3	20.7	19.4	17.6	16.3	15.2	17.4
11	13.9	12.9	11.6	10.8	10.2	10.0	8.5	8.9	10.3	12.6	16.0	21.0	21.9	22.3	22.4	22.5	22.5	22.3	21.9	21.1	19.8	18.7	17.9	17.1	16.5
12	16.4	15.5	14.5	14.0	12.9	12.1	12.3	12.3	13.8	15.5	17.4	18.9	19.5	20.2	20.6	20.9	20.8	20.1	19.0	18.0	17.2	16.5	15.4	14.9	16.6
13	14.6	13.4	12.8	13.5	12.8	12.9	12.9	12.4	13.8	15.2	16.6	18.3	20.0	22.0	22.7	23.1	23.0	22.4	21.8	20.9	20.5	19.4	18.6	18.3	17.6
14	16.9	15.8	14.2	14.2	15.1	15.7	15.0	15.2	16.5	18.1	19.6	21.2	22.7	23.9	24.2	24.4	24.2	23.5	22.9	22.4	21.8	21.8	20.0	18.5	19.5
15	17.4	17.2	17.0	15.8	14.9	14.4	14.3	13.7	15.1	16.8	19.1	21.1	22.6	22.1	22.1	22.5	21.7	20.8	19.8	18.7	18.2	17.5	15.9	14.9	18.1
16	15.2	13.8	13.1	12.3	11.1	10.6	10.6	10.2	12.6	14.6	16.9	18.5	20.4	21.4	21.7	21.8	21.3	20.7	19.5	18.4	18.3	17.1	15.5	15.3	16.3
17	14.9	14.1	14.1	15.8	15.5	14.8	13.9	13.5	14.4	15.4	17.0	CAL	CAL	CAL	CAL	CAL	CAL	20.6	18.4	17.7	16.2	15.2	13.7	12.5	15.4
18	11.6	10.8	9.1	8.8	8.0	7.5	7.2	7.1	9.8	12.6	15.1	17.8	20.5	22.8	23.8	24.5	23.5	21.5	20.1	19.3	18.2	16.6	15.0	14.0	15.2
19	12.6	11.8	11.1	10.0	9.0	9.1	8.0	8.5	9.7	12.2	15.6	19.7	21.7	23.4	25.3	26.0	25.6	24.5	22.1	20.7	19.5	17.2	16.8	14.8	16.5
20	13.3	12.7	11.2	9.9	9.9	9.0	9.4	8.7	9.3	12.4	15.4	18.8	20.5	21.4	22.9	23.2	22.8	21.8	20.5	20.0	19.1	17.4	17.1	16.4	16.0
21	15.6	15.4	13.6	13.0	11.5	10.8	10.3	10.4	13.1	14.9	17.2	19.0	21.8	23.3	23.5	23.4	22.9	22.0	20.9	19.2	17.7	16.8	16.6	16.9	17.1
22	15.6	14.8	14.0	13.8	13.5	13.7	12.2	12.8	14.4	15.8	19.2	20.0	20.9	21.5	21.8	21.1	20.5	19.4	18.4	18.1	16.7	16.4	15.8	15.1	16.9
23	14.2	13.5	12.9	12.9	12.7	12.6	12.9	13.1	13.7	14.2	15.3	17.1	19.0	19.3	19.4	19.6	19.0	18.1	17.2	15.9	15.3	14.7	14.2	13.3	15.4
24	13.1	12.9	12.5	11.8	11.3	10.1	10.3	10.5	10.6	9.2	8.8	10.2	12.6	13.7	14.5	13.2	11.1	9.0	8.2	7.9	7.8	7.7	7.7	6.9	10.5
25	6.4	6.0	5.3	4.8	4.4	4.1	3.4	4.0	6.3	7.9	10.7	12.4	14.5	16.7	17.9	18.1	17.8	17.2	15.6	14.8	13.6	12.6	11.4	10.6	10.7
26	10.0	9.8	8.5	8.2	7.7	7.0	6.1	5.6	9.0	12.2	14.9	17.4	19.3	20.8	21.4	22.2	21.6	20.4	18.6	17.3	16.5	15.3	14.0	12.7	14.0
27	11.4	10.6	9.3	8.8	7.5	6.5	6.5	6.6	8.4	12.8	15.8	17.8	20.4	22.0	22.8	23.3	22.5	21.2	19.8	18.6	18.0	17.1	16.4	16.0	15.0
28	15.1	14.7	14.7	13.8	14.6	14.2	14.2	14.4	14.5	15.3	17.3	17.4	17.1	17.8	18.0	18.1	17.6	17.1	16.5	16.2	15.9	15.6	15.5	15.3	15.9
HRAVE	13.4	12.7	11.9	11.4	10.8	10.3	9.8	9.8	11.4	13.4	15.7	17.9	19.8	21.1	22.1	22.4	22.1	21.0	19.5	18.6	17.7	16.4	15.4	14.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	11.7	13.7	14.6	14.6	16.8	18.2	16.4	16.3	17.9	17.4	16.5	16.6	17.6	19.5	18.1	16.3	15.4	15.2	16.5	16.0	17.1	16.9	15.4	10.5	10.7
MAX	17.6	20.7	22.3	22.8	24.6	26.8	25.0	25.3	27.9	25.9	22.5	20.9	23.1	24.4	22.6	21.8	20.6	24.5	26.0	23.2	23.5	21.8	19.6	14.5	18.1
MIN	7.6	6.8	7.6	7.6	8.3	11.0	8.6	8.2	9.5	9.7	8.5	12.1	12.4	14.2	13.7	10.2	12.5	7.1	8.0	8.7	10.3	12.2	12.6	6.9	3.4

DAY	26	27	28	29	30	31
AVE	14.0	15.0	15.9	***	***	***
MAX	22.2	23.3	18.1	***	***	***
MIN	5.6	6.5	13.8	***	***	***

MONTHLY AVERAGE = 15.7 MONTHLY MAXIMUM = 27.9 MONTHLY MINIMUM = 3.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
FEBRUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.2	0.3	0.2	0.2	0.3	0.1	0.0	-0.1	-0.2	-0.4	-0.4	-0.7	-1.3	-0.6	-0.6	-0.6	-0.3	0.1	0.3	0.3	0.4	0.4	0.6	0.7	0.0
2	0.6	0.4	0.5	0.6	0.8	0.6	0.9	0.4	-0.4	-0.9	-1.2	-1.0	-0.8	-0.4	-0.3	-0.3	-0.2	0.5	0.6	0.4	0.3	0.6	0.5	0.5	0.1
3	0.6	0.5	0.6	0.5	0.5	0.7	0.5	0.3	-0.8	-1.2	-1.1	-1.1	-0.8	-0.5	-0.4	-0.4	-0.1	0.4	0.6	0.8	0.8	0.4	0.7	0.6	0.1
4	0.5	0.6	0.6	0.4	0.4	0.6	0.5	0.1	-0.5	-1.0	-0.8	-0.6	-0.6	-0.6	-0.5	-0.4	-0.1	0.3	0.6	0.7	0.6	0.4	0.4	0.9	0.1
5	0.8	0.8	0.5	0.4	0.5	0.6	0.6	0.2	-0.8	-1.3	-1.4	-1.3	-1.2	-0.8	-0.4	0.1	0.3	0.5	0.4	0.3	0.3	0.7	0.5	0.7	0.0
6	0.9	0.9	0.8	0.3	0.5	1.0	0.8	0.3	-0.6	-1.1	-1.4	-1.3	-1.0	-0.8	-0.4	-0.4	-0.4	0.2	0.8	0.6	0.6	0.8	0.8	0.9	0.1
7	0.9	0.7	0.6	0.7	0.6	0.6	0.6	0.2	-0.8	-1.2	-0.7	-0.6	-0.6	-0.6	-0.6	-0.5	-0.3	0.2	0.6	0.6	0.6	0.6	0.6	0.6	0.1
8	0.7	0.6	0.6	0.6	0.5	0.6	0.4	0.0	-1.0	-1.1	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6	-0.3	0.2	0.5	0.5	0.8	0.6	0.6	0.5	0.1
9	0.5	0.5	0.5	0.4	0.6	0.5	0.4	0.1	-0.9	-1.1	-1.5	-1.5	-1.0	-0.6	-0.5	-0.5	-0.4	0.1	0.4	0.5	0.6	0.5	0.5	0.7	-0.1
10	0.7	0.5	0.4	0.4	0.7	0.6	0.6	0.2	-1.0	-1.0	-1.0	-0.8	-0.8	-0.7	-0.6	-0.6	-0.4	0.1	0.5	0.5	0.6	0.5	0.4	0.6	0.0
11	0.7	0.6	0.5	0.5	0.6	0.7	0.6	0.1	-0.5	-0.4	-0.4	-0.6	-0.6	-0.5	-0.3	-0.2	0.1	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.1
12	0.2	0.3	0.4	0.3	0.4	0.4	0.3	0.1	-0.6	-1.0	-1.4	-1.3	-1.1	-0.9	-0.8	-0.4	-0.1	0.2	0.3	0.5	0.4	0.4	0.5	0.6	-0.1
13	0.4	0.4	0.6	0.1	0.2	0.1	0.1	0.1	-0.3	-0.6	-0.7	-0.6	-0.7	-0.7	-0.5	-0.2	0.1	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.0
14	0.4	0.5	0.6	0.7	0.5	0.3	0.4	0.2	-0.3	-0.4	-0.5	-0.6	-0.8	-0.7	-0.3	-0.3	-0.1	0.1	0.2	0.2	0.3	0.2	0.5	0.4	0.1
15	0.3	0.4	0.4	0.6	0.2	0.3	0.3	0.2	0.0	-0.6	-0.9	-0.9	-0.8	-0.6	-0.5	-0.7	-0.4	-0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.0
16	0.3	0.4	0.5	0.4	0.4	0.4	0.6	0.0	-1.0	-1.0	-0.8	-0.8	-0.9	-0.9	-0.8	-0.8	-0.6	-0.2	0.2	0.3	0.4	0.6	0.4	0.3	-0.1
17	0.5	0.4	0.5	0.2	0.0	0.0	0.1	0.0	-0.5	-0.8	-1.1	CAL	CAL	CAL	CAL	CAL	CAL	-0.1	0.3	0.4	0.6	0.4	0.7	0.6	0.1
18	0.6	0.6	0.6	0.6	0.5	0.6	0.5	-0.2	-1.1	-1.5	-1.1	-1.0	-0.9	-0.9	-0.8	-0.7	-0.3	0.0	0.3	0.5	0.7	0.7	0.6	0.7	0.0
19	0.7	0.8	0.6	0.6	0.5	0.4	0.6	0.3	-0.7	-1.1	-1.1	-1.0	-0.8	-0.7	-0.9	-0.8	-0.4	-0.1	0.3	0.4	0.5	0.5	0.4	0.7	0.0
20	0.4	0.5	0.6	0.7	0.4	0.5	0.6	0.1	-0.3	-0.8	-0.9	-0.8	-0.6	-0.6	-0.6	-0.5	-0.2	0.1	0.3	0.4	0.4	0.6	0.3	0.4	0.0
21	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.2	-1.2	-0.8	-0.6	-0.5	-0.7	-0.8	-0.7	-0.7	-0.4	0.1	0.4	0.5	0.3	0.2	0.4	0.4	0.0
22	0.8	0.8	0.6	0.6	0.5	0.4	0.3	0.1	-0.5	-0.5	-0.8	-0.6	-0.5	-0.4	-0.4	-0.3	-0.2	-0.1	0.2	0.3	0.5	0.5	0.2	0.1	0.1
23	0.3	0.2	0.2	0.2	0.2	0.1	0.0	-0.1	-0.4	-0.4	-0.6	-0.6	-0.8	-1.0	-0.9	-0.9	-0.5	-0.2	0.0	0.1	0.1	0.2	0.4	0.3	-0.2
24	0.2	0.1	0.0	0.0	0.2	0.1	0.1	0.0	-0.2	0.0	-0.2	-0.6	-0.9	-1.0	-1.1	-0.6	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	-0.1
25	0.3	0.3	0.3	0.4	0.4	0.3	0.2	-0.2	-0.9	-0.8	-0.9	-0.8	-0.8	-0.8	-0.8	-0.9	-0.6	-0.2	0.2	0.3	0.5	0.5	0.5	0.6	-0.1
26	0.5	0.5	0.5	0.5	0.4	0.6	0.6	0.2	-1.1	-1.5	-1.3	-1.1	-1.1	-0.9	-0.7	-0.8	-0.6	-0.2	0.4	0.6	0.4	0.4	0.7	0.6	-0.1
27	0.7	0.6	0.6	0.6	0.5	0.6	0.9	-0.2	-0.8	-1.3	-1.4	-0.9	-1.2	-1.0	-0.9	-0.9	-0.6	-0.1	0.2	0.3	0.3	0.5	0.4	0.3	-0.1
28	0.3	0.4	0.4	0.3	0.3	0.6	0.4	0.1	0.0	-0.3	-0.4	-0.2	-0.1	-0.2	-0.2	-0.3	-0.3	-0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1
HRAVE	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.1	-0.6	-0.9	-0.9	-0.8	-0.8	-0.7	-0.6	-0.5	-0.3	0.1	0.3	0.4	0.4	0.4	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	-0.1	0.0	0.1	-0.1	0.0	0.1	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.1	-0.2	-0.1	-0.1
MAX	0.7	0.9	0.8	0.9	0.8	1.0	0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.7	0.7	0.8	0.7	0.6	0.8	0.4	0.3	0.6
MIN	-1.3	-1.2	-1.2	-1.0	-1.4	-1.4	-1.2	-1.1	-1.5	-1.0	-0.6	-1.4	-0.7	-0.8	-0.9	-1.0	-1.1	-1.5	-1.1	-0.9	-1.2	-0.8	-1.0	-1.1	-0.9

DAY	26	27	28	29	30	31
AVE	-0.1	-0.1	0.1	***	***	***
MAX	0.7	0.9	0.6	***	***	***
MIN	-1.5	-1.4	-0.4	***	***	***

MONTHLY AVERAGE = 0.0 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = -1.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
FEBRUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.14	0.28	0.56	0.69	0.67	0.58	0.44	0.25	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.15
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.38	0.54	0.64	0.69	0.66	0.47	0.39	0.20	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.18
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.39	0.54	0.65	0.70	0.68	0.59	0.44	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.19
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.18	0.39	0.55	0.66	0.70	0.68	0.60	0.45	0.26	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.19
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.41	0.56	0.68	0.72	0.70	0.61	0.47	0.27	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.20
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.40	0.56	0.68	0.73	0.66	0.61	0.42	0.28	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.19
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.41	0.57	0.69	0.74	0.71	0.62	0.48	0.28	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.20
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.41	0.57	0.69	0.73	0.70	0.62	0.47	0.27	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.20
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.42	0.58	0.69	0.74	0.71	0.63	0.49	0.29	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.20
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.43	0.59	0.70	0.75	0.73	0.64	0.49	0.29	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.21
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.43	0.58	0.70	0.75	0.73	0.64	0.49	0.30	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.21
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.43	0.58	0.68	0.74	0.72	0.64	0.49	0.30	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.21
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.43	0.59	0.70	0.75	0.72	0.63	0.49	0.29	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.21
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.36	0.48	0.61	0.68	0.53	0.27	0.19	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.15
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.34	0.50	0.78	0.59	0.30	0.32	0.42	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.15
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.43	0.57	0.70	0.76	0.72	0.64	0.50	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.21
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.46	0.62	CAL	CAL	CAL	CAL	CAL	CAL	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.09
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.46	0.62	0.74	0.79	0.75	0.61	0.49	0.24	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.21
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.37	0.52	0.74	0.72	0.78	0.69	0.53	0.31	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.21
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.14	0.39	0.43	0.64	0.54	0.44	0.39	0.29	0.13	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.15
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.45	0.44	0.56	0.71	0.63	0.49	0.37	0.21	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.18
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.38	0.57	0.38	0.31	0.30	0.28	0.18	0.13	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.12
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.23	0.21	0.40	0.47	0.68	0.73	0.58	0.48	0.20	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.17
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.04	0.10	0.48	0.82	0.56	0.65	0.28	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.13
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.49	0.65	0.76	0.81	0.78	0.69	0.54	0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.23
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.29	0.49	0.66	0.75	0.77	0.78	0.68	0.55	0.35	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.23
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.50	0.65	0.77	0.81	0.79	0.69	0.54	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.23
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.21	0.18	0.11	0.11	0.13	0.13	0.18	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.06
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.21	0.38	0.52	0.64	0.69	0.64	0.56	0.43	0.24	0.06	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.15	0.18	0.19	0.19	0.20	0.19	0.20	0.20	0.20	0.21	0.21	0.21	0.21	0.15	0.15	0.21	0.09	0.21	0.21	0.15	0.18	0.12	0.17	0.13	0.23
MAX	0.69	0.69	0.70	0.70	0.72	0.73	0.74	0.73	0.74	0.75	0.75	0.74	0.75	0.68	0.78	0.76	0.62	0.79	0.78	0.64	0.71	0.57	0.73	0.82	0.81
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
AVE	0.23	0.23	0.06	***	***	***
MAX	0.78	0.81	0.21	***	***	***
MIN	0.00	0.00	0.00	***	***	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	3.5	3.7	3.3	3.8	4.1	4.0	3.8	4.2	3.7	3.7	3.5	2.8	2.4	3.8	7.0	6.1	6.5	6.5	5.9	6.6	6.8	7.3	5.4	4.5	4.7
2	5.6	5.4	5.2	6.3	6.6	5.9	5.4	5.4	5.3	5.0	4.9	3.8	3.5	2.7	2.1	2.2	2.0	2.0	1.8	3.2	6.2	4.5	3.9	3.4	4.3
3	5.2	6.0	4.7	4.5	3.8	3.1	5.2	4.0	4.0	4.7	3.4	3.6	3.1	2.9	2.5	2.3	3.0	2.2	1.8	1.9	1.4	1.6	2.1	2.5	3.3
4	2.5	2.7	2.2	4.1	3.4	2.0	2.0	***	***	***	***	5.4	5.0	3.7	4.0	4.0	4.9	***	5.7	***	2.8	1.8	1.8	1.7	3.3
5	2.2	2.2	2.4	2.5	1.8	2.5	3.1	3.1	3.0	3.3	3.4	3.5	4.2	4.8	5.2	4.5	5.6	6.2	7.5	7.4	7.3	7.7	7.1	6.2	4.4
6	5.1	5.3	5.8	6.7	6.9	6.3	6.6	5.9	6.5	6.2	6.3	4.1	4.0	5.9	5.5	5.4	6.1	5.4	8.1	7.7	7.0	6.2	6.4	6.0	6.1
7	6.2	5.2	4.6	4.4	4.7	4.3	4.2	4.4	4.8	4.1	3.9	3.8	4.1	4.0	3.5	5.9	7.9	8.4	7.2	7.5	8.5	6.4	6.0	6.1	5.4
8	6.3	7.2	6.8	6.9	6.1	6.5	8.0	9.1	10.0	9.5	8.5	7.6	7.4	6.3	6.4	6.7	5.9	6.4	6.4	6.3	6.8	6.7	7.2	7.1	7.2
9	7.2	7.4	7.2	6.9	6.5	6.6	6.7	7.8	8.0	7.2	7.0	6.7	5.2	5.4	4.3	3.6	3.3	4.2	5.8	3.9	2.4	2.5	2.6	3.8	5.5
10	2.8	3.2	2.9	4.2	4.8	5.2	4.8	4.1	4.3	4.5	4.2	3.3	4.0	4.4	3.5	3.1	2.9	3.6	6.0	5.0	6.1	5.8	2.1	1.7	4.0
11	2.9	3.0	2.2	3.4	3.1	3.1	3.3	3.4	4.2	3.9	2.9	2.3	2.8	2.8	2.8	3.3	3.1	3.6	3.7	2.3	2.3	3.2	4.0	4.1	3.2
12	3.3	3.3	3.3	3.4	3.9	4.6	4.8	4.2	4.3	3.8	3.5	3.5	3.3	3.2	3.3	3.1	2.5	1.8	2.2	2.9	4.9	7.9	8.8	7.4	4.0
13	6.7	6.2	6.3	5.2	4.6	3.7	3.2	3.0	2.3	7.4	***	***	3.9	3.0	2.9	4.0	4.1	4.0	2.4	2.7	3.6	4.0	2.8	1.6	4.0
14	2.0	2.2	2.4	2.7	2.7	2.5	2.7	3.0	2.8	3.2	2.8	2.6	3.2	3.9	4.5	4.8	5.1	5.0	***	3.9	2.6	2.1	2.5	2.9	3.1
15	3.2	3.5	3.7	4.2	4.1	4.0	3.9	4.2	4.6	3.9	3.9	4.8	5.4	6.4	5.0	4.7	4.6	3.8	4.7	5.1	4.9	6.5	4.4	4.6	4.5
16	3.5	3.8	4.2	4.2	4.4	3.5	2.4	3.0	2.2	2.0	3.0	3.9	3.2	2.5	2.1	2.8	3.0	2.0	6.1	6.6	5.8	4.2	3.3	4.2	3.6
17	2.5	1.5	2.6	2.5	2.7	3.0	3.1	3.0	4.1	3.2	2.9	1.8	2.5	2.6	4.5	5.0	***	4.7	3.6	3.9	3.8	***	3.3	2.8	3.2
18	2.4	2.6	2.4	2.3	3.3	3.3	3.2	3.2	2.9	1.8	2.2	3.2	2.7	2.5	2.8	2.5	2.2	3.3	2.8	2.2	2.0	2.4	2.0	1.6	2.6
19	1.7	2.0	3.1	3.6	3.3	2.4	2.8	3.3	3.3	3.2	3.0	2.6	3.2	5.3	4.5	5.7	5.6	4.7	2.5	2.8	1.9	2.9	2.8	5.1	3.4
20	5.1	4.6	4.3	3.6	2.9	3.5	3.7	3.7	3.5	3.7	3.5	3.2	2.5	2.5	2.6	2.8	3.2	4.0	6.1	4.8	2.8	1.6	1.9	2.3	3.4
21	2.6	2.4	2.5	3.1	3.0	2.1	3.3	3.8	4.5	2.3	0.9	2.4	2.7	3.2	4.2	5.0	6.0	***	6.0	4.1	3.0	2.4	1.7	1.6	3.2
22	0.9	1.8	2.5	2.8	2.8	3.3	3.6	3.5	2.7	3.4	2.6	1.2	2.5	3.9	6.5	6.4	6.2	6.3	4.6	4.4	4.2	3.5	1.9	1.8	3.5
23	1.9	1.2	1.9	2.8	2.7	2.7	2.8	5.4	6.7	***	***	5.7	5.7	5.3	6.7	7.7	***	4.8	4.3	2.8	3.8	6.1	***	***	4.3
24	6.8	7.6	5.8	6.5	6.6	5.6	6.2	5.6	5.3	4.5	4.0	4.1	4.4	4.4	3.9	2.6	3.4	5.3	7.3	6.2	7.4	6.2	5.3	5.7	5.4
25	4.8	5.0	4.6	3.9	2.9	3.0	3.0	2.8	3.6	2.4	2.6	2.7	5.4	***	***	***	***	5.1	5.4	4.4	3.1	3.1	3.4	2.8	3.7
26	3.2	3.5	3.1	5.3	4.4	2.5	1.9	2.2	2.5	2.5	2.4	3.5	4.4	6.4	6.3	6.2	8.8	5.9	4.3	3.5	2.9	1.5	2.8	3.1	3.9
27	2.5	3.5	3.1	3.0	2.6	2.1	2.9	3.0	2.8	2.4	2.5	2.8	2.8	5.1	5.7	4.6	4.2	3.2	5.4	5.8	4.0	2.6	2.7	3.4	3.4
28	3.4	3.8	4.6	4.3	3.7	3.6	3.7	4.3	4.1	4.0	4.0	3.4	3.1	3.6	2.4	2.7	2.7	***	6.1	5.6	4.0	2.9	2.2	2.5	3.7
29	3.1	3.7	4.0	3.9	3.2	3.1	3.2	2.9	2.7	2.9	3.4	2.8	2.2	2.5	2.9	2.8	2.9	3.8	6.5	3.9	2.0	2.2	3.0	4.0	3.2
30	4.2	3.2	3.2	3.4	3.5	3.8	3.6	4.8	4.8	5.2	4.2	3.4	2.7	2.3	3.1	6.3	***	***	***	6.3	1.0	3.3	5.0	3.5	3.9
31	3.0	3.1	3.6	2.4	3.5	2.7	2.2	3.1	3.7	4.6	5.0	6.1	4.9	***	***	***	***	***	2.6	2.5	3.2	***	4.3	7.8	3.8
HRAVE	3.8	3.9	3.8	4.1	4.0	3.7	3.8	4.1	4.2	4.1	3.7	3.7	3.8	4.0	4.2	4.4	4.4	4.5	4.9	4.5	4.2	4.1	3.8	3.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.7	4.3	3.3	3.3	4.4	6.1	5.4	7.2	5.5	4.0	3.2	4.0	4.0	3.1	4.5	3.6	3.2	2.6	3.4	3.4	3.2	3.5	4.3	5.4	3.7
MAX	7.3	6.6	6.0	5.7	7.7	8.1	8.5	10.0	8.0	6.1	4.2	8.8	7.4	5.1	6.5	6.6	5.0	3.3	5.7	6.1	6.0	6.5	7.7	7.6	5.4
MIN	2.4	1.8	1.4	1.7	1.8	4.0	3.5	5.9	2.4	1.7	2.2	1.8	1.6	2.0	3.2	2.0	1.5	1.6	1.7	1.6	0.9	0.9	1.2	2.6	2.4

DAY	26	27	28	29	30	31
AVE	3.9	3.4	3.7	3.2	3.9	3.8
MAX	8.8	5.8	6.1	6.5	6.3	7.8
MIN	1.5	2.1	2.2	2.0	1.0	2.2

MONTHLY AVERAGE = 4.1 MONTHLY MAXIMUM = 10.0 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.8% OPERATIONAL RECOVERY RATE = 95.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	2.5	2.8	3.0	3.3	3.7	3.3	3.0	3.4	2.6	3.6	4.2	3.0	2.7	4.4	9.2	6.2	5.8	6.6	6.4	7.6	7.4	7.8	6.2	3.3	4.7
2	5.7	5.5	7.1	7.4	6.5	5.1	5.7	5.2	6.0	5.3	6.1	4.1	4.0	3.3	1.5	1.6	2.0	1.4	6.1	5.1	6.9	5.9	4.3	4.0	4.8
3	5.3	5.8	4.8	4.3	3.7	4.5	4.8	4.8	4.7	4.7	3.4	4.4	2.9	2.5	2.0	2.1	2.7	2.1	1.3	0.8	2.3	2.7	2.9	2.5	3.4
4	2.0	3.5	4.3	4.0	3.3	1.8	2.0	***	***	***	***	6.5	6.8	2.7	3.0	3.1	5.8	***	5.5	***	3.1	1.8	2.7	3.5	3.6
5	2.8	2.1	2.1	2.4	2.5	3.1	3.2	3.0	3.2	4.4	4.1	4.2	3.9	5.3	4.9	4.4	5.4	6.4	6.4	8.2	7.9	10.9	7.8	6.4	4.8
6	5.7	6.0	6.5	7.6	7.1	6.7	7.9	6.9	7.9	7.7	8.0	5.6	4.3	5.5	5.6	5.3	6.2	5.2	8.6	8.1	8.9	7.0	6.9	6.3	6.7
7	6.1	5.7	5.8	5.5	5.2	4.7	4.3	4.2	4.5	5.6	5.2	4.6	5.1	5.6	4.7	6.0	6.6	7.7	7.8	7.7	9.5	8.8	5.4	7.4	6.0
8	7.6	8.0	7.9	8.0	8.0	6.9	8.9	10.8	11.2	7.2	10.1	7.1	8.2	6.2	7.1	7.3	5.9	6.7	6.6	5.7	7.2	7.5	8.1	9.0	7.8
9	8.5	9.4	8.8	8.0	7.7	9.2	7.3	10.6	8.5	7.9	7.3	7.4	6.6	5.3	4.0	3.9	3.6	3.5	4.6	3.4	3.0	3.1	4.6	5.6	6.3
10	4.3	5.0	5.6	6.9	6.2	6.2	4.5	4.4	4.9	5.0	5.6	4.5	3.9	4.0	3.3	3.2	2.9	3.8	4.6	4.2	4.5	4.9	1.3	1.8	4.4
11	2.8	2.5	2.0	3.9	2.9	2.3	2.7	2.9	3.7	4.0	3.1	2.2	2.3	2.8	3.1	3.8	3.4	3.2	2.9	3.5	2.7	3.2	3.9	3.8	3.1
12	2.9	3.1	3.3	3.1	3.9	4.8	5.1	4.2	3.9	3.8	3.2	3.3	3.2	3.2	3.4	2.9	2.0	1.6	2.5	3.9	4.3	10.2	9.3	7.9	4.1
13	7.5	6.6	5.7	5.0	4.1	4.4	4.6	3.4	3.0	8.3	***	***	3.5	3.3	2.1	2.5	3.6	3.3	3.6	4.9	3.9	3.7	3.3	3.0	4.2
14	1.6	1.7	0.8	1.5	1.9	2.2	2.6	2.5	2.6	3.5	3.0	2.2	2.2	3.5	4.6	4.8	5.1	5.4	***	4.5	3.5	1.7	1.7	2.8	2.9
15	3.1	3.7	3.0	2.8	3.2	3.3	4.3	4.3	4.6	4.9	5.9	6.5	6.6	6.2	5.1	6.4	4.0	3.2	5.1	5.2	5.4	6.6	5.2	4.6	4.7
16	3.5	4.0	4.5	5.3	5.4	4.2	3.7	4.5	3.2	3.3	4.2	4.8	3.5	2.2	1.8	1.7	3.4	1.7	5.0	7.1	5.9	4.4	4.4	4.8	4.0
17	3.0	2.4	3.7	3.1	2.4	3.3	2.9	4.3	4.9	3.5	3.2	2.7	2.9	3.3	4.5	5.7	***	3.6	2.0	2.6	3.4	***	3.3	2.9	3.3
18	2.2	2.5	2.8	3.1	3.4	3.6	3.1	3.2	3.5	2.7	2.3	3.7	2.6	3.5	2.6	1.9	2.6	3.4	2.8	1.8	1.2	2.7	1.9	1.8	2.7
19	1.6	1.8	3.3	3.6	3.1	2.5	2.6	2.7	2.6	3.3	3.5	3.4	4.0	6.2	5.2	5.7	5.5	4.4	2.9	3.2	2.2	4.8	4.1	6.1	3.7
20	5.8	4.9	4.2	3.5	3.1	4.3	3.5	4.2	4.3	5.2	4.2	4.0	3.0	2.6	2.5	1.5	3.4	3.7	5.9	4.9	3.4	2.8	1.2	1.6	3.7
21	2.2	1.6	2.1	2.9	2.4	2.1	3.3	3.2	3.1	1.5	1.3	3.7	3.3	2.8	3.8	4.9	5.4	***	6.3	4.1	2.3	2.2	2.1	1.4	3.0
22	1.3	1.1	1.4	1.7	1.6	2.3	3.3	4.0	3.6	4.8	3.9	2.4	2.5	3.6	5.1	6.9	6.3	6.2	5.4	4.0	5.0	3.7	3.6	2.7	3.6
23	2.9	2.2	2.4	1.9	2.4	2.5	4.3	6.1	10.5	9.1	***	9.4	7.3	6.8	6.4	7.1	***	5.6	5.2	4.2	3.7	8.4	***	***	5.4
24	7.0	10.1	6.6	7.7	7.7	6.0	5.7	5.5	5.3	4.5	4.8	7.1	4.8	5.8	5.7	2.2	2.2	6.0	9.5	6.1	7.2	6.9	5.7	7.0	6.1
25	5.6	5.0	4.7	3.4	2.6	3.1	2.9	2.7	3.7	2.9	2.7	3.3	7.8	***	***	***	***	5.5	5.1	4.3	3.0	2.3	2.7	3.0	3.8
26	3.2	3.2	2.6	6.0	4.4	2.6	3.1	5.4	4.0	2.4	2.3	4.3	5.2	5.2	6.9	9.4	11.4	6.5	4.1	3.5	2.9	1.4	2.7	3.3	4.4
27	3.0	3.2	2.8	2.5	2.3	2.1	2.6	2.9	2.1	1.6	2.3	2.5	2.1	6.1	9.0	6.7	3.5	3.3	6.1	6.3	3.9	3.0	2.5	3.6	3.6
28	2.9	3.5	3.6	3.4	2.7	3.7	4.0	4.5	4.2	4.5	4.2	4.1	3.8	4.0	2.8	2.5	2.5	***	6.6	5.0	4.0	3.8	2.8	1.9	3.7
29	2.5	3.5	3.4	3.3	2.3	2.8	2.6	2.3	3.1	3.4	3.9	3.3	2.2	2.1	1.9	3.8	3.5	4.8	7.2	4.3	2.2	1.9	4.7	3.3	3.3
30	3.3	2.6	3.8	2.7	3.7	3.6	3.5	5.0	5.0	6.0	4.9	3.3	2.4	3.0	2.8	6.7	***	***	***	8.0	2.7	3.0	4.5	4.3	4.0
31	3.0	2.5	2.3	2.3	3.3	2.9	2.5	3.1	3.8	4.9	4.5	6.9	6.7	***	***	***	***	***	3.7	2.6	3.3	***	5.9	7.4	4.0
HRAVE	3.9	4.1	4.0	4.2	4.0	3.9	4.0	4.5	4.6	4.7	4.3	4.5	4.2	4.2	4.3	4.5	4.4	4.4	5.2	4.8	4.4	4.7	4.2	4.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.7	4.8	3.4	3.6	4.8	6.7	6.0	7.8	6.3	4.4	3.1	4.1	4.2	2.9	4.7	4.0	3.3	2.7	3.7	3.7	3.0	3.6	5.4	6.1	3.8
MAX	9.2	7.4	5.8	6.8	10.9	8.9	9.5	11.2	10.6	6.9	4.0	10.2	8.3	5.4	6.6	7.1	5.7	3.7	6.2	5.9	6.3	6.9	10.5	10.1	7.8
MIN	2.5	1.4	0.8	1.8	2.1	4.3	4.2	5.7	3.0	1.3	2.0	1.6	2.1	0.8	2.8	1.7	2.0	1.2	1.6	1.2	1.3	1.1	1.9	2.2	2.3

DAY	26	27	28	29	30	31
AVE	4.4	3.6	3.7	3.3	4.0	4.0
MAX	11.4	9.0	6.6	7.2	8.0	7.4
MIN	1.4	1.6	1.9	1.9	2.4	2.3

MONTHLY AVERAGE = 4.3 MONTHLY MAXIMUM = 11.4 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 96.0% OPERATIONAL RECOVERY RATE = 96.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
DECEMBER - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	2.6	3.3	3.8	3.9	4.3	3.9	5.9	3.0	2.6	3.6	7.7	4.1	2.7	3.0	***	5.8	6.4	7.6	6.9	7.9	***	9.1	7.5	4.6	5.0
2	8.2	5.6	6.6	11.1	7.8	5.5	5.4	6.0	7.7	6.9	9.2	5.6	4.4	3.5	2.1	***	***	***	6.3	5.7	***	5.8	7.5	3.9	6.2
3	5.4	5.5	4.7	4.1	4.0	6.0	5.3	5.5	5.1	5.4	3.7	4.9	4.1	2.9	2.6	1.7	3.3	1.7	2.2	1.1	2.6	2.4	3.0	2.4	3.7
4	2.2	4.4	4.6	3.0	4.0	1.5	3.6	***	***	***	***	***	7.2	***	2.8	2.9	***	***	***	***	3.0	3.8	3.6	4.9	3.7
5	4.1	1.9	2.4	3.2	3.7	4.0	2.9	3.1	3.3	4.7	4.1	4.8	4.7	5.8	4.8	4.9	5.2	5.5	7.7	8.5	9.2	11.5	8.6	7.5	5.3
6	6.1	6.7	7.4	8.0	7.4	7.3	9.3	7.6	8.3	7.7	7.7	5.7	4.2	5.3	5.6	5.8	6.4	5.2	8.4	***	8.6	7.2	7.3	6.6	7.0
7	5.9	5.6	6.1	5.6	4.2	4.1	4.1	3.1	3.6	6.0	6.2	4.8	5.3	5.5	4.8	5.2	6.4	7.5	5.6	8.7	***	9.4	6.2	7.8	5.7
8	8.1	7.7	7.9	8.6	8.8	8.7	9.6	9.4	13.2	6.8	***	***	***	6.3	***	***	6.3	***	***	5.9	***	8.0	***	8.0	8.2
9	8.0	9.3	7.8	7.9	6.6	9.6	9.0	10.3	9.8	6.9	7.9	8.7	7.3	4.5	3.6	4.2	3.5	3.7	4.8	2.8	3.6	4.4	5.8	6.4	6.5
10	5.0	5.1	5.8	7.0	6.4	6.1	5.1	4.0	4.9	4.7	6.9	5.6	4.1	3.6	3.4	3.6	2.9	2.8	4.4	4.4	3.8	3.4	1.4	1.1	4.4
11	3.7	2.4	2.0	3.7	2.4	2.0	2.7	2.9	4.3	3.6	2.8	2.7	2.6	3.6	2.8	***	4.3	***	2.4	5.2	3.2	3.0	4.3	6.2	3.3
12	2.1	4.0	3.3	2.8	4.5	3.9	4.5	4.4	4.1	2.9	2.7	3.2	3.3	4.4	3.9	2.8	2.3	4.6	2.3	3.5	4.3	10.4	***	8.0	4.0
13	7.6	6.3	6.0	5.1	3.7	4.1	5.0	3.7	3.6	7.7	***	***	***	5.0	3.0	3.6	2.6	2.4	2.8	4.6	4.0	3.7	3.3	2.8	4.3
14	1.5	1.6	0.8	1.6	2.7	2.6	2.2	3.6	2.6	3.6	2.9	3.2	3.6	1.9	6.1	4.2	***	***	***	5.2	4.7	2.0	2.1	3.5	3.0
15	3.1	3.8	3.5	2.3	2.8	2.9	5.3	3.7	4.4	5.2	6.7	7.6	8.2	8.4	5.6	6.9	3.9	3.0	5.2	5.3	5.7	6.1	5.1	4.1	4.9
16	2.7	4.8	4.0	4.6	5.6	3.8	3.7	4.8	3.1	3.2	2.5	5.3	4.7	2.4	3.5	2.9	3.5	1.5	3.8	***	6.7	5.1	4.0	4.5	3.9
17	2.4	2.4	2.7	3.6	4.4	***	2.3	4.4	4.8	3.9	3.3	2.8	3.4	4.0	4.5	6.3	***	4.4	3.0	3.4	***	***	3.9	3.6	3.7
18	2.2	2.7	2.6	2.7	3.6	4.1	3.1	3.6	3.7	3.2	2.6	2.0	3.0	4.2	2.0	1.8	3.2	4.1	3.2	1.4	1.1	3.1	2.3	2.5	2.8
19	1.3	2.0	3.3	3.8	3.7	3.0	2.7	3.0	3.3	3.9	3.7	3.8	4.9	5.9	4.3	6.6	4.8	4.1	3.7	5.7	3.6	4.8	4.3	6.3	4.0
20	6.2	4.8	4.4	4.1	3.4	4.1	3.0	3.7	4.7	5.4	4.4	4.2	3.5	3.5	2.3	1.3	***	***	5.7	4.3	3.9	4.0	1.6	2.6	3.9
21	2.3	1.9	2.7	2.7	2.0	1.7	3.9	3.2	3.8	2.3	1.6	4.5	3.4	3.0	4.0	4.2	5.6	***	***	***	2.0	2.0	2.6	1.3	2.9
22	1.2	1.1	3.2	4.0	2.3	2.7	2.8	3.3	4.3	5.1	3.9	4.1	2.6	3.6	5.0	7.1	6.5	***	***	***	5.9	3.9	5.2	3.3	3.9
23	3.5	1.7	2.5	1.9	2.5	2.8	3.8	6.5	9.1	***	***	***	***	***	***	***	***	***	***	6.2	4.1	10.5	***	***	4.6
24	***	11.9	***	8.0	7.5	6.5	6.1	6.2	7.7	7.4	5.2	9.3	6.9	7.4	4.9	2.2	***	***	***	6.8	***	6.2	5.6	6.4	6.8
25	5.7	5.7	4.6	3.5	3.0	3.9	2.7	4.2	6.0	4.0	3.2	2.6	8.0	***	***	***	***	6.2	5.2	4.4	2.5	2.3	2.9	3.1	4.2
26	3.1	4.1	4.1	***	7.6	***	3.9	7.1	5.6	2.1	3.8	6.5	5.1	4.2	***	11.8	12.7	***	***	***	4.6	1.8	3.5	2.7	5.2
27	2.7	3.8	2.8	***	2.8	4.4	2.6	3.5	3.9	2.8	2.4	3.7	1.9	7.8	10.6	6.6	3.5	5.9	***	***	***	3.2	2.5	4.6	4.1
28	5.2	5.0	4.3	4.0	8.2	6.1	5.6	3.8	4.5	5.3	5.7	6.3	5.4	4.8	4.3	***	***	***	5.4	***	***	***	3.2	1.8	4.9
29	4.5	3.6	4.6	3.1	3.3	***	3.9	4.0	2.4	4.1	3.9	3.0	3.2	***	3.3	***	***	***	***	***	2.4	2.9	6.0	***	3.6
30	***	2.6	4.7	3.5	6.2	4.1	3.5	4.8	5.3	7.0	5.7	5.6	5.7	3.4	3.2	***	***	***	***	11.1	7.3	***	4.4	5.8	5.2
31	4.7	4.4	2.0	2.8	3.5	3.7	2.6	2.8	4.8	7.3	6.9	10.2	6.8	***	***	***	***	***	3.8	***	***	***	6.0	11.1	5.2
HRAVE	4.2	4.4	4.2	4.5	4.6	4.4	4.4	4.6	5.1	4.9	4.7	5.0	4.7	4.5	4.1	4.7	4.9	4.4	4.6	5.3	4.4	5.2	4.4	4.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.0	6.2	3.7	3.7	5.3	7.0	5.7	8.2	6.5	4.4	3.3	4.0	4.3	3.0	4.9	3.9	3.7	2.8	4.0	3.9	2.9	3.9	4.6	6.8	4.2
MAX	9.1	11.1	6.0	7.2	11.5	9.3	9.4	13.2	10.3	7.0	6.2	10.4	7.7	6.1	8.4	6.7	6.3	4.2	6.6	6.2	5.6	7.1	10.5	11.9	8.0
MIN	2.6	2.1	1.1	1.5	1.9	4.2	3.1	5.9	2.8	1.1	2.0	2.1	2.4	0.8	2.3	1.5	2.3	1.1	1.3	1.3	1.3	1.1	1.7	2.2	2.3

DAY	26	27	28	29	30	31
AVE	5.2	4.1	4.9	3.6	5.2	5.2
MAX	12.7	10.6	8.2	6.0	11.1	11.1
MIN	1.8	1.9	1.8	2.4	2.6	2.0

MONTHLY AVERAGE = 4.6 MONTHLY MAXIMUM = 13.2 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 85.3% OPERATIONAL RECOVERY RATE = 85.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
DECEMBER - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	113	106	99	102	103	121	112	141	157	107	84	87	8	23	21	41	53	57	60	58	60	64	87	98	356
2	75	83	73	67	65	81	78	72	78	96	101	96	92	102	95	99	100	91	37	328	289	230	149	83	270
3	65	63	70	72	71	59	63	73	74	70	89	80	84	77	114	187	284	348	316	266	319	6	54	77	277
4	88	338	335	355	79	45	57	***	***	***	***	281	280	280	277	272	278	***	349	***	282	221	175	113	162
5	93	97	97	87	94	100	122	122	103	98	105	108	88	78	64	38	61	52	60	63	65	65	69	67	333
6	68	66	67	67	68	64	66	68	69	71	74	92	74	69	67	64	66	59	63	63	68	69	66	69	102
7	70	77	79	97	104	115	109	124	113	95	79	81	76	41	51	37	58	61	60	61	63	66	72	68	8
8	69	64	67	66	68	67	63	64	63	64	67	74	67	67	70	68	64	67	69	67	67	69	66	66	106
9	64	65	67	68	69	71	68	68	67	71	72	83	77	73	54	18	31	351	302	315	331	358	42	80	129
10	87	68	30	75	98	111	115	106	83	73	83	82	47	47	80	81	70	357	296	303	301	301	92	117	126
11	116	130	94	99	101	114	111	111	135	116	128	128	91	189	260	270	272	281	322	33	55	89	107	111	306
12	98	110	110	90	87	85	95	108	103	98	93	90	97	87	82	92	84	140	252	282	295	287	291	291	320
13	287	289	294	288	281	269	258	270	263	288	***	***	316	231	170	161	144	165	190	264	288	287	281	200	122
14	99	100	137	107	101	93	90	100	91	95	113	158	227	271	274	276	277	284	***	319	328	57	87	87	182
15	89	103	108	118	113	109	132	148	147	124	93	81	71	60	60	58	37	7	16	31	44	65	86	90	231
16	92	74	70	68	69	75	85	93	55	68	80	73	88	91	143	107	127	147	298	300	296	288	287	287	90
17	278	251	128	136	97	98	97	129	175	183	179	281	285	299	327	290	***	260	163	158	159	***	96	159	320
18	103	88	86	109	78	86	91	95	76	40	357	305	95	76	79	86	105	59	15	69	33	26	358	53	306
19	33	79	95	103	104	91	97	111	147	130	109	123	112	77	39	14	16	16	11	10	26	39	32	67	337
20	74	98	150	160	111	102	94	97	104	98	99	108	139	159	173	271	271	277	293	296	304	241	129	96	325
21	94	92	97	94	104	90	99	120	151	108	53	109	169	253	277	281	291	***	291	295	296	299	345	45	235
22	38	90	94	101	102	107	118	118	122	124	100	165	260	273	288	284	286	295	315	295	291	288	257	190	192
23	272	7	77	91	57	357	9	8	11	***	***	14	8	8	14	9	***	2	356	64	53	47	***	***	290
24	24	41	64	65	72	86	106	131	102	97	97	98	97	76	67	55	73	58	60	60	65	69	71	65	332
25	65	71	78	83	82	69	71	63	64	8	1	345	292	***	***	***	***	249	181	190	182	174	176	252	220
26	278	280	277	289	329	341	267	106	95	146	177	270	272	276	273	280	295	276	282	286	277	18	88	98	196
27	86	95	110	102	86	83	96	100	103	101	94	91	243	18	66	75	4	26	306	292	301	353	85	96	122
28	102	120	146	139	148	128	131	110	107	89	85	86	118	179	150	233	263	***	289	291	291	303	343	69	239
29	90	103	109	115	104	99	101	114	107	95	93	103	124	99	142	218	269	277	293	355	40	35	95	103	2
30	109	91	90	105	106	108	99	85	86	83	82	84	44	297	282	287	***	***	***	354	30	288	294	308	65
31	32	80	75	70	73	39	19	354	13	39	65	73	158	***	***	***	***	***	55	79	85	***	306	261	179

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.8% OPERATIONAL RECOVERY RATE = 95.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
DECEMBER - 2014

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	109	128	108	93	102	125	98	92	103	96	84	75	54	92	44	66	53	55	65	57	65	43	73	91	346
2	69	76	66	66	67	78	75	71	75	71	78	85	90	85	52	96	120	101	88	42	299	275	114	85	284
3	67	76	75	72	74	71	71	70	67	74	87	81	85	93	164	183	296	360	120	309	30	356	68	70	170
4	36	306	335	10	71	28	53	***	***	***	***	285	281	298	283	269	278	***	341	***	89	263	209	86	335
5	75	153	120	95	148	93	81	81	76	80	89	89	89	79	72	56	66	66	74	76	78	71	77	82	217
6	80	77	72	69	68	67	74	76	78	73	76	71	61	57	71	70	71	72	68	68	90	87	70	67	163
7	73	78	78	83	82	86	87	91	89	77	78	74	62	40	40	57	55	64	68	68	65	66	84	66	337
8	70	71	71	73	74	72	72	69	71	88	83	88	71	73	82	80	61	65	70	71	72	68	72	65	283
9	64	67	72	72	73	72	70	70	81	86	73	78	92	77	52	18	24	349	318	339	34	42	63	69	24
10	72	62	53	61	71	75	81	77	75	72	67	69	55	56	48	78	68	291	313	313	302	301	27	66	94
11	146	148	108	116	111	105	103	92	79	89	138	79	86	152	266	280	278	283	317	35	38	73	107	105	347
12	82	81	84	90	91	82	84	95	90	90	84	98	119	88	88	96	133	265	243	279	293	288	293	296	239
13	284	285	280	271	262	247	215	251	249	289	***	***	298	255	247	180	155	172	267	281	281	288	278	278	346
14	353	5	112	116	115	101	96	102	100	122	137	149	283	288	280	276	274	179	***	328	335	20	78	77	264
15	84	91	111	100	107	97	88	91	81	79	72	71	71	52	65	76	47	19	23	51	63	71	75	78	286
16	82	69	65	66	70	67	60	65	48	46	64	69	78	84	160	113	150	200	289	292	295	285	268	279	286
17	283	213	146	182	162	133	144	158	212	208	230	257	259	285	293	296	***	238	212	156	161	***	125	183	166
18	88	88	74	74	84	94	89	82	72	66	44	340	17	89	68	115	98	66	33	334	16	28	4	69	51
19	47	61	84	83	79	77	82	111	113	98	98	83	86	72	42	36	27	36	44	14	48	47	29	56	47
20	70	93	84	78	73	74	93	77	72	74	79	73	80	103	143	217	253	272	294	289	302	318	307	113	49
21	83	71	90	98	107	102	107	144	154	58	110	133	164	189	281	282	307	***	297	311	306	280	303	32	248
22	322	325	90	102	118	111	141	153	154	147	150	176	255	276	283	274	278	294	307	292	290	280	308	300	23
23	297	314	329	22	56	2	10	39	22	52	***	47	15	11	27	355	***	23	355	72	69	54	***	***	336
24	57	53	59	69	78	89	95	103	93	82	84	104	107	78	59	51	54	63	61	58	77	77	72	54	283
25	66	74	71	74	72	79	79	50	61	25	6	332	302	***	***	***	***	229	142	217	193	190	183	253	54
26	269	276	267	288	328	336	332	89	107	169	194	274	266	279	275	272	274	279	272	282	269	335	90	99	106
27	101	100	98	107	91	105	99	93	105	104	95	106	276	28	82	68	25	31	314	296	302	351	67	85	131
28	103	135	153	132	147	94	89	85	80	77	78	74	149	167	158	208	274	***	292	294	298	303	348	40	335
29	96	102	113	113	98	94	91	122	87	80	81	88	102	100	60	177	267	281	292	344	48	24	107	103	67
30	105	83	93	105	95	107	96	79	82	75	70	78	13	291	330	276	***	***	***	293	54	298	300	330	62
31	27	61	56	72	73	53	44	5	5	59	40	72	163	***	***	***	***	***	86	75	101	***	270	264	117

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 96.0% OPERATIONAL RECOVERY RATE = 96.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
DECEMBER - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	90	143	114	93	99	106	147	109	130	95	94	81	50	101	***	46	47	55	63	50	***	55	63	83	184
2	68	80	71	67	67	127	116	83	83	82	92	94	98	82	74	***	***	***	85	45	***	222	113	73	345
3	62	74	77	71	74	66	74	76	73	84	85	86	100	101	140	172	251	166	102	222	37	0	68	17	31
4	52	324	315	56	77	47	52	***	***	***	***	***	277	***	271	271	***	***	***	***	80	229	206	72	273
5	81	162	282	121	176	70	73	86	81	80	89	81	89	73	70	60	68	71	72	80	88	70	79	93	121
6	85	79	75	68	76	72	77	83	80	74	76	67	83	55	66	75	79	72	68	***	90	89	68	68	60
7	75	79	83	82	81	86	85	88	84	75	83	54	47	44	36	82	54	63	81	67	***	68	88	62	142
8	64	73	71	81	83	71	70	75	77	99	***	***	***	74	***	***	60	***	***	71	***	76	***	70	244
9	65	71	71	73	85	75	88	67	87	95	76	79	94	64	52	20	26	326	311	335	354	40	71	80	281
10	80	57	56	59	69	83	90	80	87	76	63	66	53	56	52	76	77	351	308	311	305	335	61	206	167
11	152	166	122	117	116	105	99	92	76	94	154	87	95	155	245	***	278	***	325	16	32	98	109	115	5
12	51	91	83	94	93	126	91	97	91	87	73	109	112	107	88	89	117	271	225	262	291	289	***	294	123
13	279	284	273	265	248	233	219	256	205	287	***	***	***	263	257	260	224	247	263	299	280	291	279	273	359
14	86	39	97	120	150	91	93	75	99	118	131	122	48	307	272	267	***	***	***	326	358	30	84	69	121
15	83	91	89	100	104	106	84	103	74	75	78	71	71	43	53	64	50	25	24	51	70	67	81	87	201
16	96	72	78	70	71	61	62	82	27	36	102	76	78	90	142	352	150	182	286	***	299	277	270	280	277
17	298	81	178	175	131	***	123	161	217	206	224	252	256	267	283	296	***	225	280	138	***	***	140	165	84
18	89	102	88	77	94	99	93	83	84	67	50	327	103	92	110	115	108	85	67	11	31	34	337	19	113
19	58	45	97	77	68	78	90	111	95	88	96	71	76	69	40	52	39	38	59	20	18	45	25	53	248
20	64	104	88	69	83	81	101	83	78	71	69	73	74	84	165	244	***	***	299	284	319	316	325	139	220
21	72	67	88	94	108	114	111	147	154	69	79	129	185	185	282	293	308	***	***	***	301	127	295	21	280
22	318	326	96	76	120	94	120	144	158	152	148	168	250	276	278	275	278	***	***	***	287	294	306	301	154
23	288	302	324	22	37	357	11	31	27	***	***	***	***	***	***	***	***	***	***	63	126	65	***	***	159
24	***	34	***	64	86	72	112	115	92	95	88	123	109	72	58	62	***	***	***	43	***	89	62	41	329
25	63	77	72	73	71	88	81	66	48	13	8	350	314	***	***	***	***	225	155	212	175	199	226	256	114
26	271	355	255	***	327	***	333	78	142	74	88	286	267	238	***	280	190	***	***	***	258	327	134	171	319
27	121	103	102	***	98	199	97	90	87	81	89	77	215	23	65	71	20	34	***	***	***	23	46	95	290
28	114	127	132	137	147	124	121	95	85	91	93	46	158	173	148	***	***	***	292	***	***	***	350	19	295
29	104	102	115	112	109	***	75	111	91	67	77	85	93	***	355	***	***	***	***	***	40	25	115	***	328
30	***	85	98	33	94	113	92	85	88	76	66	111	244	297	336	***	***	***	***	353	69	***	309	343	310
31	54	94	152	78	72	73	39	351	267	66	34	75	160	***	***	***	***	***	82	***	***	***	274	279	343

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 85.3% OPERATIONAL RECOVERY RATE = 85.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.19	0.17	0.25	0.31	0.26	0.17	0.12	0.29	0.21	0.20	0.39	0.57	0.89	0.84	0.83	1.04	0.91	0.52	0.38	0.54	0.70	0.67	0.54	0.27	0.47
2	0.44	0.46	0.48	0.54	0.58	0.50	0.51	0.41	0.45	0.52	0.50	0.29	0.66	0.40	0.25	0.35	0.35	0.36	0.50	0.49	0.68	0.52	0.25	0.51	0.46
3	0.66	0.55	0.46	0.45	0.32	0.47	0.55	0.41	0.43	0.40	0.60	0.55	0.39	0.53	0.60	0.67	0.50	0.44	0.44	0.27	0.33	0.35	0.30	0.15	0.45
4	0.20	0.36	0.42	***	0.47	0.39	***	***	***	***	***	***	0.56	0.59	0.66	0.76	0.49	***	***	***	0.60	0.22	0.14	0.05	0.42
5	0.12	0.18	0.15	0.14	0.22	0.14	0.18	0.10	0.05	0.07	0.23	0.38	0.84	0.99	1.04	0.86	0.74	0.62	0.73	0.72	0.71	0.67	0.57	0.54	0.46
6	0.47	0.58	0.55	0.42	0.55	0.54	0.58	0.51	0.65	0.64	0.57	0.45	0.46	0.68	0.48	0.59	0.64	0.60	0.72	0.49	0.60	0.64	0.68	0.40	0.56
7	0.44	0.45	0.19	0.13	0.10	0.08	0.13	0.21	0.27	0.29	0.27	0.55	0.88	0.95	0.46	0.65	0.67	0.57	0.55	0.61	0.73	0.61	0.47	0.48	0.45
8	0.38	0.54	0.53	0.61	0.58	0.48	0.62	0.66	0.73	1.00	0.94	0.87	1.05	1.00	1.01	0.81	0.60	0.63	0.78	0.56	0.58	0.64	0.74	0.66	0.71
9	0.61	0.59	0.50	0.59	0.53	0.58	0.66	0.63	0.71	0.65	0.99	0.84	0.88	0.79	1.04	0.80	0.83	0.65	0.46	0.45	0.40	0.41	0.32	0.32	0.63
10	0.25	0.22	0.15	0.24	0.28	0.21	0.17	0.14	0.14	0.23	0.40	0.58	1.02	0.88	0.70	0.64	0.62	0.70	***	***	0.41	0.34	0.33	0.25	0.40
11	0.16	0.06	0.16	0.06	0.01	0.02	0.10	0.07	0.20	0.31	0.49	0.42	0.61	0.74	0.67	0.62	0.35	***	0.33	0.39	0.31	0.30	0.20	0.13	0.29
12	0.13	0.20	0.09	0.23	0.28	0.41	0.29	0.26	0.20	0.25	0.24	0.49	0.90	0.72	0.72	0.58	0.54	0.45	0.46	0.66	0.53	0.75	0.62	0.58	0.44
13	0.45	0.33	0.40	0.26	0.27	0.41	0.44	0.64	0.71	0.60	***	***	0.37	0.33	0.18	0.29	0.40	0.30	0.44	0.56	0.23	0.67	0.60	0.25	0.41
14	0.12	0.10	0.13	0.03	0.02	0.06	0.01	0.04	0.01	0.15	0.46	0.89	0.93	0.89	0.71	0.65	0.43	0.47	***	0.50	0.09	0.15	0.24	0.35	0.32
15	0.24	0.08	0.02	0.11	0.11	0.16	0.34	0.22	0.26	0.30	0.34	0.82	0.94	0.88	0.84	0.64	0.44	0.49	0.38	0.41	0.50	0.56	0.36	0.31	0.41
16	0.31	0.29	0.34	0.36	0.25	0.19	0.20	0.10	0.23	0.12	0.22	0.25	0.27	0.33	0.66	0.85	0.64	0.37	0.54	0.48	0.37	0.46	0.19	0.27	0.35
17	0.39	0.24	0.41	0.33	0.36	0.24	0.28	0.23	0.30	0.53	0.49	0.43	0.39	0.42	0.56	0.81	***	0.31	0.41	0.20	0.20	***	0.60	0.65	0.40
18	0.37	0.10	0.24	0.17	0.36	0.31	0.31	0.28	0.25	0.29	0.29	0.60	0.51	0.47	0.53	0.33	0.31	0.45	0.46	0.60	0.53	0.36	0.17	0.17	0.35
19	0.23	0.12	0.17	0.20	0.15	0.13	0.10	0.14	0.14	0.19	0.45	0.54	0.71	0.92	1.07	1.11	1.01	0.69	0.55	0.42	0.38	0.48	0.38	0.37	0.44
20	0.28	0.30	0.36	0.35	0.16	0.17	0.15	0.20	0.14	0.25	0.30	0.38	0.49	0.71	0.72	0.56	0.64	0.36	0.33	0.33	0.48	0.33	0.21	0.04	0.34
21	0.09	0.21	0.12	0.20	0.12	0.10	0.08	0.20	0.14	0.15	0.37	0.56	0.48	0.74	0.74	0.83	0.58	***	0.67	0.60	0.56	0.55	0.41	0.13	0.38
22	0.31	0.12	0.04	0.10	0.01	0.03	0.02	0.03	0.03	0.18	0.30	0.32	0.43	0.61	0.83	0.78	0.77	0.58	0.42	0.31	0.25	0.31	0.34	0.26	0.31
23	0.19	0.10	0.11	0.14	0.29	0.32	0.31	0.95	1.12	***	***	1.34	1.39	1.31	1.12	0.93	***	0.95	0.98	0.80	0.76	0.77	***	***	0.73
24	1.06	1.16	0.96	0.74	0.56	0.51	0.59	0.44	0.33	0.63	0.72	0.73	0.79	0.95	1.03	0.28	0.44	0.58	0.73	0.64	0.80	0.51	0.52	0.67	0.68
25	0.39	0.47	0.58	0.52	0.36	0.36	0.40	0.33	0.44	0.35	0.28	0.30	0.58	***	***	***	***	0.46	0.64	0.56	0.40	0.36	0.31	0.40	0.42
26	0.31	0.51	0.47	0.47	0.47	0.33	0.40	0.26	0.34	0.34	0.83	1.02	1.01	1.00	0.80	0.72	0.62	0.32	0.28	0.21	0.46	0.22	0.17	0.08	0.49
27	0.23	0.30	0.25	0.33	0.34	0.25	0.18	0.06	0.08	0.36	0.44	0.58	0.75	1.12	1.17	1.29	0.81	0.69	***	***	***	0.47	0.33	0.23	0.49
28	0.26	0.26	0.26	0.18	0.16	0.12	0.20	0.27	0.29	0.17	0.32	0.59	0.88	0.99	0.81	0.81	0.45	***	0.44	0.33	0.21	0.31	0.25	0.33	0.39
29	0.07	0.19	0.28	0.24	0.13	0.14	0.03	0.04	0.10	0.14	0.36	0.54	0.68	0.68	0.80	0.65	0.53	0.74	***	0.39	0.36	0.33	0.14	0.23	0.34
30	0.20	0.13	0.20	0.06	0.13	0.25	0.26	0.60	0.37	0.39	0.41	0.50	0.55	0.48	0.67	0.85	***	***	***	0.39	0.23	0.39	0.46	0.36	0.38
31	0.38	0.34	0.53	0.35	0.42	0.49	0.37	0.27	0.37	0.60	0.85	0.90	0.65	***	***	***	***	***	0.64	0.52	0.53	***	***	***	0.51
HRAVE	0.32	0.31	0.32	0.30	0.29	0.28	0.29	0.30	0.32	0.36	0.47	0.60	0.71	0.76	0.75	0.72	0.59	0.53	0.53	0.48	0.46	0.46	0.37	0.33	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.47	0.46	0.45	0.42	0.46	0.56	0.45	0.71	0.63	0.40	0.29	0.44	0.41	0.32	0.41	0.35	0.40	0.35	0.44	0.34	0.38	0.31	0.73	0.68	0.42
MAX	1.04	0.68	0.67	0.76	1.04	0.72	0.95	1.05	1.04	1.02	0.74	0.90	0.71	0.93	0.94	0.85	0.81	0.60	1.11	0.72	0.83	0.83	1.39	1.16	0.64
MIN	0.12	0.25	0.15	0.05	0.05	0.40	0.08	0.38	0.32	0.14	0.01	0.09	0.18	0.01	0.02	0.10	0.20	0.10	0.10	0.04	0.08	0.01	0.10	0.28	0.28

DAY	26	27	28	29	30	31
AVE	0.49	0.49	0.39	0.34	0.38	0.51
MAX	1.02	1.29	0.99	0.80	0.85	0.90
MIN	0.08	0.06	0.12	0.03	0.06	0.27

MONTHLY AVERAGE = 0.4 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.1% OPERATIONAL RECOVERY RATE = 94.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.23	0.10	0.31	0.30	0.29	0.23	0.17	0.29	0.33	0.31	0.53	0.71	0.70	0.77	0.66	***	0.86	0.49	0.31	0.62	0.66	0.54	0.61	0.39	0.45
2	0.43	0.44	0.65	0.55	0.49	0.58	0.52	0.67	0.72	0.54	0.87	0.66	0.63	0.40	0.13	0.34	0.41	0.42	0.55	0.41	0.83	0.49	0.29	0.57	0.52
3	0.57	0.50	0.67	0.60	0.49	0.70	0.46	0.33	0.31	0.37	0.62	0.68	0.55	0.44	0.44	0.51	0.56	0.46	0.48	0.42	0.53	0.42	0.41	0.28	0.49
4	0.30	0.37	0.45	***	0.34	0.39	***	***	***	***	***	***	0.44	***	0.55	0.53	0.40	***	***	***	0.68	0.36	0.50	0.45	0.44
5	0.65	0.44	0.32	0.39	0.43	0.49	0.22	0.14	0.22	0.02	0.14	0.25	0.81	0.71	1.11	0.86	0.57	0.50	0.68	0.24	0.66	0.65	0.41	0.37	0.47
6	0.33	0.48	0.33	0.37	0.54	0.48	0.31	0.58	0.63	0.44	0.53	0.38	0.33	0.57	0.41	0.61	0.56	0.40	0.69	0.50	0.57	0.68	0.68	0.35	0.49
7	0.33	0.42	0.24	0.15	0.30	0.17	0.25	0.20	0.32	0.60	0.46	0.46	0.56	0.94	0.42	0.39	0.47	0.54	0.50	0.38	0.57	0.77	0.45	0.31	0.42
8	0.39	0.18	0.25	0.38	0.50	0.41	0.66	0.79	0.68	0.82	0.75	0.73	1.08	0.92	1.00	0.63	0.62	0.53	0.77	0.54	0.50	0.68	0.73	0.67	0.63
9	0.67	0.66	0.38	0.48	0.59	0.71	0.65	0.68	0.72	0.63	0.79	1.00	0.95	0.82	1.11	0.80	0.77	0.55	0.38	0.43	0.41	0.43	0.28	0.41	0.64
10	0.30	0.30	0.28	0.40	0.35	0.27	0.17	0.08	0.18	0.22	0.43	0.48	0.91	0.84	0.83	0.52	0.57	0.92	***	***	0.48	***	0.32	0.31	0.44
11	0.28	0.01	0.49	0.41	0.26	0.60	0.13	0.28	0.30	0.18	0.24	0.34	0.39	0.62	0.45	0.53	0.44	***	0.51	0.77	0.21	0.22	0.20	0.35	0.36
12	0.76	0.81	0.43	0.29	0.23	0.32	0.47	0.43	0.66	0.20	0.29	0.34	0.65	0.43	0.78	0.49	0.56	0.61	0.50	0.87	0.75	0.59	***	0.51	0.52
13	0.53	0.43	0.38	0.31	0.39	0.53	0.61	0.67	0.81	0.74	***	***	***	0.20	0.08	0.16	0.41	0.33	0.39	0.76	0.53	***	0.37	0.16	0.44
14	0.02	0.28	0.18	0.01	0.01	0.01	0.01	0.01	0.05	0.13	0.25	0.64	0.94	0.76	0.99	0.62	0.35	***	***	***	0.27	0.26	0.21	0.08	0.29
15	0.21	0.06	0.11	0.10	0.27	0.03	0.11	0.19	0.24	0.16	0.42	0.66	0.86	0.80	0.94	0.66	0.45	0.50	0.41	0.41	0.49	0.50	0.48	0.58	0.40
16	0.61	0.61	0.59	0.49	0.43	0.28	0.37	0.35	0.26	0.09	0.24	0.27	0.23	0.28	0.56	0.86	0.65	0.38	0.52	***	***	0.39	0.39	0.38	0.42
17	0.24	0.49	0.43	0.37	0.49	0.28	0.24	0.32	0.65	0.36	0.39	0.30	0.22	0.27	0.44	0.97	***	0.28	0.48	0.34	***	***	0.80	0.41	0.42
18	0.19	0.23	0.41	0.38	0.56	0.21	0.50	0.43	0.34	0.34	0.31	0.73	0.58	0.47	0.44	0.41	0.49	0.55	0.53	0.44	0.41	0.53	0.36	0.28	0.42
19	0.20	0.05	0.13	0.15	0.18	0.10	0.06	0.14	0.14	0.18	0.20	0.25	0.58	0.83	1.29	1.04	0.93	0.68	0.74	0.71	0.71	0.52	0.53	0.36	0.45
20	0.35	0.43	0.25	0.24	0.04	0.11	0.11	0.34	0.19	0.19	0.55	0.37	0.37	0.46	0.46	0.29	0.53	***	0.32	0.38	0.69	0.43	0.25	0.41	0.34
21	0.22	0.05	0.01	0.16	0.38	0.01	0.05	0.11	0.01	0.01	0.44	0.40	0.27	0.48	0.91	0.95	0.56	***	***	0.25	0.66	0.52	0.62	0.42	0.34
22	0.49	0.10	0.06	0.18	0.01	0.01	0.01	0.01	0.09	0.28	0.47	0.26	0.27	0.45	0.89	0.75	0.62	***	***	***	0.40	0.21	0.37	0.41	0.30
23	0.26	0.37	0.09	0.09	0.15	0.13	0.14	0.86	***	***	***	1.20	***	***	***	***	***	0.91	0.93	0.93	0.61	***	***	***	0.51
24	***	***	1.12	0.70	0.62	0.46	0.63	0.49	0.34	0.64	0.80	0.86	1.20	0.93	1.08	0.28	0.42	0.54	0.73	0.50	0.83	0.49	0.54	0.61	0.67
25	0.53	0.65	0.60	0.69	0.23	0.28	0.26	0.19	0.20	0.34	0.31	0.64	0.74	***	***	***	***	0.63	0.81	0.73	0.65	0.36	0.06	0.71	0.48
26	0.26	0.53	0.36	0.39	0.63	0.51	0.23	0.08	0.32	0.49	1.03	0.90	1.03	0.99	1.03	0.88	1.10	***	0.08	***	0.39	0.59	0.13	0.05	0.55
27	0.24	0.38	0.11	0.15	0.67	0.39	0.15	0.12	0.01	0.33	0.23	0.43	0.85	1.07	1.18	1.36	0.75	0.63	***	***	***	0.61	0.27	0.26	0.49
28	0.08	0.15	0.21	0.04	0.21	0.18	0.17	0.40	0.45	0.14	0.58	0.70	0.82	1.03	0.84	0.80	0.88	***	***	***	***	0.41	0.17	0.10	0.42
29	0.13	0.12	0.14	0.08	0.12	0.02	0.02	0.07	0.08	0.32	0.19	0.49	0.80	0.74	0.93	0.72	0.55	0.92	***	0.44	0.33	0.16	0.08	0.19	0.33
30	0.16	0.12	0.16	0.12	0.10	0.07	0.19	0.64	0.76	0.47	0.43	0.81	0.64	0.41	0.60	***	***	***	***	0.46	0.36	0.45	0.59	0.25	0.39
31	0.36	0.35	0.60	0.18	0.31	0.52	0.64	0.22	0.45	0.72	0.93	1.05	0.75	***	***	***	***	***	***	0.61	***	***	***	***	0.55
HRAVE	0.34	0.34	0.35	0.30	0.34	0.31	0.28	0.34	0.36	0.35	0.48	0.59	0.66	0.65	0.73	0.65	0.60	0.56	0.54	0.53	0.55	0.47	0.40	0.37	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.45	0.52	0.49	0.44	0.47	0.49	0.42	0.63	0.64	0.44	0.36	0.52	0.44	0.29	0.40	0.42	0.42	0.42	0.45	0.34	0.34	0.30	0.51	0.67	0.48
MAX	0.86	0.87	0.70	0.68	1.11	0.69	0.94	1.08	1.11	0.92	0.77	0.87	0.81	0.99	0.94	0.86	0.97	0.73	1.29	0.69	0.95	0.89	1.20	1.20	0.81
MIN	0.10	0.13	0.28	0.30	0.02	0.31	0.15	0.18	0.28	0.08	0.01	0.20	0.08	0.01	0.03	0.09	0.22	0.19	0.05	0.04	0.01	0.01	0.09	0.28	0.06

DAY	26	27	28	29	30	31
AVE	0.55	0.49	0.42	0.33	0.39	0.55
MAX	1.10	1.36	1.03	0.93	0.81	1.05
MIN	0.05	0.01	0.04	0.02	0.07	0.18

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 89.8% OPERATIONAL RECOVERY RATE = 89.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
DECEMBER - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.25	0.10	0.40	***	***	0.04	0.12	0.29	0.37	0.36	0.82	0.65	0.62	***	***	***	***	***	***	***	***	***	0.87	0.40	0.41
2	0.35	***	0.62	***	***	***	0.40	***	1.06	0.52	0.87	0.60	0.64	0.41	0.16	***	***	***	0.68	***	***	0.54	0.33	0.53	0.55
3	***	***	***	0.66	0.56	0.72	0.43	0.24	0.31	0.38	0.37	0.67	0.58	0.41	0.47	0.59	0.68	0.37	0.48	0.47	0.54	0.31	0.38	0.25	0.47
4	0.32	0.32	0.28	***	0.27	0.31	***	***	***	***	***	***	***	***	0.70	0.43	***	***	***	***	***	0.50	0.50	0.66	0.43
5	0.70	0.50	0.35	0.42	0.44	0.68	0.33	0.32	0.34	0.21	0.17	0.37	0.84	0.74	1.20	0.95	0.55	0.50	0.71	0.27	***	0.52	0.36	0.35	0.51
6	0.32	0.49	0.38	0.36	0.50	0.37	0.40	0.76	0.63	0.43	0.54	0.55	0.35	0.49	0.43	0.63	0.35	0.31	***	***	***	***	***	***	0.46
7	***	0.42	0.26	0.20	0.45	0.33	0.28	0.22	0.43	0.80	0.53	0.62	0.61	0.96	0.43	0.26	***	0.46	0.54	0.36	***	0.86	0.50	0.30	0.47
8	0.41	0.24	0.26	0.35	1.02	0.49	0.72	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.50
9	***	0.71	0.34	0.55	0.58	0.70	0.71	***	***	***	0.63	***	1.10	***	***	0.77	0.69	0.68	0.37	0.45	0.44	0.42	0.39	0.55	0.59
10	0.36	0.28	0.34	0.63	0.50	0.42	0.34	0.16	0.26	0.23	0.40	0.49	0.95	0.86	0.93	0.51	0.57	1.03	***	***	***	***	0.35	0.24	0.49
11	0.27	0.01	0.48	0.54	0.66	0.72	0.37	0.43	0.60	0.25	0.32	0.47	0.50	0.64	0.44	***	***	***	0.58	0.74	0.24	0.21	0.21	0.31	0.43
12	1.02	0.90	0.39	0.28	***	0.22	0.43	0.39	0.72	0.29	0.45	0.37	0.70	0.47	0.81	0.45	0.61	0.62	0.51	0.89	0.77	***	***	***	0.56
13	***	***	0.38	0.33	0.43	0.64	0.72	0.58	0.80	0.82	***	***	***	0.38	0.25	0.25	0.54	0.46	0.40	0.70	0.65	***	0.31	0.16	0.49
14	0.02	0.26	0.29	0.01	0.01	0.01	0.01	0.01	0.04	0.29	0.25	0.73	0.90	0.74	0.96	0.68	***	***	***	***	***	0.28	0.24	0.08	0.31
15	0.22	0.07	0.03	0.12	0.42	0.04	0.06	0.16	0.41	0.29	0.60	0.67	***	***	***	***	***	0.50	0.38	0.42	0.45	0.51	0.52	0.58	0.34
16	0.58	0.57	0.56	0.55	0.50	0.25	0.62	0.65	0.32	0.13	0.33	0.32	0.25	0.24	0.60	0.97	0.64	0.32	***	***	***	0.42	0.43	0.37	0.46
17	0.27	0.50	***	***	***	***	***	0.35	0.54	0.39	0.64	0.48	0.24	0.29	0.43	***	***	***	0.51	0.36	***	***	***	***	0.42
18	0.27	0.52	0.60	0.69	0.59	0.23	0.65	0.50	0.39	0.37	0.37	***	0.65	0.44	0.42	0.42	0.52	0.57	***	0.42	0.46	0.70	0.40	0.33	0.48
19	0.19	0.05	0.10	0.35	0.42	0.24	0.09	0.13	0.30	0.35	0.50	0.49	0.76	***	1.12	***	***	0.68	0.75	0.66	0.74	0.55	0.59	***	0.45
20	0.32	0.45	0.23	0.16	0.05	0.16	0.13	0.30	0.16	0.24	0.65	0.46	0.58	0.33	0.50	0.29	***	***	***	***	***	0.42	0.23	***	0.31
21	0.21	0.06	0.01	0.26	0.36	0.01	0.06	0.12	0.01	0.15	0.67	0.61	0.36	0.49	0.87	1.12	***	***	***	***	***	***	0.60	0.42	0.35
22	0.46	0.06	0.05	0.32	***	***	0.01	0.15	0.30	0.39	0.50	0.27	0.24	0.41	0.84	***	0.58	***	***	***	***	0.22	0.55	0.66	0.35
23	0.49	0.48	0.25	0.13	0.15	0.13	0.18	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.26
24	***	***	***	***	***	***	0.69	0.51	0.34	0.71	0.84	0.93	1.24	***	***	***	***	***	***	***	***	***	***	***	0.75
25	***	***	***	***	0.10	0.28	0.29	0.23	0.22	0.43	0.41	0.61	0.88	***	***	***	***	***	***	0.83	***	0.32	0.08	***	0.39
26	***	***	***	***	***	***	***	***	0.37	0.56	1.21	0.88	0.78	***	***	***	***	***	***	***	0.37	0.53	***	***	0.67
27	0.20	0.40	0.09	***	0.63	0.32	0.12	0.10	0.01	0.33	0.25	0.38	0.88	***	***	***	***	***	***	***	***	***	***	***	0.31
28	0.08	0.19	0.21	0.03	0.19	0.19	0.18	0.35	0.38	0.26	0.70	***	0.97	0.91	***	***	***	***	***	***	***	***	***	***	0.36
29	***	0.12	0.12	0.07	0.10	***	0.02	0.06	0.08	0.41	0.28	0.53	0.73	***	***	***	***	***	***	***	***	***	***	***	0.23
30	***	***	0.16	0.14	0.10	0.07	0.22	0.68	0.73	0.47	0.45	0.78	0.71	0.38	0.63	***	***	***	***	1.18	***	***	***	***	0.48
31	***	***	***	0.21	0.34	0.53	0.60	0.24	0.59	0.69	0.95	1.20	***	***	***	***	***	***	***	***	***	***	***	***	0.59
HRAVE	0.35	0.33	0.29	0.32	0.39	0.32	0.33	0.32	0.40	0.40	0.54	0.59	0.68	0.53	0.64	0.59	0.57	0.54	0.54	0.60	0.52	0.46	0.41	0.39	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.41	0.55	0.47	0.43	0.51	0.46	0.47	0.50	0.59	0.49	0.43	0.56	0.49	0.31	0.34	0.46	0.42	0.48	0.45	0.31	0.35	0.35	0.26	0.75	0.39
MAX	0.87	1.06	0.72	0.70	1.20	0.76	0.96	1.02	1.10	1.03	0.74	1.02	0.82	0.96	0.67	0.97	0.64	0.70	1.12	0.65	1.12	0.84	0.49	1.24	0.88
MIN	0.04	0.16	0.24	0.27	0.17	0.31	0.20	0.24	0.34	0.16	0.01	0.22	0.16	0.01	0.03	0.13	0.24	0.23	0.05	0.05	0.01	0.01	0.13	0.34	0.08

DAY	26	27	28	29	30	31
AVE	0.67	0.31	0.36	0.23	0.48	0.59
MAX	1.21	0.88	0.97	0.73	1.18	1.20
MIN	0.37	0.01	0.03	0.02	0.07	0.21

MONTHLY AVERAGE = 0.4 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 64.7% OPERATIONAL RECOVERY RATE = 64.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	7.3	2.6	1.7	2.2	1.6	1.1	1.2	1.3	2.3	1.9	2.7	3.3	3.9	4.6	4.1	3.5	4.0	4.0	3.9	4.6	4.7	4.3	3.3	3.7	3.2
2	3.0	1.8	1.8	1.6	1.6	2.0	2.0	2.0	2.2	2.4	2.2	3.0	3.6	4.7	5.2	5.5	5.8	6.1	5.7	7.4	3.8	2.3	2.3	1.2	3.3
3	1.6	2.4	2.7	2.9	2.6	2.9	3.7	4.0	3.1	2.7	2.9	2.8	3.1	3.4	4.3	4.8	4.3	4.9	***	3.8	2.3	1.4	1.5	2.7	3.1
4	3.3	3.8	3.5	3.4	4.0	4.6	5.0	4.5	5.3	6.1	7.5	8.2	6.5	5.6	5.6	5.6	7.4	8.6	9.4	8.9	9.3	9.1	8.7	8.2	6.3
5	6.9	7.3	7.7	8.3	8.8	9.3	10.1	9.1	10.1	10.1	10.5	***	7.9	7.7	9.1	***	***	***	9.5	7.9	9.0	8.3	8.4	7.6	8.7
6	7.9	7.9	8.1	8.2	8.4	7.9	6.4	7.2	7.2	6.2	4.5	4.1	6.4	7.3	7.0	6.3	7.9	***	***	10.7	***	9.7	7.3	6.8	7.3
7	8.2	8.1	8.5	8.0	9.1	9.5	9.5	9.9	10.0	11.2	11.6	10.5	9.1	7.6	8.5	8.5	***	***	***	***	8.3	***	***	***	9.2
8	***	***	***	***	***	***	***	15.1	***	***	9.6	10.6	9.8	8.1	6.7	7.0	7.2	6.9	8.1	9.0	9.8	8.2	6.3	7.0	8.6
9	8.6	8.7	10.1	10.7	10.2	10.1	9.7	11.8	11.8	11.6	10.2	11.1	11.5	9.3	9.7	9.4	8.9	9.9	8.9	***	***	***	***	11.3	10.2
10	***	11.6	10.6	10.0	9.5	8.7	***	11.4	11.1	8.9	7.5	6.5	5.3	5.1	4.9	4.2	4.9	5.7	6.2	6.4	6.2	6.6	6.4	6.3	7.5
11	5.2	4.6	4.1	4.1	5.1	4.7	4.8	5.8	5.3	4.5	4.1	4.0	3.7	3.2	2.8	3.4	5.0	5.5	5.0	3.7	4.1	3.3	3.0	3.4	4.3
12	3.1	2.3	3.1	4.2	2.4	2.6	1.9	2.9	2.4	3.1	3.5	2.9	3.4	3.1	3.8	3.2	3.0	3.5	***	***	1.9	1.3	2.0	2.4	2.8
13	2.9	2.5	3.1	3.7	3.8	2.9	2.2	2.9	3.1	3.0	2.1	2.5	2.2	2.3	3.0	6.6	4.2	2.8	3.3	4.9	3.1	3.6	3.3	3.1	3.2
14	2.2	1.9	2.2	3.3	3.1	3.3	4.1	4.6	5.2	5.1	4.6	4.2	4.2	4.2	4.3	3.3	3.4	2.8	1.5	3.6	5.1	4.7	4.0	4.6	3.7
15	4.9	3.6	4.2	5.2	4.6	4.7	6.9	7.5	7.5	6.9	7.9	6.8	6.1	6.1	7.1	8.6	9.4	7.1	6.4	7.8	8.4	6.3	6.0	6.1	6.5
16	5.2	7.4	9.0	10.2	9.9	10.4	10.0	9.8	9.4	8.4	7.7	6.6	6.1	6.1	5.9	5.2	4.5	4.4	6.2	7.4	7.0	6.5	6.0	5.8	7.3
17	4.9	4.6	4.4	4.0	4.2	4.2	4.3	5.1	4.8	4.3	3.8	3.3	3.1	2.7	2.7	3.6	4.5	5.3	5.9	4.8	3.3	2.3	2.8	3.6	4.0
18	4.1	3.8	3.4	4.5	4.9	5.4	5.4	4.5	4.2	4.3	5.3	5.1	4.9	4.1	3.9	4.0	3.9	2.9	2.5	1.5	1.8	2.1	1.8	2.7	3.8
19	3.5	4.6	4.7	2.7	3.3	4.8	4.3	4.2	4.0	4.2	3.4	3.0	3.4	2.7	2.4	2.9	4.2	4.4	4.9	5.3	5.0	2.5	1.6	2.8	3.7
20	3.4	3.4	3.4	4.0	3.6	3.2	3.2	3.5	3.9	3.1	2.7	2.8	2.3	2.8	2.9	3.2	3.5	3.4	3.9	4.4	1.7	2.7	3.5	3.9	3.3
21	3.4	2.9	3.3	3.0	3.2	2.6	1.5	2.8	4.2	3.3	2.6	1.9	3.2	5.9	7.3	6.9	6.1	6.2	***	6.1	6.5	3.8	2.8	2.3	4.0
22	2.4	3.6	4.7	4.7	5.2	4.1	***	4.2	4.4	9.8	4.5	6.3	7.6	4.9	4.8	5.6	4.9	4.4	4.7	5.8	7.7	7.1	6.2	5.2	5.3
23	5.2	5.9	7.4	7.5	7.2	5.2	7.2	7.5	7.5	7.6	7.0	7.3	7.6	7.2	6.4	6.3	6.2	6.6	8.0	7.3	6.9	8.2	8.9	8.5	7.1
24	8.0	7.8	***	9.8	10.3	10.0	12.4	10.0	***	***	***	***	***	***	***	6.5	6.0	6.0	6.7	8.4	7.3	5.9	5.4	6.1	7.9
25	6.8	6.1	6.3	6.7	6.6	5.8	5.2	5.7	6.4	6.5	5.9	6.6	6.7	7.6	6.0	5.8	6.3	8.4	8.5	7.8	8.8	8.6	8.7	8.3	6.9
26	6.9	6.9	8.5	7.8	8.6	8.7	8.1	8.5	9.4	9.1	8.4	7.4	5.2	5.5	6.3	7.4	***	7.0	8.3	7.6	6.4	5.6	4.1	3.8	7.2
27	3.9	5.3	4.3	4.0	4.7	5.0	5.0	5.2	4.2	4.8	4.1	3.4	2.2	3.1	3.2	3.3	3.5	4.7	6.4	5.5	***	4.2	3.1	1.8	4.1
28	1.7	2.2	2.8	2.5	3.5	3.8	3.5	2.8	3.4	2.9	2.6	3.1	3.3	3.2	3.6	3.4	5.9	7.4	***	6.0	5.7	3.0	2.0	2.5	3.5
29	2.1	2.2	3.0	3.4	3.1	3.8	3.6	3.7	4.1	4.8	4.7	3.9	3.3	3.8	2.5	2.5	4.2	5.4	4.5	6.6	6.6	8.4	9.3	9.4	4.5
30	***	12.0	***	***	***	***	10.2	***	8.9	***	9.8	10.7	11.0	***	8.5	8.4	***	***	***	***	6.1	5.9	***	6.3	8.9
31	5.7	4.8	5.0	5.8	5.8	5.9	5.9	6.6	5.9	5.2	4.7	3.5	3.5	2.9	2.4	2.8	2.4	***	3.2	2.7	1.4	2.4	2.6	2.4	4.1
HRAVE	4.7	5.1	5.1	5.4	5.5	5.4	5.6	6.1	5.9	5.8	5.6	5.4	5.3	5.0	5.2	5.3	5.2	5.6	5.9	6.1	5.6	5.1	4.7	5.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.2	3.3	3.1	6.3	8.7	7.3	9.2	8.6	10.2	7.5	4.3	2.8	3.2	3.7	6.5	7.3	4.0	3.8	3.7	3.3	4.0	5.3	7.1	7.9	6.9
MAX	7.3	7.4	4.9	9.4	10.5	10.7	11.6	15.1	11.8	11.6	5.8	4.2	6.6	5.2	9.4	10.4	5.9	5.4	5.3	4.4	7.3	9.8	8.9	12.4	8.8
MIN	1.1	1.2	1.4	3.3	6.9	4.1	7.6	6.3	8.6	4.2	2.8	1.3	2.1	1.5	3.6	4.4	2.3	1.5	1.6	1.7	1.5	2.4	5.2	5.4	5.2

DAY	26	27	28	29	30	31
AVE	7.2	4.1	3.5	4.5	8.9	4.1
MAX	9.4	6.4	7.4	9.4	12.0	6.6
MIN	3.8	1.8	1.7	2.1	5.9	1.4

MONTHLY AVERAGE = 5.4 MONTHLY MAXIMUM = 15.1 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 92.1% OPERATIONAL RECOVERY RATE = 92.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	6.9	2.9	2.3	2.3	2.2	1.5	1.1	1.7	3.0	1.7	1.9	2.8	2.9	4.4	4.1	3.5	4.0	5.2	4.2	5.2	4.5	4.6	3.5	3.4	3.3
2	2.7	1.3	2.1	2.1	2.6	2.2	2.3	2.5	2.2	2.7	2.6	3.0	4.1	4.1	4.8	4.7	4.2	6.0	4.7	7.7	3.5	2.1	2.0	2.3	3.3
3	1.0	1.8	2.1	2.1	2.3	2.2	3.1	4.3	4.2	5.6	4.1	3.0	2.4	3.7	4.6	5.3	4.9	4.7	***	4.5	2.1	1.4	1.0	1.9	3.1
4	2.6	3.1	3.0	3.0	3.8	5.0	4.6	5.1	6.8	7.9	8.0	8.4	6.2	6.1	5.5	6.0	9.7	9.1	9.3	11.2	10.3	10.3	9.7	8.6	6.8
5	7.5	8.4	8.7	10.0	9.9	12.2	11.2	9.6	12.9	11.7	9.3	***	10.1	6.7	7.9	9.4	***	***	10.8	8.5	8.7	7.4	9.6	9.4	9.5
6	9.3	7.8	9.3	8.6	9.0	9.2	8.9	8.9	8.9	7.6	6.6	5.1	6.4	6.5	9.3	7.5	7.4	***	***	9.9	***	9.9	7.6	8.2	8.2
7	9.1	9.1	9.3	8.7	8.8	9.6	10.2	11.5	13.1	12.4	11.6	10.5	10.5	9.0	9.9	8.7	***	***	***	***	12.1	***	***	***	10.2
8	***	***	***	***	***	***	***	17.2	***	***	9.2	11.6	9.5	9.4	6.5	6.7	9.4	8.1	7.9	8.4	10.6	8.8	6.5	7.5	9.2
9	7.7	9.7	12.1	11.4	11.0	11.5	10.4	13.4	12.0	11.2	10.0	11.5	13.9	12.7	10.5	9.1	8.4	12.4	10.4	***	***	***	***	13.5	11.1
10	***	12.7	12.3	8.8	9.0	9.8	***	12.0	11.1	8.9	7.3	6.2	6.3	6.2	5.2	4.7	5.5	6.9	7.4	6.5	6.5	7.6	6.2	6.2	7.9
11	4.8	4.9	4.1	4.6	5.4	5.3	5.5	5.6	5.9	4.8	4.1	3.7	3.2	2.8	3.2	3.3	6.3	6.0	5.4	3.2	4.9	3.0	2.3	3.5	4.4
12	3.6	2.3	3.8	5.2	3.1	3.7	2.5	3.2	3.3	3.5	2.9	3.0	3.3	4.2	3.0	1.8	2.0	3.0	***	***	1.8	1.5	3.2	2.1	3.0
13	2.8	2.4	2.5	3.1	4.1	3.1	2.3	2.6	3.1	2.8	2.5	2.9	3.1	2.6	2.5	5.6	4.1	3.4	4.0	5.2	4.0	2.7	3.0	3.2	3.2
14	2.3	2.3	2.5	3.8	4.4	5.1	5.0	5.4	5.7	5.6	4.3	4.9	4.4	4.8	4.9	4.3	3.4	2.7	2.6	4.0	4.6	6.1	4.5	4.8	4.3
15	6.8	3.2	3.7	6.0	5.9	6.0	7.0	8.0	7.8	7.2	7.5	8.4	7.2	6.6	7.1	9.6	9.4	6.8	6.8	6.7	9.8	6.7	6.5	6.7	7.0
16	4.7	7.8	11.1	10.4	10.9	10.6	11.7	9.5	9.2	10.4	9.3	6.8	7.2	7.9	6.3	5.9	4.7	5.2	5.5	7.4	7.3	6.9	6.3	6.1	7.9
17	5.5	4.0	2.5	3.5	4.7	4.4	4.0	5.2	5.0	4.8	4.0	3.3	2.6	1.5	1.6	3.2	5.3	6.1	7.0	4.9	4.0	2.0	2.4	3.5	4.0
18	3.4	3.5	3.6	4.9	4.1	5.8	4.7	4.8	5.2	6.3	7.1	7.0	5.3	3.6	3.7	3.7	3.6	2.1	2.3	2.1	2.3	2.2	2.6	2.6	4.0
19	3.4	4.2	3.7	2.3	2.9	3.7	3.1	2.4	3.7	4.5	3.4	2.6	2.1	2.3	2.7	2.8	4.9	4.7	5.1	6.8	5.4	3.7	2.8	3.5	3.6
20	3.0	3.1	3.6	2.7	2.3	2.0	2.5	3.0	3.1	3.0	1.9	2.3	2.1	2.9	2.9	2.8	3.2	3.0	4.2	4.4	1.4	3.1	3.7	3.4	2.9
21	5.3	2.0	2.8	2.8	3.1	2.0	1.8	2.4	4.2	5.2	3.7	2.4	3.1	5.6	7.1	7.1	6.4	7.1	***	8.1	7.0	4.0	3.1	1.8	4.3
22	1.2	4.1	5.1	6.5	4.3	5.3	***	3.9	4.1	9.1	4.7	6.0	7.4	5.3	4.1	4.6	4.6	3.7	5.2	6.2	7.8	7.4	6.3	6.4	5.4
23	6.1	6.5	7.0	8.8	8.0	5.8	7.5	8.0	7.8	8.4	6.5	5.7	7.3	7.3	6.5	8.4	7.7	8.6	8.0	8.6	7.2	8.0	10.4	9.6	7.7
24	8.1	8.8	***	11.6	12.1	10.8	10.3	9.4	***	***	***	***	***	***	***	7.6	5.7	4.7	8.8	11.5	7.6	5.5	5.1	8.1	8.5
25	6.8	6.6	6.7	6.2	6.1	6.4	4.8	6.3	5.8	6.3	5.5	5.4	6.9	9.1	6.3	4.9	7.9	8.8	8.5	7.9	10.7	10.6	8.6	8.3	7.1
26	6.1	7.0	8.2	7.9	8.9	8.0	8.4	8.4	9.6	8.1	9.1	6.9	5.6	4.6	5.8	8.1	***	6.3	8.3	7.3	6.3	5.9	4.0	4.2	7.1
27	3.8	5.8	4.9	4.5	5.0	5.7	5.4	5.6	5.2	5.5	5.5	4.3	2.5	2.7	4.2	3.9	2.7	4.7	7.4	5.7	***	6.1	3.1	2.2	4.6
28	2.1	1.9	2.0	2.0	2.6	3.2	2.7	3.4	3.3	2.9	2.8	3.1	2.8	2.6	1.9	2.2	6.0	8.4	***	5.7	5.0	3.4	2.6	3.2	3.3
29	2.7	1.9	2.0	3.3	3.8	3.5	3.2	3.7	4.9	6.8	6.1	4.4	4.0	4.5	2.8	3.2	5.8	5.7	4.5	7.1	6.6	8.6	10.8	9.9	5.0
30	***	10.6	***	***	***	***	13.1	***	8.4	***	11.3	13.7	13.1	***	9.6	7.3	***	***	***	***	5.8	3.9	***	6.6	9.4
31	5.5	4.6	5.6	6.0	6.3	6.3	6.1	6.3	5.5	4.1	4.2	4.6	4.2	3.2	2.3	3.0	***	***	4.4	3.0	1.8	2.2	2.4	1.7	4.2
HRAVE	4.8	5.1	5.2	5.6	5.7	5.9	5.8	6.5	6.4	6.4	5.9	5.6	5.7	5.3	5.2	5.5	5.7	5.9	6.4	6.6	6.1	5.4	5.0	5.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.3	3.3	3.1	6.8	9.5	8.2	10.2	9.2	11.1	7.9	4.4	3.0	3.2	4.3	7.0	7.9	4.0	4.0	3.6	2.9	4.3	5.4	7.7	8.5	7.1
MAX	6.9	7.7	5.6	11.2	12.9	9.9	13.1	17.2	13.9	12.7	6.3	5.2	5.6	6.1	9.8	11.7	7.0	7.1	6.8	4.4	8.1	9.1	10.4	12.1	10.7
MIN	1.1	1.3	1.0	2.6	6.7	5.1	8.7	6.5	7.7	4.7	2.3	1.5	2.3	2.3	3.2	4.7	1.5	2.1	2.1	1.4	1.8	1.2	5.7	4.7	4.8

DAY	26	27	28	29	30	31
AVE	7.1	4.6	3.3	5.0	9.4	4.2
MAX	9.6	7.4	8.4	10.8	13.7	6.3
MIN	4.0	2.2	1.9	1.9	3.9	1.7

MONTHLY AVERAGE = 5.7 MONTHLY MAXIMUM = 17.2 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 92.1% OPERATIONAL RECOVERY RATE = 92.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
JANUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	7.9	3.8	3.2	2.6	2.1	0.8	1.0	1.9	3.2	2.0	2.3	2.2	2.9	4.3	4.3	3.9	4.0	5.0	4.0	***	***	***	***	***	3.2
2	2.2	2.0	2.2	3.8	3.5	2.7	2.4	3.2	2.3	3.4	3.0	3.1	4.5	3.9	4.6	5.9	3.5	***	***	***	***	2.0	1.8	3.2	3.2
3	1.2	1.7	2.2	2.0	2.7	2.1	3.0	4.6	4.4	7.2	4.7	3.2	2.8	6.4	5.0	5.0	5.4	***	***	***	2.0	1.8	3.3	3.0	3.5
4	2.5	2.8	2.8	3.0	4.3	4.9	3.6	6.6	7.3	9.6	9.6	9.5	6.5	6.6	5.7	6.4	10.3	***	***	***	10.2	***	9.2	7.9	6.5
5	8.9	9.9	9.4	9.5	9.4	11.9	11.5	10.2	***	15.1	***	***	***	***	***	***	***	***	***	9.2	9.7	***	9.8	10.3	10.4
6	11.6	8.9	11.1	10.2	9.4	9.0	9.6	10.9	10.5	10.4	7.6	7.0	***	***	9.6	6.5	***	***	***	***	***	***	6.8	8.9	9.2
7	8.9	8.6	8.0	10.3	10.1	10.1	10.4	***	***	10.7	13.4	***	***	***	6.9	***	***	***	***	***	***	***	***	***	9.7
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9.4	8.8	8.6	***	10.5	8.2	5.4	6.9	8.2
9	7.4	10.1	9.8	***	10.6	11.4	10.0	***	11.9	***	9.0	***	***	***	***	***	***	***	***	***	***	***	***	***	10.0
10	***	***	***	***	8.4	***	***	***	***	***	7.5	5.2	5.7	7.1	5.4	5.1	5.0	6.3	6.5	6.4	6.0	8.6	6.6	6.2	6.4
11	4.9	4.5	3.6	5.4	6.5	5.4	5.8	5.6	6.4	4.6	4.5	3.7	3.4	3.2	2.9	3.6	6.8	6.2	5.6	3.8	5.4	3.0	2.7	3.4	4.6
12	3.7	1.5	4.2	4.6	2.9	4.0	4.8	3.5	3.1	3.2	2.4	4.2	3.3	3.9	3.5	2.0	2.7	***	***	***	1.7	3.3	3.4	2.1	3.2
13	3.2	2.4	2.6	2.9	4.1	4.2	2.8	2.7	2.4	2.5	2.5	2.8	2.6	3.3	2.2	***	4.1	3.4	4.3	5.4	4.4	3.7	4.4	3.9	3.3
14	3.4	2.9	3.9	4.1	4.2	6.3	5.1	4.6	6.4	6.5	4.7	5.7	5.0	6.9	6.2	4.0	3.1	2.5	3.4	4.1	4.7	6.0	4.3	5.3	4.7
15	6.4	3.3	3.6	7.0	6.1	6.2	6.7	7.5	8.6	7.3	8.0	9.3	7.6	7.8	***	***	***	7.2	6.5	7.2	10.6	7.0	6.7	6.6	7.0
16	4.0	7.8	11.9	8.4	11.2	10.4	12.5	11.9	9.8	***	***	***	6.9	8.0	6.1	***	***	5.7	5.8	***	***	7.5	***	6.0	8.4
17	5.5	3.8	2.5	3.4	4.0	3.5	5.8	4.7	4.7	4.3	4.4	3.1	5.1	2.1	1.8	4.1	5.4	***	7.5	***	5.2	2.1	2.8	3.8	4.1
18	3.1	3.3	4.0	3.7	3.9	5.8	3.6	4.1	5.1	5.7	8.5	5.3	5.3	4.2	***	***	3.2	3.3	***	***	2.5	2.4	2.7	4.1	4.2
19	3.4	4.1	4.3	2.4	3.5	5.3	3.1	4.4	4.7	4.6	4.4	2.1	2.2	4.6	2.5	2.6	***	***	***	7.2	***	4.1	2.9	5.1	3.9
20	3.3	3.3	3.4	2.9	2.1	2.0	1.9	2.7	3.7	3.1	3.0	2.8	3.4	2.6	2.7	3.0	3.4	***	***	4.0	1.5	4.9	3.7	3.2	3.0
21	3.7	2.1	2.5	3.0	3.0	2.2	2.1	2.4	5.8	4.6	2.0	2.0	3.0	***	6.8	***	***	***	***	***	***	4.4	3.5	2.5	3.3
22	1.8	4.3	***	6.9	***	***	***	***	***	***	***	6.9	***	***	***	***	4.3	***	6.0	***	***	***	***	6.7	5.3
23	6.2	6.1	8.0	8.2	5.8	4.0	***	8.1	7.4	***	6.7	6.1	***	9.3	***	***	***	***	***	11.8	7.2	***	***	***	7.3
24	***	***	***	***	12.1	***	***	***	***	***	***	***	***	***	***	***	***	4.1	***	14.3	***	6.2	***	10.1	9.3
25	7.6	9.8	8.9	***	9.3	9.4	4.6	7.1	8.6	10.1	6.7	5.3	***	***	***	4.6	***	***	***	***	11.7	10.8	***	9.2	8.2
26	6.3	6.6	9.8	9.5	10.3	***	***	***	***	8.4	***	***	5.6	***	***	***	***	***	***	***	***	5.7	3.7	4.8	7.1
27	3.9	5.6	5.5	4.4	5.2	5.7	5.8	6.7	6.5	6.7	5.9	4.9	3.5	3.2	5.1	4.1	3.3	***	***	***	***	***	2.8	2.2	4.8
28	2.1	1.8	1.9	2.1	1.5	2.7	2.9	3.4	2.9	2.3	2.2	1.8	2.4	2.1	2.4	1.9	7.2	***	***	***	***	4.1	2.4	2.9	2.6
29	2.7	2.2	1.5	3.0	4.7	3.6	2.8	3.7	3.9	5.8	5.8	4.9	5.3	5.0	3.3	3.8	4.3	5.0	3.4	6.8	5.7	***	***	***	4.2
30	***	***	***	***	***	***	***	***	***	***	10.8	13.3	***	***	***	***	***	***	***	***	***	***	***	6.4	10.2
31	6.4	4.6	5.9	6.4	5.9	6.4	6.0	5.8	5.6	4.3	***	***	***	3.5	2.8	2.9	***	***	***	3.2	2.7	2.3	2.5	1.8	4.4
HRAVE	4.9	4.7	5.3	5.2	6.0	5.6	5.3	5.5	5.9	6.2	5.8	5.0	4.4	4.9	4.5	4.1	5.0	5.2	5.6	6.9	6.0	5.0	4.4	5.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.2	3.2	3.5	6.5	10.4	9.2	9.7	8.2	10.0	6.4	4.6	3.2	3.3	4.7	7.0	8.4	4.1	4.2	3.9	3.0	3.3	5.3	7.3	9.3	8.2
MAX	7.9	5.9	7.2	10.3	15.1	11.6	13.4	10.5	11.9	8.6	6.8	4.8	5.4	6.9	10.6	12.5	7.5	8.5	7.2	4.9	6.8	6.9	11.8	14.3	11.7
MIN	0.8	1.8	1.2	2.5	8.9	6.5	6.9	5.4	7.4	5.0	2.7	1.5	2.2	2.5	3.3	4.0	1.8	2.4	2.1	1.5	2.0	1.8	4.0	4.1	4.6

DAY	26	27	28	29	30	31
AVE	7.1	4.8	2.6	4.2	10.2	4.4
MAX	10.3	6.7	7.2	6.8	13.3	6.4
MIN	3.7	2.2	1.5	1.5	6.4	1.8

MONTHLY AVERAGE = 5.3 MONTHLY MAXIMUM = 15.1 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 68.4% OPERATIONAL RECOVERY RATE = 68.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
JANUARY - 2015

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	281	262	258	288	257	172	315	11	47	337	289	278	275	278	277	277	327	279	288	294	298	305	314	293	119
2	316	340	345	1	339	324	340	351	343	342	333	275	272	277	271	267	272	279	297	283	291	293	283	337	231
3	145	103	100	103	96	102	108	113	120	118	96	157	258	265	273	297	290	277	***	338	358	60	119	88	224
4	101	108	103	98	120	151	142	110	84	69	62	63	64	66	55	53	30	34	55	59	58	60	63	67	348
5	68	66	65	64	63	60	62	65	60	59	64	***	57	30	57	***	***	***	61	67	69	65	71	76	268
6	68	72	69	68	70	68	92	75	71	80	96	91	75	57	23	42	25	***	***	58	***	62	70	68	141
7	68	72	67	71	66	65	66	60	62	58	59	61	68	82	76	70	***	***	***	***	96	***	***	***	309
8	***	***	***	***	***	***	***	71	***	***	61	63	67	69	84	68	69	69	65	60	61	68	77	69	105
9	63	62	60	55	60	62	61	59	58	56	60	59	64	72	65	68	64	62	71	***	***	***	***	77	270
10	***	82	75	73	79	77	***	82	75	78	71	74	79	76	15	37	45	37	51	57	56	57	54	65	204
11	66	74	87	84	66	69	70	63	77	92	89	86	84	77	68	55	55	39	25	42	11	316	314	76	159
12	63	49	44	49	25	60	56	65	68	99	112	102	140	137	158	256	282	282	***	***	331	57	73	87	121
13	95	106	108	110	136	131	71	79	88	93	92	69	74	302	332	284	289	308	64	55	60	74	73	59	148
14	360	11	49	13	25	24	28	62	61	60	78	79	82	65	9	344	86	77	142	345	28	63	68	66	68
15	66	74	73	72	95	81	64	64	69	75	60	59	70	71	44	50	61	68	80	67	59	62	73	73	124
16	79	76	69	59	59	59	68	56	58	62	74	80	75	69	71	21	13	24	44	58	56	62	64	67	166
17	82	114	144	107	109	140	132	114	120	96	100	131	150	221	286	306	280	296	290	303	346	73	91	93	197
18	107	110	103	116	125	116	150	109	124	88	71	77	73	74	73	73	40	3	337	318	1	6	29	82	14
19	85	113	115	103	101	115	125	116	109	99	95	104	42	242	275	290	287	291	300	294	300	286	97	91	352
20	103	105	103	106	106	125	125	130	121	127	89	89	87	69	16	269	279	283	311	69	29	83	96	104	150
21	110	111	104	94	102	103	118	84	93	261	27	93	283	286	275	275	279	276	***	67	39	22	333	25	50
22	19	61	71	69	62	346	***	78	85	89	87	81	26	23	21	45	25	356	3	80	75	69	71	73	153
23	68	71	70	77	80	79	71	72	68	68	70	57	30	64	55	51	64	64	62	64	64	66	65	67	221
24	63	62	***	61	64	62	58	65	***	***	***	***	***	***	***	54	75	94	72	63	68	71	84	74	176
25	72	70	67	63	67	71	77	74	68	72	69	73	83	32	49	61	60	58	59	62	60	60	60	61	25
26	68	64	64	66	65	65	65	61	63	61	64	66	53	76	76	78	***	67	70	74	73	75	350	44	298
27	71	67	81	87	76	76	74	79	87	76	77	57	1	78	80	70	273	282	297	294	***	300	344	57	164
28	78	85	90	91	103	111	120	126	120	99	99	118	87	107	253	135	282	289	***	294	297	320	339	329	203
29	356	83	108	105	94	108	116	106	99	100	86	73	82	82	89	98	82	68	70	66	70	68	69	79	122
30	***	84	***	***	***	***	71	***	68	***	68	72	69	***	69	71	***	***	***	***	68	75	***	66	50
31	69	71	67	68	66	63	68	64	68	70	80	89	82	94	63	88	85	***	100	83	87	93	99	92	146

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 92.1% OPERATIONAL RECOVERY RATE = 92.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
JANUARY - 2015

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	266	212	237	287	316	308	319	331	31	11	340	331	277	284	271	262	347	295	294	296	306	310	325	293	114
2	316	352	357	7	0	351	355	2	353	330	313	286	289	273	267	258	261	279	309	284	311	308	307	322	265
3	256	109	102	121	93	106	112	134	149	148	131	168	213	270	285	289	304	279	***	348	348	73	133	84	13
4	104	106	106	93	91	85	88	80	66	63	62	67	64	65	49	55	42	40	42	58	67	72	62	69	89
5	62	61	63	62	68	62	70	67	58	79	72	***	62	50	44	25	***	***	54	72	81	74	80	74	110
6	68	76	72	61	69	65	71	67	67	72	82	73	67	54	42	33	37	***	***	62	***	67	69	66	66
7	68	73	68	74	68	67	63	62	65	61	65	57	69	77	86	71	***	***	***	***	93	***	***	***	126
8	***	***	***	***	***	***	***	68	***	***	67	62	70	66	74	82	81	62	69	61	55	77	91	71	122
9	64	69	81	74	66	74	76	69	50	64	60	65	64	68	80	74	68	67	90	***	***	***	***	83	149
10	***	83	84	82	90	80	***	84	78	79	63	77	80	65	42	47	52	60	58	66	60	59	60	69	312
11	73	81	80	76	65	65	71	64	75	79	89	86	88	79	60	66	57	55	45	21	1	2	5	68	231
12	57	33	46	63	39	51	66	60	44	75	116	123	155	112	98	350	334	292	***	***	351	332	95	75	180
13	84	110	104	123	149	127	69	72	72	92	65	70	90	351	335	307	297	316	82	69	62	67	73	71	335
14	14	15	37	34	28	31	46	61	59	46	70	78	83	60	34	12	50	73	94	23	51	62	60	60	295
15	66	67	70	72	74	75	64	62	69	72	63	66	80	86	61	64	62	74	80	66	66	67	75	75	87
16	86	89	80	66	65	54	59	58	55	64	72	90	83	76	63	80	36	42	52	55	53	53	62	67	356
17	84	108	131	90	88	83	84	77	80	80	81	83	104	218	255	6	296	303	294	299	322	76	84	83	245
18	81	80	73	73	87	75	83	78	71	63	63	73	77	67	73	73	61	1	303	311	349	0	24	41	65
19	75	87	123	116	93	95	96	124	81	80	104	94	50	246	271	319	287	325	298	301	312	284	260	110	99
20	109	112	113	111	96	101	84	90	86	88	99	84	69	51	183	240	269	300	304	71	24	93	86	108	226
21	78	111	92	88	88	111	160	105	91	258	346	341	283	281	279	271	281	278	***	60	39	22	345	45	258
22	58	82	83	71	66	7	***	76	89	86	79	101	26	51	13	50	13	9	13	79	67	74	85	78	229
23	74	75	72	89	84	80	75	85	75	81	70	58	53	33	57	76	63	78	68	59	70	68	65	59	209
24	62	53	***	64	67	61	62	66	***	***	***	***	***	***	***	47	79	79	70	71	67	73	87	74	46
25	76	87	68	62	63	76	86	76	64	70	65	75	70	33	32	37	50	48	52	68	60	71	59	53	201
26	66	67	74	71	63	66	67	60	70	68	67	71	65	74	81	83	***	65	73	78	83	74	198	41	357
27	79	70	82	82	73	69	75	80	80	70	69	69	61	52	64	91	281	279	304	300	***	297	333	339	170
28	348	358	51	7	83	102	139	154	152	125	127	99	76	74	13	312	264	289	***	298	294	312	346	321	207
29	323	351	100	86	128	117	119	94	82	68	67	67	71	80	88	77	81	55	61	81	76	78	73	75	110
30	***	84	***	***	***	***	74	***	98	***	86	72	78	***	67	79	***	***	***	***	84	126	***	76	6
31	85	76	73	81	80	69	75	71	77	82	83	93	95	102	58	109	***	***	107	42	41	88	109	92	228

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 92.1% OPERATIONAL RECOVERY RATE = 92.1%
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ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
JANUARY - 2015

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	265	221	240	286	315	338	316	336	56	9	353	330	277	296	274	268	348	294	291	***	***	***	***	***	289
2	326	42	356	12	355	335	342	5	295	336	327	289	282	268	243	258	278	***	***	***	***	***	315	320	124
3	205	102	143	116	88	104	112	136	142	138	120	184	196	253	301	287	291	***	***	***	353	96	97	91	296
4	82	106	109	100	88	101	100	72	50	50	61	76	65	66	51	40	38	***	***	***	72	***	74	74	183
5	61	59	58	65	71	62	68	66	***	81	***	***	***	***	***	***	***	***	***	67	85	***	77	79	344
6	71	74	69	67	64	78	74	81	78	73	85	94	***	***	47	30	***	***	***	***	***	***	74	61	65
7	68	66	73	76	70	66	61	***	***	93	63	***	***	***	97	***	***	***	***	***	***	***	***	***	62
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	78	53	71	***	60	75	72	72	320
9	72	69	71	***	71	77	78	***	51	***	67	***	***	***	***	***	***	***	***	***	***	***	***	***	283
10	***	***	***	***	86	***	***	***	***	***	45	89	86	64	49	55	60	53	58	65	64	66	60	72	327
11	71	81	86	88	64	67	80	70	72	81	98	94	94	72	56	63	42	51	33	13	19	358	12	58	175
12	50	92	63	60	26	54	90	52	59	85	108	131	118	109	102	14	334	***	***	***	347	31	96	85	280
13	85	108	100	120	151	120	78	72	83	100	93	77	81	347	318	***	298	315	64	69	52	56	85	72	240
14	3	6	30	46	33	50	40	59	65	54	71	79	77	56	33	12	41	66	98	26	50	67	60	59	341
15	64	74	76	82	73	80	68	64	76	64	60	68	80	85	***	***	***	78	77	75	70	67	73	71	227
16	89	89	78	69	75	52	54	75	56	***	***	***	81	80	67	***	***	41	49	***	***	52	***	59	101
17	87	117	143	94	95	100	95	73	84	88	86	66	105	147	252	338	288	***	295	***	318	80	89	84	107
18	86	81	87	76	92	78	95	75	73	55	60	44	75	66	***	***	54	67	***	***	338	327	44	31	109
19	70	75	128	105	101	96	94	87	78	77	93	75	59	343	268	327	***	***	***	305	***	291	231	102	193
20	113	116	134	113	104	121	120	92	87	95	133	78	60	48	170	180	249	***	***	31	119	103	85	108	29
21	85	114	94	96	86	110	133	97	93	241	343	61	272	***	279	***	***	***	***	***	***	13	355	56	359
22	122	89	***	80	***	***	***	***	***	***	***	103	***	***	***	***	42	***	10	***	***	***	***	78	353
23	72	75	71	90	78	79	***	76	73	***	75	65	***	25	***	***	***	***	***	64	74	***	***	***	309
24	***	***	***	***	74	***	***	***	***	***	***	***	***	***	***	***	***	83	***	67	***	75	***	82	140
25	81	90	87	***	36	61	85	81	55	61	67	80	***	***	***	39	***	***	***	***	61	67	***	59	72
26	64	73	75	81	58	***	***	***	***	67	***	***	68	***	***	***	***	***	***	***	***	73	204	31	99
27	55	75	91	77	72	69	74	85	86	61	83	70	70	56	54	81	240	***	***	***	***	***	333	307	133
28	334	57	65	353	88	102	155	159	133	124	126	73	69	57	52	282	295	***	***	***	***	306	340	333	208
29	330	347	45	104	131	98	128	99	89	73	81	68	69	86	89	96	78	46	71	83	89	***	***	***	289
30	***	***	***	***	***	***	***	***	***	***	85	83	***	***	***	***	***	***	***	***	***	***	***	81	183
31	95	70	78	84	77	67	77	72	77	87	***	***	***	103	50	107	***	***	***	37	48	90	108	93	260

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 68.4% OPERATIONAL RECOVERY RATE = 68.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	0.43	0.21	0.20	0.18	0.20	0.21	0.27	0.43	0.38	0.56	0.55	0.49	0.52	0.44	0.62	0.83	0.56	0.41	***	***	0.16	0.13	***	0.39
2	0.53	0.24	0.19	0.23	0.08	0.17	0.25	0.21	0.29	0.38	0.36	0.52	0.73	0.89	0.72	0.73	0.71	0.99	0.56	0.43	0.22	0.21	0.21	0.13	0.42
3	0.20	0.03	0.17	0.09	0.01	0.05	0.12	0.13	0.22	0.23	0.34	0.61	0.76	0.62	0.84	1.01	0.69	0.44	***	0.75	0.33	0.03	0.27	0.07	0.35
4	0.10	0.19	0.08	0.19	0.20	0.34	0.38	0.27	0.37	0.65	0.91	0.66	0.69	0.83	0.69	0.93	0.69	0.72	0.66	0.65	0.75	0.71	0.60	0.58	0.54
5	0.64	0.65	0.42	0.62	0.64	0.96	0.70	0.55	0.61	0.89	0.65	***	1.47	1.36	1.37	***	***	***	1.13	0.75	0.84	0.61	0.54	0.42	0.79
6	0.60	0.55	0.53	0.61	0.57	0.70	0.53	0.61	0.72	0.65	0.59	0.64	1.11	0.99	0.86	0.98	1.04	***	***	0.88	***	0.84	0.92	0.55	0.74
7	0.65	0.61	0.63	0.60	0.65	0.65	0.62	0.76	0.69	0.72	0.97	***	1.06	0.87	1.18	1.08	***	***	***	***	1.09	***	***	***	0.80
8	***	***	***	***	***	***	***	***	***	***	***	1.25	1.08	0.67	1.33	1.21	0.74	0.57	0.60	0.85	0.91	0.91	0.49	0.60	0.86
9	0.78	0.76	0.81	0.98	0.82	0.83	0.78	0.90	1.05	0.91	1.27	0.89	0.79	***	0.96	0.81	1.09	***	***	***	***	***	***	0.80	0.90
10	***	0.88	0.82	***	0.42	0.64	***	0.62	0.76	0.62	0.73	1.05	1.06	1.07	1.02	0.71	0.81	0.69	0.55	0.47	0.51	0.40	0.66	0.64	0.72
11	0.56	0.36	0.20	0.26	0.35	0.34	0.30	0.39	0.56	0.32	0.68	0.77	0.68	0.46	0.51	0.32	0.54	0.52	0.71	0.58	0.53	0.47	0.43	0.55	0.47
12	0.57	0.31	0.26	0.46	0.37	0.26	0.23	0.27	0.14	0.17	0.32	0.61	0.80	0.73	0.92	0.67	0.32	0.22	***	***	0.16	0.19	0.38	0.31	0.39
13	0.24	0.16	0.06	0.07	0.18	0.27	0.32	0.26	0.15	0.19	0.23	0.38	0.64	0.44	0.66	0.56	0.32	0.24	0.49	0.62	0.43	0.48	0.41	0.57	0.35
14	0.32	0.19	0.31	0.34	0.65	0.55	0.51	0.40	0.46	0.58	0.74	0.87	0.85	0.87	1.00	0.81	0.75	0.69	0.54	0.54	0.65	0.66	0.32	0.54	0.59
15	0.63	0.27	0.47	0.58	0.38	0.33	0.61	0.71	0.83	0.95	1.02	0.78	1.29	0.97	1.00	0.88	0.79	0.72	0.62	0.55	0.51	0.58	0.37	0.63	0.69
16	0.72	0.63	0.74	0.77	0.87	1.07	1.08	0.85	0.78	0.91	0.86	0.89	0.94	0.97	1.24	1.13	1.14	0.76	0.57	0.74	0.60	0.71	0.50	0.51	0.83
17	0.40	0.35	0.27	0.20	0.31	0.37	0.28	0.35	0.30	0.25	0.29	0.52	0.94	0.69	0.53	0.81	0.71	0.59	0.44	0.57	0.69	0.24	0.25	0.23	0.44
18	0.17	0.19	0.07	0.24	0.35	0.33	0.48	0.21	0.25	0.25	0.62	0.93	1.13	0.75	0.56	0.39	0.57	0.48	0.46	0.40	0.37	0.28	0.13	0.21	0.41
19	0.38	0.33	0.20	0.10	0.10	0.25	0.33	0.28	0.17	0.21	0.38	0.53	0.83	0.88	0.67	0.50	0.58	0.49	0.78	0.74	0.29	0.35	0.12	0.17	0.40
20	0.03	0.13	0.06	0.03	0.13	0.11	0.01	0.03	0.04	0.05	0.23	0.47	0.52	0.60	0.85	0.78	0.72	0.41	0.22	0.84	0.32	0.20	0.25	0.23	0.30
21	0.06	0.07	0.13	0.05	0.18	0.09	0.17	0.17	0.38	0.32	0.28	0.58	0.82	1.06	1.07	0.93	0.87	1.10	***	1.11	0.93	0.67	0.41	0.53	0.52
22	0.52	0.74	0.55	0.58	0.58	0.90	***	0.88	1.02	0.93	1.29	1.05	1.11	1.06	1.26	1.19	0.92	0.94	0.85	0.91	0.60	0.91	0.56	0.71	0.87
23	0.71	0.41	0.65	0.59	0.45	0.45	0.50	0.66	0.67	1.03	1.02	1.08	1.20	1.01	0.94	1.02	1.06	1.14	0.82	0.72	0.67	0.74	***	0.80	0.80
24	1.03	1.16	***	0.87	0.88	1.00	0.93	1.26	***	***	***	***	***	***	***	1.35	1.01	0.69	0.82	0.85	0.78	0.62	0.54	0.60	0.90
25	0.72	0.72	0.54	0.62	0.69	0.58	0.42	0.39	0.44	0.66	0.62	0.86	1.29	1.13	0.91	0.71	0.74	0.79	0.80	0.75	0.79	0.73	0.81	0.66	0.72
26	0.58	0.57	0.67	0.54	0.60	0.71	0.73	0.68	0.90	0.75	1.03	1.02	0.89	0.74	0.76	1.02	***	0.96	0.62	0.49	0.69	0.55	0.40	0.42	0.71
27	0.35	0.47	0.35	0.30	0.31	0.42	0.45	0.53	0.28	0.27	0.55	0.53	0.68	0.67	0.83	0.77	0.74	0.52	0.44	0.28	***	0.17	0.37	0.09	0.45
28	0.04	0.18	0.25	0.15	0.16	0.13	0.11	0.05	0.12	0.16	0.33	0.78	0.79	0.89	1.00	0.97	0.74	0.74	***	0.33	0.24	0.57	0.36	0.28	0.41
29	0.31	0.09	0.11	0.23	0.20	0.26	0.29	0.26	0.38	0.34	0.37	0.52	0.56	0.61	0.46	0.39	0.45	0.63	0.88	0.85	0.78	***	0.60	0.80	0.45
30	***	0.70	***	***	***	***	0.65	***	0.61	***	***	0.58	***	***	0.66	0.90	***	***	***	***	***	***	***	0.85	0.71
31	0.55	0.46	0.43	0.56	0.70	0.60	0.59	0.61	0.49	0.66	0.58	0.55	***	0.51	0.37	0.17	0.53	***	0.33	0.29	0.19	0.22	0.45	0.21	0.46
HRAVE	0.46	0.43	0.36	0.39	0.41	0.47	0.45	0.47	0.49	0.52	0.64	0.73	0.90	0.82	0.85	0.81	0.74	0.66	0.62	0.65	0.57	0.49	0.43	0.47	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.39	0.42	0.35	0.54	0.79	0.74	0.80	0.86	0.90	0.72	0.47	0.39	0.35	0.59	0.69	0.83	0.44	0.41	0.40	0.30	0.52	0.87	0.80	0.90	0.72
MAX	0.83	0.99	1.01	0.93	1.47	1.11	1.18	1.33	1.27	1.07	0.77	0.92	0.66	1.00	1.29	1.24	0.94	1.13	0.88	0.85	1.11	1.29	1.20	1.35	1.29
MIN	0.13	0.08	0.01	0.08	0.42	0.53	0.60	0.49	0.76	0.40	0.20	0.14	0.06	0.19	0.27	0.50	0.20	0.07	0.10	0.01	0.05	0.52	0.41	0.54	0.39

DAY	26	27	28	29	30	31
AVE	0.71	0.45	0.41	0.45	0.71	0.46
MAX	1.03	0.83	1.00	0.88	0.90	0.70
MIN	0.40	0.09	0.04	0.09	0.58	0.17

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 89.7% OPERATIONAL RECOVERY RATE = 89.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	0.43	0.32	0.09	0.11	0.28	0.23	0.48	0.57	0.58	0.47	0.35	0.50	0.43	0.48	0.64	0.86	0.88	0.62	***	***	0.10	***	***	0.44
2	0.08	0.03	0.09	0.09	0.27	0.21	0.26	0.25	0.21	0.36	0.32	0.37	0.72	0.51	0.88	0.83	0.69	1.05	***	***	0.23	0.22	0.45	0.34	0.38
3	0.05	0.04	0.13	0.01	0.01	0.01	0.05	0.23	0.43	0.18	0.16	0.45	0.52	0.58	0.86	0.87	0.56	***	***	***	0.44	0.09	0.02	0.01	0.27
4	0.03	0.04	0.02	0.29	0.20	0.27	0.19	0.30	0.41	0.61	0.82	0.59	0.44	0.56	0.66	0.88	0.75	0.81	0.60	0.62	0.63	0.76	0.53	0.58	0.48
5	0.79	0.74	0.59	0.47	0.60	0.72	0.80	0.55	0.58	1.01	1.04	***	1.63	***	1.84	0.97	***	***	1.24	0.72	0.84	0.72	0.59	0.38	0.84
6	0.64	0.64	0.49	0.94	0.89	0.59	0.73	0.56	0.72	0.86	0.68	0.93	1.23	***	0.78	0.88	0.96	***	***	***	***	0.68	0.89	0.47	0.77
7	0.57	0.68	0.61	0.42	0.50	0.58	0.69	0.78	0.78	0.78	1.03	***	***	0.87	0.81	0.99	***	***	***	***	***	***	***	***	0.72
8	***	***	***	***	***	***	***	***	***	***	***	1.21	0.96	***	1.18	1.04	0.63	0.66	0.47	0.64	0.75	0.57	0.37	0.63	0.76
9	0.45	0.40	0.65	0.99	0.71	0.58	0.64	0.78	1.05	0.76	1.10	0.91	0.79	***	***	***	***	***	***	***	***	***	***	***	0.75
10	***	***	0.78	***	***	0.61	***	0.52	0.54	***	0.61	1.00	0.98	1.07	1.17	0.80	0.60	0.65	0.44	0.48	0.55	0.42	0.61	0.47	0.68
11	0.53	0.27	0.24	0.54	0.30	0.42	0.39	0.29	0.61	0.25	0.51	0.62	0.63	0.52	0.49	0.30	0.45	0.42	0.70	0.55	0.52	0.66	0.32	0.66	0.47
12	0.61	0.30	0.28	0.45	0.52	0.25	0.24	0.07	0.14	0.15	0.15	0.31	0.87	0.90	0.74	0.57	0.24	0.23	***	***	0.08	0.28	0.36	0.08	0.36
13	0.04	0.05	0.01	0.01	0.05	0.43	0.38	0.47	0.29	0.07	0.28	0.40	0.71	0.40	0.82	0.66	0.41	0.34	0.53	0.59	0.36	0.33	0.40	0.33	0.35
14	0.17	0.08	0.21	0.25	0.55	0.36	0.50	0.45	0.62	0.41	0.84	0.88	0.87	0.90	0.98	0.91	0.76	0.67	0.54	0.53	0.55	0.63	0.29	0.57	0.56
15	0.61	0.30	0.33	0.43	0.29	0.21	0.46	0.57	0.70	0.85	0.97	0.61	1.15	0.78	0.98	0.93	***	0.63	0.52	0.67	0.47	0.46	0.30	0.51	0.60
16	0.61	0.62	0.85	0.72	1.00	0.83	1.14	0.73	0.67	0.74	0.86	0.80	0.94	1.03	1.12	1.09	0.90	0.75	0.53	0.69	0.66	0.70	0.52	0.54	0.79
17	0.41	0.37	0.27	0.13	0.36	0.48	0.30	0.29	0.29	0.46	0.37	0.36	0.57	0.38	0.45	0.77	0.68	***	0.41	0.48	0.51	0.31	0.33	0.52	0.41
18	0.15	0.29	0.30	0.34	0.77	0.44	0.40	0.41	0.49	0.52	0.64	0.67	1.13	0.67	0.66	0.35	0.61	0.58	0.41	0.29	0.31	0.11	0.16	0.50	0.47
19	0.20	0.30	0.13	0.17	0.10	0.41	0.36	0.49	0.32	0.27	0.27	0.41	0.76	0.79	0.55	0.29	0.44	***	***	0.34	0.31	0.29	0.27	0.46	0.36
20	0.36	0.28	0.01	0.01	0.07	0.16	0.04	0.04	0.23	0.31	0.23	0.44	0.46	0.65	0.92	0.80	0.77	0.84	***	0.72	0.48	0.20	0.22	0.17	0.37
21	0.02	0.35	0.42	0.51	0.57	0.11	0.15	0.14	0.69	0.42	0.48	0.43	0.79	1.17	1.07	1.00	0.87	***	***	0.73	***	0.75	0.39	0.56	0.55
22	0.47	0.68	0.60	0.72	0.82	***	***	0.93	1.16	***	1.21	***	1.23	1.13	1.17	1.07	0.96	1.09	1.02	***	***	***	***	***	0.62	0.93
23	0.73	0.46	0.63	0.57	0.41	0.44	0.39	0.72	0.69	0.91	1.08	1.30	***	1.00	0.95	1.01	0.98	***	***	0.66	0.70	0.74	***	***	0.76
24	0.89	1.10	***	0.82	0.76	0.86	***	***	***	***	***	***	***	***	***	***	***	***	0.63	0.83	0.96	0.77	0.59	0.50	0.48	0.77
25	0.59	0.92	0.66	0.71	0.61	0.66	0.63	0.44	0.74	1.04	0.78	0.77	1.24	***	0.97	0.65	0.79	0.78	0.74	0.70	0.80	0.68	0.94	0.61	0.76
26	0.60	0.63	0.67	0.55	0.56	0.69	0.64	0.62	0.84	0.78	1.03	0.90	0.96	0.69	***	***	***	***	0.51	0.49	0.71	0.57	0.43	0.43	0.66
27	0.38	0.46	0.20	0.22	0.09	0.22	0.47	0.65	0.49	0.33	0.44	0.54	0.71	0.67	0.93	0.88	0.83	0.50	0.27	***	***	0.21	0.26	0.03	0.44
28	0.10	0.15	0.17	0.11	0.39	0.37	0.01	0.09	0.02	0.01	0.04	0.64	0.58	0.75	0.85	1.00	0.67	***	***	***	***	0.66	0.33	0.32	0.36
29	0.35	0.02	0.21	0.35	0.33	0.11	0.17	0.31	0.47	0.41	0.38	0.45	0.49	0.71	0.46	0.48	0.58	0.54	0.72	0.78	***	***	***	***	0.42
30	***	0.84	***	***	***	***	***	***	0.55	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.78	0.72
31	0.44	0.40	0.37	0.53	0.37	0.42	0.48	0.51	0.36	0.48	0.46	***	***	0.49	0.37	0.04	***	***	***	0.29	0.08	0.10	0.43	0.24	0.36
HRAVE	0.40	0.41	0.37	0.41	0.44	0.42	0.41	0.45	0.54	0.52	0.62	0.65	0.84	0.74	0.86	0.77	0.70	0.67	0.62	0.60	0.51	0.45	0.41	0.43	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.44	0.38	0.27	0.48	0.84	0.77	0.72	0.76	0.75	0.68	0.47	0.36	0.35	0.56	0.60	0.79	0.41	0.47	0.36	0.37	0.55	0.93	0.76	0.77	0.76
MAX	0.88	1.05	0.87	0.88	1.84	1.23	1.03	1.21	1.10	1.17	0.70	0.90	0.82	0.98	1.15	1.14	0.77	1.13	0.79	0.92	1.17	1.23	1.30	1.10	1.24
MIN	0.09	0.03	0.01	0.02	0.38	0.47	0.42	0.37	0.40	0.42	0.24	0.07	0.01	0.08	0.21	0.52	0.13	0.11	0.10	0.01	0.02	0.47	0.39	0.48	0.44

DAY	26	27	28	29	30	31
AVE	0.66	0.44	0.36	0.42	0.72	0.36
MAX	1.03	0.93	1.00	0.78	0.84	0.53
MIN	0.43	0.03	0.01	0.02	0.55	0.04

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.8 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 82.0% OPERATIONAL RECOVERY RATE = 82.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	0.35	0.27	0.09	0.10	0.27	0.26	0.45	0.58	0.52	0.42	0.41	0.51	0.46	0.47	0.53	0.87	0.92	1.08	***	***	***	***	***	0.48
2	***	0.02	0.09	0.10	0.31	0.35	0.36	0.20	0.18	0.38	0.32	0.34	0.72	0.46	0.95	0.93	***	***	***	***	***	***	0.38	0.29	0.38
3	0.04	0.05	0.10	0.01	0.01	0.01	0.05	0.22	0.47	0.20	0.16	0.47	0.46	0.70	***	***	***	***	***	***	0.38	***	***	0.01	0.21
4	0.02	0.03	0.02	0.29	0.20	0.29	0.15	0.33	0.34	0.63	0.84	***	0.43	0.54	***	1.15	***	***	***	***	***	***	***	***	0.38
5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6	***	***	***	0.99	1.03	0.60	0.67	0.89	0.74	1.04	0.92	1.09	***	***	***	***	***	***	***	***	***	***	0.75	0.60	0.85
7	***	***	***	0.34	***	***	***	***	***	0.85	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.60
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
9	***	***	***	***	***	***	***	***	***	***	1.15	***	***	***	***	***	***	***	***	***	***	***	***	***	1.15
10	***	***	***	***	***	***	***	***	***	***	***	***	1.10	1.24	1.24	0.98	0.49	***	***	***	***	***	***	***	1.01
11	0.51	0.31	0.26	0.50	0.35	0.39	0.39	0.32	0.63	0.28	0.51	0.67	0.65	0.49	0.48	0.24	***	***	0.69	0.59	0.51	0.60	0.30	0.65	0.47
12	0.61	0.33	0.27	0.44	0.49	0.28	0.20	0.08	0.16	0.24	0.12	0.33	0.91	0.99	0.70	0.54	0.25	***	***	***	***	0.24	0.34	0.12	0.38
13	0.13	0.06	***	0.01	0.04	0.45	0.42	0.62	0.26	0.03	0.28	0.38	0.70	0.38	0.81	***	***	0.41	***	***	***	***	***	0.27	0.33
14	0.18	0.26	0.21	0.29	0.51	0.48	***	***	0.53	0.38	0.90	0.90	0.80	1.00	***	1.03	0.78	0.76	0.50	0.55	***	***	***	***	0.59
15	0.58	***	***	0.42	0.34	0.10	***	***	0.63	0.89	***	0.53	0.95	0.71	***	***	***	***	***	***	***	0.24	0.22	0.48	0.51
16	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.49	0.49
17	0.38	***	0.23	0.14	0.38	0.44	0.34	0.29	0.32	0.52	0.70	0.61	0.59	0.42	0.44	0.78	***	***	***	***	***	0.33	0.29	0.50	0.43
18	0.20	0.35	0.51	0.39	0.85	0.52	0.43	0.37	0.65	0.66	0.81	0.84	1.14	0.62	***	***	***	0.61	***	***	0.30	0.12	0.16	0.47	0.53
19	0.19	0.36	***	0.18	0.14	0.43	0.40	***	0.38	0.55	0.33	0.45	0.85	0.86	0.60	0.30	***	***	***	***	***	0.25	0.30	0.43	0.41
20	0.38	***	0.01	0.01	0.08	0.14	0.03	0.06	0.30	0.44	0.28	0.45	0.45	0.61	0.93	0.84	***	***	***	***	0.57	0.16	0.23	0.12	0.32
21	***	0.31	0.38	0.43	0.55	***	***	0.24	0.64	0.41	0.44	0.44	0.66	***	***	***	***	***	***	***	***	***	0.44	0.56	0.46
22	0.44	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.44
23	***	***	***	***	***	***	***	0.90	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.90
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	1.13	0.77	***	***	***	***	***	***	***	***	***	***	***	***	***	0.95
26	***	***	***	***	***	***	***	***	***	***	***	***	1.02	***	***	***	***	***	***	***	***	***	0.44	0.49	0.65
27	0.40	***	0.20	0.22	0.13	0.25	0.49	0.64	0.52	0.46	0.41	0.48	0.61	0.63	0.95	0.94	0.92	***	***	***	***	***	0.42	0.03	0.48
28	0.10	0.24	0.15	0.09	0.31	0.38	0.01	0.10	0.02	0.03	0.03	0.64	0.65	0.82	0.86	1.10	0.66	***	***	***	***	0.37	0.49	0.29	0.37
29	0.34	0.02	0.17	0.33	0.37	0.10	0.14	0.31	0.43	0.41	0.42	0.42	0.47	0.63	0.49	0.51	0.77	***	0.55	***	***	***	***	***	0.38
30	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
31	***	***	***	***	0.34	***	***	***	***	***	***	***	***	0.43	0.40	0.01	***	***	***	0.39	0.10	0.05	***	0.23	0.24
HRAVE	0.30	0.21	0.21	0.28	0.34	0.32	0.29	0.38	0.43	0.50	0.52	0.56	0.72	0.67	0.72	0.71	0.68	0.68	0.70	0.51	0.37	0.26	0.37	0.35	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.48	0.38	0.21	0.38	***	0.85	0.60	***	1.15	1.01	0.47	0.38	0.33	0.59	0.51	0.49	0.43	0.53	0.41	0.32	0.46	0.44	0.90	***	0.95
MAX	1.08	0.95	0.70	1.15	***	1.09	0.85	***	1.15	1.24	0.69	0.99	0.81	1.03	0.95	0.49	0.78	1.14	0.86	0.93	0.66	0.44	0.90	***	1.13
MIN	0.09	0.02	0.01	0.02	***	0.60	0.34	***	1.15	0.49	0.24	0.08	0.01	0.18	0.10	0.49	0.14	0.12	0.14	0.01	0.24	0.44	0.90	***	0.77

DAY	26	27	28	29	30	31
AVE	0.65	0.48	0.37	0.38	***	0.24
MAX	1.02	0.95	1.10	0.77	***	0.43
MIN	0.44	0.03	0.01	0.02	***	0.01

MONTHLY AVERAGE = 0.4 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 44.1% OPERATIONAL RECOVERY RATE = 44.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
FEBRUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	2.2	1.9	1.1	1.7	1.6	2.5	2.4	2.0	2.7	2.8	2.2	1.4	2.0	3.0	3.5	3.7	4.0	5.0	***	6.2	3.3	2.0	2.7	2.9	2.7
2	2.4	2.5	3.8	4.1	3.8	3.7	4.2	4.6	4.8	4.8	4.2	3.8	3.7	4.7	3.7	3.2	2.8	1.8	2.0	2.0	2.0	1.5	1.7	1.5	3.2
3	2.2	3.8	4.9	3.4	2.9	3.6	3.4	3.8	4.1	3.9	3.3	2.9	2.6	2.0	3.1	4.1	5.1	5.1	6.0	4.4	3.2	2.2	1.9	2.4	3.5
4	2.4	2.8	3.6	3.6	2.6	2.8	3.2	3.1	2.0	2.2	2.4	2.0	1.9	2.5	3.0	4.5	5.2	***	***	***	4.2	2.0	2.1	3.0	2.9
5	3.4	3.3	3.9	4.7	4.5	3.4	3.8	3.5	4.0	4.3	3.8	3.8	3.3	3.6	3.4	3.3	5.0	5.7	6.9	8.1	9.3	7.2	7.0	5.4	4.8
6	5.5	5.7	5.8	5.9	5.9	5.7	5.3	4.7	4.5	4.4	4.2	3.6	3.6	3.1	3.0	3.0	3.2	3.5	4.6	3.4	2.2	2.2	2.4	3.4	4.1
7	4.2	3.6	2.9	3.0	3.2	3.8	2.9	3.1	3.0	2.8	2.8	2.5	3.2	3.0	3.7	5.0	5.8	6.2	5.8	4.9	3.4	2.7	2.2	3.0	3.6
8	3.5	3.5	3.6	3.8	3.8	3.3	3.4	4.2	4.0	3.3	2.2	2.0	2.4	2.0	3.4	4.5	5.7	5.9	***	5.8	4.6	2.0	2.4	2.4	3.6
9	2.1	3.2	3.6	3.8	3.4	3.6	3.3	3.7	4.0	3.5	2.9	3.2	3.0	3.4	2.2	3.7	3.4	5.5	7.5	7.0	5.5	3.1	1.9	2.5	3.7
10	3.1	4.5	4.4	2.3	2.9	3.1	3.3	3.5	3.0	2.7	2.4	2.5	2.0	3.1	4.9	5.6	6.5	6.6	6.6	4.3	2.6	1.4	2.3	2.8	3.6
11	3.7	3.5	3.4	3.3	3.4	3.0	3.5	3.4	2.8	1.9	2.1	4.5	9.0	6.2	6.5	6.9	6.1	5.3	5.0	5.2	7.2	6.6	5.5	5.7	4.7
12	5.9	5.6	5.4	6.4	5.7	5.1	5.6	6.4	6.8	6.6	7.9	9.1	***	10.9	7.8	7.5	6.8	8.1	6.3	4.4	4.7	4.3	4.0	5.3	6.4
13	6.0	6.8	7.4	8.5	8.4	9.0	10.3	7.7	9.3	9.4	7.9	7.6	8.8	6.9	8.0	6.8	6.5	6.5	6.3	6.4	6.7	6.7	6.6	7.1	7.6
14	7.4	7.0	6.8	5.4	7.1	7.9	7.5	8.1	8.8	8.8	6.3	5.6	5.5	5.0	5.4	4.0	4.5	5.8	6.3	5.9	5.2	6.0	5.4	4.1	6.2
15	2.9	2.0	2.7	2.7	2.0	2.1	2.4	2.5	2.6	2.3	2.0	1.7	5.4	6.6	6.5	5.2	5.1	5.2	6.0	5.8	3.8	4.2	4.4	2.6	3.7
16	1.7	2.4	2.8	2.5	2.6	2.9	2.6	2.7	2.9	2.9	2.4	3.5	5.1	6.5	7.3	9.3	8.5	7.0	7.1	4.4	1.5	2.5	2.0	2.2	4.0
17	1.3	2.2	2.5	6.4	8.2	7.8	6.9	7.2	6.3	6.6	6.2	5.0	4.3	4.1	4.9	4.8	5.6	6.1	7.0	5.2	3.3	1.9	2.9	3.0	5.0
18	3.2	3.4	2.9	3.5	3.5	3.2	3.5	3.7	3.1	3.2	2.7	2.9	3.2	3.4	3.6	3.8	4.9	***	6.8	6.2	3.8	3.5	2.1	3.0	3.6
19	3.2	3.4	3.7	4.4	4.8	4.5	3.4	2.9	2.6	3.5	3.2	2.7	3.5	3.4	4.1	5.3	5.9	6.6	6.7	5.7	4.6	2.5	2.3	2.6	4.0
20	3.0	2.9	2.7	2.9	3.2	3.3	3.5	2.7	2.5	2.5	2.5	2.6	2.0	2.7	3.6	5.4	5.7	***	5.0	3.9	5.1	5.0	3.1	1.7	3.4
21	3.0	2.9	3.0	2.3	2.8	2.8	2.7	3.2	3.4	2.2	1.8	1.0	3.0	4.5	5.4	5.9	5.6	4.6	3.9	3.8	2.8	2.9	2.4	2.5	3.3
22	3.9	4.0	3.2	2.2	1.2	0.9	1.7	1.9	1.3	1.7	4.8	5.0	4.0	6.1	7.4	6.8	6.5	8.1	5.3	3.5	4.1	3.5	3.7	4.7	4.0
23	3.6	5.9	6.0	4.7	3.7	4.9	6.6	5.8	5.2	4.7	5.0	5.6	6.9	8.2	7.4	6.8	6.8	7.1	7.5	7.3	4.1	2.4	2.0	3.6	5.5
24	4.9	4.9	6.6	4.6	2.9	2.2	2.2	4.1	4.2	4.5	1.2	1.8	3.7	4.2	7.0	6.5	4.5	3.7	4.1	4.3	3.7	3.3	3.4	2.6	4.0
25	2.2	3.3	2.7	3.0	3.5	3.4	2.5	2.6	2.2	2.0	2.4	1.8	3.2	4.6	6.5	6.6	7.1	7.6	7.0	4.4	2.5	1.7	2.8	3.4	3.7
26	3.5	4.0	2.9	3.6	2.8	2.8	2.3	3.3	3.7	2.9	3.0	2.9	3.3	4.0	4.3	4.5	6.8	7.3	6.3	4.8	4.4	3.6	2.2	3.6	3.9
27	4.2	4.5	4.2	3.4	4.1	3.5	3.7	3.1	4.0	4.0	3.0	3.3	3.5	5.1	7.3	9.6	9.1	***	7.3	7.2	6.5	5.1	4.4	5.0	5.0
28	5.7	4.1	2.9	2.7	3.2	3.7	4.1	4.7	5.9	4.1	6.4	8.9	7.5	8.9	8.8	7.7	7.7	6.3	5.0	4.8	4.1	2.4	2.8	3.1	5.2
HRAVE	3.6	3.8	3.9	3.9	3.9	3.9	3.9	4.0	4.1	3.9	3.6	3.7	4.1	4.7	5.2	5.5	5.7	5.9	5.9	5.2	4.2	3.4	3.2	3.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.7	3.2	3.5	2.9	4.8	4.1	3.6	3.6	3.7	3.6	4.7	6.4	7.6	6.2	3.7	4.0	5.0	3.6	4.0	3.4	3.3	4.0	5.5	4.0	3.7
MAX	6.2	4.8	6.0	5.2	9.3	5.9	6.2	5.9	7.5	6.6	9.0	10.9	10.3	8.8	6.6	9.3	8.2	6.8	6.7	5.7	5.9	8.1	8.2	7.0	7.6
MIN	1.1	1.5	1.9	1.9	3.3	2.2	2.2	2.0	1.9	1.4	1.9	4.0	6.0	4.0	1.7	1.5	1.3	2.1	2.3	1.7	1.0	0.9	2.0	1.2	1.7

DAY	26	27	28	29	30	31
AVE	3.9	5.0	5.2	***	***	***
MAX	7.3	9.6	8.9	***	***	***
MIN	2.2	3.0	2.4	***	***	***

MONTHLY AVERAGE = 4.2 MONTHLY MAXIMUM = 10.9 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 98.7% OPERATIONAL RECOVERY RATE = 98.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	1.5	1.4	1.6	1.7	1.4	2.2	2.3	2.2	2.5	2.6	1.9	1.4	1.8	1.8	2.0	3.6	3.3	4.5	***	6.9	2.7	2.1	2.4	2.7	2.5
2	2.2	2.8	3.7	3.9	4.2	4.6	4.3	5.4	6.2	6.5	5.8	4.4	4.1	5.0	4.1	3.5	3.1	2.3	1.2	2.2	2.2	1.8	1.3	1.5	3.6
3	1.5	3.1	3.5	2.9	2.7	3.1	3.6	4.2	3.5	3.5	3.5	3.4	2.3	1.6	2.2	4.1	6.8	6.0	6.1	4.3	3.8	2.4	1.7	1.6	3.4
4	1.7	2.3	2.9	2.9	2.8	2.3	2.3	3.1	2.2	2.2	1.7	1.9	1.8	2.2	2.9	4.9	6.2	***	***	***	4.7	2.8	1.4	2.6	2.8
5	2.5	2.9	3.3	3.2	4.5	3.5	3.3	3.0	4.1	5.0	5.5	4.8	4.0	4.1	3.5	3.2	4.5	7.2	8.0	7.9	9.4	7.4	7.1	6.7	4.9
6	6.3	6.5	6.3	6.1	5.9	6.0	5.7	5.3	5.9	5.0	4.7	4.2	4.1	3.2	2.3	3.1	4.4	3.2	4.5	3.4	2.3	2.8	1.8	3.2	4.4
7	3.8	3.4	2.3	2.8	2.0	2.8	2.2	2.5	1.6	2.5	2.8	2.6	2.3	2.2	3.9	4.8	6.7	5.4	5.8	4.6	3.6	2.5	1.5	2.6	3.2
8	2.9	3.5	2.5	1.9	2.1	2.6	2.8	2.5	2.9	2.5	2.1	2.4	0.9	1.9	3.6	4.9	6.7	6.1	***	5.9	5.8	3.0	2.5	2.3	3.2
9	1.6	1.9	2.5	3.5	2.8	2.3	2.0	2.7	3.6	3.1	2.5	3.3	2.1	2.1	2.4	3.9	3.4	5.3	7.7	7.8	7.3	3.8	2.6	1.7	3.4
10	3.8	3.3	2.8	1.6	2.7	2.7	2.8	2.5	3.5	3.7	3.1	2.2	1.5	2.3	6.1	6.2	8.4	7.5	7.3	5.0	3.8	4.4	3.8	3.5	3.9
11	3.5	3.2	2.9	3.2	2.7	2.7	2.4	2.2	3.3	3.9	3.1	3.8	8.5	5.0	7.2	6.4	5.0	5.2	4.5	5.6	7.2	6.2	6.2	5.9	4.6
12	5.5	5.3	5.4	7.7	6.3	7.0	5.5	7.0	7.0	7.1	8.8	10.8	***	12.1	10.3	7.5	5.5	7.9	6.4	4.6	4.9	5.2	4.4	6.3	6.9
13	6.6	7.7	8.1	8.8	9.3	9.4	10.9	8.6	10.9	13.5	10.3	9.2	7.1	8.6	8.4	6.0	5.3	5.8	6.3	7.2	7.4	7.5	7.5	7.1	8.2
14	7.2	10.3	8.4	6.1	6.9	7.9	8.6	10.5	8.3	8.8	6.5	5.4	6.9	6.2	6.3	4.2	4.8	5.4	6.7	6.4	4.7	6.2	4.8	3.6	6.7
15	3.8	2.0	2.0	2.4	2.1	2.0	1.8	1.9	2.2	1.4	1.6	2.2	4.6	5.1	6.3	6.4	5.7	4.9	6.8	3.1	4.1	3.3	1.6	2.6	3.3
16	2.8	3.1	2.5	3.0	3.4	2.5	2.2	2.5	2.6	2.1	1.4	3.1	4.0	6.9	7.1	7.7	8.8	7.9	6.9	4.6	3.1	3.8	3.6	5.1	4.2
17	2.5	3.8	2.8	6.3	8.4	8.1	8.2	6.3	6.8	5.9	7.7	5.1	6.1	3.7	4.7	3.7	5.9	4.3	7.1	5.0	3.6	2.3	2.2	2.8	5.1
18	2.8	3.2	2.9	2.7	2.9	3.2	2.9	2.7	3.0	3.0	2.4	2.8	4.3	3.1	2.2	3.0	4.3	***	7.5	6.7	2.2	2.8	3.9	2.8	3.4
19	3.0	2.8	2.7	3.0	3.3	3.2	2.9	2.7	2.6	3.4	3.3	3.0	3.1	1.8	4.5	4.5	6.4	6.9	7.8	7.1	5.1	3.5	3.5	2.0	3.8
20	2.8	2.4	2.8	2.9	3.5	2.8	2.4	1.8	2.4	2.2	1.9	2.3	3.0	2.5	3.0	5.5	5.7	***	5.4	3.8	4.3	4.4	4.5	4.2	3.3
21	4.0	2.7	2.6	3.5	2.3	2.3	2.7	2.8	3.4	3.0	2.5	1.4	3.3	2.9	4.5	4.5	4.9	4.3	4.3	4.8	3.9	3.5	3.4	4.1	3.4
22	4.5	4.0	2.5	4.5	2.4	1.6	2.2	1.1	2.8	2.8	4.5	5.1	4.3	3.4	6.9	6.4	8.0	8.9	7.0	4.9	5.4	2.9	3.9	3.9	4.3
23	3.1	6.8	5.3	5.1	3.2	4.9	7.1	5.3	5.3	5.0	4.7	5.7	7.1	6.7	7.2	6.5	5.7	7.8	7.8	7.2	2.5	3.5	2.6	3.7	5.4
24	4.4	4.1	4.7	4.8	3.8	2.3	2.3	5.0	3.8	3.7	2.3	1.6	3.8	5.2	6.2	6.9	5.6	3.9	3.3	3.7	3.8	3.0	2.6	2.4	3.9
25	2.2	3.2	2.3	2.7	3.1	2.7	2.4	2.5	2.0	1.8	1.6	0.9	2.7	5.1	5.9	6.7	8.1	9.0	6.8	5.2	4.3	1.9	2.9	2.6	3.7
26	3.3	3.9	3.0	3.8	3.0	2.7	2.5	2.9	3.9	3.4	3.3	3.6	3.8	4.7	3.7	3.2	7.0	7.2	6.2	4.1	4.6	3.2	1.0	3.1	3.8
27	3.8	3.9	5.8	4.0	5.0	4.1	2.8	3.4	4.4	4.7	3.7	4.3	4.2	6.7	6.2	8.2	7.9	***	7.2	6.9	7.5	6.3	4.3	5.8	5.3
28	5.7	4.6	3.6	4.0	4.9	5.9	5.8	6.1	6.3	3.7	5.3	11.6	7.0	10.6	8.2	7.6	6.9	6.3	4.8	5.1	4.0	2.0	3.9	4.2	5.8
HRAVE	3.5	3.9	3.6	3.9	3.8	3.8	3.8	3.9	4.2	4.1	3.9	4.0	4.0	4.5	5.1	5.3	5.9	6.0	6.1	5.3	4.6	3.7	3.3	3.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.5	3.6	3.4	2.8	4.9	4.4	3.2	3.2	3.4	3.9	4.6	6.9	8.2	6.7	3.3	4.2	5.1	3.4	3.8	3.3	3.4	4.3	5.4	3.9	3.7
MAX	6.9	6.5	6.8	6.2	9.4	6.5	6.7	6.7	7.8	8.4	8.5	12.1	13.5	10.5	6.8	8.8	8.4	7.5	7.8	5.7	4.9	8.9	7.8	6.9	9.0
MIN	1.4	1.2	1.5	1.4	2.5	1.8	1.5	0.9	1.6	1.5	2.2	4.4	5.3	3.6	1.4	1.4	2.2	2.2	1.8	1.8	1.4	1.1	2.5	1.6	0.9

DAY	26	27	28	29	30	31
AVE	3.8	5.3	5.8	***	***	***
MAX	7.2	8.2	11.6	***	***	***
MIN	1.0	2.8	2.0	***	***	***

MONTHLY AVERAGE = 4.3 MONTHLY MAXIMUM = 13.5 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 98.7% OPERATIONAL RECOVERY RATE = 98.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	1.7	1.0	1.4	1.9	1.6	2.6	2.5	2.0	2.5	2.5	1.7	1.7	1.6	1.7	2.2	2.6	3.8	***	***	***	3.4	2.3	2.5	2.5	2.2
2	2.5	3.7	4.2	4.2	4.6	4.2	4.8	5.3	8.0	6.3	6.9	4.2	4.4	5.8	4.7	3.8	3.8	2.9	1.5	2.3	2.2	2.5	1.0	1.5	4.0
3	1.9	3.0	3.0	2.4	2.0	3.7	3.8	4.0	3.5	3.3	3.4	3.7	2.7	1.9	2.7	5.0	***	***	***	***	4.1	2.5	1.6	1.9	3.0
4	1.6	2.6	3.0	3.0	2.4	1.6	2.7	3.0	2.0	4.4	3.3	2.9	1.8	2.7	3.7	4.6	8.3	***	***	***	4.3	2.4	3.2	3.0	3.2
5	1.9	2.2	3.1	3.1	3.5	3.2	3.4	2.3	3.4	4.9	5.3	4.6	4.4	3.6	4.1	3.3	4.4	5.9	***	***	***	7.4	7.4	7.3	4.2
6	6.6	7.5	5.9	6.7	6.9	6.3	6.2	5.1	6.4	5.5	5.4	4.3	4.4	3.6	2.2	1.3	4.6	***	***	***	2.2	2.6	1.7	3.2	4.7
7	4.1	3.9	3.2	1.9	2.0	2.5	3.0	2.0	1.7	3.2	2.0	2.3	3.7	2.9	5.3	***	***	***	***	***	***	1.5	1.3	2.5	2.7
8	3.2	3.4	3.4	2.5	2.8	2.3	2.4	1.5	3.0	4.1	2.1	2.7	1.8	1.9	2.5	3.6	***	***	***	***	***	2.7	4.7	4.7	2.9
9	2.7	2.4	2.5	3.1	2.3	2.7	1.8	2.8	4.1	3.0	2.5	4.1	2.5	2.8	2.2	3.6	3.1	***	7.3	***	***	4.3	3.0	2.1	3.1
10	3.8	3.1	2.5	2.7	3.1	3.1	2.3	1.8	3.5	3.5	2.1	3.6	3.0	2.3	8.6	6.4	***	***	***	5.3	4.0	6.3	3.8	4.5	3.8
11	3.1	3.8	2.6	3.2	2.7	2.5	2.3	4.7	2.7	3.0	3.1	4.8	7.9	4.8	***	6.9	***	***	5.8	***	***	***	***	***	4.0
12	***	***	***	***	6.5	***	***	7.9	7.2	***	9.2	***	***	9.5	9.8	***	***	***	5.4	4.8	4.2	5.6	4.9	6.1	6.8
13	7.3	7.7	8.0	7.0	***	10.0	***	8.9	7.9	14.9	***	***	7.3	***	10.0	***	***	***	***	***	***	***	7.8	7.6	8.7
14	7.4	11.8	8.8	6.6	7.5	8.6	8.9	9.9	8.5	7.8	6.7	5.7	5.6	6.0	5.8	4.5	***	***	***	6.7	4.8	***	4.1	3.7	7.0
15	4.3	2.6	4.1	1.4	1.7	2.9	2.1	1.5	2.2	1.9	2.5	2.4	5.7	4.6	8.0	6.4	5.1	***	***	***	2.7	4.0	1.4	3.2	3.4
16	3.2	4.5	3.7	2.9	5.1	4.4	2.5	1.4	3.6	2.2	2.0	3.9	3.3	6.7	8.6	***	***	***	***	5.3	4.4	3.6	3.6	3.4	3.9
17	3.5	4.6	1.6	8.0	6.4	***	***	6.8	***	***	***	4.5	5.9	3.7	***	3.5	***	5.7	***	***	***	3.3	***	***	4.8
18	3.0	3.6	3.8	2.7	1.6	2.8	3.1	3.5	3.1	4.3	2.2	2.5	5.2	4.5	4.3	2.9	2.6	***	***	***	2.3	2.7	4.0	3.8	3.3
19	3.5	3.1	2.6	4.5	4.3	2.8	2.6	2.9	3.3	4.9	4.6	3.0	4.9	2.3	3.4	***	***	7.1	***	7.0	***	3.5	4.6	4.4	4.0
20	3.1	4.6	3.4	3.1	5.2	4.8	2.3	2.4	3.0	3.3	3.8	4.7	4.3	3.2	3.9	***	***	***	***	***	4.6	6.2	4.4	4.5	3.9
21	4.1	2.9	3.4	4.2	3.5	3.3	2.7	2.7	3.9	3.0	3.0	2.1	3.4	3.0	4.8	4.9	4.9	***	***	4.7	4.3	2.8	3.4	3.8	3.6
22	5.5	5.0	2.8	5.1	1.0	2.7	3.4	3.5	3.4	3.1	4.1	5.4	6.1	2.9	5.5	***	7.7	***	***	***	5.3	3.8	3.9	4.1	4.2
23	4.2	9.1	***	***	4.3	4.6	***	***	5.2	4.9	5.0	5.5	8.1	6.3	7.4	4.8	6.2	6.4	***	***	2.5	4.5	2.9	3.2	5.3
24	5.1	3.4	4.7	4.5	3.8	1.6	1.9	5.7	4.8	***	3.7	1.1	3.2	4.5	4.9	6.3	***	***	2.5	3.7	4.0	2.8	2.0	2.3	3.6
25	1.9	4.2	3.5	2.5	2.8	2.8	2.6	2.4	1.7	1.9	4.0	2.4	4.3	6.6	5.5	6.1	8.4	7.2	6.5	5.1	4.1	3.2	2.4	2.6	3.9
26	3.3	4.2	3.0	3.6	2.8	2.9	2.7	2.5	4.4	3.5	3.1	3.9	4.8	4.4	3.2	4.7	***	***	5.5	***	***	1.3	0.5	6.6	3.5
27	4.8	4.0	4.9	4.4	5.2	4.9	3.8	3.3	4.9	3.8	4.5	4.8	7.2	7.4	***	***	***	***	***	6.9	7.4	6.2	4.7	7.3	5.3
28	4.9	4.9	3.6	4.0	5.1	5.8	6.2	7.2	6.6	5.7	6.1	12.8	9.0	15.8	8.4	8.3	6.4	5.6	***	***	3.7	2.7	3.8	4.4	6.4
HRAVE	3.8	4.3	3.7	3.8	3.7	3.8	3.3	4.0	4.2	4.4	3.9	4.0	4.7	4.6	5.3	4.7	5.3	5.8	4.9	5.2	3.9	3.6	3.4	4.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.2	4.0	3.0	3.2	4.2	4.7	2.7	2.9	3.1	3.8	4.0	6.8	8.7	7.0	3.4	3.9	4.8	3.3	4.0	3.9	3.6	4.2	5.3	3.6	3.9
MAX	3.8	8.0	5.0	8.3	7.4	7.5	5.3	4.7	7.3	8.6	7.9	9.8	14.9	11.8	8.0	8.6	8.0	5.2	7.1	6.2	4.9	7.7	9.1	6.3	8.4
MIN	1.0	1.0	1.6	1.6	1.9	1.3	1.3	1.5	1.8	1.8	2.3	4.2	7.0	3.7	1.4	1.4	1.6	1.6	2.3	2.3	2.1	1.0	2.5	1.1	1.7

DAY	26	27	28	29	30	31
AVE	3.5	5.3	6.4	***	***	***
MAX	6.6	7.4	15.8	***	***	***
MIN	0.5	3.3	2.7	***	***	***

MONTHLY AVERAGE = 4.1 MONTHLY MAXIMUM = 15.8 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 81.2% OPERATIONAL RECOVERY RATE = 81.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
FEBRUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	114	90	33	13	44	61	58	45	85	82	118	93	332	268	275	276	280	290	***	295	321	48	101	98	172
2	97	95	108	131	101	88	82	86	86	85	93	93	84	79	80	31	271	11	74	297	331	335	343	10	95
3	83	100	122	117	95	105	112	108	119	99	100	98	109	154	279	275	286	298	304	309	316	303	69	91	329
4	83	94	109	125	125	107	105	119	133	104	91	96	167	274	275	283	288	***	***	***	320	329	68	91	116
5	94	102	116	141	126	92	129	128	98	108	92	98	111	89	84	60	37	42	54	56	59	64	70	81	20
6	75	75	70	68	67	72	82	90	92	88	95	95	90	83	24	343	271	274	288	300	302	45	87	79	166
7	103	109	107	99	109	132	137	107	120	97	77	88	173	264	276	276	282	287	302	292	297	314	103	103	193
8	102	93	107	134	128	114	136	153	144	136	100	120	207	274	270	284	290	294	***	304	309	18	90	86	203
9	88	111	111	120	106	138	139	122	128	105	96	112	172	226	307	267	269	284	294	297	303	332	94	115	182
10	98	114	138	106	102	123	145	129	126	135	105	100	141	228	278	279	278	281	279	281	293	235	155	99	350
11	98	101	95	96	117	129	108	105	107	121	84	21	65	6	1	10	9	359	15	74	84	91	96	89	282
12	52	46	82	105	102	88	72	68	86	101	126	117	***	115	98	90	89	87	93	102	91	82	87	90	259
13	71	74	77	65	66	61	63	66	72	75	73	74	65	73	78	80	67	15	23	36	53	61	67	69	27
14	65	65	69	77	64	61	67	61	59	60	68	71	73	76	76	87	77	61	52	58	69	67	68	65	327
15	52	66	121	122	63	71	88	92	94	106	160	156	284	293	283	265	282	286	289	288	293	306	289	273	142
16	161	95	99	89	87	90	93	99	94	120	148	273	277	276	273	281	278	276	280	270	303	285	158	139	194
17	339	295	311	31	62	53	28	69	82	74	71	81	54	284	261	266	269	273	281	283	281	359	96	89	146
18	85	88	88	101	112	122	106	113	126	87	95	103	155	176	197	266	283	***	292	292	113	74	52	92	177
19	87	96	115	127	126	116	111	94	90	86	83	89	201	270	278	287	291	290	287	287	286	245	150	95	201
20	85	83	81	82	84	101	108	113	90	84	83	70	180	272	273	279	271	***	273	258	112	17	139	135	261
21	104	122	102	102	93	78	86	100	107	79	67	311	287	272	268	281	280	291	297	292	268	272	232	218	10
22	278	281	340	55	27	329	88	0	348	17	295	278	269	259	269	275	274	284	281	281	192	251	266	282	121
23	276	296	295	288	285	290	285	297	293	277	285	264	260	274	272	274	275	280	277	292	281	254	291	283	287
24	286	287	309	293	293	228	225	295	275	270	336	260	272	266	277	287	320	13	64	73	85	90	80	77	344
25	75	85	85	90	103	102	92	96	94	98	105	116	274	285	283	280	278	278	279	275	261	126	92	99	347
26	102	110	92	92	109	108	129	91	96	111	96	95	132	114	262	273	277	275	280	284	284	284	66	104	316
27	108	111	112	104	109	107	121	100	70	71	80	84	89	250	260	243	253	***	274	278	269	273	271	257	243
28	250	264	260	213	193	221	203	220	246	268	251	229	249	236	241	253	273	285	291	281	271	240	215	263	302

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 98.7% OPERATIONAL RECOVERY RATE = 98.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	119	121	63	79	66	71	70	47	86	55	84	46	360	336	272	282	300	305	***	304	337	38	108	111	315
2	90	91	91	104	96	76	84	82	75	68	76	83	78	76	90	19	287	20	219	314	353	1	315	357	240
3	74	89	103	142	111	96	88	83	83	88	87	69	69	135	316	277	292	293	304	321	318	332	4	82	206
4	79	87	104	142	154	145	126	149	127	100	90	84	24	318	320	300	291	***	***	***	336	352	33	86	71
5	93	91	98	104	137	91	91	90	83	81	68	72	79	78	67	26	22	32	53	56	65	76	72	73	6
6	75	76	69	68	71	71	78	78	73	74	83	82	85	59	116	4	293	289	292	304	289	27	65	79	335
7	97	103	107	88	129	164	152	116	118	83	80	101	85	268	269	309	279	317	305	313	312	277	290	107	234
8	116	93	103	118	139	102	89	91	99	98	100	146	31	314	284	296	296	297	***	320	297	203	114	81	220
9	32	103	137	139	101	110	82	86	78	84	90	99	80	13	346	205	265	282	292	294	305	293	348	46	309
10	81	111	138	92	79	83	73	96	79	69	80	106	92	248	285	285	285	280	280	292	342	269	118	104	33
11	110	99	87	86	110	99	90	158	80	65	60	39	56	11	17	19	356	3	17	82	83	97	94	88	110
12	60	51	87	111	105	95	67	70	85	94	115	115	***	116	99	97	100	89	94	108	88	89	90	98	272
13	68	78	82	65	79	64	63	68	78	77	69	73	62	67	84	83	72	30	23	26	49	70	57	80	168
14	73	66	68	70	66	61	71	56	60	60	75	75	60	61	65	87	77	57	60	62	85	75	75	69	78
15	51	110	140	149	339	2	30	83	88	111	147	333	308	303	300	267	280	287	282	310	83	142	156	134	330
16	303	172	148	96	86	76	85	109	107	136	13	301	278	284	277	279	271	286	285	265	270	352	81	115	247
17	288	288	219	58	58	61	15	53	71	77	75	73	74	1	279	277	271	222	277	289	333	297	80	93	201
18	83	84	87	109	131	142	108	92	92	84	101	127	122	139	166	230	308	***	306	294	103	70	19	115	305
19	88	97	126	126	119	101	87	83	90	78	61	73	164	350	258	292	299	291	288	289	348	167	160	0	216
20	45	78	30	88	83	97	121	132	88	58	56	94	167	264	255	283	263	***	271	324	130	129	144	24	190
21	120	152	136	140	93	99	84	101	129	112	119	99	297	273	275	287	273	327	299	321	285	259	267	256	359
22	275	251	320	30	240	213	189	162	197	209	272	269	319	261	265	262	270	285	281	275	355	44	268	275	112
23	229	283	291	270	297	285	284	300	282	277	280	263	258	260	260	272	276	268	268	303	9	180	295	290	248
24	295	237	311	297	300	280	315	292	259	273	30	220	272	261	272	286	307	2	60	75	87	99	102	80	13
25	86	97	86	99	105	99	97	96	138	140	91	199	318	276	297	279	270	279	271	277	242	143	104	101	33
26	115	117	102	91	89	124	160	92	75	81	89	96	135	157	218	254	284	274	280	279	258	196	347	108	304
27	108	129	114	113	137	139	135	89	71	85	92	90	107	245	263	243	254	***	276	279	259	269	260	251	222
28	242	252	217	213	201	210	202	207	237	256	240	250	253	225	251	258	268	282	290	284	279	249	194	231	138

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 98.7% OPERATIONAL RECOVERY RATE = 98.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	108	106	59	70	70	74	65	15	78	41	89	47	339	16	238	271	299	***	***	***	333	18	106	106	228
2	96	92	84	92	92	76	86	74	96	65	80	88	81	76	97	22	286	358	168	314	346	3	323	355	19
3	89	85	106	139	123	87	89	89	87	94	85	61	63	158	293	233	***	***	***	***	323	334	7	86	183
4	77	90	105	122	122	137	112	127	120	91	95	89	2	300	290	295	291	***	***	***	346	338	115	98	265
5	78	92	85	85	109	95	94	94	86	79	61	73	77	85	75	18	27	13	***	***	***	78	70	74	46
6	76	72	71	72	77	70	73	79	72	71	79	94	98	69	13	106	295	***	***	***	293	28	63	90	302
7	106	107	110	56	116	165	154	77	115	83	31	108	100	214	248	***	***	***	***	***	***	294	14	147	232
8	117	91	121	125	134	105	108	93	112	86	47	153	63	341	284	310	***	***	***	***	***	195	99	92	334
9	34	109	85	148	95	125	83	94	78	79	95	89	58	3	342	224	219	***	293	***	***	289	343	76	325
10	85	114	127	103	78	101	81	90	76	64	75	112	80	233	295	298	***	***	***	280	334	81	92	136	258
11	110	103	47	91	121	97	83	200	85	53	351	25	33	22	***	14	***	***	353	***	***	***	***	***	308
12	***	***	***	***	105	***	***	75	78	***	115	***	***	110	91	***	***	***	106	108	95	88	90	91	287
13	51	90	76	79	***	67	***	57	78	77	***	***	62	***	82	***	***	***	***	***	***	***	55	81	210
14	75	66	67	80	65	60	72	54	59	62	75	74	57	62	66	83	***	***	***	61	90	***	70	68	41
15	28	208	120	165	354	58	14	55	97	104	131	273	311	299	280	268	271	***	***	***	25	260	131	110	321
16	184	161	68	54	125	37	70	202	121	145	326	295	291	285	269	***	***	***	***	268	265	338	40	153	180
17	299	283	90	43	50	***	***	40	***	***	***	63	92	108	***	284	***	172	***	***	***	317	***	***	273
18	48	67	96	126	102	147	109	126	128	83	84	121	119	120	267	213	303	***	***	***	92	48	10	117	286
19	98	102	123	126	122	107	97	91	99	77	57	69	159	292	253	***	***	291	***	289	***	161	177	287	296
20	51	51	26	63	89	107	121	132	103	35	360	90	171	274	270	***	***	***	***	***	86	130	161	66	258
21	141	168	106	133	354	74	69	99	129	127	132	146	320	279	269	283	274	***	***	288	294	253	269	250	120
22	262	249	332	54	251	166	178	122	196	210	265	269	330	255	285	***	261	***	***	***	19	27	282	284	342
23	176	301	***	***	337	286	***	***	286	274	277	263	259	265	254	270	275	265	***	***	11	198	290	304	170
24	302	221	310	301	286	262	319	296	204	***	45	173	284	241	302	309	***	***	50	84	95	144	111	77	237
25	72	89	162	92	100	102	95	101	149	151	43	278	285	279	302	284	267	287	275	276	249	60	25	105	114
26	119	113	98	79	92	116	168	96	70	76	93	97	133	138	182	264	***	***	281	***	***	39	305	122	134
27	102	129	107	111	140	133	125	97	71	68	90	80	65	181	***	***	***	***	***	278	257	255	255	245	133
28	237	266	217	195	200	215	193	206	236	244	246	232	245	221	253	257	274	278	***	***	284	233	209	237	172

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 81.2% OPERATIONAL RECOVERY RATE = 81.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
FEBRUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.08	0.17	0.29	0.14	0.36	0.36	0.31	0.41	0.22	0.44	0.44	0.40	0.32	0.47	0.72	0.81	0.63	0.54	***	0.22	0.22	0.13	0.07	0.23	0.35
2	0.08	0.24	0.26	0.20	0.26	0.34	0.37	0.38	0.29	0.35	0.41	0.66	0.83	1.08	0.72	0.74	0.55	0.30	0.24	0.23	0.25	0.38	0.22	0.17	0.40
3	0.11	0.26	0.40	0.09	0.10	0.14	0.20	0.19	0.26	0.21	0.57	0.45	0.72	0.86	0.79	0.68	0.78	0.53	0.19	0.28	0.24	0.19	0.05	0.01	0.35
4	0.05	0.03	0.04	0.09	0.02	0.02	0.01	0.10	0.26	0.17	0.34	0.51	0.48	0.45	0.56	0.73	0.77	***	***	***	0.48	0.13	0.23	0.14	0.27
5	0.04	0.03	0.10	0.20	0.20	0.25	0.20	0.05	0.21	0.21	0.36	0.41	0.55	0.85	0.63	0.57	0.62	0.49	0.50	0.66	0.58	0.66	0.54	0.44	0.39
6	0.32	0.37	0.44	0.43	0.49	0.61	0.38	0.23	0.27	0.26	0.45	0.54	0.73	0.57	0.95	0.84	0.76	0.68	0.31	0.40	0.42	0.31	0.05	0.24	0.46
7	0.36	0.12	0.17	0.06	0.02	0.14	0.08	0.02	0.03	0.24	0.32	0.47	0.78	0.68	0.68	0.89	0.72	0.49	0.35	***	0.28	0.63	0.06	0.09	0.33
8	0.18	0.30	0.25	0.12	0.02	0.14	0.15	0.26	0.15	0.26	0.47	0.91	0.79	0.48	0.54	0.90	0.73	0.62	***	0.25	0.42	0.28	0.07	0.25	0.37
9	0.22	0.02	0.01	0.07	0.05	0.11	0.13	0.07	0.21	0.24	0.25	0.69	0.77	1.06	0.68	0.84	0.79	0.39	0.44	0.43	0.79	0.45	0.19	0.37	0.39
10	0.30	0.28	0.16	0.14	0.19	0.12	0.10	0.10	0.03	0.30	0.40	0.39	0.41	0.70	0.83	0.99	0.67	0.83	0.77	0.57	0.45	0.36	0.55	0.48	0.42
11	0.28	0.43	0.36	0.20	0.13	0.03	0.08	0.11	0.37	0.33	0.48	1.08	1.21	0.99	1.11	1.12	1.10	1.21	1.03	***	0.46	0.53	0.67	0.55	0.60
12	0.59	0.59	0.62	0.65	0.43	0.41	0.61	0.80	0.50	0.77	0.94	0.95	***	1.00	0.99	0.99	0.95	0.94	0.50	0.45	0.61	0.76	0.50	0.38	0.69
13	0.78	0.47	0.39	0.71	0.76	1.19	1.19	0.81	0.87	0.80	1.10	1.11	1.21	1.29	1.07	0.95	1.09	1.04	0.77	0.65	0.75	0.57	0.62	0.55	0.86
14	0.49	0.61	0.56	0.37	0.56	0.69	0.68	0.58	0.64	0.84	1.24	1.02	1.14	0.98	1.06	0.68	0.80	0.60	0.68	0.76	0.56	0.67	0.50	0.45	0.72
15	0.48	0.34	0.27	0.40	0.40	0.28	0.32	0.31	0.02	0.13	0.38	0.68	0.90	0.84	0.65	0.79	0.79	0.54	0.37	0.58	0.42	0.47	0.37	0.33	0.46
16	0.38	0.40	0.20	0.21	0.25	0.29	0.30	0.13	0.01	0.12	0.42	0.61	0.94	0.84	0.81	0.81	0.70	0.83	0.54	0.46	0.58	0.66	0.36	0.30	0.46
17	0.40	0.36	0.50	0.73	0.81	1.08	1.09	1.36	1.02	1.06	1.03	0.86	1.07	0.91	1.02	1.06	1.08	0.98	0.58	0.55	0.65	0.42	0.43	0.50	0.81
18	0.44	0.35	0.12	0.31	0.17	0.06	0.15	0.25	0.34	0.30	0.60	0.65	0.93	0.90	0.98	0.97	0.78	***	0.53	0.54	0.44	0.61	0.52	0.30	0.49
19	0.41	0.23	0.24	0.20	0.17	0.20	0.08	0.13	0.12	0.16	0.43	0.57	1.11	0.75	0.97	0.99	0.88	0.79	0.41	0.48	0.64	0.69	0.63	0.38	0.49
20	0.51	0.25	0.32	0.45	0.39	0.20	0.18	0.28	0.24	0.15	0.33	0.68	0.74	0.67	0.59	0.90	0.80	***	0.49	0.49	0.69	0.74	0.68	0.55	0.49
21	0.40	0.39	0.38	0.39	0.22	0.31	0.06	0.30	0.13	0.25	0.38	0.54	0.69	0.92	0.85	0.73	0.84	0.68	0.43	0.71	0.37	0.40	0.46	0.48	0.47
22	0.40	0.46	0.45	0.52	0.57	0.44	0.28	0.29	0.31	0.22	0.83	0.76	0.85	0.75	0.76	0.86	0.84	0.77	0.46	0.40	0.77	0.75	0.59	0.59	0.58
23	0.61	0.29	0.37	0.60	0.47	0.32	0.57	0.54	0.76	0.76	0.79	0.93	0.91	1.07	1.03	0.95	0.78	0.66	0.44	0.39	0.53	0.40	0.44	0.45	0.63
24	0.56	0.40	0.51	0.48	0.26	0.30	0.33	0.31	0.66	***	0.45	0.45	0.78	0.97	0.92	0.88	1.01	0.79	0.75	0.47	0.57	0.38	0.44	0.33	0.57
25	0.24	0.43	0.25	0.10	0.08	0.19	0.16	0.02	0.08	0.43	0.69	0.61	0.79	0.97	0.92	0.91	0.74	0.84	0.50	0.25	0.27	0.40	0.29	0.30	0.44
26	0.11	0.25	0.24	0.40	0.09	0.06	0.05	0.07	0.20	0.33	0.63	0.71	0.90	0.98	1.10	0.91	1.16	1.02	0.78	0.57	0.66	0.57	0.38	0.29	0.52
27	0.36	0.20	0.24	0.19	0.26	0.20	0.20	0.33	0.41	0.50	0.38	0.79	0.88	0.91	1.32	1.09	1.04	***	0.61	0.65	0.69	0.53	0.80	0.72	0.58
28	0.60	0.43	0.48	0.47	0.36	0.39	0.39	0.40	0.53	0.40	0.75	0.70	0.94	0.94	1.05	0.93	0.91	0.68	0.42	0.56	0.55	0.39	0.53	0.36	0.59
HRAVE	0.35	0.31	0.31	0.32	0.29	0.32	0.31	0.32	0.33	0.38	0.57	0.68	0.83	0.85	0.87	0.88	0.83	0.72	0.52	0.48	0.51	0.48	0.40	0.37	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.35	0.40	0.35	0.27	0.39	0.46	0.33	0.37	0.39	0.42	0.60	0.69	0.86	0.72	0.46	0.46	0.81	0.49	0.49	0.49	0.47	0.58	0.63	0.57	0.44
MAX	0.81	1.08	0.86	0.77	0.85	0.95	0.89	0.91	1.06	0.99	1.21	1.00	1.29	1.24	0.90	0.94	1.36	0.98	1.11	0.90	0.92	0.86	1.07	1.01	0.97
MIN	0.07	0.08	0.01	0.01	0.03	0.05	0.02	0.02	0.01	0.03	0.03	0.38	0.39	0.37	0.02	0.01	0.36	0.06	0.08	0.15	0.06	0.22	0.29	0.26	0.02

DAY	26	27	28	29	30	31
AVE	0.52	0.58	0.59	***	***	***
MAX	1.16	1.32	1.05	***	***	***
MIN	0.05	0.19	0.36	***	***	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 98.2% OPERATIONAL RECOVERY RATE = 98.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.03	0.16	0.27	0.05	0.07	0.26	0.32	0.51	0.22	0.37	0.17	0.26	0.11	0.13	0.62	0.81	0.64	0.43	***	***	0.06	0.04	0.01	0.10	0.26
2	0.02	0.16	0.09	0.23	0.16	0.55	0.43	0.24	0.68	0.43	0.35	0.66	0.76	0.92	0.88	0.76	0.51	0.34	0.23	0.18	0.38	0.20	0.13	0.07	0.39
3	0.21	0.29	0.50	0.09	0.56	0.52	0.38	0.59	0.24	0.14	0.24	0.40	0.58	0.50	0.35	0.57	0.77	***	***	***	0.19	0.32	0.24	0.10	0.37
4	0.01	0.20	0.02	0.07	0.01	0.11	0.01	0.20	0.26	0.16	0.10	0.27	0.34	0.37	0.44	0.61	0.82	***	***	***	0.42	0.45	0.32	0.14	0.25
5	0.20	0.49	0.06	0.18	0.12	0.13	0.19	0.25	0.22	0.26	0.42	0.27	0.42	0.93	0.54	0.61	0.58	0.45	0.46	0.70	0.37	0.55	0.57	0.46	0.39
6	0.48	0.40	0.35	0.23	0.29	0.63	0.57	0.17	0.30	0.40	0.26	0.28	0.83	0.45	0.97	0.89	0.91	0.62	0.61	0.41	0.74	0.44	0.02	0.16	0.48
7	0.22	0.03	0.21	0.49	0.03	0.13	0.13	0.01	0.19	0.12	0.20	0.27	0.54	0.52	0.74	0.93	0.57	0.50	***	***	0.31	0.72	0.22	0.44	0.34
8	0.06	0.35	0.65	0.28	0.02	0.21	0.16	0.28	0.41	0.07	0.18	0.27	0.50	0.35	0.42	0.86	0.70	0.69	***	***	***	0.35	0.40	0.37	0.36
9	0.14	0.02	0.01	0.27	0.44	0.11	0.24	0.43	0.28	0.04	0.03	0.32	0.46	0.55	0.52	0.82	0.71	0.36	***	0.41	***	0.53	0.27	0.49	0.34
10	0.39	0.58	0.05	0.06	0.13	0.32	0.31	0.11	0.25	0.13	0.19	0.37	0.37	0.56	0.71	1.00	0.80	***	0.62	0.53	0.62	0.52	0.63	0.72	0.43
11	0.26	0.66	0.33	0.50	0.38	0.02	0.04	0.17	0.34	0.32	0.74	1.01	1.17	0.96	1.20	1.12	***	1.23	***	***	***	0.58	0.66	0.58	0.61
12	0.56	0.60	0.64	0.63	0.36	0.56	0.61	0.87	0.43	0.76	0.83	***	***	***	0.87	0.99	0.75	***	0.42	0.37	0.49	0.80	0.52	0.38	0.62
13	0.73	0.46	0.50	0.79	0.81	1.09	1.17	0.93	0.92	0.81	***	1.04	1.01	1.46	0.95	0.99	1.22	1.00	0.85	0.65	0.62	0.54	0.81	0.66	0.87
14	0.51	0.55	0.63	0.59	0.50	0.53	0.54	0.59	0.57	0.65	1.16	1.13	1.01	1.01	1.00	0.52	0.94	0.58	0.61	0.70	0.52	0.69	0.52	0.44	0.69
15	0.39	0.55	0.56	0.35	0.41	0.71	0.28	0.36	0.25	0.04	0.30	0.61	0.93	0.81	0.63	0.70	0.79	0.67	***	0.70	0.61	0.67	0.65	0.48	0.54
16	0.54	0.50	0.55	0.53	0.62	0.51	0.45	0.22	0.02	0.06	0.12	0.38	0.89	1.01	0.77	***	0.70	0.92	***	0.57	0.83	0.69	0.68	0.54	0.55
17	0.61	0.51	0.50	0.74	0.58	***	1.02	1.27	***	0.75	1.06	0.90	1.08	1.31	1.07	1.22	0.98	1.09	0.54	0.53	0.53	0.58	0.64	0.59	0.82
18	0.80	0.69	0.09	0.09	0.06	0.01	0.03	0.04	0.37	0.66	0.51	0.43	0.88	0.91	1.02	1.01	0.92	***	***	0.48	0.39	0.53	0.55	0.28	0.49
19	0.37	0.39	0.83	0.61	0.08	0.12	0.10	0.23	0.77	0.51	0.51	0.47	1.08	0.79	0.89	0.90	0.84	0.70	***	***	0.70	0.73	0.58	0.44	0.57
20	0.61	0.61	0.72	0.76	0.33	0.15	0.12	0.23	0.11	0.56	0.15	0.27	0.61	0.55	0.59	0.69	0.70	***	0.26	0.64	0.44	0.50	0.67	0.60	0.47
21	0.61	0.55	0.48	0.42	0.62	0.62	0.20	0.81	0.79	0.22	0.24	0.36	0.46	0.75	0.97	0.73	0.70	0.70	0.33	0.71	0.63	0.61	0.47	0.54	0.56
22	0.51	0.40	0.53	0.71	0.69	0.46	0.28	0.20	0.24	0.22	0.95	0.89	0.87	0.84	0.88	0.72	0.92	***	***	***	0.67	0.85	0.78	0.54	0.63
23	0.59	0.43	0.40	0.56	0.60	0.36	0.52	***	0.65	0.62	0.72	0.94	1.14	1.09	1.05	0.94	0.79	0.65	0.40	0.42	0.72	0.61	0.50	***	0.67
24	0.54	0.55	0.55	0.43	0.44	0.46	0.56	0.26	0.71	***	0.60	0.58	0.84	0.91	0.87	0.99	0.87	0.77	0.72	0.32	0.25	0.16	0.32	0.15	0.56
25	0.06	0.18	0.22	0.01	0.07	0.25	0.02	0.28	0.02	0.44	0.58	0.41	0.69	0.84	1.08	0.91	0.65	0.97	***	0.26	0.56	0.44	0.60	0.23	0.42
26	0.16	0.07	0.36	0.43	0.15	0.13	0.11	0.06	0.23	0.34	0.36	0.58	0.87	1.17	0.86	1.03	1.30	0.71	0.68	***	0.49	0.63	0.37	0.47	0.50
27	0.68	0.66	0.33	0.24	0.25	0.18	0.20	0.51	0.47	0.65	0.43	0.79	1.10	1.03	1.23	1.22	0.79	***	***	0.64	0.65	0.57	0.88	1.01	0.66
28	0.60	0.66	0.51	0.33	0.33	0.60	0.34	0.47	0.48	0.45	0.81	***	0.85	0.98	0.96	0.82	0.87	0.66	0.23	***	0.72	0.57	0.46	0.44	0.60
HRAVE	0.39	0.42	0.39	0.38	0.33	0.36	0.33	0.38	0.39	0.38	0.45	0.54	0.76	0.80	0.82	0.87	0.81	0.70	0.50	0.51	0.52	0.53	0.48	0.42	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.26	0.39	0.37	0.25	0.39	0.48	0.34	0.36	0.34	0.43	0.61	0.62	0.87	0.69	0.54	0.55	0.82	0.49	0.57	0.47	0.56	0.63	0.67	0.56	0.42
MAX	0.81	0.92	0.77	0.82	0.93	0.97	0.93	0.86	0.82	1.00	1.23	0.99	1.46	1.16	0.93	1.01	1.31	1.02	1.08	0.76	0.97	0.95	1.14	0.99	1.08
MIN	0.01	0.02	0.09	0.01	0.06	0.02	0.01	0.02	0.01	0.05	0.02	0.36	0.46	0.44	0.04	0.02	0.50	0.01	0.08	0.11	0.20	0.20	0.36	0.15	0.01

DAY	26	27	28	29	30	31
AVE	0.50	0.66	0.60	***	***	***
MAX	1.30	1.23	0.98	***	***	***
MIN	0.06	0.18	0.23	***	***	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 93.0% OPERATIONAL RECOVERY RATE = 93.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.03	***	0.32	0.06	0.11	0.29	0.33	0.48	0.21	0.41	0.14	0.26	0.18	0.21	0.63	0.80	0.65	***	***	***	0.12	0.07	0.01	0.09	0.27
2	0.02	***	0.27	0.80	0.18	0.76	0.46	0.26	0.89	0.63	0.33	0.65	0.74	0.94	0.93	0.76	0.56	***	***	0.20	0.38	***	0.08	0.05	0.49
3	***	0.28	0.43	0.10	1.29	0.47	0.45	0.82	0.52	0.26	0.30	0.47	0.57	0.52	0.37	0.51	***	***	***	***	***	***	0.25	0.09	0.45
4	0.01	0.54	***	***	0.01	***	0.01	0.24	0.33	0.17	0.08	0.26	0.37	0.44	0.51	0.56	***	***	***	***	0.46	0.42	0.30	0.13	0.28
5	0.18	0.53	0.29	0.20	0.18	0.08	0.31	0.72	0.45	0.36	0.40	0.32	0.59	0.97	0.53	***	***	***	***	***	***	0.49	0.59	0.46	0.43
6	0.45	0.44	0.32	0.25	0.31	0.62	0.54	0.22	0.35	0.37	0.26	0.30	0.76	0.46	1.05	***	1.06	***	***	***	0.81	0.44	0.02	0.24	0.46
7	0.20	0.02	0.23	0.46	***	***	0.12	0.01	0.20	0.12	0.17	0.42	0.57	0.53	0.77	***	***	***	***	***	***	0.79	0.22	0.38	0.33
8	0.04	0.33	0.60	0.25	***	0.30	0.11	0.34	0.45	0.13	0.18	0.34	0.55	0.37	0.44	0.88	***	***	***	***	***	0.33	0.44	0.34	0.36
9	0.04	0.03	0.01	0.27	0.55	0.19	0.24	0.52	0.40	0.47	0.06	0.35	0.60	0.61	0.50	0.81	0.71	***	***	***	***	0.57	0.31	0.47	0.39
10	0.44	0.60	0.04	0.10	0.17	0.30	0.41	0.11	0.41	0.23	0.16	0.42	0.43	0.52	0.73	0.91	***	***	***	***	***	0.60	0.60	0.82	0.42
11	0.27	0.62	***	0.49	0.33	0.01	0.04	***	0.35	0.50	0.71	1.02	***	***	***	***	***	***	***	***	***	***	***	***	0.43
12	***	***	***	***	***	***	***	***	0.43	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.43
13	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.71	0.71
14	***	0.50	0.60	0.60	0.45	***	0.54	0.56	0.53	***	***	***	0.91	1.05	***	0.52	***	***	***	***	***	***	***	0.45	0.61
15	0.42	0.55	0.55	0.36	0.42	0.66	0.25	0.33	0.23	0.03	0.28	0.56	1.12	***	0.63	0.71	0.80	***	***	***	0.56	0.62	0.69	0.54	0.52
16	0.46	0.51	0.53	0.45	0.87	0.79	0.58	0.15	0.02	0.08	0.17	0.36	0.83	0.99	0.76	***	***	***	***	0.63	0.80	0.69	0.72	0.53	0.55
17	0.66	0.48	0.53	***	***	***	***	***	***	***	***	***	***	1.47	***	***	***	***	***	***	***	***	***	***	0.78
18	***	***	***	***	***	***	***	0.06	0.35	0.59	0.50	0.35	0.92	***	***	***	***	***	***	***	0.41	***	0.64	0.29	0.46
19	0.28	0.41	0.91	0.56	***	0.12	0.10	0.36	0.70	0.59	0.57	0.49	0.96	0.95	***	***	***	***	***	***	***	0.64	0.59	0.47	0.54
20	0.63	0.57	0.74	***	***	***	***	***	0.11	0.51	0.13	0.30	0.63	0.53	0.69	***	***	***	***	***	0.48	0.50	0.75	0.62	0.51
21	0.66	0.62	0.47	0.44	0.57	0.67	0.21	0.75	0.72	0.27	0.29	0.42	0.52	0.64	0.89	0.66	***	***	***	***	0.68	0.65	0.55	0.51	0.56
22	0.50	0.46	0.51	0.61	0.75	0.48	0.24	0.21	0.37	0.71	0.94	1.00	0.93	0.88	0.90	***	***	***	***	***	0.68	0.84	0.86	0.55	0.65
23	0.57	***	***	***	0.65	0.42	***	***	***	0.52	***	1.02	1.23	1.03	1.09	***	0.87	***	***	***	0.74	0.61	***	***	0.80
24	0.52	***	***	0.48	***	***	0.78	0.26	***	***	0.63	0.61	0.84	0.98	0.80	1.13	***	***	0.77	0.32	0.15	0.05	0.18	0.13	0.54
25	0.03	0.18	0.15	0.03	0.05	0.54	0.29	0.46	0.16	0.49	0.68	0.45	0.71	0.88	1.15	0.94	***	***	***	***	0.67	0.48	1.05	0.31	0.49
26	0.16	0.11	0.40	0.41	0.18	0.11	0.09	0.06	0.55	0.50	0.37	0.61	1.01	1.26	0.75	0.85	***	***	***	***	***	0.62	0.36	0.46	0.47
27	***	***	***	***	***	***	***	0.50	0.50	0.64	0.39	0.77	1.15	***	***	***	***	***	***	***	0.64	***	0.84	1.01	0.72
28	0.59	0.63	0.49	0.37	0.33	0.57	0.36	0.43	0.46	0.49	0.71	***	***	***	***	***	***	***	***	***	***	***	0.44	0.44	0.49
HRAVE	0.33	0.42	0.42	0.36	0.41	0.41	0.31	0.36	0.40	0.39	0.37	0.51	0.74	0.77	0.74	0.77	0.78	***	0.77	0.38	0.54	0.52	0.48	0.42	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.27	0.49	0.45	0.28	0.43	0.46	0.33	0.36	0.39	0.42	0.43	0.43	0.71	0.61	0.52	0.55	0.78	0.46	0.54	0.51	0.56	0.65	0.80	0.54	0.49
MAX	0.80	0.94	1.29	0.56	0.97	1.06	0.79	0.88	0.81	0.91	1.02	0.43	0.71	1.05	1.12	0.99	1.47	0.92	0.96	0.75	0.89	1.00	1.23	1.13	1.15
MIN	0.01	0.02	0.09	0.01	0.08	0.02	0.01	0.04	0.01	0.04	0.01	0.43	0.71	0.45	0.03	0.02	0.48	0.06	0.10	0.11	0.21	0.21	0.42	0.05	0.03

DAY	26	27	28	29	30	31
AVE	0.47	0.72	0.49	***	***	***
MAX	1.26	1.15	0.71	***	***	***
MIN	0.06	0.39	0.33	***	***	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 62.2% OPERATIONAL RECOVERY RATE = 62.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

SODAR AND 10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

FOURTH MONITORING QUARTER MARCH THROUGH MAY 2015

ASARCO HAYDEN COMPLEX METEOROLOGICAL MONITORING PROGRAM FOR REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
2027 Broadway, Suite B
Boulder, CO 80302

June, 2015

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. The smelter air emissions are released to the atmosphere through a 1,000-foot (approximately 300 meter) tall stack. To help refine future AERMOD air dispersion modeling at the facility, ASARCO has been performing site-specific meteorological monitoring at Hayden. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

ASARCO supplemented the 10 meter meteorological tower with a Remtech PA-0 phased-array acoustic Sodar in late May 2014 that measures winds at elevations ranging from approximately 50 to 400 meters above ground level. Sodar (SOnic Detection And Ranging) systems are used to remotely measure the vertical turbulence structure and the wind profile of the lower layer of the atmosphere. Sodar systems are like radar systems except that sound waves rather than radio waves are used. A profile of the atmosphere as a function of height can be obtained by analyzing the return signal at a series of times following the transmission of each pulse. Three antenna beams oriented along the U, V, and W directions allow the calculation of horizontal and vertical wind speeds and directions. Phased-array Sodar systems use a single array of speaker drivers and horns (transducers), and the three antenna beams are electronically generated and steered by phasing the transducers appropriately.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the fourth monitoring quarter sodar and 10-meter tower data validation report for the period March through May 2015. This report includes validation of the additional parameters pressure, precipitation, and relative humidity collected at ST-10 for the period June 2014 through May 2015. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the quarter, and Appendix C presents additional monthly validated data tables for precipitation, pressure, and relative humidity for the first three monitoring quarters.

2.0 CHRONOLOGICAL SUMMARY

The tower and sodar data was remotely collected and reviewed on a daily basis. The sodar data was also regularly compared to the tower wind data to ensure proper sodar operation. No significant operational events occurred during the period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

The fourth quarter calibration of the ST-10 meteorological tower equipment was performed on June 10, 2015, and the calibration results are presented in Appendix A. The calibrations demonstrate that the meteorological systems were operating within the acceptable DQO ranges, as listed in the project's QAPP Table B-1. The Sodar and ST-10 QAPP does not list calibration DQOs for the parameters collected at ST-10 that are not used in AERMOD dispersion modeling, those parameters being pressure, precipitation, and relative humidity. The DQOs that were used to validate these three additional parameters are listed in Tables 0-7 and 0-8 in EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems - Volume IV: Meteorological Measurements Version 2.0* (March 2008), which list PSD measurement DQOs. All previous calibrations for these three parameters were also reviewed, and all calibration results were within acceptable limits with one minor exception. That exception was the June 2015 atmospheric pressure calibration, which was 1.8 mm Hg over the DQO; no adjustments were made to the data for this minor exception, and the corrective response was to adjust and recalibrate the sensor.

A quality assurance performance audit was also conducted on the ST-10 meteorological tower and the sodar on June 10, 2015, before any tower calibrations or adjustments were made. This audit was performed by independent personnel, using independent certified audit standards. The results from this audit are also presented in Appendix A, and indicate that the meteorological systems were operating within the acceptable DQO ranges.

3.2 Sodar Calibration and Audit Results

Section 9.6 of EPA's Met Monitoring Guidance notes that, other than directional alignment checks, a true calibration verification of a sodar is difficult because of the nature of the measurement technique. In addition, because the PA0 sodar system is a multiple frequency phased array system, a transponder cannot be used to test this system. However, the PA0 performs numerous internal signal checks during normal operation. Therefore, there are no specific sodar calibration procedures except for leveling the antenna and checking orientation, and both of these checks have been performed.

A sodar performance audit was performed on June 10, 2015. This audit compared sodar measurements with an independent measurement technique, a tethersonde system, as recommended in Section 9.6 of EPA's Met Monitoring Guidance. The tethersonde system uses a

tethered balloon to lift a measurement package or "sonde" to an altitude corresponding with the Sodar measurements. This method then collects data over a minimum of five sodar 15-minute averaging periods. Table 9-4 in EPA's Met Monitoring Guidance recommends sodar DQO audit goals for the systematic difference and comparability, as listed below.

Table 1 – Sodar DQOs

Systematic Difference (Bias)	Comparability (RMS Error)
U and V component $< \pm$ 1 m/s	U and V component $< \pm$ 2 m/s
Wind Speed $< \pm$ 1 m/s	Wind Speed $< \pm$ 2 m/s
Wind Direction $< \pm$ 10 Degrees	Wind Direction $< \pm$ 30 Degrees

The results from the sodar tethersonde audit are presented in Appendix A. All test results are within the Project DQOs and indicate acceptable instrument performance.

3.3 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). Additional data screening is also performed on the sodar data. The internal sodar diagnostic data, including signal to noise ratios (SNRs), the FEMAX ground clutter number, the JAM internal electronic test diagnostic value, and the number of spurious signals (SPU) are screened against manufacturer recommended values. Time series data from the Sodar are screened against rates of change and persistence criteria, and the vertical profiles of the Sodar are screened against expected rate of change with altitude criteria. If the comparisons fall outside of typical ranges, the record is flagged for further inspection. The 15-minute Sodar data are averaged into hourly data using unit vector wind direction averages and scalar wind speed averages, in accordance with Section 6.2 of EPA's Met Monitoring Guidance.

Table 1 summarizes the data screening and validation criteria used for both the 10 meter meteorological tower parameters and the sodar.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were 0.7, -1.3, and -3.1 mm Hg over the entire year period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, including any necessary data edits.

Table 2 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%
Sodar Internal Diagnostic Data	JAM > 0, FEMAX > 600, SNR % total bandwidth > 5, SPU > 7.
Sodar Time Series Rate of Change	Same range and persistence checks as listed above for wind speed and direction.
Sodar Rate of Change for Altitude Gates	WS difference more than 4.5 m/s between altitude gates, and WD difference more than 120 degrees between altitude gates.
Sodar Comparison to 10-meter Wind Data	When Wind Speed is > 2 m/s and time is between 10am and 5 pm, then: Wind Speed Average Bias < 1 m/s, WD Standard Deviation Variability < 2 m/s, Wind Direction Average Bias < 10 degrees, WD Standard Deviation Variability < 30 degrees

Quality control comparisons of the hourly average 100 meter sodar wind speed and direction data to the hourly average 10 meter meteorological measurements are also performed for the quarter. These tests are performed only when the atmosphere is well mixed and the 10 meter surface winds should be coupled to the Sodar height winds, which occurs during daytime periods (between 10 am and 5 pm) with moderate wind speeds (greater than 2 m/s). The average difference and standard deviation of differences for wind speed and wind direction were computed and compared to the same DQOs EPA recommends for sodar audits against nearby meteorological towers (even though for an audit, the sodar and tower measurement heights are at the same height, and therefore should agree better than 10 and 100 meter data). Table 2 presents the results of this quality control comparison, and demonstrate that the sodar agrees with the 10-meter tower within the EPA recommended DQO criteria. Note that the 100 meter minus 10 meter wind speed average difference is 0.7 m/s, indicating that on average the wind speeds at the sodar 100 meter level are higher than 10 meter wind speeds.

Table 3 – Sodar QC Comparisons to 10m Tower Wind Data

Parameter	EPA DQOs	System Performance
Wind Speed Average Difference (m/s)	< 1	0.7
Wind Speed Std Dev Difference (m/s)	< 2	1.0
Wind Direction Average Difference (degrees)	< 10	-3
Wind Direction Std Dev Difference (degrees)	< 30	23

Note: The 100m level of hourly averaged sodar wind data was compared to 10m tower wind data.

3.4 Data Capture Statistics

Based on the review of data from calibrations, audits, and the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 3 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis, and the quarterly data capture rates are well above 90% for each month for all parameters except the 400 m level sodar winds and 300m and 400m sigma W data. This is not unexpected, as sodars have difficulty collecting data at altitudes greater than approximately 300 meters, especially in hot and dry locations such as the ST-10 site. EPA also notes in Section 9.8 of the Met Monitoring Guidance that "data capture for wind direction and wind speed from a sodar is defined somewhat differently than for more conventional instruments", and " an averaging period (e.g., hourly) is considered valid if there are at least three valid levels of data for the period (independent of height)". The data capture rates for all sodar levels equal to and below 300 meters in height all meet the data completeness DQO, and therefore the sodar data capture rates meet EPA requirements.

In summary, all meteorological data collected during the quarter meets the DQO completeness goal for all parameters.

Table 4 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp Delta T	Solar Rad	100m WS/WD	300m WS/WD	400m WS/WD	100m SW	300m SW	400m SW
Jun-14	100.0	100.0	100.0	100.0	95.3	95.3	78.2	93.3	82.6	35.7
Jul-14	100.0	100.0	100.0	100.0	98.8	98.8	92.5	98.1	94.0	76.2
Aug-14	99.3	99.3	99.3	99.3	98.7	98.5	94.5	98.1	95.0	84.0
Sep-14	100.0	100.0	100.0	100.0	96.8	96.8	90.3	96.0	92.1	80.6
Oct-14	100.0	100.0	100.0	100.0	99.2	99.1	87.4	98.4	93.0	72.7
Nov-14	100.0	100.0	100.0	100.0	98.2	98.2	81.5	97.4	92.2	52.5
Dec-14	100.0	100.0	100.0	100.0	95.8	96.0	85.3	94.1	89.8	64.7
Jan-15	100.0	100.0	100.0	100.0	92.1	92.1	68.4	89.7	82.0	44.1
Feb-15	99.1	99.1	99.1	99.1	98.7	98.7	81.2	98.2	93.0	62.2
Mar-15	100.0	100.0	100.0	100.0	98.3	98.3	76.1	97.3	89.4	50.9
Apr-15	100.0	100.0	100.0	100.0	97.1	97.1	76.8	96.4	88.6	50.0
May-15	100.0	100.0	100.0	100.0	95.3	95.2	78.1	94.5	86.8	59.3
Quarter 1	99.8	99.8	99.8	99.8	97.6	97.6	88.5	96.5	90.6	65.6
Quarter 2	100.0	100.0	100.0	100.0	98.1	98.0	86.4	97.3	92.4	68.6
Quarter 3	99.7	99.7	99.7	99.7	95.4	95.5	78.2	93.9	88.1	56.8
Quarter 4	100.0	100.0	100.0	100.0	96.9	96.9	77.0	96.1	88.3	53.4
Year to date	99.9	99.9	99.9	99.9	97.0	97.0	82.5	95.9	89.9	61.1

Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and year to date.

4.0 DATA RESULTS

Appendix B presents plots of various monthly data summaries and data tables for the reporting period (these tables include sodar data for the 100, 300, and 400 meter levels). Also submitted with this report are 15-minute and hourly data files in a format designed for AERMET data processing (all sodar altitude levels are included in these data files).

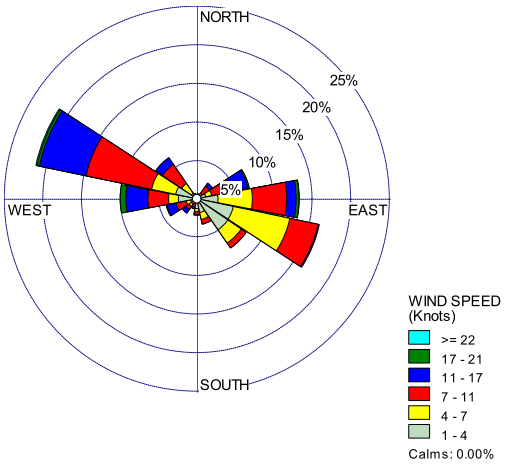
Figure 1 presents plots of the quarterly wind speed and wind direction data at selected heights of 10, 100, and 300 meters above ground, in a format called a "wind rose" plot. These wind roses indicated that there are two predominate wind directions at the site; one from the east (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours). As expected, the wind speeds at 100 and 300 meter levels are typically higher than the 10 meter winds, with fewer hourly observations in the lower wind speed ranges (gray and yellow bars in the wind roses).

The review of the wind data indicates that there is a diurnal flow pattern at the site, with winds frequently from the east and southeast directions in the morning and evening hours with light to moderate speeds, followed by afternoons with moderate to strong winds. This pattern is evident in the wind roses, and can also be seen in an example of the daily wind data profiles shown in Figure 2 with light easterly and southeasterly flows in the morning followed by stronger westerly wind flows during the afternoon hours. This pattern repeats itself for the majority of the days, and results in the observed bi-modal wind rose distributions.

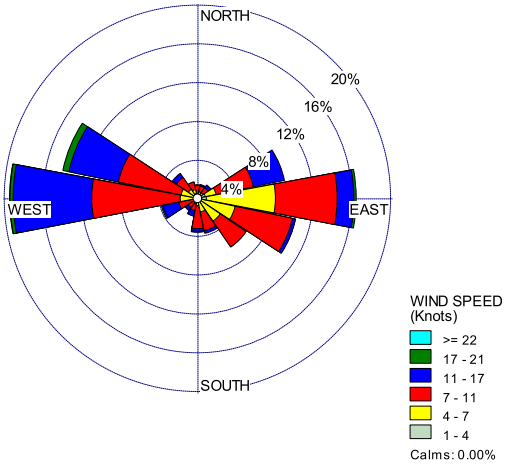
A complete one year digital data base in an ASCII format suitable for AERMET processing is included with this data report. In addition, an AERMET Stage 1 input file for this onsite data has also been developed. It is recommended that Sodar data up to 400m be used for AERMET processing, for the following reasons. First, this altitude extends 100m taller than the main stack height, which will allow AERMOD to properly simulate stack tip downwash, plume rise, and plume transport. Second, the data capture rates at altitudes above 400m are lower than at altitudes below 400m, and there is an increased number of data screening flags (which indicates that data from higher elevations may not be as reliable as data from 400m and lower altitudes). Therefore, it is not likely that data from these higher Sodar altitudes would add to the accuracy of the AERMET data profile. The included AERMET Stage 1 input file for the onsite data is setup to only process Sodar data up to 400m altitude.

Figure 1 –Wind Rose Plots

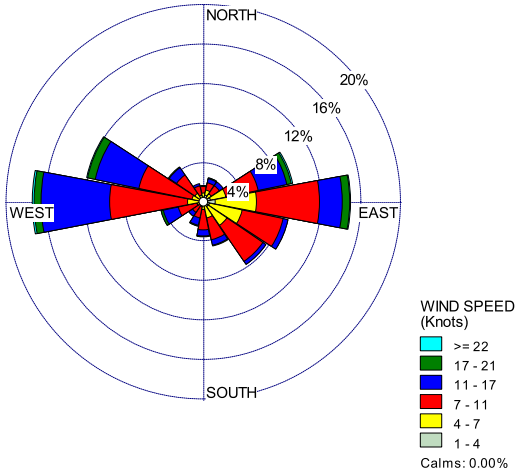
10-Meter Wind Rose



100-Meter Wind Rose

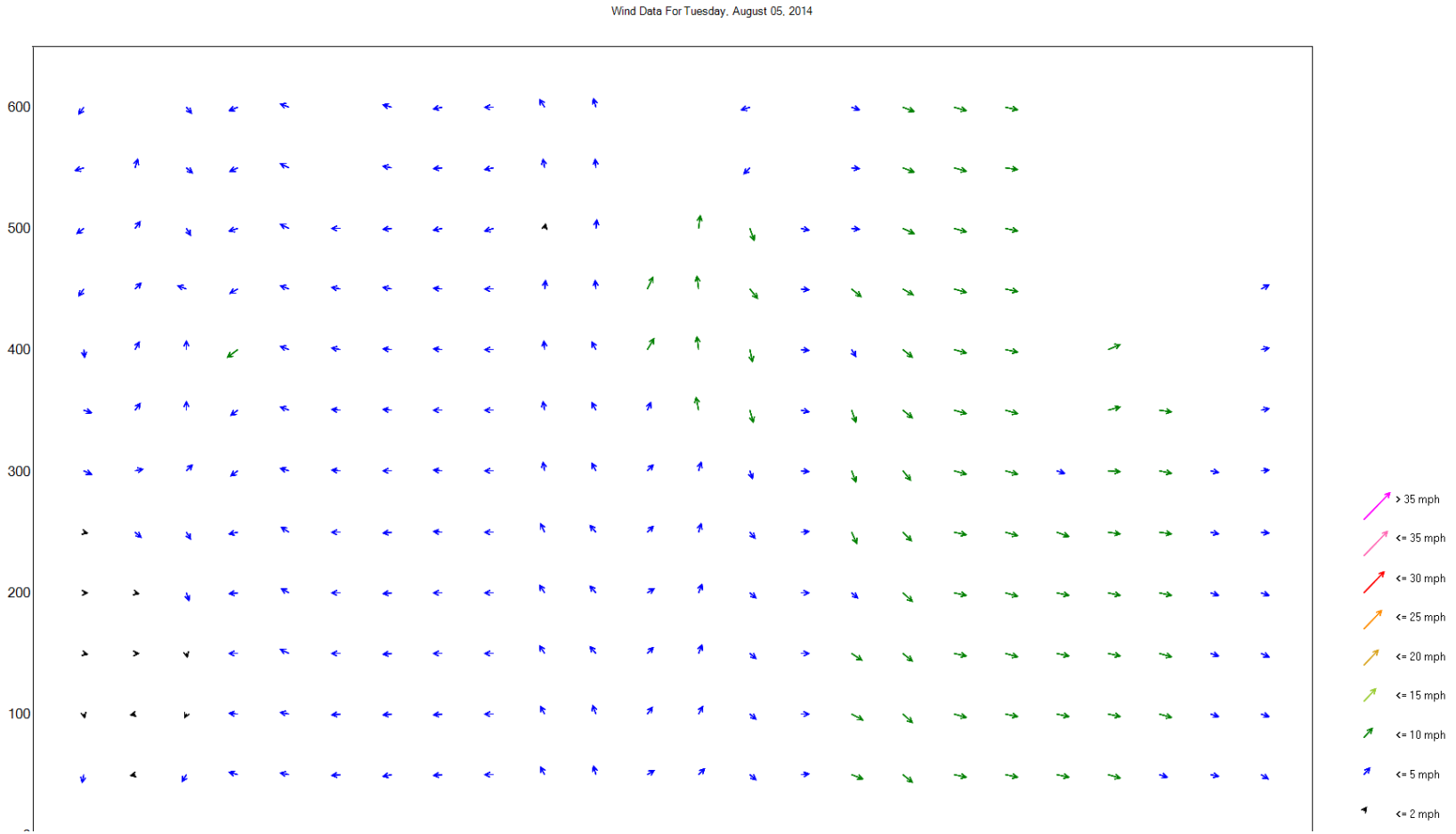


300-Meter Wind Rose



Wind directions are the direction the wind is blowing FROM.

Figure 2 – Example of Typical Diurnal Wind Flow Patterns



Note: Arrows are wind flow vectors and point to the direction the wind is blowing to.

APPENDIX A

Data Screening and Validation Results

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 6/10/2015 By: Rebecca Moore

RM Young Wind Monitor AQ Sensor SN :	126168
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Met One 083 SN N3538
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN 4015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Oakton 4 Thermistor SN 86818
Relative Humidity Standard	Extech RH390 SN 130327978

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.4	0.4	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater
Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.3 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	0	-1
45	41	42	1
90	86	87	1
135	131	131	0
180	176	176	0
225	221	221	0
270	266	266	0
315	311	311	0

Note: Readings adjusted for data logger offset

Magnetic Deviation (east is positive) =	10.3
Vane alignment rod (magnetic) =	349
Alignment (true) =	359
Data Logger Offset =	-4

Acceptable Tolerance is 3 degrees linearity, 5 degrees total
Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 10 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
1.7	1.2	-0.5	1.4	-0.3	0.05
20.0	20.4	0.4	20.2	0.2	0.03
38.2	38.3	0.1	38.2	0.0	0.06

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.34	0.34	0.00	0%

Solar Radiation Standard is LiCor 200 SN 68334
Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
40.5	37.8	-2.7

For RH the DQO limit is ± 7%

BAROMETRIC PRESSURE SENSOR

Standard (mm Hg)	Logger (mm Hg)	Difference (mm Hg)
697.1	701.17	4.1

Acceptable tolerance is 2.3 mm Hg

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.50	0.45	-0.05

45 tips

Note: Input 250 ml for a target of 0.50 inches (50 tips).
The water must be input over at least 10 minutes.
Acceptable tolerance is 10% of input.

Comments:
Calibration starts 09:15, is over 13:30
Replaced WS bearings

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 6/10/2015 Auditor: John Podrez

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 126168
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Wind Speed Audit Standard:	RM Young 18802 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton SN M100608

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %	After Bearing Replacement	
0	0.0	0.5	0.5	NA	0	
300	3.4	3.4	0.0	-1.0%	3.4	302
900	10.3	10.3	0.0	0.0%	10.3	
1800	20.6	20.6	0.0	0.0%	20.6	
3600	41.2	41.2	0.0	0.0%	41.2	
6000	68.7	68.7	0.0	0.0%	68.7	

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.45 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	1	0
45	41	41	0
90	86	86	0
135	131	131	0
180	176	176	0
225	221	222	1
270	266	267	1
315	311	311	0

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic) = 348 upper range was 352

Alignment (true) = 358

Note - Data Logger program has offset of -4 degrees.

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 11 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
1.7	1.2	-0.5	1.4	-0.3	0.05
20.0	20.4	0.4	20.1	0.1	-0.07
38.2	38.2	0.0	38.2	0.0	-0.07

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)	
1.19	1.12	-0.07	-3%	(mV * .1025)

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

Comments:

Audit starts 09:15, is over 11:01

precipt was 46 tips, data logger 00.46 inches

ASARCO Hayden - Remtech PA0 Sodar QA Audit
Audit performed using Tethersonde system SN 102

Site: ST-10 Date: 6/10/2015 Auditor: Mark Podrez

Time (MST)	Tethersonde System Data			Sodar Data			Sonde Components		Sodar Components		Differences			
Ending	Height agl	Speed m/s	Direction	Height agl	Speed m/s	Direction	U m/s	V m/s	U m/s	V m/s	Wind Speed m/s	Wind Direction	U m/s	V m/s
9:15	214	1.8	333	200	3.0	350	-1.7	-0.6	-2.4	-1.8	1.2	17	-0.7	-1.2
10:00	160	3.5	290	150	4.2	275	-3.3	1.4	-3.3	2.6	0.7	-15	0.0	1.2
10:15	178	2.8	286	150	4	280	-2.5	1.3	-3.4	2.2	1.2	-6	-0.9	0.9
10:30	227	2.1	285	250	2.5	315	-1.8	1.0	-2.5	-0.1	0.4	30	-0.7	-1.1
10:45	186	3.7	290	200	3.4	275	-3.4	1.4	-2.7	2.1	-0.3	-15	0.7	0.7
Average of Differences											0.6	2	-0.3	0.1
Standard Deviation of Differences											0.6	20	0.7	1.1
EPA Audit Target - Average Difference (Bias)											≤ 1	≤ 10	≤ 1	≤ 1
EPA Audit Target - Standard Deviation (Comparibility)											≤ 2	≤ 30	≤ 2	≤ 2

NOTE: Sodar beam #1 orientation is 133 true, so U and V components are aligned along this direction.

ASARCO ST-10 10-Meter Data - QA Screen Test Results for 4th Quarter - Note that WS is in mph, Temperature and Delat T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	15030502	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15031703	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15031706	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15032011	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15032106	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15041004	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15041109	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15041817	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high wind speeds - WS is valid
4	WS	15042309	WIND SPD TOO CONSTANT 3 HR	0.19	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15042411	WIND SPD TOO CONSTANT 3 HR	0.12	Moderate to high wind speeds - WS is valid
4	WS	15050307	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
4	WS	15052403	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - Stable flow - WS is valid
7	WD	15030603	WIND DIR TOO CONSTANT 3 HR	1.0	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15030710	WIND DIR TOO CONSTANT 3 HR	0.2	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15030711	WIND DIR TOO CONSTANT 3 HR	0.9	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15040206	WIND DIR TOO CONSTANT 3 HR	1.0	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15042806	WIND DIR TOO CONSTANT 3 HR	0.07	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15050803	WIND DIR TOO CONSTANT 3 HR	0.4	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15051614	WIND DIR TOO CONSTANT 3 HR	1	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15052820	WIND DIR TOO CONSTANT 3 HR	0.9	Moderate to high wind speeds and low sigma theta - WD is valid
7	WD	15053021	WIND DIR TOO CONSTANT 3 HR	0.9	Moderate to high wind speeds and low sigma theta - WD is valid
11	TP	15030213	HIGH RATE OF C CHANGE	5.4	During wind shift at afternoon transition - Data is Valid
15	D1	15042211	DT LARGE READING	-2.16	High Solar Insolation - Data is valid
15	D1	15042212	DT LARGE READING	-2.22	High Solar Insolation - Data is valid
15	D1	15050612	DT LARGE READING	-2.06	High Solar Insolation - Data is valid
15	D1	15051112	DT LARGE READING	-2.05	High Solar Insolation - Data is valid
15	D1	15051312	DT LARGE READING	-2.18	High Solar Insolation - Data is valid
15	D1	15051412	DT LARGE READING	-2.03	High Solar Insolation - Data is valid
15	D1	15051413	DT LARGE READING	-2.08	High Solar Insolation - Data is valid
15	D1	15051811	DT LARGE READING	-2.37	High Solar Insolation - Data is valid
15	D1	15052011	DT LARGE READING	-2.06	High Solar Insolation - Data is valid
15	D1	15052013	DT LARGE READING	-2.12	High Solar Insolation - Data is valid
15	D1	15052209	DT LARGE READING	-2.24	High Solar Insolation - Data is valid
15	D1	15052211	DT LARGE READING	-2.07	High Solar Insolation - Data is valid
15	D1	15052212	DT LARGE READING	-2.13	High Solar Insolation - Data is valid
15	D1	15052612	DT LARGE READING	-2.03	High Solar Insolation - Data is valid
17	D1	15042523	DT - During Nighttime	-0.17	Just outside of Screening Limit - Moderate Winds and recent rainfall (overcast) - Data is valid
17	D1	15042604	DT - During Nighttime	-0.11	Just outside of Screening Limit - Moderate Winds and recent rainfall (overcast) - Data is valid
17	D1	15051422	DT - During Nighttime	-0.14	Just outside of Screening Limit - Moderate Winds - Data is valid
17	D1	15051501	DT - During Nighttime	-0.14	Just outside of Screening Limit - Moderate Winds - Data is valid
17	D1	15051502	DT - During Nighttime	-0.11	Just outside of Screening Limit - Moderate Winds - Data is valid
17	D1	15051601	DT - During Nighttime	-0.14	Just outside of Screening Limit - Moderate Winds and recent rainfall (overcast) - Data is valid
20	SR	15051112	SR OUT OF MAX/MIN	1.09	Just outside of Screening Limit - Data is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results - Precip, RH, and Pressure for Monitoring Qtrs 1-3

ITYPE	PARM	DATE	CODE	Value	Temp	Comments
18	RH	14060113	OUT OF LIMITS	3.3	38.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060114	OUT OF LIMITS	3.0	38.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060115	OUT OF LIMITS	3.1	38.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060116	OUT OF LIMITS	3.7	38.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060211	OUT OF LIMITS	2.9	37.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060212	OUT OF LIMITS	2.3	38.6	High Ambient Temperature in daytime hours - data is valid
18	RH	14060213	OUT OF LIMITS	1.7	40.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060214	OUT OF LIMITS	1.5	40.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14060215	OUT OF LIMITS	1.1	40.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060216	OUT OF LIMITS	1.1	40.6	High Ambient Temperature in daytime hours - data is valid
18	RH	14060217	OUT OF LIMITS	1.8	39.6	High Ambient Temperature in daytime hours - data is valid
18	RH	14060218	OUT OF LIMITS	3.3	38.2	High Ambient Temperature in daytime hours - data is valid
18	RH	14060219	OUT OF LIMITS	4.0	37.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060312	OUT OF LIMITS	4.0	39.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060313	OUT OF LIMITS	3.4	40.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060314	OUT OF LIMITS	3.7	40.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060316	OUT OF LIMITS	3.7	39.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060317	OUT OF LIMITS	3.1	39.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060409	OUT OF LIMITS	3.1	33.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060410	OUT OF LIMITS	0.4	35.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14060411	OUT OF LIMITS	0.6	37.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060412	OUT OF LIMITS	0.6	39.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060413	OUT OF LIMITS	0.6	39.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060414	OUT OF LIMITS	0.3	39.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14060415	OUT OF LIMITS	0.3	39.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14060416	OUT OF LIMITS	0.1	39.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060417	OUT OF LIMITS	0.1	38.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060418	OUT OF LIMITS	0.2	37.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060419	OUT OF LIMITS	1.6	36.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060420	OUT OF LIMITS	3.6	34.2	High Ambient Temperature in daytime hours - data is valid
18	RH	14060509	OUT OF LIMITS	3.0	32.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060510	OUT OF LIMITS	0.8	34.4	High Ambient Temperature in daytime hours - data is valid
18	RH	14060511	OUT OF LIMITS	0.1	37.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060512	OUT OF LIMITS	0.1	38.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060513	OUT OF LIMITS	0.1	39.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14060514	OUT OF LIMITS	0.1	40.2	High Ambient Temperature in daytime hours - data is valid
18	RH	14060515	OUT OF LIMITS	0.1	39.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060516	OUT OF LIMITS	0.1	39.6	High Ambient Temperature in daytime hours - data is valid
18	RH	14060517	OUT OF LIMITS	0.1	38.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14060518	OUT OF LIMITS	0.1	38.2	High Ambient Temperature in daytime hours - data is valid
18	RH	14060519	OUT OF LIMITS	0.6	36.2	High Ambient Temperature in daytime hours - data is valid
18	RH	14060520	OUT OF LIMITS	2.8	34.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060521	OUT OF LIMITS	3.6	32.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060609	OUT OF LIMITS	2.6	31.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060610	OUT OF LIMITS	1.5	34.4	High Ambient Temperature in daytime hours - data is valid
18	RH	14060611	OUT OF LIMITS	0.5	36.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060612	OUT OF LIMITS	0.3	37.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14060613	OUT OF LIMITS	0.1	38.6	High Ambient Temperature in daytime hours - data is valid
18	RH	14060614	OUT OF LIMITS	0.1	38.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060615	OUT OF LIMITS	0.1	38.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060616	OUT OF LIMITS	0.1	38.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060617	OUT OF LIMITS	0.1	38.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060618	OUT OF LIMITS	0.6	36.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060619	OUT OF LIMITS	2.5	35.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060620	OUT OF LIMITS	3.8	34.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060709	OUT OF LIMITS	3.7	31.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060710	OUT OF LIMITS	3.2	33.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060711	OUT OF LIMITS	1.2	36.4	High Ambient Temperature in daytime hours - data is valid
18	RH	14060712	OUT OF LIMITS	2.4	37.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060713	OUT OF LIMITS	1.9	38.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14060714	OUT OF LIMITS	0.2	39.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14060715	OUT OF LIMITS	0.1	38.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060716	OUT OF LIMITS	0.1	38.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14060717	OUT OF LIMITS	0.2	38.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060718	OUT OF LIMITS	0.9	37.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060719	OUT OF LIMITS	2.4	35.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060911	OUT OF LIMITS	1.3	37.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14060912	OUT OF LIMITS	1.7	38.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060913	OUT OF LIMITS	0.3	39.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060914	OUT OF LIMITS	0.2	40.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14060915	OUT OF LIMITS	1.1	40.4	High Ambient Temperature in daytime hours - data is valid
18	RH	14060916	OUT OF LIMITS	1.1	40.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14060917	OUT OF LIMITS	0.3	39.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060918	OUT OF LIMITS	0.7	38.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14060919	OUT OF LIMITS	1.4	37.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060920	OUT OF LIMITS	2.7	35.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14060921	OUT OF LIMITS	3.3	34.2	High Ambient Temperature in daytime hours - data is valid
18	RH	14061019	OUT OF LIMITS	4.0	37.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14061511	OUT OF LIMITS	3.9	35.4	High Ambient Temperature in daytime hours - data is valid
18	RH	14061512	OUT OF LIMITS	3.3	37.2	High Ambient Temperature in daytime hours - data is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results - Precip, RH, and Pressure for Monitoring Qtrs 1-3

ITYPE	PARM	DATE	CODE	Value	Temp	Comments
18	RH	14061513	OUT OF LIMITS	2.7	37.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14061514	OUT OF LIMITS	1.0	37.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14061515	OUT OF LIMITS	1.2	37.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14061516	OUT OF LIMITS	2.7	36.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14061517	OUT OF LIMITS	3.5	35.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14061518	OUT OF LIMITS	3.6	34.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14062310	OUT OF LIMITS	3.4	34.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14062311	OUT OF LIMITS	0.9	36.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14062312	OUT OF LIMITS	2.6	37.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14062313	OUT OF LIMITS	2.9	38.6	High Ambient Temperature in daytime hours - data is valid
18	RH	14062314	OUT OF LIMITS	3.7	38.9	High Ambient Temperature in daytime hours - data is valid
18	RH	14062315	OUT OF LIMITS	3.3	39.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14062316	OUT OF LIMITS	3.0	39.1	High Ambient Temperature in daytime hours - data is valid
18	RH	14062320	OUT OF LIMITS	3.8	34.3	High Ambient Temperature in daytime hours - data is valid
18	RH	14062410	OUT OF LIMITS	3.3	35.5	High Ambient Temperature in daytime hours - data is valid
18	RH	14062411	OUT OF LIMITS	2.1	36.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14062412	OUT OF LIMITS	0.6	38.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14062413	OUT OF LIMITS	0.8	38.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14062414	OUT OF LIMITS	1.3	38.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14062415	OUT OF LIMITS	2.6	38.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14062416	OUT OF LIMITS	3.6	39.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14062417	OUT OF LIMITS	3.4	38.7	High Ambient Temperature in daytime hours - data is valid
18	RH	14062418	OUT OF LIMITS	3.2	37.8	High Ambient Temperature in daytime hours - data is valid
18	RH	14062511	OUT OF LIMITS	3.3	37.0	High Ambient Temperature in daytime hours - data is valid
18	RH	14100215	OUT OF LIMITS	3.8	31.3	High Ambient Temperature in daytime hours - data is valid
18	RH	15032714	OUT OF LIMITS	2.6	31.8	High Ambient Temperature in daytime hours - data is valid
18	RH	15032715	OUT OF LIMITS	1.9	32.3	High Ambient Temperature in daytime hours - data is valid
18	RH	15032716	OUT OF LIMITS	2.7	32.7	High Ambient Temperature in daytime hours - data is valid
18	RH	15032814	OUT OF LIMITS	3.4	32.4	High Ambient Temperature in daytime hours - data is valid
18	RH	15032815	OUT OF LIMITS	2.7	32.5	High Ambient Temperature in daytime hours - data is valid
18	RH	15032816	OUT OF LIMITS	2.9	32.3	High Ambient Temperature in daytime hours - data is valid
18	RH	15032817	OUT OF LIMITS	3.6	31.4	High Ambient Temperature in daytime hours - data is valid
18	RH	15032915	OUT OF LIMITS	3.6	32.5	High Ambient Temperature in daytime hours - data is valid
18	RH	15040415	OUT OF LIMITS	4.0	30.5	High Ambient Temperature in daytime hours - data is valid
18	RH	15040614	OUT OF LIMITS	3.9	28.6	High Ambient Temperature in daytime hours - data is valid
18	RH	15050113	OUT OF LIMITS	3.8	34.8	High Ambient Temperature in daytime hours - data is valid
18	RH	15050114	OUT OF LIMITS	3.5	35.3	High Ambient Temperature in daytime hours - data is valid
18	RH	15050115	OUT OF LIMITS	3.6	35.7	High Ambient Temperature in daytime hours - data is valid
18	RH	15050116	OUT OF LIMITS	4.0	35.1	High Ambient Temperature in daytime hours - data is valid
18	RH	15052015	OUT OF LIMITS	3.8	32.5	High Ambient Temperature in daytime hours - data is valid
18	RH	15053013	OUT OF LIMITS	4.0	37.9	High Ambient Temperature in daytime hours - data is valid
18	RH	15053014	OUT OF LIMITS	3.7	38.6	High Ambient Temperature in daytime hours - data is valid
19	RH	14100817	OUT OF LIMITS	95.5	19.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100818	OUT OF LIMITS	95.6	19.0	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100819	OUT OF LIMITS	96.3	18.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100820	OUT OF LIMITS	96.9	18.8	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100821	OUT OF LIMITS	97.8	18.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100822	OUT OF LIMITS	97.5	18.5	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100823	OUT OF LIMITS	97.5	18.5	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100900	OUT OF LIMITS	97.8	18.3	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100901	OUT OF LIMITS	98.0	18.4	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14100902	OUT OF LIMITS	98.0	18.5	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14101002	OUT OF LIMITS	95.7	16.8	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14101003	OUT OF LIMITS	97.2	16.4	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14101004	OUT OF LIMITS	97.5	16.0	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14101005	OUT OF LIMITS	97.7	15.8	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14101006	OUT OF LIMITS	98.1	15.8	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14120404	OUT OF LIMITS	96.0	14.7	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14120405	OUT OF LIMITS	97.4	14.5	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14120406	OUT OF LIMITS	98.1	14.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14120407	OUT OF LIMITS	98.5	14.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14120408	OUT OF LIMITS	98.7	14.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14120409	OUT OF LIMITS	98.9	14.4	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14120410	OUT OF LIMITS	98.8	14.6	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14120411	OUT OF LIMITS	96.9	14.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121406	OUT OF LIMITS	97.2	4.8	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121407	OUT OF LIMITS	97.6	5.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121721	OUT OF LIMITS	96.7	8.4	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121722	OUT OF LIMITS	97.5	8.4	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121723	OUT OF LIMITS	97.6	8.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121800	OUT OF LIMITS	97.5	8.3	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121801	OUT OF LIMITS	97.5	8.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121802	OUT OF LIMITS	98.0	7.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121803	OUT OF LIMITS	98.1	7.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121804	OUT OF LIMITS	98.1	7.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121805	OUT OF LIMITS	98.5	7.5	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121806	OUT OF LIMITS	98.5	7.8	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121807	OUT OF LIMITS	97.7	8.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121808	OUT OF LIMITS	96.5	8.0	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121900	OUT OF LIMITS	95.5	6.6	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results - Precip, RH, and Pressure for Monitoring Qtrs 1-3

ITYPE	PARM	DATE	CODE	Value	Temp	Comments
19	RH	14121901	OUT OF LIMITS	96.0	6.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121902	OUT OF LIMITS	96.9	5.6	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121903	OUT OF LIMITS	97.4	5.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121904	OUT OF LIMITS	97.8	4.7	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121905	OUT OF LIMITS	98.0	4.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121906	OUT OF LIMITS	98.2	3.8	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121907	OUT OF LIMITS	98.4	3.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14121908	OUT OF LIMITS	98.0	5.3	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14122106	OUT OF LIMITS	95.7	4.5	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	14123121	OUT OF LIMITS	96.6	3.0	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14123122	OUT OF LIMITS	96.0	1.7	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	14123123	OUT OF LIMITS	96.7	0.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010100	OUT OF LIMITS	96.6	0.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010101	OUT OF LIMITS	97.5	0.7	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010102	OUT OF LIMITS	97.9	0.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010103	OUT OF LIMITS	98.0	1.0	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010104	OUT OF LIMITS	98.1	1.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010105	OUT OF LIMITS	97.7	1.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010106	OUT OF LIMITS	97.6	1.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010107	OUT OF LIMITS	97.3	1.2	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010108	OUT OF LIMITS	96.0	1.5	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15010204	OUT OF LIMITS	96.4	-1.4	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15010205	OUT OF LIMITS	96.5	-1.8	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15010206	OUT OF LIMITS	96.4	-2.1	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15010207	OUT OF LIMITS	96.1	-2.3	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020101	OUT OF LIMITS	95.8	10.1	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020102	OUT OF LIMITS	97.6	9.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020103	OUT OF LIMITS	97.7	9.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020104	OUT OF LIMITS	97.8	8.7	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020105	OUT OF LIMITS	98.2	8.2	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020106	OUT OF LIMITS	98.2	8.1	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020107	OUT OF LIMITS	98.1	7.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020108	OUT OF LIMITS	98.4	7.8	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020109	OUT OF LIMITS	97.9	8.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020110	OUT OF LIMITS	95.5	8.9	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020203	OUT OF LIMITS	95.8	8.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15020206	OUT OF LIMITS	96.0	6.8	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15022502	OUT OF LIMITS	96.1	5.3	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15022503	OUT OF LIMITS	97.2	4.8	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15022504	OUT OF LIMITS	97.8	4.4	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15022505	OUT OF LIMITS	97.6	4.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15022506	OUT OF LIMITS	97.7	3.4	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15022507	OUT OF LIMITS	98.3	4.0	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15030301	OUT OF LIMITS	95.6	8.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15030303	OUT OF LIMITS	95.7	8.3	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15030304	OUT OF LIMITS	96.6	8.0	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15030305	OUT OF LIMITS	97.8	7.4	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15030306	OUT OF LIMITS	98.4	6.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15030307	OUT OF LIMITS	98.7	6.1	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15030308	OUT OF LIMITS	97.8	7.0	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15031905	OUT OF LIMITS	95.5	12.9	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15042601	OUT OF LIMITS	95.6	11.5	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
19	RH	15042604	OUT OF LIMITS	95.9	10.3	High RH in evening/morning hours with cooler temperatures and some rainfall - data is valid
21	PR	14070520	OUT OF LIMITS	0.59	NA	Rainfall confirmed at other AZMET monitors in the area for this day - data is valid
21	PR	14081717	OUT OF LIMITS	0.32	NA	Significant Change in Temperature and Winds during the hour - data is valid
21	PR	14081914	OUT OF LIMITS	0.24	NA	Rainfall confirmed at other AZMET monitors in the area for this day - data is valid
21	PR	14100901	OUT OF LIMITS	0.24	NA	Rainfall confirmed at other AZMET monitors in the area for this day - data is valid
21	PR	15013018	OUT OF LIMITS	0.32	NA	Rainfall confirmed at other AZMET monitors in the area for this day - data is valid

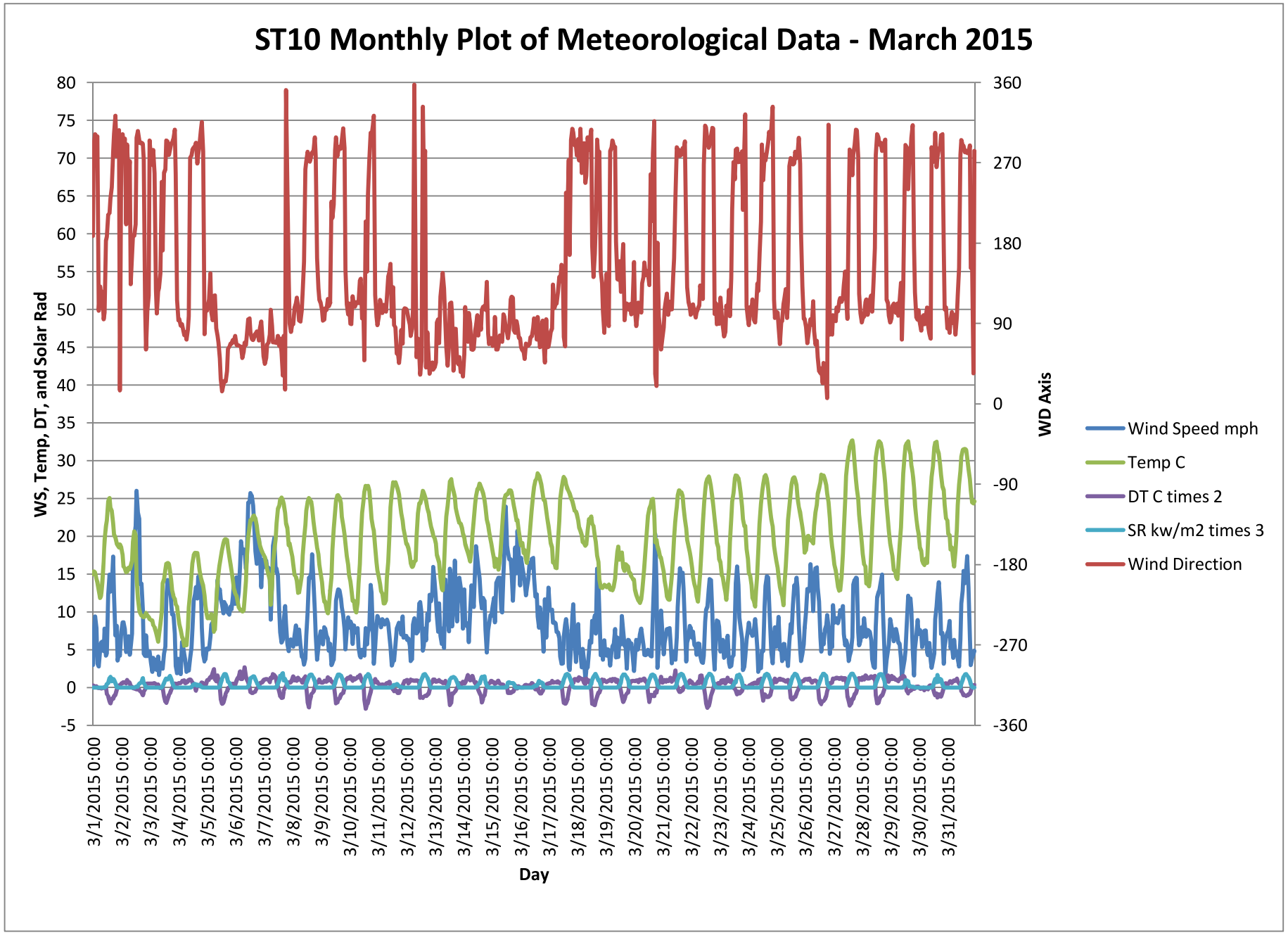
AZMET and WRCC Reported Precipitation Normals (inches/month)

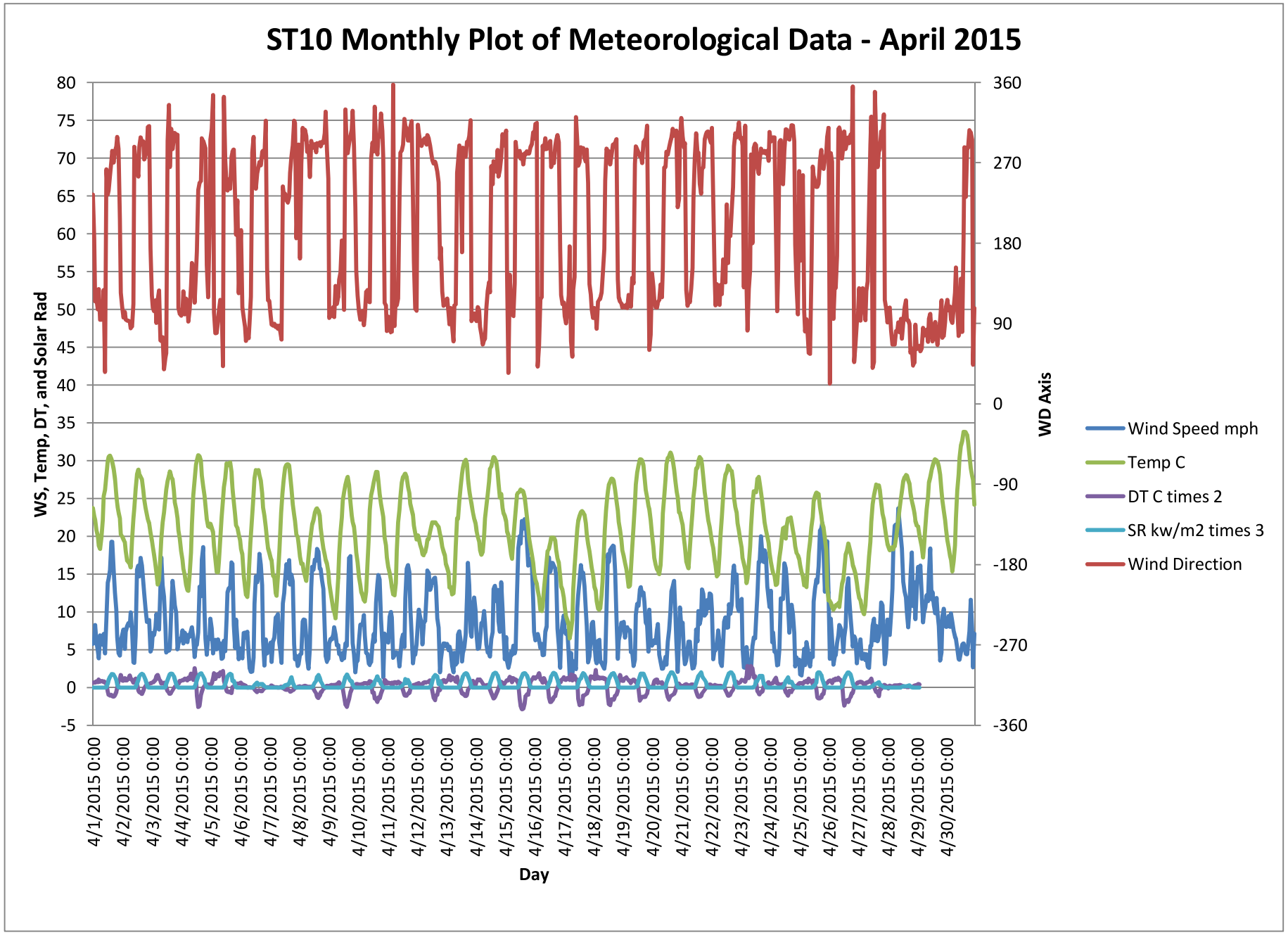
Month	Coolidge	Safford	Globe	ST-10 over 1 yr period
Jan	0.84	0.68	2.00	1.72
Feb	0.89	0.81	1.96	0.09
Mar	0.95	0.49	1.55	0.15
Apr	0.38	0.28	0.39	0.62
May	0.20	0.24	0.63	0.34
Jun	0.03	0.28	0.13	0.00
Jul	0.61	0.99	2.04	1.54
Aug	1.03	2.19	2.30	1.89
Sep	0.35	0.82	1.23	0.75
Oct	0.66	0.77	0.86	1.12
Nov	0.56	0.44	0.91	0.00
Dec	0.86	0.96	1.29	1.92
Total	7.36	8.95	15.29	10.14

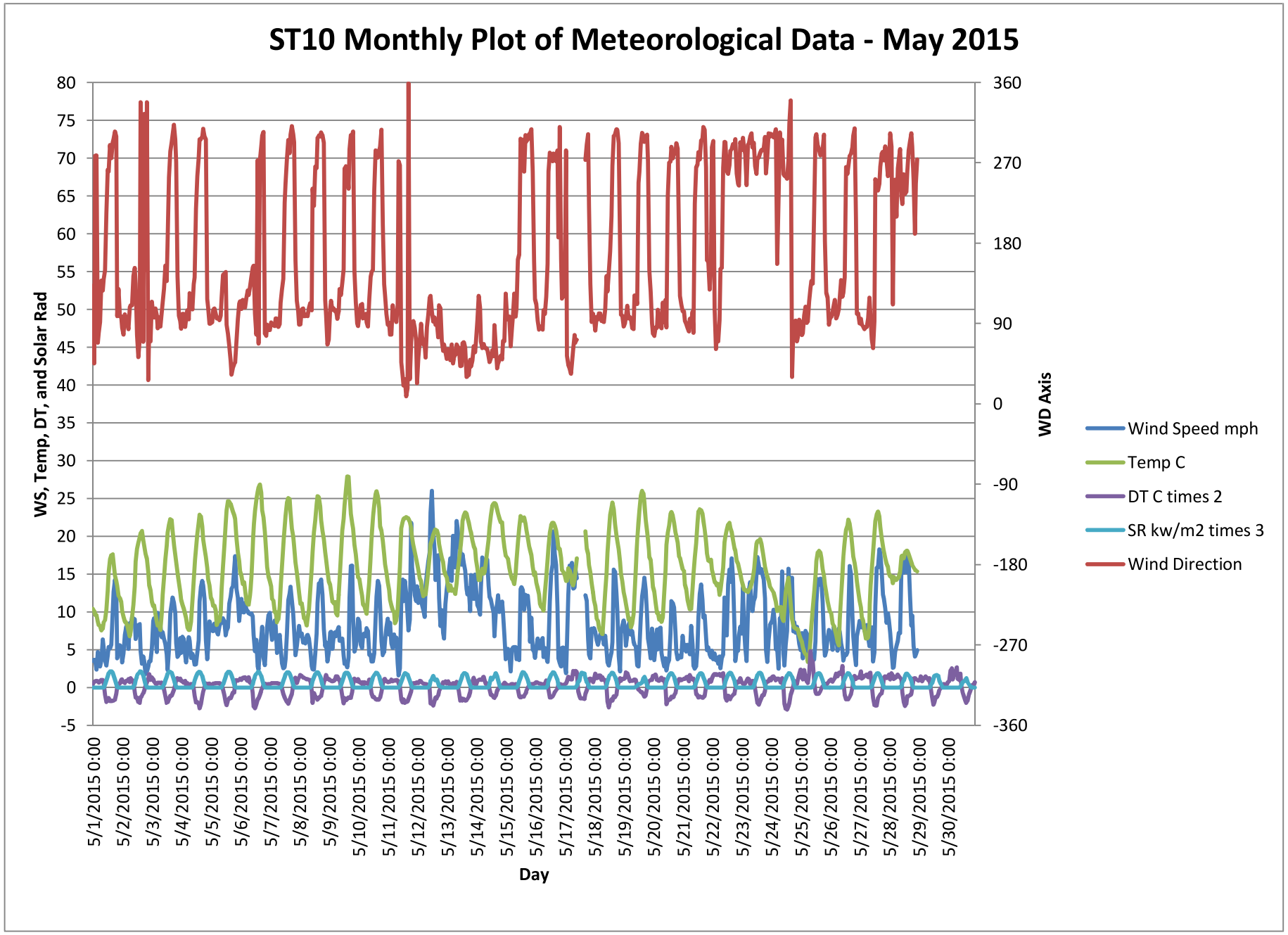
APPENDIX B

Monthly Data Plots and Tables

March through May 2015


ST10 Monthly Plot of Meteorological Data - March 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
3/1/2015 0:00
3/2/2015 0:00
3/3/2015 0:00
3/4/2015 0:00
3/5/2015 0:00
3/6/2015 0:00
3/7/2015 0:00
3/8/2015 0:00
3/9/2015 0:00
3/10/2015 0:00
3/11/2015 0:00
3/12/2015 0:00
3/13/2015 0:00
3/14/2015 0:00
3/15/2015 0:00
3/16/2015 0:00
3/17/2015 0:00
3/18/2015 0:00
3/19/2015 0:00
3/20/2015 0:00
3/21/2015 0:00
3/22/2015 0:00
3/23/2015 0:00
3/24/2015 0:00
3/25/2015 0:00
3/26/2015 0:00
3/27/2015 0:00
3/28/2015 0:00
3/29/2015 0:00
3/30/2015 0:00
3/31/2015 0:00


ST10 Monthly Plot of Meteorological Data - April 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
4/1/2015 0:00
4/2/2015 0:00
4/3/2015 0:00
4/4/2015 0:00
4/5/2015 0:00
4/6/2015 0:00
4/7/2015 0:00
4/8/2015 0:00
4/9/2015 0:00
4/10/2015 0:00
4/11/2015 0:00
4/12/2015 0:00
4/13/2015 0:00
4/14/2015 0:00
4/15/2015 0:00
4/16/2015 0:00
4/17/2015 0:00
4/18/2015 0:00
4/19/2015 0:00
4/20/2015 0:00
4/21/2015 0:00
4/22/2015 0:00
4/23/2015 0:00
4/24/2015 0:00
4/25/2015 0:00
4/26/2015 0:00
4/27/2015 0:00
4/28/2015 0:00
4/29/2015 0:00
4/30/2015 0:00


ST10 Monthly Plot of Meteorological Data - May 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
5/1/2015 0:00
5/2/2015 0:00
5/3/2015 0:00
5/4/2015 0:00
5/5/2015 0:00
5/6/2015 0:00
5/7/2015 0:00
5/8/2015 0:00
5/9/2015 0:00
5/10/2015 0:00
5/11/2015 0:00
5/12/2015 0:00
5/13/2015 0:00
5/14/2015 0:00
5/15/2015 0:00
5/16/2015 0:00
5/17/2015 0:00
5/18/2015 0:00
5/19/2015 0:00
5/20/2015 0:00
5/21/2015 0:00
5/22/2015 0:00
5/23/2015 0:00
5/24/2015 0:00
5/25/2015 0:00
5/26/2015 0:00
5/27/2015 0:00
5/28/2015 0:00
5/29/2015 0:00
5/30/2015 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
MARCH - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	2.9	7.3	9.4	7.8	3.2	2.8	4.9	5.8	6.1	4.8	7.8	4.2	4.6	12.2	14.9	12.7	13.4	17.3	12.0	6.9	8.1	3.5	4.6	4.2	7.6
2	7.3	8.6	8.6	7.7	4.7	5.3	6.8	4.3	5.3	7.2	16.9	19.9	21.4	26.0	23.1	22.3	13.7	13.7	10.3	4.4	4.2	6.9	4.2	4.7	10.7
3	4.8	3.3	2.0	3.9	2.5	3.7	2.3	4.1	1.6	3.2	2.7	2.5	4.4	5.4	11.7	14.2	13.2	13.8	11.1	9.7	9.6	7.1	2.8	1.9	5.9
4	3.8	3.3	1.8	6.0	5.5	4.4	3.7	2.1	2.8	2.3	3.9	5.2	7.5	11.4	12.3	13.3	11.8	14.6	14.1	13.1	7.9	4.3	3.5	3.7	6.8
5	5.2	5.1	5.1	6.7	8.2	8.6	8.4	9.0	10.4	14.2	12.3	12.9	11.7	10.9	9.8	11.3	11.0	10.2	9.9	9.6	10.7	10.3	12.0	13.7	9.9
6	11.1	14.5	11.2	12.6	16.1	19.3	17.8	18.3	18.0	15.7	17.3	24.4	24.6	25.7	25.3	24.0	21.9	18.0	16.3	18.2	19.6	18.0	13.3	16.8	18.2
7	15.9	17.1	16.8	15.8	15.8	14.6	9.0	13.6	18.7	19.7	15.4	15.7	14.7	10.1	7.3	5.9	6.3	8.8	10.8	8.4	5.7	4.8	6.0	6.3	11.8
8	6.0	5.4	6.9	8.2	5.7	7.4	7.7	5.7	4.1	4.1	3.0	3.8	6.8	10.0	14.5	14.5	15.1	17.6	14.0	10.1	6.9	3.7	5.4	6.4	8.0
9	7.4	6.6	5.7	8.0	7.8	6.8	6.4	4.9	5.8	2.9	3.3	3.6	6.9	11.5	12.5	12.9	12.8	11.7	10.6	9.6	7.7	5.0	7.5	9.3	7.8
10	7.9	8.7	8.4	5.7	8.2	7.3	7.4	7.8	5.3	4.2	4.0	5.0	4.5	4.2	7.8	5.7	7.3	7.9	13.6	12.5	6.9	3.1	5.3	8.3	7.0
11	9.5	8.9	8.8	7.9	9.0	8.4	8.3	8.8	8.9	8.5	6.6	5.4	2.9	3.6	3.6	5.6	7.8	8.1	8.6	8.3	7.0	9.4	6.6	6.7	7.4
12	6.8	6.3	6.4	5.5	3.5	3.7	8.3	9.2	7.2	7.1	7.4	11.1	11.3	9.8	4.9	5.5	7.8	6.3	9.8	8.8	12.2	11.4	12.6	16.0	8.3
13	14.0	11.6	9.5	7.3	11.1	6.8	5.8	7.8	5.2	14.3	11.1	9.8	7.4	15.7	14.0	8.1	11.3	16.7	12.7	8.7	13.4	14.5	13.3	11.1	10.9
14	7.8	13.0	8.2	8.1	8.5	6.0	10.0	13.5	12.7	10.6	15.8	18.7	17.0	15.9	14.5	11.4	10.5	11.8	11.5	7.7	4.6	7.6	8.4	9.5	11.0
15	9.4	10.8	11.8	8.6	13.8	14.2	14.5	14.5	10.4	9.9	15.0	17.7	23.9	18.8	17.9	16.9	16.9	15.3	11.5	14.1	18.5	15.1	20.7	17.5	14.9
16	13.5	17.1	15.9	14.8	14.0	12.2	13.1	14.3	16.5	15.8	17.0	17.1	14.5	12.0	12.3	9.4	7.9	10.6	9.0	7.1	4.7	11.6	6.6	9.0	12.3
17	13.2	10.2	10.1	10.3	8.6	8.6	8.4	7.4	7.3	6.6	4.1	3.1	3.2	6.7	8.3	9.0	7.6	2.8	2.3	5.2	9.3	11.0	6.2	3.3	7.2
18	6.3	8.4	5.0	4.4	2.7	5.1	3.6	1.0	2.2	2.6	4.8	6.2	6.0	8.8	8.5	9.5	7.2	15.7	13.6	10.0	4.3	5.4	3.7	6.2	6.3
19	4.6	4.2	5.1	4.6	2.9	4.7	5.3	5.7	7.7	3.9	6.6	4.0	6.4	5.7	9.4	7.4	5.5	5.8	2.5	6.3	6.2	5.4	5.8	4.1	5.4
20	2.2	4.0	6.3	5.0	5.4	7.0	7.8	6.9	5.6	4.3	4.3	4.4	5.0	4.4	4.1	4.1	9.9	15.2	20.2	13.5	2.6	5.2	8.1	10.2	6.9
21	7.2	4.4	5.9	6.9	7.7	7.7	7.8	6.1	3.2	4.8	3.9	3.7	6.7	10.7	13.8	15.7	14.7	15.2	13.1	8.2	3.5	6.0	6.7	8.1	8.0
22	7.9	6.6	7.4	5.7	5.4	4.3	5.8	5.7	4.2	3.5	3.2	4.2	8.7	10.2	10.7	13.0	14.3	14.2	9.7	5.2	2.4	6.9	8.9	8.8	7.4
23	8.0	4.7	5.7	6.3	3.9	4.2	5.8	6.8	3.2	2.7	2.8	3.8	4.2	8.9	13.8	16.0	13.5	9.2	7.8	6.4	2.3	2.8	4.0	6.3	6.4
24	7.6	8.6	7.3	7.3	6.8	7.5	9.0	7.7	5.0	2.0	2.9	2.5	4.8	4.8	10.7	13.4	14.7	14.5	11.4	7.3	4.6	3.2	6.9	8.0	7.4
25	5.4	7.4	9.3	4.9	5.0	3.5	5.7	5.7	3.8	4.0	2.8	6.0	8.4	7.2	10.9	13.5	13.0	14.5	13.2	8.4	5.0	3.5	4.4	5.7	7.1
26	7.9	9.9	13.0	12.7	12.9	16.3	14.0	10.1	13.3	15.8	15.9	13.2	11.4	6.7	4.8	6.9	5.7	7.6	8.2	9.6	8.0	4.5	6.7	5.3	10.0
27	10.9	8.6	9.1	9.1	8.5	9.2	10.2	9.7	10.8	7.1	5.6	6.2	5.6	3.5	4.1	4.9	6.6	13.6	14.2	14.5	14.4	7.3	5.6	6.2	8.6
28	8.0	6.7	9.1	7.3	6.7	7.6	7.4	7.3	6.2	3.8	2.8	2.6	8.1	11.9	12.5	12.9	13.9	14.9	10.0	5.2	1.6	3.6	4.8	5.7	7.5
29	9.0	8.0	7.5	6.1	7.6	7.7	6.8	6.0	5.8	3.8	1.5	2.6	3.7	4.8	8.6	12.1	10.7	11.8	10.3	5.0	1.6	5.1	6.8	8.9	6.7
30	7.1	7.6	7.1	5.4	6.4	7.5	7.6	4.7	4.3	5.9	3.5	2.6	3.5	4.5	9.0	10.7	12.3	13.9	11.1	7.1	7.2	3.1	5.4	6.6	6.8
31	7.2	7.5	8.8	5.2	5.6	3.9	6.3	4.3	4.7	3.8	2.8	6.4	11.1	12.8	15.4	13.8	15.8	17.4	13.1	6.7	3.0	3.8	4.5	4.9	7.9
HRAVE	7.9	8.2	8.2	7.6	7.5	7.6	7.9	7.7	7.3	7.1	7.3	8.0	9.1	10.2	11.3	11.5	11.4	12.5	11.2	8.9	7.2	6.9	7.1	7.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.6	10.7	5.9	6.8	9.9	18.2	11.8	8.0	7.8	7.0	7.4	8.3	10.9	11.0	14.9	12.3	7.2	6.3	5.4	6.9	8.0	7.4	6.4	7.4	7.1
MAX	17.3	26.0	14.2	14.6	14.2	25.7	19.7	17.6	12.9	13.6	9.5	16.0	16.7	18.7	23.9	17.1	13.2	15.7	9.4	20.2	15.7	14.3	16.0	14.7	14.5
MIN	2.8	4.2	1.6	1.8	5.1	11.1	4.8	3.0	2.9	3.1	2.9	3.5	5.2	4.6	8.6	4.7	2.3	1.0	2.5	2.2	3.2	2.4	2.3	2.0	2.8

DAY	26	27	28	29	30	31
AVE	10.0	8.6	7.5	6.7	6.8	7.9
MAX	16.3	14.5	14.9	12.1	13.9	17.4
MIN	4.5	3.5	1.6	1.5	2.6	2.8

MONTHLY AVERAGE = 8.6 MONTHLY MAXIMUM = 26.0 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MARCH - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	188	291	302	299	300	104	132	124	126	95	102	183	187	212	214	230	242	282	302	323	277	299	306	15	133
2	284	302	292	297	201	290	252	272	134	167	188	189	201	298	305	296	292	292	291	274	109	61	104	122	284
3	295	275	268	284	258	129	101	126	131	146	248	172	259	263	295	293	279	284	292	292	297	307	257	116	275
4	94	95	88	89	84	77	80	72	83	98	275	278	284	287	288	292	269	279	291	307	316	282	78	103	286
5	104	109	117	146	103	94	121	122	85	76	69	51	28	14	22	25	25	37	61	64	67	67	72	69	251
6	76	66	65	66	65	64	51	58	68	66	77	95	96	80	73	72	74	78	81	79	71	84	92	71	314
7	53	45	51	66	68	77	105	87	69	69	69	68	76	65	73	58	32	76	16	351	244	143	90	81	146
8	90	89	107	112	119	108	93	92	105	125	159	263	272	283	275	271	278	281	283	298	277	163	129	117	166
9	113	105	93	94	107	105	117	109	114	226	208	223	284	298	277	283	288	286	296	308	287	150	112	100	155
10	112	90	89	121	110	109	114	114	113	138	140	96	100	49	204	148	234	273	303	300	312	323	122	98	281
11	88	97	116	111	102	111	109	103	118	142	148	157	98	131	88	85	57	60	46	56	83	68	104	107	57
12	106	104	95	89	76	84	106	357	139	52	73	55	33	48	333	262	283	41	80	50	34	42	46	38	153
13	41	47	91	95	68	120	136	147	129	90	63	43	65	112	113	99	37	84	84	47	44	52	36	42	349
14	30	55	108	77	69	102	90	61	60	62	82	88	99	77	94	83	105	109	110	105	137	78	67	73	107
15	73	65	69	97	61	61	66	76	72	70	100	97	86	80	74	85	117	120	118	83	80	93	88	74	69
16	73	64	60	58	50	68	66	65	67	74	76	85	96	89	72	97	77	63	74	93	69	46	95	63	231
17	64	73	81	85	134	107	112	113	125	142	137	156	140	75	64	237	211	273	167	295	308	304	290	290	166
18	278	296	273	308	259	286	292	247	255	299	285	295	307	178	142	168	203	296	274	283	149	135	103	80	345
19	118	145	93	87	283	287	295	289	288	182	140	139	160	126	150	179	94	105	112	107	106	112	100	113	145
20	159	105	87	102	114	112	102	135	142	158	144	149	146	133	257	205	280	317	33	20	180	98	83	61	320
21	74	86	106	117	123	100	114	106	106	143	163	232	288	285	285	278	279	287	283	294	187	130	115	108	110
22	100	108	112	103	97	103	107	110	133	121	118	267	312	309	294	287	291	300	309	308	101	112	89	93	179
23	90	119	98	88	76	81	110	102	128	98	141	217	271	252	284	286	271	280	271	283	217	286	324	109	293
24	95	88	109	106	117	95	91	105	134	126	169	204	291	250	279	273	282	293	305	298	309	333	117	96	274
25	103	102	87	67	91	93	112	118	129	96	116	266	275	272	268	270	283	275	278	298	269	190	131	96	31
26	95	86	68	76	88	95	89	115	82	66	70	52	37	34	40	23	46	41	23	6	313	78	83	77	238
27	99	94	93	108	104	115	118	114	119	133	148	120	95	224	285	276	256	279	290	307	306	277	123	101	176
28	91	96	98	113	117	100	113	116	121	103	137	174	279	302	298	290	292	283	288	292	296	117	113	99	345
29	91	96	110	112	105	102	112	99	116	136	72	131	241	290	288	240	270	278	298	312	176	125	97	94	356
30	105	90	82	97	99	89	98	108	88	78	73	287	271	273	303	265	276	285	287	301	302	175	106	108	179
31	85	92	80	94	103	90	100	78	97	121	152	279	295	289	289	282	284	281	281	289	152	154	34	283	265

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	27	14	8	9	13	39	8	6	11	24	25	46	50	29	22	17	14	9	11	20	32	21	26	67	23
2	41	12	6	9	46	48	20	30	23	14	19	20	18	11	9	10	12	9	9	60	32	22	30	40	23
3	13	33	24	8	47	14	23	9	40	40	35	59	36	47	20	13	15	9	8	5	6	8	29	27	24
4	24	16	29	8	12	18	30	18	24	34	28	27	32	19	22	17	15	10	7	7	53	36	35	34	23
5	15	24	24	21	19	11	13	13	27	11	17	23	21	20	26	23	20	17	11	8	6	5	5	4	16
6	10	8	9	7	6	7	10	12	8	11	13	13	12	12	13	11	10	12	8	8	8	8	13	8	10
7	13	11	11	9	8	6	26	11	8	10	10	15	15	18	52	49	22	18	27	48	47	59	36	26	23
8	10	42	26	11	19	11	10	13	17	25	37	46	23	20	15	13	14	9	6	6	28	17	8	9	18
9	8	9	9	8	9	9	10	12	13	30	29	44	24	21	21	17	15	13	7	6	15	9	7	9	15
10	9	7	7	15	8	7	7	7	11	22	31	33	42	50	28	34	22	19	7	7	25	42	36	8	20
11	6	7	8	9	6	7	7	6	7	9	16	23	53	45	34	23	19	13	12	10	15	11	12	10	15
12	18	13	9	28	42	49	35	23	27	24	15	21	20	24	62	30	21	41	22	20	13	15	19	12	25
13	12	17	13	11	12	13	12	8	25	16	17	26	53	16	21	30	35	15	11	16	13	15	15	15	18
14	18	13	22	13	12	24	8	7	15	18	19	17	23	18	20	28	45	15	7	21	11	6	8	11	17
15	13	9	19	18	7	7	5	6	11	13	16	19	14	20	18	20	9	12	9	8	7	13	11	7	12
16	35	9	10	10	12	13	8	10	9	9	13	15	19	25	19	27	32	16	11	17	24	13	24	12	16
17	8	10	19	16	13	6	7	12	10	16	35	57	44	25	18	37	14	36	28	16	7	8	28	33	21
18	18	7	12	21	25	13	26	36	26	27	25	16	19	25	15	16	17	8	9	8	36	19	16	7	19
19	31	18	10	19	32	18	7	11	11	32	20	32	12	13	12	26	34	14	43	11	14	16	11	22	19
20	38	12	10	23	12	10	9	10	14	20	38	33	44	49	56	54	36	26	13	35	25	13	14	13	25
21	14	47	11	10	9	8	8	11	39	21	39	49	28	20	17	13	16	11	7	5	29	6	8	10	18
22	9	10	10	13	10	12	11	9	14	25	34	31	27	25	27	16	12	13	8	8	34	11	6	6	16
23	9	14	14	7	22	21	11	9	17	32	40	45	50	40	20	15	17	18	9	12	51	32	14	46	23
24	9	6	10	15	10	8	6	9	15	46	39	52	41	35	30	18	15	12	9	6	13	30	8	9	19
25	10	11	7	25	14	24	10	8	17	26	49	26	24	31	29	15	19	12	7	7	20	31	26	17	19
26	14	10	13	13	11	9	14	15	15	16	12	23	22	45	54	44	41	19	13	10	8	29	10	27	20
27	9	11	8	7	8	7	6	7	10	16	24	28	26	53	39	33	29	10	7	6	5	24	11	6	16
28	7	10	7	11	10	10	8	9	14	24	39	55	36	25	19	18	16	11	8	7	59	17	13	10	18
29	8	8	9	10	8	7	9	7	12	24	60	38	47	50	30	21	21	15	6	15	19	8	15	9	19
30	10	7	8	19	12	7	7	10	11	14	36	36	33	49	33	32	11	9	6	7	7	39	17	22	18
31	10	9	7	13	13	29	10	13	12	25	58	25	24	22	18	17	13	10	8	6	20	19	25	25	18
HRAVE	15	14	13	13	16	15	12	12	17	22	29	32	30	29	26	24	20	15	11	14	22	19	17	18	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	23	23	24	23	16	10	23	18	15	20	15	25	18	17	12	16	21	19	19	25	18	16	23	19	19
MAX	67	60	59	53	27	13	59	46	44	50	53	62	53	45	20	35	57	36	43	56	49	34	51	52	49
MIN	6	6	5	7	4	6	6	6	6	7	6	9	8	6	5	8	6	7	7	9	5	6	7	6	7

DAY	26	27	28	29	30	31
AVE	20	16	18	19	18	18
MAX	54	53	59	60	49	58
MIN	8	5	7	6	6	6

MONTHLY AVERAGE = 19.0 MONTHLY MAXIMUM = 66.8 MONTHLY MINIMUM = 4.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	15.0	15.3	15.1	14.3	13.9	12.9	11.8	12.1	14.1	16.6	19.5	21.3	22.1	24.5	25.0	23.8	23.3	21.7	20.2	19.8	19.0	18.8	18.5	18.9	18.2
2	18.5	17.5	16.0	15.8	15.2	15.3	15.8	15.7	16.0	16.7	19.2	20.6	20.0	14.7	11.8	10.3	9.9	9.5	9.4	9.3	9.4	9.9	9.6	9.3	14.0
3	9.0	8.9	8.8	8.3	8.0	7.4	6.9	6.1	7.0	8.4	10.0	13.8	14.2	15.6	16.4	16.5	16.3	15.5	14.1	12.8	12.1	11.7	11.0	10.7	11.2
4	9.2	8.4	7.6	6.7	6.4	5.5	5.6	5.6	7.9	10.6	12.5	14.9	16.4	17.4	17.8	17.7	17.8	16.9	15.4	14.5	14.1	13.4	12.2	10.8	11.9
5	9.6	9.2	9.4	9.2	9.7	9.5	7.3	7.6	10.9	13.9	15.3	16.3	17.3	18.2	19.1	19.4	19.6	19.5	18.5	17.3	16.2	15.4	14.2	13.1	14.0
6	12.5	12.1	11.6	10.6	10.2	10.3	10.1	10.2	11.7	14.1	17.2	19.8	21.3	22.1	22.1	22.6	22.7	22.4	21.4	20.4	19.5	18.8	18.2	17.8	16.7
7	17.6	17.3	16.4	15.6	15.0	14.2	10.9	13.5	16.3	18.1	19.6	21.7	23.6	24.0	24.9	25.1	24.7	24.2	23.1	21.7	21.0	18.8	19.0	18.1	19.4
8	17.3	16.3	14.9	14.6	14.1	12.5	12.5	13.6	14.8	17.4	19.6	21.5	23.4	24.5	25.0	24.9	24.6	23.8	22.0	20.5	19.9	18.5	17.6	16.2	18.7
9	15.1	13.9	12.5	11.3	11.4	10.3	9.8	10.4	12.8	14.6	18.2	21.0	23.2	24.6	25.4	25.4	25.1	24.4	22.5	21.5	20.2	19.0	17.4	16.2	17.8
10	14.8	14.0	13.1	11.5	11.5	10.4	9.9	11.2	13.7	16.3	19.6	23.1	24.6	25.9	26.7	26.4	26.6	26.0	24.0	22.3	21.2	20.7	18.5	16.5	18.7
11	15.4	14.6	13.7	12.8	12.4	11.1	11.1	11.5	14.4	16.6	20.5	23.8	25.8	27.1	26.9	27.1	26.6	26.2	25.5	24.5	23.0	22.0	21.0	20.1	19.7
12	19.0	18.9	18.4	17.4	16.5	15.9	16.0	16.6	16.8	20.0	23.0	24.3	24.3	25.0	26.0	25.7	25.1	24.7	23.7	23.1	22.2	21.3	20.6	20.1	21.0
13	19.8	19.0	17.5	16.9	16.5	14.4	13.1	12.9	16.0	20.5	22.6	24.0	25.9	27.2	27.5	26.7	25.9	25.2	23.8	22.9	22.2	21.7	21.6	21.1	21.0
14	20.3	19.8	19.0	18.4	17.8	17.4	16.6	18.0	20.1	22.1	24.2	25.3	26.2	26.2	26.9	26.5	26.2	25.6	24.8	23.8	22.2	21.5	20.6	19.6	22.1
15	19.0	18.0	17.0	15.9	17.0	16.6	15.6	16.8	19.2	21.3	23.5	24.8	25.4	25.5	25.7	26.0	26.1	25.8	24.7	24.0	23.1	22.1	22.1	20.7	21.5
16	19.5	18.8	19.1	17.8	18.1	16.9	16.4	17.9	19.8	21.8	23.6	25.3	26.5	27.4	27.7	28.3	28.0	27.5	26.8	25.7	24.9	24.7	23.4	22.4	22.9
17	21.4	20.0	19.1	18.5	16.5	16.5	15.8	15.8	19.2	22.0	24.9	26.3	27.3	27.8	27.5	26.9	26.3	26.0	25.6	25.0	24.6	24.1	23.4	23.3	22.7
18	22.9	22.1	21.2	20.7	20.1	19.2	19.1	18.7	18.9	20.8	22.2	22.0	22.6	21.6	21.4	20.0	19.2	17.5	16.6	14.3	13.3	13.1	13.3	13.5	18.9
19	13.5	13.3	13.4	13.6	12.9	12.9	12.9	13.4	14.4	16.1	18.0	18.6	16.9	17.0	17.8	15.9	15.4	16.3	16.1	15.9	15.2	15.0	14.7	14.4	15.1
20	14.2	12.9	12.2	11.8	11.5	11.2	11.7	12.6	14.5	16.2	18.6	21.0	22.7	23.6	24.1	24.8	24.9	22.7	19.2	19.5	18.7	18.1	17.2	17.1	17.5
21	16.2	15.3	14.1	13.1	12.1	11.6	11.6	13.0	14.6	17.8	20.0	21.9	23.8	25.3	26.0	25.9	25.8	25.3	23.8	22.2	21.0	19.5	18.7	17.9	19.0
22	17.1	15.8	14.6	13.7	13.1	12.1	11.4	13.6	15.3	18.2	21.5	23.9	26.0	27.0	27.6	27.9	27.5	26.6	25.0	24.1	22.4	20.6	19.1	18.6	20.1
23	17.0	16.5	14.9	14.6	13.5	12.6	11.6	13.6	15.7	19.2	22.3	24.6	25.7	27.6	28.0	28.0	27.7	27.0	25.6	23.9	22.3	21.4	21.4	18.3	20.5
24	17.0	15.2	14.8	13.6	11.9	11.5	10.7	12.8	15.0	18.5	22.0	24.2	25.3	26.9	27.9	28.1	27.5	26.3	24.8	23.2	22.2	21.3	18.7	17.9	19.9
25	16.8	15.8	14.7	13.3	12.5	12.1	10.9	13.5	15.9	19.1	22.1	23.9	25.7	26.9	27.6	27.8	27.4	26.7	25.2	23.9	23.1	22.3	21.2	19.7	20.3
26	17.9	18.1	19.8	20.0	19.5	19.5	19.3	19.0	21.4	23.1	24.1	25.6	26.3	27.1	28.1	27.9	28.0	27.5	26.7	25.6	24.5	22.4	20.4	18.6	22.9
27	17.8	16.2	15.5	14.7	13.4	12.8	12.8	14.6	17.7	20.8	24.6	28.0	29.8	30.9	31.8	32.3	32.7	32.0	29.6	27.4	26.2	24.9	22.8	21.0	22.9
28	19.1	17.7	16.3	16.0	13.7	13.8	13.4	14.3	18.1	21.1	24.7	27.9	30.4	31.6	32.4	32.5	32.3	31.4	29.8	28.2	27.0	24.1	22.1	20.7	23.3
29	19.0	18.0	17.4	15.5	15.4	14.7	14.3	16.1	18.8	21.2	24.1	28.3	30.6	31.9	32.3	32.5	31.6	30.9	29.4	28.3	26.5	24.1	22.5	21.0	23.5
30	20.4	18.5	18.0	16.8	16.4	16.2	17.0	16.5	19.3	23.0	26.0	27.8	29.2	31.8	32.4	32.5	31.5	30.9	29.4	28.1	26.6	26.1	24.1	22.4	24.2
31	22.1	20.2	20.2	18.3	18.5	16.8	16.0	18.0	20.8	24.1	26.8	28.6	30.5	31.3	31.5	31.5	31.4	30.4	28.9	27.5	26.1	24.5	24.4	24.6	24.7
HRAVE	16.9	16.1	15.4	14.6	14.0	13.4	12.8	13.7	15.8	18.4	21.0	23.0	24.3	25.1	25.5	25.4	25.1	24.4	23.1	22.0	21.0	20.0	19.0	18.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	18.2	14.0	11.2	11.9	14.0	16.7	19.4	18.7	17.8	18.7	19.7	21.0	21.0	22.1	21.5	22.9	22.7	18.9	15.1	17.5	19.0	20.1	20.5	19.9	20.3
MAX	25.0	20.6	16.5	17.8	19.6	22.7	25.1	25.0	25.4	26.7	27.1	26.0	27.5	26.9	26.1	28.3	27.8	22.9	18.6	24.9	26.0	27.9	28.0	28.1	27.8
MIN	11.8	9.3	6.1	5.5	7.3	10.1	10.9	12.5	9.8	9.9	11.1	15.9	12.9	16.6	15.6	16.4	15.8	13.1	12.9	11.2	11.6	11.4	11.6	10.7	10.9

DAY	26	27	28	29	30	31
AVE	22.9	22.9	23.3	23.5	24.2	24.7
MAX	28.1	32.7	32.5	32.5	32.5	31.5
MIN	17.9	12.8	13.4	14.3	16.2	16.0

MONTHLY AVERAGE = 19.5 MONTHLY MAXIMUM = 32.7 MONTHLY MINIMUM = 5.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.1	0.2	0.1	0.2	0.3	0.4	0.4	-0.4	-1.0	-1.2	-1.6	-1.1	-1.1	-1.4	-1.5	-0.8	-0.6	-0.3	0.0	0.1	0.2	0.2	0.3	0.2	-0.3
2	0.2	0.2	0.2	0.4	0.3	0.3	0.2	0.2	0.0	-0.2	-0.5	-1.0	-0.9	-0.9	-0.5	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	-0.1
3	0.1	0.3	0.3	0.5	0.3	0.4	0.3	0.2	-0.2	-0.6	-0.7	-1.5	-0.6	-0.8	-1.0	-1.1	-0.7	-0.4	0.1	0.3	0.1	0.1	0.3	0.3	-0.2
4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.0	-0.7	-0.7	-0.7	-0.9	-1.0	-1.2	-1.2	-1.2	-0.9	-0.5	0.0	0.1	0.2	0.5	0.4	0.5	-0.2
5	0.6	0.6	0.8	0.8	0.8	0.8	1.6	0.9	-0.6	-1.1	-1.1	-1.0	-0.9	-0.8	-0.7	-0.5	-0.1	0.2	0.4	0.5	0.5	0.7	0.8	0.7	0.2
6	0.5	0.3	0.3	0.4	0.4	0.2	0.1	-0.2	-0.6	-0.9	-1.2	-1.3	-1.2	-0.9	-0.6	-0.4	0.0	0.2	0.5	0.4	0.3	0.4	0.4	0.3	-0.1
7	0.2	0.2	0.2	0.3	0.4	0.4	0.7	0.0	-0.5	-0.7	-0.9	-1.1	-1.3	-1.1	-0.9	-0.8	-0.3	0.0	0.2	0.3	0.3	0.4	0.3	0.6	-0.1
8	0.6	0.5	0.4	0.2	0.4	0.5	0.4	-0.3	-1.0	-1.0	-1.0	-0.9	-1.0	-1.1	-1.1	-1.0	-0.7	-0.3	0.2	0.4	0.4	0.4	0.4	0.4	-0.2
9	0.4	0.5	0.7	0.5	0.6	0.5	0.3	-0.3	-1.3	-0.7	-0.9	-0.9	-0.9	-1.1	-1.2	-1.0	-0.7	-0.3	0.2	0.5	0.4	0.4	0.5	0.5	-0.1
10	0.6	0.6	0.7	0.7	0.4	0.6	0.4	-0.6	-1.3	-1.2	-1.0	-1.2	-1.1	-1.1	-1.3	-1.0	-0.7	-0.3	0.2	0.5	0.5	0.5	0.6	0.7	-0.2
11	0.7	0.7	0.6	0.5	0.5	0.5	0.5	-0.4	-1.1	-1.2	-1.4	-1.3	-1.1	-1.0	-0.7	-0.8	-0.3	-0.1	0.2	0.3	0.4	0.5	0.5	0.6	-0.1
12	0.7	0.5	0.6	0.4	0.5	0.5	0.6	0.3	-0.1	-0.3	-1.0	-1.0	-0.8	-0.9	-0.9	-0.6	-0.5	-0.2	0.0	0.1	0.1	0.1	0.1	0.1	-0.1
13	0.1	0.2	0.4	0.4	0.3	0.8	1.0	-0.2	-0.5	-1.1	-1.3	-1.1	-1.3	-1.6	-1.5	-0.7	-0.3	-0.1	0.1	0.2	0.1	0.1	0.2	0.3	-0.2
14	0.3	0.2	0.3	0.4	0.6	0.6	0.7	0.1	-0.6	-1.0	-1.4	-1.5	-1.6	-1.2	-1.4	-0.8	-0.4	0.0	0.3	0.4	0.4	0.8	0.5	0.4	-0.2
15	0.5	0.8	0.6	0.7	0.7	0.6	0.6	-0.1	-0.8	-1.3	-1.6	-1.7	-1.3	-1.2	-0.9	-0.7	-0.3	0.1	0.4	0.5	0.4	0.4	0.4	0.3	-0.1
16	0.3	0.5	0.4	0.6	0.3	0.4	0.5	-0.2	-0.7	-1.2	-1.4	-1.6	-1.7	-1.5	-1.0	-1.0	-0.4	0.0	0.3	0.4	0.4	0.2	0.3	0.4	-0.2
17	0.5	0.5	0.6	0.4	0.9	0.8	0.5	0.3	-1.3	-1.4	-1.3	-1.0	-1.1	-1.2	-0.8	-0.4	-0.3	-0.2	0.1	0.3	0.3	0.2	0.2	0.2	-0.1
18	0.2	0.2	0.3	0.3	0.4	0.3	0.5	0.4	0.1	-0.5	-0.7	-0.5	-0.7	-0.5	-0.7	-0.5	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	0.1	-0.1
19	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.0	-0.4	-0.8	-1.4	-1.0	-0.5	-0.6	-1.0	-0.4	-0.1	0.0	0.4	0.3	0.2	0.2	0.2	0.3	-0.2
20	0.2	0.4	0.5	0.3	0.3	0.2	0.2	-0.7	-1.2	-1.0	-1.1	-1.3	-1.5	-1.4	-1.0	-0.9	-0.9	-0.4	-0.1	0.0	0.1	0.4	0.4	0.2	-0.3
21	0.3	0.3	0.4	0.4	0.6	0.4	0.1	-0.9	-0.7	-1.2	-1.0	-0.9	-1.1	-1.2	-1.2	-1.1	-0.8	-0.5	0.0	0.5	0.4	0.4	0.4	0.3	-0.3
22	0.5	0.5	0.4	0.4	0.5	0.6	0.3	-0.9	-1.0	-0.9	-1.1	-0.9	-1.1	-1.1	-1.2	-1.0	-0.9	-0.5	0.2	0.6	0.5	0.6	0.7	0.7	-0.2
23	0.6	0.4	0.4	0.7	0.5	0.4	0.4	-0.6	-0.7	-0.8	-0.9	-1.1	-0.9	-1.1	-1.3	-1.1	-0.8	-0.5	0.1	0.6	0.4	0.5	0.4	0.8	-0.2
24	0.9	0.6	0.6	0.6	0.7	0.6	0.3	-0.9	-1.1	-0.7	-1.0	-0.9	-1.0	-1.1	-1.2	-1.1	-0.9	-0.5	0.1	0.6	0.7	0.6	0.7	0.7	-0.1
25	0.6	0.5	0.7	0.5	0.5	0.8	0.6	-0.6	-0.9	-1.2	-1.0	-1.0	-1.3	-1.1	-1.2	-1.2	-0.9	-0.6	0.0	0.3	0.4	0.5	0.5	0.7	-0.2
26	0.7	0.8	0.5	0.4	0.4	0.3	0.3	-0.2	-0.8	-1.1	-1.3	-1.3	-1.2	-1.1	-1.0	-0.7	-0.5	0.0	0.5	0.6	0.7	0.7	0.8	0.7	-0.1
27	0.7	0.8	0.8	0.6	0.5	0.6	0.1	-0.9	-1.6	-1.8	-1.5	-1.8	-1.8	-1.0	-1.0	-0.9	-0.7	-0.6	0.0	0.4	0.6	0.6	0.6	0.8	-0.3
28	0.7	0.8	0.8	0.6	0.9	0.6	0.2	-0.9	-1.5	-1.1	-1.0	-1.0	-1.1	-1.2	-1.2	-1.1	-0.9	-0.5	0.1	0.6	0.6	0.9	0.7	0.8	-0.1
29	0.8	0.7	0.6	0.6	0.7	0.6	0.2	-0.9	-1.5	-0.9	-0.6	-1.0	-1.0	-1.0	-1.0	-0.9	-0.6	-0.3	0.2	0.6	0.7	0.6	0.7	0.7	-0.1
30	0.6	0.8	0.6	0.5	0.6	0.6	0.5	-0.3	-0.7	-1.5	-1.1	-0.6	-0.6	-1.1	-1.0	-0.8	-0.5	-0.3	0.2	0.6	0.5	0.5	0.6	0.6	0.0
31	0.9	0.5	0.8	0.6	0.6	0.8	0.3	-0.6	-1.3	-1.2	-0.8	-1.0	-1.3	-1.3	-1.3	-1.2	-0.9	-0.6	0.0	0.6	0.4	0.3	0.5	0.4	-0.2
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.3	-0.8	-1.0	-1.1	-1.1	-1.1	-1.1	-1.0	-0.8	-0.6	-0.2	0.1	0.4	0.4	0.4	0.4	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.3	-0.1	-0.2	-0.2	0.2	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.2	-0.1	-0.2
MAX	0.4	0.4	0.5	0.5	1.6	0.5	0.7	0.6	0.7	0.7	0.7	0.7	1.0	0.8	0.8	0.6	0.9	0.5	0.4	0.5	0.6	0.7	0.8	0.9	0.8
MIN	-1.6	-1.0	-1.5	-1.2	-1.1	-1.3	-1.3	-1.1	-1.3	-1.3	-1.4	-1.0	-1.6	-1.6	-1.7	-1.7	-1.4	-0.7	-1.4	-1.5	-1.2	-1.2	-1.3	-1.2	-1.3

DAY	26	27	28	29	30	31
AVE	-0.1	-0.3	-0.1	-0.1	0.0	-0.2
MAX	0.8	0.8	0.9	0.8	0.8	0.9
MIN	-1.3	-1.8	-1.5	-1.5	-1.5	-1.3

MONTHLY AVERAGE = -0.2 MONTHLY MAXIMUM = 1.6 MONTHLY MINIMUM = -1.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	703	703	703	703	703	703	704	704	705	705	704	704	703	703	702	702	702	702	702	703	703	704	704	704	703
2	703	703	703	702	702	702	703	703	703	703	702	702	701	701	701	702	703	703	704	704	705	704	704	704	703
3	704	703	703	702	702	702	702	702	703	703	703	702	702	701	700	700	700	700	700	700	701	701	701	701	702
4	701	701	701	701	701	701	702	703	704	704	704	704	704	704	704	704	704	704	705	706	707	707	708	708	704
5	708	708	708	708	709	709	710	711	711	712	711	711	710	710	709	709	708	708	709	709	709	709	710	710	709
6	710	710	710	709	709	709	709	709	710	710	709	708	707	706	705	705	705	705	705	705	706	706	706	706	707
7	706	706	706	706	706	706	706	706	706	706	706	706	705	704	703	703	702	702	703	703	703	704	704	704	705
8	704	704	704	704	704	704	704	705	705	705	705	704	703	703	702	702	701	701	702	702	702	703	703	703	703
9	703	703	703	703	703	703	703	703	704	704	703	703	702	701	701	700	700	701	701	701	701	702	702	702	702
10	703	703	703	703	703	703	703	704	705	705	705	704	704	703	703	703	703	703	703	704	704	705	705	705	704
11	705	706	706	706	706	707	707	708	709	709	709	708	708	707	706	706	705	705	705	705	706	706	706	706	706
12	706	706	705	705	705	705	706	706	706	706	706	705	705	704	703	703	703	703	703	704	704	704	704	704	705
13	704	704	704	704	704	705	705	706	706	706	706	705	705	704	704	704	704	704	705	705	706	706	707	706	705
14	707	708	708	708	708	709	709	709	710	710	709	709	708	707	706	706	706	706	706	706	707	708	708	708	708
15	708	708	709	708	709	709	709	709	709	709	709	708	707	707	706	705	705	704	705	705	706	706	706	706	707
16	706	707	706	706	706	707	707	707	707	707	706	706	705	704	703	703	702	702	702	703	703	703	704	704	705
17	704	704	703	703	704	704	704	705	705	705	705	704	704	703	702	702	702	702	702	702	702	703	703	703	703
18	704	704	704	704	704	704	704	705	705	705	705	705	704	704	704	704	704	704	704	705	705	705	705	705	704
19	705	704	704	704	704	704	704	705	705	705	705	705	704	704	703	704	703	703	704	705	705	706	706	706	704
20	706	706	706	706	706	707	707	708	708	708	708	707	706	706	705	704	704	705	705	705	706	706	706	706	706
21	706	706	706	706	706	706	707	708	708	708	708	707	706	706	705	705	705	705	705	705	706	707	707	707	706
22	707	707	707	707	708	708	708	709	709	709	709	708	708	707	706	706	706	706	706	706	706	706	707	707	707
23	707	707	706	706	706	707	707	707	707	707	707	706	706	705	704	704	704	704	704	704	704	705	705	705	706
24	705	705	705	705	705	705	705	706	706	706	706	705	704	704	703	703	702	702	702	702	703	703	703	703	704
25	703	703	703	703	704	704	705	705	705	706	705	705	705	704	704	703	703	703	704	704	705	705	706	706	704
26	706	706	706	706	706	707	707	708	708	708	708	708	707	707	706	706	705	705	706	706	707	707	708	708	707
27	708	708	708	708	708	708	708	709	709	709	709	708	707	706	706	705	704	704	705	705	705	706	706	706	707
28	707	707	707	707	707	707	708	708	708	708	708	707	706	706	705	705	704	705	705	705	705	706	706	706	706
29	706	706	706	706	706	706	707	707	708	708	707	707	706	705	705	704	704	704	704	705	705	705	705	705	706
30	706	706	706	706	706	706	706	707	707	707	707	707	706	705	704	703	703	703	703	703	704	704	704	704	705
31	704	704	704	704	704	705	705	705	705	705	705	705	704	703	702	702	701	701	701	701	702	702	702	703	703
HRAVE	705	705	705	705	705	705	706	706	707	707	706	706	705	704	704	704	703	704	704	704	705	705	705	705	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	703	703	702	704	709	707	705	703	702	704	706	705	705	708	707	705	703	704	704	706	706	707	706	704	704
MAX	705	705	704	708	712	710	706	705	704	705	709	706	707	710	709	707	705	705	706	708	708	709	707	706	706
MIN	702	701	700	701	708	705	702	701	700	703	705	703	704	706	704	702	702	704	703	704	705	706	704	702	703

DAY	26	27	28	29	30	31
AVE	707	707	706	706	705	703
MAX	708	709	708	708	707	705
MIN	705	704	704	704	703	701

MONTHLY AVERAGE = 705.0 MONTHLY MAXIMUM = 711.5 MONTHLY MINIMUM = 700.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	65	62	62	65	69	75	77	75	64	53	41	34	33	25	24	28	32	37	44	46	48	50	49	46	50
2	48	54	64	68	71	71	63	64	58	54	44	39	44	69	83	88	94	94	90	95	95	86	90	94	72
3	95	96	95	96	97	98	98	99	98	88	78	54	47	40	34	32	27	26	36	44	51	57	60	64	67
4	72	77	82	85	85	88	89	86	73	57	53	44	36	33	33	34	34	35	37	40	41	42	51	59	57
5	64	65	56	48	40	36	48	48	34	24	24	25	23	21	19	17	15	15	17	20	22	24	28	31	32
6	34	35	36	38	38	37	39	36	32	27	20	14	10	8	9	9	8	9	12	17	20	22	23	23	23
7	24	22	23	23	26	28	41	32	24	23	22	21	20	20	18	18	18	19	22	25	26	32	31	34	25
8	37	40	43	46	47	53	53	49	44	34	29	25	22	20	20	19	18	19	21	23	25	28	32	35	33
9	39	42	47	50	51	54	56	53	43	37	30	22	19	17	16	13	13	14	17	21	24	26	32	33	32
10	36	39	42	46	47	51	52	46	37	29	23	15	11	9	9	9	10	11	14	16	18	20	23	28	27
11	30	32	33	36	37	42	41	40	32	27	21	17	13	11	11	11	12	13	17	17	18	19	22	24	24
12	26	27	29	31	34	36	35	34	34	27	19	18	19	17	14	15	16	17	20	21	26	29	32	33	25
13	35	36	40	43	43	49	53	53	44	31	26	23	19	14	12	13	18	20	23	26	30	30	30	31	31
14	33	33	34	35	36	37	39	34	29	25	20	16	14	14	13	13	14	15	17	19	22	23	23	24	24
15	26	28	30	32	30	30	32	30	26	22	18	15	12	12	12	11	10	10	13	13	14	16	16	17	20
16	20	21	21	24	24	24	26	25	26	25	26	24	21	20	20	19	19	21	24	29	30	31	33	35	24
17	36	40	43	45	51	52	56	53	43	35	29	26	23	22	25	28	28	32	32	32	26	22	24	24	34
18	25	29	33	34	34	37	39	41	41	37	37	39	37	43	43	54	55	60	63	80	93	95	94	90	51
19	90	94	94	91	95	96	94	92	86	71	60	55	74	69	65	71	74	69	69	73	77	76	78	79	79
20	79	88	90	90	92	92	89	80	69	60	51	44	33	28	27	24	27	36	50	42	51	53	52	52	58
21	55	61	67	72	76	77	75	66	59	47	38	32	31	26	24	22	21	20	23	26	32	37	42	44	45
22	46	50	53	59	60	66	68	56	46	37	29	22	15	15	14	13	12	12	14	19	23	26	29	31	34
23	34	38	43	45	50	55	57	49	39	30	24	19	18	12	9	9	10	12	15	18	22	25	22	29	29
24	32	36	36	39	45	47	48	39	33	22	17	12	10	8	7	6	8	10	12	15	18	21	24	26	24
25	28	30	32	37	39	43	45	37	30	24	19	20	16	14	14	14	15	15	17	19	20	22	26	28	25
26	32	30	18	15	16	15	14	16	12	10	9	8	8	7	5	5	5	7	9	10	12	15	17	22	13
27	22	25	27	30	33	35	35	31	25	20	14	10	8	5	3	2	3	5	8	10	10	12	16	19	17
28	21	24	27	29	34	32	33	30	23	17	12	9	7	5	3	3	3	4	6	8	11	13	15	18	16
29	19	20	23	26	27	28	29	24	20	16	14	8	5	5	5	4	4	6	7	10	11	15	16	18	15
30	20	22	21	25	26	26	25	27	22	17	13	12	10	7	7	7	9	9	11	13	16	17	19	23	17
31	22	25	25	29	31	35	35	30	26	19	17	15	13	12	11	12	12	13	15	17	20	22	24	25	21
HRAVE	40	43	44	46	48	50	51	48	41	34	28	24	22	20	20	20	21	22	25	28	31	32	35	37	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	50	72	67	57	32	23	25	33	32	27	24	25	31	24	20	24	34	51	79	58	45	34	29	24	25
MAX	77	95	99	89	65	39	41	53	56	52	42	36	53	39	32	35	56	95	96	92	77	68	57	48	45
MIN	24	39	26	33	15	8	18	18	13	9	11	14	12	13	10	19	22	25	55	24	20	12	9	6	14

DAY	26	27	28	29	30	31
AVE	13	17	16	15	17	21
MAX	32	35	34	29	27	35
MIN	5	2	3	4	7	11

MONTHLY AVERAGE = 33.7 MONTHLY MAXIMUM = 98.7 MONTHLY MINIMUM = 1.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.49	0.66	0.70	0.71	0.81	0.71	0.27	0.25	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.07
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.12	0.35	0.67	0.43	0.41	0.13	0.06	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.33
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.24	0.46	0.64	0.65	0.62	0.74	0.66	0.57	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	5.18
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.51	0.67	0.80	0.83	0.87	0.77	0.63	0.46	0.15	0.01	0.00	0.00	0.00	0.00	0.00	6.12
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.54	0.70	0.81	0.86	0.83	0.74	0.58	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.07
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.54	0.71	0.82	0.88	0.85	0.75	0.59	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	6.17
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.33	0.45	0.65	0.75	0.85	0.81	0.64	0.57	0.29	0.05	0.01	0.00	0.00	0.00	0.00	0.00	5.52
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.53	0.69	0.81	0.86	0.83	0.74	0.57	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.01
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.33	0.54	0.71	0.82	0.86	0.83	0.75	0.59	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	6.13
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.35	0.55	0.72	0.84	0.89	0.85	0.75	0.59	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	6.24
11	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.29	0.45	0.68	0.76	0.76	0.66	0.38	0.39	0.20	0.11	0.00	0.00	0.00	0.00	0.00	0.00	4.83
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.28	0.50	0.52	0.46	0.59	0.64	0.24	0.21	0.06	0.00	0.00	0.00	0.00	0.00	0.00	3.65
13	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.55	0.71	0.82	0.88	0.83	0.78	0.35	0.20	0.12	0.01	0.00	0.00	0.00	0.00	0.00	5.75
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.56	0.71	0.83	0.88	0.82	0.81	0.53	0.28	0.14	0.02	0.00	0.00	0.00	0.00	0.00	6.08
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.58	0.74	0.85	0.90	0.87	0.77	0.62	0.42	0.18	0.01	0.00	0.00	0.00	0.00	0.00	6.49
16	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.57	0.73	0.84	0.88	0.85	0.76	0.60	0.40	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.34
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.36	0.56	0.73	0.66	0.52	0.61	0.28	0.12	0.07	0.07	0.01	0.00	0.00	0.00	0.00	0.00	4.14
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.08	0.38	0.32	0.20	0.32	0.17	0.16	0.10	0.07	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.87
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.19	0.53	0.54	0.45	0.11	0.21	0.39	0.05	0.16	0.07	0.01	0.00	0.00	0.00	0.00	0.00	2.80
20	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.38	0.57	0.73	0.84	0.89	0.86	0.77	0.64	0.40	0.09	0.01	0.00	0.00	0.00	0.00	0.00	6.37
21	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.39	0.59	0.75	0.86	0.90	0.87	0.78	0.62	0.41	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.56
22	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.40	0.60	0.77	0.88	0.92	0.88	0.77	0.58	0.41	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.59
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.41	0.61	0.77	0.87	0.90	0.90	0.80	0.64	0.43	0.16	0.03	0.00	0.00	0.00	0.00	0.00	6.71
24	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.42	0.63	0.76	0.83	0.93	0.90	0.80	0.64	0.43	0.16	0.03	0.00	0.00	0.00	0.00	0.00	6.75
25	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.39	0.62	0.78	0.88	0.92	0.89	0.79	0.62	0.42	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.72
26	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.43	0.63	0.79	0.90	0.94	0.91	0.81	0.65	0.44	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.93
27	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.64	0.81	0.91	0.95	0.93	0.83	0.67	0.45	0.18	0.03	0.00	0.00	0.00	0.00	0.00	7.09
28	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.45	0.66	0.82	0.92	0.96	0.93	0.83	0.67	0.45	0.18	0.03	0.00	0.00	0.00	0.00	0.00	7.15
29	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.43	0.54	0.66	0.83	0.81	0.77	0.69	0.49	0.29	0.14	0.02	0.00	0.00	0.00	0.00	0.00	5.92
30	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.23	0.56	0.71	0.58	0.65	0.82	0.71	0.43	0.21	0.14	0.02	0.00	0.00	0.00	0.00	0.00	5.26
31	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.44	0.64	0.79	0.89	0.92	0.89	0.80	0.64	0.43	0.16	0.03	0.00	0.00	0.00	0.00	0.00	6.89
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.33	0.53	0.69	0.77	0.78	0.77	0.68	0.49	0.33	0.13	0.01	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.07	2.33	5.18	6.12	6.07	6.17	5.52	6.01	6.13	6.24	4.83	3.65	5.75	6.08	6.49	6.34	4.14	1.87	2.80	6.37	6.56	6.59	6.71	6.75	6.72
MAX	0.81	0.67	0.74	0.87	0.86	0.88	0.85	0.86	0.86	0.89	0.76	0.64	0.88	0.88	0.90	0.88	0.73	0.38	0.54	0.89	0.90	0.92	0.90	0.93	0.92
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.93	7.09	7.15	5.92	5.26	6.89
MAX	0.94	0.95	0.96	0.83	0.82	0.92
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.01	0.00	0.06
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03	0.00	0.00	0.00	0.07
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.15 MONTHLY MAXIMUM = 0.04 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.8	6.5	8.2	6.0	4.9	3.8	6.9	6.1	5.6	7.1	4.5	9.1	13.8	14.3	15.5	19.2	19.2	15.7	12.5	10.3	6.7	4.5	4.2	6.2	9.0
2	6.9	7.7	5.1	7.4	8.1	8.5	8.2	9.9	7.6	3.3	3.2	6.8	15.5	16.1	14.7	17.1	16.1	13.9	12.4	10.4	8.7	8.7	8.9	4.7	9.6
3	5.4	7.2	6.9	7.9	9.7	8.6	7.7	13.2	17.2	13.5	12.0	8.3	4.7	5.3	4.8	5.1	10.2	14.1	12.3	10.9	9.9	5.1	5.7	6.4	8.8
4	6.3	7.6	5.8	7.2	6.5	6.0	6.9	6.7	7.5	7.9	6.5	4.1	5.7	5.6	7.3	13.3	12.1	16.9	18.6	10.0	6.4	4.3	6.6	6.4	8.0
5	9.1	7.8	4.5	5.4	6.3	5.0	6.4	5.6	5.8	3.8	4.0	6.2	4.8	9.1	12.5	13.1	13.2	16.5	16.4	8.2	5.2	9.0	6.4	3.8	7.8
6	5.1	4.6	3.8	7.2	7.2	6.6	7.4	4.5	2.6	2.1	2.1	4.0	11.0	14.7	13.9	15.0	17.7	16.3	13.5	6.2	2.9	6.3	4.5	5.5	7.7
7	5.2	6.0	3.3	6.1	6.6	9.2	9.2	9.7	5.9	4.6	3.2	11.1	12.5	14.2	16.3	14.4	16.9	13.6	14.9	14.1	5.8	3.7	4.2	2.8	8.9
8	3.1	4.3	4.4	8.7	9.0	8.9	6.5	3.7	2.5	5.2	13.2	15.9	15.6	16.9	16.8	18.3	17.9	15.7	15.6	14.1	13.0	7.6	4.1	3.4	10.2
9	3.7	5.9	6.4	6.4	6.9	7.9	7.0	5.6	5.6	4.4	4.4	3.6	4.6	3.8	5.8	5.5	10.4	17.1	17.4	10.3	5.9	4.4	2.0	3.2	6.6
10	3.5	6.2	8.3	8.3	8.3	9.6	6.9	4.6	4.4	3.2	2.9	3.3	5.7	7.1	6.1	11.2	13.7	14.9	14.2	9.0	5.8	1.4	7.1	6.1	7.2
11	6.4	5.9	9.3	10.0	9.2	3.9	4.2	4.6	4.6	4.6	2.8	4.1	6.3	7.0	5.3	11.8	15.6	16.2	15.2	10.6	7.0	3.2	4.2	4.3	7.4
12	5.7	8.6	10.3	9.3	8.6	5.7	8.4	8.8	12.2	15.5	15.2	12.9	13.5	13.7	14.3	14.5	13.3	9.1	7.9	2.0	3.7	5.1	5.8	5.8	9.6
13	5.5	5.8	4.9	5.4	4.7	2.9	2.0	4.6	3.0	3.2	7.0	7.4	6.1	3.4	4.6	5.3	7.0	11.9	16.5	13.5	7.3	6.7	10.4	11.9	6.7
14	10.2	7.1	5.1	5.2	6.4	8.5	8.6	10.1	8.5	5.7	4.6	4.5	4.1	6.4	7.3	12.9	13.4	11.4	12.9	8.7	7.4	13.9	10.4	7.3	8.4
15	3.7	6.6	3.4	2.6	3.4	4.7	4.3	5.5	4.5	5.0	12.3	18.4	20.0	19.0	22.0	21.0	22.2	22.2	19.5	16.1	16.6	17.0	16.4	11.7	12.4
16	7.3	6.2	6.7	7.1	6.3	5.2	5.8	4.3	4.3	7.4	8.1	16.1	17.2	15.3	15.9	16.5	16.1	15.8	14.8	7.8	5.5	2.6	6.7	8.5	9.5
17	9.5	7.5	7.1	7.5	4.3	1.7	4.6	1.9	3.5	2.9	2.4	10.4	12.3	14.2	16.2	14.7	15.2	13.4	10.2	8.1	3.3	4.1	6.5	8.3	7.9
18	8.7	5.8	3.7	3.2	6.2	6.3	3.4	3.3	2.9	2.5	3.4	10.8	17.6	16.6	18.2	18.5	18.7	18.7	15.4	9.3	3.8	6.2	7.1	8.5	9.1
19	8.2	8.7	6.6	7.8	8.0	7.6	7.6	4.7	4.7	2.8	3.7	9.6	11.1	10.8	12.9	13.2	12.3	12.5	11.4	8.6	8.3	4.7	10.3	6.1	8.4
20	5.5	5.8	6.2	5.9	7.7	8.4	4.3	3.4	2.5	2.5	3.0	4.0	3.0	6.0	7.6	10.2	12.6	13.3	14.1	9.6	6.1	2.1	6.5	10.6	6.7
21	8.0	8.6	4.3	3.1	3.6	5.1	6.0	6.0	3.9	2.5	2.6	3.2	7.7	6.1	10.1	8.4	9.3	13.0	12.3	9.5	9.7	11.5	10.5	12.4	7.4
22	12.2	10.4	3.7	5.0	4.9	5.7	7.5	5.8	3.3	2.8	6.0	8.6	9.2	7.9	7.9	11.0	9.7	10.9	15.2	16.1	13.9	14.9	10.8	10.1	8.9
23	10.9	11.7	5.3	2.6	2.6	5.3	4.0	2.6	2.7	2.5	5.5	6.6	6.5	8.9	12.2	16.6	16.6	20.0	17.7	16.6	18.1	17.5	13.4	11.7	9.9
24	10.6	12.8	6.0	7.2	4.7	4.7	2.9	3.0	5.1	11.7	11.6	11.7	16.4	15.7	14.4	11.0	7.2	9.4	10.9	9.7	7.2	2.8	4.0	3.1	8.5
25	3.7	1.7	1.6	3.1	5.1	2.9	6.0	5.0	3.8	2.8	4.5	4.1	11.4	13.1	14.3	13.9	16.0	20.8	21.0	21.8	17.7	12.6	18.1	19.3	10.2
26	12.6	3.8	9.1	6.3	3.0	4.1	4.2	5.9	6.9	8.3	7.8	7.2	4.7	6.6	8.0	13.2	14.4	11.8	9.3	7.1	5.4	6.8	6.3	3.2	7.3
27	4.5	5.3	6.3	3.8	3.8	4.4	3.6	4.4	2.8	2.6	5.5	5.5	8.2	9.1	6.2	8.1	6.1	6.8	7.6	11.2	10.8	5.8	3.1	4.6	5.8
28	8.9	7.2	6.9	9.6	13.1	18.5	21.4	21.5	20.4	23.7	21.6	19.7	18.4	14.0	12.6	11.9	10.0	7.9	10.5	14.5	17.9	10.8	13.9	9.0	14.3
29	13.0	15.9	14.9	16.1	12.3	8.6	9.8	10.6	12.2	11.4	15.0	18.4	11.6	12.6	10.9	9.8	11.8	9.9	8.1	3.6	4.7	9.4	10.4	8.4	11.2
30	8.0	8.1	9.5	8.0	9.8	8.6	7.5	6.7	6.4	5.1	3.8	3.7	4.6	5.7	5.8	5.2	4.4	4.4	5.6	7.4	11.6	7.7	2.6	7.1	6.6
HRAVE	7.2	7.2	6.3	6.6	6.7	6.6	6.6	6.4	6.1	6.0	6.7	8.6	10.1	10.6	11.3	12.7	13.3	13.8	13.5	10.5	8.5	7.4	7.7	7.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.0	9.6	8.8	8.0	7.8	7.7	8.9	10.2	6.6	7.2	7.4	9.6	6.7	8.4	12.4	9.5	7.9	9.1	8.4	6.7	7.4	8.9	9.9	8.5	10.2
MAX	19.2	17.1	17.2	18.6	16.5	17.7	16.9	18.3	17.4	14.9	16.2	15.5	16.5	13.9	22.2	17.2	16.2	18.7	13.2	14.1	13.0	16.1	20.0	16.4	21.8
MIN	3.8	3.2	4.7	4.1	3.8	2.1	2.8	2.5	2.0	1.4	2.8	2.0	2.0	4.1	2.6	2.6	1.7	2.5	2.8	2.1	2.5	2.8	2.5	2.8	1.6

DAY	26	27	28	29	30	31
AVE	7.3	5.8	14.3	11.2	6.6	***
MAX	14.4	11.2	23.7	18.4	11.6	***
MIN	3.0	2.6	6.9	3.6	2.6	***

MONTHLY AVERAGE = 8.7 MONTHLY MAXIMUM = 23.7 MONTHLY MINIMUM = 1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	234	184	115	117	106	128	94	94	103	128	35	263	234	239	256	271	283	270	282	288	299	285	207	124	190
2	109	97	103	94	93	93	92	85	87	112	288	270	265	255	287	298	293	294	274	280	284	310	311	174	45
3	121	108	104	116	91	116	127	72	70	74	39	51	57	294	335	265	308	285	296	303	301	301	107	101	249
4	99	102	126	100	118	111	92	106	132	158	151	113	147	171	240	248	249	297	294	289	286	156	120	190	180
5	296	308	346	102	79	80	93	105	116	112	42	344	273	244	239	251	241	277	282	285	229	189	228	124	137
6	169	194	109	97	86	70	82	73	90	120	281	299	256	241	258	266	271	267	281	284	276	317	153	117	287
7	115	98	89	88	90	86	87	84	88	79	72	244	232	236	228	225	232	259	277	289	317	314	185	238	172
8	290	163	269	309	296	307	300	283	288	254	295	288	287	291	282	292	290	293	288	293	293	303	327	284	147
9	252	96	101	99	108	97	132	112	120	139	147	183	147	106	330	286	281	292	300	307	328	288	220	149	164
10	121	104	94	96	104	88	98	125	127	115	114	274	292	283	333	292	279	298	300	325	305	275	113	110	13
11	82	98	83	80	80	358	87	120	111	118	226	280	283	290	319	311	309	295	295	310	317	227	160	107	164
12	105	313	304	293	289	293	296	297	291	301	297	289	279	273	269	271	268	260	248	162	175	126	110	116	343
13	111	118	102	89	108	87	70	110	111	259	270	290	257	170	287	283	277	293	293	300	318	93	98	101	139
14	94	93	109	104	86	78	67	72	73	107	126	136	125	266	246	272	269	260	284	255	262	276	302	289	236
15	298	306	144	35	145	109	101	98	135	293	279	277	284	275	279	268	280	279	283	280	280	288	291	304	15
16	297	314	315	42	65	117	119	289	285	297	286	288	289	294	265	272	270	288	295	301	293	173	122	112	157
17	113	98	90	106	121	176	70	53	128	142	321	293	267	271	287	282	286	276	271	285	248	134	122	106	306
18	96	107	102	84	115	117	118	125	148	174	250	286	282	283	268	278	290	290	292	296	140	119	114	112	222
19	108	110	108	111	108	122	119	109	141	135	269	288	285	281	277	280	269	294	295	296	312	163	60	77	312
20	146	132	116	108	108	113	116	133	119	153	264	266	282	279	287	294	298	308	301	300	306	220	229	293	213
21	320	300	287	292	128	110	119	114	129	152	229	276	303	281	281	247	235	264	265	296	302	304	305	297	300
22	292	309	228	145	111	134	124	111	133	123	162	148	136	223	158	192	188	217	243	288	303	298	304	315	6
23	297	298	289	130	312	130	82	129	151	279	180	286	291	290	265	257	273	286	281	281	283	280	283	272	335
24	304	294	296	298	298	201	104	146	293	295	256	246	284	308	307	297	296	306	312	311	294	179	132	100	102
25	261	160	209	256	103	81	95	76	57	56	144	266	255	249	243	243	247	272	285	266	263	274	281	299	8
26	309	23	281	271	95	136	130	166	308	310	303	275	289	305	285	293	299	292	302	298	356	47	68	92	4
27	93	130	93	117	130	116	94	127	137	216	290	322	40	47	349	295	265	284	285	305	303	324	116	107	348
28	91	105	108	82	67	66	67	82	83	91	80	95	73	90	108	116	94	94	89	57	62	43	46	89	243
29	62	63	65	59	63	85	77	78	83	69	95	101	79	70	80	92	74	66	81	94	116	74	76	92	200
30	109	116	105	109	95	91	107	125	153	108	76	81	140	80	185	287	232	287	287	306	304	296	44	108	187

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
APRIL - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	22	39	18	12	13	12	10	8	15	23	42	30	22	26	22	17	14	14	9	5	5	15	24	12	18
2	12	12	38	7	8	10	7	6	13	40	39	28	19	22	21	14	14	12	7	7	9	8	8	47	17
3	9	8	8	8	8	14	16	12	11	12	22	28	57	43	52	55	29	10	9	6	4	48	17	10	21
4	10	9	12	8	9	8	8	7	9	10	24	50	31	45	34	18	18	11	7	4	31	12	8	27	17
5	18	13	40	19	24	20	11	10	19	34	52	31	61	32	19	23	24	12	6	6	13	9	54	22	24
6	14	17	12	9	10	22	8	13	34	48	52	50	30	26	21	27	17	15	9	24	41	14	25	10	23
7	9	7	22	38	10	11	8	6	15	24	57	55	27	22	21	24	18	18	10	7	18	33	28	39	22
8	30	11	14	6	6	9	27	33	59	44	15	13	15	15	18	14	12	14	10	7	7	13	18	20	18
9	28	9	9	11	13	8	7	12	16	23	39	64	47	66	59	39	27	12	10	13	18	18	15	13	24
10	10	8	6	7	8	4	8	9	17	32	54	61	46	43	42	32	15	12	11	18	8	28	7	10	21
11	8	8	6	6	9	24	19	12	13	29	48	44	31	46	47	20	16	9	9	10	9	21	22	17	20
12	23	30	12	10	8	16	6	8	9	10	12	15	11	12	11	10	11	12	14	43	36	10	8	10	14
13	10	11	10	10	9	16	21	12	25	35	20	26	30	57	60	38	40	15	8	7	26	18	14	13	22
14	14	20	26	19	11	7	6	9	15	37	42	56	62	47	60	24	19	18	10	9	13	9	10	46	25
15	50	37	46	50	23	14	13	13	17	33	23	17	13	17	16	18	11	10	9	7	8	10	9	11	20
16	11	18	13	22	15	20	14	50	33	32	27	16	18	21	24	16	18	16	9	8	7	25	7	7	19
17	8	9	9	8	29	33	15	49	25	33	58	27	23	21	17	22	17	12	16	6	32	12	9	7	21
18	8	14	17	27	8	6	21	19	40	51	43	20	18	17	15	17	14	12	10	9	39	8	6	7	19
19	7	8	9	9	9	8	14	10	23	38	53	21	19	25	20	18	17	16	11	6	5	32	14	21	17
20	12	8	39	11	14	8	13	17	27	46	36	30	52	52	50	37	18	16	13	7	6	27	45	20	25
21	15	11	27	22	34	11	8	9	19	46	54	52	38	48	46	44	26	24	13	6	8	10	10	8	25
22	5	8	24	11	8	16	9	11	30	54	44	38	32	40	34	32	27	24	13	8	8	9	9	10	21
23	7	8	53	41	35	40	39	32	30	49	45	44	35	23	24	20	18	13	10	9	7	8	9	11	25
24	11	10	16	9	19	26	26	35	47	16	20	24	18	14	13	19	32	18	14	8	11	36	18	38	21
25	16	20	47	51	12	15	10	9	30	52	54	70	29	24	25	22	16	11	9	15	15	13	10	9	24
26	13	43	9	24	43	46	24	20	42	13	16	28	30	22	25	13	13	13	13	14	41	32	17	17	24
27	16	12	5	17	12	12	18	12	27	34	27	44	34	27	41	30	24	22	13	7	7	19	25	21	21
28	13	17	16	16	9	9	9	11	14	13	15	16	16	24	23	21	25	30	13	15	11	10	10	17	15
29	8	11	9	8	12	16	9	10	14	20	20	14	25	19	31	32	20	14	18	17	17	11	11	10	16
30	6	9	6	11	6	6	7	9	11	29	36	43	55	39	50	48	31	36	9	8	5	15	33	11	22
HRAVE	14	15	19	17	15	16	14	16	23	32	36	35	31	31	31	25	20	16	11	11	15	18	17	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	18	17	21	17	24	23	22	18	24	21	20	14	22	25	20	19	21	19	17	25	25	21	25	21	24
MAX	42	47	57	50	61	52	57	59	66	61	48	43	60	62	50	50	58	51	53	52	54	54	53	47	70
MIN	5	6	4	4	6	8	6	6	7	4	6	6	7	6	7	7	6	6	5	6	6	5	7	8	9

DAY	26	27	28	29	30	31
AVE	24	21	15	16	22	***
MAX	46	44	30	32	55	***
MIN	9	5	9	8	5	***

MONTHLY AVERAGE = 20.6 MONTHLY MAXIMUM = 70.4 MONTHLY MINIMUM = 3.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
APRIL - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	23.7	22.7	22.1	20.8	20.1	18.8	18.3	19.8	22.1	25.3	26.1	28.0	29.9	30.5	30.6	30.2	29.8	29.0	27.4	25.6	24.3	23.2	22.4	20.2	24.6
2	20.0	19.5	19.2	18.0	16.7	16.5	16.3	15.9	19.5	22.3	23.7	26.2	28.1	28.8	28.2	27.9	27.5	26.0	24.9	23.7	22.9	22.2	21.7	20.5	22.3
3	19.5	18.6	17.5	16.2	15.2	13.6	14.2	17.4	19.7	21.9	23.1	25.0	26.2	27.3	28.0	28.6	27.9	27.5	26.0	24.5	23.6	22.4	20.7	19.7	21.8
4	18.0	16.9	15.7	14.9	13.6	12.9	12.8	15.0	17.8	21.6	25.4	27.4	29.5	30.0	30.7	30.5	29.9	28.0	26.6	25.3	24.1	22.2	21.3	21.1	22.1
5	21.6	21.1	20.5	18.6	17.0	15.3	15.2	16.7	19.6	22.5	24.8	26.5	27.6	29.6	29.4	29.4	29.8	28.5	26.4	24.5	22.8	21.5	21.1	20.2	22.9
6	19.4	18.3	17.6	14.9	13.2	12.2	12.0	14.0	17.0	20.2	23.1	25.4	27.7	28.7	28.6	28.8	28.1	27.3	25.7	23.8	22.7	21.2	19.5	18.5	21.2
7	17.8	17.1	16.7	14.8	14.6	12.6	12.1	14.7	18.0	21.6	23.8	26.5	28.0	29.0	29.4	29.5	29.4	28.2	26.4	24.2	22.8	22.0	20.2	19.9	21.6
8	19.0	17.3	16.4	16.4	15.5	14.8	14.1	15.3	17.2	19.1	20.6	21.5	22.1	23.1	23.5	23.7	23.4	22.7	21.1	19.6	18.4	17.5	16.9	16.4	19.0
9	15.3	13.8	12.6	11.5	10.4	10.1	9.1	11.6	14.5	17.6	20.5	22.5	24.7	25.8	26.9	27.5	27.9	26.8	24.6	22.7	21.9	21.2	19.5	17.9	19.0
10	16.5	14.6	13.6	12.7	12.2	11.5	11.4	12.7	16.4	20.0	23.4	25.4	26.2	27.2	27.7	28.5	28.5	27.4	25.6	24.2	23.3	22.5	19.8	18.8	20.4
11	17.2	15.9	15.2	14.2	13.3	12.3	12.2	13.8	18.1	21.8	23.5	25.2	27.1	27.9	28.1	28.3	27.8	26.5	25.7	24.3	23.5	22.8	21.4	20.4	21.1
12	19.5	20.1	19.7	18.9	18.3	17.7	17.5	17.9	18.7	19.5	19.7	20.6	21.3	21.8	21.9	21.8	21.7	21.5	21.2	20.3	19.8	18.6	18.0	17.4	19.7
13	16.4	15.8	15.1	13.2	13.2	12.3	12.4	13.9	18.6	22.3	22.3	24.7	26.6	28.3	29.1	29.8	30.1	29.5	27.7	26.0	25.0	24.3	23.1	22.3	21.8
14	21.7	20.8	19.9	19.3	18.2	17.5	18.0	20.0	22.4	24.0	25.5	27.2	28.9	29.2	30.0	30.4	30.3	29.9	28.5	27.0	25.1	25.6	23.7	23.1	24.4
15	22.6	22.0	20.6	20.1	18.8	17.5	17.0	19.7	21.9	23.3	25.4	25.7	25.9	26.2	26.1	25.9	25.2	24.2	22.6	21.0	19.7	18.6	17.6	16.5	21.8
16	15.2	14.2	13.6	12.9	12.0	10.2	10.1	10.7	13.0	14.9	16.8	18.0	18.3	19.1	19.8	19.8	19.8	19.4	18.2	17.0	16.5	14.7	13.4	12.9	15.4
17	11.9	10.7	9.4	8.8	8.3	6.5	7.5	8.9	13.0	16.0	18.5	21.0	22.0	22.6	23.1	23.3	23.1	22.8	21.7	20.3	19.0	18.0	16.7	15.8	16.2
18	14.9	13.3	12.8	11.4	10.4	10.3	10.4	12.2	15.6	18.9	21.7	24.5	25.9	26.8	27.2	27.6	27.5	27.2	26.1	24.7	23.4	21.9	20.8	19.4	19.8
19	18.1	17.4	16.4	15.6	14.8	13.3	13.5	15.4	18.5	21.3	24.4	26.8	28.5	29.4	30.1	30.1	30.0	29.3	28.0	26.1	25.2	24.0	23.6	22.1	22.6
20	20.2	18.6	17.1	16.3	15.6	15.5	15.0	16.2	19.5	23.0	25.2	27.6	29.5	30.3	30.6	31.1	30.7	30.0	28.8	27.2	26.3	25.1	23.1	23.1	23.6
21	22.2	21.5	19.6	18.6	16.7	16.1	15.8	18.4	21.0	23.3	25.2	26.7	28.9	29.1	29.9	30.4	30.2	29.5	27.7	25.8	24.6	23.4	22.1	21.2	23.7
22	20.0	19.3	18.4	16.9	16.2	14.7	14.9	17.7	20.0	22.5	25.3	26.9	28.1	28.5	29.3	29.2	28.8	28.6	27.3	25.1	23.8	23.1	21.7	20.7	22.8
23	19.5	18.5	17.1	16.4	15.6	13.8	14.4	16.3	18.7	21.3	24.2	26.0	25.9	25.8	27.6	27.8	27.1	25.8	24.5	23.0	21.8	20.8	20.0	19.1	21.3
24	17.8	16.6	15.6	15.1	14.8	13.6	13.7	15.3	17.2	18.4	19.6	21.0	21.1	19.7	21.4	22.3	22.4	22.5	21.8	20.8	19.8	18.6	17.8	17.5	18.5
25	17.0	16.1	15.3	14.8	13.5	13.6	13.2	16.0	17.8	19.2	21.2	22.6	24.6	25.3	25.7	25.7	25.6	23.9	22.8	21.7	21.1	19.7	18.1	13.3	19.5
26	11.5	11.5	11.2	10.7	10.3	10.6	10.9	10.9	11.2	10.6	12.2	13.7	14.3	15.6	17.6	18.1	19.0	18.6	17.8	16.9	16.2	15.6	15.0	13.8	13.9
27	12.8	11.9	11.6	10.5	10.1	9.7	10.9	12.7	14.8	17.3	19.3	21.9	24.2	25.4	26.0	26.8	26.7	26.7	26.1	24.4	23.0	22.2	21.3	20.0	19.0
28	19.0	18.6	18.1	18.3	18.6	18.3	18.6	19.7	21.1	22.3	23.6	25.2	25.9	27.2	27.8	28.1	28.0	27.4	26.9	25.7	24.7	23.9	23.0	22.0	23.0
29	21.4	21.3	20.1	19.5	18.6	17.2	18.5	21.2	23.6	25.2	27.1	27.8	28.7	29.2	29.8	30.2	30.1	29.9	29.2	28.1	26.0	24.7	23.4	22.1	24.7
30	20.9	19.4	18.5	17.4	16.9	15.4	16.7	18.8	22.4	26.0	28.1	30.3	31.9	32.6	33.8	33.8	33.7	33.4	32.5	30.7	29.0	28.0	27.4	24.1	25.9
HRAVE	18.4	17.4	16.6	15.6	14.8	13.8	13.9	15.6	18.3	20.8	22.8	24.6	25.9	26.7	27.3	27.5	27.3	26.6	25.3	23.8	22.7	21.7	20.5	19.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	24.6	22.3	21.8	22.1	22.9	21.2	21.6	19.0	19.0	20.4	21.1	19.7	21.8	24.4	21.8	15.4	16.2	19.8	22.6	23.6	23.7	22.8	21.3	18.5	19.5
MAX	30.6	28.8	28.6	30.7	29.8	28.8	29.5	23.7	27.9	28.5	28.3	21.9	30.1	30.4	26.2	19.8	23.3	27.6	30.1	31.1	30.4	29.3	27.8	22.5	25.7
MIN	18.3	15.9	13.6	12.8	15.2	12.0	12.1	14.1	9.1	11.4	12.2	17.4	12.3	17.5	16.5	10.1	6.5	10.3	13.3	15.0	15.8	14.7	13.8	13.6	13.2

DAY	26	27	28	29	30	31
AVE	13.9	19.0	23.0	24.7	25.9	***
MAX	19.0	26.8	28.1	30.2	33.8	***
MIN	10.3	9.7	18.1	17.2	15.4	***

MONTHLY AVERAGE = 21.1 MONTHLY MAXIMUM = 33.8 MONTHLY MINIMUM = 6.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.3	0.6	0.5	0.4	0.6	0.4	0.2	-1.1	-1.6	-1.7	-1.1	-1.3	-1.5	-1.4	-1.3	-1.1	-0.9	-0.6	-0.1	0.4	0.5	0.5	0.5	0.5	-0.3
2	0.6	0.6	0.5	1.1	0.9	0.7	0.3	-0.5	-1.4	-0.9	-0.8	-1.2	-1.3	-1.4	-1.1	-1.0	-0.9	-0.3	0.0	0.2	0.3	0.3	0.4	0.4	-0.2
3	0.4	0.4	0.7	0.4	0.5	0.7	0.7	-0.4	-1.0	-1.5	-1.2	-1.5	-1.4	-1.2	-1.2	-1.0	-0.6	-0.6	-0.1	0.3	0.4	0.7	0.6	0.6	-0.2
4	0.7	0.6	0.6	0.6	0.5	0.5	0.3	-0.9	-1.5	-1.8	-1.8	-1.3	-1.6	-1.3	-1.2	-1.1	-0.8	-0.4	0.0	0.4	0.5	0.4	0.4	0.4	-0.3
5	0.4	0.4	0.6	0.8	0.8	0.6	0.2	-1.1	-1.5	-1.1	-1.2	-1.2	-1.0	-1.4	-1.2	-1.0	-0.9	-0.5	0.0	0.5	0.7	0.7	0.7	0.5	-0.2
6	0.4	0.8	0.6	0.9	0.8	0.7	0.1	-0.9	-0.7	-0.7	-0.7	-1.0	-1.4	-1.7	-1.3	-1.2	-0.9	-0.5	-0.1	0.4	0.4	0.6	0.5	0.4	-0.2
7	0.4	0.7	0.7	1.0	1.2	1.1	0.2	-1.1	-1.5	-1.4	-1.1	-1.4	-1.5	-1.6	-1.6	-1.2	-1.0	-0.5	-0.1	0.2	0.3	0.3	0.3	0.3	-0.3
8	0.3	0.4	0.6	0.5	0.5	0.4	0.1	-0.4	-0.6	-0.9	-1.2	-1.4	-1.5	-1.6	-1.4	-1.3	-1.1	-0.8	-0.3	0.1	0.2	0.3	0.3	0.3	-0.4
9	0.5	0.7	0.7	0.4	0.9	0.6	0.6	-0.8	-1.3	-1.3	-1.4	-1.1	-1.6	-1.3	-1.2	-1.0	-0.9	-0.7	-0.2	0.2	0.4	0.6	0.3	0.5	-0.3
10	0.6	0.7	0.7	0.6	0.7	1.0	0.2	-0.7	-1.1	-1.0	-1.1	-1.0	-1.2	-1.3	-1.2	-1.2	-1.0	-0.7	-0.1	0.2	0.4	0.4	0.7	0.7	-0.2
11	0.6	0.7	0.7	0.6	0.5	0.4	0.1	-0.6	-1.2	-1.4	-1.0	-1.0	-1.4	-1.4	-1.0	-1.0	-0.8	-0.5	-0.2	0.2	0.3	0.3	0.4	0.3	-0.3
12	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.0	-0.3	-0.7	-0.7	-0.7	-0.6	-0.5	-0.4	-0.3	-0.3	-0.2	0.0	0.1	0.3	0.3	0.4	0.4	0.0
13	0.4	0.6	0.6	0.5	0.6	0.5	0.0	-0.8	-1.1	-1.3	-1.1	-1.3	-1.3	-1.1	-1.2	-0.9	-1.0	-0.9	-0.3	0.1	0.3	0.3	0.3	0.2	-0.3
14	0.3	0.5	0.4	0.5	0.8	0.7	0.2	-0.8	-1.5	-1.5	-1.6	-1.6	-1.5	-1.3	-1.2	-1.2	-1.0	-0.7	-0.3	0.2	0.3	0.3	0.4	0.4	-0.4
15	0.4	0.5	0.6	0.6	0.6	0.8	0.1	-1.3	-1.4	-0.9	-1.2	-1.3	-1.4	-1.3	-1.3	-1.1	-0.9	-0.7	-0.2	0.1	0.1	0.2	0.2	0.2	-0.4
16	0.4	0.4	0.4	0.3	0.4	0.8	-0.2	-0.6	-0.8	-1.0	-1.2	-1.4	-1.5	-1.6	-1.5	-1.3	-1.0	-0.8	-0.3	0.2	0.4	0.6	0.4	0.4	-0.4
17	0.4	0.4	0.5	0.5	0.2	0.3	-0.1	-0.5	-1.0	-0.8	-0.9	-1.4	-1.4	-1.5	-1.5	-1.3	-1.1	-0.9	-0.3	0.2	0.5	0.4	0.5	0.5	-0.3
18	0.6	0.7	0.5	0.6	0.7	0.7	0.2	-0.6	-0.7	-1.0	-0.8	-1.3	-1.4	-1.5	-1.3	-1.2	-1.0	-0.7	-0.2	0.2	0.4	0.5	0.5	0.4	-0.2
19	0.4	0.5	0.7	0.5	0.4	0.5	-0.2	-1.0	-1.2	-0.9	-0.9	-1.3	-1.4	-1.5	-1.5	-1.3	-1.1	-0.7	-0.2	0.4	0.6	0.9	0.6	0.8	-0.3
20	1.0	0.6	0.6	0.9	0.9	1.0	0.2	-0.6	-0.6	-0.8	-0.9	-1.1	-1.0	-1.3	-1.3	-1.3	-1.0	-0.7	-0.2	0.3	0.6	0.6	0.4	0.3	-0.1
21	0.3	0.5	0.4	0.6	0.6	0.8	0.2	-1.2	-1.2	-0.9	-0.9	-0.9	-1.4	-1.3	-1.4	-1.2	-1.0	-0.8	-0.2	0.3	0.3	0.3	0.2	0.2	-0.3
22	0.3	0.2	0.4	0.6	0.7	0.6	-0.3	-1.4	-1.0	-1.0	-1.8	-2.2	-2.2	-1.5	-1.7	-1.5	-1.1	-0.8	-0.2	0.0	0.2	0.2	0.2	0.2	-0.6
23	0.2	0.3	0.5	0.5	0.8	0.5	-0.3	-0.6	-0.7	-0.8	-1.5	-1.5	-1.2	-0.9	-1.4	-1.4	-1.1	-0.8	-0.4	0.0	-0.1	0.0	-0.1	0.1	-0.4
24	0.1	0.1	0.3	0.3	0.2	0.2	-0.2	-0.6	-0.7	-1.1	-0.9	-1.5	-1.3	-1.0	-1.5	-1.3	-0.8	-0.7	-0.3	0.0	0.3	0.1	0.3	0.3	-0.4
25	0.4	0.2	0.3	0.6	0.4	0.4	-0.4	-1.1	-1.0	-0.9	-1.4	-1.2	-1.6	-1.6	-1.4	-1.1	-0.7	-0.3	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	-0.5
26	-0.1	-0.1	0.1	0.1	-0.1	0.1	0.0	0.0	0.0	-0.1	-0.3	-0.4	-0.3	-0.7	-0.8	-0.4	-0.6	-0.3	0.0	0.2	0.3	0.3	0.4	0.3	-0.1
27	0.4	0.5	0.5	0.6	0.6	0.6	-0.4	-1.0	-0.7	-0.6	-0.8	-1.0	-1.3	-1.3	-1.0	-1.0	-0.7	-0.7	-0.3	0.2	0.4	0.4	0.4	0.6	-0.2
28	0.4	0.3	0.4	0.4	0.3	0.2	-0.2	-0.6	-1.1	-1.4	-1.5	-1.8	-1.4	-1.6	-1.5	-1.2	-0.8	-0.3	0.2	0.1	0.1	0.1	0.1	0.5	-0.4
29	0.4	0.2	0.3	0.3	0.3	0.3	-0.2	-1.0	-1.4	-1.5	-2.0	-1.9	-1.8	-1.6	-1.4	-1.1	-0.6	-0.2	0.3	0.6	0.9	0.8	0.5	0.7	-0.4
30	0.9	1.1	1.0	0.9	0.8	0.9	0.0	-1.0	-1.4	-1.3	-1.3	-1.2	-1.2	-1.4	-1.3	-0.9	-0.7	-0.6	-0.2	0.5	0.5	0.6	0.7	0.7	-0.2
HRAVE	0.4	0.5	0.5	0.6	0.6	0.6	0.1	-0.8	-1.0	-1.1	-1.1	-1.3	-1.4	-1.3	-1.3	-1.1	-0.9	-0.6	-0.2	0.2	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.3	-0.2	-0.2	-0.3	-0.2	-0.2	-0.3	-0.4	-0.3	-0.2	-0.3	0.0	-0.3	-0.4	-0.4	-0.4	-0.3	-0.2	-0.3	-0.1	-0.3	-0.6	-0.4	-0.4	-0.5
MAX	0.6	1.1	0.7	0.7	0.8	0.9	1.2	0.6	0.9	1.0	0.7	0.4	0.6	0.8	0.8	0.8	0.5	0.7	0.9	1.0	0.8	0.7	0.8	0.3	0.6
MIN	-1.7	-1.4	-1.5	-1.8	-1.5	-1.7	-1.6	-1.6	-1.6	-1.3	-1.4	-0.7	-1.3	-1.6	-1.4	-1.6	-1.5	-1.5	-1.5	-1.3	-1.4	-2.2	-1.5	-1.5	-1.6

DAY	26	27	28	29	30	31
AVE	-0.1	-0.2	-0.4	-0.4	-0.2	***
MAX	0.4	0.6	0.5	0.9	1.1	***
MIN	-0.8	-1.3	-1.8	-2.0	-1.4	***

MONTHLY AVERAGE = -0.3 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = -2.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	703	703	702	702	703	703	704	704	704	703	703	702	701	701	700	700	700	700	700	701	702	702	702	702
2	702	702	703	702	702	703	703	703	704	704	703	703	703	702	702	701	702	702	702	702	703	704	704	704	703
3	705	705	705	705	705	706	706	707	707	707	707	707	706	705	705	704	704	704	704	704	705	705	705	705	705
4	705	705	705	704	704	704	705	705	705	705	705	704	703	702	702	701	701	701	701	701	701	701	702	702	703
5	702	702	702	702	702	702	702	703	703	702	702	702	701	700	700	699	699	699	699	699	700	700	701	701	701
6	701	701	701	701	701	702	702	703	703	703	703	703	702	702	701	701	701	701	701	701	701	702	702	702	702
7	703	703	703	703	703	703	704	704	705	705	704	704	703	703	702	702	701	701	701	701	702	702	702	703	703
8	703	702	702	702	702	703	703	704	704	704	704	703	703	702	702	701	701	701	702	702	702	703	703	703	703
9	704	703	703	703	703	703	704	704	705	705	704	704	703	702	702	701	701	701	701	702	702	703	703	703	703
10	703	703	703	703	703	704	704	705	705	705	704	704	704	703	702	702	701	701	701	702	702	703	703	703	703
11	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	700	700	700	700	700	701	701	701	702	702
12	702	702	702	702	702	702	703	703	703	704	703	703	703	702	702	702	702	702	702	703	703	704	704	704	703
13	705	705	705	705	705	706	706	707	707	707	707	706	706	705	705	704	704	704	704	704	705	706	707	707	705
14	707	707	707	707	707	707	707	707	707	707	707	706	705	704	703	702	702	702	701	701	701	702	702	702	705
15	702	702	702	702	702	702	702	703	703	703	702	702	702	701	701	700	700	700	700	700	701	702	702	702	701
16	702	702	702	702	703	703	703	704	704	704	704	704	704	704	704	704	704	704	704	704	705	706	706	706	704
17	706	706	706	706	706	706	706	707	707	706	706	705	705	704	704	704	704	704	704	704	705	705	705	705	705
18	705	705	705	705	705	705	705	706	706	705	705	704	704	703	703	702	702	701	701	702	702	702	703	703	704
19	703	703	703	703	703	704	704	705	705	704	704	703	703	702	701	701	700	700	700	701	701	701	701	701	702
20	702	702	702	702	702	702	702	703	703	703	702	701	701	700	699	699	698	698	698	699	700	700	701	701	701
21	702	702	702	702	702	702	703	703	703	703	703	702	701	700	699	699	699	699	699	699	700	700	701	701	701
22	702	701	701	701	701	702	702	703	703	703	703	702	701	701	700	700	699	699	699	699	700	701	701	702	701
23	702	702	701	701	701	701	702	702	702	702	702	701	700	700	699	698	698	698	699	699	700	701	701	701	701
24	701	701	702	702	702	703	703	704	704	704	704	704	703	703	703	702	702	702	702	702	702	703	703	703	703
25	703	703	703	703	703	703	704	704	704	704	703	703	702	701	700	700	699	699	699	699	699	700	700	700	701
26	701	700	700	700	700	700	701	701	701	701	702	702	702	701	701	700	700	701	701	701	702	702	702	702	701
27	702	702	702	702	702	703	703	704	704	703	703	703	703	702	702	702	702	702	702	702	703	704	704	704	703
28	705	705	705	706	706	706	707	707	708	708	707	707	706	706	705	704	704	704	704	704	705	706	706	706	706
29	706	705	705	705	706	706	706	706	706	706	705	705	704	704	703	702	702	702	702	702	702	702	703	703	704
30	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	701	700	700	701	701	701	702	702	702
HRAVE	703	703	703	703	703	703	704	704	704	704	704	703	703	702	702	701	701	701	701	701	702	702	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	702	703	705	703	701	702	703	703	703	703	702	703	705	705	701	704	705	704	702	701	701	701	701	703	701
MAX	704	704	707	705	703	703	705	704	705	705	704	704	707	707	703	706	707	706	705	703	703	703	702	704	704
MIN	700	701	704	701	699	701	701	701	701	701	700	702	704	701	700	702	704	701	700	698	699	699	698	701	699

DAY	26	27	28	29	30	31
AVE	701	703	706	704	702	***
MAX	702	704	708	706	704	***
MIN	700	702	704	702	700	***

MONTHLY AVERAGE = 702.7 MONTHLY MAXIMUM = 707.6 MONTHLY MINIMUM = 698.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	30	33	34	40	41	45	43	37	34	28	26	23	17	15	12	11	11	12	16	18	20	20	21	25	25
2	24	22	21	23	25	24	25	27	20	14	12	11	8	9	10	10	11	14	18	21	22	18	17	18	18
3	21	24	25	29	30	33	31	20	15	12	11	10	8	9	7	7	9	10	12	13	14	15	20	21	17
4	23	26	27	30	31	33	32	28	25	19	14	11	8	7	6	4	6	9	10	11	12	15	18	16	17
5	15	17	19	21	24	27	27	24	20	14	12	11	8	6	6	6	5	5	5	6	6	6	6	10	13
6	11	14	17	17	19	23	22	19	16	11	8	8	5	4	4	4	5	6	8	11	14	15	15	17	12
7	18	19	21	24	25	27	27	22	18	12	9	8	7	6	5	5	6	8	10	11	13	15	17	19	15
8	21	22	25	23	24	27	30	28	25	22	21	21	21	18	17	17	19	21	24	25	25	25	25	24	23
9	27	32	35	37	40	41	40	34	27	21	17	14	10	8	8	8	6	8	11	13	13	13	16	19	21
10	22	25	26	28	28	29	29	27	21	15	11	10	10	9	7	7	6	8	9	11	12	13	17	18	17
11	20	23	23	25	27	32	30	26	21	17	16	14	13	12	11	11	9	10	10	11	12	13	15	16	17
12	18	19	22	24	27	25	26	25	25	36	40	40	37	30	23	22	24	26	30	33	35	39	45	48	30
13	52	55	58	58	60	63	62	50	44	42	39	30	23	13	9	8	11	16	19	21	23	25	30	34	35
14	34	36	39	40	42	42	39	33	29	25	20	17	15	15	14	13	13	14	16	18	20	13	15	15	24
15	17	20	23	25	28	31	31	26	24	23	20	17	13	8	7	7	7	6	7	10	10	9	9	10	16
16	11	13	13	14	15	18	18	19	15	13	10	7	7	7	7	7	8	7	9	12	13	15	17	18	12
17	18	21	24	25	24	29	28	25	17	13	11	12	11	11	11	12	12	12	14	16	18	20	21	22	18
18	24	26	28	31	32	32	31	25	20	17	14	12	9	9	9	8	8	8	9	11	13	14	16	17	17
19	19	20	21	22	24	26	25	22	18	15	13	11	8	7	6	6	6	6	8	10	11	12	13	15	14
20	17	19	22	24	25	25	26	23	18	13	11	9	6	6	6	6	6	7	8	9	10	12	15	17	14
21	19	20	24	25	28	30	29	24	20	16	13	12	9	8	8	6	5	5	7	8	10	12	19	21	16
22	23	25	27	32	33	36	35	30	25	21	14	10	8	5	6	9	10	9	11	14	15	18	22	24	19
23	27	30	33	36	37	39	37	31	28	24	20	18	18	17	12	13	14	17	21	24	27	29	32	35	26
24	38	43	47	51	55	56	56	51	49	46	42	36	37	45	39	36	34	33	34	38	41	45	47	47	44
25	46	47	50	50	56	56	55	45	40	36	32	30	25	24	23	22	20	24	26	29	31	37	44	81	39
26	95	96	92	91	96	93	93	90	89	91	87	78	73	68	57	51	45	46	47	51	55	58	61	72	74
27	78	79	85	85	86	91	84	71	60	51	45	36	28	26	24	24	24	24	26	31	36	38	43	49	51
28	54	52	52	46	39	37	35	32	30	28	26	23	23	20	19	18	17	18	19	23	26	30	33	33	31
29	34	31	35	40	39	43	38	26	20	17	14	12	11	9	8	6	6	6	7	11	14	17	19	21	20
30	24	28	30	32	34	41	34	28	22	14	11	8	6	7	6	6	5	6	8	11	13	14	16	22	18
HRAVE	29	31	33	35	37	38	37	32	28	24	21	19	16	15	13	12	12	13	15	18	19	21	23	27	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	25	18	17	17	13	12	15	23	21	17	17	30	35	24	16	12	18	17	14	14	16	19	26	44	39
MAX	45	27	33	33	27	23	27	30	41	29	32	48	63	42	31	19	29	32	26	26	30	36	39	56	81
MIN	11	8	7	4	5	4	5	17	6	6	9	18	8	13	6	7	11	8	6	6	5	5	12	33	20

DAY	26	27	28	29	30	31
AVE	74	51	31	20	18	***
MAX	96	91	54	43	41	***
MIN	45	24	17	6	5	***

MONTHLY AVERAGE = 23.8 MONTHLY MAXIMUM = 95.9 MONTHLY MINIMUM = 3.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
APRIL - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.44	0.64	0.79	0.91	0.94	0.85	0.75	0.64	0.44	0.18	0.03	0.00	0.00	0.00	0.00	0.00	6.88
2	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.19	0.44	0.53	0.61	0.89	0.98	0.88	0.55	0.53	0.40	0.09	0.02	0.00	0.00	0.00	0.00	0.00	6.17
3	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.47	0.67	0.83	0.92	0.97	0.95	0.80	0.61	0.30	0.21	0.03	0.00	0.00	0.00	0.00	0.00	7.06
4	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.44	0.62	0.80	0.86	1.01	0.72	0.74	0.58	0.36	0.12	0.02	0.00	0.00	0.00	0.00	0.00	6.54
5	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.26	0.48	0.68	0.83	0.92	0.91	0.77	0.57	0.54	0.42	0.18	0.03	0.00	0.00	0.00	0.00	0.00	6.64
6	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.49	0.69	0.84	0.94	0.98	0.94	0.83	0.66	0.39	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.32
7	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27	0.50	0.70	0.85	0.94	0.92	0.96	0.82	0.60	0.42	0.19	0.03	0.00	0.00	0.00	0.00	0.00	7.26
8	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27	0.49	0.69	0.84	0.93	0.96	0.93	0.82	0.66	0.39	0.21	0.04	0.00	0.00	0.00	0.00	0.00	7.29
9	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.38	0.67	0.85	0.94	0.99	0.94	0.84	0.68	0.40	0.23	0.05	0.00	0.00	0.00	0.00	0.00	7.24
10	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.50	0.70	0.85	0.95	0.97	0.93	0.84	0.68	0.39	0.24	0.03	0.00	0.00	0.00	0.00	0.00	7.43
11	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.50	0.70	0.85	0.95	1.00	0.94	0.65	0.45	0.34	0.16	0.06	0.00	0.00	0.00	0.00	0.00	6.95
12	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.20	0.33	0.25	0.31	0.26	0.24	0.21	0.15	0.17	0.08	0.03	0.00	0.00	0.00	0.00	0.00	2.30
13	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.50	0.70	0.85	0.94	0.98	0.95	0.85	0.68	0.38	0.24	0.05	0.00	0.00	0.00	0.00	0.00	7.47
14	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.50	0.69	0.84	0.93	0.97	0.85	0.64	0.61	0.41	0.25	0.05	0.00	0.00	0.00	0.00	0.00	7.10
15	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.51	0.70	0.85	0.93	0.96	0.93	0.83	0.67	0.40	0.25	0.05	0.00	0.00	0.00	0.00	0.00	7.45
16	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.54	0.74	0.89	0.98	1.00	0.96	0.86	0.69	0.39	0.26	0.06	0.00	0.00	0.00	0.00	0.00	7.77
17	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.53	0.73	0.88	0.96	0.99	0.96	0.86	0.69	0.34	0.27	0.06	0.00	0.00	0.00	0.00	0.00	7.67
18	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.31	0.53	0.73	0.88	0.96	0.99	0.96	0.86	0.70	0.35	0.26	0.06	0.00	0.00	0.00	0.00	0.00	7.67
19	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.53	0.73	0.88	0.96	0.99	0.95	0.85	0.70	0.38	0.26	0.06	0.00	0.00	0.00	0.00	0.00	7.70
20	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.54	0.73	0.88	0.97	1.00	0.96	0.86	0.70	0.40	0.26	0.06	0.00	0.00	0.00	0.00	0.00	7.77
21	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.52	0.72	0.87	0.97	0.99	0.96	0.82	0.70	0.40	0.26	0.04	0.00	0.00	0.00	0.00	0.00	7.64
22	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.53	0.73	0.88	0.96	0.99	0.96	0.86	0.65	0.35	0.29	0.06	0.00	0.00	0.00	0.00	0.00	7.67
23	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.54	0.73	0.88	0.97	0.70	0.41	0.78	0.73	0.40	0.27	0.07	0.00	0.00	0.00	0.00	0.00	6.91
24	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.42	0.47	0.52	0.77	0.56	0.38	0.77	0.49	0.27	0.18	0.06	0.00	0.00	0.00	0.00	0.00	5.18
25	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.48	0.72	0.83	0.86	0.89	0.84	0.59	0.48	0.23	0.08	0.02	0.00	0.00	0.00	0.00	0.00	6.45
26	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.06	0.03	0.10	0.27	0.27	0.22	0.63	0.62	0.25	0.42	0.18	0.02	0.00	0.00	0.00	0.00	0.00	3.10
27	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.55	0.74	0.88	0.96	0.99	0.94	0.83	0.54	0.38	0.29	0.09	0.00	0.00	0.00	0.00	0.00	7.66
28	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.28	0.55	0.74	0.88	0.96	0.99	0.95	0.86	0.64	0.39	0.29	0.09	0.00	0.00	0.00	0.00	0.00	7.74
29	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.56	0.76	0.90	0.99	1.02	0.99	0.89	0.65	0.39	0.30	0.09	0.00	0.00	0.00	0.00	0.00	8.01
30	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.57	0.76	0.90	0.99	1.01	0.97	0.88	0.62	0.39	0.30	0.07	0.00	0.00	0.00	0.00	0.00	7.96
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.48	0.66	0.80	0.89	0.90	0.85	0.76	0.60	0.37	0.22	0.05	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.88	6.17	7.06	6.54	6.64	7.32	7.26	7.29	7.24	7.43	6.95	2.30	7.47	7.10	7.45	7.77	7.67	7.67	7.70	7.77	7.64	7.67	6.91	5.18	6.45
MAX	0.94	0.98	0.97	1.01	0.92	0.98	0.96	0.96	0.99	0.97	1.00	0.33	0.98	0.97	0.96	1.00	0.99	0.99	0.99	1.00	0.99	0.99	0.97	0.77	0.89
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	3.10	7.66	7.74	8.01	7.96	***
MAX	0.63	0.99	0.99	1.02	1.01	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
APRIL - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
26	0.14	0.05	0.00	0.08	0.07	0.02	0.00	0.02	0.17	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.61	0.00	0.00	0.00	0.00	***
MAX	0.17	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.62 MONTHLY MAXIMUM = 0.17 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
MAY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	8.6	9.1	9.3	8.2	4.9	3.9	4.3	5.3	3.3	2.6	2.5	5.8	5.8	6.7	10.1	12.1	14.6	15.2	14.1	10.6	10.6	6.3	2.9	4.8	7.6
2	5.5	5.8	7.2	3.7	6.2	5.3	4.3	4.8	6.2	3.0	4.9	5.3	7.9	12.5	13.8	14.0	15.4	14.5	12.3	10.4	23.9	16.8	12.8	6.3	9.3
3	8.4	7.8	9.9	8.0	2.1	4.1	4.3	4.2	2.9	4.2	4.5	6.1	6.2	5.5	7.9	7.5	10.7	8.1	12.9	10.9	8.3	10.8	4.6	16.7	7.4
4	19.3	7.0	6.1	14.7	4.9	3.3	2.9	2.3	5.2	7.3	5.8	5.0	5.8	14.1	15.1	18.3	18.8	23.4	6.4	4.9	5.8	10.6	6.2	5.9	9.1
5	4.2	6.9	5.7	5.7	5.1	4.5	4.8	5.2	4.9	4.1	3.9	4.3	7.2	11.3	11.7	11.6	9.6	10.1	10.0	6.0	3.0	1.8	5.4	4.5	6.3
6	5.4	6.5	3.8	5.1	5.7	6.7	6.0	5.3	2.5	3.0	6.5	9.6	10.1	12.2	11.7	10.7	11.8	11.8	14.4	18.1	17.7	16.0	15.9	11.9	9.5
7	6.7	11.4	14.0	9.4	6.6	2.9	2.2	1.9	2.4	3.1	5.0	6.8	5.1	8.2	11.7	11.2	11.5	14.4	8.6	4.7	7.7	9.0	5.0	5.6	7.3
8	10.4	12.6	15.4	13.5	8.7	3.8	1.7	1.9	4.4	13.0	18.1	21.9	26.4	24.4	22.9	20.6	23.3	21.6	16.3	11.1	9.9	1.7	2.8	6.6	13.0
9	6.9	13.7	11.5	6.5	5.3	2.2	2.3	3.4	4.7	7.8	8.7	9.8	8.3	11.8	14.5	14.5	15.3	12.0	13.8	9.7	7.6	7.8	2.9	2.8	8.5
10	4.1	6.8	7.1	4.6	3.3	6.6	5.1	4.2	3.4	3.2	7.9	6.8	9.1	11.4	12.8	12.2	14.2	13.0	9.9	7.0	6.8	3.7	5.0	5.8	7.2
11	8.0	6.3	5.5	7.4	7.7	8.9	6.4	7.9	8.4	5.6	4.6	5.7	7.4	7.2	8.4	10.1	7.9	6.5	9.9	11.9	7.2	5.5	8.3	8.8	7.6
12	7.1	7.2	6.3	8.6	6.9	8.1	7.2	6.5	2.9	3.3	5.5	8.9	9.1	11.8	14.5	13.1	13.8	12.8	10.9	7.9	4.0	7.9	13.8	11.8	8.7
13	7.9	10.8	10.5	8.6	6.8	3.5	3.0	3.7	2.3	4.5	4.6	4.8	8.6	6.9	8.5	9.5	7.8	10.0	12.3	13.1	6.6	3.8	6.1	4.9	7.0
14	10.5	8.1	4.4	1.7	3.5	4.3	2.8	2.9	4.6	7.7	13.9	15.1	15.6	15.8	17.8	16.2	18.4	17.9	20.4	22.4	23.0	19.3	12.9	10.5	12.1
15	13.3	12.2	9.4	7.6	9.1	10.9	12.0	8.9	9.1	10.6	7.9	11.2	11.5	15.5	13.8	13.3	15.0	20.2	18.9	12.0	2.2	1.9	2.1	2.5	10.5
16	15.8	25.4	6.9	7.0	2.0	2.4	1.7	3.8	8.7	8.0	9.7	10.8	9.5	9.6	12.4	15.4	13.5	12.6	10.5	7.8	5.8	5.1	4.1	3.6	8.8
17	3.2	2.9	7.0	6.1	7.7	8.2	4.9	3.8	3.2	3.6	3.4	4.3	5.6	4.2	7.0	8.3	9.6	9.5	13.9	12.1	8.1	3.0	4.0	4.9	6.2
18	7.6	5.6	4.0	4.7	6.9	5.3	6.9	7.2	3.5	2.9	5.6	13.7	10.1	14.4	19.4	19.6	19.4	11.9	11.6	20.3	20.4	8.2	6.3	6.3	10.1
19	4.7	2.9	3.9	3.8	3.6	3.5	5.6	5.3	2.9	2.8	4.5	4.8	6.6	10.0	13.6	15.9	15.7	15.3	14.5	9.4	5.9	2.2	3.8	1.0	6.8
20	4.7	5.8	7.3	7.2	7.6	6.6	6.1	5.8	5.5	4.1	3.9	7.6	6.8	9.0	6.1	10.1	13.7	15.3	17.1	11.1	7.7	6.1	10.3	3.3	7.9
21	3.7	5.1	2.3	4.3	3.2	9.0	7.3	5.2	5.0	1.8	3.0	3.5	6.7	7.1	13.2	15.6	19.2	17.5	24.1	21.6	14.6	13.5	13.8	6.3	9.4
22	6.7	7.6	1.8	3.3	5.2	4.3	6.6	6.2	5.4	9.3	7.4	13.3	13.6	17.7	15.6	17.1	17.8	20.4	19.0	22.3	11.5	8.6	6.5	6.8	10.6
23	7.1	5.0	4.3	4.1	3.1	3.8	3.3	2.6	4.3	4.4	4.0	4.9	6.2	14.1	17.1	16.7	16.7	14.3	14.2	11.7	7.5	7.1	5.2	3.7	7.7
24	5.7	7.1	7.2	7.2	4.6	4.2	5.8	4.9	2.8	4.2	5.0	4.9	6.6	9.7	14.9	16.8	18.7	17.9	16.6	12.9	7.4	6.1	7.7	3.2	8.4
25	5.0	5.8	7.0	6.3	7.1	6.0	3.9	3.3	2.9	4.0	8.4	11.6	12.1	11.3	11.4	12.6	13.1	13.6	13.0	9.6	6.2	5.0	3.0	2.7	7.7
26	7.5	7.3	6.7	3.8	5.6	6.3	7.6	4.9	3.7	2.4	2.8	3.6	6.9	6.6	6.5	11.6	14.2	15.9	16.9	11.6	4.1	3.3	2.7	4.6	7.0
27	4.5	7.2	3.8	4.3	5.7	6.5	7.8	6.0	3.8	3.8	3.1	3.5	5.4	6.9	5.8	11.5	13.1	18.0	13.6	11.1	8.3	7.3	6.6	7.7	7.3
28	4.5	5.4	8.2	7.6	7.6	7.3	6.4	4.1	2.4	2.6	3.4	3.9	5.9	8.1	13.3	16.3	16.9	16.1	16.7	11.8	7.8	5.7	6.3	3.8	8.0
29	5.9	6.8	8.6	8.1	5.8	6.1	6.7	4.1	2.5	2.7	3.6	6.8	8.9	11.5	11.1	11.5	11.9	12.4	14.2	12.8	10.9	9.2	3.7	5.1	8.0
30	4.3	7.2	6.8	5.8	3.9	6.2	5.1	3.6	2.3	2.1	3.1	5.0	5.2	5.0	8.5	16.8	14.1	16.6	16.9	14.6	10.1	7.0	1.8	4.9	7.4
31	5.4	6.6	8.0	4.4	6.6	5.6	7.8	5.7	5.7	4.3	3.7	4.2	5.3	9.3	15.0	16.0	18.3	15.3	12.3	9.7	6.8	4.9	12.0	7.7	8.4
HRAVE	7.2	7.9	7.1	6.5	5.6	5.5	5.2	4.7	4.2	4.7	5.8	7.5	8.6	10.6	12.5	13.8	14.6	14.7	14.1	12.0	9.3	7.3	6.6	6.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.6	9.3	7.4	9.1	6.3	9.5	7.3	13.0	8.5	7.2	7.6	8.7	7.0	12.1	10.5	8.8	6.2	10.1	6.8	7.9	9.4	10.6	7.7	8.4	7.7
MAX	15.2	23.9	16.7	23.4	11.7	18.1	14.4	26.4	15.3	14.2	11.9	14.5	13.1	23.0	20.2	25.4	13.9	20.4	15.9	17.1	24.1	22.3	17.1	18.7	13.6
MIN	2.5	3.0	2.1	2.3	1.8	2.5	1.9	1.7	2.2	3.2	4.6	2.9	2.3	1.7	1.9	1.7	2.9	2.9	1.0	3.3	1.8	1.8	2.6	2.8	2.7

DAY	26	27	28	29	30	31
AVE	7.0	7.3	8.0	8.0	7.4	8.4
MAX	16.9	18.0	16.9	14.2	16.9	18.3
MIN	2.4	3.1	2.4	2.5	1.8	3.7

MONTHLY AVERAGE = 8.4 MONTHLY MAXIMUM = 26.4 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	96	104	113	102	107	101	108	110	154	309	263	272	271	281	291	289	299	290	296	301	290	310	274	118	238
2	115	111	111	105	108	124	106	124	134	294	292	295	296	296	286	285	285	277	268	250	238	258	273	252	132
3	291	284	299	310	264	134	109	111	127	96	103	130	165	163	252	296	295	271	282	282	307	308	265	265	241
4	302	298	254	291	194	317	281	304	6	238	67	78	283	289	287	280	314	307	262	68	106	144	135	98	98
5	142	90	113	100	84	87	122	126	120	89	44	272	293	301	299	293	278	294	293	318	338	214	77	92	91
6	93	82	130	101	83	87	92	114	103	39	81	123	225	230	284	252	253	243	278	273	282	310	313	298	3
7	282	298	315	296	299	180	129	96	66	298	268	131	104	236	209	229	212	219	150	187	296	307	293	302	44
8	311	316	316	316	305	322	99	93	276	318	301	300	287	284	270	262	280	294	306	294	283	275	289	288	111
9	287	293	296	276	237	281	312	342	330	308	294	292	297	297	295	288	289	278	297	303	309	307	289	102	166
10	112	103	89	100	106	115	110	117	112	213	287	278	263	281	286	279	271	274	278	283	315	331	127	106	124
11	112	105	111	104	122	110	123	129	140	147	148	161	144	135	179	166	179	162	164	153	139	118	89	113	10
12	162	146	88	88	96	124	109	123	107	135	144	175	248	204	207	221	229	237	243	250	297	159	155	157	283
13	129	83	101	114	110	129	151	151	146	130	150	136	118	107	211	265	209	242	253	301	305	160	284	283	290
14	319	318	294	262	112	102	316	327	121	170	197	208	215	192	223	229	237	254	277	281	281	294	302	286	10
15	273	283	274	275	277	292	294	295	303	295	254	206	210	240	264	240	239	276	296	286	258	344	192	141	205
16	248	302	226	236	338	168	270	272	313	293	304	307	301	302	302	292	290	283	298	308	318	318	103	68	115
17	69	66	92	94	116	124	126	131	79	64	30	52	321	232	281	288	280	290	281	303	305	311	132	124	90
18	115	92	95	96	93	105	114	123	122	141	147	135	179	245	251	265	271	272	290	281	280	246	181	210	310
19	279	349	151	112	111	110	109	95	128	270	255	256	311	315	309	295	301	301	312	315	303	101	69	43	174
20	100	124	111	96	110	109	111	115	118	125	153	148	135	143	142	286	288	248	292	296	286	232	308	229	31
21	275	223	133	113	125	116	104	132	131	145	188	271	287	175	222	239	232	244	279	283	298	295	293	305	151
22	315	304	257	109	116	108	106	115	113	125	163	188	200	234	246	241	245	258	290	288	292	267	289	313	198
23	304	314	303	143	141	120	127	204	285	285	291	262	288	314	305	290	284	296	287	280	302	307	292	173	310
24	120	115	114	111	99	120	112	111	143	283	230	286	291	302	296	295	298	300	303	296	296	299	308	278	186
25	113	109	104	106	92	117	123	133	151	293	300	304	302	297	290	290	282	287	294	289	307	296	106	143	119
26	131	119	90	84	126	113	103	126	126	160	181	151	125	120	254	279	291	299	301	303	291	295	175	140	229
27	90	283	163	125	95	107	90	114	138	151	142	143	150	74	247	281	277	297	304	301	302	305	306	301	177
28	343	100	92	90	96	98	106	133	130	146	277	305	270	299	308	304	289	297	302	301	301	294	302	154	192
29	123	101	91	92	99	112	122	128	128	184	279	288	295	286	297	317	302	292	288	301	306	298	298	103	339
30	104	86	115	98	77	91	98	116	127	221	282	292	249	283	291	279	286	287	291	301	300	300	40	104	356
31	106	106	94	115	78	107	90	140	143	181	241	129	104	297	279	285	296	294	297	313	298	280	314	289	316

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	6	7	8	9	22	15	8	10	37	30	44	25	35	32	25	21	20	13	10	7	3	11	22	11	18
2	15	12	7	9	8	10	10	10	34	41	31	29	32	20	20	16	15	16	12	11	12	15	16	28	18
3	15	17	9	24	31	10	9	14	20	28	46	53	59	66	44	50	17	24	25	9	10	10	52	16	27
4	12	43	41	42	33	34	64	59	54	39	33	26	47	17	19	13	11	10	45	47	35	22	16	13	32
5	16	10	37	12	11	12	18	10	19	36	41	45	30	15	19	17	20	19	15	11	44	30	11	17	21
6	11	19	13	18	12	12	11	16	39	34	27	36	35	24	23	27	30	20	14	9	8	10	10	9	19
7	9	9	9	6	8	60	48	53	46	54	61	59	55	39	26	30	24	19	22	63	47	10	37	42	35
8	9	7	7	8	9	17	37	52	35	19	13	11	11	13	14	14	14	12	13	12	13	40	22	16	17
9	13	11	8	9	8	34	49	35	50	30	31	32	40	20	21	16	13	18	15	11	7	7	14	17	21
10	18	8	7	26	24	7	8	16	29	51	27	31	29	28	18	21	16	12	10	8	7	28	41	12	20
11	10	14	18	15	8	6	10	8	15	20	29	47	37	63	26	28	21	27	12	7	9	10	11	27	20
12	48	20	15	14	13	18	10	10	33	38	33	25	26	21	16	14	13	14	11	24	44	51	11	12	22
13	12	10	9	8	8	12	15	15	58	31	51	57	28	40	41	30	25	25	11	9	8	17	31	14	24
14	9	10	40	35	28	43	54	53	28	33	18	22	22	22	19	20	18	14	9	7	8	9	11	9	23
15	11	9	10	9	8	7	7	10	13	13	25	27	20	16	28	24	18	15	9	9	51	40	36	38	19
16	26	13	36	23	44	39	29	34	18	17	21	18	24	22	20	18	18	15	16	12	8	12	19	19	22
17	21	19	18	18	16	9	7	27	32	53	54	50	45	66	47	47	19	17	7	8	6	54	23	9	28
18	7	15	22	11	17	18	10	11	26	47	38	21	29	18	22	18	14	17	18	10	9	35	22	21	20
19	44	70	27	10	10	14	9	18	41	43	37	51	52	38	23	19	16	15	14	10	13	32	30	45	28
20	14	10	7	7	8	6	8	11	23	35	49	37	51	25	27	49	16	17	10	8	10	32	10	23	20
21	21	16	22	14	15	9	10	11	13	50	45	62	61	42	32	18	17	18	11	8	9	7	8	21	22
22	37	44	59	28	12	16	8	15	21	15	39	30	34	23	27	19	18	19	14	8	13	9	11	7	22
23	8	9	16	10	13	13	15	40	26	33	56	53	32	25	18	14	15	17	11	7	6	7	36	22	21
24	6	8	8	9	12	16	9	17	35	40	35	58	47	31	19	19	14	14	12	9	8	5	6	16	19
25	44	9	8	11	8	9	10	17	32	39	25	25	25	27	29	18	14	15	12	7	7	18	41	24	20
26	5	14	30	35	7	8	10	15	25	46	53	53	47	58	62	20	16	15	10	8	15	19	22	6	25
27	33	15	18	12	7	7	10	11	27	23	35	52	36	44	51	26	16	11	12	8	6	6	7	7	20
28	35	11	6	8	11	9	10	19	43	47	38	54	34	35	29	18	15	15	11	8	8	11	8	28	21
29	7	7	7	8	11	10	9	15	42	52	39	30	28	26	29	24	23	21	10	8	6	7	27	26	20
30	12	9	12	15	37	8	12	15	39	54	41	33	40	51	31	16	18	13	9	7	6	28	63	11	24
31	12	20	7	17	10	14	9	16	13	47	52	46	47	43	17	15	13	15	10	8	7	17	10	17	20
HRAVE	18	16	17	15	15	16	17	21	31	37	38	39	37	33	27	23	17	17	14	12	14	20	22	19	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	18	18	27	32	21	19	35	17	21	20	20	22	24	23	19	22	28	20	28	20	22	22	21	19	20
MAX	44	41	66	64	45	39	63	52	50	51	63	51	58	54	51	44	66	47	70	51	62	59	56	58	44
MIN	3	7	9	10	10	8	6	7	7	7	6	10	8	7	7	8	6	7	9	6	7	7	6	5	7

DAY	26	27	28	29	30	31
AVE	25	20	21	20	24	20
MAX	62	52	54	52	63	52
MIN	5	6	6	6	6	7

MONTHLY AVERAGE = 22.2 MONTHLY MAXIMUM = 70.3 MONTHLY MINIMUM = 3.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MAY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	23.2	21.9	21.4	20.4	18.7	17.6	17.8	20.3	23.1	25.6	28.6	31.5	33.4	34.8	35.3	35.7	35.1	34.5	32.8	30.8	29.7	28.9	27.9	25.9	27.3
2	24.6	23.7	22.3	21.8	20.8	19.8	19.6	20.7	23.2	26.3	28.6	29.9	31.8	33.0	33.6	33.5	33.4	32.9	31.7	30.0	29.0	29.8	27.9	26.5	27.3
3	25.4	24.7	23.4	22.9	21.9	20.8	20.6	22.3	23.3	27.1	28.9	30.4	31.0	31.6	31.2	30.1	31.1	31.5	30.6	28.6	27.6	27.2	24.4	22.9	26.6
4	20.5	19.5	19.2	17.5	17.0	17.3	17.5	17.6	19.2	18.7	18.3	21.4	24.4	25.4	26.6	25.0	22.4	20.3	18.9	19.0	18.9	18.1	17.1	17.1	19.9
5	16.7	16.0	15.4	14.6	14.8	14.6	14.4	15.7	17.7	20.4	21.6	22.3	22.9	23.7	25.4	25.5	26.2	25.8	24.9	23.8	23.1	21.9	20.7	20.0	20.3
6	19.5	18.9	18.3	17.9	16.7	16.6	16.8	18.0	20.5	22.1	24.2	27.4	30.0	28.8	28.4	29.2	29.7	29.1	27.6	26.0	24.2	23.0	22.3	21.3	23.2
7	19.7	18.8	18.3	17.3	16.1	14.9	15.6	17.3	20.1	21.8	23.9	25.8	26.4	27.6	28.8	28.1	27.9	26.8	22.8	21.3	21.2	20.7	20.1	19.1	21.7
8	18.6	17.9	17.2	16.5	15.6	15.0	14.7	16.5	18.3	19.5	20.3	21.0	21.5	21.7	22.1	22.4	22.0	20.6	18.9	17.9	17.0	16.5	16.2	15.8	18.5
9	15.2	14.3	13.6	13.1	12.7	12.4	12.9	14.4	15.5	16.6	17.9	19.0	20.1	21.0	21.9	22.0	22.0	21.6	20.7	19.4	18.6	18.0	16.8	15.9	17.3
10	14.8	14.0	13.1	12.1	11.5	11.0	12.4	14.9	17.7	19.8	22.2	23.8	25.2	25.8	26.5	26.9	26.9	26.5	25.7	24.1	23.4	22.6	20.9	19.7	20.1
11	18.7	17.4	16.5	15.2	14.6	14.4	15.5	17.9	21.6	24.7	27.4	29.9	31.6	31.5	32.4	32.7	32.5	32.3	31.4	29.6	28.0	26.6	25.3	24.9	24.7
12	23.5	22.0	21.3	20.4	19.0	17.2	18.5	20.6	23.6	25.7	27.2	28.6	28.4	28.6	28.0	27.5	27.2	26.8	26.1	25.1	24.3	23.4	22.2	20.5	24.0
13	19.4	19.0	18.3	17.3	16.6	15.7	16.8	18.7	20.8	23.2	25.1	27.1	29.1	30.3	30.6	31.6	31.0	30.6	29.4	27.8	26.9	25.9	25.1	24.3	24.2
14	23.8	23.5	22.5	21.2	20.4	19.5	19.8	21.4	24.3	26.7	26.7	28.3	29.4	30.6	30.7	29.8	28.8	27.5	25.0	23.1	21.3	20.4	19.9	19.3	24.3
15	18.5	17.6	17.0	16.5	16.1	15.7	15.7	16.1	16.6	17.3	18.6	20.3	20.9	20.8	20.6	20.8	21.1	19.5	16.0	15.2	14.9	14.9	14.6	14.5	17.5
16	14.0	11.0	10.9	11.6	11.6	11.1	11.7	13.5	13.9	14.4	16.1	17.3	18.6	19.4	20.6	21.2	21.5	21.1	20.4	19.0	18.1	17.8	16.5	16.0	16.1
17	15.4	14.8	14.4	14.3	14.0	14.0	14.4	16.6	19.5	21.5	23.3	24.8	26.4	27.4	28.2	28.6	28.6	28.3	27.2	25.7	24.4	23.5	21.8	20.8	21.6
18	19.7	19.4	18.4	17.2	15.9	15.4	15.9	19.2	21.6	24.2	27.7	30.6	31.1	30.2	30.4	30.3	29.4	28.2	27.3	25.9	24.7	24.0	23.3	21.7	23.8
19	20.9	20.3	18.7	17.3	16.4	15.5	16.1	19.0	21.3	22.3	24.2	25.6	26.9	27.9	28.4	28.7	28.3	27.7	26.5	25.2	24.1	23.4	22.0	21.1	22.8
20	19.4	17.9	17.1	16.6	16.1	14.8	16.0	18.7	22.0	24.9	27.2	30.4	31.2	32.9	32.1	32.5	32.4	31.6	29.7	28.3	26.6	25.1	24.4	23.6	24.6
21	23.3	21.5	21.0	19.7	18.4	17.5	18.5	19.7	21.0	23.6	25.7	28.1	29.9	31.3	31.6	31.1	30.9	29.7	27.8	25.4	23.7	22.7	21.7	20.6	24.3
22	20.1	19.3	18.4	17.2	15.6	15.0	16.0	19.1	21.7	24.7	26.3	28.1	29.0	28.6	27.9	28.0	27.7	26.1	24.0	21.5	20.4	19.8	19.0	18.4	22.2
23	17.7	17.3	16.5	15.1	14.8	14.0	15.1	16.2	18.3	20.3	21.8	23.2	23.9	25.3	25.6	25.8	25.5	25.0	24.1	22.6	21.7	21.2	20.3	19.0	20.4
24	18.2	17.6	16.7	15.9	15.1	14.1	15.3	18.3	20.2	22.0	24.2	25.0	25.7	26.1	27.5	27.9	27.2	26.5	25.6	24.3	23.3	22.3	21.6	20.4	21.7
25	19.3	18.4	17.6	16.7	16.1	15.5	16.2	18.6	21.2	23.7	25.8	27.3	28.3	28.9	29.5	29.9	29.9	29.4	28.7	27.1	26.1	25.5	24.1	23.1	23.6
26	21.6	20.9	19.6	18.9	17.5	17.9	19.3	21.5	23.7	25.9	28.3	30.5	32.3	33.1	33.4	33.6	33.2	32.3	30.9	29.5	28.5	27.6	26.0	24.7	26.3
27	23.6	23.2	22.2	22.0	20.7	19.8	20.0	21.0	23.4	25.5	27.0	29.6	32.0	33.1	34.3	34.7	33.8	32.4	31.9	30.6	28.7	27.5	26.8	26.1	27.1
28	24.7	22.9	21.6	20.3	19.2	19.3	20.9	22.4	25.1	28.1	30.0	32.3	33.8	34.8	35.2	35.2	35.0	34.4	33.3	31.6	29.9	28.8	27.9	26.2	28.0
29	25.0	24.1	22.5	21.1	20.2	20.0	21.0	23.1	26.2	29.5	31.7	34.3	35.3	36.1	36.2	36.3	36.3	36.1	35.1	33.3	31.6	30.4	29.1	27.5	29.3
30	26.1	24.6	23.2	22.5	20.5	20.8	21.3	24.1	27.5	30.1	32.7	35.2	37.0	37.9	38.6	38.7	38.4	37.8	36.3	34.7	33.2	32.0	31.6	29.4	30.6
31	27.7	26.4	26.3	25.0	23.1	22.5	24.1	25.3	29.3	32.8	35.1	37.1	38.5	39.3	39.0	39.7	39.0	38.2	37.5	35.8	34.4	32.7	32.4	31.6	32.2
HRAVE	20.6	19.6	18.8	17.9	17.0	16.4	17.1	19.0	21.3	23.5	25.4	27.3	28.6	29.3	29.7	29.8	29.5	28.7	27.4	25.9	24.8	23.9	22.9	21.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	27.3	27.3	26.6	19.9	20.3	23.2	21.7	18.5	17.3	20.1	24.7	24.0	24.2	24.3	17.5	16.1	21.6	23.8	22.8	24.6	24.3	22.2	20.4	21.7	23.6
MAX	35.7	33.6	31.6	26.6	26.2	30.0	28.8	22.4	22.0	26.9	32.7	28.6	31.6	30.7	21.1	21.5	28.6	31.1	28.7	32.9	31.6	29.0	25.8	27.9	29.9
MIN	17.6	19.6	20.6	17.0	14.4	16.6	14.9	14.7	12.4	11.0	14.4	17.2	15.7	19.3	14.5	10.9	14.0	15.4	15.5	14.8	17.5	15.0	14.0	14.1	15.5

DAY	26	27	28	29	30	31
AVE	26.3	27.1	28.0	29.3	30.6	32.2
MAX	33.6	34.7	35.2	36.3	38.7	39.7
MIN	17.5	19.8	19.2	20.0	20.5	22.5

MONTHLY AVERAGE = 23.6 MONTHLY MAXIMUM = 39.7 MONTHLY MINIMUM = 10.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	1.0	0.9	0.5	1.0	0.7	0.7	-0.1	-1.1	-0.8	-0.7	-0.7	-1.0	-1.1	-1.3	-1.4	-1.2	-1.0	-0.7	0.0	0.4	0.8	0.5	0.7	0.7	-0.1
2	0.9	0.9	0.5	0.7	0.4	0.6	0.3	-0.4	-1.0	-0.7	-0.9	-1.0	-1.2	-1.5	-1.5	-1.3	-1.1	-0.8	-0.3	0.1	0.0	0.1	0.2	0.1	-0.3
3	0.3	0.2	0.3	0.3	0.5	0.4	0.1	-0.8	-0.7	-1.1	-1.4	-1.7	-1.7	-1.4	-1.1	-0.4	-0.5	-0.5	-0.2	0.2	0.2	0.3	0.5	0.3	-0.3
4	0.3	0.1	0.3	0.4	0.2	0.2	0.0	0.0	-0.4	-0.2	-0.2	-1.1	-1.0	-1.0	-1.1	-0.6	-0.3	-0.2	-0.1	0.1	0.1	0.0	-0.1	0.0	-0.2
5	0.0	0.1	0.2	0.2	0.2	0.1	0.0	-0.8	-1.1	-1.2	-1.1	-0.9	-0.9	-0.8	-1.3	-1.0	-1.0	-0.8	-0.4	0.1	0.3	0.4	0.4	0.3	-0.4
6	0.3	0.3	0.2	0.5	0.3	0.3	-0.2	-0.5	-0.7	-0.8	-1.2	-1.9	-2.1	-1.3	-1.1	-1.0	-1.0	-0.6	-0.2	0.0	0.0	0.1	0.1	0.2	-0.4
7	0.3	0.3	0.2	0.2	0.3	0.3	-0.2	-0.5	-0.8	-0.9	-1.2	-1.8	-1.5	-1.5	-1.8	-1.3	-1.1	-0.7	-0.1	-0.1	0.1	0.1	0.2	0.3	-0.5
8	0.1	0.1	0.1	0.1	0.2	0.3	-0.2	-0.5	-0.8	-1.1	-1.5	-1.6	-1.5	-1.5	-1.3	-1.1	-1.1	-0.9	-0.4	-0.1	0.0	0.0	0.0	0.0	-0.5
9	0.0	-0.1	-0.1	0.0	0.0	0.1	-0.1	-0.7	-1.1	-1.1	-1.3	-1.5	-1.5	-1.7	-1.6	-1.5	-1.4	-1.0	-0.6	0.0	0.2	0.3	0.4	0.4	-0.6
10	0.6	0.6	0.4	0.6	0.5	0.3	-0.8	-1.0	-1.1	-0.7	-1.2	-1.3	-1.4	-1.5	-1.6	-1.4	-1.1	-0.9	-0.6	0.1	0.3	0.4	0.5	0.6	-0.4
11	0.5	0.5	0.6	0.7	0.6	0.2	-0.6	-1.2	-1.8	-1.5	-1.4	-1.6	-2.0	-1.6	-1.6	-1.3	-1.0	-0.7	-0.2	0.3	0.6	0.5	0.7	0.5	-0.5
12	0.6	0.4	0.7	0.9	0.7	0.5	-0.4	-1.2	-0.9	-1.1	-1.2	-1.3	-1.0	-1.0	-0.9	-0.7	-0.5	-0.3	0.0	0.1	0.2	0.2	0.1	0.1	-0.2
13	0.1	0.1	0.2	0.2	0.3	0.6	-0.4	-0.8	-0.7	-1.5	-1.4	-1.6	-2.2	-1.9	-1.4	-1.3	-1.0	-0.8	-0.3	0.0	0.1	0.2	0.2	0.3	-0.5
14	0.2	0.1	0.3	0.4	0.3	0.2	0.3	-0.4	-1.1	-1.6	-1.5	-2.0	-2.0	-2.1	-1.9	-1.4	-1.0	-0.6	-0.3	-0.1	-0.1	-0.2	-0.1	-0.1	-0.6
15	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.2	-0.3	-0.6	-0.7	-0.7	-1.1	-1.0	-0.7	-0.8	-0.6	-0.8	-0.5	-0.4	-0.2	-0.1	0.1	0.0	-0.1	-0.4
16	0.0	-0.1	0.3	0.1	0.0	0.1	-0.1	-0.5	-0.5	-0.6	-1.0	-1.2	-1.3	-1.2	-1.3	-1.3	-1.3	-1.0	-0.6	0.0	0.3	0.4	0.4	0.2	-0.4
17	0.2	0.2	0.1	0.2	0.1	0.2	-0.1	-0.8	-1.0	-1.2	-1.1	-1.2	-1.4	-1.3	-1.5	-1.3	-1.2	-1.0	-0.6	0.0	0.2	0.4	0.5	0.6	-0.5
18	0.5	0.6	0.5	0.5	0.8	0.6	0.0	-1.3	-1.0	-1.0	-1.7	-2.4	-1.9	-1.2	-1.0	-1.1	-0.7	-0.4	-0.1	-0.1	0.0	0.1	0.2	0.2	-0.4
19	0.4	0.2	0.3	0.5	0.6	0.4	-0.7	-1.2	-0.9	-0.7	-1.0	-1.2	-1.4	-1.5	-1.5	-1.5	-1.3	-0.9	-0.5	0.0	0.4	0.3	0.8	0.4	-0.4
20	0.5	0.8	0.6	0.5	0.5	0.7	-0.6	-1.2	-1.5	-1.4	-1.2	-2.1	-1.8	-2.1	-1.4	-1.1	-1.1	-0.6	-0.3	0.1	0.4	0.4	0.2	0.3	-0.5
21	0.3	0.4	0.3	0.6	0.6	0.4	-0.4	-0.6	-0.7	-0.6	-0.8	-1.0	-1.4	-1.6	-1.7	-1.4	-1.2	-0.7	-0.5	-0.1	0.0	0.2	0.2	0.3	-0.4
22	0.4	0.3	0.4	0.3	0.8	0.5	-0.4	-1.5	-1.6	-2.2	-1.8	-2.1	-2.1	-2.0	-1.5	-1.4	-1.1	-0.8	-0.6	-0.3	-0.1	0.0	0.1	0.2	-0.7
23	0.2	0.2	0.3	0.3	0.2	0.1	-0.5	-0.5	-0.7	-1.0	-1.1	-1.3	-1.4	-1.6	-1.6	-1.6	-1.3	-1.1	-0.7	-0.1	0.2	0.2	0.3	0.4	-0.5
24	0.3	0.3	0.3	0.4	0.5	0.2	-0.7	-1.3	-0.9	-0.9	-1.3	-1.1	-1.2	-1.2	-1.6	-1.6	-1.3	-0.9	-0.6	-0.1	0.2	0.4	0.3	0.4	-0.5
25	0.5	0.4	0.5	0.5	0.6	0.2	-0.5	-0.8	-0.8	-1.0	-1.2	-1.5	-1.6	-1.6	-1.6	-1.6	-1.4	-1.1	-0.7	-0.1	0.3	0.6	0.6	0.5	-0.5
26	0.5	0.4	0.5	0.6	0.5	0.2	-0.9	-1.1	-1.1	-0.9	-1.1	-1.2	-2.0	-1.7	-1.4	-1.3	-1.0	-0.8	-0.4	0.1	0.3	0.5	0.9	0.3	-0.4
27	0.4	0.6	0.4	0.3	0.4	0.3	0.0	-0.5	-0.7	-0.9	-0.8	-1.1	-1.6	-1.6	-1.3	-1.3	-0.8	-0.6	-0.4	0.1	0.4	0.5	0.5	0.5	-0.3
28	0.5	0.6	0.6	0.6	0.6	0.4	-1.0	-1.1	-0.8	-0.9	-1.0	-1.1	-1.4	-1.5	-1.5	-1.5	-1.3	-1.0	-0.6	0.0	0.3	0.4	0.6	0.6	-0.4
29	0.4	0.5	0.6	0.6	0.6	0.4	-0.8	-1.0	-0.7	-0.9	-1.0	-1.4	-1.5	-1.7	-1.5	-1.4	-1.2	-0.9	-0.7	0.0	0.5	0.6	0.6	0.6	-0.4
30	0.6	0.7	0.9	0.7	0.8	0.5	-0.7	-0.9	-0.8	-0.9	-1.0	-1.1	-1.2	-1.4	-1.4	-1.5	-1.3	-0.9	-0.4	0.1	0.4	0.6	0.4	0.7	-0.3
31	0.7	0.6	0.9	0.7	0.7	0.5	-0.2	-1.1	-1.3	-1.2	-1.2	-1.5	-1.7	-1.5	-1.2	-1.5	-1.3	-1.0	-0.6	0.1	0.6	0.5	0.4	0.4	-0.4
HRAVE	0.4	0.4	0.4	0.4	0.4	0.3	-0.3	-0.8	-0.9	-1.0	-1.1	-1.4	-1.5	-1.5	-1.4	-1.2	-1.1	-0.8	-0.4	0.0	0.2	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	-0.3	-0.3	-0.2	-0.4	-0.4	-0.5	-0.5	-0.6	-0.4	-0.5	-0.2	-0.5	-0.6	-0.4	-0.4	-0.5	-0.4	-0.4	-0.5	-0.4	-0.7	-0.5	-0.5	-0.5
MAX	1.0	0.9	0.5	0.4	0.4	0.5	0.3	0.3	0.4	0.6	0.7	0.9	0.6	0.4	0.1	0.4	0.6	0.8	0.8	0.8	0.6	0.8	0.4	0.5	0.6
MIN	-1.4	-1.5	-1.7	-1.1	-1.3	-2.1	-1.8	-1.6	-1.7	-1.6	-2.0	-1.3	-2.2	-2.1	-1.1	-1.3	-1.5	-2.4	-1.5	-2.1	-1.7	-2.2	-1.6	-1.6	-1.6

DAY	26	27	28	29	30	31
AVE	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4
MAX	0.9	0.6	0.6	0.6	0.9	0.9
MIN	-2.0	-1.6	-1.5	-1.7	-1.5	-1.7

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = -2.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MAY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	702	702	702	702	703	703	704	704	704	704	704	703	703	702	701	701	700	700	700	701	701	701	702	702	702
2	702	702	702	702	702	703	703	703	704	703	703	703	702	701	700	700	699	699	699	700	700	701	701	702	702
3	703	703	703	703	703	703	703	704	704	704	703	703	702	701	700	700	699	699	699	699	700	700	701	701	701
4	701	702	702	702	702	702	702	703	703	703	703	703	702	701	700	700	700	701	701	702	703	704	704	704	702
5	703	703	703	703	703	703	703	704	704	704	704	703	703	702	702	702	701	701	701	701	702	702	702	702	703
6	702	702	702	702	702	702	702	702	702	702	701	700	700	699	699	698	698	698	698	698	699	700	700	701	700
7	701	701	700	700	701	701	701	702	702	702	702	701	700	700	700	699	699	698	699	700	700	701	701	701	700
8	701	701	701	701	701	701	702	702	702	702	702	702	701	701	701	701	701	701	702	702	702	703	703	704	702
9	704	704	704	704	705	705	705	705	705	705	705	705	705	704	704	703	703	703	703	704	704	704	705	705	704
10	704	704	704	704	704	704	705	705	705	705	704	704	704	703	703	703	703	703	703	703	704	704	704	704	704
11	704	704	704	704	704	704	704	705	705	704	704	703	703	702	701	701	700	700	700	700	701	701	701	701	702
12	702	702	702	702	703	703	703	703	703	703	703	703	702	702	703	702	702	702	702	702	703	703	704	704	703
13	705	705	705	705	705	705	705	706	706	705	705	704	704	703	702	701	701	701	701	701	701	701	701	702	703
14	701	701	701	701	701	702	702	702	703	702	702	702	701	701	700	699	699	699	699	700	701	701	702	702	701
15	702	702	702	702	702	702	702	703	703	703	703	702	702	701	701	700	700	700	700	701	701	701	701	700	702
16	701	701	702	702	702	703	703	704	704	705	705	705	705	705	705	705	705	705	705	705	705	706	706	706	704
17	705	705	705	705	705	705	706	706	706	706	706	706	705	705	704	704	703	703	703	704	704	704	704	705	705
18	705	705	705	705	705	705	705	705	705	704	704	703	703	702	702	701	701	701	701	702	702	703	704	704	703
19	704	704	704	704	704	704	705	705	705	705	705	705	704	704	703	703	703	703	703	703	703	704	704	704	704
20	704	704	704	704	704	704	704	705	705	704	704	704	703	702	702	701	701	701	701	701	702	703	703	703	703
21	703	703	703	703	703	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	702	703	703	703	702
22	704	703	703	703	703	703	704	704	704	703	703	703	702	702	702	702	701	702	702	703	703	704	704	705	703
23	705	704	704	704	705	705	706	706	706	706	706	705	705	704	704	703	703	703	703	703	704	704	704	704	704
24	704	704	704	704	703	704	704	704	704	704	704	703	703	702	701	701	701	701	701	702	702	703	703	703	703
25	703	703	703	703	703	704	704	705	705	704	704	704	704	703	703	703	703	702	702	703	703	703	704	704	703
26	704	704	704	704	705	705	705	706	705	705	705	704	704	703	703	702	702	702	702	702	703	703	703	704	704
27	704	704	704	704	704	704	705	705	705	705	705	704	704	703	702	702	702	702	702	702	702	703	703	704	703
28	704	704	704	704	704	705	705	705	705	705	705	704	704	703	703	702	702	702	702	702	703	703	703	704	704
29	704	704	704	704	704	705	705	705	705	705	705	704	704	703	703	702	702	702	702	702	703	703	703	704	704
30	704	704	704	704	704	705	705	705	705	705	705	705	704	703	703	702	702	702	702	702	702	703	703	703	704
31	703	703	703	704	704	704	705	705	705	704	704	704	703	702	702	702	701	701	701	702	702	703	703	704	703
HRAVE	703	703	703	703	703	703	704	704	704	704	704	703	703	702	702	701	701	701	701	702	702	703	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	702	702	701	702	703	700	700	702	704	704	702	703	703	701	702	704	705	703	704	703	702	703	704	703	703
MAX	704	704	704	704	704	702	702	704	705	705	705	704	706	703	703	706	706	705	705	705	703	705	706	704	705
MIN	700	699	699	700	701	698	698	701	703	703	700	702	701	699	700	701	703	701	703	701	700	701	703	701	702

DAY	26	27	28	29	30	31
AVE	704	703	704	704	704	703
MAX	706	705	705	705	705	705
MIN	702	702	702	702	702	701

MONTHLY AVERAGE = 702.8 MONTHLY MAXIMUM = 706.1 MONTHLY MINIMUM = 697.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	24	27	26	30	35	39	39	31	21	18	13	10	7	4	4	4	4	5	6	8	9	10	12	16	17
2	18	20	21	23	25	29	31	28	23	18	15	13	11	10	9	9	9	10	12	14	17	15	20	26	18
3	28	29	32	33	36	39	40	35	33	24	20	17	16	14	15	22	18	15	15	19	21	25	41	47	26
4	57	62	65	78	81	79	80	82	69	73	75	57	41	39	36	42	40	47	56	57	59	60	64	62	61
5	64	72	79	87	87	88	87	78	62	48	43	42	42	37	32	32	29	29	32	37	40	46	51	53	54
6	55	59	59	62	70	69	67	61	45	40	33	24	12	10	15	11	10	10	14	21	29	31	30	35	36
7	41	45	48	52	56	63	59	50	38	33	28	22	20	19	17	20	20	24	39	45	43	43	44	50	38
8	49	47	41	38	40	43	50	44	37	36	36	35	36	34	30	26	28	32	35	35	34	36	33	34	37
9	38	44	47	50	52	55	53	47	41	36	32	27	24	21	19	18	20	21	22	26	28	28	32	36	34
10	38	40	43	45	46	48	42	34	27	24	24	22	20	19	18	17	17	16	17	20	21	23	26	29	28
11	31	34	36	40	41	41	37	32	24	20	16	10	8	8	6	6	6	6	7	9	10	12	12	13	19
12	15	20	22	23	26	28	24	21	16	13	12	13	13	10	10	12	14	14	15	18	22	24	25	33	18
13	39	41	45	50	53	55	49	41	34	28	25	21	16	15	16	15	16	18	21	24	26	28	30	32	31
14	32	32	33	38	40	43	44	40	30	24	19	17	16	11	11	14	13	13	19	26	29	28	27	29	26
15	34	35	36	39	41	44	47	47	46	45	41	33	28	30	34	34	36	46	70	75	75	75	76	81	48
16	77	87	83	81	84	92	91	79	74	70	61	54	47	44	38	36	32	32	33	39	43	44	50	54	59
17	56	59	58	59	60	61	60	50	36	31	26	21	20	18	17	16	16	16	18	20	22	24	28	30	34
18	33	34	38	41	46	48	43	34	27	22	17	11	10	11	12	12	13	15	17	16	9	8	8	12	22
19	12	14	16	20	23	24	22	18	17	21	18	17	15	13	12	11	12	13	14	16	19	21	23	27	18
20	28	29	32	33	34	39	34	28	20	16	13	8	7	5	5	4	5	8	11	13	16	18	20	21	19
21	21	24	28	29	33	34	33	30	28	21	18	14	11	7	8	10	8	10	15	22	20	16	16	18	20
22	18	20	23	26	27	29	27	22	17	15	12	9	9	9	12	12	12	18	27	35	39	41	40	40	22
23	39	41	42	44	45	47	41	38	34	28	25	22	21	20	19	18	18	17	19	24	25	27	29	31	30
24	33	35	36	37	40	42	38	31	27	27	23	22	21	20	18	18	18	18	18	22	25	27	28	31	27
25	33	35	36	38	39	41	35	31	26	24	24	22	21	19	18	17	17	18	20	22	24	26	29	30	27
26	32	34	36	40	41	41	35	29	25	21	19	15	12	11	10	9	10	12	14	17	19	20	22	24	23
27	27	26	27	29	31	33	31	28	23	19	17	14	10	8	7	4	6	9	10	12	15	16	17	18	18
28	20	23	24	26	28	28	24	21	18	14	13	8	6	5	5	6	6	6	7	10	12	12	14	17	15
29	18	19	19	22	24	25	21	18	15	10	9	7	6	5	5	5	5	5	5	6	8	9	12	13	12
30	15	15	18	18	23	21	19	16	12	10	8	5	5	4	4	4	5	5	7	8	9	11	13	16	11
31	17	18	18	20	22	24	20	19	15	13	13	11	7	8	7	6	7	8	8	10	12	14	14	13	13
HRAVE	34	36	38	40	43	45	43	37	31	27	24	20	17	16	15	15	15	17	20	23	25	26	29	31	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	17	18	26	61	54	36	38	37	34	28	19	18	31	26	48	59	34	22	18	19	20	22	30	27	27
MAX	39	31	47	82	88	70	63	50	55	48	41	33	55	44	81	92	61	48	27	39	34	41	47	42	41
MIN	4	9	14	36	29	10	17	26	18	16	6	10	15	11	28	32	16	8	11	4	7	9	17	18	17

DAY	26	27	28	29	30	31
AVE	23	18	15	12	11	13
MAX	41	33	28	25	23	24
MIN	9	4	5	5	4	6

MONTHLY AVERAGE = 27.8 MONTHLY MAXIMUM = 92.0 MONTHLY MINIMUM = 3.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.56	0.76	0.90	0.99	1.02	0.99	0.88	0.62	0.44	0.29	0.04	0.00	0.00	0.00	0.00	0.00	7.96
2	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.19	0.39	0.61	0.63	0.83	0.98	0.96	0.86	0.61	0.44	0.30	0.09	0.00	0.00	0.00	0.00	0.00	6.95
3	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.37	0.74	0.89	0.98	1.02	0.90	0.46	0.25	0.34	0.28	0.10	0.00	0.00	0.00	0.00	0.00	6.67
4	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.12	0.35	0.08	0.34	0.99	1.00	0.73	0.78	0.29	0.15	0.07	0.02	0.00	0.00	0.00	0.00	0.00	5.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.29	0.52	0.72	0.89	0.62	0.51	0.28	0.74	0.43	0.48	0.27	0.08	0.00	0.00	0.00	0.00	0.00	5.87
6	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.19	0.49	0.55	0.49	0.97	1.00	0.69	0.56	0.55	0.49	0.27	0.07	0.00	0.00	0.00	0.00	0.00	6.40
7	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.57	0.76	0.86	0.94	0.86	0.98	0.85	0.49	0.41	0.18	0.04	0.00	0.00	0.00	0.00	0.00	7.44
8	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.56	0.76	0.89	0.97	1.01	0.95	0.87	0.61	0.50	0.29	0.09	0.00	0.00	0.00	0.00	0.00	8.00
9	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.60	0.78	0.92	0.99	1.01	0.98	0.88	0.59	0.52	0.30	0.10	0.00	0.00	0.00	0.00	0.00	8.20
10	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.58	0.77	0.90	0.98	1.00	0.97	0.87	0.60	0.52	0.31	0.10	0.00	0.00	0.00	0.00	0.00	8.14
11	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.60	0.78	0.89	1.05	1.09	0.80	0.64	0.53	0.37	0.32	0.11	0.00	0.00	0.00	0.00	0.00	7.74
12	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.54	0.61	0.54	0.44	0.46	0.41	0.33	0.24	0.18	0.15	0.04	0.00	0.00	0.00	0.00	0.00	4.43
13	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.37	0.58	0.76	0.89	0.97	0.95	0.92	0.71	0.60	0.31	0.23	0.05	0.00	0.00	0.00	0.00	0.00	7.52
14	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.31	0.47	0.68	0.57	1.01	1.01	0.98	0.88	0.54	0.41	0.23	0.05	0.00	0.00	0.00	0.00	0.00	7.21
15	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.11	0.19	0.20	0.26	0.38	0.33	0.29	0.38	0.20	0.35	0.10	0.05	0.00	0.00	0.00	0.00	0.00	2.90
16	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.32	0.25	0.31	0.61	0.75	0.73	0.69	0.68	0.57	0.54	0.32	0.12	0.00	0.00	0.00	0.00	0.00	5.96
17	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.34	0.61	0.78	0.91	0.99	1.01	0.97	0.87	0.57	0.53	0.31	0.11	0.00	0.00	0.00	0.00	0.00	8.08
18	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.59	0.78	0.91	1.03	0.75	0.42	0.55	0.52	0.32	0.09	0.03	0.00	0.00	0.00	0.00	0.00	6.54
19	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.39	0.61	0.79	0.92	1.00	1.02	0.98	0.89	0.57	0.54	0.33	0.12	0.00	0.00	0.00	0.00	0.00	8.35
20	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.34	0.60	0.79	0.93	1.01	1.01	0.96	0.56	0.47	0.45	0.19	0.09	0.00	0.00	0.00	0.00	0.00	7.56
21	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.17	0.30	0.37	0.78	0.98	0.94	0.91	0.79	0.63	0.56	0.29	0.12	0.00	0.00	0.00	0.00	0.00	6.98
22	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.42	0.62	0.79	0.92	1.02	1.08	1.01	0.81	0.60	0.53	0.29	0.09	0.01	0.00	0.00	0.00	0.00	8.36
23	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.59	0.77	0.90	0.99	1.01	0.98	0.87	0.61	0.54	0.33	0.12	0.01	0.00	0.00	0.00	0.00	8.26
24	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.59	0.76	0.89	0.93	0.73	0.56	0.85	0.69	0.51	0.33	0.13	0.01	0.00	0.00	0.00	0.00	7.54
25	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.59	0.76	0.90	0.98	1.01	0.97	0.87	0.62	0.54	0.33	0.13	0.01	0.00	0.00	0.00	0.00	8.27
26	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.39	0.60	0.77	0.91	1.00	1.03	0.98	0.84	0.48	0.38	0.25	0.09	0.00	0.00	0.00	0.00	0.00	7.90
27	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.22	0.36	0.41	0.55	0.77	0.97	0.99	0.90	0.55	0.28	0.24	0.13	0.01	0.00	0.00	0.00	0.00	6.49
28	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.40	0.61	0.79	0.93	1.01	1.06	1.00	0.90	0.63	0.56	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.57
29	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.40	0.61	0.79	0.92	1.00	1.04	0.99	0.89	0.63	0.56	0.34	0.14	0.01	0.00	0.00	0.00	0.00	8.50
30	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.78	0.91	1.00	1.03	0.99	0.89	0.62	0.55	0.32	0.11	0.01	0.00	0.00	0.00	0.00	8.36
31	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.59	0.76	0.89	0.98	1.02	0.88	0.62	0.65	0.54	0.33	0.13	0.01	0.00	0.00	0.00	0.00	7.93
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.32	0.52	0.67	0.79	0.92	0.93	0.84	0.76	0.53	0.45	0.27	0.09	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	7.96	6.95	6.67	5.00	5.87	6.40	7.44	8.00	8.20	8.14	7.74	4.43	7.52	7.21	2.90	5.96	8.08	6.54	8.35	7.56	6.98	8.36	8.26	7.54	8.27
MAX	1.02	0.98	1.02	1.00	0.89	1.00	0.98	1.01	1.01	1.00	1.09	0.61	0.97	1.01	0.38	0.75	1.01	1.03	1.02	1.01	0.98	1.08	1.01	0.93	1.01
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	7.90	6.49	8.57	8.50	8.36	7.93
MAX	1.03	0.99	1.06	1.04	1.03	1.02
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.01	0.09
4	0.00	0.00	0.01	0.08	0.00	0.00	0.01	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
5	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.03	0.01	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.09	0.15	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.03	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.34 MONTHLY MAXIMUM = 0.08 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	1.8	2.7	4.4	4.7	3.3	1.8	1.9	2.5	3.2	3.3	3.8	4.1	3.8	6.1	8.1	6.8	6.2	7.5	5.7	3.8	4.7	3.0	3.3	2.9	4.1
2	4.0	4.3	4.5	4.6	3.6	3.5	4.3	3.6	3.9	5.5	7.8	10.9	12.2	10.2	***	9.7	***	6.6	6.3	3.3	2.9	3.6	3.0	3.0	5.5
3	2.2	2.0	1.5	1.3	1.5	1.7	2.1	2.4	2.1	2.0	1.5	3.0	3.8	4.0	4.8	6.4	6.6	6.6	6.3	5.9	4.9	4.2	2.8	1.8	3.4
4	1.8	1.8	1.5	2.0	2.2	2.1	1.7	1.7	1.6	2.5	3.0	3.8	4.4	5.5	5.9	6.1	5.4	6.1	***	***	***	2.5	2.0	1.9	3.1
5	2.5	3.0	3.8	3.2	4.3	5.2	4.5	4.3	5.2	6.3	6.2	5.7	5.4	5.8	5.3	5.0	5.3	5.8	5.3	4.3	4.9	5.0	5.6	6.4	4.9
6	5.9	6.8	6.3	6.0	6.5	8.5	8.5	8.8	7.8	6.8	6.6	8.6	10.8	10.5	9.8	***	***	9.0	7.7	7.6	8.1	7.3	6.2	7.3	7.8
7	7.3	8.9	8.1	8.2	7.6	8.0	8.2	7.7	8.0	7.9	7.1	6.3	6.8	5.3	4.7	4.4	4.1	3.8	4.6	4.6	4.3	3.2	2.0	3.1	6.0
8	3.0	2.3	2.8	3.9	3.4	3.0	3.5	3.4	2.5	2.2	2.7	3.3	4.5	5.8	6.2	6.8	6.6	7.5	10.1	6.7	5.1	2.5	1.3	2.5	4.2
9	3.2	3.4	3.7	4.4	4.8	4.8	4.0	3.1	3.9	2.2	1.6	2.5	3.5	5.4	6.3	6.7	6.3	5.9	6.0	5.0	4.8	1.7	2.5	4.1	4.2
10	3.2	4.2	4.0	3.4	4.1	4.9	4.8	3.4	3.3	2.5	2.5	3.6	3.7	4.7	5.1	4.8	4.1	4.3	6.3	6.5	5.2	3.3	2.4	3.2	4.1
11	3.6	4.2	4.3	4.5	4.1	4.1	4.8	4.3	4.2	3.8	3.8	3.1	4.1	4.4	3.0	3.6	3.5	4.8	4.8	4.7	4.4	4.0	3.4	3.2	4.0
12	4.0	4.3	3.4	3.4	2.3	2.4	3.0	4.4	2.9	4.5	3.9	5.0	5.4	4.4	3.6	3.8	4.5	3.9	4.3	4.7	5.0	5.4	6.2	6.8	4.2
13	6.9	6.6	6.5	4.4	5.4	5.7	4.2	4.3	5.0	5.8	5.6	5.3	4.5	6.9	7.1	5.7	3.6	7.4	***	4.6	5.6	6.9	6.9	6.6	5.7
14	5.8	6.5	5.4	4.8	5.7	5.2	5.2	6.7	6.8	5.0	5.6	7.9	8.5	6.8	7.0	6.5	5.1	5.5	5.7	4.6	3.0	3.0	3.9	5.3	5.6
15	5.8	5.2	6.4	6.5	7.2	6.9	7.2	7.0	5.3	5.1	5.2	6.5	***	7.2	7.9	7.0	8.3	6.9	5.9	6.0	7.4	7.3	8.7	8.4	6.8
16	8.1	8.2	7.7	7.5	7.4	7.3	6.8	7.2	7.8	7.2	6.5	7.5	6.9	5.9	4.9	4.7	3.9	4.7	4.8	3.7	3.4	3.6	3.8	3.8	6.0
17	6.1	5.9	5.8	6.2	5.4	3.9	3.8	3.9	3.7	3.3	3.1	4.4	3.5	3.8	4.5	3.9	5.4	2.5	2.0	3.1	4.3	6.6	5.0	2.6	4.3
18	3.2	5.0	3.5	3.5	3.1	3.1	3.5	2.2	1.7	2.3	3.5	3.8	3.8	3.9	3.3	5.0	3.7	5.6	7.0	***	1.5	2.3	3.8	3.3	3.5
19	2.3	1.5	4.8	2.8	1.9	1.5	2.2	3.9	4.1	3.5	3.4	3.8	3.0	2.9	3.2	5.4	3.7	2.3	1.9	2.6	2.7	2.7	2.7	2.4	3.0
20	1.3	1.3	2.5	3.4	2.8	3.8	4.3	4.1	2.5	2.6	2.5	3.3	4.2	4.1	3.7	4.1	4.8	6.2	7.1	8.1	2.5	1.1	3.9	5.2	3.7
21	4.5	1.8	2.5	3.4	4.1	4.2	4.3	3.8	2.5	3.1	3.0	3.2	4.7	5.4	6.6	7.4	7.0	7.1	6.6	5.4	3.1	1.4	2.7	3.2	4.2
22	4.2	4.2	4.6	4.0	3.4	3.7	3.8	3.6	2.7	2.3	2.5	2.2	4.1	4.7	5.1	6.3	6.4	7.1	***	3.8	1.6	3.2	3.7	4.2	4.0
23	3.5	2.8	2.8	3.1	2.7	2.5	3.4	3.4	3.0	2.2	2.8	3.2	3.8	5.3	7.0	6.9	6.8	4.8	4.2	3.5	2.7	2.7	3.3	3.3	3.7
24	3.5	3.7	3.9	3.8	3.0	3.1	4.0	4.4	3.3	2.3	2.2	4.1	4.2	4.6	6.5	7.2	6.9	7.2	6.3	3.9	4.0	3.1	2.1	3.2	4.2
25	3.2	3.5	4.1	3.2	3.0	2.7	3.3	3.0	2.9	2.8	3.0	3.8	4.6	4.4	6.4	6.7	6.4	7.2	7.0	5.9	4.2	2.9	2.7	2.8	4.1
26	4.1	5.3	6.6	6.0	5.8	6.4	7.3	6.3	5.9	8.8	9.3	6.3	4.8	5.0	5.0	4.8	4.2	4.5	4.1	5.1	3.5	3.1	2.9	2.7	5.3
27	4.5	4.4	4.1	3.9	4.9	4.8	5.1	5.4	5.6	3.7	3.4	4.1	3.8	4.1	5.0	3.8	4.4	6.3	***	7.4	***	4.3	2.3	2.6	4.5
28	3.2	3.3	3.9	4.4	3.4	3.8	4.5	3.6	3.8	2.8	3.0	3.4	4.2	5.4	5.9	6.8	7.7	7.3	6.6	4.5	3.1	2.3	2.7	2.4	4.3
29	3.4	4.2	4.6	3.3	3.9	4.1	3.8	3.1	3.3	2.9	2.7	3.4	3.5	4.6	4.6	6.6	5.2	6.1	5.1	3.4	1.8	2.4	3.1	4.1	3.9
30	4.3	3.5	3.1	2.8	3.2	3.3	3.3	3.1	3.1	2.8	2.7	2.0	2.9	4.3	5.2	5.4	5.2	6.6	6.6	4.8	4.1	3.1	2.0	2.7	3.8
31	3.4	3.0	3.5	3.3	3.8	3.3	3.2	3.2	2.6	2.5	2.6	3.5	6.0	6.3	6.8	6.8	7.7	8.1	7.1	4.8	2.3	2.0	2.5	3.2	4.2
HRAVE	4.0	4.1	4.3	4.2	4.1	4.2	4.3	4.2	4.0	3.9	4.0	4.6	5.0	5.4	5.6	5.8	5.5	6.0	5.8	4.9	4.0	3.5	3.5	3.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.1	5.5	3.4	3.1	4.9	7.8	6.0	4.2	4.2	4.1	4.0	4.2	5.7	5.6	6.8	6.0	4.3	3.5	3.0	3.7	4.2	4.0	3.7	4.2	4.1
MAX	8.1	12.2	6.6	6.1	6.4	10.8	8.9	10.1	6.7	6.5	4.8	6.8	7.4	8.5	8.7	8.2	6.6	7.0	5.4	8.1	7.4	7.1	7.0	7.2	7.2
MIN	1.8	2.9	1.3	1.5	2.5	5.9	2.0	1.3	1.6	2.4	3.0	2.3	3.6	3.0	5.1	3.4	2.0	1.5	1.5	1.1	1.4	1.6	2.2	2.1	2.7

DAY	26	27	28	29	30	31
AVE	5.3	4.5	4.3	3.9	3.8	4.2
MAX	9.3	7.4	7.7	6.6	6.6	8.1
MIN	2.7	2.3	2.3	1.8	2.0	2.0

MONTHLY AVERAGE = 4.5 MONTHLY MAXIMUM = 12.2 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
MARCH - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	2.3	3.5	5.1	4.9	4.8	3.4	1.1	2.0	3.1	3.3	3.2	3.6	3.7	5.9	7.5	7.0	6.1	7.1	4.9	4.5	3.8	4.1	4.9	4.7	4.4
2	3.9	4.6	3.1	3.6	3.3	3.8	5.8	6.3	5.9	5.5	7.6	11.8	11.3	9.5	***	10.2	***	6.9	7.1	3.5	3.0	3.5	3.8	3.2	5.8
3	1.9	1.9	2.3	2.0	1.8	1.7	1.1	1.6	1.8	2.0	1.3	3.5	2.6	3.6	3.4	5.8	7.4	6.8	8.4	5.8	6.0	4.5	2.5	2.0	3.4
4	1.7	1.5	1.4	1.7	1.3	1.7	1.6	1.5	1.4	2.0	2.8	3.3	5.2	6.6	7.0	6.3	6.9	6.5	***	***	***	2.0	3.2	2.7	3.3
5	2.7	2.4	3.6	3.6	4.4	4.9	4.6	4.8	6.0	6.8	10.0	5.1	6.4	6.2	6.2	4.4	6.7	5.2	6.2	4.9	5.0	4.9	5.7	5.9	5.3
6	7.6	6.3	6.6	7.0	7.0	9.1	8.0	9.0	9.0	8.1	5.8	11.0	13.8	14.4	13.2	***	***	9.9	9.1	9.3	12.3	9.8	10.2	9.1	9.3
7	8.7	9.0	8.0	9.3	8.6	9.2	12.2	9.8	11.4	8.3	8.4	6.4	8.0	6.2	6.1	4.9	4.9	3.0	3.7	5.5	4.7	2.8	3.0	3.5	6.9
8	2.3	2.6	2.2	3.5	4.1	2.9	2.9	2.4	2.2	2.1	2.5	2.7	3.5	4.9	8.8	8.4	6.9	6.9	12.1	6.4	5.5	4.6	3.1	2.3	4.4
9	3.4	2.6	3.0	3.9	3.6	4.4	3.5	2.2	2.4	2.8	2.3	3.0	2.8	4.9	6.0	5.2	4.3	5.3	5.8	5.8	4.4	3.1	1.9	3.4	3.8
10	3.5	3.2	3.0	2.8	2.9	3.4	3.7	2.8	2.2	1.9	2.3	2.8	4.5	5.2	6.5	3.9	4.2	4.3	4.9	5.7	4.1	3.6	2.2	2.8	3.6
11	3.2	6.0	4.1	3.7	3.2	2.6	4.1	4.0	4.0	4.7	4.9	3.0	4.0	4.7	3.5	3.4	4.3	6.1	6.2	5.1	3.6	4.1	4.1	3.9	4.2
12	5.6	4.8	3.1	4.5	3.6	2.4	3.3	2.8	4.7	6.1	4.8	5.3	6.9	5.8	7.0	4.6	3.6	4.5	3.2	5.3	5.3	4.1	6.9	8.0	4.8
13	6.9	6.8	7.7	4.7	5.2	5.9	4.9	4.8	5.8	7.6	6.6	8.2	5.3	7.9	7.3	5.0	5.7	8.3	***	5.1	7.1	9.4	6.7	5.5	6.5
14	6.4	7.3	5.7	4.2	6.4	5.6	5.1	7.2	7.5	5.3	6.2	8.2	8.2	7.0	7.3	7.2	4.5	5.4	6.0	5.0	2.7	3.7	3.5	5.1	5.9
15	5.8	5.3	7.7	6.1	7.3	7.6	8.0	7.6	6.0	6.2	5.8	6.1	***	6.3	10.7	9.6	10.0	8.1	5.8	5.7	7.8	9.7	8.7	9.9	7.5
16	8.5	8.1	8.6	8.4	7.5	8.6	7.6	7.1	7.9	6.7	5.7	6.9	6.4	6.5	4.5	4.9	5.4	5.2	5.0	6.0	4.5	5.1	4.1	3.9	6.4
17	5.8	6.9	6.8	6.1	5.4	4.3	4.7	4.2	4.6	3.8	3.1	4.8	3.7	4.9	5.4	4.0	5.1	1.9	2.2	2.8	4.2	6.6	3.1	4.3	4.5
18	4.5	4.7	3.5	3.7	3.5	2.6	3.8	2.0	2.3	2.7	3.9	4.2	4.2	2.4	2.4	5.8	4.0	5.8	6.9	***	3.1	4.7	6.3	5.9	4.0
19	3.9	4.3	5.5	4.6	2.6	2.6	2.1	3.2	4.9	3.3	3.5	3.9	2.8	2.7	1.8	5.5	4.4	1.7	2.3	3.0	3.3	4.5	4.5	2.7	3.5
20	3.0	3.4	3.5	3.5	3.2	3.6	3.5	3.3	2.4	2.6	2.8	3.3	3.4	3.5	4.4	3.7	4.3	7.3	7.6	10.5	4.3	3.3	3.8	4.4	4.1
21	2.6	2.2	4.0	3.4	3.7	3.8	3.8	2.7	2.1	2.8	2.7	2.8	5.6	5.8	7.8	7.2	4.8	7.3	6.2	5.8	3.4	3.2	2.1	1.2	4.0
22	3.7	4.9	5.1	4.8	3.5	3.4	2.4	2.9	1.8	1.5	3.2	2.4	4.5	3.8	5.7	6.3	7.8	8.0	***	3.3	2.9	5.4	3.4	3.3	4.1
23	4.1	4.7	3.5	3.6	2.8	3.1	3.5	3.5	1.7	3.2	2.6	3.3	4.7	4.6	9.4	8.1	6.6	4.5	4.2	3.9	2.9	3.5	3.4	3.1	4.1
24	3.1	3.3	3.3	4.0	2.9	2.9	3.2	4.1	3.5	2.6	1.1	4.7	4.3	4.3	5.2	6.3	8.3	8.0	7.3	3.2	2.9	4.3	3.1	2.9	4.1
25	3.2	3.5	4.0	2.8	2.8	2.5	2.9	4.7	3.7	4.1	4.5	4.4	7.1	5.2	5.0	6.2	6.7	6.4	7.9	6.0	4.2	2.5	4.3	4.4	4.5
26	4.0	5.6	6.8	6.2	4.4	6.4	7.0	6.5	5.2	8.7	10.6	6.1	4.6	4.3	7.1	5.8	2.8	3.8	5.9	5.3	3.0	2.8	3.1	3.0	5.4
27	4.3	3.5	3.7	4.9	3.8	3.8	4.8	4.4	5.7	3.2	3.3	4.5	6.3	4.9	3.8	3.8	3.9	6.4	***	8.0	***	4.1	1.7	1.3	4.3
28	2.2	2.4	4.1	3.7	3.5	3.7	2.6	3.3	2.7	2.2	3.0	3.4	3.3	5.0	6.9	7.4	7.0	8.2	6.9	4.9	2.7	1.8	2.3	1.9	4.0
29	3.1	3.9	4.9	3.8	3.8	3.3	4.0	2.6	3.0	2.6	2.9	4.7	2.6	4.7	3.6	6.1	5.9	7.5	5.9	3.5	3.9	4.1	4.1	4.0	4.1
30	3.4	2.6	2.9	2.7	3.0	3.3	3.2	3.8	3.0	3.3	3.3	3.7	2.5	5.2	4.1	5.0	6.8	6.3	5.9	4.7	5.7	3.2	2.9	2.8	3.9
31	3.4	2.9	3.6	3.0	4.3	3.6	2.9	3.4	2.1	2.5	3.4	3.3	4.9	7.9	7.6	7.2	7.9	8.3	7.0	4.9	2.8	4.3	2.4	3.7	4.5
HRAVE	4.2	4.3	4.5	4.3	4.1	4.2	4.3	4.2	4.2	4.1	4.3	4.9	5.2	5.6	6.2	6.0	5.8	6.2	6.1	5.3	4.5	4.4	4.0	4.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.4	5.8	3.4	3.3	5.3	9.3	6.9	4.4	3.8	3.6	4.2	4.8	6.5	5.9	7.5	6.4	4.5	4.0	3.5	4.1	4.0	4.1	4.1	4.1	4.5
MAX	7.5	11.8	8.4	7.0	10.0	14.4	12.2	12.1	6.0	6.5	6.2	8.0	9.4	8.2	10.7	8.6	6.9	6.9	5.5	10.5	7.8	8.0	9.4	8.3	7.9
MIN	1.1	3.0	1.1	1.3	2.4	5.8	2.8	2.1	1.9	1.9	2.6	2.4	4.7	2.7	5.3	3.9	1.9	2.0	1.7	2.4	1.2	1.5	1.7	1.1	2.5

DAY	26	27	28	29	30	31
AVE	5.4	4.3	4.0	4.1	3.9	4.5
MAX	10.6	8.0	8.2	7.5	6.8	8.3
MIN	2.8	1.3	1.8	2.6	2.5	2.1

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 14.4 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
MARCH - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.6	3.6	5.5	5.1	3.4	4.0	1.5	2.1	2.9	3.5	4.3	3.6	4.2	5.9	10.2	9.7	6.3	***	***	4.2	4.5	4.2	5.7	6.7	4.8
2	4.0	4.5	3.4	3.4	3.1	4.5	5.6	5.3	6.2	5.7	6.4	***	***	***	***	8.7	***	***	7.5	3.8	4.0	4.3	4.9	3.4	4.9
3	3.0	2.1	2.9	2.2	2.0	2.0	2.4	3.0	1.5	1.9	2.1	5.0	3.2	2.9	4.6	6.4	8.8	***	***	***	***	4.7	2.7	2.8	3.3
4	3.2	3.2	2.3	1.8	2.3	3.1	1.8	1.5	1.1	2.5	3.2	2.8	4.3	6.9	6.3	***	***	***	***	***	***	1.5	3.2	3.0	3.0
5	2.7	2.7	4.9	3.8	4.6	5.5	4.7	5.1	6.6	6.4	9.3	6.6	4.7	6.3	7.1	***	***	5.5	***	4.6	***	5.9	6.9	***	5.5
6	11.0	6.1	9.2	7.1	6.7	***	9.7	8.6	9.3	11.1	5.6	10.5	12.4	15.5	12.4	***	***	***	***	***	***	***	10.7	8.7	9.7
7	8.7	***	7.2	10.8	9.1	***	13.8	10.1	10.0	6.0	***	6.1	***	6.2	6.8	5.2	4.7	2.9	4.3	5.2	4.6	2.7	2.1	3.5	6.5
8	2.0	3.1	2.4	4.2	6.0	3.5	1.7	3.6	3.0	3.2	4.2	4.0	5.1	5.5	9.2	7.7	7.4	7.1	***	***	***	4.4	3.4	2.0	4.4
9	3.9	2.7	3.6	3.4	2.8	4.3	2.7	2.1	2.4	4.1	2.7	2.3	5.6	4.9	7.8	7.3	5.4	***	***	5.9	5.4	3.0	1.9	3.1	4.0
10	4.2	3.0	4.3	3.8	4.3	3.7	5.1	3.7	2.2	2.7	2.9	4.2	6.7	5.5	6.0	3.9	3.2	***	***	5.0	***	5.2	2.9	2.6	4.0
11	3.9	9.4	5.0	3.8	3.2	2.9	4.3	3.6	3.7	4.0	5.2	***	6.9	5.1	4.0	4.1	5.3	5.8	5.8	6.0	4.0	4.7	5.4	5.7	4.9
12	5.5	5.4	3.0	***	3.2	2.2	3.8	5.9	5.2	6.1	7.4	6.4	***	5.8	7.4	6.2	4.2	***	***	3.5	***	5.7	***	***	5.1
13	***	6.9	7.9	4.2	4.2	5.7	4.9	5.9	6.6	10.7	6.6	8.3	5.6	7.9	***	4.8	***	***	***	6.1	7.7	***	***	***	6.5
14	7.1	7.9	6.6	4.6	6.7	5.6	5.4	8.0	***	***	4.9	***	***	6.8	6.7	8.5	4.8	***	***	6.5	2.8	***	3.8	5.4	6.0
15	5.8	6.1	8.7	8.6	6.9	***	7.4	8.2	5.2	6.6	6.2	***	***	***	***	***	***	***	***	***	***	***	***	***	7.0
16	9.0	***	***	8.2	7.5	***	***	7.7	7.6	***	4.0	***	5.9	7.2	5.7	4.9	5.2	5.6	4.8	6.2	4.3	7.0	4.2	4.2	6.1
17	5.8	7.6	6.4	6.2	5.3	4.4	4.9	4.0	3.9	3.9	3.0	5.2	5.7	4.2	6.1	3.2	6.2	***	3.0	3.3	4.7	8.1	***	6.9	5.1
18	6.7	4.5	3.0	***	4.6	2.8	***	***	***	3.9	3.5	4.3	4.5	2.9	2.5	5.9	4.3	***	***	***	4.1	5.8	5.4	5.7	4.4
19	4.5	3.5	5.1	5.2	3.1	3.5	2.1	***	5.1	3.5	4.8	6.5	2.4	2.4	2.1	4.7	3.5	1.3	2.6	***	***	5.2	4.9	4.7	3.8
20	3.7	4.4	3.5	4.3	3.5	3.9	3.2	3.6	2.5	2.6	3.3	4.8	3.0	4.4	6.3	3.8	4.3	7.1	***	***	4.2	2.0	3.6	5.2	4.0
21	3.8	2.8	3.7	4.1	5.0	3.8	3.2	2.3	2.8	2.3	3.1	3.1	6.1	5.7	7.4	8.8	***	***	***	7.2	3.2	2.9	2.7	1.4	4.1
22	3.8	5.1	6.4	3.8	5.1	3.2	1.9	3.4	2.0	3.5	3.8	4.5	4.6	5.6	5.8	6.6	7.5	8.3	***	***	3.5	5.4	3.6	3.3	4.6
23	4.3	7.8	3.5	2.8	2.5	3.6	3.5	3.3	3.0	6.4	3.3	3.2	4.6	4.3	***	8.2	***	***	***	***	3.5	3.6	4.4	***	4.2
24	3.2	3.1	3.5	3.9	3.0	3.1	3.8	4.7	3.6	2.7	2.7	4.1	2.9	6.6	***	***	***	***	***	***	***	4.5	3.9	3.1	3.7
25	3.2	4.9	4.7	4.8	4.2	2.5	3.0	5.8	4.2	5.1	4.6	4.7	6.8	***	5.4	7.8	***	***	***	***	***	2.5	4.5	4.0	4.6
26	3.3	***	***	***	***	***	***	***	***	***	9.6	***	4.0	***	6.2	5.6	***	***	***	***	***	***	3.4	3.6	5.1
27	4.8	***	6.7	4.9	3.8	4.6	6.4	6.3	6.6	3.7	4.6	5.1	6.3	6.1	3.8	***	***	***	***	9.8	***	***	***	2.9	5.4
28	1.5	4.2	***	6.2	5.0	3.5	2.8	4.7	2.7	3.7	3.0	4.7	6.3	4.7	***	***	***	9.6	7.2	***	***	***	***	***	4.6
29	3.8	4.7	4.3	4.5	7.3	5.3	4.5	5.9	4.4	2.7	5.2	4.9	2.2	5.1	***	6.4	***	***	***	***	***	5.2	6.0	6.3	4.9
30	3.9	3.0	4.4	3.6	***	4.8	3.8	5.9	3.1	5.9	5.0	5.0	***	***	3.6	***	7.4	***	***	***	***	3.8	5.5	***	4.6
31	4.5	3.2	3.7	3.7	5.1	3.9	3.8	3.9	2.3	4.2	4.0	4.4	5.4	9.8	***	***	8.0	9.0	***	***	***	5.1	2.7	4.4	4.8
HRAVE	4.6	4.7	4.9	4.8	4.6	3.8	4.3	4.9	4.3	4.6	4.6	5.0	5.2	5.9	6.2	6.3	5.7	6.2	5.0	5.5	4.3	4.5	4.3	4.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.8	4.9	3.3	3.0	5.5	9.7	6.5	4.4	4.0	4.0	4.9	5.1	6.5	6.0	7.0	6.1	5.1	4.4	3.8	4.0	4.1	4.6	4.2	3.7	4.6
MAX	10.2	8.7	8.8	6.9	9.3	15.5	13.8	9.2	7.8	6.7	9.4	7.4	10.7	8.5	8.7	9.0	8.1	6.7	6.5	7.1	8.8	8.3	8.2	6.6	7.8
MIN	1.5	3.1	1.5	1.1	2.7	5.6	2.1	1.7	1.9	2.2	2.9	2.2	4.2	2.8	5.2	4.0	3.0	2.5	1.3	2.0	1.4	1.9	2.5	2.7	2.5

DAY	26	27	28	29	30	31
AVE	5.1	5.4	4.6	4.9	4.6	4.8
MAX	9.6	9.8	9.6	7.3	7.4	9.8
MIN	3.3	2.9	1.5	2.2	3.0	2.3

MONTHLY AVERAGE = 4.9 MONTHLY MAXIMUM = 15.5 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 76.1% OPERATIONAL RECOVERY RATE = 76.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
MARCH - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	206	263	280	285	287	340	82	89	98	91	94	137	199	208	234	224	247	268	297	346	287	275	268	213	91
2	231	308	291	292	275	274	241	255	176	173	183	181	192	292	***	298	***	295	289	336	80	65	56	77	12
3	348	337	356	329	342	72	90	76	69	76	13	195	243	265	273	281	282	278	282	292	287	288	293	13	22
4	67	46	16	72	82	67	28	61	56	82	323	278	273	269	273	282	268	263	***	***	***	319	304	341	20
5	98	91	76	80	77	71	79	87	72	71	78	45	26	11	13	8	23	27	71	73	72	77	77	78	305
6	69	77	70	70	68	63	61	62	70	72	76	84	28	98	96	***	***	79	87	84	78	83	95	89	259
7	70	59	60	68	70	73	74	72	67	67	69	69	87	86	80	63	5	71	39	349	15	163	77	96	36
8	97	81	73	117	122	84	109	132	93	83	112	224	268	271	277	274	273	278	297	280	285	286	61	104	342
9	105	106	107	106	118	131	135	132	155	94	61	177	277	307	277	274	274	282	281	286	292	264	105	110	97
10	98	108	105	111	132	141	132	129	146	156	100	82	75	81	196	169	223	263	282	300	292	291	2	96	158
11	96	101	126	150	137	120	136	120	101	92	84	145	106	103	90	87	41	76	61	68	70	77	86	100	185
12	84	75	82	77	59	16	76	4	65	71	75	74	24	72	29	266	279	356	83	69	43	36	51	36	240
13	40	49	65	79	71	65	72	77	73	75	78	45	77	100	106	101	65	59	***	74	56	54	55	51	321
14	43	55	69	73	64	60	66	61	62	76	81	97	87	84	92	88	99	97	110	105	95	82	78	76	103
15	80	85	70	65	64	69	73	83	90	83	90	107	***	87	84	92	97	113	108	98	86	93	96	88	269
16	94	76	73	67	62	66	65	63	72	78	76	94	97	98	84	92	86	78	73	91	84	84	84	80	346
17	71	71	72	68	76	86	104	93	99	98	119	168	185	96	80	106	264	258	283	272	283	289	285	288	119
18	273	298	286	288	294	298	286	280	305	305	299	278	276	271	118	176	175	279	281	***	282	62	339	172	61
19	118	86	73	75	4	348	301	284	283	219	159	167	171	114	134	175	187	164	140	125	145	146	121	85	201
20	62	106	80	79	85	118	114	119	112	107	126	105	176	188	251	254	255	277	14	14	133	68	71	67	155
21	68	43	59	75	95	112	130	131	79	92	118	223	275	272	274	268	276	283	279	274	276	224	125	126	90
22	112	119	112	120	110	118	126	126	127	84	120	208	292	280	284	282	286	286	***	341	38	89	98	103	247
23	100	99	101	101	96	88	94	106	150	86	85	175	269	257	266	274	276	269	270	277	271	290	291	356	151
24	105	111	124	125	98	98	101	111	97	126	145	184	251	265	274	272	277	283	289	286	172	285	30	103	290
25	102	104	109	96	84	88	98	105	112	112	116	270	273	269	270	263	272	270	275	281	286	278	317	101	178
26	75	71	63	64	77	88	78	76	88	71	142	77	24	21	70	4	2	46	10	1	312	340	33	45	251
27	83	98	110	135	126	126	143	142	153	122	93	132	84	139	273	269	266	275	***	288	***	289	301	102	24
28	105	93	100	111	124	127	145	119	138	88	136	179	266	308	319	278	282	281	279	284	261	304	85	88	98
29	91	109	121	108	118	149	139	146	141	92	58	131	249	275	282	250	266	272	280	329	324	98	84	101	337
30	115	91	96	89	87	101	139	120	88	87	88	349	287	273	296	266	263	277	276	288	286	295	59	90	213
31	104	83	93	101	113	137	93	83	84	93	145	265	280	281	275	281	278	278	279	281	278	280	281	292	60

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
MARCH - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	201	259	263	278	348	338	13	86	88	85	119	168	139	185	208	212	242	274	297	326	297	267	236	194	102
2	154	273	280	278	272	265	221	201	189	179	187	169	197	277	***	298	***	291	295	331	35	66	82	86	310
3	36	18	11	28	356	20	74	74	27	8	26	142	105	239	341	285	288	272	289	296	293	291	340	358	159
4	8	22	314	33	68	60	37	11	6	18	313	280	279	295	296	289	260	264	***	***	***	19	38	343	150
5	93	72	75	81	73	66	89	81	61	83	85	70	20	17	28	339	26	48	83	77	67	47	83	69	348
6	77	82	75	66	65	72	61	68	75	72	71	89	19	75	77	***	***	74	86	87	81	77	89	84	223
7	81	67	60	62	77	72	78	66	79	60	60	79	93	72	63	78	88	78	63	5	50	125	67	97	26
8	124	101	23	100	144	79	96	116	98	79	87	196	278	280	272	272	286	284	298	277	284	285	105	146	298
9	127	123	110	109	119	144	141	119	166	124	110	152	292	275	267	282	296	279	286	268	270	189	155	127	356
10	104	101	102	112	115	149	127	113	121	99	62	306	69	87	174	156	205	252	260	297	298	318	218	93	106
11	98	99	129	125	128	131	145	101	87	71	68	122	102	95	92	80	57	74	53	93	47	64	79	96	138
12	76	74	86	87	82	17	82	42	27	69	84	84	28	53	83	214	301	28	109	76	24	32	60	21	286
13	44	55	70	74	70	63	67	75	70	70	78	61	57	93	94	102	90	55	***	77	37	76	47	53	192
14	56	50	63	76	63	58	63	68	62	71	78	94	81	73	23	100	93	95	106	91	91	82	72	88	157
15	84	84	68	70	60	70	74	81	89	86	88	109	***	104	96	98	95	111	113	99	104	70	101	97	245
16	93	86	69	69	58	70	64	68	71	83	85	87	92	86	94	96	97	73	56	85	80	67	84	89	116
17	78	80	87	75	73	82	77	94	80	77	88	140	123	114	84	129	261	264	278	261	275	290	328	309	239
18	349	348	121	256	60	138	284	289	327	321	333	277	279	296	117	173	172	275	275	***	9	320	276	198	99
19	67	356	26	97	58	49	310	276	277	218	139	171	174	113	136	179	197	203	178	184	172	98	94	45	310
20	16	339	99	87	68	91	114	123	89	103	87	100	120	79	41	345	223	287	21	17	311	90	137	77	71
21	353	12	35	48	90	91	91	151	74	69	57	265	283	275	269	290	277	281	272	275	269	280	221	141	151
22	120	143	135	140	137	137	134	162	141	122	149	325	297	305	280	277	289	286	***	20	80	108	104	113	49
23	113	110	145	159	124	100	98	135	156	129	138	154	271	186	275	274	276	271	270	271	284	292	321	294	162
24	93	110	134	160	111	85	105	139	91	160	143	178	184	263	270	263	261	283	277	259	108	342	251	100	305
25	141	105	109	100	61	67	98	135	148	147	134	269	269	282	279	266	267	271	271	281	313	224	51	81	29
26	70	64	63	57	72	95	75	80	89	66	143	80	55	45	88	356	323	36	21	353	292	346	31	18	193
27	64	91	96	84	109	135	124	128	141	117	119	133	99	138	1	247	271	279	***	296	***	301	305	90	294
28	119	81	94	117	136	130	149	122	106	54	133	165	263	309	311	276	277	275	281	277	307	312	74	86	105
29	82	105	135	123	130	159	118	161	131	81	85	126	138	279	336	264	247	265	284	331	250	102	99	105	63
30	123	111	100	111	95	120	158	134	88	86	83	352	298	298	19	266	290	271	281	291	277	8	205	93	235
31	97	83	91	98	139	157	100	85	89	116	137	321	277	253	286	277	276	270	275	276	274	358	286	279	226

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
MARCH - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	240	274	266	281	338	32	356	86	84	90	136	97	78	206	200	227	250	***	***	331	293	274	220	200	60
2	142	273	231	280	288	271	212	191	186	179	216	***	***	***	***	331	***	***	305	335	38	81	99	84	17
3	49	52	11	46	359	21	110	72	29	359	26	115	96	155	34	281	294	***	***	***	***	284	342	358	320
4	28	106	348	34	67	79	56	356	33	8	317	280	270	295	307	***	***	***	***	***	***	30	39	344	52
5	109	64	67	77	72	69	98	82	34	64	74	98	50	357	71	***	***	46	***	78	***	46	96	***	311
6	97	93	72	64	64	***	60	70	76	82	81	87	22	76	74	***	***	***	***	***	***	***	84	90	269
7	80	***	63	56	72	***	63	65	76	72	***	65	***	68	70	84	82	63	100	16	59	124	55	92	243
8	117	105	6	103	106	29	56	111	5	80	118	167	298	270	274	275	269	287	***	***	***	279	102	116	73
9	125	128	130	102	114	141	109	122	182	130	78	176	290	298	277	274	289	***	***	258	216	191	100	97	282
10	87	90	94	114	87	157	128	120	345	114	39	273	51	78	170	135	170	***	***	296	***	320	301	95	217
11	106	112	132	126	125	130	140	108	77	78	64	***	96	92	82	67	58	62	36	23	14	44	90	108	232
12	79	72	91	***	74	29	97	41	302	53	78	90	***	52	85	171	310	***	***	29	***	43	***	***	341
13	***	61	70	80	77	63	67	75	61	78	75	61	60	94	***	115	***	***	***	83	50	***	***	***	133
14	57	48	65	78	70	38	58	74	***	***	99	***	***	43	22	98	86	***	***	86	108	***	75	87	61
15	82	81	76	72	67	***	89	76	89	85	100	***	***	***	***	***	***	***	***	***	***	55	***	***	154
16	100	***	***	62	39	***	***	69	73	***	95	***	95	100	92	90	91	80	59	90	57	66	85	84	273
17	77	85	88	73	63	78	84	92	84	73	94	139	116	108	80	123	252	***	268	223	276	296	***	277	318
18	325	342	144	***	77	107	***	***	***	291	300	276	274	328	115	171	171	***	***	***	27	317	255	202	250
19	71	48	358	115	55	266	330	***	274	223	154	152	120	126	111	175	187	163	178	***	***	123	111	77	326
20	249	336	90	84	59	83	110	133	94	121	84	103	152	106	40	211	219	286	***	***	274	165	123	62	320
21	120	94	47	65	95	106	102	148	99	65	8	288	298	277	263	291	***	***	***	264	269	288	197	29	238
22	112	138	130	128	149	128	134	129	160	135	146	16	304	276	274	280	276	282	***	***	34	108	105	118	20
23	119	118	152	132	120	68	110	154	188	124	160	127	256	220	***	269	***	***	***	***	265	298	304	***	140
24	85	115	138	147	114	89	102	116	90	157	84	175	169	281	***	***	***	***	***	***	***	333	135	101	279
25	122	130	123	31	75	81	95	125	143	125	159	234	269	***	275	264	***	***	***	***	***	238	153	44	154
26	63	***	***	***	***	***	***	***	***	***	142	***	51	***	60	355	***	***	***	***	***	***	95	13	236
27	54	***	103	68	110	124	122	169	143	119	128	142	99	141	36	***	***	***	***	312	***	***	***	153	47
28	22	82	***	121	138	126	144	103	121	22	120	167	228	274	***	***	***	265	280	***	***	***	***	***	289
29	83	105	137	121	134	158	116	126	116	83	79	130	151	280	***	256	***	***	***	***	***	68	115	115	330
30	126	117	120	84	***	101	158	114	88	94	85	13	***	***	354	***	285	***	***	***	***	52	212	***	219
31	81	81	90	87	139	164	109	90	92	159	133	289	274	261	***	***	286	267	***	***	***	2	290	283	265

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 76.2% OPERATIONAL RECOVERY RATE = 76.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.23	0.50	0.30	0.36	0.29	0.32	0.25	0.03	0.14	0.53	0.84	1.10	1.09	1.07	1.12	0.93	0.85	0.81	0.37	0.69	0.57	0.40	0.61	0.84	0.59
2	1.02	0.57	0.48	0.51	0.76	0.59	0.54	0.63	0.51	0.47	0.91	0.83	***	0.77	***	1.02	***	0.43	0.52	0.41	0.35	0.59	0.43	0.27	0.60
3	0.32	0.16	0.13	0.23	0.47	0.12	0.10	0.07	0.23	0.46	0.53	0.77	0.88	1.02	1.21	0.97	0.83	0.94	0.61	0.31	0.25	0.52	0.33	0.31	0.49
4	0.19	0.26	0.17	0.09	0.18	0.08	0.19	0.04	0.26	0.47	0.67	0.92	1.03	1.04	0.98	0.97	1.14	0.80	***	***	***	0.58	0.45	0.42	0.52
5	0.27	0.35	0.42	0.55	0.65	0.47	0.50	0.23	0.58	1.11	1.24	1.17	1.39	1.09	1.08	1.06	1.12	1.01	1.03	0.60	0.57	0.46	0.42	0.56	0.75
6	0.59	0.58	0.52	0.44	0.52	0.74	0.66	0.86	0.93	0.70	1.15	0.74	0.90	***	***	***	***	***	0.73	0.60	0.65	0.78	0.73	0.73	0.71
7	0.63	0.78	0.71	0.85	0.87	0.53	0.58	0.76	0.79	0.86	0.95	0.96	0.84	1.11	1.06	1.13	1.11	0.89	0.67	0.71	0.66	0.44	0.49	0.45	0.78
8	0.36	0.46	0.39	0.42	0.23	0.17	0.20	0.31	0.30	0.55	0.68	0.95	0.94	1.05	1.19	1.10	0.69	0.58	0.59	0.44	0.52	0.42	0.51	0.29	0.56
9	0.18	0.19	0.20	0.30	0.17	0.21	0.09	0.07	0.14	0.45	0.46	0.61	0.78	1.00	1.04	0.94	0.85	0.79	0.50	0.23	0.37	0.44	0.32	0.31	0.44
10	0.21	0.23	0.18	0.35	0.34	0.19	0.23	0.24	0.18	0.24	0.35	0.98	0.97	1.15	1.10	1.19	1.10	0.75	0.63	0.53	0.59	0.68	0.43	0.53	0.56
11	0.48	0.12	0.27	0.39	0.28	0.20	0.37	0.18	0.30	0.24	0.33	0.60	0.85	0.88	0.89	0.86	0.90	0.81	0.59	0.59	0.46	0.41	0.56	0.46	0.50
12	0.57	0.46	0.37	0.54	0.33	0.33	0.31	0.49	0.51	0.65	0.60	0.99	0.87	0.92	1.21	0.96	0.92	0.82	0.46	0.74	0.89	0.85	0.96	0.99	0.70
13	1.02	0.74	0.57	0.38	0.45	0.49	0.19	0.14	0.42	0.81	1.16	0.97	1.05	0.97	1.20	0.92	0.81	0.62	***	0.59	0.65	0.72	0.76	0.72	0.71
14	0.61	0.75	0.59	0.58	0.45	0.55	0.39	0.46	0.65	1.02	1.08	0.93	1.02	1.29	1.07	1.02	1.05	0.66	0.59	0.52	0.57	0.64	0.57	0.54	0.73
15	0.46	0.63	0.59	0.43	0.55	0.64	0.58	0.49	0.70	0.95	0.78	1.04	***	1.21	1.42	1.19	1.19	0.79	0.43	0.39	0.70	0.73	0.75	0.72	0.75
16	0.71	0.84	0.98	0.81	0.72	0.71	0.65	0.51	0.69	0.94	1.12	0.96	1.29	1.27	1.22	1.11	1.12	0.93	0.58	0.50	0.70	0.83	0.73	0.63	0.86
17	0.43	0.43	0.53	0.55	0.42	0.17	0.20	0.21	0.19	0.34	0.67	1.09	1.09	0.91	0.99	0.75	0.62	0.44	0.31	0.39	0.36	0.54	0.47	0.45	0.52
18	0.66	0.38	0.37	0.53	0.58	0.58	0.28	0.22	0.21	0.54	0.92	0.82	0.77	0.80	0.44	0.44	0.55	0.79	0.45	***	0.51	0.59	0.72	0.75	0.56
19	0.77	0.65	0.67	0.67	0.57	0.36	0.30	0.54	0.65	0.68	0.78	0.71	0.37	0.13	0.46	0.50	0.44	0.26	0.16	0.35	0.46	0.49	0.51	0.59	0.50
20	0.66	0.52	0.47	0.43	0.30	0.31	0.31	0.19	0.25	0.48	0.80	0.87	0.98	1.05	1.23	1.16	1.05	0.67	0.81	0.98	0.82	0.75	0.62	0.68	0.68
21	0.73	0.56	0.39	0.39	0.34	0.22	0.23	0.07	0.33	0.69	0.59	0.95	1.15	1.09	0.98	0.98	0.88	0.74	0.58	0.35	0.37	0.43	0.39	0.39	0.58
22	0.38	0.43	0.37	0.23	0.25	0.26	0.05	0.06	0.24	0.35	0.71	0.76	0.99	1.11	1.06	0.91	0.80	0.86	***	0.69	0.62	0.50	0.44	0.36	0.54
23	0.43	0.49	0.58	0.39	0.30	0.29	0.22	0.15	0.31	0.58	0.96	1.00	0.71	1.15	0.87	1.02	0.85	0.67	0.84	0.72	0.79	0.48	0.42	0.37	0.61
24	0.44	0.48	0.41	0.55	0.41	0.33	0.27	0.28	0.33	0.61	0.79	0.97	0.91	1.11	1.15	0.96	0.96	1.01	***	***	0.70	0.58	0.50	0.48	0.65
25	0.53	0.44	0.48	0.51	0.54	0.39	0.24	0.07	0.15	0.44	0.84	0.96	0.96	1.18	1.10	1.06	0.98	0.75	0.70	0.37	0.41	0.37	0.51	0.44	0.60
26	0.40	0.42	0.75	0.97	0.74	0.96	0.86	0.72	0.96	1.14	1.07	1.08	1.26	1.21	1.28	1.24	1.09	0.76	0.79	0.87	0.78	0.68	0.65	0.50	0.88
27	0.38	0.48	0.52	0.46	0.32	0.22	0.36	0.36	0.54	0.72	0.64	0.78	0.95	0.98	1.16	1.27	0.89	0.87	***	0.44	***	0.46	0.36	0.24	0.61
28	0.23	0.35	0.32	0.37	0.35	0.18	0.26	0.09	0.30	0.42	0.81	0.96	1.17	1.29	0.90	0.97	1.00	1.01	0.72	0.34	0.49	0.32	0.36	0.29	0.56
29	0.45	0.41	0.34	0.20	0.44	0.36	0.24	0.32	0.06	0.38	0.66	0.94	1.09	1.08	1.04	0.87	1.16	0.94	***	0.72	0.34	0.44	0.58	0.41	0.59
30	0.32	0.28	0.45	0.35	0.34	0.27	0.24	0.21	0.27	0.27	0.45	0.65	0.60	1.14	0.98	1.07	0.93	0.86	0.61	0.34	0.28	0.61	0.48	0.39	0.52
31	0.39	0.41	0.38	0.37	0.21	0.27	0.19	0.20	0.24	0.39	0.80	1.05	0.97	0.97	1.04	0.95	1.00	0.97	0.54	0.35	0.45	0.52	0.53	0.60	0.57
HRAVE	0.49	0.46	0.45	0.46	0.43	0.37	0.33	0.30	0.40	0.60	0.79	0.91	0.96	1.03	1.05	0.98	0.93	0.77	0.59	0.53	0.55	0.56	0.54	0.51	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.59	0.60	0.49	0.52	0.75	0.71	0.78	0.56	0.44	0.56	0.50	0.70	0.71	0.73	0.75	0.86	0.52	0.56	0.50	0.68	0.58	0.54	0.61	0.65	0.60
MAX	1.12	1.02	1.21	1.14	1.39	1.15	1.13	1.19	1.04	1.19	0.90	1.21	1.20	1.29	1.42	1.29	1.09	0.92	0.78	1.23	1.15	1.11	1.15	1.15	1.18
MIN	0.03	0.27	0.07	0.04	0.23	0.44	0.44	0.17	0.07	0.18	0.12	0.31	0.14	0.39	0.39	0.50	0.17	0.21	0.13	0.19	0.07	0.05	0.15	0.27	0.07

DAY	26	27	28	29	30	31
AVE	0.88	0.61	0.56	0.59	0.52	0.57
MAX	1.28	1.27	1.29	1.16	1.14	1.05
MIN	0.40	0.22	0.09	0.06	0.21	0.19

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 97.3% OPERATIONAL RECOVERY RATE = 97.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
MARCH - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.45	0.56	0.42	0.52	0.64	0.42	0.32	0.24	0.32	0.36	0.73	0.92	1.17	1.09	1.01	0.99	0.77	0.89	***	0.71	0.77	0.46	0.64	0.65	0.65
2	1.12	0.64	0.32	0.43	0.86	0.64	0.43	0.53	0.54	0.42	0.81	***	***	***	***	***	***	0.41	0.44	0.51	0.53	0.50	0.41	0.19	0.54
3	0.34	0.33	0.28	0.37	0.80	0.54	0.13	0.28	0.33	0.28	0.57	0.87	0.84	0.88	1.15	1.01	0.82	0.79	***	0.25	***	0.26	0.39	0.40	0.54
4	0.26	0.28	0.41	0.29	0.06	0.01	0.08	0.02	0.48	0.41	0.44	0.95	1.23	1.01	1.10	0.98	1.24	0.59	***	***	***	0.55	0.71	0.64	0.56
5	0.79	0.31	0.48	0.58	0.68	0.51	0.66	0.37	0.71	***	1.25	1.16	1.18	1.10	0.99	1.02	1.06	0.74	0.71	0.49	0.49	0.40	0.46	0.51	0.72
6	0.52	0.57	0.48	0.39	0.52	0.68	0.61	0.88	0.82	0.74	1.08	***	***	***	***	***	***	***	***	***	***	***	0.71	0.77	0.67
7	0.78	0.77	0.60	0.86	0.78	0.47	0.48	0.89	0.60	***	***	0.95	0.77	0.95	1.18	1.16	1.14	0.84	0.75	0.83	0.87	0.62	0.62	0.60	0.80
8	0.46	0.47	0.48	0.37	0.25	0.14	0.15	0.14	0.16	0.33	0.53	0.75	0.94	1.11	1.02	1.18	0.70	***	***	0.39	0.58	0.61	0.40	0.38	0.52
9	0.23	0.13	0.11	0.43	0.47	0.46	0.11	0.28	0.26	0.21	0.22	0.67	0.66	1.10	0.99	0.81	0.89	0.66	***	0.43	0.44	0.46	0.46	0.50	0.48
10	0.43	0.28	0.22	0.54	0.72	0.22	0.21	0.61	0.44	0.21	0.44	0.77	1.16	1.15	1.00	1.15	1.20	0.60	***	***	0.60	0.74	0.58	0.45	0.62
11	0.40	0.13	0.38	0.37	0.21	0.36	0.48	0.43	0.48	0.35	0.23	0.62	0.89	0.86	0.78	0.92	0.82	***	***	***	0.38	0.40	0.57	0.46	0.50
12	0.59	0.44	0.45	0.50	0.65	0.38	0.33	0.46	0.37	0.49	0.54	0.95	0.80	1.01	1.27	1.14	0.98	0.89	0.30	0.76	1.01	***	1.01	***	0.70
13	0.94	0.83	0.47	0.37	0.50	0.50	0.27	0.32	0.45	0.71	1.10	1.04	0.98	0.93	0.96	0.75	0.87	***	***	0.62	0.59	0.62	0.74	0.68	0.69
14	0.65	0.72	0.62	0.57	0.40	0.43	0.42	0.38	0.61	1.09	0.98	***	1.35	1.20	1.09	1.10	1.32	0.74	***	0.56	0.57	0.58	0.42	0.42	0.74
15	0.54	0.67	0.35	0.39	0.50	0.55	0.44	0.47	0.69	0.76	0.65	1.01	***	***	***	***	***	***	***	***	0.84	0.79	0.73	***	0.63
16	0.63	0.77	0.89	0.78	0.68	0.77	0.62	0.49	0.70	0.89	1.34	0.87	1.33	1.30	1.24	0.97	0.99	0.94	0.61	0.77	0.93	1.04	0.93	0.64	0.88
17	0.65	0.57	0.65	0.71	0.69	0.29	0.27	0.13	0.21	0.30	0.68	1.03	1.04	0.98	1.19	0.84	0.67	0.34	0.28	0.47	0.25	0.53	0.59	0.59	0.58
18	0.75	0.46	0.50	0.60	0.59	0.59	0.24	0.15	0.60	0.62	0.85	0.67	0.77	0.76	0.55	0.40	0.55	***	***	***	0.62	0.55	0.67	0.68	0.58
19	0.68	0.53	0.70	0.70	0.53	0.42	0.34	***	0.62	0.65	0.59	0.82	0.54	0.12	0.17	0.35	0.49	0.31	0.14	0.68	0.72	0.53	0.64	0.65	0.52
20	0.67	0.54	0.61	0.90	0.62	0.48	0.51	0.04	0.46	0.25	0.34	0.73	0.92	0.84	1.34	1.22	0.95	0.78	0.71	1.11	0.76	0.66	0.65	0.74	0.70
21	0.41	0.63	0.63	0.57	0.44	0.84	0.25	0.21	0.22	0.58	0.34	1.00	1.20	1.21	0.90	0.87	0.84	0.79	***	0.45	0.54	0.60	0.63	0.62	0.64
22	0.48	0.50	0.43	0.33	0.51	0.51	0.54	0.32	0.01	0.09	0.47	0.68	0.98	1.01	1.04	0.98	0.90	0.67	***	0.81	0.54	0.57	0.54	0.33	0.58
23	0.37	0.46	0.54	0.35	0.27	0.51	0.59	0.57	0.15	0.40	0.68	0.90	1.08	1.01	1.02	1.09	0.83	0.70	***	***	0.80	0.47	0.40	0.44	0.62
24	0.51	0.70	0.61	0.74	0.52	0.52	0.20	0.54	0.56	0.38	0.82	0.86	0.88	1.12	1.13	1.11	0.81	***	***	***	0.94	0.54	0.56	0.47	0.69
25	0.69	0.46	0.58	0.51	0.60	0.62	0.54	0.53	0.80	0.49	0.88	1.00	1.13	1.32	1.13	***	1.01	0.80	0.54	0.39	0.50	0.45	0.62	0.56	0.70
26	0.46	0.42	0.69	0.88	0.72	***	***	0.53	0.60	***	***	1.11	1.28	1.09	1.19	1.35	0.95	0.73	0.70	***	***	0.69	0.77	0.76	0.83
27	0.40	0.48	0.77	0.57	0.33	0.24	0.41	0.42	0.44	0.36	0.88	0.78	0.87	1.01	1.00	1.19	***	0.95	***	0.70	***	***	0.39	0.19	0.62
28	0.18	0.36	0.43	0.44	0.43	0.35	0.33	0.51	0.54	0.60	0.63	0.98	1.06	1.14	0.81	***	0.70	0.89	***	0.35	0.61	0.45	0.42	0.25	0.57
29	0.43	0.39	0.47	0.36	0.26	0.24	0.21	0.24	0.20	0.33	0.61	0.92	1.22	1.20	1.05	0.86	***	***	***	0.48	0.38	0.33	0.50	0.42	0.53
30	0.35	0.35	0.49	0.34	0.51	0.28	0.37	0.11	0.35	0.48	0.54	0.65	0.64	1.18	1.08	0.97	0.94	***	***	***	0.29	0.57	0.58	0.38	0.55
31	0.40	0.44	0.52	0.49	0.32	0.34	0.24	0.15	0.04	0.14	0.88	0.95	0.95	1.11	1.17	1.01	0.90	1.17	0.53	0.29	0.44	0.56	0.52	0.67	0.59
HRAVE	0.53	0.49	0.50	0.52	0.52	0.44	0.36	0.37	0.44	0.46	0.69	0.88	0.99	1.03	1.02	0.98	0.90	0.74	0.52	0.57	0.62	0.55	0.59	0.52	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.65	0.54	0.54	0.56	0.72	0.67	0.80	0.52	0.48	0.62	0.50	0.70	0.69	0.74	0.63	0.88	0.58	0.58	0.52	0.70	0.64	0.58	0.62	0.69	0.70
MAX	1.17	1.12	1.15	1.24	1.25	1.08	1.18	1.18	1.10	1.20	0.92	1.27	1.10	1.35	1.01	1.34	1.19	0.85	0.82	1.34	1.21	1.04	1.09	1.13	1.32
MIN	0.24	0.19	0.13	0.01	0.31	0.39	0.47	0.14	0.11	0.21	0.13	0.30	0.27	0.38	0.35	0.49	0.13	0.15	0.12	0.04	0.21	0.01	0.15	0.20	0.39

DAY	26	27	28	29	30	31
AVE	0.83	0.62	0.57	0.53	0.55	0.59
MAX	1.35	1.19	1.14	1.22	1.18	1.17
MIN	0.42	0.19	0.18	0.20	0.11	0.04

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 89.4% OPERATIONAL RECOVERY RATE = 89.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
MARCH - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.47	0.52	0.56	0.66	0.68	0.43	0.28	0.24	0.28	0.48	0.79	0.90	1.22	1.17	1.06	1.01	0.75	***	***	1.06	0.85	0.50	0.71	0.67	0.69
2	1.06	0.62	0.33	0.43	0.92	0.61	0.45	0.52	0.50	0.41	0.67	***	***	***	***	***	***	***	***	0.53	0.50	0.51	0.69	0.23	0.56
3	0.37	0.38	0.35	0.48	0.74	0.55	0.13	0.34	0.41	0.36	0.59	0.85	0.86	0.88	1.15	1.18	***	***	***	***	***	***	0.37	0.49	0.58
4	0.50	0.29	0.39	0.31	0.06	0.01	0.10	0.04	0.55	0.53	0.56	0.94	1.35	***	***	***	***	***	***	***	***	***	0.71	0.65	0.47
5	0.79	***	***	***	***	***	***	0.47	0.67	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.64
6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
7	***	***	***	***	***	***	***	0.97	***	***	***	***	***	***	1.32	1.19	***	***	***	0.94	0.86	0.62	0.68	0.66	0.90
8	0.45	0.51	0.50	0.26	0.28	0.15	0.16	0.15	0.15	0.30	0.46	***	1.01	***	0.86	***	***	***	***	***	***	0.63	0.32	0.37	0.41
9	***	0.14	0.12	***	***	0.41	0.10	0.41	0.30	0.19	0.23	0.69	0.61	***	***	***	***	***	***	***	***	0.45	0.50	0.53	0.36
10	0.59	0.28	0.22	0.49	0.72	***	0.20	0.55	0.41	0.29	0.44	***	***	***	***	***	***	***	***	***	***	***	***	***	0.42
11	***	0.06	0.36	0.35	0.21	***	***	0.44	0.48	0.32	0.23	0.62	***	***	***	***	***	***	***	***	0.33	***	***	0.52	0.36
12	0.54	0.45	***	***	0.62	0.42	***	0.41	0.30	0.53	0.50	***	***	***	***	1.17	***	***	***	***	***	***	***	***	0.55
13	***	***	0.54	0.34	0.49	0.32	0.25	0.31	0.43	0.50	***	***	0.90	***	***	***	***	***	***	***	***	***	***	***	0.45
14	0.68	0.76	0.65	0.58	0.34	0.38	0.46	***	***	***	***	***	***	***	***	***	***	***	***	***	0.57	***	0.27	0.32	0.50
15	***	***	0.29	0.37	***	***	***	***	0.79	0.76	0.72	***	***	***	***	***	***	***	***	***	***	***	***	***	0.59
16	***	***	***	***	***	***	***	***	***	***	***	***	1.49	1.21	***	0.91	***	***	***	1.17	0.90	0.90	1.02	0.66	1.03
17	0.70	0.63	0.72	0.71	0.69	0.28	0.26	0.13	0.23	0.26	0.73	1.04	1.09	1.16	1.31	***	0.67	***	0.29	0.58	***	***	0.46	0.60	0.63
18	0.66	0.49	0.50	0.53	0.59	0.51	***	***	***	0.79	0.72	0.61	0.72	0.69	0.60	***	0.49	***	***	***	0.75	0.62	0.64	0.63	0.62
19	0.60	0.53	0.78	0.78	0.56	0.47	***	***	***	0.66	0.63	0.86	0.57	0.12	0.19	0.41	0.47	0.29	0.14	0.64	0.72	0.54	0.70	0.81	0.55
20	0.63	0.62	0.62	0.74	0.59	0.80	0.91	0.09	0.49	0.25	0.32	0.75	0.85	0.88	***	1.27	0.94	0.90	***	***	0.78	0.65	0.63	0.76	0.69
21	0.42	0.68	0.65	0.56	0.52	1.00	0.53	0.26	0.23	0.64	0.62	1.00	1.16	1.23	0.87	***	***	***	***	***	0.55	0.60	0.69	0.61	0.67
22	0.44	0.54	0.42	0.34	0.51	0.49	0.48	0.36	0.01	0.10	0.45	0.65	0.81	0.81	***	***	***	***	***	***	0.55	0.55	0.62	0.31	0.47
23	0.37	0.43	0.51	0.43	0.27	0.49	0.65	0.53	0.14	0.41	0.65	0.90	1.18	***	***	***	***	***	***	***	***	0.53	***	***	0.53
24	0.65	0.66	0.66	0.83	0.54	***	***	0.75	0.52	0.40	0.87	***	***	***	***	***	***	***	***	***	***	***	0.52	0.51	0.63
25	0.64	0.47	0.60	0.44	0.59	0.71	***	0.53	0.71	0.44	1.00	1.06	1.10	***	0.86	***	***	***	***	***	***	0.50	0.63	0.59	0.68
26	0.44	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.82	0.83	0.70
27	0.33	***	***	0.52	0.31	0.26	0.43	0.42	0.46	0.36	0.86	0.78	***	***	***	***	***	***	***	***	***	***	***	***	0.47
28	***	0.43	***	***	0.52	0.38	0.35	0.51	0.48	0.57	0.64	***	***	***	***	***	***	***	***	***	***	***	***	***	0.49
29	***	***	0.56	0.34	***	***	0.18	0.37	0.29	0.31	0.60	***	***	***	***	***	***	***	***	***	***	***	***	***	0.38
30	***	***	***	***	***	***	0.40	0.11	0.36	0.45	0.57	0.68	***	***	***	***	***	***	***	***	0.63	0.65	***	***	0.48
31	0.36	***	0.57	0.57	0.35	0.35	0.20	0.14	0.04	0.26	0.87	0.98	***	***	***	***	***	***	***	***	***	***	***	0.47	0.76	0.46
HRAVE	0.56	0.47	0.50	0.50	0.50	0.45	0.34	0.38	0.38	0.42	0.61	0.83	0.99	0.91	0.91	1.02	0.66	0.59	0.22	0.82	0.67	0.59	0.60	0.58	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.69	0.56	0.58	0.47	0.64	***	0.90	0.41	0.36	0.42	0.36	0.55	0.45	0.50	0.59	1.03	0.63	0.62	0.55	0.69	0.67	0.47	0.53	0.63	0.68
MAX	1.22	1.06	1.18	1.35	0.79	***	1.32	1.01	0.69	0.72	0.62	1.17	0.90	0.76	0.79	1.49	1.31	0.79	0.86	1.27	1.23	0.81	1.18	0.87	1.10
MIN	0.24	0.23	0.13	0.01	0.47	***	0.62	0.15	0.10	0.20	0.06	0.30	0.25	0.27	0.29	0.66	0.13	0.49	0.12	0.09	0.23	0.01	0.14	0.40	0.44

DAY	26	27	28	29	30	31
AVE	0.70	0.47	0.49	0.38	0.48	0.46
MAX	0.83	0.86	0.64	0.60	0.68	0.98
MIN	0.44	0.26	0.35	0.18	0.11	0.04

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 50.9% OPERATIONAL RECOVERY RATE = 50.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.4	3.0	4.8	3.3	3.4	2.3	2.1	2.6	3.1	3.4	3.3	4.3	6.9	6.3	7.7	7.7	7.7	6.8	7.2	6.1	4.8	3.7	3.3	3.7	4.6
2	3.8	2.6	2.8	3.3	4.4	4.7	4.8	4.6	3.9	3.4	3.6	4.0	6.8	***	6.6	7.8	7.7	6.6	6.3	6.6	6.1	5.8	4.4	4.2	5.0
3	2.5	2.9	3.9	4.0	4.3	5.9	5.4	6.5	6.8	6.5	8.1	5.8	4.2	4.3	4.6	4.6	4.4	6.2	11.1	6.1	5.6	3.8	2.5	3.2	5.1
4	3.0	3.8	4.0	4.1	3.8	3.2	3.3	3.8	4.0	3.9	3.1	3.5	4.6	4.5	4.2	6.2	6.9	6.8	***	***	4.7	2.6	2.3	3.1	4.1
5	5.2	4.6	3.2	2.7	2.8	2.7	2.9	3.5	3.2	3.2	4.0	4.4	4.1	4.0	6.3	5.9	5.6	6.6	***	5.8	3.0	4.2	4.5	3.7	4.2
6	3.5	4.0	2.7	2.6	3.5	3.5	3.2	3.0	2.6	2.9	3.0	4.0	4.9	7.2	***	***	6.0	***	6.4	9.3	3.3	3.4	2.5	2.3	4.0
7	2.7	2.8	1.6	1.5	2.5	3.4	3.5	3.7	3.1	3.0	3.8	4.6	7.2	6.3	7.1	7.5	***	7.7	7.2	8.3	5.8	3.5	3.8	2.8	4.5
8	2.8	1.9	2.8	4.3	5.5	5.8	6.5	4.2	2.7	3.7	5.5	6.7	7.3	7.0	8.3	8.1	8.9	7.7	7.4	7.1	7.8	6.8	4.2	3.3	5.7
9	2.5	2.3	3.0	2.8	3.6	4.0	3.5	3.3	3.2	2.5	2.7	4.1	4.1	4.5	4.3	4.4	4.6	7.1	***	6.8	3.9	4.2	3.7	2.3	3.8
10	2.2	2.0	3.1	4.4	4.2	3.5	3.3	2.8	2.7	2.7	3.5	3.9	4.0	5.3	4.8	6.1	5.9	6.4	7.2	5.9	3.6	5.3	3.6	3.3	4.2
11	3.0	3.6	4.2	4.2	3.7	2.7	2.6	2.7	2.7	2.6	3.2	3.8	4.2	4.7	4.6	4.4	6.8	7.2	7.3	6.5	5.4	3.5	3.5	3.1	4.2
12	2.8	4.5	6.2	5.1	4.7	3.9	3.9	5.3	5.8	7.3	7.2	6.8	6.4	6.9	7.1	7.2	7.6	6.3	5.4	2.9	2.6	2.4	2.7	3.0	5.2
13	3.1	2.9	2.8	2.8	3.0	2.1	1.5	2.0	2.2	2.8	3.8	4.6	4.3	4.2	3.9	4.2	3.9	5.0	7.2	7.4	5.9	3.1	4.4	6.1	3.9
14	5.3	4.3	3.6	3.5	2.8	3.5	3.7	4.7	4.1	3.9	4.1	4.2	4.5	4.2	4.7	6.3	6.8	6.4	6.3	6.1	6.1	8.7	6.4	5.4	5.0
15	3.6	4.0	3.4	2.5	2.8	1.9	2.4	3.0	2.9	2.9	5.0	6.8	9.1	9.9	10.4	***	***	***	***	8.9	8.7	9.2	9.1	7.2	5.7
16	6.3	4.4	4.2	4.0	4.9	3.5	2.8	2.3	2.9	4.4	5.3	6.8	6.7	7.0	6.3	7.8	7.9	7.7	7.3	5.4	6.7	2.5	2.8	3.6	5.2
17	4.7	5.0	3.9	4.2	4.8	2.0	2.2	2.6	2.5	2.5	3.6	5.3	6.2	6.6	7.9	7.4	8.3	6.8	5.4	5.2	3.7	4.0	2.9	3.9	4.6
18	4.4	4.0	3.9	3.5	3.7	3.6	3.5	3.4	3.2	3.2	3.2	4.7	7.1	8.0	7.8	***	7.5	7.5	***	6.7	4.2	2.5	2.8	3.5	4.6
19	3.6	3.3	3.6	3.9	4.3	4.9	4.4	4.5	3.2	2.2	2.6	4.8	6.0	6.4	7.5	7.5	5.3	5.1	5.7	5.6	4.3	3.2	2.9	5.8	4.6
20	3.7	3.3	2.8	3.1	3.9	4.3	3.7	2.8	2.7	2.3	3.4	3.4	4.8	4.9	4.8	6.2	5.2	6.0	***	6.2	4.1	3.8	3.5	4.7	4.1
21	4.4	4.4	3.8	4.2	2.6	2.0	2.7	3.2	2.5	2.3	3.6	4.0	5.3	5.4	5.4	3.8	5.7	6.4	7.3	6.3	6.3	6.4	6.2	6.6	4.6
22	7.2	6.9	4.2	1.6	2.2	2.4	3.8	3.9	3.0	3.2	3.8	5.0	5.9	4.9	4.4	5.9	6.6	5.3	7.9	7.9	7.6	7.1	6.8	***	5.1
23	6.1	6.7	4.9	2.5	2.3	2.1	3.1	0.8	0.9	2.5	3.5	4.1	4.1	4.0	6.0	8.1	7.0	7.9	7.2	8.7	8.9	9.5	7.6	6.5	5.2
24	6.2	5.8	4.8	3.6	4.0	2.9	1.5	1.7	3.1	5.1	6.5	6.9	7.6	7.5	7.6	6.2	5.2	4.4	5.7	4.8	4.3	3.2	2.8	2.1	4.7
25	2.7	2.4	2.6	3.1	2.5	2.4	2.2	2.5	2.4	3.7	3.4	3.9	6.2	7.1	7.0	6.5	7.4	7.9	***	***	7.1	6.7	6.7	8.3	4.8
26	***	4.8	5.5	4.9	1.9	1.7	2.5	3.8	3.7	5.2	4.4	4.4	3.5	4.1	4.5	5.7	6.8	5.6	5.4	5.3	3.8	3.2	3.8	2.5	4.2
27	3.4	3.2	3.4	3.8	3.1	3.2	2.7	2.8	2.2	1.9	3.5	3.8	5.0	4.8	4.7	4.7	4.5	3.7	4.1	5.4	6.3	4.7	2.2	2.3	3.7
28	4.2	4.1	4.0	6.2	6.7	7.4	9.7	9.5	9.1	8.9	8.0	9.8	8.8	6.8	6.3	4.7	6.3	4.4	4.9	6.0	8.4	5.8	6.7	5.3	6.7
29	5.4	7.3	7.8	7.7	6.8	6.3	6.0	5.6	5.4	5.4	6.6	7.7	5.8	5.3	5.4	4.9	6.7	4.9	4.6	2.8	2.7	4.4	6.4	5.1	5.7
30	3.9	3.6	4.0	4.0	4.3	3.9	3.6	4.1	3.8	3.9	3.5	3.5	4.2	4.2	3.9	4.2	4.1	4.2	3.6	***	5.9	5.0	2.9	2.6	4.0
HRAVE	4.0	4.0	3.8	3.7	3.8	3.5	3.6	3.6	3.5	3.7	4.3	5.0	5.7	5.7	6.0	6.1	6.3	6.2	6.4	6.3	5.4	4.7	4.3	4.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.6	5.0	5.1	4.1	4.2	4.0	4.5	5.7	3.8	4.2	4.2	5.2	3.9	5.0	5.7	5.2	4.6	4.6	4.6	4.1	4.6	5.1	5.2	4.7	4.8
MAX	7.7	7.8	11.1	6.9	6.6	9.3	8.3	8.9	7.1	7.2	7.3	7.6	7.4	8.7	10.4	7.9	8.3	8.0	7.5	6.2	7.3	7.9	9.5	7.6	8.3
MIN	2.1	2.6	2.5	2.3	2.7	2.3	1.5	1.9	2.3	2.0	2.6	2.4	1.5	2.8	1.9	2.3	2.0	2.5	2.2	2.3	2.0	1.6	0.8	1.5	2.2

DAY	26	27	28	29	30	31
AVE	4.2	3.7	6.7	5.7	4.0	***
MAX	6.8	6.3	9.8	7.8	5.9	***
MIN	1.7	1.9	4.0	2.7	2.6	***

MONTHLY AVERAGE = 4.7 MONTHLY MAXIMUM = 11.1 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 97.1% OPERATIONAL RECOVERY RATE = 97.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.8	3.2	3.5	2.9	4.2	4.1	3.0	2.7	3.3	4.0	3.2	4.7	6.4	7.4	5.3	8.1	9.4	10.1	7.1	8.2	6.9	5.2	3.5	3.2	5.2
2	4.0	3.1	3.3	3.5	4.1	4.3	3.9	4.1	4.0	3.0	4.9	4.1	8.7	***	6.0	6.8	7.0	7.9	7.6	6.3	5.6	5.8	5.0	4.7	5.1
3	2.8	2.6	3.7	3.5	4.1	5.2	6.0	7.9	7.5	7.2	8.0	7.7	5.1	4.9	4.2	4.3	4.7	6.2	10.9	8.2	5.0	3.9	2.2	2.3	5.3
4	3.2	3.5	3.5	4.1	3.7	3.0	3.0	4.2	4.5	4.0	3.5	3.6	4.7	5.8	3.8	6.4	8.4	7.4	***	***	4.5	1.9	2.1	2.9	4.2
5	5.8	4.8	3.2	1.7	2.1	3.1	2.4	3.0	2.9	3.0	4.8	3.9	4.6	5.1	5.5	7.0	6.2	4.3	***	5.3	2.7	4.5	4.9	5.0	4.2
6	3.4	3.9	4.6	2.3	3.4	5.4	4.1	2.8	2.8	4.0	1.8	3.0	6.2	6.7	***	***	6.1	***	6.5	8.6	3.5	3.5	2.1	2.3	4.1
7	3.2	3.5	2.8	1.9	2.7	2.0	3.5	3.9	3.0	4.1	5.9	5.8	8.2	5.9	10.8	5.6	***	7.2	7.7	7.7	6.1	5.3	2.2	3.1	4.9
8	3.0	2.5	2.5	4.7	5.7	5.5	6.5	4.5	2.8	2.6	5.3	7.2	8.6	9.1	8.1	7.7	9.2	9.4	8.2	6.9	6.3	6.5	4.5	4.8	5.9
9	3.2	2.2	2.4	2.9	3.7	3.8	3.0	3.4	3.1	2.3	2.2	4.1	3.9	7.2	3.5	5.1	4.6	7.6	***	7.5	4.3	4.3	3.1	4.0	4.0
10	4.1	2.5	3.0	3.7	4.1	3.3	3.1	2.7	2.6	2.5	3.6	3.8	1.9	4.4	5.7	5.6	5.6	6.1	7.2	4.5	3.2	4.1	6.5	3.4	4.1
11	3.4	3.7	4.0	5.0	4.8	2.8	2.3	3.3	2.1	3.4	2.7	3.8	4.1	5.9	3.6	5.2	6.7	7.3	7.6	8.1	6.5	3.9	3.2	3.1	4.4
12	2.8	5.1	6.3	4.5	5.7	4.8	4.5	5.2	6.5	6.7	5.3	4.6	5.6	7.6	8.2	6.9	8.4	7.8	5.5	2.8	3.3	1.9	3.7	3.6	5.3
13	3.4	3.2	2.9	2.8	1.7	1.2	1.4	1.3	1.6	2.1	3.5	4.6	4.3	5.0	3.5	4.2	4.4	7.2	8.0	6.9	6.3	4.2	5.6	6.3	4.0
14	6.5	3.8	3.6	3.6	3.8	3.7	4.8	4.6	4.8	4.1	3.8	5.2	4.2	3.6	5.2	5.3	4.5	7.9	7.1	6.7	6.4	8.3	6.1	4.7	5.1
15	2.8	3.8	2.9	3.0	2.9	2.8	1.6	2.5	2.8	2.4	4.9	6.5	10.0	7.3	12.2	***	***	***	***	8.2	6.5	6.2	9.5	5.9	5.2
16	5.9	5.7	4.5	3.6	6.0	3.8	2.2	2.0	3.7	2.3	5.0	4.6	8.6	7.5	7.3	9.1	8.1	7.7	7.2	6.9	9.5	3.4	4.3	3.5	5.5
17	5.7	4.8	4.6	4.8	3.2	3.4	3.9	2.2	2.2	2.5	2.5	4.9	6.2	6.5	9.1	8.0	8.7	7.2	8.1	5.1	4.5	4.6	5.2	3.2	5.0
18	3.8	4.9	4.5	3.4	2.7	2.8	3.1	2.9	4.0	3.4	1.6	4.5	5.6	6.6	10.1	***	10.9	7.8	***	6.6	5.3	4.7	2.1	1.9	4.7
19	4.1	3.2	2.8	2.7	3.4	4.2	4.2	5.2	3.9	3.2	2.0	5.2	7.4	6.9	6.2	9.8	5.4	5.0	5.7	5.4	4.8	5.2	3.2	6.0	4.8
20	4.2	4.9	2.4	3.0	3.4	4.2	3.7	2.8	2.8	3.9	2.8	3.8	3.7	4.4	4.8	5.9	6.9	5.0	***	5.8	3.3	3.8	4.5	4.8	4.1
21	5.2	4.4	3.1	3.5	3.2	1.5	2.9	3.4	2.1	2.3	2.9	2.9	6.1	4.4	6.3	4.8	6.3	6.7	8.7	9.2	5.9	4.7	6.8	6.9	4.8
22	7.2	5.2	3.6	4.4	3.6	2.5	2.7	3.2	3.2	3.1	5.1	6.7	6.4	6.4	5.1	8.2	5.1	3.6	7.4	10.3	8.6	6.7	6.8	***	5.4
23	5.4	5.3	2.3	3.7	3.1	3.2	2.2	2.0	1.0	2.4	3.9	4.2	4.4	5.1	5.9	11.7	8.8	9.9	12.2	7.8	8.7	9.9	7.2	4.9	5.6
24	4.3	4.4	4.1	3.4	3.6	2.6	2.4	2.8	3.4	5.5	6.1	6.8	7.9	7.8	7.1	6.4	5.1	4.4	5.1	5.8	3.3	5.1	4.8	3.7	4.8
25	3.5	2.7	3.4	3.2	3.5	1.1	1.2	2.0	2.2	3.9	1.5	4.2	6.1	5.2	5.6	5.4	6.7	6.3	***	***	6.7	6.6	3.7	9.1	4.3
26	***	5.5	6.0	5.1	2.9	3.0	2.8	4.8	4.6	5.1	5.7	4.2	3.4	4.2	4.9	5.2	7.3	6.0	5.4	5.7	3.8	2.7	3.4	2.8	4.5
27	3.3	3.0	3.7	3.0	3.2	3.4	3.1	3.0	2.4	2.0	2.7	3.3	5.9	4.9	5.7	5.1	4.0	3.4	3.7	7.2	6.7	1.6	3.1	3.4	3.8
28	4.1	4.5	4.5	6.4	6.4	7.2	9.7	10.7	11.0	10.5	9.5	9.5	7.0	7.2	6.4	4.7	8.1	6.3	4.9	7.0	8.8	6.3	6.7	5.4	7.2
29	5.2	8.4	9.2	8.0	6.4	7.3	6.5	5.9	6.9	9.2	7.5	8.9	7.3	7.7	8.8	6.3	6.7	6.2	4.8	2.4	3.1	5.3	6.2	4.6	6.6
30	3.8	3.1	4.3	4.3	3.7	4.0	4.2	6.0	4.2	4.9	4.9	3.9	4.6	4.1	3.8	4.5	7.0	4.9	3.6	***	6.2	5.2	2.8	2.0	4.3
HRAVE	4.2	4.0	3.8	3.8	3.8	3.6	3.6	3.8	3.7	4.0	4.2	5.0	5.9	6.0	6.3	6.4	6.8	6.7	7.0	6.7	5.5	4.8	4.5	4.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.2	5.1	5.3	4.2	4.2	4.1	4.9	5.9	4.0	4.1	4.4	5.3	4.0	5.1	5.2	5.5	5.0	4.7	4.8	4.1	4.8	5.4	5.6	4.8	4.3
MAX	10.1	8.7	10.9	8.4	7.0	8.6	10.8	9.4	7.6	7.2	8.1	8.4	8.0	8.3	12.2	9.5	9.1	10.9	9.8	6.9	9.2	10.3	12.2	7.9	9.1
MIN	2.7	3.0	2.2	1.9	1.7	1.8	1.9	2.5	2.2	1.9	2.1	1.9	1.2	3.6	1.6	2.0	2.2	1.6	2.0	2.4	1.5	2.5	1.0	2.4	1.1

DAY	26	27	28	29	30	31
AVE	4.5	3.8	7.2	6.6	4.3	***
MAX	7.3	7.2	11.0	9.2	7.0	***
MIN	2.7	1.6	4.1	2.4	2.0	***

MONTHLY AVERAGE = 4.9 MONTHLY MAXIMUM = 12.2 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 97.1% OPERATIONAL RECOVERY RATE = 97.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	7.7	4.0	3.3	3.3	3.8	4.1	3.1	2.7	2.9	3.2	4.6	6.4	7.7	9.2	4.6	10.0	***	***	***	9.0	***	3.8	3.7	3.2	5.0
2	5.4	3.5	3.3	3.8	***	***	***	***	3.5	3.5	3.0	***	10.8	***	7.1	4.6	***	8.3	7.5	***	6.2	5.4	4.4	6.1	5.4
3	2.3	***	***	***	***	5.8	5.8	***	***	***	***	***	4.4	5.1	6.2	4.3	***	***	***	***	***	***	1.7	***	4.5
4	3.1	4.3	3.5	5.6	4.1	3.0	3.2	5.6	5.0	3.0	6.6	6.2	3.8	5.7	6.4	9.3	***	***	***	***	***	***	4.0	5.6	4.9
5	***	5.9	***	***	***	3.1	1.7	3.5	3.5	3.5	5.3	5.3	4.9	4.1	5.8	***	6.9	5.7	***	***	2.4	5.6	4.9	5.6	4.6
6	***	4.5	3.8	***	5.8	6.6	5.2	3.2	3.3	5.1	***	2.9	***	***	***	***	***	***	5.9	***	***	***	***	2.6	4.4
7	***	5.2	***	***	3.0	2.1	***	***	5.0	4.6	7.8	***	***	***	12.8	8.2	***	***	***	***	***	***	1.8	3.3	5.4
8	3.3	5.0	5.2	4.9	4.8	3.4	7.7	4.8	3.4	3.1	6.1	8.8	9.2	9.4	10.5	***	***	***	***	***	***	8.2	4.9	4.0	5.9
9	2.6	3.8	2.4	2.7	4.8	3.7	3.2	3.8	3.7	3.2	1.9	4.2	5.0	9.5	***	***	4.2	8.2	***	***	***	***	3.3	5.1	4.2
10	5.2	3.5	4.1	3.3	4.7	3.1	3.0	5.9	3.8	2.8	4.9	5.1	3.0	4.5	5.2	5.1	***	***	***	***	***	***	6.8	***	4.4
11	3.6	4.9	7.6	5.9	4.9	5.3	2.1	4.8	3.6	4.1	2.8	5.1	5.2	5.6	4.7	5.3	***	***	***	7.9	***	4.6	2.9	4.5	4.8
12	6.9	5.2	6.4	4.9	5.5	5.1	***	***	***	6.6	5.5	4.1	5.9	6.2	***	***	8.8	9.2	8.5	4.1	5.0	3.5	4.2	3.5	5.7
13	3.5	3.6	3.9	3.1	3.7	3.6	2.0	2.7	2.5	2.1	4.3	3.9	4.2	4.2	3.2	3.4	5.0	7.2	7.7	7.5	7.2	3.8	4.9	5.9	4.3
14	8.7	3.8	3.5	3.8	4.2	4.0	5.0	4.8	5.2	2.4	3.3	5.7	4.3	3.2	3.9	4.8	5.5	6.6	***	4.8	7.2	9.2	5.8	5.0	5.0
15	3.5	5.5	2.9	3.0	2.7	2.8	3.2	4.1	3.5	4.3	6.3	8.0	***	5.7	***	***	***	***	***	10.2	5.3	***	***	10.0	5.1
16	4.7	5.4	4.6	4.2	7.4	5.0	4.6	1.7	8.4	5.2	3.3	7.1	9.8	***	***	9.7	***	***	8.6	***	***	***	3.3	***	5.8
17	***	5.7	7.0	***	3.7	5.6	7.4	1.6	3.6	2.2	2.5	6.2	6.0	6.6	***	***	9.6	***	9.7	***	4.6	7.1	8.7	4.1	5.7
18	3.9	6.1	6.3	3.9	3.1	3.1	3.6	4.3	4.3	4.5	2.5	6.1	***	***	***	***	12.3	***	***	***	3.5	7.4	2.2	5.1	4.9
19	3.6	5.4	2.5	2.4	2.5	6.1	3.8	7.3	5.0	3.9	3.0	5.3	9.9	10.1	7.2	10.9	***	***	***	***	5.6	6.2	5.0	6.6	5.6
20	6.1	6.6	3.5	3.3	4.0	3.8	3.7	3.3	5.2	6.0	***	5.0	4.1	4.7	5.4	***	6.4	5.4	***	***	***	***	7.4	6.0	5.0
21	5.1	4.6	4.3	4.5	4.7	1.9	4.2	3.8	2.3	3.5	3.4	2.0	4.0	5.0	***	2.2	***	8.6	***	7.6	***	***	6.1	7.0	4.5
22	7.6	6.8	4.2	4.5	5.4	3.4	2.3	3.4	3.6	3.7	4.8	6.5	8.0	6.4	5.4	7.4	4.6	***	***	10.4	***	***	6.7	***	5.5
23	5.8	6.9	2.7	3.9	2.5	3.6	2.9	2.5	1.2	2.9	3.3	7.7	4.2	4.5	6.6	11.8	10.9	***	13.5	***	7.8	11.4	6.9	4.9	5.8
24	4.2	4.2	5.8	3.4	2.9	2.8	2.6	3.1	4.7	6.6	4.9	6.7	9.5	7.6	6.9	6.5	5.4	5.9	7.5	6.7	3.7	4.2	4.7	3.8	5.2
25	2.3	3.6	2.6	5.5	5.4	2.8	3.1	2.1	2.2	4.1	1.7	4.5	7.9	6.9	5.5	5.0	8.6	***	***	***	8.4	9.7	4.6	***	4.8
26	***	***	6.9	4.9	***	3.5	3.4	6.1	5.6	5.4	6.3	5.0	3.3	4.7	4.6	5.9	7.0	6.7	5.4	4.9	3.0	6.1	5.5	5.1	5.2
27	3.0	2.7	3.5	2.8	3.4	2.9	2.8	2.8	2.2	2.1	2.7	4.2	6.9	6.2	7.2	4.4	3.7	5.3	3.4	8.7	7.0	3.1	3.6	3.8	4.1
28	3.8	5.3	5.9	6.6	6.2	7.1	9.5	10.6	***	***	10.3	8.4	9.9	8.0	7.8	5.2	6.7	6.0	6.4	5.9	8.5	5.7	5.9	6.1	7.1
29	6.9	10.9	11.0	8.9	6.8	7.9	9.0	6.3	6.9	10.2	7.2	***	7.2	8.6	9.0	***	***	***	***	***	4.3	7.0	6.0	5.1	7.7
30	4.5	4.2	4.6	6.7	5.7	4.3	4.9	5.4	4.3	7.7	5.5	4.3	4.1	4.8	3.5	5.5	9.2	***	***	***	6.2	***	1.9	2.1	5.0
HRAVE	4.7	5.0	4.6	4.4	4.4	4.1	4.2	4.2	4.0	4.3	4.6	5.6	6.3	6.3	6.4	6.5	7.2	6.9	7.6	7.3	5.6	6.2	4.7	5.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.0	5.4	4.5	4.9	4.6	4.4	5.4	5.9	4.2	4.4	4.8	5.7	4.3	5.0	5.1	5.8	5.7	4.9	5.6	5.0	4.5	5.5	5.8	5.2	4.8
MAX	10.0	10.8	6.2	9.3	6.9	6.6	12.8	10.5	9.5	6.8	7.9	9.2	7.7	9.2	10.2	9.8	9.7	12.3	10.9	7.4	8.6	10.4	13.5	9.5	9.7
MIN	2.7	3.0	1.7	3.0	1.7	2.6	1.8	3.1	1.9	2.8	2.1	3.5	2.0	2.4	2.7	1.7	1.6	2.2	2.4	3.3	1.9	2.3	1.2	2.6	1.7

DAY	26	27	28	29	30	31
AVE	5.2	4.1	7.1	7.7	5.0	***
MAX	7.0	8.7	10.6	11.0	9.2	***
MIN	3.0	2.1	3.8	4.3	1.9	***

MONTHLY AVERAGE = 5.2 MONTHLY MAXIMUM = 13.5 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 76.8% OPERATIONAL RECOVERY RATE = 76.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	255	192	179	141	146	126	102	95	112	131	102	294	246	253	254	271	284	279	277	283	273	272	261	169	275
2	167	136	200	121	117	120	116	107	99	115	85	267	265	***	284	288	282	282	273	270	267	281	284	281	23
3	150	117	106	108	104	67	69	67	76	70	10	80	88	315	303	286	304	277	178	293	293	301	11	85	61
4	91	105	128	121	106	88	103	111	91	89	131	54	176	166	267	256	266	277	***	***	277	254	153	190	314
5	273	285	334	72	85	86	102	98	100	101	90	357	279	228	257	265	235	267	***	272	252	195	247	324	297
6	254	238	231	127	97	83	79	77	87	96	217	265	259	248	***	***	273	***	273	285	270	282	265	160	313
7	157	121	174	204	108	87	92	99	97	89	73	105	257	245	252	214	***	259	270	276	285	266	257	260	196
8	252	259	269	283	285	291	289	304	302	263	278	278	275	277	276	279	281	278	284	288	283	281	283	283	209
9	282	89	99	92	80	102	95	99	119	155	122	182	179	158	128	310	265	268	***	289	2	246	5	320	183
10	335	61	100	107	108	100	116	120	88	81	135	178	269	272	275	279	280	287	290	340	292	85	97	103	307
11	96	100	104	107	100	91	82	82	84	101	177	271	262	271	313	341	340	292	289	290	291	277	179	345	229
12	189	310	293	288	293	304	300	284	286	289	287	283	273	275	275	264	268	260	263	265	308	161	165	159	24
13	158	135	143	108	104	101	21	62	96	215	274	281	266	229	195	266	267	282	283	289	291	86	113	120	229
14	110	107	87	86	91	88	91	82	83	86	124	152	153	222	267	261	259	263	276	263	252	261	276	278	93
15	296	308	265	282	289	337	129	110	144	219	275	266	280	268	272	***	***	***	***	279	276	280	284	285	146
16	286	291	288	11	65	78	98	31	285	289	273	275	275	276	281	276	266	279	284	287	322	204	152	106	349
17	113	115	103	107	149	156	88	98	131	130	196	284	272	268	280	271	281	269	270	280	267	127	128	109	55
18	113	114	128	111	117	121	149	136	145	177	237	275	280	276	254	***	285	282	***	286	276	148	100	145	65
19	150	115	130	118	136	116	113	120	112	128	218	265	286	268	279	271	268	278	282	284	282	328	67	35	33
20	68	145	102	103	113	116	105	89	84	147	251	271	268	261	276	270	279	289	***	291	302	131	167	253	242
21	284	294	288	284	321	82	99	104	124	127	126	270	206	262	270	254	195	261	260	278	284	284	278	283	202
22	283	287	290	13	96	94	107	120	115	166	147	168	175	227	172	177	196	192	249	272	289	291	288	***	228
23	304	294	309	8	4	9	127	309	141	221	263	170	316	269	307	250	273	281	279	277	276	274	273	270	296
24	284	284	276	283	280	277	201	233	258	280	270	250	257	290	292	291	278	284	292	297	340	314	210	304	237
25	309	281	284	295	176	149	93	94	89	84	114	272	260	253	252	244	250	253	***	***	267	277	265	289	213
26	***	279	288	275	125	151	189	177	225	297	305	291	274	284	275	282	288	285	289	289	317	57	65	75	186
27	63	76	84	68	74	79	89	92	101	127	274	342	61	81	16	297	271	269	279	292	297	292	292	69	324
28	74	96	83	75	72	74	80	79	90	91	86	103	85	99	95	101	95	88	97	75	77	65	61	84	304
29	83	77	75	68	70	69	70	79	89	73	87	96	87	82	84	89	84	80	77	115	87	67	67	74	211
30	91	102	92	94	90	104	101	95	86	89	86	90	130	97	163	265	182	220	271	***	286	290	314	80	214

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 97.1% OPERATIONAL RECOVERY RATE = 97.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	232	181	178	132	155	144	108	133	155	147	91	283	236	274	244	245	269	276	283	267	263	261	266	185	91
2	161	148	200	145	115	127	117	111	119	133	87	283	257	***	254	277	292	287	276	273	268	275	284	308	132
3	63	123	121	100	100	64	69	63	88	66	1	67	81	307	282	263	294	270	183	297	291	307	48	75	162
4	96	111	142	130	104	89	102	83	71	78	105	58	181	148	308	263	264	281	***	***	280	282	121	188	8
5	268	281	332	106	49	74	108	100	87	139	90	30	285	184	237	278	245	253	***	262	243	189	240	317	126
6	278	230	277	133	102	95	28	76	80	85	325	348	266	256	***	***	258	***	278	280	272	285	15	156	295
7	145	108	234	202	111	88	90	95	92	92	93	118	248	261	262	245	***	266	274	276	287	276	267	257	121
8	247	248	294	281	278	295	296	326	4	269	309	282	291	284	274	282	294	282	286	291	280	291	287	308	110
9	311	83	96	99	74	98	88	85	116	112	98	175	173	128	150	315	280	274	***	280	349	207	109	348	13
10	332	11	73	113	138	104	99	78	75	87	142	191	140	285	272	327	273	287	298	322	301	127	127	102	24
11	94	105	126	140	119	82	64	80	92	83	177	287	271	286	288	291	318	294	304	289	295	195	336	88	179
12	144	272	292	289	287	301	294	286	289	289	290	272	268	262	276	269	269	267	264	278	276	63	120	147	147
13	171	99	115	98	101	142	299	357	9	304	287	281	279	250	264	275	197	268	283	282	295	76	128	134	6
14	121	112	96	102	119	96	97	88	83	25	181	127	132	175	254	273	290	252	275	269	257	263	262	287	175
15	343	297	200	288	272	325	158	135	149	314	270	273	281	263	275	***	***	***	***	286	254	263	287	287	81
16	282	304	287	13	73	69	129	276	292	338	278	287	294	274	280	252	269	293	259	275	350	198	115	101	76
17	116	138	117	116	148	182	95	114	112	156	224	258	257	269	274	249	310	294	271	279	269	82	162	119	125
18	117	146	140	150	128	137	166	131	145	179	270	283	270	275	255	***	292	282	***	286	253	172	100	138	92
19	157	130	123	131	140	120	136	120	105	132	316	270	268	269	271	271	274	274	283	281	282	176	50	47	126
20	63	185	105	99	140	103	95	92	86	87	232	266	323	279	286	294	270	272	***	289	324	90	191	269	336
21	269	288	272	210	300	56	73	108	122	137	284	345	120	288	279	239	203	261	261	276	292	232	272	285	19
22	285	277	260	135	72	107	92	137	128	143	135	165	141	185	171	164	193	170	250	259	290	284	267	***	292
23	317	255	161	135	81	19	88	318	25	12	246	156	6	295	301	272	288	284	281	272	269	262	259	246	163
24	213	209	200	233	271	274	258	252	251	278	278	252	272	296	282	296	278	281	305	281	103	113	193	315	202
25	15	219	191	260	136	164	27	85	94	68	323	276	259	277	249	242	248	252	***	***	275	275	224	282	87
26	***	275	294	282	152	213	245	195	228	280	288	284	280	282	278	274	287	288	287	306	15	70	74	80	120
27	53	71	73	76	68	68	72	74	88	99	286	1	64	66	354	301	270	266	281	281	285	207	292	338	96
28	90	112	101	98	88	81	80	78	89	86	88	88	85	70	87	112	93	92	111	63	61	55	72	78	95
29	102	91	82	75	74	76	72	80	101	106	94	95	90	84	74	94	81	75	99	131	80	68	60	76	151
30	80	111	94	90	93	94	88	75	75	100	89	91	129	99	168	207	166	222	276	***	306	295	27	71	122

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 97.1% OPERATIONAL RECOVERY RATE = 97.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	205	180	175	114	143	143	108	136	132	193	91	221	239	281	224	256	***	***	***	258	***	239	246	168	100
2	178	137	195	81	***	***	***	***	123	115	112	***	262	***	260	282	***	274	282	***	265	274	282	298	89
3	82	***	***	***	***	74	74	***	***	***	***	***	45	310	245	3	***	***	***	***	***	***	36	***	96
4	102	112	147	107	93	95	106	98	71	72	111	84	172	146	283	256	***	***	***	***	***	***	75	1	275
5	***	275	***	***	***	70	121	101	79	123	112	71	278	207	217	***	231	259	***	***	247	189	228	281	241
6	***	243	266	***	99	102	28	61	274	121	***	331	***	***	***	***	***	***	269	***	***	***	***	146	24
7	***	85	***	***	109	71	***	***	71	90	57	***	***	***	267	247	***	***	***	***	***	***	252	261	291
8	246	191	45	282	314	206	312	354	339	311	283	271	293	278	263	***	***	***	***	***	***	296	306	325	169
9	317	98	92	109	68	96	71	61	54	104	78	174	203	148	***	***	271	315	***	***	***	***	151	341	360
10	324	50	78	118	130	103	102	85	101	108	152	183	296	261	276	319	***	***	***	***	***	***	150	***	239
11	43	129	147	137	118	65	71	85	47	94	179	310	286	276	272	291	***	***	***	283	***	231	12	72	6
12	125	272	297	292	284	334	***	***	***	282	308	254	261	268	***	***	260	254	263	249	258	122	101	106	248
13	176	90	109	128	47	54	266	29	352	358	290	275	270	270	343	308	207	256	267	284	288	83	162	114	202
14	124	103	111	104	111	102	90	82	78	18	139	135	137	203	274	287	271	249	***	261	257	278	259	291	343
15	329	283	227	282	287	292	123	85	118	236	270	269	***	286	***	***	***	***	***	286	283	***	***	280	50
16	293	289	286	56	71	85	140	318	292	243	226	267	296	***	***	236	***	***	261	***	***	***	63	***	14
17	***	149	118	***	113	175	106	119	341	176	238	254	245	289	***	***	322	***	272	***	279	25	145	119	164
18	111	131	153	134	141	122	161	116	144	174	269	307	***	***	***	***	299	***	***	***	268	194	98	193	54
19	134	159	145	118	45	108	166	86	109	129	194	268	273	260	278	286	***	***	***	***	282	187	51	54	343
20	77	172	133	123	124	116	108	75	106	102	***	255	285	286	305	***	270	260	***	***	***	***	205	273	323
21	270	312	241	212	310	41	70	143	112	158	236	277	122	287	***	204	***	251	***	304	***	***	278	284	44
22	293	284	276	71	98	111	91	124	134	162	130	141	132	163	173	165	155	***	***	264	***	***	271	***	41
23	316	279	154	108	78	24	67	333	63	343	233	144	21	298	302	284	296	***	269	***	265	257	253	264	216
24	158	224	240	63	297	270	270	242	207	273	272	249	270	292	274	296	270	279	293	292	137	113	177	328	234
25	317	167	194	348	21	101	101	82	124	76	50	95	263	255	249	238	247	***	***	***	276	287	255	***	144
26	***	***	308	294	***	246	248	205	231	276	284	286	287	278	262	272	286	281	289	314	69	129	90	30	67
27	76	79	78	82	83	71	72	77	87	97	292	352	69	55	356	308	275	248	275	281	268	265	357	330	32
28	110	115	106	124	91	82	80	78	***	***	87	75	93	70	82	120	91	97	81	63	40	49	80	74	93
29	108	105	83	69	70	61	82	71	99	108	89	***	81	76	79	***	***	***	***	***	104	86	65	73	228
30	83	114	95	74	89	93	95	84	82	105	99	89	110	89	132	219	157	***	***	***	298	***	84	72	241

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 76.8% OPERATIONAL RECOVERY RATE = 76.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
APRIL - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.54	0.79	0.73	0.41	0.20	0.20	0.41	0.04	0.17	0.82	1.04	1.11	1.11	1.17	1.24	1.26	1.20	0.77	0.74	0.43	0.55	0.28	0.29	0.33	0.66
2	0.53	0.56	0.71	0.60	0.35	0.44	0.44	0.47	0.60	0.86	1.01	1.05	1.08	***	1.08	0.85	0.87	0.78	0.58	0.91	0.49	0.44	0.36	0.53	0.68
3	0.46	0.31	0.37	0.26	0.32	0.40	0.60	0.83	0.99	1.00	1.31	1.37	1.13	1.32	1.32	1.21	1.03	0.70	0.67	0.56	0.67	0.40	0.67	0.51	0.77
4	0.28	0.31	0.23	0.44	0.25	0.08	0.06	0.23	0.25	0.32	0.54	0.93	1.02	1.08	1.16	0.84	0.94	1.01	***	***	0.42	0.27	0.24	0.63	0.52
5	0.95	0.69	0.59	0.52	0.32	0.31	0.13	0.30	0.29	0.60	1.01	0.95	0.92	1.02	1.11	1.10	0.86	0.78	***	0.71	0.26	0.51	0.50	0.71	0.66
6	0.58	0.48	0.38	0.50	0.64	0.56	0.52	0.32	0.46	0.68	1.07	1.14	0.95	0.94	***	***	1.14	***	***	0.66	0.80	0.74	0.58	0.22	0.67
7	0.25	0.32	0.58	0.34	0.32	0.56	0.74	0.54	0.31	0.54	0.87	1.17	1.11	1.02	1.10	1.01	1.00	0.83	1.04	0.52	0.56	0.72	0.60	0.48	0.69
8	0.23	0.48	0.43	0.38	0.35	0.35	0.47	0.54	0.84	0.95	0.90	0.76	1.06	1.03	1.15	1.05	0.95	0.97	0.75	0.47	0.54	0.51	0.49	0.38	0.67
9	0.36	0.44	0.18	0.25	0.33	0.21	0.13	0.22	0.35	0.65	0.92	1.07	1.18	1.12	1.12	1.08	1.00	0.55	***	0.30	0.75	0.82	0.73	0.59	0.62
10	0.33	0.34	0.28	0.37	0.25	0.32	0.29	0.27	0.33	0.51	0.89	0.98	1.10	1.07	1.31	1.01	1.08	0.86	0.87	0.85	0.98	0.62	0.66	0.65	0.68
11	0.75	0.38	0.29	0.51	0.48	0.27	0.17	0.08	0.19	0.81	0.93	0.94	0.98	1.10	0.93	0.91	0.88	0.92	0.74	0.63	0.55	0.67	0.86	0.62	0.65
12	0.57	0.61	0.66	0.61	0.45	0.50	0.60	0.64	0.51	0.73	0.82	0.82	0.76	0.76	0.72	0.65	0.86	0.57	0.33	0.29	0.68	0.63	0.41	0.40	0.61
13	0.40	0.25	0.34	0.27	0.08	0.02	0.01	0.02	0.15	0.84	0.87	1.02	1.00	1.19	1.24	1.14	1.10	0.91	0.74	0.70	0.53	0.80	0.61	0.68	0.62
14	0.73	0.58	0.58	0.65	0.53	0.25	0.27	0.43	0.68	0.93	1.07	1.05	1.23	1.05	1.13	1.20	0.81	0.93	0.74	0.48	0.49	0.48	0.66	0.81	0.74
15	0.66	0.63	0.84	0.65	0.69	0.33	0.09	0.19	0.24	0.76	0.74	0.88	0.89	1.37	1.24	***	***	***	***	1.03	0.76	0.75	0.67	0.66	0.70
16	0.53	0.43	0.77	0.77	0.51	0.28	0.24	0.44	0.66	1.12	1.09	1.01	1.28	1.04	1.17	0.94	0.90	0.77	0.95	0.70	0.95	0.99	0.54	0.50	0.77
17	0.45	0.34	0.30	0.27	0.32	0.24	0.23	0.42	0.27	0.44	0.99	0.92	0.84	0.89	0.97	1.16	1.03	1.04	0.59	0.42	0.76	0.82	0.44	0.53	0.61
18	0.52	0.48	0.36	0.32	0.26	0.15	0.23	0.20	0.33	0.60	0.88	0.81	0.93	1.10	1.06	***	1.09	0.87	***	0.82	0.68	0.72	0.57	0.51	0.61
19	0.50	0.38	0.23	0.32	0.46	0.45	0.38	0.16	0.39	0.57	0.87	1.05	1.07	1.21	1.07	1.05	0.87	0.71	0.89	0.80	0.61	0.76	0.54	0.75	0.67
20	0.48	0.53	0.50	0.36	0.25	0.25	0.21	0.23	0.53	0.90	0.76	0.97	1.23	1.42	1.17	1.11	0.96	0.79	***	0.66	0.58	0.57	0.80	0.94	0.70
21	0.73	0.74	0.49	0.40	0.46	0.23	0.32	0.01	0.25	0.58	1.18	1.01	1.03	1.31	1.22	1.22	0.78	1.12	0.92	0.61	0.52	0.82	0.71	0.62	0.72
22	0.63	0.60	0.66	0.49	0.47	0.17	0.12	0.21	0.32	0.87	0.95	1.07	1.11	1.31	1.31	1.10	1.29	1.08	0.77	0.71	0.80	0.82	0.51	***	0.76
23	0.64	0.38	0.45	0.52	0.45	0.25	0.20	0.26	0.38	0.84	1.02	1.07	0.99	0.99	0.98	0.72	0.88	0.98	0.52	0.78	0.63	0.59	0.64	0.80	0.67
24	0.66	0.71	0.77	0.72	0.62	0.34	0.32	0.35	0.76	1.04	0.99	1.02	1.19	0.97	1.00	0.90	1.06	0.89	0.90	0.69	0.74	0.69	0.81	0.59	0.78
25	0.68	0.55	0.59	0.71	0.55	0.28	0.32	0.26	0.37	1.02	1.24	1.30	1.12	0.93	0.96	1.06	0.84	0.72	***	***	***	0.82	0.60	0.84	0.75
26	***	***	0.45	0.33	***	0.50	0.32	0.48	0.55	0.38	0.46	0.66	0.54	0.53	0.73	0.89	0.83	0.73	0.69	0.50	0.50	0.58	0.57	0.39	0.55
27	0.29	0.44	0.23	0.30	0.27	0.09	0.04	0.07	0.26	0.61	0.70	0.98	1.23	1.25	1.00	0.92	0.72	0.79	0.65	0.27	0.32	0.65	0.62	0.60	0.55
28	0.49	0.48	0.45	0.53	0.61	0.56	0.83	0.95	0.45	***	0.93	0.87	0.82	1.07	1.36	1.12	1.04	1.03	0.68	0.55	0.69	0.56	0.46	0.63	0.75
29	0.48	0.75	0.61	0.69	0.68	0.50	0.48	0.52	0.88	1.12	1.06	0.99	1.07	1.01	1.06	1.20	1.04	0.92	0.68	***	0.55	0.54	0.54	0.62	0.78
30	0.54	0.51	0.34	0.44	0.36	0.39	0.23	0.25	0.36	0.83	0.85	1.11	1.11	1.07	1.10	1.13	0.87	0.93	0.88	***	0.56	0.48	0.33	0.24	0.65
HRAVE	0.53	0.50	0.48	0.46	0.41	0.32	0.31	0.33	0.44	0.76	0.93	1.00	1.04	1.08	1.10	1.03	0.96	0.86	0.74	0.62	0.62	0.63	0.57	0.58	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.66	0.68	0.77	0.52	0.66	0.67	0.69	0.67	0.62	0.68	0.65	0.61	0.62	0.74	0.70	0.77	0.61	0.61	0.67	0.70	0.72	0.76	0.67	0.78	0.75
MAX	1.26	1.08	1.37	1.16	1.11	1.14	1.17	1.15	1.18	1.31	1.10	0.86	1.24	1.23	1.37	1.28	1.16	1.10	1.21	1.42	1.31	1.31	1.07	1.19	1.30
MIN	0.04	0.35	0.26	0.06	0.13	0.22	0.25	0.23	0.13	0.25	0.08	0.29	0.01	0.25	0.09	0.24	0.23	0.15	0.16	0.21	0.01	0.12	0.20	0.32	0.26

DAY	26	27	28	29	30	31
AVE	0.55	0.55	0.75	0.78	0.65	***
MAX	0.89	1.25	1.36	1.20	1.13	***
MIN	0.32	0.04	0.45	0.48	0.23	***

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.4% OPERATIONAL RECOVERY RATE = 96.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.81	0.81	0.65	0.57	0.30	0.25	0.08	0.24	0.15	0.48	1.04	1.17	0.99	1.20	1.49	***	***	***	***	***	0.53	0.36	0.33	0.29	0.62
2	0.44	0.59	0.69	0.60	0.39	0.37	0.43	0.49	0.50	0.90	0.94	0.92	1.24	***	***	***	0.69	0.59	***	***	0.50	0.41	0.41	0.52	0.61
3	0.55	0.39	0.35	0.51	0.28	0.49	0.62	0.86	***	***	1.29	1.24	1.00	1.30	1.20	1.21	1.17	0.65	***	***	***	***	0.52	0.51	0.79
4	0.45	0.34	0.23	0.37	0.37	0.29	0.22	0.85	0.66	0.25	0.65	0.95	1.05	0.94	1.15	0.79	***	0.93	***	***	0.51	0.19	0.30	0.57	0.57
5	0.92	0.73	0.51	0.47	0.26	0.33	0.26	0.31	0.14	0.59	1.07	0.98	0.99	1.05	0.92	***	***	***	***	***	0.25	0.56	0.58	0.84	0.62
6	0.60	0.50	0.37	0.38	0.65	0.48	0.55	0.70	0.75	0.81	1.07	1.07	1.23	***	***	***	***	***	***	0.35	0.69	***	***	***	0.68
7	0.59	0.25	0.63	0.45	0.35	0.40	***	0.53	0.46	0.51	0.82	***	1.04	0.81	***	***	***	0.94	1.12	0.58	0.61	0.69	0.80	0.62	0.64
8	0.35	0.44	0.39	0.44	0.42	0.58	0.41	0.50	0.71	0.84	0.92	0.73	0.93	1.05	1.06	0.89	0.94	0.98	0.80	0.58	0.42	0.37	0.70	0.56	0.67
9	0.64	0.91	0.37	0.51	0.39	0.23	0.40	0.77	0.56	0.50	0.80	1.06	1.07	1.21	***	1.31	1.28	0.78	***	0.32	***	0.92	0.67	0.58	0.73
10	0.49	0.50	0.41	0.40	0.36	0.15	0.22	0.66	0.55	0.45	0.86	1.05	1.12	1.08	1.27	0.95	***	0.60	0.74	0.91	1.03	0.67	0.75	0.55	0.69
11	0.71	0.43	0.42	0.52	0.43	0.23	0.33	0.41	0.38	0.79	0.80	1.00	1.07	1.02	0.86	0.81	***	***	***	0.49	0.46	0.74	0.73	0.63	0.63
12	0.61	0.73	0.63	0.51	0.51	0.37	0.45	0.30	0.28	0.75	0.85	0.86	0.89	0.95	0.87	0.72	0.87	0.66	0.48	0.47	0.60	0.67	0.63	0.56	0.63
13	0.40	0.53	0.37	0.43	0.47	0.39	0.15	0.04	0.14	0.66	0.57	0.84	1.08	1.20	1.31	1.26	1.03	0.74	0.71	0.53	0.77	0.74	0.59	0.59	0.65
14	0.74	0.72	0.83	0.68	0.48	0.23	0.31	0.45	0.75	1.08	1.26	1.31	1.49	1.33	1.02	1.08	0.84	0.98	0.74	0.38	0.64	0.71	0.74	0.89	0.82
15	0.99	0.86	0.87	1.00	0.83	0.48	0.12	0.34	0.25	0.49	0.66	0.98	0.74	***	***	***	***	***	***	1.25	0.78	0.90	0.61	0.78	0.72
16	0.58	0.68	0.83	0.85	0.58	0.35	0.11	0.52	0.84	1.20	0.97	1.04	1.23	***	1.29	1.12	1.06	0.91	1.01	0.46	0.94	1.10	0.68	0.68	0.83
17	0.68	0.51	0.42	0.33	0.57	0.25	0.20	0.42	0.28	0.52	1.12	1.01	0.83	0.94	0.85	1.30	0.91	1.16	0.54	0.40	0.84	0.79	0.56	0.68	0.67
18	0.58	0.82	0.53	0.41	0.73	0.25	0.15	0.40	0.39	0.46	0.78	0.76	0.91	***	1.13	***	***	0.80	***	0.72	0.70	0.67	0.62	0.56	0.62
19	0.46	0.54	0.41	0.52	0.61	0.78	0.43	0.26	0.29	0.57	0.82	1.13	1.19	1.01	1.02	1.19	0.97	***	***	0.39	0.54	1.15	0.57	0.97	0.72
20	0.56	0.39	0.75	0.55	0.57	0.36	0.32	0.29	0.60	0.93	0.68	1.00	1.09	1.24	0.89	0.89	***	0.75	***	0.83	0.51	0.56	0.82	0.94	0.71
21	0.77	0.92	0.63	0.42	0.50	0.25	0.54	0.56	0.19	0.72	1.15	0.92	1.07	1.33	1.16	1.07	***	1.06	1.18	0.68	0.54	0.87	0.65	0.53	0.77
22	0.46	0.39	0.39	0.53	0.44	0.66	0.65	0.21	0.34	0.72	0.83	1.12	1.16	1.31	1.34	1.21	1.12	1.04	0.61	0.86	***	0.78	0.65	***	0.76
23	0.81	0.78	0.63	0.58	0.64	0.42	0.30	0.59	0.51	0.77	1.03	1.12	0.95	0.97	0.84	0.61	***	***	0.44	0.57	0.77	***	0.68	0.76	0.70
24	0.78	0.82	0.87	0.74	0.84	0.61	0.33	0.33	0.77	0.96	0.84	0.89	1.11	1.00	1.06	0.81	0.76	0.97	0.82	***	0.61	0.68	0.63	0.56	0.77
25	0.51	0.50	0.64	0.82	0.68	0.35	0.34	0.05	0.10	0.92	1.02	1.39	1.26	1.15	1.06	1.02	0.78	0.78	***	***	***	0.84	0.75	***	0.75
26	***	***	0.56	0.71	***	0.49	0.44	0.64	0.53	0.23	0.40	0.64	0.43	0.54	0.79	1.04	0.85	0.85	0.70	0.62	0.61	0.65	0.54	0.67	0.62
27	0.63	0.45	0.46	0.46	0.48	0.08	0.08	0.06	0.05	0.40	0.60	0.84	1.28	1.18	1.09	0.96	0.94	0.69	0.62	0.60	0.50	0.66	0.60	0.68	0.60
28	0.59	0.69	0.49	0.66	0.50	0.40	0.71	***	***	***	0.79	0.92	0.87	0.95	1.24	1.33	1.22	1.15	0.83	0.28	0.69	0.56	0.50	0.72	0.77
29	0.68	0.69	0.71	0.65	0.71	0.45	0.57	0.69	0.97	1.15	0.93	1.08	0.87	1.10	1.15	1.17	1.05	***	***	***	0.55	0.68	0.70	0.79	0.83
30	0.59	0.66	0.59	0.54	0.58	0.69	0.71	0.53	0.47	0.93	0.81	1.01	1.20	1.01	1.04	1.04	0.96	0.85	0.78	***	***	0.57	0.27	0.33	0.73
HRAVE	0.62	0.61	0.55	0.55	0.51	0.39	0.36	0.45	0.45	0.70	0.88	1.00	1.05	1.07	1.08	1.03	0.97	0.86	0.76	0.58	0.62	0.68	0.61	0.64	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.62	0.61	0.79	0.57	0.62	0.68	0.64	0.67	0.73	0.69	0.63	0.63	0.65	0.82	0.72	0.83	0.67	0.62	0.72	0.71	0.77	0.76	0.70	0.77	0.75
MAX	1.49	1.24	1.30	1.15	1.07	1.23	1.12	1.06	1.31	1.27	1.07	0.95	1.31	1.49	1.25	1.29	1.30	1.13	1.19	1.24	1.33	1.34	1.12	1.11	1.39
MIN	0.08	0.37	0.28	0.19	0.14	0.35	0.25	0.35	0.23	0.15	0.23	0.28	0.04	0.23	0.12	0.11	0.20	0.15	0.26	0.29	0.19	0.21	0.30	0.33	0.05

DAY	26	27	28	29	30	31
AVE	0.62	0.60	0.77	0.83	0.73	***
MAX	1.04	1.28	1.33	1.17	1.20	***
MIN	0.23	0.05	0.28	0.45	0.27	***

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 88.6% OPERATIONAL RECOVERY RATE = 88.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
APRIL - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	0.78	0.60	0.56	0.29	0.27	0.09	0.23	0.19	0.51	1.02	1.29	***	***	***	***	***	***	***	***	***	***	0.37	0.29	0.50
2	0.42	0.55	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.49
3	***	***	***	***	***	0.60	0.60	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.60
4	***	***	***	***	0.38	0.17	0.35	0.85	0.64	0.29	0.60	***	***	***	***	***	***	***	***	***	***	***	***	***	0.47
5	***	***	***	***	***	***	***	0.42	0.13	0.63	***	***	***	***	***	***	***	***	***	***	***	***	0.65	***	0.46
6	***	***	***	***	***	0.40	***	0.75	0.76	0.89	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.70
7	***	***	***	***	***	***	***	***	***	0.46	***	***	***	***	***	***	***	***	***	***	***	***	0.83	0.69	0.66
8	0.31	***	0.38	***	***	***	0.44	0.44	0.72	0.91	0.89	0.77	***	***	***	***	***	***	***	***	***	0.40	0.65	0.57	0.59
9	***	0.92	0.36	0.40	***	***	0.38	0.69	0.49	0.45	0.91	1.15	1.05	***	***	***	1.48	***	***	***	***	***	0.73	0.54	0.73
10	0.55	0.54	0.47	0.44	0.36	***	0.26	0.76	0.66	0.46	***	***	***	***	1.21	***	***	***	***	***	***	***	***	***	0.57
11	***	0.42	***	0.50	0.38	0.19	0.37	0.55	0.37	0.82	0.72	1.03	1.15	0.96	1.05	***	***	***	***	***	***	***	***	0.65	0.65
12	0.60	0.80	***	0.42	0.66	***	***	***	***	0.89	0.89	0.88	0.95	1.00	***	***	***	***	0.53	0.46	0.67	0.63	0.60	0.49	0.70
13	0.49	0.55	0.49	0.52	0.52	0.41	0.15	0.09	0.18	0.65	0.56	0.79	1.10	1.33	***	***	***	0.74	***	***	0.93	0.70	0.59	0.61	0.60
14	0.74	0.70	0.76	0.71	0.51	0.22	0.32	0.49	0.76	1.05	1.35	1.47	1.36	***	0.98	***	***	***	***	***	0.69	***	0.80	0.99	0.82
15	0.90	0.96	0.83	0.96	0.83	0.52	0.12	0.30	0.25	0.46	0.64	***	***	***	***	***	***	***	***	***	***	***	***	***	0.62
16	***	0.72	***	0.86	***	***	***	0.53	0.97	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.77
17	***	***	***	***	0.53	***	***	***	0.35	0.60	0.96	***	***	***	***	***	***	***	***	***	***	0.78	***	***	0.64
18	***	0.72	0.63	0.48	0.72	0.31	***	0.48	0.45	0.45	0.81	***	***	***	***	***	***	***	***	***	0.60	***	0.60	0.54	0.57
19	0.45	0.56	0.39	0.54	0.54	0.95	0.57	0.26	0.27	0.56	0.82	1.17	***	1.08	***	***	***	***	***	***	***	1.15	***	***	0.67
20	0.53	0.32	0.77	0.57	0.74	***	0.36	0.33	***	***	***	***	***	1.28	***	***	***	***	***	***	***	***	0.85	0.92	0.67
21	0.85	0.97	0.50	0.44	0.49	0.21	0.55	0.50	0.21	0.75	***	0.72	***	***	***	***	***	***	***	***	***	***	0.64	0.55	0.57
22	***	0.35	0.39	0.58	0.43	0.77	0.59	0.19	0.32	0.77	0.80	***	***	***	***	***	***	***	***	***	***	***	0.57	***	0.52
23	0.75	0.88	0.69	0.48	0.70	0.39	0.40	0.66	0.46	0.73	1.01	1.09	0.73	0.94	***	***	***	***	***	***	***	***	0.71	0.72	0.71
24	0.75	0.83	0.86	0.83	0.89	0.65	0.59	0.45	0.92	1.10	0.87	1.03	1.12	1.07	1.09	0.88	0.81	1.04	0.84	***	0.66	0.76	0.94	0.74	0.86
25	0.58	0.59	0.67	0.89	0.80	0.76	0.57	0.05	0.12	0.91	1.10	1.31	1.34	1.07	1.06	0.97	***	***	***	***	***	0.87	0.72	***	0.80
26	***	***	0.57	0.66	***	0.52	0.51	0.62	0.55	0.34	0.54	0.66	0.50	0.50	1.04	1.14	0.80	0.86	0.79	0.58	0.78	0.74	0.64	0.79	0.67
27	0.80	0.63	0.55	0.80	0.55	0.16	0.59	0.80	0.47	0.39	0.56	0.85	1.31	1.20	1.04	0.99	0.90	0.62	0.71	***	0.49	0.68	0.60	0.62	0.71
28	0.63	0.76	0.73	1.02	0.54	0.39	***	***	***	***	***	0.89	0.79	0.97	1.37	1.37	1.12	1.28	1.10	0.19	***	0.58	0.56	0.75	0.84
29	0.69	0.66	0.74	0.60	0.70	0.63	0.55	0.69	***	1.19	0.87	***	***	1.14	***	***	***	***	***	***	***	***	0.81	0.82	0.78
30	0.65	0.64	0.55	0.58	0.59	0.70	0.68	0.50	0.45	0.85	0.82	1.05	***	***	***	***	***	***	***	***	***	***	0.20	0.32	0.61
HRAVE	0.63	0.68	0.60	0.63	0.58	0.46	0.43	0.48	0.46	0.68	0.84	1.01	1.04	1.04	1.11	1.07	1.02	0.91	0.79	0.41	0.69	0.73	0.65	0.64	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.50	0.49	0.60	0.47	0.46	0.70	0.66	0.59	0.73	0.57	0.65	0.70	0.60	0.82	0.62	0.77	0.64	0.57	0.67	0.67	0.57	0.52	0.71	0.86	0.80
MAX	1.29	0.55	0.60	0.85	0.65	0.89	0.83	0.91	1.48	1.21	1.15	1.00	1.33	1.47	0.96	0.97	0.96	0.81	1.17	1.28	0.97	0.80	1.09	1.12	1.34
MIN	0.09	0.42	0.60	0.17	0.13	0.40	0.46	0.31	0.36	0.26	0.19	0.42	0.09	0.22	0.12	0.53	0.35	0.31	0.26	0.32	0.21	0.19	0.39	0.45	0.05

DAY	26	27	28	29	30	31
AVE	0.67	0.71	0.84	0.78	0.61	***
MAX	1.14	1.31	1.37	1.19	1.05	***
MIN	0.34	0.16	0.19	0.55	0.20	***

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 50.0% OPERATIONAL RECOVERY RATE = 50.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
MAY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.4	3.8	5.3	5.0	4.1	2.5	2.8	3.4	3.5	1.6	2.1	3.1	4.1	4.4	5.3	5.7	6.6	7.2	7.3	6.8	5.2	3.7	3.0	2.5	4.3
2	2.5	3.0	2.7	2.4	2.5	2.4	2.5	2.5	3.1	2.8	3.4	3.4	4.7	5.6	5.9	6.2	6.3	6.9	6.5	5.2	8.7	***	6.9	5.7	4.4
3	4.4	4.3	5.8	5.4	3.3	1.9	2.4	2.5	2.1	2.9	4.0	4.4	4.8	4.3	4.5	4.3	6.0	4.5	5.9	7.2	5.2	4.9	4.3	4.3	4.3
4	9.9	6.0	2.8	4.7	2.9	1.0	1.8	2.6	3.3	2.2	2.5	2.8	3.3	5.2	7.1	8.8	9.3	9.7	4.7	3.0	3.5	5.0	5.1	4.2	4.6
5	3.0	3.3	2.8	3.4	2.9	3.1	2.9	2.6	3.0	3.3	3.4	3.4	4.1	5.4	6.0	5.8	5.5	5.4	5.7	3.9	2.9	3.0	2.9	2.3	3.7
6	3.0	3.3	2.8	3.1	3.0	2.8	3.1	3.4	2.4	1.7	3.8	4.4	5.4	6.2	5.7	5.6	7.0	6.0	7.3	7.4	9.7	9.0	8.0	7.6	5.1
7	5.4	5.5	7.9	5.2	4.5	3.5	2.3	2.0	2.2	3.5	3.6	4.6	4.3	4.1	6.3	6.6	5.8	7.0	5.1	4.9	4.0	5.9	5.1	4.3	4.7
8	6.0	5.1	6.7	6.5	5.8	4.2	2.5	2.4	2.6	5.0	8.6	9.2	10.7	10.2	***	10.7	8.9	10.3	8.9	6.2	6.7	4.2	3.3	4.5	6.5
9	6.1	7.2	7.1	5.4	3.8	2.8	2.2	2.6	3.5	4.3	4.9	5.0	4.9	5.8	6.5	6.3	6.4	5.9	6.3	6.1	4.9	3.2	3.0	2.9	4.9
10	1.7	2.5	2.9	2.6	2.4	2.8	3.4	3.2	2.5	3.2	4.5	4.8	4.9	6.2	6.0	6.9	6.3	7.2	5.7	5.1	3.7	4.7	3.0	2.5	4.1
11	3.6	3.6	3.4	3.4	3.6	4.7	3.6	3.6	3.5	3.2	3.1	3.6	5.8	4.9	4.8	4.8	5.4	4.2	5.0	6.7	5.3	4.7	4.0	4.3	4.3
12	4.2	4.3	3.0	3.7	3.2	3.5	4.3	3.2	2.7	2.5	3.3	4.8	5.5	6.8	8.7	7.4	7.6	7.5	6.8	6.7	4.0	5.3	7.8	8.7	5.2
13	7.1	5.9	5.9	5.9	4.5	3.5	2.2	2.2	2.5	3.5	3.3	4.1	5.1	5.4	3.8	5.0	***	4.1	***	***	4.3	4.4	4.0	3.4	4.3
14	4.1	3.9	3.5	5.5	3.5	2.6	2.8	3.5	3.0	4.6	5.6	8.5	7.3	8.9	8.1	9.7	8.8	***	***	***	***	***	***	4.2	5.4
15	5.4	6.6	5.4	4.6	4.3	5.6	5.9	4.8	4.2	4.9	5.9	6.2	6.7	7.0	7.3	5.7	7.7	8.0	9.8	7.0	4.6	2.5	2.3	5.6	5.8
16	6.3	***	1.7	4.7	2.9	1.8	2.3	2.7	3.8	4.3	4.5	5.9	5.3	5.2	5.8	7.5	6.3	6.3	5.5	4.8	3.5	5.2	2.8	2.4	4.4
17	2.4	2.5	3.7	4.3	4.4	3.9	2.9	2.5	2.7	3.5	4.5	3.8	4.0	4.2	5.3	5.5	5.1	4.6	6.2	6.6	5.6	2.9	3.5	3.9	4.1
18	3.3	4.0	3.5	2.1	2.5	2.5	3.8	3.8	3.1	2.9	4.3	4.9	5.1	6.9	15.4	***	***	5.7	3.7	***	***	***	4.1	4.2	4.5
19	4.0	3.4	4.2	4.9	2.6	2.4	2.7	3.3	3.0	3.2	4.5	4.5	4.6	4.3	6.0	6.6	7.0	7.8	7.2	***	3.7	3.4	2.4	4.7	4.4
20	4.8	3.5	3.5	3.9	4.0	3.2	3.4	3.4	2.9	2.9	3.4	4.5	5.4	5.3	4.2	5.5	5.9	7.1	***	***	4.9	3.5	6.5	2.7	4.3
21	3.3	3.2	2.5	2.1	2.3	3.2	4.2	3.4	2.9	2.6	3.3	4.1	4.9	5.8	8.1	7.6	***	***	***	***	7.6	6.7	7.6	5.6	4.5
22	3.9	4.1	2.8	2.3	2.7	2.7	3.2	3.2	2.7	4.2	5.1	6.2	8.1	8.7	9.2	7.6	9.6	8.6	7.5	8.4	***	3.9	4.3	3.7	5.3
23	4.5	4.2	4.6	2.0	0.6	1.1	1.8	2.3	3.2	3.6	4.2	3.6	4.4	5.8	8.7	8.6	7.4	6.8	6.7	***	4.8	3.4	3.7	3.8	4.3
24	2.1	2.9	3.9	4.6	3.6	3.4	3.6	3.8	2.7	3.5	3.8	4.1	5.9	5.0	7.3	8.5	9.5	8.4	7.6	***	5.5	3.2	4.7	6.1	4.9
25	2.8	2.7	3.2	3.5	3.4	4.0	4.1	3.2	2.2	2.2	4.0	6.1	6.6	4.5	5.8	6.5	7.0	6.9	6.0	5.6	4.3	3.3	2.5	1.9	4.3
26	2.7	3.5	3.2	2.5	2.3	2.7	3.5	3.0	2.7	2.7	3.2	3.5	4.3	5.0	4.7	5.5	6.8	6.8	8.4	***	3.0	2.6	2.2	2.8	3.8
27	2.1	4.1	3.6	2.3	2.1	3.1	3.3	3.4	3.3	2.5	3.0	3.6	4.4	4.1	5.0	5.6	5.8	7.7	6.9	6.1	5.1	4.7	4.1	4.0	4.2
28	3.2	1.2	2.8	3.3	3.5	3.0	4.0	3.2	2.5	3.0	2.9	4.1	3.8	4.8	6.2	7.7	7.2	7.5	7.3	***	5.5	4.5	3.7	1.9	4.2
29	1.5	2.7	3.5	3.5	3.2	3.5	5.3	2.8	2.0	2.4	3.1	5.3	5.2	5.9	6.1	5.3	6.0	5.8	5.8	***	***	5.1	4.5	2.9	4.2
30	2.8	2.9	3.4	3.5	2.4	3.3	3.9	3.9	2.9	2.8	3.5	3.3	3.9	4.2	4.9	5.4	7.2	7.7	***	***	6.0	4.2	2.9	2.1	4.0
31	2.5	2.6	3.7	3.0	3.0	3.8	3.7	4.2	3.4	3.2	3.6	3.7	4.5	5.2	6.3	7.4	8.8	7.2	6.2	***	***	3.3	5.8	5.3	4.6
HRAVE	3.9	3.9	3.9	3.8	3.2	3.0	3.2	3.1	2.9	3.2	4.0	4.6	5.2	5.7	6.5	6.7	7.0	6.8	6.5	6.0	5.1	4.3	4.3	4.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.3	4.4	4.3	4.6	3.7	5.1	4.7	6.5	4.9	4.1	4.3	5.2	4.3	5.4	5.8	4.4	4.1	4.5	4.4	4.3	4.5	5.3	4.3	4.9	4.3
MAX	7.3	8.7	7.2	9.9	6.0	9.7	7.9	10.7	7.2	7.2	6.7	8.7	7.1	9.7	9.8	7.5	6.6	15.4	7.8	7.1	8.1	9.6	8.7	9.5	7.0
MIN	1.6	2.4	1.9	1.0	2.3	1.7	2.0	2.4	2.2	1.7	3.1	2.5	2.2	2.6	2.3	1.7	2.4	2.1	2.4	2.7	2.1	2.3	0.6	2.1	1.9

DAY	26	27	28	29	30	31
AVE	3.8	4.2	4.2	4.2	4.0	4.6
MAX	8.4	7.7	7.7	6.1	7.7	8.8
MIN	2.2	2.1	1.2	1.5	2.1	2.5

MONTHLY AVERAGE = 4.6 MONTHLY MAXIMUM = 15.4 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.3% OPERATIONAL RECOVERY RATE = 95.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
MAY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.3	3.7	5.0	5.2	4.4	2.8	2.8	2.5	2.5	1.9	2.4	3.8	4.7	4.9	3.8	5.6	8.9	6.7	4.8	6.9	5.1	3.5	2.8	8.2	4.4
2	2.2	2.2	3.1	1.9	2.9	1.3	0.9	1.3	2.6	2.0	3.2	3.1	5.7	6.0	7.5	7.9	5.6	5.1	6.1	7.3	11.7	***	8.7	6.3	4.6
3	4.5	3.7	5.9	5.2	3.5	1.7	1.5	1.9	1.9	2.4	3.3	5.4	4.4	4.5	3.5	4.9	3.6	3.5	3.3	6.7	5.8	5.8	4.4	5.0	4.0
4	10.5	4.0	3.2	4.1	2.3	1.7	4.1	4.2	3.9	2.8	2.3	2.3	3.4	5.0	6.8	7.7	10.4	9.5	4.4	3.0	4.7	5.7	5.8	3.2	4.8
5	3.1	4.0	2.6	2.4	3.7	4.2	3.7	3.2	4.2	3.3	3.4	4.4	4.1	5.3	5.8	6.8	5.9	6.2	5.3	4.1	3.8	5.2	3.7	2.5	4.2
6	3.0	2.7	2.0	1.9	3.0	2.2	2.2	3.1	2.7	2.3	4.0	4.7	7.0	8.8	4.9	4.4	7.3	4.8	7.2	8.6	9.6	5.9	8.4	7.4	4.9
7	4.8	5.9	5.6	4.7	4.4	3.7	3.3	3.0	2.3	3.7	5.0	5.1	5.9	5.5	5.6	6.6	5.4	6.9	5.8	5.4	4.7	6.7	4.1	3.3	4.9
8	3.5	4.0	5.9	6.5	6.0	2.6	2.9	2.5	2.8	5.0	6.3	9.5	10.4	7.8	***	10.0	10.0	9.9	6.1	5.3	5.2	4.5	4.4	4.3	5.9
9	7.9	7.5	7.5	5.8	4.4	4.2	3.1	2.8	4.2	4.5	4.7	6.1	7.2	7.3	5.6	6.8	7.5	6.9	5.2	5.7	5.6	2.8	3.0	2.5	5.4
10	3.4	3.1	3.1	2.2	2.2	2.2	2.8	2.7	2.1	2.2	4.4	4.2	5.2	5.0	4.9	7.8	7.9	6.2	4.8	5.1	5.1	4.4	3.8	3.8	4.1
11	3.5	3.2	3.5	3.5	4.2	4.3	3.8	4.0	4.2	3.5	3.2	3.6	6.2	6.4	4.8	6.3	7.7	4.2	5.1	7.1	7.1	4.9	3.9	4.9	4.7
12	4.4	3.6	3.4	4.7	3.3	4.2	4.3	2.6	3.0	3.4	3.3	4.9	6.1	7.0	8.2	6.3	7.3	7.6	6.6	6.9	3.2	5.0	7.2	10.0	5.3
13	9.1	4.6	3.2	5.6	5.3	4.8	2.6	2.5	2.5	2.3	3.2	4.9	5.4	6.1	4.4	4.8	***	4.2	***	***	5.0	4.2	1.9	4.7	4.3
14	3.4	3.1	2.7	3.4	4.0	2.1	2.8	4.1	3.4	5.2	8.4	8.7	7.1	6.9	8.5	8.2	8.8	***	***	***	***	***	***	4.0	5.3
15	4.2	5.6	6.2	6.8	4.2	5.5	5.9	4.0	3.4	4.6	4.9	4.7	6.3	7.3	6.9	6.0	7.8	11.7	11.8	8.4	4.7	2.3	2.1	3.2	5.8
16	7.0	***	4.9	5.5	4.1	3.6	3.5	3.6	3.5	4.8	4.0	5.5	5.2	6.0	4.8	6.4	8.0	6.8	5.8	5.0	4.5	4.2	4.3	3.0	4.9
17	3.1	3.0	3.1	4.0	4.8	4.4	2.9	3.0	2.7	2.8	4.5	3.8	3.9	4.1	4.0	6.7	3.5	4.2	7.1	6.2	7.4	4.5	3.3	3.1	4.2
18	3.5	3.0	3.0	3.0	2.5	2.0	3.1	3.5	2.6	3.8	4.3	6.5	5.4	7.7	15.8	***	***	5.9	***	***	***	***	4.4	4.5	4.7
19	4.7	3.7	4.6	5.5	5.3	3.2	4.9	3.1	2.7	3.0	4.7	6.1	4.0	3.6	7.4	7.4	7.7	7.3	7.9	***	6.8	4.5	4.6	6.1	5.2
20	5.0	2.2	4.0	4.0	4.3	2.4	3.2	4.3	2.5	3.5	3.8	5.9	6.0	7.2	6.4	6.7	6.2	7.2	***	***	6.2	3.2	5.6	3.4	4.7
21	4.9	3.7	3.1	3.8	3.4	3.3	4.7	3.1	2.6	2.5	3.9	4.6	3.2	6.5	6.3	7.0	***	***	***	***	6.2	7.2	7.5	5.8	4.7
22	3.8	4.2	2.6	1.9	3.4	2.5	3.2	3.5	2.5	4.7	7.3	7.8	9.3	8.2	9.7	7.8	9.2	8.9	10.0	10.6	***	3.9	3.7	4.4	5.8
23	4.0	4.4	7.0	3.4	2.4	2.5	2.7	2.3	2.9	4.0	6.2	3.5	5.6	8.0	8.1	9.0	7.3	8.0	8.2	***	5.1	3.2	5.2	7.8	5.3
24	4.7	3.0	3.6	4.5	5.4	3.4	3.5	4.0	2.6	2.4	4.5	3.9	4.5	6.3	8.3	8.6	10.5	10.1	7.8	***	5.9	2.9	3.5	5.1	5.2
25	3.7	3.8	2.9	3.1	4.4	3.9	4.9	3.3	2.1	2.5	3.6	6.6	6.9	4.8	6.2	5.9	5.4	6.5	6.5	5.4	4.6	3.6	2.6	4.3	4.5
26	3.5	2.6	2.9	2.3	2.0	2.2	2.5	2.7	3.2	2.8	3.0	5.5	6.4	6.2	5.2	6.4	6.6	7.7	7.3	***	3.7	3.1	2.8	3.8	4.1
27	2.5	5.0	4.3	3.6	3.2	2.9	2.8	3.1	3.5	3.0	3.5	3.2	6.6	6.0	6.6	6.1	5.9	9.4	7.7	7.2	7.5	4.6	6.0	8.0	5.1
28	3.4	2.4	2.4	3.2	3.0	2.3	3.3	3.2	2.3	2.7	3.7	4.8	5.4	5.3	5.9	9.5	6.6	8.6	7.5	***	5.0	5.4	3.8	2.4	4.4
29	3.5	2.8	2.7	3.4	4.0	3.3	4.2	2.6	2.8	2.6	3.7	4.8	5.9	5.7	6.7	7.0	8.2	6.7	5.8	***	***	4.3	5.4	2.9	4.5
30	4.8	4.3	4.0	2.4	2.6	3.2	3.5	3.6	7.1	3.6	2.1	4.7	4.4	4.2	6.4	6.3	7.4	7.6	***	***	6.2	5.2	3.9	2.5	4.5
31	1.8	2.3	2.9	3.5	3.2	4.1	4.1	4.2	3.4	2.5	3.8	4.0	5.4	3.8	4.9	4.3	6.7	6.4	6.3	***	***	3.0	5.1	5.7	4.2
HRAVE	4.3	3.7	3.9	3.9	3.7	3.1	3.3	3.1	3.0	3.2	4.1	5.1	5.7	6.1	6.5	6.8	7.3	7.0	6.6	6.4	5.8	4.4	4.5	4.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.4	4.6	4.0	4.8	4.2	4.9	4.9	5.9	5.4	4.1	4.7	5.3	4.3	5.3	5.8	4.9	4.2	4.7	5.2	4.7	4.7	5.8	5.3	5.2	4.5
MAX	8.9	11.7	6.7	10.5	6.8	9.6	6.9	10.4	7.9	7.9	7.7	10.0	9.1	8.8	11.8	8.0	7.4	15.8	7.9	7.2	7.5	10.6	9.0	10.5	6.9
MIN	1.9	0.9	1.5	1.7	2.4	1.9	2.3	2.5	2.5	2.1	3.2	2.6	1.9	2.1	2.1	3.0	2.7	2.0	2.7	2.2	2.5	1.9	2.3	2.4	2.1

DAY	26	27	28	29	30	31
AVE	4.1	5.1	4.4	4.5	4.5	4.2
MAX	7.7	9.4	9.5	8.2	7.6	6.7
MIN	2.0	2.5	2.3	2.6	2.1	1.8

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 15.8 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.2% OPERATIONAL RECOVERY RATE = 95.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
MAY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.0	3.5	4.6	5.0	4.9	3.9	4.1	2.3	2.9	2.0	2.8	4.1	4.9	5.0	4.0	6.1	11.2	***	***	***	***	***	***	***	4.4
2	2.8	3.6	3.1	1.6	4.8	2.7	2.5	2.7	3.4	2.7	2.3	2.9	7.7	7.1	8.8	7.9	6.0	5.7	6.6	9.2	***	***	9.9	6.8	5.0
3	4.4	4.1	5.7	4.3	3.4	1.9	1.2	2.4	4.0	4.3	3.3	4.3	6.5	4.6	3.6	5.6	3.8	3.4	3.2	***	6.0	6.3	4.2	5.5	4.2
4	10.6	2.7	3.4	3.5	2.9	2.2	4.8	5.0	4.2	3.9	3.2	2.2	4.7	5.0	6.0	7.0	9.6	***	4.0	2.4	5.2	6.1	5.3	2.6	4.6
5	2.2	4.3	3.1	2.0	2.8	4.2	4.3	3.3	4.4	4.0	4.4	4.2	5.4	5.7	6.3	7.1	6.5	6.2	5.0	5.8	4.9	6.5	5.3	3.9	4.7
6	3.2	2.5	0.9	1.5	2.3	2.2	1.8	3.1	3.5	3.0	5.1	5.3	5.9	8.3	5.0	5.2	6.5	4.6	6.1	***	9.6	***	***	7.7	4.4
7	5.4	6.8	6.6	4.1	4.7	3.6	3.6	3.2	2.8	4.0	3.5	4.4	8.1	6.1	6.0	4.7	5.4	7.0	5.9	5.2	5.5	7.1	4.6	3.9	5.1
8	3.9	5.0	6.6	6.2	***	***	***	2.6	2.3	4.7	7.8	***	***	***	***	***	***	***	5.6	6.2	5.4	4.1	4.6	4.7	5.0
9	11.1	9.7	8.0	6.0	4.5	4.5	3.3	2.6	4.6	4.1	4.5	4.9	5.3	8.4	7.0	8.6	6.2	7.4	5.6	***	***	2.7	5.0	3.3	5.8
10	4.6	3.5	4.9	2.0	2.5	3.2	2.4	2.0	2.1	2.2	3.4	2.9	6.3	4.5	4.8	7.1	7.5	7.1	4.8	4.4	5.2	3.4	3.8	5.5	4.2
11	5.1	3.6	4.2	4.0	5.1	4.3	4.6	4.3	4.0	4.8	2.8	4.8	8.0	5.8	4.6	6.0	***	5.2	***	***	6.1	***	***	5.0	4.8
12	4.6	4.1	2.9	6.1	3.0	4.7	6.3	4.4	6.0	7.1	3.5	4.9	5.6	***	***	***	8.1	***	***	***	7.8	5.9	7.7	10.6	5.7
13	8.5	4.5	3.8	6.2	5.0	4.7	3.0	3.2	2.3	2.2	3.1	6.5	6.6	7.4	7.4	5.7	***	***	***	***	5.0	2.2	2.7	5.2	4.8
14	4.2	***	1.7	3.8	4.4	1.6	4.0	4.0	4.1	***	7.9	8.2	***	9.8	11.9	***	***	***	***	***	***	***	***	***	4.1	5.4
15	5.5	6.2	5.4	6.7	5.7	5.2	5.9	4.1	3.6	4.9	5.1	5.5	7.0	8.1	6.1	7.0	8.4	11.2	10.9	9.3	4.8	1.6	4.7	4.0	6.1
16	7.5	***	5.1	6.2	5.3	4.2	4.4	3.8	3.4	5.1	3.3	5.1	5.0	4.7	3.9	6.2	8.9	8.3	5.6	***	4.7	5.7	4.2	3.9	5.2
17	4.5	3.4	4.8	4.6	6.5	4.1	3.3	3.0	3.0	4.1	3.7	4.4	4.4	4.6	4.1	5.2	2.4	4.4	6.0	***	***	3.6	3.9	4.3	4.2
18	2.8	2.0	2.6	3.4	3.1	3.2	5.1	3.3	2.2	4.6	5.9	6.9	***	***	22.3	***	***	***	***	***	***	***	***	***	5.2
19	7.6	***	***	***	***	***	7.2	3.0	2.9	2.8	5.0	6.8	***	***	***	8.0	***	***	***	***	5.5	***	4.4	6.7	5.4
20	5.9	1.4	2.9	4.0	4.3	2.8	4.1	4.9	2.6	4.0	3.1	5.1	8.1	6.9	***	***	***	***	***	***	***	***	***	2.9	4.2
21	4.9	5.6	3.8	4.8	3.1	3.4	5.3	3.2	2.6	***	***	5.8	3.2	7.2	***	***	***	***	***	***	***	***	***	5.3	4.5
22	***	***	3.4	2.1	4.6	4.4	4.5	3.6	3.8	5.5	6.9	7.4	7.8	7.5	***	***	11.8	***	***	***	***	4.0	***	4.3	5.4
23	3.9	4.6	7.1	3.7	2.6	2.5	2.8	2.3	4.3	4.0	7.7	5.6	5.1	7.2	***	***	***	***	***	***	***	3.3	4.7	7.4	4.6
24	4.0	4.7	2.6	3.3	5.8	3.6	4.2	5.0	2.0	2.6	7.3	4.8	3.2	6.8	7.3	9.2	***	***	***	***	***	2.5	4.1	6.9	4.7
25	2.5	6.1	3.2	3.0	5.2	4.2	6.2	3.5	2.5	4.4	3.8	9.8	7.4	5.7	8.5	5.6	6.4	8.7	7.8	***	***	***	3.5	4.1	5.3
26	3.5	2.3	3.0	1.8	1.9	2.0	2.6	2.6	4.0	3.3	3.1	4.7	6.7	4.8	5.5	8.8	7.2	***	***	***	***	***	3.8	3.7	4.0
27	1.8	5.7	4.9	3.8	2.1	3.3	2.7	3.0	3.6	4.4	3.8	3.4	7.9	***	7.2	***	***	***	***	***	***	***	***	9.5	4.5
28	***	2.5	2.0	3.4	3.0	***	3.6	4.4	3.8	***	3.8	4.5	6.6	5.4	5.7	***	***	***	***	***	***	***	***	***	3.4	4.0
29	4.6	2.5	6.3	3.5	4.1	3.2	4.2	2.9	3.1	4.9	3.8	4.4	4.6	5.7	7.6	***	7.7	5.7	***	***	***	***	***	***	4.6
30	6.1	***	3.7	1.9	2.7	4.7	4.2	3.4	8.1	3.8	2.1	4.9	4.8	3.0	5.7	6.2	8.0	7.6	***	***	5.6	3.6	1.9	4.6
31	1.4	2.4	3.1	3.4	2.9	7.2	4.8	6.0	3.4	2.7	2.7	2.8	5.1	3.8	5.5	5.0	5.6	6.3	7.2	***	***	***	5.7	6.4	4.4
HRAVE	4.9	4.1	4.1	3.9	3.9	3.6	4.0	3.5	3.5	3.9	4.3	5.1	6.0	6.1	6.9	6.6	7.2	6.6	6.0	6.1	5.8	4.4	4.8	5.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.4	5.0	4.2	4.6	4.7	4.4	5.1	5.0	5.8	4.2	4.8	5.7	4.8	5.4	6.1	5.2	4.2	5.2	5.4	4.2	4.5	5.4	4.6	4.7	5.3
MAX	11.2	9.9	6.5	10.6	7.1	9.6	8.1	7.8	11.1	7.5	8.0	10.6	8.5	11.9	11.2	8.9	6.5	22.3	8.0	8.1	7.2	11.8	7.7	9.2	9.8
MIN	2.0	1.6	1.2	2.2	2.0	0.9	2.8	2.3	2.6	2.0	2.8	2.9	2.2	1.6	1.6	3.3	2.4	2.0	2.8	1.4	2.6	2.1	2.3	2.0	2.5

DAY	26	27	28	29	30	31
AVE	4.0	4.5	4.0	4.6	4.6	4.4
MAX	8.8	9.5	6.6	7.7	8.1	7.2
MIN	1.8	1.8	2.0	2.5	1.9	1.4

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 22.3 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 78.1% OPERATIONAL RECOVERY RATE = 78.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
MAY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	78	99	120	121	111	97	108	119	162	303	273	272	271	274	279	281	281	276	287	289	293	289	294	335	344
2	91	137	129	107	156	127	115	102	105	48	280	276	274	282	275	281	273	272	268	249	242	***	269	255	40
3	277	277	284	285	295	41	84	81	82	84	130	175	165	177	199	277	280	272	274	266	277	290	316	265	247
4	290	283	259	242	266	203	39	54	46	328	85	82	326	279	282	274	292	296	288	81	80	150	164	154	294
5	146	147	137	128	150	127	92	102	136	118	81	358	269	284	279	278	273	282	283	288	312	26	49	43	163
6	83	97	145	149	98	79	78	80	109	172	72	109	212	241	272	266	261	254	269	262	274	278	315	286	343
7	294	293	294	292	293	294	299	313	23	336	265	191	131	199	190	240	197	231	182	169	286	286	285	284	37
8	291	306	316	312	296	293	288	351	291	295	307	293	288	289	***	270	269	290	292	288	283	273	272	273	121
9	277	278	292	278	264	271	261	292	355	279	290	273	270	279	277	277	281	277	278	290	290	105	87	337	253
10	16	87	92	87	82	88	111	125	126	183	271	272	264	269	275	274	263	272	269	264	277	238	124	123	130
11	106	91	79	85	103	132	108	91	107	112	101	142	169	157	166	177	173	178	166	164	156	161	140	143	321
12	215	173	136	82	91	85	139	117	87	138	170	165	262	198	204	200	243	248	244	246	257	178	157	161	21
13	161	135	106	148	143	128	95	94	157	136	128	155	156	102	136	262	***	263	***	***	326	74	257	171	106
14	195	23	168	135	140	158	328	340	111	173	184	205	192	189	219	247	244	***	***	***	***	***	***	149	1
15	252	279	266	270	281	285	287	286	291	285	272	210	197	246	262	256	230	251	295	294	292	308	61	307	341
16	201	***	244	250	260	237	232	271	284	280	279	286	285	292	286	286	283	282	281	294	208	104	77	58	332
17	56	68	69	73	72	84	101	99	90	84	92	357	341	273	278	280	270	278	278	288	290	159	184	176	252
18	100	120	143	116	71	85	76	95	106	113	174	161	157	227	281	***	***	267	272	***	***	***	241	188	157
19	250	108	43	31	107	105	103	91	110	267	270	271	305	325	310	274	277	291	314	***	327	125	51	98	197
20	117	63	85	105	112	99	92	110	112	138	164	175	124	148	182	253	275	268	***	***	286	260	288	197	66
21	313	278	325	70	78	95	135	109	80	99	173	230	271	199	218	253	***	***	***	***	290	286	281	279	349
22	36	345	341	33	80	85	90	111	106	120	171	180	189	207	246	251	249	251	287	287	***	230	274	263	103
23	109	343	16	334	82	242	357	282	278	267	268	278	286	349	306	293	278	281	280	***	280	153	78	262	5
24	86	106	110	111	109	107	107	118	144	251	253	229	275	282	286	280	289	295	294	***	308	147	223	151	116
25	107	97	103	112	107	120	126	109	102	237	299	293	283	308	263	272	270	278	282	285	282	312	24	37	156
26	93	106	89	0	77	101	127	100	98	126	190	174	175	128	173	266	284	288	292	***	284	275	286	325	202
27	346	284	288	315	110	103	92	102	140	151	173	177	166	151	267	259	274	286	289	288	285	287	284	283	264
28	281	150	102	102	98	102	133	135	100	166	240	325	285	291	286	322	279	277	288	***	292	293	306	291	305
29	90	133	106	100	90	111	149	111	113	156	279	274	327	281	279	322	297	280	281	***	***	287	283	337	70
30	79	87	97	103	97	102	107	121	113	198	262	284	273	262	265	272	281	283	***	***	294	301	315	20	291
31	77	96	108	104	91	75	85	73	86	95	265	207	177	315	275	278	289	282	276	***	***	273	287	310	252

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.3% OPERATIONAL RECOVERY RATE = 95.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
MAY - 2015

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	77	103	132	146	120	108	94	102	145	297	279	281	307	284	270	279	288	266	318	288	296	296	299	340	233
2	70	119	107	67	242	159	63	92	120	71	291	266	270	288	286	274	259	257	267	231	234	***	267	262	245
3	280	267	278	281	286	15	66	72	67	54	107	177	156	186	220	281	292	274	271	260	268	275	315	258	19
4	290	272	267	206	189	68	58	58	43	26	113	111	260	287	273	280	295	293	309	72	78	168	172	165	305
5	152	158	177	137	164	150	122	129	150	151	120	15	272	281	283	278	275	278	280	329	7	130	42	52	239
6	91	104	138	158	109	113	92	96	117	160	96	119	204	205	267	231	206	255	242	254	269	271	305	287	9
7	306	293	285	302	299	283	270	263	327	321	264	168	130	150	212	216	187	225	187	170	277	283	111	112	124
8	244	295	303	321	306	266	291	343	309	301	308	288	286	278	***	257	263	288	320	297	283	269	260	253	189
9	280	266	294	279	268	274	261	275	339	275	281	284	269	290	279	267	277	280	292	286	310	180	172	135	358
10	120	90	90	82	92	84	90	119	126	175	276	267	274	275	281	275	264	271	293	223	281	30	156	202	82
11	140	95	83	79	81	87	96	89	80	83	85	167	176	105	135	171	185	143	157	159	148	151	144	164	273
12	219	182	124	87	102	98	129	125	101	122	122	145	261	197	206	200	215	240	235	243	254	169	153	160	325
13	163	120	32	154	153	151	103	90	90	113	158	130	169	108	140	257	***	267	***	***	311	39	140	143	259
14	188	51	198	141	125	207	303	319	87	155	175	210	207	180	186	241	252	***	***	***	***	***	***	119	115
15	36	293	325	324	279	285	289	284	310	289	262	224	228	255	267	245	213	243	294	293	290	346	52	177	62
16	198	***	198	240	251	246	254	259	267	262	273	291	282	270	306	287	287	284	280	313	82	144	97	78	9
17	48	67	76	79	71	72	97	101	93	60	79	17	92	185	295	267	264	313	286	307	315	103	151	221	31
18	187	146	157	220	37	89	74	89	105	142	145	157	163	229	279	***	***	271	***	***	***	***	264	205	168
19	221	117	45	56	127	77	108	95	75	239	253	253	330	282	282	271	275	279	323	***	14	99	277	115	232
20	87	53	63	105	118	83	90	102	111	113	160	174	142	161	163	240	283	269	***	***	289	247	272	198	202
21	321	160	254	138	6	79	129	106	64	127	177	247	248	209	201	237	***	***	***	***	289	299	282	333	190
22	42	325	352	313	82	5	99	119	143	126	184	160	198	222	248	237	272	273	287	292	***	205	230	162	74
23	103	254	344	353	306	287	346	278	267	249	271	252	265	329	306	295	274	284	285	***	282	164	122	130	341
24	94	12	99	123	128	146	127	142	173	288	260	253	262	310	292	269	281	306	312	***	311	77	243	170	23
25	105	192	56	112	87	134	150	133	149	303	320	305	332	299	249	290	273	282	278	289	295	302	356	210	143
26	259	126	80	357	8	83	109	128	116	152	269	125	167	143	142	270	272	274	288	***	270	166	220	188	172
27	116	288	301	280	248	110	101	129	147	136	173	174	170	149	278	253	271	289	291	287	269	293	303	269	4
28	326	92	96	103	108	93	132	134	100	199	262	323	267	279	280	309	266	280	293	***	292	290	299	288	348
29	115	124	148	103	94	110	147	103	114	115	298	295	321	295	281	329	291	269	276	***	***	285	266	339	301
30	108	91	92	126	95	111	103	121	97	163	190	245	295	265	270	261	252	271	***	***	300	321	290	278	233
31	37	90	111	104	82	68	85	81	79	101	284	82	168	314	274	253	278	288	274	***	***	271	284	306	160

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.2% OPERATIONAL RECOVERY RATE = 95.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	29	90	108	147	119	135	107	99	162	297	269	289	282	257	286	282	300	***	***	***	***	***	***	***	90
2	45	121	108	66	291	138	81	119	132	132	358	249	275	292	287	273	262	264	268	199	***	***	270	283	135
3	310	267	277	277	284	63	91	70	65	18	82	137	149	175	195	281	295	260	277	***	268	280	351	272	164
4	291	248	259	210	182	76	61	54	42	38	127	159	207	278	266	280	281	***	322	48	79	175	184	216	325
5	138	170	201	163	175	157	141	135	153	152	118	27	303	267	281	277	300	281	284	54	44	133	31	36	194
6	119	145	258	286	108	124	100	99	108	215	95	114	206	198	276	247	191	205	194	***	267	***	***	288	197
7	339	297	299	295	293	276	262	244	216	29	270	115	132	148	203	194	182	233	186	167	287	287	93	79	87
8	82	301	325	319	***	***	***	342	293	306	326	***	***	***	***	***	***	***	322	303	282	260	254	229	65
9	291	256	295	282	262	295	264	139	28	282	334	309	274	257	277	263	274	243	341	***	***	168	169	355	140
10	42	97	112	51	63	91	78	108	110	84	273	251	293	291	276	287	270	273	300	232	271	27	93	63	295
11	97	101	86	66	79	93	96	89	82	99	72	160	179	112	125	138	***	154	***	***	134	***	***	163	352
12	138	186	7	83	111	91	133	130	81	121	124	135	246	***	***	***	203	***	***	***	240	153	154	158	284
13	144	97	251	161	157	142	105	104	69	116	112	116	158	119	134	257	***	***	***	***	303	56	146	140	157
14	235	***	155	143	151	188	333	337	108	***	178	213	***	182	184	***	***	***	***	***	***	***	***	121	188
15	0	279	313	328	272	285	283	287	296	284	257	205	239	251	262	240	229	225	282	286	308	348	281	179	228
16	200	***	196	249	248	242	252	257	260	259	305	300	285	306	310	274	281	276	278	***	110	167	103	53	355
17	63	50	85	86	71	78	89	94	81	68	80	13	70	190	320	264	235	297	274	***	***	91	131	283	188
18	239	254	244	290	31	112	69	91	119	165	132	143	***	***	289	***	***	***	***	***	***	***	***	***	174
19	224	***	***	***	***	***	114	91	101	177	201	261	***	***	***	280	***	***	***	***	18	***	320	130	108
20	73	94	96	104	115	59	75	101	102	101	160	180	147	129	***	***	***	***	***	***	***	***	***	195	298
21	341	162	135	40	18	81	121	106	66	***	***	218	225	226	***	***	***	***	***	***	***	***	***	310	67
22	***	***	27	342	69	334	151	114	110	149	200	174	198	221	***	***	268	***	***	***	***	212	***	170	312
23	112	205	348	352	295	270	350	278	252	243	253	278	277	326	***	***	***	***	***	***	***	158	129	128	222
24	84	52	71	104	127	131	109	123	177	272	273	266	219	311	284	251	***	***	***	***	***	87	282	179	301
25	267	215	50	108	70	135	150	139	128	247	292	317	322	285	254	297	280	282	265	***	***	***	32	249	280
26	233	112	59	1	13	114	96	125	108	185	210	135	157	157	169	254	278	***	***	***	***	***	200	195	239
27	89	293	314	292	30	114	106	128	148	108	180	153	166	***	290	***	***	***	***	***	***	***	***	275	12
28	***	34	85	112	122	***	118	135	148	***	267	333	273	348	299	***	***	***	***	***	***	***	***	283	9
29	182	115	130	104	99	100	151	114	128	188	317	314	303	298	270	***	294	304	***	***	***	***	***	***	196
30	109	***	103	116	20	82	98	112	65	164	234	232	289	266	274	261	264	269	***	***	***	336	289	222	259
31	18	86	109	103	82	83	87	88	79	129	289	150	178	330	274	253	257	277	280	***	***	***	275	306	98

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 78.1% OPERATIONAL RECOVERY RATE = 78.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.22	0.40	0.46	0.36	0.26	0.08	0.01	0.04	0.37	0.37	0.57	0.68	1.04	1.30	1.00	1.09	1.11	0.90	1.16	0.74	0.56	0.41	0.53	0.39	0.59
2	0.28	0.33	0.25	0.26	0.27	0.11	0.10	0.19	0.37	0.65	0.72	0.85	1.13	1.16	1.17	1.08	0.87	0.91	0.86	0.48	0.69	***	0.60	0.85	0.62
3	0.78	0.71	0.54	0.30	0.37	0.12	0.05	0.16	0.16	0.70	0.88	1.13	1.06	1.11	1.19	0.99	0.98	0.85	0.85	0.54	0.53	0.43	0.53	0.44	0.64
4	0.66	0.73	0.48	0.63	0.49	0.22	0.35	0.36	0.62	0.49	0.38	0.37	0.88	0.93	0.98	0.82	0.59	0.74	0.56	0.35	0.44	0.64	0.56	0.39	0.57
5	0.27	0.29	0.29	0.30	0.22	0.18	0.25	0.21	0.55	0.91	1.00	0.90	0.86	0.88	0.89	1.01	0.79	0.90	0.56	0.48	0.75	0.58	0.51	0.37	0.58
6	0.20	0.23	0.48	0.30	0.25	0.37	0.19	0.28	0.49	0.66	0.82	1.01	1.19	1.06	1.15	1.00	1.08	0.71	0.71	0.66	0.65	0.57	0.57	0.61	0.63
7	0.35	0.28	0.48	0.36	0.26	0.25	0.45	0.55	0.67	1.04	1.06	0.99	0.96	1.02	1.14	1.06	0.86	0.91	0.74	0.68	0.55	0.44	0.63	0.57	0.68
8	0.56	0.70	0.54	0.46	0.51	0.54	0.22	0.49	0.72	0.80	1.01	1.05	0.99	1.37	***	1.13	1.09	1.37	1.04	0.71	0.58	0.47	0.67	0.60	0.77
9	0.57	0.52	0.58	0.41	0.30	0.26	0.29	0.61	0.78	0.97	1.05	1.09	1.32	0.90	1.17	0.99	0.86	0.91	0.82	0.66	0.57	0.67	0.71	0.65	0.74
10	0.43	0.33	0.52	0.46	0.28	0.02	0.16	0.18	0.51	0.87	0.98	1.08	1.01	1.16	1.18	1.05	1.07	0.99	0.75	0.48	0.41	0.72	0.57	0.61	0.66
11	0.40	0.57	0.44	0.36	0.40	0.27	0.16	0.11	0.32	0.61	0.78	0.81	1.25	1.27	1.15	0.93	1.04	0.94	0.59	0.78	0.50	0.65	0.64	0.58	0.65
12	0.75	0.70	0.43	0.57	0.58	0.16	0.39	0.27	0.54	0.90	0.94	0.95	0.88	0.95	0.88	0.94	0.78	0.82	0.44	0.58	0.52	0.81	0.68	0.64	0.67
13	0.52	0.78	0.63	0.55	0.25	0.13	0.08	0.12	0.73	0.74	0.91	1.12	1.16	1.01	0.94	1.11	***	0.79	***	***	0.62	0.77	0.76	0.64	0.68
14	0.62	0.67	0.64	0.64	0.69	0.24	0.41	0.61	0.82	0.93	0.97	0.92	1.17	1.22	1.12	0.91	1.31	***	***	***	***	***	***	0.84	0.82
15	0.77	0.73	0.80	0.64	0.60	0.36	0.36	0.54	0.64	0.60	0.81	0.92	1.07	0.97	0.92	0.99	0.84	0.96	0.75	0.47	0.41	0.61	0.71	0.75	0.72
16	0.63	***	0.61	0.85	0.39	0.22	0.12	0.27	0.56	0.63	0.92	0.99	0.95	0.92	0.95	0.82	1.05	0.90	0.71	0.57	0.53	0.96	0.60	0.57	0.68
17	0.68	0.52	0.53	0.45	0.39	0.28	0.07	0.41	0.63	0.86	1.17	0.98	1.15	1.11	1.24	1.16	1.13	0.90	0.64	0.55	0.68	0.90	0.60	0.62	0.74
18	0.57	0.53	0.58	0.53	0.46	0.15	0.13	0.12	0.53	0.90	0.98	1.13	1.09	1.02	1.03	***	***	0.95	0.58	***	***	***	0.89	0.73	0.68
19	0.74	0.83	0.82	0.79	0.43	0.16	0.04	0.55	0.69	0.87	1.11	1.17	1.36	1.29	***	1.05	1.02	0.88	0.91	***	0.80	0.71	0.70	0.77	0.80
20	0.63	0.57	0.57	0.43	0.46	0.25	0.09	0.22	0.50	0.71	0.91	0.88	1.24	1.25	1.09	1.24	1.22	1.03	***	***	0.55	0.57	0.70	0.81	0.72
21	0.78	0.67	0.43	0.43	0.37	0.32	0.24	0.24	0.24	0.56	0.82	1.05	1.20	1.13	1.19	1.03	***	***	***	***	0.77	0.82	0.52	0.52	0.67
22	0.88	0.70	0.61	0.45	0.45	0.21	0.21	0.35	0.59	0.96	1.14	1.18	1.14	0.99	0.87	0.72	0.86	0.95	0.69	***	***	0.79	0.55	0.61	0.72
23	0.64	0.72	0.65	0.28	0.20	0.16	0.23	0.47	0.70	0.90	1.12	1.22	1.19	0.93	1.01	1.19	1.01	1.02	0.94	***	0.42	0.71	0.92	0.75	0.76
24	0.58	0.63	0.46	0.36	0.28	0.34	0.11	0.34	0.70	0.89	1.14	1.07	1.13	1.13	1.15	1.20	1.10	1.03	1.00	***	0.55	0.85	0.49	0.68	0.75
25	0.71	0.56	0.33	0.44	0.52	0.35	0.22	0.07	0.39	0.50	0.99	1.08	1.24	1.13	1.11	1.16	0.94	0.76	0.89	0.61	0.31	0.39	0.59	0.38	0.65
26	0.48	0.48	0.46	0.52	0.37	0.01	0.29	0.18	0.40	0.86	1.10	1.16	1.27	1.21	1.25	1.36	0.86	0.96	0.95	***	0.28	0.41	0.41	0.41	0.68
27	0.35	0.42	0.56	0.61	0.40	0.12	0.09	0.23	0.36	0.62	0.50	0.95	1.08	1.21	1.03	0.81	1.01	***	0.77	0.66	0.70	0.57	***	0.53	0.62
28	0.31	0.44	0.44	0.42	0.37	0.20	0.32	0.24	0.74	0.73	0.76	1.15	1.21	1.06	0.81	0.93	1.21	0.87	0.95	***	0.57	0.49	0.25	***	0.66
29	0.34	0.36	0.28	0.31	0.31	0.22	0.31	0.31	0.47	0.80	0.95	1.10	1.04	1.14	1.38	***	1.10	0.90	0.70	***	***	0.74	0.61	0.69	0.67
30	0.53	0.43	0.29	0.40	0.37	0.12	0.33	0.54	0.54	0.88	0.98	1.05	1.06	1.17	1.17	1.21	1.11	0.97	***	***	0.42	0.22	0.60	0.47	0.68
31	0.32	0.29	0.27	0.44	0.41	0.36	0.30	0.28	0.35	0.63	0.94	0.97	1.21	1.33	0.89	0.87	0.89	1.04	0.95	***	***	0.48	0.60	0.56	0.65
HRAVE	0.53	0.54	0.50	0.46	0.38	0.22	0.21	0.31	0.54	0.76	0.92	1.00	1.11	1.11	1.07	1.03	0.99	0.92	0.79	0.59	0.55	0.62	0.61	0.60	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.59	0.62	0.64	0.57	0.58	0.63	0.68	0.77	0.74	0.66	0.65	0.67	0.68	0.82	0.72	0.68	0.74	0.68	0.80	0.72	0.67	0.72	0.76	0.75	0.65
MAX	1.30	1.17	1.19	0.98	1.01	1.19	1.14	1.37	1.32	1.18	1.27	0.95	1.16	1.31	1.07	1.05	1.24	1.13	1.36	1.25	1.20	1.18	1.22	1.20	1.24
MIN	0.01	0.10	0.05	0.22	0.18	0.19	0.25	0.22	0.26	0.02	0.11	0.16	0.08	0.24	0.36	0.12	0.07	0.12	0.04	0.09	0.24	0.21	0.16	0.11	0.07

DAY	26	27	28	29	30	31
AVE	0.68	0.62	0.66	0.67	0.68	0.65
MAX	1.36	1.21	1.21	1.38	1.21	1.33
MIN	0.01	0.09	0.20	0.22	0.12	0.27

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.5% OPERATIONAL RECOVERY RATE = 94.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.37	0.56	0.43	0.48	0.54	0.16	0.03	0.03	0.28	0.27	0.55	0.55	0.79	1.08	0.87	1.12	***	0.82	***	0.71	0.69	0.33	0.57	0.30	0.52
2	0.20	0.15	0.33	0.33	0.22	0.28	0.16	0.06	0.34	0.42	0.73	1.02	1.21	1.06	1.14	0.88	0.94	1.00	0.83	0.60	0.60	***	0.64	0.78	0.61
3	0.81	0.66	0.66	0.41	0.48	0.04	0.39	0.35	0.70	0.59	0.69	1.00	1.22	0.98	1.16	1.14	1.08	0.68	0.70	0.59	0.57	0.61	0.61	0.77	0.70
4	0.64	0.61	0.52	0.74	0.53	0.21	0.34	0.42	0.45	0.57	0.39	0.22	0.90	0.90	0.83	0.83	0.42	0.52	0.49	0.28	0.56	0.69	0.60	0.36	0.54
5	0.25	0.26	0.12	0.26	0.34	0.22	0.15	0.15	0.39	0.79	1.00	0.97	1.16	0.98	0.96	0.89	0.79	0.95	0.66	***	0.72	0.78	0.66	0.43	0.60
6	0.33	0.29	0.20	0.23	0.28	0.05	0.08	0.12	0.11	0.48	0.89	0.87	0.95	1.06	1.01	1.00	1.26	0.86	***	***	0.59	0.63	***	0.72	0.57
7	0.52	0.62	0.51	0.50	0.26	0.35	0.43	0.46	0.55	0.92	1.23	1.31	1.31	1.11	1.06	1.07	0.97	0.71	0.65	0.70	0.50	0.28	0.52	0.66	0.72
8	0.91	0.88	***	***	0.45	0.44	0.46	0.37	0.62	0.80	1.09	1.23	1.15	***	***	1.38	***	1.46	1.05	0.73	0.61	0.68	0.59	0.65	0.82
9	0.63	0.55	0.39	0.36	0.45	0.26	0.35	0.76	0.76	1.03	1.06	1.08	1.32	0.96	1.22	0.72	0.68	1.14	1.02	***	0.46	0.31	0.43	0.56	0.72
10	0.51	0.62	0.61	0.45	0.43	0.17	0.30	0.20	0.56	0.49	0.75	1.41	1.09	1.07	1.18	0.92	0.98	1.05	0.62	0.36	0.53	0.60	0.45	0.56	0.66
11	0.39	0.45	0.64	0.54	0.44	0.40	0.23	0.29	0.43	0.34	0.65	0.85	1.12	1.24	1.18	0.79	0.90	0.96	0.84	1.15	0.56	0.62	0.74	0.50	0.68
12	0.89	0.99	0.49	0.52	0.57	0.83	0.25	0.11	0.56	0.88	0.80	0.88	1.06	0.79	1.18	1.06	0.94	***	0.21	0.54	0.58	0.95	0.69	0.59	0.71
13	0.57	0.83	0.89	0.48	0.22	0.26	0.35	0.07	0.54	0.74	0.99	1.00	1.13	1.07	0.92	0.96	***	***	***	***	0.70	0.70	0.84	0.53	0.69
14	0.51	0.66	0.64	0.45	0.62	0.25	0.30	0.74	0.88	0.92	1.02	0.74	1.03	1.16	1.37	1.00	1.45	***	***	***	***	***	***	***	0.66	0.80
15	0.94	0.99	1.12	0.83	0.67	0.26	***	0.25	0.66	0.73	0.69	0.88	1.11	1.02	0.80	0.85	0.96	0.88	0.60	0.65	0.56	0.52	0.55	0.61	0.74
16	0.66	***	0.51	0.72	0.38	0.08	0.18	0.25	0.43	0.57	0.96	0.69	0.96	1.09	1.02	0.76	0.87	0.97	0.81	***	0.55	0.65	0.71	0.50	0.65
17	0.72	0.74	0.49	0.51	0.48	0.21	0.03	0.26	0.56	0.77	1.01	1.11	1.04	1.30	1.13	0.93	0.94	1.02	0.75	***	***	0.68	0.47	0.50	0.71
18	0.59	0.66	0.51	0.47	0.52	0.05	0.08	0.12	0.40	0.84	0.78	***	***	1.01	0.97	***	***	***	***	***	***	***	***	0.68	0.55
19	0.75	0.86	0.80	***	0.50	0.21	0.10	0.38	0.65	0.94	1.00	1.03	1.30	1.18	***	1.05	1.05	0.81	***	***	0.88	0.78	0.74	0.63	0.78
20	0.61	0.62	0.64	0.50	0.51	0.18	0.15	0.18	0.37	0.67	0.94	0.66	0.98	***	***	***	***	***	***	***	***	0.63	0.94	0.54	0.57
21	0.63	0.64	0.39	0.51	0.50	0.34	0.25	0.21	0.23	0.50	0.85	0.97	1.01	0.89	1.03	***	***	***	***	***	***	***	0.46	0.51	0.58
22	0.91	0.74	0.71	0.61	0.57	0.25	0.57	0.21	0.45	0.85	1.16	1.22	1.23	***	1.16	***	0.80	***	***	***	***	0.93	0.78	0.77	0.77
23	0.70	0.93	0.80	0.49	0.45	0.15	0.33	0.46	0.60	0.87	0.98	1.31	1.49	1.11	0.93	1.16	0.76	0.85	1.09	***	***	0.64	0.68	0.70	0.79
24	0.61	0.57	0.67	0.38	0.36	0.43	0.26	0.25	0.56	0.84	1.15	1.09	1.05	1.32	1.24	0.91	1.11	***	***	***	***	0.88	0.84	0.70	0.76
25	0.68	0.63	0.46	0.51	0.64	0.38	0.16	0.07	0.44	0.50	1.03	1.17	1.16	1.21	1.26	1.24	0.87	0.81	0.85	***	***	0.70	0.62	0.69	0.73
26	0.63	0.51	0.47	0.51	0.35	0.04	0.11	0.04	0.32	0.70	1.01	1.24	1.26	1.19	1.18	1.25	0.92	1.04	***	***	0.48	0.60	0.79	0.53	0.69
27	0.48	0.73	0.73	0.71	0.59	0.04	0.02	0.56	0.31	0.43	0.45	0.86	1.16	1.29	1.08	0.98	0.94	***	***	***	***	0.32	***	0.47	0.64
28	0.44	0.58	0.62	0.63	0.44	0.15	0.19	0.17	0.76	0.68	0.80	1.13	1.09	1.11	0.87	1.06	1.51	0.90	***	***	0.43	***	***	***	0.71
29	0.50	0.44	0.42	0.32	0.28	0.10	0.12	0.12	0.39	0.75	0.81	0.96	1.18	1.14	1.46	***	1.08	0.67	0.69	***	***	***	***	0.71	0.64
30	0.53	0.40	0.27	0.28	0.21	0.10	0.32	0.57	0.57	0.74	0.89	1.14	1.14	1.05	1.24	***	***	0.82	***	***	0.52	0.13	0.54	0.42	0.59
31	0.36	0.53	0.30	0.43	0.29	0.42	0.38	0.46	0.37	0.58	0.93	0.87	1.09	1.32	0.84	1.03	0.88	***	***	***	***	***	0.63	0.58	0.65
HRAVE	0.59	0.62	0.54	0.49	0.44	0.24	0.24	0.28	0.49	0.68	0.88	0.98	1.12	1.10	1.08	1.00	0.96	0.90	0.74	0.63	0.58	0.61	0.64	0.59	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.52	0.61	0.70	0.54	0.60	0.57	0.72	0.82	0.72	0.66	0.68	0.71	0.69	0.80	0.74	0.65	0.71	0.55	0.78	0.57	0.58	0.77	0.79	0.76	0.73
MAX	1.12	1.21	1.22	0.90	1.16	1.26	1.31	1.46	1.32	1.41	1.24	1.18	1.13	1.45	1.12	1.09	1.30	1.01	1.30	0.98	1.03	1.23	1.49	1.32	1.26
MIN	0.03	0.06	0.04	0.21	0.12	0.05	0.26	0.37	0.26	0.17	0.23	0.11	0.07	0.25	0.25	0.08	0.03	0.05	0.10	0.15	0.21	0.21	0.15	0.25	0.07

DAY	26	27	28	29	30	31
AVE	0.69	0.64	0.71	0.64	0.59	0.65
MAX	1.26	1.29	1.51	1.46	1.24	1.32
MIN	0.04	0.02	0.15	0.10	0.10	0.29

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 86.8% OPERATIONAL RECOVERY RATE = 86.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
MAY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.37	0.61	0.47	0.50	0.51	0.15	0.23	0.12	0.28	0.29	0.52	0.54	0.79	***	***	***	***	***	***	***	***	***	***	***	0.41
2	0.21	0.13	0.35	0.33	0.27	0.23	0.13	0.09	0.30	0.43	0.68	1.01	1.22	***	***	***	***	***	***	***	***	***	0.55	0.83	0.45
3	0.72	0.71	0.69	0.40	0.60	0.04	0.33	0.33	0.64	0.73	0.71	1.08	1.21	0.90	1.09	1.32	1.16	0.71	***	***	0.56	0.63	0.63	0.81	0.73
4	0.62	0.61	0.52	0.68	0.58	0.29	0.53	0.46	0.44	0.67	0.37	0.42	0.91	0.93	0.93	0.81	0.44	***	0.37	0.33	0.50	0.79	0.51	0.40	0.57
5	0.31	0.34	0.42	0.31	0.43	0.19	0.20	0.43	0.50	0.78	1.00	0.96	1.09	0.98	0.91	0.85	0.81	1.02	0.67	***	0.62	0.90	0.77	0.50	0.65
6	0.65	0.41	0.19	0.39	0.58	0.52	0.68	0.51	0.72	0.56	0.95	0.84	0.87	***	1.07	***	***	***	***	***	***	***	***	0.75	0.65
7	0.48	0.59	***	0.39	0.32	0.32	0.47	0.48	0.55	1.03	1.26	1.31	1.36	1.22	1.01	1.08	1.05	0.73	0.61	0.76	0.54	0.28	0.54	0.91	0.75
8	0.94	***	***	***	***	***	***	0.41	0.54	0.80	1.15	***	***	***	***	***	***	***	1.04	0.91	***	0.81	0.60	0.64	0.78
9	0.75	***	0.35	0.39	0.55	0.32	0.45	0.87	0.87	1.16	0.91	1.14	1.28	1.01	1.51	0.60	***	1.13	1.24	***	***	0.36	0.54	0.57	0.80
10	0.50	0.67	0.65	0.53	0.41	0.20	0.40	0.32	0.61	0.60	0.85	1.38	1.01	1.02	1.22	0.83	0.87	***	***	***	0.69	0.63	0.48	0.60	0.69
11	0.37	0.43	0.73	0.63	0.51	0.47	0.78	0.58	1.09	0.74	0.71	0.88	0.91	***	***	0.63	***	***	***	***	***	***	***	0.62	0.67
12	0.90	0.99	0.51	0.54	0.69	0.76	0.25	0.13	0.61	0.87	0.80	0.92	1.06	***	***	***	***	***	***	***	0.53	1.05	0.68	0.56	0.70
13	0.53	0.78	0.88	0.48	0.24	0.26	0.49	0.07	0.52	0.84	0.93	0.89	1.07	1.25	0.87	0.85	***	***	***	***	***	0.77	0.88	0.57	0.69
14	0.51	***	0.62	0.47	0.59	***	0.40	0.78	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.73	0.59
15	0.99	1.00	1.00	0.78	0.69	***	***	0.23	0.60	0.64	0.72	0.84	1.15	1.01	***	0.87	***	***	0.56	0.68	0.55	0.59	0.68	0.75	0.75
16	0.82	***	0.47	0.58	0.42	0.13	0.24	0.35	0.40	0.48	0.91	0.69	1.00	1.18	0.98	0.81	0.82	0.96	0.84	***	0.65	0.59	0.58	0.46	0.65
17	0.71	0.66	0.52	0.62	0.53	0.16	0.01	0.31	0.54	0.82	1.00	1.05	1.06	1.35	1.20	0.96	0.93	1.07	***	***	***	0.67	0.51	0.46	0.72
18	0.50	0.62	0.48	0.47	0.52	0.09	0.15	0.13	0.39	0.74	0.85	***	***	***	***	***	***	***	***	***	***	***	***	***	0.45
19	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.85	***	***	***	0.85
20	0.60	***	***	***	***	***	0.13	0.24	0.39	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.55	0.38
21	0.66	0.58	0.39	0.58	0.62	0.40	0.27	0.24	0.21	***	***	1.04	1.09	***	***	***	***	***	***	***	***	***	***	***	0.55
22	***	***	***	0.74	***	***	***	0.19	0.45	***	1.32	1.05	***	***	***	***	***	***	***	***	***	1.02	***	0.84	0.80
23	0.75	***	***	0.49	0.48	0.18	0.34	0.42	0.59	0.79	1.03	1.23	1.36	1.24	***	***	***	***	***	***	***	0.68	0.65	0.63	0.72
24	0.59	0.59	0.65	0.41	***	0.53	0.26	0.22	0.54	0.79	1.14	1.13	1.03	1.34	1.33	0.79	***	***	***	***	***	***	***	0.74	0.75
25	0.62	0.68	0.48	0.53	0.69	***	0.16	0.06	0.46	0.52	1.09	***	1.01	1.18	***	***	***	***	***	***	***	***	0.68	0.69	0.63
26	0.67	0.55	0.43	0.54	0.36	0.03	0.08	0.04	0.32	0.70	0.97	***	***	***	***	1.16	***	***	***	***	***	***	0.64	0.47	0.50
27	0.48	0.74	0.59	0.67	0.61	0.05	0.02	0.74	0.27	0.38	***	0.86	1.00	***	1.12	***	***	***	***	***	***	***	***	***	0.58
28	***	0.73	0.70	0.63	***	***	0.18	0.15	0.69	***	0.81	***	***	***	***	***	***	***	***	***	***	***	***	***	0.56
29	***	0.47	0.45	***	0.25	0.09	0.10	0.13	0.41	0.63	0.73	1.00	***	***	***	***	***	***	***	***	***	***	***	***	0.43
30	***	***	***	***	***	0.14	0.34	***	***	***	0.79	***	***	***	***	***	***	***	***	***	***	***	***	***	0.42
31	***	0.50	0.35	0.35	***	0.51	0.44	0.42	0.37	0.56	0.94	***	***	***	***	***	***	***	***	***	***	***	***	***	0.49
HRAVE	0.61	0.61	0.54	0.52	0.50	0.26	0.30	0.33	0.51	0.69	0.89	0.96	1.07	1.12	1.10	0.89	0.87	0.94	0.76	0.67	0.61	0.70	0.62	0.64	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.41	0.45	0.73	0.57	0.65	0.65	0.75	0.78	0.80	0.69	0.67	0.70	0.69	0.59	0.75	0.65	0.72	0.45	0.85	0.38	0.55	0.80	0.72	0.75	0.63
MAX	0.79	1.22	1.32	0.93	1.09	1.07	1.36	1.15	1.51	1.38	1.09	1.06	1.25	0.78	1.15	1.18	1.35	0.85	0.85	0.60	1.09	1.32	1.36	1.34	1.18
MIN	0.12	0.09	0.04	0.29	0.19	0.19	0.28	0.41	0.32	0.20	0.37	0.13	0.07	0.40	0.23	0.13	0.01	0.09	0.85	0.13	0.21	0.19	0.18	0.22	0.06

DAY	26	27	28	29	30	31
AVE	0.50	0.58	0.56	0.43	0.42	0.49
MAX	1.16	1.12	0.81	1.00	0.79	0.94
MIN	0.03	0.02	0.15	0.09	0.14	0.35

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 59.3% OPERATIONAL RECOVERY RATE = 59.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

APPENDIX C

Precipitation, Pressure, and Relative Humidity Monthly Data Tables

June 2014 through February 2015

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JUNE - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	700	700	700	700	700	700	701	701	701	701	701	700	700	699	699	698	698	698	698	698	699	699	699	699	699
2	700	700	700	700	700	700	701	701	701	700	700	700	699	699	698	698	698	697	698	698	698	699	699	699	699
3	699	699	699	699	699	700	700	701	701	700	700	700	699	698	698	698	698	698	698	698	698	699	699	699	699
4	699	699	699	699	699	700	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	698	699
5	698	698	698	698	698	699	699	699	700	699	699	698	698	697	697	696	696	696	696	696	696	697	697	697	698
6	697	697	697	698	698	698	698	699	699	698	698	698	697	697	696	696	696	696	696	696	697	697	697	697	697
7	697	697	697	698	698	698	699	699	699	699	699	698	698	697	697	696	696	696	696	696	697	697	698	698	697
8	698	698	698	698	699	699	700	700	700	700	700	699	699	698	697	697	697	696	697	697	698	698	698	699	698
9	699	699	699	699	700	700	700	701	701	701	700	700	699	699	698	697	697	697	697	697	697	698	698	698	699
10	698	698	698	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	699	699	698
11	699	699	699	699	700	700	700	701	701	701	700	700	700	699	699	699	698	698	699	699	699	700	700	701	700
12	701	701	701	701	701	702	702	702	703	702	702	702	701	701	700	700	699	699	699	699	699	700	700	701	701
13	701	701	700	700	701	701	701	702	701	701	701	701	700	699	699	698	698	697	697	697	698	698	698	698	699
14	698	698	698	698	699	699	699	699	700	699	699	699	698	698	697	697	697	697	697	697	698	698	698	699	698
15	699	699	699	699	699	699	700	700	700	700	700	700	699	699	699	698	698	698	698	698	699	699	699	699	699
16	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	699	698	698	698	698	699	699	700	700	700
17	700	700	700	700	701	701	701	701	702	701	701	701	700	700	699	699	698	698	698	698	699	699	699	699	700
18	699	700	700	700	700	700	701	701	701	700	700	700	700	700	699	699	699	699	699	699	700	700	701	701	700
19	701	701	701	701	701	702	702	703	703	703	703	702	702	701	701	700	700	700	700	700	700	701	701	701	701
20	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	698	699	699	699	700	700	700	700
21	700	700	700	701	701	701	702	702	702	702	701	701	700	700	700	699	699	698	699	699	699	700	700	700	700
22	700	700	701	701	701	701	702	702	702	702	702	701	700	700	700	699	699	698	698	699	699	699	700	700	700
23	700	700	700	700	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	699	700	700	701	701	701
24	701	702	702	702	702	702	703	703	704	703	703	703	702	702	701	700	700	699	699	699	700	700	700	700	701
25	700	701	701	701	701	701	702	702	702	702	702	702	701	700	700	699	699	698	698	699	699	699	700	700	700
26	700	700	700	700	701	701	701	702	702	701	701	700	700	699	699	698	698	697	697	697	698	698	698	698	699
27	699	699	699	699	699	699	699	700	700	700	700	699	699	698	698	697	697	697	697	697	697	698	698	698	698
28	698	699	699	699	699	700	700	700	701	701	700	700	700	699	699	699	698	698	699	699	699	700	700	700	699
29	700	700	701	701	702	702	703	703	703	703	702	702	701	701	700	699	699	699	699	699	699	700	700	700	701
30	700	701	701	701	702	702	702	703	702	702	702	701	701	700	699	699	699	698	698	698	698	699	699	699	700
HRAVE	699	699	700	700	700	700	701	701	701	701	701	700	700	699	699	698	698	698	698	698	698	699	699	699	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	699	699	699	699	698	697	697	698	699	698	700	701	699	698	699	700	700	700	701	700	700	700	701	701	700
MAX	701	701	701	700	700	699	699	700	701	700	701	703	702	700	700	701	702	701	703	702	702	702	702	704	702
MIN	698	697	698	697	696	696	696	696	697	697	698	699	697	697	698	698	698	699	700	698	698	698	699	699	698

DAY	26	27	28	29	30	31
AVE	699	698	699	701	700	***
MAX	702	700	701	703	703	***
MIN	697	697	698	699	698	***

MONTHLY AVERAGE = 699.4 MONTHLY MAXIMUM = 703.5 MONTHLY MINIMUM = 695.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JUNE - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	15	15	16	17	20	24	18	15	11	9	7	6	5	3	3	3	4	5	6	7	9	10	13	14	11
2	16	16	17	18	21	20	17	15	11	8	5	3	2	2	2	1	1	2	3	4	6	8	7	10	9
3	10	13	12	13	15	16	14	13	10	7	5	5	4	3	4	4	4	3	4	5	6	7	9	9	8
4	12	14	14	16	17	17	14	10	6	3	0	1	1	1	0	0	0	0	0	2	4	5	6	9	6
5	9	10	12	11	12	14	14	10	6	3	1	0	0	0	0	0	0	0	0	1	3	4	5	6	5
6	7	8	9	9	11	11	9	10	6	3	2	0	0	0	0	0	0	0	1	2	4	7	7	9	5
7	9	11	10	12	14	13	12	9	6	4	3	1	2	2	0	0	0	0	1	2	4	6	6	7	6
8	10	13	14	18	18	16	13	14	11	9	13	12	8	7	8	8	8	9	11	13	14	14	15	17	12
9	19	19	23	24	26	26	22	19	15	11	4	1	2	0	0	1	1	0	1	1	3	3	5	7	10
10	9	12	11	13	14	13	12	9	8	12	16	14	12	9	5	7	9	10	7	4	6	11	17	17	11
11	19	24	25	25	27	28	24	21	17	14	15	14	15	15	14	12	10	9	9	12	13	14	12	10	17
12	10	12	16	19	20	19	19	18	15	9	6	6	5	5	5	5	7	8	10	12	14	16	20	25	13
13	26	28	29	31	33	34	31	27	24	20	18	16	15	14	13	13	12	12	14	15	16	18	20	22	21
14	24	23	24	26	27	28	24	22	20	17	13	12	11	11	10	9	8	7	5	5	5	5	5	8	14
15	11	13	10	11	12	11	9	12	11	12	9	4	3	3	1	1	3	3	4	5	7	10	11	14	8
16	15	14	13	13	15	17	16	14	9	7	6	6	7	8	7	7	7	8	9	12	15	14	15	15	11
17	17	24	24	24	23	24	23	22	20	21	22	20	17	15	15	16	16	16	17	19	20	22	23	23	20
18	24	24	27	29	30	30	26	24	20	18	20	18	16	14	13	14	13	14	16	17	19	20	21	21	20
19	21	23	25	26	28	28	26	22	17	13	11	12	12	11	10	9	10	11	12	15	16	16	18	19	17
20	21	23	26	27	28	28	24	20	15	13	11	9	8	7	6	6	7	8	9	10	12	13	14	14	15
21	15	17	19	22	25	26	23	19	17	15	12	11	10	9	8	9	9	10	11	12	14	15	17	19	15
22	19	19	22	21	24	24	20	16	12	7	6	6	7	6	5	5	7	8	7	8	9	8	8	8	12
23	8	9	12	12	15	16	14	12	9	6	3	1	3	3	4	3	3	5	5	4	4	6	5	6	7
24	8	10	12	12	14	16	13	12	9	4	3	2	1	1	1	3	4	3	3	5	6	8	9	10	7
25	12	12	13	15	15	17	14	13	12	9	5	3	5	6	6	7	7	9	7	7	8	9	9	13	10
26	16	18	21	22	24	25	21	19	17	14	16	15	13	11	9	6	4	5	4	7	9	10	12	12	14
27	14	15	16	18	21	21	21	17	15	15	14	11	9	8	8	10	10	12	12	14	16	18	20	21	15
28	22	26	26	27	28	29	23	20	17	15	15	13	12	11	10	9	10	10	11	12	14	16	17	19	17
29	21	22	24	24	26	28	26	21	22	25	21	19	19	18	17	15	16	15	14	13	15	16	18	20	20
30	22	26	28	30	32	33	29	26	26	22	20	17	15	14	13	12	11	9	8	9	11	12	14	16	19
HRAVE	15	17	18	19	21	22	19	17	14	12	10	9	8	7	7	6	7	7	7	9	10	11	13	14	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	11	9	8	6	5	5	6	12	10	11	17	13	21	14	8	11	20	20	17	15	15	12	7	7	10
MAX	24	21	16	17	14	11	14	18	26	17	28	25	34	28	14	17	24	30	28	28	26	24	16	16	17
MIN	3	1	3	0	0	0	0	7	0	4	9	5	12	5	1	6	15	13	9	6	8	5	1	1	3

DAY	26	27	28	29	30	31
AVE	14	15	17	20	19	***
MAX	25	21	29	28	33	***
MIN	4	8	9	13	8	***

MONTHLY AVERAGE = 12.4 MONTHLY MAXIMUM = 33.6 MONTHLY MINIMUM = 0.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JUNE - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.00 MONTHLY MAXIMUM = 0.00 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JULY - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	699	699	700	700	700	701	701	701	701	701	701	701	700	700	699	699	699	698	698	698	699	699	700	700	700
2	700	700	700	700	701	701	702	703	703	703	703	702	702	701	700	700	699	699	699	699	700	701	701	702	701
3	702	702	702	703	703	703	704	704	704	704	703	703	702	701	701	700	700	700	703	704	703	704	705	705	703
4	705	706	705	705	705	705	705	705	705	705	705	705	704	704	703	703	702	703	704	704	705	706	706	705	705
5	705	705	705	705	706	706	706	707	706	706	706	705	705	704	703	702	702	702	702	703	704	705	705	706	705
6	706	705	705	704	704	704	704	705	705	705	704	704	703	702	701	701	700	700	700	700	701	701	701	701	703
7	701	701	702	702	702	702	702	703	703	703	703	702	701	701	700	700	699	700	700	701	702	702	702	702	701
8	702	702	702	702	702	703	703	704	704	704	703	703	702	701	701	700	700	700	701	702	703	703	704	704	702
9	704	704	704	703	703	704	704	704	704	704	704	703	703	702	701	701	700	700	701	701	702	702	703	702	703
10	702	702	702	702	702	702	703	703	703	703	702	702	701	700	700	699	699	699	699	700	701	701	702	702	701
11	702	702	702	703	703	702	703	703	703	703	703	702	702	701	700	700	700	700	701	701	701	702	702	703	702
12	703	703	703	703	703	703	703	703	704	703	703	703	702	701	701	701	703	702	702	702	702	703	703	703	703
13	703	703	703	703	703	703	703	703	704	703	703	703	702	702	701	700	700	700	701	702	704	705	705	705	703
14	705	704	704	704	705	705	705	705	705	705	705	705	704	703	703	703	703	703	703	703	704	704	704	704	704
15	705	705	705	704	705	705	705	706	706	706	705	705	704	704	703	703	703	702	702	702	703	703	703	703	704
16	703	703	703	703	703	703	703	704	704	703	703	702	702	701	701	700	700	700	700	700	700	701	701	701	702
17	701	701	701	701	701	702	702	703	703	703	702	702	702	701	701	700	700	700	700	700	701	701	701	702	701
18	702	702	702	702	703	703	703	704	704	704	704	703	703	702	702	701	701	701	701	701	701	702	702	702	702
19	702	702	702	702	703	703	703	704	704	704	703	703	703	702	702	701	701	701	701	701	701	702	702	702	702
20	702	702	702	703	703	703	704	704	704	704	704	704	703	703	702	701	701	701	701	702	702	702	703	703	703
21	703	703	703	704	704	704	705	705	705	705	705	704	704	703	703	702	702	702	702	702	702	703	703	703	703
22	703	703	703	703	703	704	704	704	705	705	704	704	703	703	702	701	701	701	701	702	702	703	703	703	703
23	704	704	704	703	704	704	704	705	704	704	704	704	703	702	702	701	701	701	701	702	702	702	702	703	703
24	703	702	702	702	702	703	703	703	703	703	702	702	701	701	700	700	699	699	699	699	700	700	701	702	701
25	702	702	702	702	702	703	703	703	703	703	703	702	702	701	701	701	700	701	702	703	704	704	704	703	702
26	704	703	703	703	703	704	704	704	704	704	704	703	703	702	701	701	700	700	700	701	701	702	702	703	702
27	703	703	703	704	705	706	707	706	706	706	705	704	703	702	701	701	702	702	702	703	704	707	706	706	704
28	706	706	705	705	705	706	706	707	707	707	707	706	706	705	705	704	703	703	703	703	704	704	704	704	705
29	704	704	704	704	704	705	705	705	705	705	705	704	704	703	702	702	701	701	701	701	702	702	702	702	703
30	702	702	702	702	703	703	703	703	703	703	703	703	702	702	701	701	700	700	700	701	701	702	702	702	702
31	702	702	702	703	703	703	703	704	705	705	705	704	704	703	702	702	701	701	701	701	702	702	703	703	703
HRAVE	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	701	701	701	701	702	703	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	701	703	705	705	703	701	702	703	701	702	703	703	704	704	702	701	702	702	703	703	703	703	701	702
MAX	701	703	705	706	707	706	703	704	704	703	703	704	705	705	706	704	703	704	704	704	705	705	705	703	704
MIN	698	699	700	702	702	700	699	700	700	699	700	701	700	703	702	700	700	701	701	701	702	701	701	699	700

DAY	26	27	28	29	30	31
AVE	702	704	705	703	702	703
MAX	704	707	707	705	703	705
MIN	700	701	703	701	700	701

MONTHLY AVERAGE = 702.6 MONTHLY MAXIMUM = 707.0 MONTHLY MINIMUM = 698.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JULY - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	20	21	21	23	25	25	23	18	15	14	12	10	9	9	8	8	7	8	8	10	11	13	14	16	15
2	18	20	20	23	24	24	24	21	17	15	13	12	11	10	10	9	9	10	10	12	14	15	17	21	16
3	22	26	26	27	34	32	31	29	27	23	20	17	12	13	13	13	18	20	51	55	61	53	59	61	31
4	56	56	56	58	63	62	62	58	52	47	42	32	29	30	28	25	25	25	41	48	61	58	57	55	47
5	54	54	52	52	60	67	66	56	46	40	35	33	30	26	25	24	24	25	28	53	85	69	74	78	48
6	86	85	77	76	69	71	77	75	67	58	47	39	30	26	24	22	21	21	24	28	33	38	42	47	49
7	50	50	49	50	51	54	54	80	75	72	61	44	37	33	31	27	29	36	42	47	59	51	55	62	50
8	64	63	63	64	68	69	66	59	53	45	39	35	31	29	30	30	29	29	29	46	66	72	75	75	51
9	74	65	75	73	75	79	72	64	58	45	39	34	31	29	27	26	23	24	26	32	42	43	44	47	48
10	52	52	57	58	60	63	62	59	51	42	37	32	28	27	25	24	23	24	27	31	34	38	39	41	41
11	42	46	50	57	56	53	48	47	42	35	33	31	25	21	23	22	31	36	40	40	38	36	37	51	39
12	58	62	64	67	67	68	65	56	45	38	32	23	20	19	18	34	70	65	62	59	63	63	65	65	52
13	62	59	59	65	66	62	64	56	47	36	28	26	20	19	19	19	21	27	36	46	74	81	88	89	49
14	87	90	89	88	92	85	84	80	70	57	51	42	37	34	35	37	40	43	45	46	47	49	49	48	59
15	51	51	50	51	54	57	58	60	57	52	43	34	31	32	34	38	39	42	42	45	49	52	54	56	47
16	60	62	66	68	71	71	64	53	44	37	33	28	26	24	23	22	21	24	26	29	34	37	38	39	42
17	40	42	45	48	49	48	49	41	25	24	19	16	15	15	14	14	13	13	13	15	16	19	21	23	27
18	22	20	23	25	28	29	29	28	25	19	18	16	14	13	13	13	13	13	14	16	20	21	21	23	20
19	23	24	26	29	34	37	39	36	28	24	23	22	18	16	15	14	14	15	16	19	21	23	25	27	24
20	28	32	31	33	34	32	31	27	22	15	11	9	9	10	9	9	10	10	11	13	16	18	21	21	19
21	23	25	26	28	28	29	31	29	24	17	14	12	11	10	9	9	10	11	12	14	15	17	18	19	18
22	22	25	26	27	30	32	31	29	27	23	21	17	14	9	8	9	9	9	10	13	17	21	22	23	20
23	28	29	32	35	38	41	36	34	29	25	20	16	15	14	11	11	13	22	26	28	28	29	29	31	26
24	31	30	31	33	35	40	42	30	24	17	14	11	9	8	7	7	6	6	6	12	15	15	27	31	20
25	33	35	37	40	43	44	43	38	34	31	27	23	21	19	25	26	24	32	40	52	56	58	58	60	38
26	61	60	63	62	65	64	60	55	43	36	30	27	25	24	23	23	22	22	22	25	31	50	52	45	41
27	46	46	50	50	49	54	61	55	51	40	32	31	25	23	19	21	25	25	25	26	31	53	52	67	40
28	65	61	60	64	61	70	67	56	44	39	34	31	27	24	25	24	21	24	25	28	31	34	37	39	41
29	39	41	45	50	53	52	49	45	36	30	27	23	20	18	16	16	16	17	20	21	24	27	28	29	31
30	32	35	37	41	41	43	40	37	31	23	21	19	16	13	12	13	12	14	15	17	21	22	27	27	25
31	30	32	34	34	35	37	38	53	59	46	39	34	32	30	27	25	18	20	23	26	27	27	31	42	33
HRAVE	44	45	46	48	50	51	51	47	41	34	30	25	22	20	20	20	21	23	26	31	37	39	41	44	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15	16	31	47	48	49	50	51	48	41	39	52	49	59	47	42	27	20	24	19	18	20	26	20	38
MAX	25	24	61	63	85	86	80	75	79	63	57	70	89	92	60	71	49	29	39	34	31	32	41	42	60
MIN	7	9	12	25	24	21	27	29	23	23	21	18	19	34	31	21	13	13	14	9	9	8	11	6	19

DAY	26	27	28	29	30	31
AVE	41	40	41	31	25	33
MAX	65	67	70	53	43	59
MIN	22	19	21	16	12	18

MONTHLY AVERAGE = 35.7 MONTHLY MAXIMUM = 92.0 MONTHLY MINIMUM = 5.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JULY - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.07
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.59	0.00	0.01	0.03	0.67
6	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.26
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.02	0.00	0.09
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.12	0.02	0.00	0.24
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.02	0.07	0.67	0.05	0.26	0.09	0.00	0.00	0.00	0.08	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.02	0.07	0.59	0.04	0.14	0.03	0.00	0.00	0.00	0.08	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.01	0.00	0.00	0.00	0.00	0.05
MAX	0.01	0.00	0.00	0.00	0.00	0.03
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.54 MONTHLY MAXIMUM = 0.59 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
AUGUST - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	704	704	704	704	704	705	705	705	705	705	704	704	703	703	702	701	701	701	701	703	703	704	704	704	703
2	705	705	704	704	704	704	704	705	704	705	705	704	704	703	702	702	702	702	703	704	704	704	704	704	704
3	704	704	704	704	704	704	704	704	705	705	704	704	703	703	702	702	701	701	701	702	702	703	703	704	703
4	704	704	703	703	703	704	704	704	704	704	704	704	703	702	702	701	701	701	701	701	702	702	703	703	703
5	703	703	703	703	703	704	704	***	***	***	***	***	703	703	702	702	701	701	701	702	702	703	703	703	703
6	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	700	700	700	701	701	701	702	702	702
7	702	702	702	702	703	703	703	703	703	703	703	703	702	702	701	701	701	700	700	700	701	701	701	702	702
8	702	702	702	702	703	703	703	703	704	703	703	703	702	702	701	700	700	699	700	700	701	701	701	702	702
9	702	702	703	703	703	703	704	704	704	704	704	703	703	702	701	700	700	700	701	701	701	702	703	704	702
10	704	704	704	704	704	704	704	704	704	704	704	704	703	702	701	701	701	700	701	703	703	704	704	703	703
11	704	703	703	703	703	704	704	704	704	704	704	704	703	703	702	701	701	701	701	702	702	703	703	703	703
12	703	703	703	703	703	704	704	704	704	704	704	704	703	702	701	702	703	704	703	703	704	704	704	704	703
13	704	704	704	704	704	704	705	705	705	704	704	704	703	703	703	703	703	702	703	703	703	703	704	703	704
14	704	704	704	704	704	704	704	705	705	704	704	704	703	703	702	702	702	702	703	703	703	703	704	703	703
15	703	703	703	704	704	704	704	705	705	705	704	704	703	703	702	702	701	701	702	702	703	703	703	703	703
16	703	703	703	703	704	704	704	705	705	705	705	704	703	703	702	702	701	701	701	702	702	702	703	703	703
17	703	703	703	703	704	704	704	704	704	704	704	703	703	702	702	701	700	700	701	702	702	702	702	703	702
18	703	703	703	703	703	703	703	703	703	703	703	702	702	701	700	700	699	699	700	701	701	701	702	702	702
19	702	702	702	702	702	702	702	702	702	702	702	701	702	701	701	701	701	701	701	701	701	702	702	702	702
20	702	702	702	702	702	703	703	703	704	704	704	703	703	702	702	701	700	700	700	701	701	702	702	702	702
21	702	702	702	703	703	703	703	703	704	704	704	704	704	703	703	703	703	703	703	703	703	704	704	704	703
22	704	704	704	704	704	704	704	705	704	704	704	704	703	703	702	702	702	701	701	702	702	702	703	703	703
23	703	703	703	703	703	703	704	704	704	704	703	703	702	702	701	701	700	700	700	700	701	701	701	701	702
24	701	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	700	700	701	701	701	701
25	702	702	702	702	702	703	703	703	703	704	703	703	702	702	702	701	701	701	701	701	702	703	704	704	702
26	704	704	704	704	704	704	705	705	705	705	705	704	704	703	702	702	702	702	704	704	704	705	705	705	704
27	705	705	705	705	705	705	706	706	706	706	706	706	705	705	704	703	703	703	703	703	704	704	704	704	705
28	704	704	704	704	704	704	704	704	704	704	704	703	703	702	701	701	700	700	700	701	701	701	701	701	702
29	701	701	701	701	701	701	702	702	702	702	702	701	701	700	700	699	699	699	699	699	700	700	700	700	700
30	700	701	701	701	701	701	702	702	702	702	702	701	700	700	699	699	699	698	698	699	699	699	700	700	700
31	700	701	701	701	701	701	702	702	702	702	702	701	701	700	700	699	699	699	699	699	700	700	701	701	701
HRAVE	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	701	701	701	701	702	702	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	703	704	703	703	703	702	702	702	702	703	703	703	704	703	703	703	702	702	702	702	703	703	702	701	702
MAX	705	705	705	704	704	704	703	704	704	704	704	704	705	705	705	705	704	703	702	704	704	705	704	702	704
MIN	701	702	701	701	701	700	700	699	700	700	701	701	702	702	701	701	700	699	701	700	702	701	700	699	701

DAY	26	27	28	29	30	31
AVE	704	705	702	700	700	701
MAX	705	706	704	702	702	702
MIN	702	703	700	699	698	699

MONTHLY AVERAGE = 702.5 MONTHLY MAXIMUM = 706.2 MONTHLY MINIMUM = 698.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
AUGUST - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	53	58	67	73	72	73	72	66	56	49	41	39	34	31	27	22	26	31	44	68	81	85	84	82	56
2	79	70	76	81	82	78	73	70	61	57	52	50	48	39	31	29	37	75	88	80	85	87	82	81	66
3	79	78	75	83	87	86	80	71	58	49	44	34	32	31	29	26	24	31	34	36	39	57	60	68	54
4	66	71	72	61	65	71	72	68	56	46	39	35	30	28	25	20	19	19	20	25	28	33	34	35	43
5	40	41	44	47	57	59	58	***	***	***	***	***	19	17	15	15	15	13	12	16	20	24	26	30	30
6	33	36	41	41	41	46	41	33	28	22	19	15	13	13	11	10	10	10	12	13	16	17	21	24	24
7	26	28	30	31	34	35	34	31	25	17	13	13	12	11	12	13	13	13	14	17	18	20	23	28	21
8	27	30	32	34	36	38	39	36	31	26	24	21	19	17	16	15	15	15	16	20	21	21	24	36	25
9	41	45	48	53	54	55	54	49	42	38	35	31	29	26	24	22	21	21	22	20	22	29	36	43	36
10	45	48	50	51	53	54	49	43	36	32	32	27	22	17	16	17	18	22	46	72	75	68	73	70	43
11	62	62	62	63	65	63	59	52	42	34	30	28	24	25	23	23	22	22	25	29	38	39	33	41	40
12	37	37	41	40	42	43	43	40	36	36	35	32	35	48	52	75	89	93	94	92	88	85	84	74	57
13	79	85	84	81	80	79	80	68	56	51	49	40	43	40	50	80	76	70	60	63	69	71	75	75	67
14	78	79	79	83	85	87	82	72	63	55	45	37	33	31	34	45	45	46	52	57	62	61	60	60	60
15	61	70	76	75	79	82	76	68	55	48	43	37	30	27	25	25	27	39	44	45	48	53	57	60	52
16	60	62	67	70	75	77	73	60	48	45	42	36	33	29	27	26	25	25	25	28	30	36	40	42	45
17	46	50	52	54	57	58	54	42	35	33	33	30	26	23	21	21	21	61	69	69	59	62	62	61	46
18	64	63	66	65	69	69	70	65	53	46	41	39	36	31	29	29	29	31	36	37	41	45	46	55	48
19	67	70	70	71	73	75	73	66	58	53	46	45	83	76	80	88	77	69	67	72	72	75	83	76	70
20	77	78	80	82	84	86	86	79	69	63	51	48	44	36	32	29	26	26	32	36	41	44	54	53	56
21	56	55	59	63	65	73	71	64	60	56	47	49	45	41	38	41	52	59	60	60	64	65	72	77	58
22	77	78	81	83	84	85	84	70	59	51	41	36	35	33	30	28	30	30	32	37	40	44	47	48	53
23	52	56	60	61	65	67	65	52	45	39	35	29	29	25	22	22	23	23	25	29	33	34	37	39	40
24	43	48	50	53	54	59	55	47	39	33	28	23	23	22	19	17	17	23	26	24	25	24	28	33	34
25	33	36	39	42	44	50	53	48	43	41	39	36	36	29	31	31	42	37	35	43	47	50	53	58	41
26	62	61	64	64	59	70	85	84	70	54	43	37	36	32	34	44	45	54	82	85	81	71	67	70	61
27	77	83	87	87	88	89	82	65	53	44	38	36	32	29	31	31	31	27	27	32	34	36	50	51	52
28	53	58	64	64	65	67	64	53	44	36	29	23	20	19	18	16	15	16	18	22	22	23	25	32	36
29	39	39	44	44	47	51	49	40	34	27	22	17	13	8	6	6	6	6	8	11	17	21	25	27	25
30	30	32	33	34	37	40	41	34	29	24	19	13	10	8	9	7	8	8	12	14	16	19	24	25	22
31	26	27	31	35	37	37	36	33	28	21	17	16	15	12	12	11	8	9	11	13	15	16	18	20	21
HRAVE	54	56	59	60	63	65	63	56	47	41	36	32	30	28	27	29	29	33	37	41	43	46	49	51	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	56	66	54	43	30	24	21	25	36	43	40	57	67	60	52	45	46	48	70	56	58	53	40	34	41
MAX	85	88	87	72	59	46	35	39	55	75	65	94	85	87	82	77	69	70	88	86	77	85	67	59	58
MIN	22	29	24	19	12	10	11	15	20	16	22	32	40	31	25	25	21	29	45	26	38	28	22	17	29

DAY	26	27	28	29	30	31
AVE	61	52	36	25	22	21
MAX	85	89	67	51	41	37
MIN	32	27	15	6	7	8

MONTHLY AVERAGE = 44.7 MONTHLY MAXIMUM = 93.9 MONTHLY MINIMUM = 5.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
AUGUST - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.02	0.00	0.00	0.11
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.01	0.00	0.00	0.00	0.00	0.09
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.15
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.06
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.11	0.12	0.05	0.01	0.00	0.00	0.00	0.00	0.32
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.18	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.25
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.32
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.24	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.15
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.11	0.09	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.32	0.25	0.00	0.00	0.00	0.32	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.05	0.08	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.12	0.18	0.00	0.00	0.00	0.32	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.15	0.00	0.00	0.00	0.00	0.00
MAX	0.12	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.89 MONTHLY MAXIMUM = 0.32 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
SEPTEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	701	701	701	701	701	702	702	702	703	703	702	702	701	701	700	699	699	699	699	699	700	700	700	700	701
2	701	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	698	698	698	698	699	699	699	699	700
3	699	699	699	700	700	700	701	701	701	701	700	700	699	698	697	697	697	697	697	697	697	698	698	698	699
4	698	698	698	698	698	698	699	699	699	700	700	699	698	698	697	697	697	697	697	699	702	703	702	702	699
5	702	702	702	702	702	702	703	703	703	704	703	703	702	702	701	701	701	701	701	701	702	702	703	703	702
6	703	703	703	703	703	703	703	704	704	704	704	703	702	702	701	701	701	702	703	703	703	703	703	703	703
7	703	703	703	703	703	703	703	703	704	704	704	703	702	701	700	700	699	699	700	700	701	701	702	702	702
8	702	701	701	701	702	702	702	702	703	704	704	704	704	703	703	702	702	702	702	702	703	703	703	703	702
9	703	703	703	703	703	703	704	704	704	704	704	703	703	702	702	701	701	701	701	702	702	702	702	702	703
10	702	702	702	702	702	702	703	703	703	703	703	703	702	702	701	701	700	700	700	701	701	701	702	702	702
11	702	702	702	702	702	702	702	702	702	702	702	702	701	701	700	699	699	699	700	700	700	701	701	701	701
12	701	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	698	698	699	699	700	701	702	701	700
13	702	702	702	702	702	703	703	704	704	704	703	703	702	702	701	701	700	700	700	701	701	701	702	702	702
14	702	702	702	702	702	702	702	703	703	703	702	702	701	701	700	700	699	699	700	700	701	701	702	702	701
15	702	702	702	702	702	702	703	703	703	703	703	703	702	701	700	700	700	700	700	701	702	702	702	703	702
16	703	704	704	704	704	704	704	704	705	705	705	704	703	703	703	702	702	702	702	702	702	702	702	702	703
17	702	702	701	701	701	701	701	701	701	701	701	701	701	701	700	700	700	699	699	700	700	699	699	699	700
18	699	699	699	699	699	700	700	700	700	700	700	700	700	699	699	699	699	699	699	700	700	700	700	700	700
19	700	700	700	700	700	701	701	701	702	702	701	701	700	700	699	699	699	699	699	700	700	701	701	701	700
20	701	701	701	701	701	702	702	703	703	703	703	702	702	701	701	700	700	700	701	701	702	702	702	702	702
21	703	703	703	703	703	703	704	704	704	704	704	704	703	702	702	701	701	701	702	703	703	704	704	704	703
22	704	704	704	704	704	704	705	705	705	705	705	704	704	703	702	702	702	702	702	702	703	703	703	703	703
23	704	704	703	703	703	704	704	704	705	705	704	704	703	702	702	701	701	701	701	701	702	702	702	703	703
24	703	703	703	703	703	703	703	704	704	704	704	703	702	701	701	701	701	701	701	701	702	702	702	703	702
25	703	703	703	703	703	704	704	704	704	704	704	704	703	702	702	701	701	701	701	701	702	702	702	702	703
26	702	702	702	702	703	703	703	703	704	704	703	703	702	701	700	700	700	700	701	701	701	702	702	702	702
27	701	701	701	701	701	701	701	701	701	701	701	700	699	698	697	697	697	698	698	699	700	700	700	700	700
28	700	700	700	700	700	700	701	701	702	702	701	701	701	700	700	700	700	700	700	701	701	701	701	702	701
29	702	702	701	701	701	701	702	702	702	702	702	702	701	701	700	700	700	700	700	700	701	701	701	701	701
30	701	702	702	701	701	702	702	702	702	702	702	701	700	700	699	699	699	699	699	699	700	700	700	700	701
HRAVE	702	702	702	702	702	702	702	703	703	703	703	702	702	701	700	700	700	700	700	700	701	701	701	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	700	699	699	702	703	702	702	703	702	701	700	702	701	702	703	700	700	700	702	703	703	703	702	703
MAX	703	702	701	703	704	704	704	704	704	703	702	702	704	703	703	705	702	700	702	703	704	705	705	704	704
MIN	699	698	697	697	701	701	699	701	701	700	699	698	700	699	700	702	699	699	699	700	701	702	701	701	701

DAY	26	27	28	29	30	31
AVE	702	700	701	701	701	***
MAX	704	701	702	702	702	***
MIN	700	697	700	700	699	***

MONTHLY AVERAGE = 701.4 MONTHLY MAXIMUM = 705.0 MONTHLY MINIMUM = 696.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
SEPTEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	25	27	30	32	35	38	37	33	28	22	15	12	12	12	10	8	9	10	14	17	18	22	24	26	21
2	29	32	33	36	38	41	37	32	29	21	15	13	12	11	10	10	10	10	11	14	17	20	22	25	22
3	27	29	29	32	33	34	36	31	28	23	20	16	11	8	7	7	12	15	19	21	21	24	25	29	22
4	31	33	33	36	37	41	40	38	32	24	21	18	18	17	17	16	17	19	23	29	61	71	67	65	33
5	67	78	74	76	78	76	78	68	56	42	37	32	29	24	23	23	25	27	29	37	38	42	42	45	48
6	47	48	50	51	53	53	53	47	40	34	28	27	25	23	31	37	46	50	55	57	74	69	67	68	47
7	66	62	63	62	61	63	63	57	50	41	36	34	33	31	28	24	25	26	31	34	38	41	43	53	44
8	58	61	61	63	67	74	80	79	82	93	89	85	92	93	89	82	74	67	73	80	82	84	85	86	78
9	89	91	89	88	89	91	88	81	68	68	62	59	64	62	50	44	41	42	51	60	63	64	63	66	68
10	71	72	75	76	75	75	76	72	60	53	43	40	34	30	30	32	33	36	40	44	46	49	52	61	53
11	62	65	67	68	70	69	69	59	52	45	38	27	21	23	23	24	26	25	29	33	35	38	44	46	44
12	48	51	55	56	60	62	59	51	43	32	30	27	24	19	19	17	17	21	29	33	32	35	37	37	37
13	39	42	43	43	44	45	46	44	39	36	34	32	29	30	27	27	27	28	31	33	34	37	38	40	36
14	41	42	43	43	45	46	46	43	38	35	32	32	28	26	24	24	25	25	28	31	33	35	36	37	35
15	38	39	41	42	44	45	45	43	39	34	29	26	24	22	20	20	22	24	27	29	31	41	41	49	34
16	51	49	51	51	55	59	61	60	76	91	88	81	68	64	61	64	64	65	65	67	68	67	73	77	66
17	81	80	79	83	82	77	77	75	71	68	65	59	79	89	87	80	82	78	79	78	71	69	68	68	76
18	70	69	68	70	73	75	76	75	69	60	54	50	47	47	45	45	41	43	51	61	64	66	67	67	61
19	73	77	76	77	80	80	81	80	69	53	46	42	38	36	43	46	45	42	47	50	51	54	57	65	59
20	65	66	70	72	76	77	77	73	60	49	42	33	33	33	34	35	37	38	47	50	54	57	60	61	54
21	66	67	69	72	73	74	74	71	61	49	41	38	34	28	30	31	27	26	30	45	59	63	64	67	53
22	71	71	72	69	69	69	70	61	51	44	39	33	27	24	28	27	28	30	34	37	39	37	38	40	46
23	44	48	51	57	59	61	62	57	52	46	39	35	31	26	19	19	25	24	25	25	25	26	29	32	38
24	34	38	42	45	49	49	54	50	42	36	31	29	26	22	32	28	25	26	32	33	33	38	44	44	37
25	45	45	52	52	50	49	49	45	40	32	28	25	22	18	16	14	18	23	26	33	37	37	38	38	35
26	43	46	50	50	53	52	46	43	39	33	29	26	23	23	24	27	37	45	50	53	56	58	60	62	43
27	62	61	65	63	64	64	65	59	56	45	40	29	24	23	24	29	37	55	69	74	75	75	76	71	55
28	71	74	74	76	84	80	79	76	57	49	43	36	32	24	20	20	21	22	25	27	26	27	29	31	46
29	33	34	38	40	42	44	48	50	37	30	21	20	18	14	13	15	14	15	19	25	28	30	31	35	29
30	37	40	40	42	43	47	50	41	34	26	21	19	17	16	15	14	14	17	20	22	24	28	32	33	29
HRAVE	53	54	56	57	59	60	61	56	50	44	39	34	33	31	30	30	31	33	37	41	44	47	48	51	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	21	22	22	33	48	47	44	78	68	53	44	37	36	35	34	66	76	61	59	54	53	46	38	37	35
MAX	38	41	36	71	78	74	66	93	91	76	70	62	46	46	49	91	89	76	81	77	74	72	62	54	52
MIN	8	10	7	16	23	23	24	58	41	30	21	17	27	24	20	49	59	41	36	33	26	24	19	22	14

DAY	26	27	28	29	30	31
AVE	43	55	46	29	29	***
MAX	62	76	84	50	50	***
MIN	23	23	20	13	14	***

MONTHLY AVERAGE = 45.0 MONTHLY MAXIMUM = 93.2 MONTHLY MINIMUM = 7.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
SEPTEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
7	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.05	0.07	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.10
17	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.01	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.04	0.03	0.03	0.29	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
MAX	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.75 MONTHLY MAXIMUM = 0.12 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
OCTOBER - 2014

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	700	700	700	700	700	700	701	701	701	701	701	700	700	699	699	699	699	699	700	700	701	701	701	701	700
2	702	702	702	703	703	704	704	705	705	706	705	705	705	704	703	703	703	703	703	704	704	705	705	705	704
3	705	705	705	706	706	706	706	707	707	707	707	706	705	704	704	704	704	704	704	704	704	705	705	705	705
4	705	705	705	705	705	705	706	706	706	706	705	705	704	703	702	702	702	702	702	702	703	703	703	704	704
5	704	704	704	704	704	704	704	704	705	705	704	704	703	702	702	701	701	701	702	702	702	703	703	703	703
6	703	703	703	703	703	704	704	704	705	705	704	704	703	702	702	702	702	702	702	702	703	703	703	703	703
7	703	703	704	704	704	704	704	704	705	705	705	704	704	703	702	702	701	702	702	702	703	703	703	702	703
8	702	703	703	703	703	703	703	703	703	703	704	703	703	702	701	701	701	701	701	701	701	701	701	701	702
9	701	701	701	701	701	701	701	702	702	702	703	703	703	702	702	702	702	702	703	703	703	704	704	704	702
10	704	704	704	704	704	704	705	705	705	705	705	705	704	703	703	703	703	703	703	704	704	704	704	704	704
11	704	704	704	704	704	705	705	705	705	705	705	705	704	703	702	702	702	702	702	703	703	703	703	703	704
12	702	702	702	702	702	702	702	703	703	703	702	702	701	700	700	700	700	700	700	701	701	702	702	702	702
13	703	703	703	704	704	705	705	706	706	706	706	706	705	705	704	704	704	704	704	705	705	705	705	705	705
14	705	705	705	705	706	706	706	706	706	706	706	705	704	703	703	702	702	702	702	703	703	703	703	703	704
15	704	704	704	704	704	704	704	704	705	705	704	704	703	702	702	702	702	702	702	703	703	703	703	703	703
16	703	703	703	703	703	704	704	704	705	704	704	703	703	702	701	701	701	701	702	702	702	703	702	702	703
17	702	703	702	702	702	703	703	704	704	705	705	705	703	702	701	701	701	701	701	702	702	702	703	702	703
18	702	702	702	702	702	702	702	703	703	703	702	701	700	700	699	699	699	699	699	699	700	700	700	700	701
19	700	700	700	700	700	701	701	701	702	702	702	701	700	700	699	700	702	702	703	703	702	703	703	703	701
20	703	703	702	702	703	703	703	703	704	704	703	703	702	701	701	701	701	701	701	701	702	702	702	702	702
21	702	702	702	702	702	703	703	703	703	703	703	703	702	701	700	700	700	700	700	701	701	702	702	702	702
22	702	702	703	703	703	703	704	704	705	705	705	704	704	703	703	703	702	703	703	704	704	704	704	704	703
23	705	705	705	705	705	705	706	706	707	707	706	706	705	704	704	704	704	704	704	704	705	705	705	705	705
24	706	706	706	706	706	706	707	707	708	708	707	707	706	705	704	704	704	704	704	705	705	705	706	706	706
25	706	706	706	706	706	706	707	707	707	707	707	706	705	705	704	704	703	703	703	704	704	704	704	704	705
26	704	704	703	703	703	703	704	704	704	704	703	703	702	701	701	700	700	700	700	700	700	701	701	701	702
27	700	700	700	700	700	701	701	701	702	702	702	702	701	701	700	701	701	701	702	702	702	703	703	704	701
28	704	704	704	704	704	705	705	706	706	706	706	705	705	704	704	703	703	704	704	704	705	705	705	705	705
29	706	706	706	706	706	706	706	707	707	707	707	706	705	705	704	704	704	704	704	705	705	705	705	705	705
30	705	706	705	705	705	706	706	707	707	707	706	706	705	704	704	703	703	703	703	704	704	704	704	704	705
31	704	704	704	704	703	704	704	704	705	704	704	703	703	702	701	701	701	700	701	701	701	701	701	701	702
HRAVE	703	703	703	703	703	704	704	704	705	705	704	704	703	702	702	702	702	702	702	702	703	703	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	704	705	704	703	703	703	702	702	704	704	702	705	704	703	703	703	701	701	702	702	703	705	706	705
MAX	701	706	707	706	705	705	705	704	704	705	705	703	706	706	705	705	705	703	703	704	703	705	707	708	707
MIN	699	702	704	702	701	702	701	701	701	703	702	700	703	702	702	701	701	699	699	701	700	702	704	704	703

DAY	26	27	28	29	30	31
AVE	702	701	705	705	705	702
MAX	704	704	706	707	707	705
MIN	700	700	703	704	703	700

MONTHLY AVERAGE = 703.2 MONTHLY MAXIMUM = 707.5 MONTHLY MINIMUM = 698.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
OCTOBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	35	37	37	42	43	47	48	40	34	27	21	19	16	16	15	15	15	17	21	23	25	28	29	32	28
2	34	36	37	39	43	45	45	34	24	21	19	15	13	11	7	4	4	7	11	18	20	21	21	20	23
3	22	25	27	29	32	33	34	32	28	20	15	12	11	10	9	9	9	10	10	11	12	14	14	20	19
4	22	22	26	30	32	32	34	32	26	20	17	11	9	9	9	9	10	11	13	15	18	19	22	25	20
5	27	28	29	33	33	34	36	34	29	27	22	22	15	13	11	10	10	13	17	17	18	20	21	25	23
6	27	28	31	33	37	41	39	34	34	26	21	19	14	13	12	13	15	18	21	22	24	28	31	29	25
7	32	34	35	36	37	37	36	33	32	28	25	19	16	15	12	13	15	17	21	24	26	30	33	34	27
8	37	38	50	54	70	79	74	55	55	62	81	93	92	92	89	87	90	96	96	96	97	98	98	98	78
9	98	98	98	93	95	92	92	95	90	92	86	87	90	81	68	78	76	78	81	82	87	90	94	93	88
10	92	95	96	97	98	98	98	94	81	71	60	56	51	48	45	44	47	53	58	61	64	70	76	81	72
11	84	86	88	89	92	91	88	82	70	59	50	44	33	26	25	27	29	35	43	47	44	45	54	63	58
12	66	67	67	71	76	81	78	75	60	48	43	41	35	30	27	26	27	25	27	27	28	33	36	24	47
13	16	14	14	16	17	18	19	20	18	17	14	12	12	10	7	6	10	14	18	21	22	27	27	26	16
14	26	37	38	42	45	47	48	48	43	26	20	17	15	16	15	15	15	16	18	19	20	21	26	27	28
15	30	34	37	39	40	44	43	46	38	23	18	16	14	15	15	16	19	25	28	29	33	36	38	40	30
16	41	46	51	50	58	62	63	56	49	37	30	26	21	21	20	18	17	22	25	27	29	34	37	39	37
17	41	46	48	51	51	51	53	55	50	45	43	43	39	35	26	22	19	21	25	30	30	35	43	46	40
18	47	47	50	53	60	61	57	50	45	34	27	23	19	16	16	16	22	25	28	29	31	35	37	39	36
19	41	42	48	49	51	52	53	53	45	36	33	29	26	27	27	45	70	70	74	73	73	72	65	72	51
20	78	73	69	68	69	72	69	65	59	52	49	46	42	39	36	32	35	38	42	42	43	44	46	51	52
21	58	58	62	59	64	69	70	60	54	48	42	41	36	32	31	29	34	36	40	39	47	48	53	54	49
22	60	62	66	68	70	74	73	70	57	46	41	36	31	27	19	18	22	26	30	35	37	43	49	55	46
23	58	60	61	64	67	68	72	64	51	43	37	32	28	23	20	18	19	22	27	32	33	40	44	47	43
24	51	53	55	57	60	63	63	59	48	39	34	29	24	19	17	18	21	24	27	29	33	38	42	46	40
25	48	50	54	58	61	63	59	54	46	36	31	25	22	19	20	19	20	24	28	30	33	36	38	41	38
26	45	49	52	53	57	62	64	60	48	41	35	36	36	34	32	32	34	38	41	43	45	42	44	47	45
27	51	53	55	57	58	60	61	62	55	45	38	35	34	32	32	31	33	37	42	44	43	46	51	53	46
28	57	62	63	65	68	70	71	66	55	45	39	36	29	24	19	17	21	23	30	34	35	40	42	46	44
29	50	52	55	58	59	63	64	58	47	38	31	28	25	17	16	17	19	21	23	24	28	30	32	35	37
30	39	39	43	48	49	49	52	49	40	32	27	23	18	16	17	19	21	21	21	20	20	22	25	28	31
31	31	32	33	33	29	26	26	26	27	26	26	25	24	23	21	24	26	28	30	33	35	37	36	37	29
HRAVE	47	48	51	53	55	58	58	54	46	39	35	32	29	26	24	24	27	29	33	35	37	39	42	44	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	28	23	19	20	23	25	27	78	88	72	58	47	16	28	30	37	40	36	51	52	49	46	43	40	38
MAX	48	45	34	34	36	41	37	98	98	98	92	81	27	48	46	63	55	61	74	78	70	74	72	63	63
MIN	15	4	9	9	10	12	12	37	68	44	25	24	6	15	14	17	19	16	26	32	29	18	18	17	19

DAY	26	27	28	29	30	31
AVE	45	46	44	37	31	29
MAX	64	62	71	64	52	37
MIN	32	31	17	16	16	21

MONTHLY AVERAGE = 40.1 MONTHLY MAXIMUM = 98.1 MONTHLY MINIMUM = 3.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
OCTOBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.07	0.01	0.04	0.04	0.04	0.02	0.00	0.02	0.00	0.15	0.02	0.00	0.01	0.50
9	0.06	0.24	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
10	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.03	0.06	0.01	0.00	0.00	0.00	0.00	0.24
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.37	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.24	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.12 MONTHLY MAXIMUM = 0.24 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
NOVEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	701	701	701	701	701	701	702	702	703	703	702	702	701	700	700	700	700	701	701	701	701	702	702	702	701
2	702	702	702	702	702	702	702	703	703	703	703	702	702	702	702	702	702	702	703	703	704	704	704	704	703
3	704	704	704	704	704	705	705	705	706	705	705	705	704	704	704	704	704	704	704	705	705	705	706	706	705
4	705	706	706	706	706	706	707	707	708	708	707	707	706	705	705	704	705	705	705	705	706	706	706	706	706
5	706	707	707	706	706	707	707	708	708	708	708	708	707	706	706	706	706	706	707	707	708	708	709	709	707
6	709	709	709	710	710	710	711	711	712	712	711	711	710	709	709	708	708	708	709	709	709	710	710	710	710
7	710	710	710	710	709	709	709	709	709	709	709	708	707	706	705	705	705	705	705	705	706	706	706	706	707
8	706	707	707	707	707	707	707	708	708	708	708	707	706	706	705	705	705	705	705	706	706	707	707	707	707
9	707	707	707	706	706	706	706	706	706	706	705	705	703	702	701	701	701	700	701	701	701	701	701	701	704
10	701	701	701	701	701	701	701	702	702	702	702	701	701	700	699	699	699	699	700	700	700	701	701	702	701
11	702	702	702	702	702	702	703	703	703	703	703	703	702	701	701	701	701	700	701	701	701	702	702	702	702
12	702	702	702	702	702	702	702	703	703	703	703	703	702	702	701	701	701	701	702	702	703	704	704	704	702
13	704	704	705	705	705	705	705	706	706	706	706	705	705	704	703	703	703	703	704	704	704	704	704	704	704
14	704	704	704	704	704	704	704	705	705	705	704	704	703	703	702	702	702	702	702	703	703	703	704	704	704
15	704	704	704	704	704	704	705	705	706	706	706	705	704	703	703	703	703	703	703	703	703	702	702	702	704
16	702	702	701	702	702	703	703	704	704	705	705	705	705	704	705	705	705	706	706	707	708	708	708	708	705
17	708	708	708	708	708	709	709	710	710	710	710	709	708	707	707	707	706	707	707	707	708	708	708	708	708
18	708	708	708	708	709	709	710	710	711	711	711	710	710	709	709	708	708	708	708	709	709	709	709	710	709
19	709	709	709	709	708	708	709	709	709	709	709	708	707	706	706	705	705	706	706	706	706	706	706	707	707
20	706	706	706	706	706	706	706	707	707	707	707	706	705	704	704	703	703	703	704	704	704	704	704	704	705
21	704	703	703	703	703	703	703	703	703	703	703	703	702	702	701	701	702	702	702	703	703	704	704	704	703
22	704	704	704	705	705	705	705	706	707	707	707	706	705	704	704	703	703	704	704	704	704	704	704	704	705
23	703	703	703	703	703	703	704	705	705	706	706	705	705	704	704	704	705	705	706	706	707	707	708	708	705
24	708	708	708	708	708	708	708	709	709	710	710	709	709	708	707	707	708	708	709	710	711	711	712	712	709
25	713	713	713	713	713	714	714	714	715	715	715	714	713	712	712	711	711	711	711	711	711	712	712	712	713
26	712	712	712	712	711	711	712	712	713	713	712	711	710	709	709	708	708	709	709	709	709	709	710	710	710
27	710	710	710	710	710	710	710	710	711	711	710	710	708	708	707	707	707	707	707	707	707	707	708	708	709
28	707	707	707	707	707	707	707	707	707	707	707	706	705	704	703	703	703	703	703	703	703	704	704	704	705
29	704	704	704	704	704	704	704	704	705	705	705	704	703	702	702	701	701	701	702	702	702	703	703	703	703
30	703	704	704	704	704	704	705	705	706	706	706	706	705	704	704	703	703	704	705	705	706	706	707	707	705
HRAVE	706	706	706	706	706	706	706	707	707	707	707	706	705	705	704	704	704	704	705	705	705	706	706	706	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	703	705	706	707	710	707	707	704	701	702	702	704	704	704	705	708	709	707	705	703	705	705	709	713
MAX	703	704	706	708	709	712	710	708	707	702	703	704	706	705	706	708	710	711	709	707	704	707	708	712	715
MIN	700	702	704	704	706	708	705	705	700	699	700	701	703	702	702	701	706	708	705	703	701	703	703	707	711

DAY	26	27	28	29	30	31
AVE	710	709	705	703	705	***
MAX	713	711	707	705	707	***
MIN	708	707	703	701	703	***

MONTHLY AVERAGE = 705.5 MONTHLY MAXIMUM = 715.1 MONTHLY MINIMUM = 698.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
NOVEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	40	43	45	46	48	52	59	55	52	45	33	28	20	12	21	32	36	44	48	50	52	53	55	56	43
2	58	59	62	64	62	58	56	53	50	51	50	48	46	42	38	40	38	36	36	38	39	41	41	45	48
3	49	52	56	58	60	63	66	61	51	42	39	32	25	21	23	25	26	29	32	33	33	35	37	40	41
4	44	47	48	51	53	56	57	55	49	39	29	21	20	18	17	16	18	21	24	25	26	27	29	31	34
5	32	32	34	37	40	43	46	46	40	34	29	28	26	22	20	19	19	21	23	24	27	31	32	37	31
6	36	39	40	43	44	47	50	49	45	38	34	30	22	19	18	22	24	27	31	35	37	37	36	38	35
7	39	41	43	44	46	47	48	46	42	35	31	29	27	23	18	14	17	18	24	25	29	34	37	40	33
8	43	46	47	49	53	55	56	54	46	35	26	22	18	19	18	17	19	21	23	25	27	29	30	32	34
9	33	34	36	37	39	40	41	40	37	33	30	27	23	20	18	16	19	22	25	28	31	35	37	40	31
10	41	45	47	49	53	53	57	53	44	39	32	24	20	16	15	15	14	18	19	20	26	29	32	35	33
11	40	41	46	49	50	53	54	54	47	39	33	30	27	26	23	23	25	30	35	37	37	37	41	46	38
12	50	54	54	56	59	62	63	62	59	49	44	42	36	29	26	27	30	35	41	44	47	49	50	51	47
13	52	55	57	61	61	63	65	62	56	45	40	36	35	33	31	30	31	36	42	39	39	40	43	43	46
14	46	48	46	49	54	53	50	59	46	37	34	34	37	39	44	51	51	53	58	62	63	64	62	64	50
15	66	67	69	70	72	75	78	75	65	56	49	49	46	42	35	35	39	40	44	45	49	52	52	54	55
16	57	60	65	68	71	74	73	73	74	69	42	30	23	17	13	15	17	17	16	16	16	15	16	17	40
17	17	17	18	19	19	21	22	23	21	20	20	20	18	17	17	16	16	17	18	19	19	21	22	22	19
18	23	24	24	26	28	30	33	34	30	25	23	21	19	18	17	16	17	18	19	20	20	21	23	26	23
19	29	30	31	32	34	35	36	37	33	28	21	18	15	11	13	14	14	16	18	22	23	27	26	30	25
20	32	33	34	35	37	39	39	37	32	24	18	16	13	11	11	11	12	14	15	17	20	22	24	25	24
21	26	28	30	31	30	32	32	32	33	32	34	31	29	26	18	16	20	24	24	28	29	32	37	38	29
22	41	42	42	46	48	49	50	52	43	36	29	25	24	22	21	20	22	27	31	33	34	36	39	43	36
23	43	46	45	50	52	53	56	56	47	38	32	30	28	26	25	23	9	5	7	8	6	7	9	11	30
24	14	16	19	21	22	22	25	25	21	17	14	12	9	8	8	9	10	14	17	17	14	12	13	13	15
25	15	17	19	19	20	22	22	24	20	16	13	9	9	7	7	7	8	11	12	12	15	17	19	21	15
26	21	23	23	26	27	26	27	29	24	18	13	10	10	12	14	14	15	17	16	20	24	25	25	25	20
27	28	28	29	32	32	35	35	34	29	21	18	15	13	13	12	12	14	16	17	17	18	18	21	24	22
28	26	25	28	29	31	33	34	35	33	27	19	16	14	12	11	12	14	16	18	19	24	25	27	28	23
29	31	34	35	37	39	41	42	40	36	27	20	17	15	14	13	11	12	14	17	22	23	25	26	28	26
30	29	34	36	37	40	40	40	42	38	31	23	17	16	15	14	14	16	19	23	23	25	26	29	34	27
HRAVE	37	39	40	42	44	46	47	47	41	35	29	26	23	20	19	20	21	23	26	27	29	31	32	35	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	43	48	41	34	31	35	33	34	31	33	38	47	46	50	55	40	19	23	25	24	29	36	30	15	15
MAX	59	64	66	57	46	50	48	56	41	57	54	63	65	64	78	74	23	34	37	39	38	52	56	25	24
MIN	12	36	21	16	19	18	14	17	16	14	23	26	30	34	35	13	16	16	11	11	16	20	5	8	7

DAY	26	27	28	29	30	31
AVE	20	22	23	26	27	***
MAX	29	35	35	42	42	***
MIN	10	12	11	11	14	***

MONTHLY AVERAGE = 32.4 MONTHLY MAXIMUM = 77.7 MONTHLY MINIMUM = 4.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
NOVEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.00 MONTHLY MAXIMUM = 0.00 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	707	708	708	707	708	708	708	709	710	710	710	709	708	707	706	706	705	706	706	706	706	706	706	706	707
2	706	706	705	705	704	704	705	705	705	706	706	705	704	704	704	704	704	704	705	706	706	707	707	707	705
3	706	706	706	706	706	706	706	706	706	707	707	706	705	704	704	704	704	704	704	704	704	704	704	704	705
4	704	704	704	704	704	704	704	704	704	705	705	704	704	704	704	704	704	704	705	705	706	706	707	707	705
5	707	707	707	708	708	708	708	709	709	709	709	709	708	708	707	707	707	707	707	707	707	707	708	708	708
6	708	708	708	708	707	708	708	709	709	709	709	709	708	708	708	708	708	708	708	708	709	709	709	709	708
7	709	709	709	709	709	709	709	710	710	710	710	709	708	708	707	707	707	707	707	707	707	708	708	708	708
8	708	708	708	707	707	707	708	708	708	708	708	707	707	706	706	706	706	706	706	706	706	706	707	706	707
9	706	706	706	706	706	705	706	706	706	706	706	706	705	704	704	704	704	704	704	704	705	705	705	705	705
10	705	705	705	705	705	705	705	705	706	706	705	705	704	703	703	702	703	703	703	703	704	704	704	704	704
11	704	705	705	705	705	705	705	706	706	707	706	706	705	705	704	704	704	704	705	705	705	705	706	706	705
12	706	706	706	706	706	707	707	707	707	708	708	707	706	705	704	704	704	704	704	704	705	705	705	706	
13	705	705	705	705	704	704	704	704	705	705	705	705	705	704	704	704	704	704	705	705	705	706	706	706	705
14	706	706	706	706	706	706	706	706	707	707	707	707	706	706	705	706	706	706	706	706	706	707	707	707	706
15	707	707	707	707	706	706	707	707	707	708	707	707	706	705	704	704	704	704	704	705	705	705	705	705	706
16	705	705	705	704	704	704	705	705	706	706	706	705	704	704	703	703	703	703	703	704	704	704	705	705	704
17	704	704	705	705	704	704	705	705	706	706	707	707	706	705	705	705	706	706	707	707	707	708	708	708	706
18	707	707	707	707	707	706	707	707	707	707	707	707	707	706	706	706	707	707	707	708	708	708	709	709	707
19	709	708	708	708	708	708	709	709	710	710	710	710	709	708	707	707	707	707	707	708	708	708	708	708	708
20	708	707	707	707	707	707	707	707	708	708	708	708	707	706	706	705	705	705	706	707	707	707	707	707	707
21	707	707	707	706	706	707	706	706	707	708	708	707	706	705	705	705	705	705	705	705	705	705	705	705	706
22	705	705	705	705	704	704	705	705	705	705	705	704	703	702	702	702	702	702	702	703	703	703	703	703	704
23	703	703	704	704	704	704	705	706	706	708	708	708	707	707	706	706	706	707	707	708	708	708	708	708	706
24	708	708	708	708	708	708	708	708	709	709	708	707	706	705	704	704	703	703	703	703	702	702	701	701	705
25	700	700	700	699	699	698	698	698	698	698	698	698	697	696	696	696	697	697	698	698	699	699	699	699	698
26	700	700	700	701	701	702	702	703	704	704	705	704	704	703	703	704	704	704	705	705	705	706	706	706	703
27	706	706	706	707	707	707	708	709	710	710	711	710	709	709	709	709	709	709	710	710	711	711	711	711	709
28	710	710	710	710	710	710	710	710	711	711	710	710	709	708	707	707	707	707	707	707	707	707	707	707	709
29	707	707	706	707	706	706	707	707	708	708	708	708	707	706	705	705	704	704	705	705	705	705	705	705	706
30	705	705	705	705	704	704	704	704	704	705	704	703	702	702	701	701	701	701	701	701	701	702	702	702	703
31	701	701	701	701	701	700	700	701	701	702	702	702	701	702	702	702	702	702	702	702	702	702	702	703	701
HRAVE	706	706	706	706	705	706	706	706	707	707	707	706	706	705	705	704	704	705	705	705	705	706	706	706	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	707	705	705	705	708	708	708	707	705	704	705	706	705	706	706	704	706	707	708	707	706	704	706	705	698
MAX	710	707	707	707	709	709	710	708	706	706	707	708	706	707	708	706	708	709	710	708	708	705	708	709	700
MIN	705	704	704	704	707	707	707	706	704	702	704	704	704	705	704	703	704	706	707	705	705	702	703	701	696

DAY	26	27	28	29	30	31
AVE	703	709	709	706	703	701
MAX	706	711	711	708	705	703
MIN	700	706	707	704	701	700

MONTHLY AVERAGE = 705.6 MONTHLY MAXIMUM = 710.7 MONTHLY MINIMUM = 696.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	35	36	40	41	44	46	47	45	41	33	27	23	22	19	19	19	20	22	23	24	25	25	31	31	31
2	34	35	34	35	36	33	35	34	34	31	26	23	19	18	18	18	20	21	22	24	29	42	49	51	30
3	54	62	63	65	67	66	64	66	59	54	46	41	39	39	37	37	42	45	49	51	54	53	57	59	53
4	62	78	86	91	96	97	98	99	99	99	99	97	89	84	74	70	71	76	80	82	87	88	90	90	87
5	90	93	89	91	91	92	91	89	84	78	69	69	58	54	54	55	58	61	60	57	57	60	61	64	72
6	69	70	72	73	76	75	80	81	81	74	76	75	66	53	50	51	51	50	50	55	56	59	60	66	65
7	70	79	85	85	84	87	86	84	77	68	57	51	41	39	42	41	43	46	48	49	48	53	53	61	62
8	66	64	62	66	68	65	59	55	52	44	39	37	35	33	33	33	35	36	36	38	40	42	43	49	47
9	49	48	57	57	61	59	56	46	45	39	35	33	32	33	33	32	34	41	53	57	57	62	64	72	48
10	75	78	79	82	78	77	78	79	77	67	54	44	41	37	36	36	39	47	55	58	62	64	70	73	62
11	77	78	83	88	88	86	83	88	73	57	45	37	33	27	28	31	35	40	44	50	54	59	55	55	58
12	66	66	69	74	73	69	73	65	66	58	40	34	28	26	27	29	33	36	38	41	44	51	62	66	51
13	71	74	75	78	82	82	75	77	82	92	91	92	91	90	93	94	92	93	93	86	77	73	79	81	84
14	83	86	90	90	94	95	97	98	95	81	69	60	54	52	48	49	53	60	64	68	74	79	87	89	76
15	92	92	92	93	93	95	95	94	84	70	60	50	44	37	34	40	41	45	46	47	48	51	62	63	65
16	67	70	68	73	74	77	78	79	77	77	72	61	48	42	34	34	38	46	64	62	61	68	73	71	63
17	72	75	89	89	91	94	95	95	95	92	84	79	73	72	73	67	74	84	90	94	95	97	98	98	86
18	98	98	98	98	98	99	99	98	97	93	94	91	91	81	78	72	78	78	81	83	85	85	90	95	90
19	96	96	97	97	98	98	98	98	98	84	71	64	53	42	40	38	40	42	46	54	56	64	68	72	71
20	74	76	80	83	87	91	88	91	84	73	60	53	49	44	44	40	41	47	56	60	64	69	72	79	67
21	83	86	90	91	90	92	96	92	86	84	69	56	48	46	43	42	48	53	56	58	64	66	73	77	70
22	80	87	87	88	90	92	91	94	90	74	63	59	53	50	48	48	52	58	63	66	71	75	78	81	72
23	83	86	89	91	93	93	93	57	29	27	28	24	20	17	14	14	14	15	16	19	19	21	22	22	42
24	22	23	26	27	34	44	49	52	45	39	31	26	22	21	20	21	23	24	25	25	26	29	35	34	30
25	40	40	42	49	50	56	63	61	60	57	51	36	26	23	29	32	45	58	53	55	64	64	68	57	49
26	45	39	35	35	35	37	44	49	49	38	28	27	26	25	25	25	27	31	34	36	40	46	51	54	37
27	61	63	65	68	73	74	78	78	68	57	47	38	31	23	20	20	22	27	37	38	40	46	51	54	49
28	57	60	61	63	66	68	69	71	60	54	39	32	26	23	19	20	24	26	31	34	36	42	48	54	45
29	58	60	62	62	68	70	70	74	65	53	42	33	28	21	18	18	22	28	30	35	41	44	46	49	46
30	53	58	61	63	64	67	67	68	59	48	34	28	26	23	21	16	16	18	20	25	29	32	37	42	41
31	46	48	48	50	52	54	56	54	52	48	35	35	76	82	88	93	94	95	93	94	95	97	96	97	70
HRAVE	65	68	70	72	74	75	76	75	70	63	54	49	45	41	40	40	43	47	50	52	55	58	62	65	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	31	30	53	87	72	65	62	47	48	62	58	51	84	76	65	63	86	90	71	67	70	72	42	30	49
MAX	47	51	67	99	93	81	87	68	72	82	88	74	94	98	95	79	98	99	98	91	96	94	93	52	68
MIN	19	18	37	62	54	50	39	33	32	36	27	26	71	48	34	34	67	72	38	40	42	48	14	20	23

DAY	26	27	28	29	30	31
AVE	37	49	45	46	41	70
MAX	54	78	71	74	68	97
MIN	25	20	19	18	16	35

MONTHLY AVERAGE = 58.7 MONTHLY MAXIMUM = 98.9 MONTHLY MINIMUM = 14.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
DECEMBER - 2014

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.02	0.02	0.10	0.05	0.02	0.06	0.19	0.18	0.19	0.15	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.03	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.01	0.02	0.02	0.01	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.02	0.06	0.03	0.01	0.27
18	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.03	0.04	0.02	0.02	0.03	0.08	0.04	0.34
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.27	0.19	0.01	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.34
MAX	0.00	0.00	0.00	0.00	0.00	0.08
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.92 MONTHLY MAXIMUM = 0.19 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JANUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	704	704	704	704	704	705	705	706	706	706	706	705	705	705	705	705	705	705	705	705	705	705	705	705
2	704	704	704	704	703	703	703	704	704	705	705	704	704	703	703	703	704	704	705	705	705	705	706	706	704
3	706	706	707	707	707	707	707	708	709	710	710	709	709	708	708	708	708	709	709	709	710	710	711	711	708
4	711	712	712	712	712	712	712	712	713	714	713	713	712	711	711	711	711	711	711	712	712	712	712	712	712
5	712	712	712	712	712	712	712	713	713	713	713	712	711	711	710	710	710	710	710	711	711	711	711	712	711
6	712	712	712	712	712	712	712	712	712	713	712	712	710	709	709	709	709	709	709	709	709	710	710	710	711
7	710	710	710	710	709	709	709	710	710	710	710	709	708	708	707	708	707	707	708	708	708	709	709	709	709
8	709	709	709	709	709	708	708	708	709	709	709	708	708	707	707	706	706	706	706	706	706	706	706	706	707
9	706	705	705	705	705	705	705	705	706	707	707	707	706	705	705	705	705	705	706	706	706	707	707	707	706
10	707	707	707	707	707	707	707	707	707	708	708	707	706	705	705	705	705	705	705	705	706	706	706	706	706
11	706	706	706	706	706	706	706	706	707	707	708	707	706	705	705	705	705	705	706	706	706	707	707	707	706
12	707	707	707	707	707	707	707	707	707	708	708	708	707	706	705	705	705	706	706	706	706	706	706	706	707
13	706	706	706	706	705	705	705	705	705	706	706	705	704	704	703	704	704	705	705	705	705	705	705	705	705
14	705	705	705	705	705	705	706	706	707	707	708	707	707	706	706	706	707	707	708	708	708	709	709	710	707
15	710	710	710	710	710	710	711	711	711	712	712	712	711	710	709	709	709	709	710	710	710	710	711	711	710
16	711	710	710	710	710	709	710	710	710	710	710	710	709	708	707	707	707	707	707	707	708	708	709	709	709
17	709	708	709	709	709	709	709	710	710	711	711	710	709	708	708	708	708	708	709	709	710	710	710	710	709
18	711	711	711	711	711	710	711	711	711	711	711	711	710	709	708	708	708	708	708	708	708	708	708	709	710
19	708	708	708	708	708	708	708	709	709	709	709	708	707	706	706	705	705	705	705	705	705	705	706	706	707
20	706	706	706	705	705	705	705	706	706	706	706	706	705	703	703	702	702	702	702	702	702	702	702	702	704
21	702	702	702	701	701	701	701	701	701	702	702	702	701	701	701	701	701	702	703	703	703	704	704	704	702
22	705	705	705	706	706	706	707	708	708	708	709	709	708	708	708	708	708	708	709	710	710	711	711	712	708
23	712	712	712	711	711	711	711	711	712	712	712	711	710	709	708	708	708	707	708	708	708	708	708	708	710
24	708	708	708	708	708	708	708	708	708	709	709	708	707	707	706	706	706	706	706	706	706	707	707	708	707
25	707	707	707	707	707	707	707	708	708	708	708	708	707	706	706	706	706	706	706	707	707	707	708	708	707
26	708	708	708	708	707	708	708	708	708	709	709	709	708	707	707	706	706	706	707	707	707	708	709	709	708
27	709	709	709	709	709	709	710	710	711	711	711	710	709	708	708	707	707	707	707	708	708	708	708	708	709
28	708	708	708	708	708	708	708	709	709	709	709	708	707	706	705	705	705	705	706	706	706	706	707	707	707
29	707	707	707	706	706	706	706	706	707	707	707	707	706	705	705	705	705	705	705	706	705	705	705	705	706
30	704	704	704	704	703	703	703	703	703	703	703	703	702	701	701	701	700	700	701	701	701	701	701	701	702
31	701	700	700	700	699	699	699	700	700	701	701	701	701	701	701	701	701	701	702	702	702	703	703	703	701
HRAVE	707	707	707	707	707	707	707	708	708	708	708	708	707	706	706	706	706	706	706	707	707	707	707	707	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	705	704	708	712	711	711	709	707	706	706	706	707	705	707	710	709	709	710	707	704	702	708	710	707	707
MAX	706	706	711	714	713	713	710	709	707	708	708	708	706	710	712	711	711	711	709	706	704	712	712	709	708
MIN	703	703	706	711	710	709	707	706	705	705	705	705	703	705	709	707	708	708	705	702	701	705	707	706	706

DAY	26	27	28	29	30	31
AVE	708	709	707	706	702	701
MAX	709	711	709	707	704	703
MIN	706	707	705	705	700	699

MONTHLY AVERAGE = 707.0 MONTHLY MAXIMUM = 713.7 MONTHLY MINIMUM = 699.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	97	98	98	98	98	98	98	97	96	92	83	78	72	67	61	57	58	65	70	72	75	77	78	80	82
2	82	91	92	95	96	97	96	96	94	86	71	57	51	52	52	51	54	58	62	64	66	70	73	76	74
3	81	86	87	89	91	93	93	93	85	76	65	56	50	46	44	42	41	46	52	58	62	67	74	79	69
4	80	85	85	85	86	87	85	87	79	67	52	46	41	38	37	36	35	36	39	40	42	44	45	50	59
5	56	58	54	52	50	51	52	52	48	43	36	33	30	27	26	25	24	25	27	29	30	32	35	39	39
6	40	41	46	48	52	55	59	57	59	51	40	30	25	23	22	21	22	23	25	27	28	29	35	38	37
7	36	41	43	40	46	44	48	42	39	35	30	28	25	21	22	24	25	26	27	28	30	32	35	38	33
8	41	43	45	45	46	46	47	47	47	46	44	45	44	43	43	42	43	45	47	49	51	51	53	55	46
9	56	58	59	61	60	62	64	66	66	64	59	57	53	49	45	44	45	47	46	44	45	46	48	49	54
10	50	51	51	53	54	55	56	56	55	53	50	46	42	41	42	42	44	45	47	48	50	51	55	54	50
11	57	63	66	67	68	71	73	63	69	63	49	43	42	40	42	41	46	46	49	51	63	71	80	80	59
12	82	81	79	78	85	87	92	92	91	87	75	67	55	52	46	58	59	66	71	74	72	77	77	80	74
13	80	79	80	82	85	87	92	95	93	87	77	73	65	67	64	89	90	85	87	84	86	83	83	84	82
14	92	94	90	92	90	91	86	87	82	74	63	57	49	44	48	40	40	43	49	50	53	56	62	60	66
15	60	64	67	74	80	80	74	73	70	63	59	52	46	40	40	38	36	37	39	43	45	47	50	50	55
16	48	49	49	52	53	54	53	55	52	45	39	34	32	29	27	23	26	28	30	30	32	35	41	47	40
17	51	54	58	63	67	66	68	69	62	50	39	32	28	25	20	18	19	23	32	37	41	47	52	55	45
18	58	60	66	63	63	65	62	67	58	49	40	29	26	23	21	21	26	27	32	36	39	44	46	49	45
19	54	54	58	63	67	68	63	71	65	50	42	35	30	26	24	23	23	25	30	35	39	47	51	57	46
20	59	66	70	71	74	77	78	81	72	53	43	33	28	22	18	19	22	25	29	33	39	43	47	49	48
21	49	55	56	57	61	63	60	62	56	44	35	30	30	29	30	32	34	38	47	50	43	46	53	50	46
22	44	43	43	36	32	22	21	24	22	20	17	17	17	17	17	18	21	24	26	39	46	48	52	58	30
23	59	61	58	55	56	59	60	58	55	48	42	39	36	32	28	27	25	25	26	27	28	30	30	32	42
24	34	36	36	37	37	36	37	37	35	35	30	25	22	19	14	10	8	8	17	18	18	19	21	22	25
25	23	26	30	28	33	34	34	38	33	34	25	22	20	19	17	18	18	19	20	21	21	23	24	25	25
26	27	30	29	29	30	31	32	33	33	30	27	24	24	23	22	22	24	24	25	25	26	27	36	38	28
27	40	39	46	48	51	53	55	64	67	72	78	60	46	33	32	32	37	45	58	63	66	66	72	75	54
28	74	74	75	79	82	83	83	88	78	64	55	48	41	35	30	17	39	50	54	57	58	60	64	67	61
29	69	70	71	70	73	73	74	75	72	68	59	48	45	40	43	43	41	45	51	51	54	56	62	66	59
30	66	72	81	87	84	87	85	88	85	84	79	77	82	89	87	88	91	90	92	91	91	93	93	87	85
31	88	88	86	85	82	82	83	82	82	81	89	92	90	90	85	82	91	94	92	94	93	94	95	95	88
HRAVE	59	62	63	64	66	66	66	68	65	59	51	46	42	39	37	37	39	41	45	47	49	52	55	58	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	82	74	69	59	39	37	33	46	54	50	59	74	82	66	55	40	45	45	46	48	46	30	42	25	25
MAX	98	97	93	87	58	59	48	55	66	56	80	92	95	94	80	55	69	67	71	81	63	58	61	37	38
MIN	57	51	41	35	24	21	21	41	44	41	40	46	64	40	36	23	18	21	23	18	29	17	25	8	17

DAY	26	27	28	29	30	31
AVE	28	54	61	59	85	88
MAX	38	78	88	75	93	95
MIN	22	32	17	40	66	81

MONTHLY AVERAGE = 53.1 MONTHLY MAXIMUM = 98.1 MONTHLY MINIMUM = 7.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JANUARY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.06	0.05	0.03	0.04	0.03	0.06	0.01	0.02	0.01	0.00	0.02	0.05	0.02	0.06	0.11	0.10	0.32	0.09	0.08	0.11	0.06	0.00	1.33
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.01	0.01	0.00	0.01	0.04	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.21
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.05	0.00	0.00	1.33	0.21
MAX	0.00	0.05	0.00	0.00	0.32	0.04
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.72 MONTHLY MAXIMUM = 0.32 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	704	704	704	704	704	705	705	706	707	707	707	706	706	705	705	705	705	705	706	706	707	707	707	705
2	707	707	707	707	707	707	707	708	708	708	708	707	706	705	705	704	704	704	704	705	705	705	706	706	706
3	706	706	706	706	706	706	706	706	707	707	707	707	706	705	705	704	704	705	705	705	706	706	706	706	706
4	706	706	706	706	706	707	707	708	708	709	708	708	707	706	706	706	706	706	706	707	707	707	708	708	707
5	708	708	708	708	708	708	709	709	709	709	709	708	708	707	706	706	705	705	705	706	706	707	707	708	707
6	708	708	708	708	708	708	708	709	709	709	709	709	708	707	707	706	706	706	707	707	707	708	708	708	708
7	708	708	708	708	707	707	708	708	708	709	709	708	707	706	706	705	705	705	706	706	707	707	707	707	707
8	707	707	707	707	707	708	708	708	708	709	709	708	707	706	705	705	705	705	705	706	706	707	707	707	707
9	707	707	707	707	707	707	707	708	708	708	708	707	706	705	704	704	703	703	704	704	704	704	704	704	706
10	704	704	704	704	704	704	704	705	705	705	705	704	704	703	702	702	701	702	702	703	703	703	704	704	703
11	704	704	704	704	704	704	705	705	706	706	706	706	705	704	704	704	705	705	705	705	707	707	708	708	705
12	708	709	709	709	709	709	710	710	711	711	711	710	709	708	708	707	707	707	707	708	708	708	708	709	709
13	709	708	708	708	708	708	708	709	709	709	709	709	708	707	706	706	706	706	706	706	707	707	708	708	708
14	708	707	708	708	707	707	707	708	708	708	708	707	706	705	705	704	704	704	704	704	705	705	705	705	706
15	705	705	705	705	705	705	705	705	705	706	706	705	704	704	703	703	702	703	703	703	704	704	704	704	704
16	704	704	704	704	703	704	704	704	705	705	705	705	704	703	702	702	702	702	702	703	703	703	704	704	703
17	704	704	705	705	705	706	706	707	708	708	708	CAL	CAL	CAL	CAL	CAL	CAL	CAL	706	706	707	707	707	707	706
18	707	707	707	708	708	708	708	709	710	710	709	709	708	706	705	705	705	706	706	707	707	708	708	708	707
19	707	707	707	707	707	707	707	707	708	708	708	707	706	705	705	704	704	704	704	704	705	705	705	705	706
20	705	705	705	704	704	704	704	705	705	705	705	704	703	703	702	702	702	702	702	702	702	702	703	703	703
21	703	703	702	702	702	702	702	703	703	703	703	703	702	701	700	700	700	699	699	700	700	700	701	701	701
22	701	701	701	700	700	700	701	701	701	701	701	701	701	700	700	700	700	700	701	701	702	702	703	702	701
23	702	702	702	702	702	703	703	704	704	705	705	704	704	704	703	703	703	704	704	704	704	704	704	704	703
24	704	704	704	704	704	704	704	704	705	705	705	705	704	704	704	704	705	705	706	707	707	707	708	708	705
25	708	708	708	708	708	708	708	708	708	708	708	707	706	705	704	703	703	703	703	704	704	704	704	704	706
26	704	704	704	704	703	703	703	703	704	704	703	702	701	700	699	699	699	699	699	699	699	699	700	700	701
27	700	700	699	699	699	699	699	700	700	700	700	699	698	697	696	696	696	696	696	697	697	698	698	698	698
28	698	698	698	698	699	699	699	700	700	701	701	701	701	701	701	700	701	701	701	702	702	703	703	703	700
HRAVE	705	705	705	705	705	705	705	706	706	706	706	706	705	704	704	703	703	703	704	704	705	705	705	705	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	705	706	706	707	707	708	707	707	706	703	705	709	708	706	704	703	706	707	706	703	701	701	703	705	706
MAX	707	708	707	709	709	709	709	709	708	705	708	711	709	708	706	705	708	710	708	705	703	703	705	708	708
MIN	703	704	704	706	705	706	705	705	703	701	704	707	706	704	702	702	704	705	704	702	699	700	702	704	703

DAY	26	27	28	29	30	31
AVE	701	698	700	***	***	***
MAX	704	700	703	***	***	***
MIN	699	696	698	***	***	***

MONTHLY AVERAGE = 704.9 MONTHLY MAXIMUM = 710.8 MONTHLY MINIMUM = 695.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
FEBRUARY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	93	96	98	98	98	98	98	98	98	98	96	84	79	60	50	47	47	59	67	71	76	81	84	86	82
2	91	94	95	96	94	95	96	93	83	77	66	53	44	43	41	39	37	39	48	53	56	65	73	77	69
3	80	83	82	84	90	91	91	92	83	70	58	52	44	38	35	32	31	37	47	54	60	65	73	77	65
4	81	84	84	86	88	92	95	91	84	70	57	47	41	40	36	32	34	39	46	51	57	64	71	74	64
5	81	83	82	78	82	90	88	86	82	60	49	41	33	25	21	23	22	22	23	25	26	31	38	43	51
6	49	51	56	52	55	62	63	63	59	49	39	32	26	22	21	19	19	21	26	28	37	45	52	55	42
7	56	60	66	66	72	72	77	78	69	53	44	34	30	26	23	20	18	26	33	35	39	46	52	59	48
8	64	70	66	70	73	73	74	66	62	46	38	31	25	24	21	22	27	32	36	40	43	50	56	63	49
9	69	68	69	75	78	73	77	83	65	52	42	35	31	30	24	12	11	26	37	40	43	49	55	59	50
10	62	62	65	71	74	74	75	79	66	50	41	34	29	24	18	17	18	22	29	33	33	37	39	46	46
11	54	58	63	67	66	68	76	76	64	51	42	21	17	13	12	14	14	16	18	22	26	30	33	34	40
12	36	39	41	44	46	48	47	48	42	35	30	27	25	23	22	22	22	24	29	32	33	35	38	39	34
13	40	42	44	43	43	43	42	44	40	37	34	33	30	26	25	23	24	25	26	29	33	35	37	39	35
14	42	46	52	54	50	47	48	48	44	39	35	32	29	27	28	28	29	31	33	34	35	37	40	47	39
15	52	54	54	58	63	64	65	68	61	53	46	38	39	43	45	42	42	44	49	54	59	64	67	70	54
16	71	76	78	80	85	86	87	87	74	64	56	56	49	43	40	38	39	45	45	51	53	54	61	61	62
17	64	67	67	35	23	21	20	19	18	15	13	CAL	CAL	CAL	CAL	CAL	CAL	15	20	22	24	28	32	35	30
18	37	39	46	46	50	51	51	52	42	33	28	23	18	13	11	9	15	20	22	22	26	30	34	37	31
19	42	45	49	51	55	54	59	56	51	42	33	23	20	17	14	12	13	14	20	22	23	29	31	36	34
20	39	43	46	50	50	52	51	54	51	40	31	24	23	21	21	20	20	23	27	30	31	35	37	39	36
21	41	42	48	52	57	61	65	61	50	42	37	34	27	24	25	26	28	31	33	38	43	45	46	43	42
22	45	51	54	55	57	56	61	59	52	48	40	35	31	31	32	36	38	42	44	45	49	50	54	59	47
23	60	61	63	63	66	66	66	70	68	65	59	48	39	37	38	36	38	41	45	55	58	62	64	67	56
24	69	70	73	79	80	90	87	79	76	79	84	72	55	48	42	47	62	78	84	84	84	85	85	90	74
25	93	93	96	97	98	98	98	98	89	72	60	51	43	36	29	29	28	30	35	39	42	46	51	56	63
26	60	62	68	70	66	75	79	79	61	45	37	32	25	21	21	19	19	20	23	25	28	31	36	41	43
27	46	49	54	56	61	65	65	65	54	40	30	25	21	19	19	20	20	23	26	29	33	37	39	42	39
28	44	46	47	51	49	49	52	54	54	54	50	50	53	50	49	49	52	54	57	60	62	63	62	63	53
HRAVE	59	62	64	65	67	68	70	69	62	53	46	40	34	30	28	27	28	32	37	40	43	47	52	55	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	82	69	65	64	51	42	48	49	50	46	40	34	35	39	54	62	30	31	34	36	42	47	56	74	63
MAX	98	96	92	95	90	63	78	74	83	79	76	48	44	54	70	87	67	52	59	54	65	61	70	90	98
MIN	47	37	31	32	21	19	18	21	11	17	12	22	23	27	38	38	13	9	12	20	24	31	36	42	28

DAY	26	27	28	29	30	31
AVE	43	39	53	***	***	***
MAX	79	65	63	***	***	***
MIN	19	19	44	***	***	***

MONTHLY AVERAGE = 49.3 MONTHLY MAXIMUM = 98.4 MONTHLY MINIMUM = 9.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
FEBRUARY - 2015

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CAL	CAL	CAL	CAL	CAL	CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.09
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	***	***	***
MAX	0.00	0.00	0.00	***	***	***
MIN	0.00	0.00	0.00	***	***	***

MONTHLY TOTAL = 0.09 MONTHLY MAXIMUM = 0.05 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

SODAR AND 10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

JUNE THROUGH NOVEMBER 2015

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

February 2016

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. The smelter air emissions are released to the atmosphere through a 1,000-foot (approximately 300 meter) tall stack. To help refine future AERMOD air dispersion modeling at the facility, ASARCO has been performing site-specific meteorological monitoring at Hayden. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

ASARCO supplemented the 10 meter meteorological tower with a Remtech PA-0 phased-array acoustic Sodar in late May 2014 that measures winds at elevations ranging from approximately 50 to 400 meters above ground level. Sodar (SOnic Detection And Ranging) systems are used to remotely measure the vertical turbulence structure and the wind profile of the lower layer of the atmosphere. Sodar systems are like radar systems except that sound waves rather than radio waves are used. A profile of the atmosphere as a function of height can be obtained by analyzing the return signal at a series of times following the transmission of each pulse. Three antenna beams oriented along the U, V, and W directions allow the calculation of horizontal and vertical wind speeds and directions. Phased-array Sodar systems use a single array of speaker drivers and horns (transducers), and the three antenna beams are electronically generated and steered by phasing the transducers appropriately.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the sodar and 10-meter tower data validation report for the period June through November 2015. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

The tower and sodar data was remotely collected and reviewed on a daily basis. The sodar data was also regularly compared to the tower wind data to ensure proper sodar operation. No significant operational events occurred during the period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A calibration of the ST-10 meteorological equipment was performed on June 10, 2015, and the calibration results are presented in Appendix A. The calibrations demonstrate that the meteorological systems were operating within the acceptable DQO ranges, as listed in the project's QAPP Table B-1. The Sodar and ST-10 QAPP does not list calibration DQOs for the parameters collected at ST-10 that are not used in AERMOD dispersion modeling, those parameters being pressure, precipitation, and relative humidity. The DQOs that were used to validate these three additional parameters are listed in Tables 0-7 and 0-8 in EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems - Volume IV: Meteorological Measurements Version 2.0* (March 2008), which list PSD measurement DQOs.

A quality assurance performance audit was also conducted on the ST-10 meteorological tower equipment on June 10, 2015, before any tower calibrations or adjustments were made. This audit was performed by independent personnel, using independent certified audit standards. The results from this audit are also presented in Appendix A, and indicate that the meteorological systems were operating within the acceptable DQO ranges.

3.2 Sodar Calibration and Audit Results

Section 9.6 of EPA's Met Monitoring Guidance notes that, other than directional alignment checks, a true calibration verification of a sodar is difficult because of the nature of the measurement technique. In addition, because the PA0 sodar system is a multiple frequency phased array system, a transponder cannot be used to test this system. However, the PA0 performs numerous internal signal checks during normal operation. Therefore, there are no specific sodar calibration procedures except for leveling the antenna and checking orientation, and both of these checks were performed during the June 10, 2015, calibration.

A sodar performance audit was performed on June 10, 2015. This audit compared sodar measurements with an independent measurement technique, a tethersonde system, as recommended in Section 9.6 of EPA's Met Monitoring Guidance. The tethersonde system uses a tethered balloon to lift a measurement package or "sonde" to an altitude corresponding with the Sodar measurements. This method then collects data over a minimum of five sodar 15-minute averaging periods. Table 9-4 in EPA's Met Monitoring Guidance recommends sodar DQO audit goals for the systematic difference and comparability, as listed below.

Table 1 – Sodar DQOs

Systematic Difference (Bias)	Comparability (RMS Error)
U and V component < ± 1 m/s	U and V component < ± 2 m/s
Wind Speed < ± 1 m/s	Wind Speed < ± 2 m/s
Wind Direction < ± 10 Degrees	Wind Direction < ± 30 Degrees

The results from the sodar tethersonde audit are presented in Appendix A. All test results are within the Project DQOs and indicate acceptable instrument performance.

3.3 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). Additional data screening is

also performed on the sodar data. The internal sodar diagnostic data, including signal to noise ratios (SNRs), the FEMAX ground clutter number, the JAM internal electronic test diagnostic value, and the number of spurious signals (SPU) are screened against manufacturer recommended values. Time series data from the Sodar are screened against rates of change and persistence criteria, and the vertical profiles of the Sodar are screened against expected rate of change with altitude criteria. If the comparisons fall outside of typical ranges, the record is flagged for further inspection. The 15-minute Sodar data are averaged into hourly data using unit vector wind direction averages and scalar wind speed averages, in accordance with Section 6.2 of EPA's Met Monitoring Guidance.

Table 1 summarizes the data screening and validation criteria used for both the 10 meter meteorological tower parameters and the sodar.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were 1.6, -3.1, and -5.9 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, including any necessary data edits. The data review resulted in the invalidation of six hours of sodar data, as noted on the QC review sheets in Appendix A.

Table 2 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%
Sodar Internal Diagnostic Data	JAM > 0, FEMAX > 600, SNR % total bandwidth > 5, SPU > 7.
Sodar Time Series Rate of Change	Same range and persistence checks as listed above for wind speed and direction.
Sodar Rate of Change for Altitude Gates	WS difference more than 4.5 m/s between altitude gates, and WD difference more than 120 degrees between altitude gates.
Sodar Comparison to 10-meter Wind Data	When Wind Speed is > 2 m/s and time is between 10am and 5 pm, then: Wind Speed Average Bias < 1 m/s, WD Standard Deviation Variability < 2 m/s, Wind Direction Average Bias < 10 degrees, WD Standard Deviation Variability < 30 degrees

Quality control comparisons of the hourly average 100 meter sodar wind speed and direction data to the hourly average 10 meter meteorological measurements are also performed for the quarter. These tests are performed only when the atmosphere is well mixed and the 10 meter surface winds should be coupled to the Sodar height winds, which occurs during daytime periods (between 10 am and 5 pm) with moderate wind speeds (greater than 2 m/s). The average difference and standard deviation of differences for wind speed and wind direction were computed and compared to the same DQOs EPA recommends for sodar audits against nearby meteorological towers (even though for an audit, the sodar and tower measurement heights are at the same height, and therefore should agree better than 10 and 100 meter data). Table 2 presents the results of this quality control comparison for two quarters, and demonstrates that the sodar agrees with the 10-meter tower within the EPA recommended DQO criteria.

Table 3 – Sodar QC Comparisons to 10m Tower Wind Data

Parameter	EPA DQOs	June-August 2015 Performance	Sept-Nov 2015 Performance
Wind Speed Average Difference (m/s)	$< \pm 1$	0.6	0.5
Wind Speed Std Dev Difference (m/s)	< 2	1.1	0.9
Wind Direction Average Difference (degrees)	$< \pm 10$	-4.8	-1.2
Wind Direction Std Dev Difference (degrees)	< 30	24.7	19.4

Note: The 100m level of hourly averaged sodar wind data was compared to 10m tower wind data.

3.4 Data Capture Statistics

Based on the review of data from calibrations, audits, and the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 3 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis, and the quarterly data capture rates are well above 90% for each month for all parameters except the 400 m level sodar winds and 300m and 400m sigma W data. This is not unexpected, as sodars have difficulty collecting data at altitudes greater than approximately 300 meters, especially in hot and dry locations such as the ST-10 site. EPA also notes in Section 9.8 of the Met Monitoring Guidance that "data capture for wind direction and wind speed from a sodar is defined somewhat differently than for more conventional instruments", and " an averaging period (e.g., hourly) is considered valid if there are at least three valid levels of data for the period (independent of height)". The data capture rates for all sodar levels equal to and below 300 meters in height all meet the data completeness DQO, and therefore the sodar data capture rates meet EPA requirements.

In summary, all meteorological data collected during the quarter meets the DQO completeness goal for all parameters.

Table 4 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip	100m WS/WD	300m WS/WD	400m WS/WD	100m SW	300m SW	400m SW
Jun-15	99.2	99.2	99.2	99.2	99.2	99.2	99.2	96.5	96.5	82.1	94.9	85.4	54.4
Jul-15	100.0	100.0	100.0	100.0	98.1	98.1	98.1	97.3	97.3	85.5	96.1	87.8	64.9
Aug-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.1	98.3	90.9	96.8	92.3	71.9
Sep-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.8	96.8	88.3	94.7	91.2	79.0
Oct-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	95.7	81.7	93.7	88.3	67.9
Nov-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.7	94.7	71.5	92.8	82.5	46.8
Dec-15													
Jan-16													
Feb-16													
Mar-16													
Apr-16													
May-16													
Quarter 1	99.7	99.7	99.7	99.7	99.1	99.1	99.1	97.3	97.4	86.2	95.9	88.5	63.8
Quarter 2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	95.7	80.5	93.7	87.3	64.6
Quarter 3													
Quarter 4													
Total	99.9	99.9	99.9	99.9	99.5	99.5	99.5	96.5	96.6	83.4	94.8	87.9	64.2

Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and year to date.

4.0 DATA RESULTS

Appendix B presents plots of various monthly data summaries and data tables for the reporting period (these tables include sodar data for the 100, 300, and 400 meter levels). Also submitted with this report are 15-minute and hourly data files in a format designed for AERMET data processing (all sodar altitude levels are included in these data files).

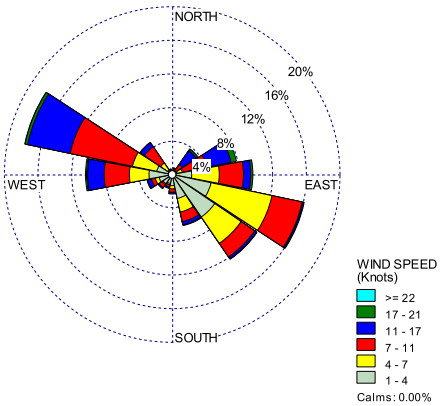
Figure 1 presents plots of the quarterly wind speed and wind direction data at selected heights of 10, 100, and 300 meters above ground, in a format called a "wind rose" plot. These wind roses indicated that there are two predominate wind directions at the site; one from the east (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours). As expected, the wind speeds at 100 and 300 meter levels are higher than the 10 meter winds, with fewer hourly observations in the lower wind speed ranges (gray and yellow bars in the wind roses).

The review of the wind data indicates that there is a diurnal flow pattern at the site, with winds frequently from the east and southeast directions in the morning and evening hours with light to moderate speeds, followed by afternoons with moderate to strong winds. This pattern is evident in the wind roses, and can also be seen in an example of the daily wind data profiles shown in Figure 2 with light easterly and southeasterly flows in the morning followed by stronger westerly wind flows during the afternoon hours. This pattern repeats itself for the majority of the days, and results in the observed bi-modal wind rose distributions.

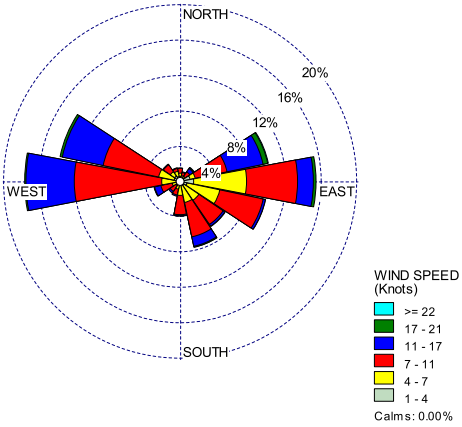
A six-month (June through November 2015) digital data base in an ASCII format suitable for AERMET processing is included with this data report. It is recommended that Sodar data only up to 400m be used for AERMET processing, for the following reasons. First, this altitude extends 100m taller than the main stack height, which will allow AERMOD to properly simulate stack tip downwash, plume rise, and plume transport. Second, the data capture rates at altitudes above 400m are lower than at altitudes below 400m, and there is an increased number of data screening flags (which indicates that data from higher elevations may not be as reliable as data from 400m and lower altitudes). Therefore, it is not likely that data from these higher Sodar altitudes would add to the accuracy of the AERMET data profile. The included AERMET Stage 1 input file for the onsite data is setup to only process Sodar data up to 400m altitude.

Figure 1 –Wind Rose Plots

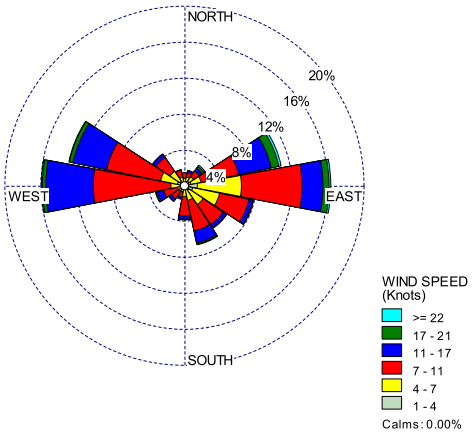
10-Meter Wind Rose



100-Meter Wind Rose

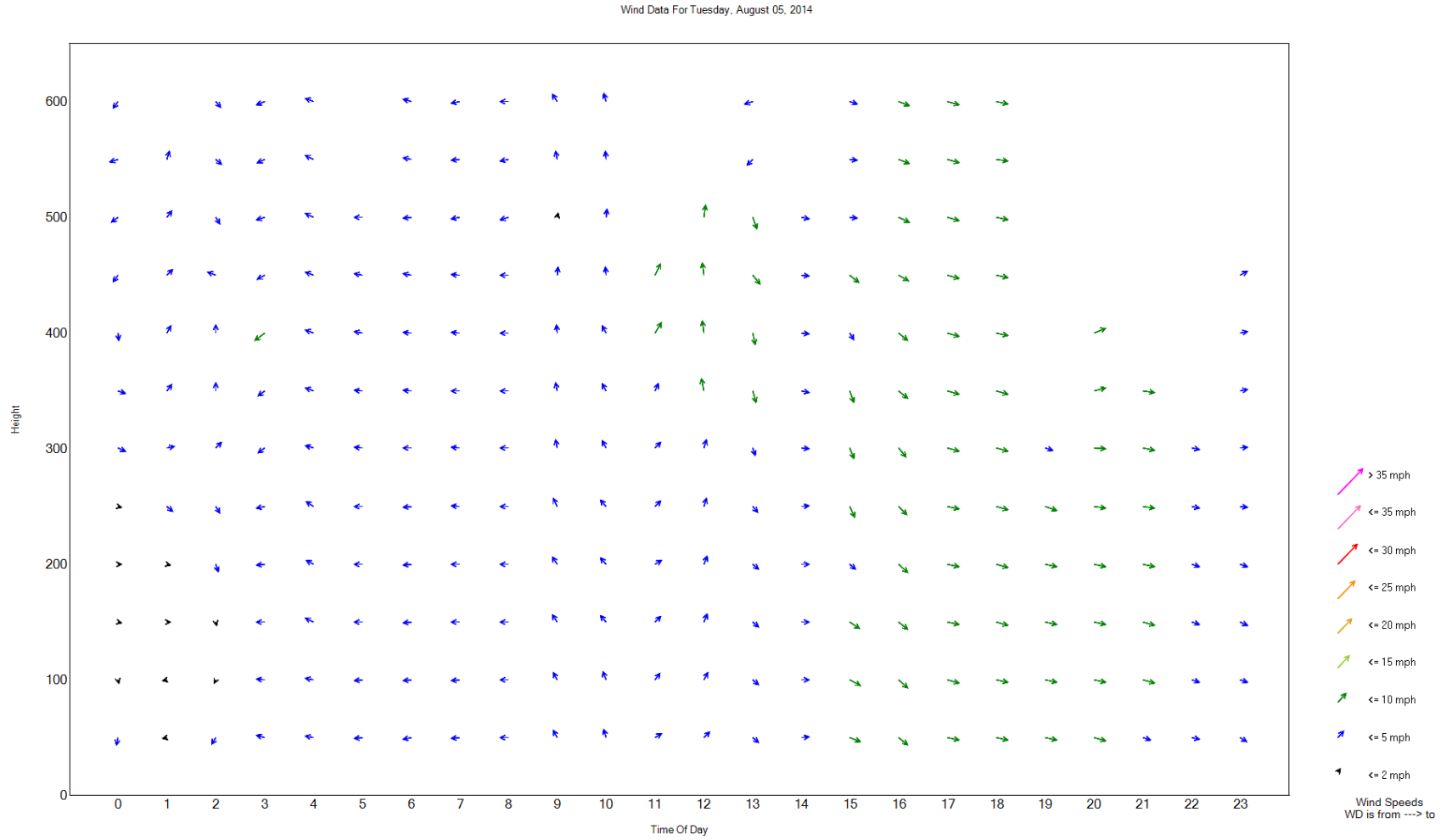


300-Meter Wind Rose



Wind directions are the direction the wind is blowing FROM.

Figure 2 – Example of Typical Diurnal Wind Flow Patterns



Note: Arrows are wind flow vectors and point to the direction the wind is blowing to.

APPENDIX A

Data Screening and Validation Results

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 6/10/2015 By: Rebecca Moore

RM Young Wind Monitor AQ Sensor SN :	126168
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Met One 083 SN N3538
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN 4015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Oakton 4 Thermistor SN 86818
Relative Humidity Standard	Extech RH390 SN 130327978

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.4	0.4	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.5 mph (0.2 mps) or 5%, whichever is greater
Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.3 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	0	-1
45	41	42	1
90	86	87	1
135	131	131	0
180	176	176	0
225	221	221	0
270	266	266	0
315	311	311	0

Note: Readings adjusted for data logger offset

Magnetic Deviation (east is positive) =	10.3
Vane alignment rod (magnetic) =	349
Alignment (true) =	359
Data Logger Offset =	-4

Acceptable Tolerance is 3 degrees linearity, 5 degrees total
Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 10 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
1.7	1.2	-0.5	1.4	-0.3	0.05
20.0	20.4	0.4	20.2	0.2	0.03
38.2	38.3	0.1	38.2	0.0	0.06

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.34	0.34	0.00	0%

Solar Radiation Standard is LiCor 200 SN 68334
Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
40.5	37.8	-2.7

For RH the DQO limit is ± 7%

BAROMETRIC PRESSURE SENSOR

Standard (mm Hg)	Logger (mm Hg)	Difference (mm Hg)
697.1	701.17	4.1

Acceptable tolerance is 2.3 mm Hg

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.50	0.45	-0.05

45 tips

Note: Input 250 ml for a target of 0.50 inches (50 tips).
The water must be input over at least 10 minutes.
Acceptable tolerance is 10% of input.

Comments:
Calibration starts 09:15, is over 13:30
Replaced WS bearings

QUALITY ASSURANCE
PERFORMANCE AUDIT REPORT

ST-10 SODAR AND 10-METER METEOROLOGICAL TOWER MONITORING STATION

June 10, 2015

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
2027 Broadway, Suite B
Boulder, CO 80302

ASARCO ST-10 SODAR AND 10-M METEOROLOGICAL MONITORING AUDIT REPORT
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Appendix A – Standard Certification Data Sheets

1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. The smelter air emissions are released to the atmosphere through a 1,000-foot (approximately 300 meter) tall stack.

To help refine future AERMOD air dispersion modeling at the facility, ASARCO has been performing site-specific meteorological monitoring at Hayden. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters (10 meter wind speed, direction, and sigma theta, 2 and 10 meter temperature and delta temperature, and solar radiation).

ASARCO supplemented the 10 meter meteorological tower by installing an Remtech PA-0 phased-array acoustic Sodar in June 2014 that measures winds at elevations ranging from approximately 50 to 400 meters above ground level. Sodar (SOnic Detection And Ranging) systems are used to remotely measure the vertical turbulence structure and the wind profile of the lower layer of the atmosphere. Sodar systems are like radar systems except that sound waves rather than radio waves are used. Sodar systems operate by issuing an acoustic pulse and then receiving the return signal for a short period of time. Both the intensity and the Doppler (frequency) shift of the return signal are analyzed to determine the wind speed, wind direction and turbulence of the atmosphere. A profile of the atmosphere as a function of height can be obtained by analyzing the return signal at a series of times following the transmission of each pulse. Three antenna beams oriented along the U, V, and W directions allow the calculation of horizontal and vertical wind speeds and directions. Phased-array Sodar systems use a single array of speaker drivers and horns (transducers), and the three antenna beams are electronically generated and steered by phasing the transducers appropriately.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as EPA's Met Monitoring Guidance). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, Data Quality Objectives (DQOs), and auditing procedures.

In June, 2015, an independent quality assurance performance audit was performed on the meteorological monitoring system. This document is the audit report. Section 2 of this report describes the performance audit procedures. Section 3 presents the audit results and compares them to the Data Quality Objectives (DQOs) listed in EPA's Met Monitoring Guidance and the Project QAPP. Appendix A presents the standard certification data sheets.

2.0 AUDIT PROCEDURES

2.1 10-Meter Meteorological Tower Audit Procedures

The 10-meter meteorological tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor. The sensors are connected to a Campbell Scientific CR-1000 data logger that scans the sensors once per second and computes and store 15-minute and hourly averages.

Quality assurance performance audits evaluate the accuracy of these tower-based meteorological sensors using equipment and personnel that are independent from those used for normal operations. Audit equipment is traceable to National Institute of Standards and Technology (NIST) and manufacturer's standards, as appropriate. The accuracy DQOs used to define an acceptable audit are listed in Table 1.

Table 1 – 10-m Meteorological Tower QA Audit DQOs

Parameter	Specifications	QAPP DQO Requirements
Wind Speed (10 meters above ground level)	Starting Torque Threshold (corresponding to sensor starting threshold of 0.5 m/s)	≤ 1 gr/cm
	Sensor Accuracy	0.2 m/s
Wind Direction (10 meters above ground level)	Starting Torque Threshold (corresponding to sensor starting threshold of 0.5 m/s)	≤ 11 gr/cm
	Sensor Accuracy	5 degrees
Temperature (at 2 and 10 meters above ground level)	Sensor Accuracy	0.5 C
Temperature Difference	Sensor Accuracy	0.1 C
Solar Radiation	Sensor Accuracy	5%

Audit procedures for meteorological sensors are presented in the Project QAPP, and are summarized below.

Wind Direction Audit Procedure

The wind sensor orientation is determined using a professional magnetic compass and the RM Young siting fixture. True north is distinguished from magnetic north by reading a magnetic compass and applying a correction factor for the magnetic declination. The declination has been determined from the USGS declination calculation program, and is 10 degrees easterly. The wind direction linearity is checked against various target directions using the RM Young Vane Angle Fixture. The sensor starting threshold is tested using a RM Young model 18331 torque gauge, and must be equal to or less than 11 gr/cm (equivalent to a wind speed threshold of 0.5 m/sec).

Wind Speed Audit Procedure

The horizontal wind speed calibration check is performed using a RM Young digital tachometer. Sensor readings are compared to the calibration values provided in the sensor manufacturer's specifications. The sensor starting threshold is tested using a RM Young model 18130 torque wheel, and must be equal to or less than 1.0 gr/cm (equivalent to a wind speed threshold of 0.5 m/sec).

Temperature and Delta Temperature Audit Procedure

The 2-meter and 10-meter temperature sensor calibration is verified by direct comparison of sensor outputs to a collocated standard thermometer at three different temperatures, encompassing the measurement range expected at this site. Sensors at the 2 and 10 meter levels are checked simultaneously in the same medium so that the delta temperature function can be verified.

Solar Radiation Audit Procedure

The solar radiation pyranometer output is audited using a collocated independent standard.

2.2 Sodar Audit Procedures

The Sodar performance audit compares Sodar measurements with an independent measurement technique, as recommended in Section 9.6 of EPA's Met Monitoring Guidelines. Sodar monitoring systems provide a remote, "indirect" measurement of wind and turbulence parameters. This presents a unique challenge to the quality assurance of these systems, since there is no direct counterpart to the bench top audit methodology of a wind vane. Therefore, a comparison between the Sodar and another measurement system is performed to establish the reasonableness of the Sodar data. One of EPA's recommended approaches to auditing a Sodar is a tethersonde intercomparison. A tethersonde system uses a tethered balloon to lift a

measurement package or "sonde" to an altitude corresponding with the Sodar measurements. This method then collects data over a minimum of five Sodar 15-minute averaging periods. The sonde readings are processed into U and V components that correspond to the Sodar beam directions, and are time averaged to correspond to the Sodar averaging period. The comparison of tethersonde versus Sodar data provides an overall evaluation of the Sodar performance.

A tethersonde system was used as the independent auditing standard for the ASARCO audit. The helium-filled, blimp-shaped, tethered balloon has a volume of 2.25 cubic meters, with dimensions of approximately 3 meters long and 1.3 meters wide. The tethersonde unit, which is suspended beneath the balloon, is capable of measuring wind speed, wind direction, temperature, and barometric pressure. The accuracy for wind speed is 5% (the sonde package uses the Renewable NRG Systems #40C Anemometer, with a stated accuracy of less than 2% uncertainty), and the wind direction accuracy is 2 degrees. The meteorological data measured by the tethersonde are scanned and stored on an SC card once every 10 seconds. The 10-second tethersonde values were then processed into 15-minute averages and compared with the 15-minute averages for the same time periods reported by the Sodar system.

The systematic difference (bias) and comparability (root-mean-square error) between the Sodar and tethersonde U and V components will be calculated using equations 9-1 and 9-2 from page 9-16 of EPA's MMGRMA guidance. Table 9-4 in the MMGRMA guidelines suggests Sodar DQO audit goals for the systematic difference and comparability, as listed below. EPA recommends that the DQO for the wind speed and wind direction comparisons should be applied when winds are greater than approximately 2 m/s (this is because when the winds are light there will be more variability in the observed speeds and directions and potentially larger differences between the Sodar and the tethersonde).

Table 2 – Sodar Performance Audit DQOs

Systematic Difference (Bias)	Comparability (RMS Error)
U and V component $< \pm 1$ m/s	U and V component $< \pm 2$ m/s
Wind Speed $< \pm 1$ m/s	Wind Speed $< \pm 2$ m/s
Wind Direction $< \pm 10$ Degrees	Wind Direction $< \pm 30$ Degrees

EPA notes that comparison results in excess of the audit goals do not necessarily mean that the data are invalid. Other reasons that can contribute to comparison results in excess of the audit goals may include unusual meteorological conditions (such as very turbulent conditions) or differences due to the locations of the two instruments. Both the reasons for and the magnitude of the measured differences should be considered in determining whether the Sodar data is valid.

In addition to the tethersonde audit, the orientation of the Sodar antenna relative to true north is measured by a compass, adjusted to compensate for the local magnetic declination. The antenna alignment is compared to the Sodar AZIMUT setting. A bubble level is used to check the antenna's level.

3.0 AUDIT RESULTS AND ANALYSIS

3.1 10-Meter Meteorological Tower Audit Results

The independent quality assurance performance audit was conducted on the meteorological tower on June 10, 2015. Table 3 presents the results for the audit, and all test results are within the Project DQOs and result in an acceptable audit.

3.2 Sodar Audit Results

The independent quality assurance performance audit of the Sodar system was conducted on June 10, 2015. EPA's Met Monitoring Guidelines recommends that data from a minimum of five Sodar averaging intervals be collected and compared, and the ASARCO audit consisted of five Sodar averaging intervals.

The tethersonde base station was located approximately 350 meters to the southeast of the Sodar antenna. The tethersonde was flown to an approximate altitude of 200 meters above ground level, close to the smelter stack height. The tethersonde clock was synchronized to the Sodar clock, and data was collected and averaged over 15 minute periods. The tethersonde altitudes were determined using the sonde measurements of barometric pressure.

The audit was performed during the morning hours after sunrise, with moderate wind speeds of 2-4 m/s and wind directions from the west and northwest. There was little turbulence evident as indicated by the tethersonde balloon's flight conditions.

Table 4 presents the results for the Sodar tethersonde audit. All test results are within the Project DQOs and result in an acceptable audit.

The orientation of the Sodar antenna, relative to true north, was measured by a compass and determined to be 120 degrees magnetic, equal to 130 degrees true. This was compared to the Sodar AZIMUT setting of 133 degrees, and the audit readings were within 3 degrees of the Sodar orientation. A bubble level was also used to confirm the antenna was level.

Table 3 – 10-meter Met Tower Audit Results

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 6/10/2015 Auditor: John Podrez

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 126168
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Wind Speed Audit Standard:	RM Young 18802 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton SN M100608

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.5	0.5	NA
300	3.4	3.4	0.0	0.0%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.5 mph (0.2 mps) or 5%, whichever is greater
Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.45 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	1	0
45	41	41	0
90	86	86	0
135	131	131	0
180	176	176	0
225	221	222	1
270	266	267	1
315	311	311	0

Magnetic Deviation (east is positive) = 10.3
Vane alignment rod (magnetic) = 348
Alignment (true) = 358
Note - Data Logger program has offset of -4 degrees.
Acceptable Tolerance is 3 degrees linearity, 5 degrees total
Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 11 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
1.7	1.2	-0.5	1.4	-0.3	0.05
20.0	20.4	0.4	20.1	0.1	-0.07
38.2	38.2	0.0	38.2	0.0	-0.07

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)	
1.19	1.12	-0.07	-3%	(mV * .1025)

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

Comments:
Audit starts 09:15, is over 11:01

Table 4 – Sodar Audit Results

ASARCO Hayden - Remtech PA0 Sodar QA Audit
Audit performed using Tethersonde system SN 102

Site: ST-10 Date: 6/10/2015 Auditor: Mark Podrez

Time (MST)	Tethersonde System Data			Sodar Data			Sonde Components		Sodar Components		Differences			
Ending	Height agl	Speed m/s	Direction	Height agl	Speed m/s	Direction	U m/s	V m/s	U m/s	V m/s	Wind Speed m/s	Wind Direction	U m/s	V m/s
9:15	214	1.8	333	200	3.0	350	-1.7	-0.6	-2.4	-1.8	1.2	17	-0.7	-1.2
10:00	160	3.5	290	150	4.2	275	-3.3	1.4	-3.3	2.6	0.7	-15	0.0	1.2
10:15	178	2.8	286	150	4	280	-2.5	1.3	-3.4	2.2	1.2	-6	-0.9	0.9
10:30	227	2.1	285	250	2.5	315	-1.8	1.0	-2.5	-0.1	0.4	30	-0.7	-1.1
10:45	186	3.7	290	200	3.4	275	-3.4	1.4	-2.7	2.1	-0.3	-15	0.7	0.7
Average of Differences											0.6	2	-0.3	0.1
Standard Deviation of Differences											0.6	20	0.7	1.1
EPA Audit Target - Average Difference (Bias)											≤ 1	≤ 10	≤ 1	≤ 1
EPA Audit Target - Standard Deviation (Comparibility)											≤ 2	≤ 30	≤ 2	≤ 2

NOTE: Sodar beam #1 orientation is 133 true, so U and V components are aligned along this direction.

APPENDIX A

Audit Standard Certification Sheets

Certificate of Accuracy

Transfer Standard Type: Electronic Thermometer Certificate No: **T 020515. 01**

Transfer standard, model/type: Oakton Temp 4 Acorn Series Thermistor Thermometer
Serial number: 86818 Probe S/N: 01J0299
submitted by/owner: RTP Environmental
2027 Broadway, Suite B
Boulder, CO 80304

Was compared to:
NIST Traceable Hg-in-glass thermometers, serial numbers 2J3106, 2Y6027, 3L9452 and ice point. Miller & Weber Hg-in-glass thermometer sn 2J3106 and 2Y6027 are traceable to NIST Test No. 209621, Test Method ASTM E-77. 2J3106 is traceable through Standard No. 1S1262. 2Y6027 is traceable through Standard No. 9C8072. Miller & Weber Hg-in-glass thermometer sn 3L9452 is traceable to NIST Thermometer 40350, through Transfer Standards 3C4465 & 1Y9716.

Date: 02/05/15 Lab temperature: 23.4 °C
Barometric Pressure: 655.5 mmHG

Reference Standard (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Transfer Standard Correction* (°C)
0.0	0.0	0.0	0.0
22.6	22.6	0.0	0.0
42.5	42.6	0.1	-0.1

Note:
If no sign is given on the correction, the true temperature is higher than the indicated temperature. If the sign is negative, the true temperature is lower than the indicated temperature.

Transfer Standard adjustments made? YES ☐ **NO** ■
Pre-calibration measurements:

Reference Thermistor (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Transfer Standard Correction* (°C)

Certified By: Date: February 5, 2015

Roger L. Sanders

Chinook Engineering
a division of Inter-Mountain Laboratories, Inc.
555 Absaraka Street
Sheridan, Wyoming 82801 USA
(307) 674-7506
chinook@imlinc.com

CERTIFICATE of CALIBRATION for LI-COR SENSOR

Pyranometer
Model Number: LI-200

Serial Number: **PY15862**

Calibration Date: **June 17, 2014**
Manufacture Date: **March 26, 1992**

Calibration Constant:

Output: **97.64** microamps per 1000 watts m^{-2}

For use with LI-COR handheld meters:

Multiplier: **-10.24** watts m^{-2} per microamp

For use with LI-COR 2220 (147 ohm) Millivolt Adapter:

Multiplier: **-69.67** watts m^{-2} per millivolt

If this is an SL sensor:

Multiplier: **-100.0** watts m^{-2} per millivolt

*Modified Sensor:

Multiplier: **-102.5** watts m^{-2} per millivolt
Resistance: **99.9** ohms

IMPORTANT: Read the appropriate instruction manual (http://www.licor.com/TSM) before using this sensor.
IMPORTANT: It is recommended that sensors be recalibrated every two years after field deployment.

Calibration Technician: Aaron DeJong

* Our records indicate this sensor is modified with a resistor attached.

LI-COR Biosciences

LI-COR Biosciences ● Environmental ● 4421 Superior Street ● P.O Box 4425 ● Lincoln, NE 68504 USA
Phone: (1) 402-467-3576 ● Fax: 402-467-2819 ● Toll-free: 800-447-3576 (USA & Canada)
envsales@licor.com ● envsupport@licor.com ● www.licor.com
Manual: http://www.licor.com/TSM

CERTIFICATE OF CALIBRATION AND TESTING

MODEL: **18801** (Comprised of Models 18820 Control Unit & 18830 Motor Assembly)
SERIAL NUMBER: 12071

R. M. Young Company certifies that the above equipment was inspected and calibrated prior to shipment in accordance with established manufacturing and testing procedures. Standards established by R.M. Young Company for calibrating the measuring and test equipment used in controlling product quality are traceable to the National Institute of Standards and Technology.

Nominal Motor Rpm	Output Frequency Hz (1)	Calculated Rpm (2)	Indicated Rpm (3)
600	320	600	600
1200	640	1200	1200
2400	1280	2400	2400
4200	2240	4200	4200
6,000	3200	6000	6000
8,100	4320	8100	8100
9,900	5280	9900	9900
☒ Clockwise and Counterclockwise rotation verified			

(1) Measured at the optical encoder output.
(2) Frequency output produces 32 pulses per revolution of motor shaft.
(3) Indicated on the Control Unit LCD display.

* Indicates out of tolerance

☒ No Calibration Adjustments Required ☐ As Found ☐ As Left

Traceable frequency meter used in calibration Model: DP5740 SN: 4863

Date of inspection 2 Jul 2014
Inspection Interval One Year

Tested By EC

ASARCO ST-10 10-Meter Data - QA Screen Test Results for June-August 2015 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	15060818	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15061404	WIND SPD TOO CONSTANT 3 HR	0.08	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15061412	WIND SPD TOO CONSTANT 3 HR	0.11	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15061603	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15061803	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15061905	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15061906	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15062009	WIND SPD TOO CONSTANT 3 HR	0.05	Light morning winds, WD does vary - WS is valid
4	WS	15062905	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15070105	WIND SPD TOO CONSTANT 3 HR	0.21	Light morning winds, WD does vary - WS is valid
4	WS	15070106	WIND SPD TOO CONSTANT 3 HR	0.04	Light morning winds, WD does vary - WS is valid
4	WS	15070107	WIND SPD TOO CONSTANT 3 HR	0.17	Light morning winds, WD does vary - WS is valid
4	WS	15070112	WIND SPD TOO CONSTANT 3 HR	0.04	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15070606	WIND SPD TOO CONSTANT 3 HR	0.05	Light morning winds, WD does vary - WS is valid
4	WS	15070607	WIND SPD TOO CONSTANT 3 HR	0.2	Light morning winds, WD does vary - WS is valid
4	WS	15070614	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15070707	WIND SPD TOO CONSTANT 3 HR	0.09	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15070922	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15071303	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15071906	WIND SPD TOO CONSTANT 3 HR	0.04	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15071907	WIND SPD TOO CONSTANT 3 HR	0.09	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15071908	WIND SPD TOO CONSTANT 3 HR	0.08	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15072017	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15072018	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15072109	WIND SPD TOO CONSTANT 3 HR	0.14	Light morning winds, WD does vary - WS is valid
4	WS	15072110	WIND SPD TOO CONSTANT 3 HR	0.14	Light morning winds, WD does vary - WS is valid
4	WS	15072111	WIND SPD TOO CONSTANT 3 HR	0.14	Light morning winds, WD does vary - WS is valid
4	WS	15072707	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15072711	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15072717	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15072800	WIND SPD TOO CONSTANT 3 HR	0.19	Light morning winds, WD does vary - WS is valid
4	WS	15080502	WIND SPD TOO CONSTANT 3 HR	0.19	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15080509	WIND SPD TOO CONSTANT 3 HR	0.21	Light morning winds, WD does vary - WS is valid
4	WS	15080515	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15080708	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15081021	WIND SPD TOO CONSTANT 3 HR	0.08	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15081204	WIND SPD TOO CONSTANT 3 HR	0.06	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15081303	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15081502	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082209	WIND SPD TOO CONSTANT 3 HR	0.05	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082210	WIND SPD TOO CONSTANT 3 HR	0.06	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082211	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082223	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082304	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082413	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082414	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082502	WIND SPD TOO CONSTANT 3 HR	0.06	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082506	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082603	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082811	WIND SPD TOO CONSTANT 3 HR	0.15	Light morning winds, WD does vary - WS is valid
4	WS	15082816	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15082906	WIND SPD TOO CONSTANT 3 HR	0.06	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15083104	WIND SPD TOO CONSTANT 3 HR	0.08	WD does vary and Sigma Theta is low to moderate - WS is valid
7	WD	15060818	WIND DIR TOO CONSTANT 3 HR	0.9	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15063017	WIND DIR TOO CONSTANT 3 HR	0.9	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15072407	WIND DIR TOO CONSTANT 3 HR	0.4	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15083109	WIND DIR TOO CONSTANT 3 HR	0.78	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15083110	WIND DIR TOO CONSTANT 3 HR	0.44	WS does vary and Sigma Theta is low to moderate - WD is valid
11	TP	15062716	HIGH RATE OF C CHANGE	5.81	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15062716	HIGH RATE OF C CHANGE	5.42	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15062814	HIGH RATE OF C CHANGE	5.93	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15070917	HIGH RATE OF C CHANGE	8.34	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15070917	HIGH RATE OF C CHANGE	7.22	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15072917	HIGH RATE OF C CHANGE	7.52	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15072917	HIGH RATE OF C CHANGE	6.85	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15072918	HIGH RATE OF C CHANGE	5.21	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15073116	HIGH RATE OF C CHANGE	5.28	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15080713	HIGH RATE OF C CHANGE	7.72	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15080713	HIGH RATE OF C CHANGE	6.62	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15081120	HIGH RATE OF C CHANGE	5.15	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15081217	HIGH RATE OF C CHANGE	5.17	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082317	HIGH RATE OF C CHANGE	9.33	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082317	HIGH RATE OF C CHANGE	8.33	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082318	HIGH RATE OF C CHANGE	6.67	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082318	HIGH RATE OF C CHANGE	5.93	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082516	HIGH RATE OF C CHANGE	5.59	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082516	HIGH RATE OF C CHANGE	5.25	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082618	HIGH RATE OF C CHANGE	6.81	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082618	HIGH RATE OF C CHANGE	6.9	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15082717	HIGH RATE OF C CHANGE	7.65	During wind shift at afternoon/evening transition - Data is Valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for June-August 2015 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
11	TP	15082717	HIGH RATE OF C CHANGE	6.94	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15083016	HIGH RATE OF C CHANGE	6.64	During wind shift at afternoon/evening transition - Data is Valid
12	TP	15082602	TEMP C TOO CONSTANT 12Hr	0.5	Stable temperature overnight - moderate WS - data is Valid
15	D1	15062414	DT LARGE READING	-2.54	High Solar Radiation neer noon - Large DT is valid
15	D1	15062712	DT LARGE READING	-2.09	High Solar Radiation neer noon - Large DT is valid
16	D1	15062814	DT + During Daytime	0.28	Moderate WS, cloud cover with some precip - Data is valid
16	D1	15080714	DT + During Daytime	0.22	Moderate WS, cloud cover with some precip - Data is valid
16	D1	15081415	DT + During Daytime	0.23	Moderate WS, cloud cover with some precip - Data is valid
17	D1	15060422	DT - During Nighttime	-0.2	Just outside of Screening Limit - Data is valid
17	D1	15060423	DT - During Nighttime	-0.1	Just outside of Screening Limit - Data is valid
17	D1	15060823	DT - During Nighttime	-0.18	Just outside of Screening Limit - Some precipitation near hour, likely cloudy sky -Data is valid
17	D1	15062622	DT - During Nighttime	-0.22	Just outside of Screening Limit - Data is valid
17	D1	15070300	DT - During Nighttime	-0.13	Just outside of Screening Limit - Some precipitation near hour, likely cloudy sky -Data is valid
17	D1	15070302	DT - During Nighttime	-0.11	Just outside of Screening Limit - Some precipitation near hour, likely cloudy sky -Data is valid
17	D1	15070504	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
17	D1	15070522	DT - During Nighttime	-0.11	Just outside of Screening Limit - Data is valid
17	D1	15070823	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
17	D1	15071522	DT - During Nighttime	-0.14	Just outside of Screening Limit - Data is valid
17	D1	15071523	DT - During Nighttime	-0.13	Just outside of Screening Limit - Data is valid
17	D1	15071600	DT - During Nighttime	-0.16	Just outside of Screening Limit - Data is valid
17	D1	15071601	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
17	D1	15071822	DT - During Nighttime	-0.25	Just outside of Screening Limit - Some precipitation near hour, likely cloudy sky -Data is valid
17	D1	15072322	DT - During Nighttime	-0.15	Just outside of Screening Limit - Data is valid
17	D1	15072323	DT - During Nighttime	-0.15	Just outside of Screening Limit - Data is valid
17	D1	15072400	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
17	D1	15072401	DT - During Nighttime	-0.11	Just outside of Screening Limit - Data is valid
17	D1	15072402	DT - During Nighttime	-0.22	Just outside of Screening Limit - Data is valid
17	D1	15072403	DT - During Nighttime	-0.23	Just outside of Screening Limit - Data is valid
17	D1	15072404	DT - During Nighttime	-0.18	Just outside of Screening Limit - Data is valid
17	D1	15072822	DT - During Nighttime	-0.2	Just outside of Screening Limit - Data is valid
17	D1	15072823	DT - During Nighttime	-0.19	Just outside of Screening Limit - Data is valid
17	D1	15072900	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
17	D1	15073122	DT - During Nighttime	-0.11	Just outside of Screening Limit - Data is valid
17	D1	15073123	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
17	D1	15080100	DT - During Nighttime	-0.14	Just outside of Screening Limit - Data is valid
17	D1	15080922	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
18	RH	15060113	OUT OF LIMITS	0.4	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060114	OUT OF LIMITS	1.3	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060115	OUT OF LIMITS	2.0	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060116	OUT OF LIMITS	2.8	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060117	OUT OF LIMITS	3.8	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060214	OUT OF LIMITS	3.7	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060313	OUT OF LIMITS	2.1	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060314	OUT OF LIMITS	2.2	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060315	OUT OF LIMITS	2.41	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060316	OUT OF LIMITS	2.94	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060317	OUT OF LIMITS	2.75	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15060318	OUT OF LIMITS	2.97	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061716	OUT OF LIMITS	3.73	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061813	OUT OF LIMITS	3.74	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061814	OUT OF LIMITS	3.69	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061815	OUT OF LIMITS	3.15	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061912	OUT OF LIMITS	3.95	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061913	OUT OF LIMITS	3.59	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061914	OUT OF LIMITS	3.31	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061915	OUT OF LIMITS	3.2	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061916	OUT OF LIMITS	3.49	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15061917	OUT OF LIMITS	3.97	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062010	OUT OF LIMITS	3.16	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062011	OUT OF LIMITS	2.05	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062012	OUT OF LIMITS	1.01	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062013	OUT OF LIMITS	0.48	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062014	OUT OF LIMITS	0.16	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062015	OUT OF LIMITS	0.14	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062016	OUT OF LIMITS	0.15	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062017	OUT OF LIMITS	0.79	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062018	OUT OF LIMITS	1.74	Low RH in afternoon hours with high temperatures - data is valid
18	RH	15062019	OUT OF LIMITS	2.99	Low RH in afternoon hours with high temperatures - data is valid
21	PR	15072918	OUT OF LIMITS	0.27	Rainfall confirmed at other AZMET monitors, and wind shift occurred - data is valid
21	PR	15080714	OUT OF LIMITS	0.34	Rainfall confirmed at other AZMET monitors, and wind shift occurred - data is valid
21	PR	15082317	OUT OF LIMITS	0.46	Rainfall confirmed at other AZMET monitors, and wind shift occurred - data is valid
21	PR	15082717	OUT OF LIMITS	0.27	Rainfall confirmed at other AZMET monitors, and wind shift occurred - data is valid
21	PR	15083016	OUT OF LIMITS	0.22	Rainfall not confirmed at other AZMET, but wind shift occurred - data is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Sept-Nov 2015 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
3	WS	15090211	WIND SPD TOO CONSTANT 12 HR	0.97	Light morning winds, WD does vary - WS is valid
3	WS	15090212	WIND SPD TOO CONSTANT 12 HR	0.97	Light morning winds, WD does vary - WS is valid
3	WS	15090213	WIND SPD TOO CONSTANT 12 HR	1	Light morning winds, WD does vary - WS is valid
3	WS	15090214	WIND SPD TOO CONSTANT 12 HR	1	Light morning winds, WD does vary - WS is valid
3	WS	15090609	WIND SPD TOO CONSTANT 12 HR	1.01	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15090610	WIND SPD TOO CONSTANT 12 HR	1.01	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15090611	WIND SPD TOO CONSTANT 12 HR	1.1	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15090612	WIND SPD TOO CONSTANT 12 HR	1.13	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15090613	WIND SPD TOO CONSTANT 12 HR	1.13	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15090614	WIND SPD TOO CONSTANT 12 HR	1.13	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15090615	WIND SPD TOO CONSTANT 12 HR	1.13	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15090618	WIND SPD TOO CONSTANT 12 HR	1.06	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15091610	WIND SPD TOO CONSTANT 12 HR	0.92	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15091708	WIND SPD TOO CONSTANT 12 HR	1.04	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15091709	WIND SPD TOO CONSTANT 12 HR	1.04	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15091710	WIND SPD TOO CONSTANT 12 HR	1.06	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15091711	WIND SPD TOO CONSTANT 12 HR	1.05	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15091712	WIND SPD TOO CONSTANT 12 HR	1.05	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15110208	WIND SPD TOO CONSTANT 12 HR	0.98	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15112519	WIND SPD TOO CONSTANT 12 HR	1.03	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15112520	WIND SPD TOO CONSTANT 12 HR	1.03	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15112521	WIND SPD TOO CONSTANT 12 HR	1.03	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15112522	WIND SPD TOO CONSTANT 12 HR	1.06	WD does vary and Sigma Theta is low to moderate - WS is valid
3	WS	15112523	WIND SPD TOO CONSTANT 12 HR	1.06	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090112	WIND SPD TOO CONSTANT 3 HR	0.19	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090115	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090212	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090403	WIND SPD TOO CONSTANT 3 HR	0.06	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090417	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090504	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090601	WIND SPD TOO CONSTANT 3 HR	0.08	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090602	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090613	WIND SPD TOO CONSTANT 3 HR	0.03	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090812	WIND SPD TOO CONSTANT 3 HR	0.08	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090813	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15090913	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15091012	WIND SPD TOO CONSTANT 3 HR	0.11	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15091116	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15091308	WIND SPD TOO CONSTANT 3 HR	0.04	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15091503	WIND SPD TOO CONSTANT 3 HR	0.07	Light morning winds, WD does vary - WS is valid
4	WS	15091603	WIND SPD TOO CONSTANT 3 HR	0.19	Light morning winds, WD does vary - WS is valid
4	WS	15091706	WIND SPD TOO CONSTANT 3 HR	0.19	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092009	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092105	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092217	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092218	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092219	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092305	WIND SPD TOO CONSTANT 3 HR	0.12	Light morning winds, WD does vary - WS is valid
4	WS	15092314	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092315	WIND SPD TOO CONSTANT 3 HR	0.06	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092405	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092600	WIND SPD TOO CONSTANT 3 HR	0.09	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092601	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092610	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092713	WIND SPD TOO CONSTANT 3 HR	0.14	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15092714	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15093004	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15100107	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15100300	WIND SPD TOO CONSTANT 3 HR	0.07	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15100301	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15100407	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15100609	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101120	WIND SPD TOO CONSTANT 3 HR	0.11	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101206	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101216	WIND SPD TOO CONSTANT 3 HR	0.11	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101217	WIND SPD TOO CONSTANT 3 HR	0.09	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101300	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101301	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101316	WIND SPD TOO CONSTANT 3 HR	0.14	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101317	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101412	WIND SPD TOO CONSTANT 3 HR	0.09	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101501	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101607	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15101903	WIND SPD TOO CONSTANT 3 HR	0.19	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102101	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102102	WIND SPD TOO CONSTANT 3 HR	0.11	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102214	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102215	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102216	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102303	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102306	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102501	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15102617	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Sept-Nov 2015 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	15110103	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110104	WIND SPD TOO CONSTANT 3 HR	0.15	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110202	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110215	WIND SPD TOO CONSTANT 3 HR	0.05	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110507	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110513	WIND SPD TOO CONSTANT 3 HR	0.19	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110603	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110604	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110900	WIND SPD TOO CONSTANT 3 HR	0.08	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15110913	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111000	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111009	WIND SPD TOO CONSTANT 3 HR	0.07	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111200	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111421	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111511	WIND SPD TOO CONSTANT 3 HR	0.19	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111701	WIND SPD TOO CONSTANT 3 HR	0.17	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111709	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111902	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111915	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15111920	WIND SPD TOO CONSTANT 3 HR	0.1	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15112006	WIND SPD TOO CONSTANT 3 HR	0.21	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15112007	WIND SPD TOO CONSTANT 3 HR	0.12	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15112015	WIND SPD TOO CONSTANT 3 HR	0.19	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15112500	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15112517	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15112607	WIND SPD TOO CONSTANT 3 HR	0.21	Light morning winds, WD does vary - WS is valid
4	WS	15112608	WIND SPD TOO CONSTANT 3 HR	0.18	Light morning winds, WD does vary - WS is valid
4	WS	15113004	WIND SPD TOO CONSTANT 3 HR	0.08	WD does vary and Sigma Theta is low to moderate - WS is valid
7	WD	15100801	WIND DIR TOO CONSTANT 3 HR	0.8	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15101316	WIND DIR TOO CONSTANT 3 HR	0.1	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15102406	WIND DIR TOO CONSTANT 3 HR	0.6	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15111919	WIND DIR TOO CONSTANT 3 HR	0.97	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15112308	WIND DIR TOO CONSTANT 3 HR	0.73	WS does vary and Sigma Theta is low to moderate - WD is valid
11	TP	15091317	HIGH RATE OF C CHANGE	7.54	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15091317	HIGH RATE OF C CHANGE	7.04	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15102915	HIGH RATE OF C CHANGE	6.86	During wind shift at afternoon/evening transition - also precip event - Data is Valid
11	TP	15102915	HIGH RATE OF C CHANGE	6.73	During wind shift at afternoon/evening transition - Data is Valid
11	TP	15111910	HIGH RATE OF C CHANGE	5.44	During wind shift at morning/afternoon transition - Data is Valid
11	TP	15112109	HIGH RATE OF C CHANGE	5.36	During wind shift at morning/afternoon transition - Data is Valid
11	TP	15112109	HIGH RATE OF C CHANGE	5.07	During wind shift at morning/afternoon transition - Data is Valid
12	TP	15101706	TEMP C TOO CONSTANT 12Hr	0.34	Stable temperature overnight - moderate WS - data is Valid
12	TP	15101707	TEMP C TOO CONSTANT 12Hr	0.34	Stable temperature overnight - moderate WS - data is Valid
12	TP	15101707	TEMP C TOO CONSTANT 12Hr	0.33	Stable temperature overnight - moderate WS - data is Valid
12	TP	15101708	TEMP C TOO CONSTANT 12Hr	0.33	Stable temperature overnight - moderate WS - data is Valid
12	TP	15101708	TEMP C TOO CONSTANT 12Hr	0.33	Stable temperature overnight - moderate WS - data is Valid
16	D1	15092113	DT + During Daytime	0.14	Moderate WS, cloud cover with some precip - Data is valid
16	D1	15092115	DT + During Daytime	0.23	Moderate WS, cloud cover with some precip - Data is valid
16	D1	15100613	DT + During Daytime	0.25	Moderate WS, cloud cover with some precip - Data is valid
16	D1	15101711	DT + During Daytime	0.14	Moderate WS, cloud cover with some precip - Data is valid
17	D1	15092204	DT - During Nighttime	-0.15	Just outside of Screening Limit - cloud cover with some precip - Data is valid
17	D1	15101622	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
17	D1	15101623	DT - During Nighttime	-0.13	Just outside of Screening Limit - Data is valid
19	RH	15092121	OUT OF LIMITS	96.4	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15092122	OUT OF LIMITS	96.2	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15092204	OUT OF LIMITS	96.2	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15092205	OUT OF LIMITS	96.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15092206	OUT OF LIMITS	96.3	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15100701	OUT OF LIMITS	96.2	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15100702	OUT OF LIMITS	95.8	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15100703	OUT OF LIMITS	97.4	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15100704	OUT OF LIMITS	97.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15100709	OUT OF LIMITS	96.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15102107	OUT OF LIMITS	95.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15102205	OUT OF LIMITS	96.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15102206	OUT OF LIMITS	95.8	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15103100	OUT OF LIMITS	96.5	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15103101	OUT OF LIMITS	97	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15103102	OUT OF LIMITS	96.9	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15103103	OUT OF LIMITS	97.4	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15103104	OUT OF LIMITS	97.9	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15103105	OUT OF LIMITS	98.3	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15103106	OUT OF LIMITS	98.3	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15103107	OUT OF LIMITS	97.7	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15110405	OUT OF LIMITS	96.1	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15110406	OUT OF LIMITS	96.6	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15110407	OUT OF LIMITS	96.7	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15111521	OUT OF LIMITS	95.5	High RH in evening/morning hours with cooler temperatures - data is valid
19	RH	15111522	OUT OF LIMITS	96.1	High RH in evening/morning hours with cooler temperatures - data is valid
21	PR	15102915	OUT OF LIMITS	0.31	Rainfall confirmed at other AZMET monitors, and wind shift occurred - data is valid

AZMET and ST10 Reported Precipitation Totals
(inches/month)

Month	Coolidge	Safford	ST-10
Jun-15	0.22	1.12	0.30
Jul-15	0.52	0.84	0.92
Aug-15	1.44	4.44	2.34
Sep-15	2.52	3.10	1.27
Oct-15	0.96	0.77	1.74
Nov-15	0.34	0.19	0.69
Dec-15			
Jan-16			
Feb-16			
Mar-16			
Apr-16			
May-16			
Totals	**6.00**	**10.46**	**7.26**

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Date/time beginning	QCCODE	SNR1	SNR2	SNR3	*Comment*
7/9/2015 17:15	NOISE > 8750	9104	9004	9102	Noise flag - data is consistent with adjacent periods - data is valid
7/13/2015 16:30	NOISE > 8750	8504	8504	8802	Noise flag - data is consistent with adjacent periods - data is valid
7/29/2015 18:15	NOISE > 8750	8505	8605	8902	Noise flag - sodar automatically invalidated data
7/29/2015 18:30	NOISE > 8750	8805	8805	9002	Noise flag - sodar automatically invalidated data
7/29/2015 20:15	NOISE > 8750	8404	8404	8803	Noise flag - data is consistent with adjacent periods - data is valid
8/7/2015 12:30	NOISE > 8750	8204	8704	8802	Noise flag - data is consistent with adjacent periods - data is valid
8/7/2015 12:45	NOISE > 8750	8504	8804	9002	Noise flag - data is consistent with adjacent periods - data is valid
8/7/2015 13:15	NOISE > 8750	8704	8604	8802	Noise flag - sodar automatically invalidated data
8/7/2015 14:00	NOISE > 8750	8804	8704	9102	Noise flag - sodar automatically invalidated data
8/7/2015 14:15	NOISE > 8750	8804	8804	9102	Noise flag - sodar automatically invalidated data
8/7/2015 14:30	NOISE > 8750	8904	8904	9202	Noise flag - sodar automatically invalidated data
8/8/2015 2:30	NOISE > 8750	8404	8504	8802	Noise flag - sodar automatically invalidated data
8/11/2015 8:15	NOISE > 8750	8804	8904	8902	Noise flag - data is consistent with adjacent periods - data is valid
8/23/2015 17:30	NOISE > 8750	9204	9203	9502	Noise flag - data is consistent with adjacent periods - data is valid
8/23/2015 17:45	NOISE > 8750	8704	8804	9102	Noise flag - sodar automatically invalidated data
8/25/2015 18:15	NOISE > 8750	8504	8404	8802	Noise flag - data is consistent with adjacent periods - data is valid
8/27/2015 17:00	NOISE > 8750	8604	8604	9002	Noise flag - sodar automatically invalidated data
8/27/2015 17:15	NOISE > 8750	9203	9103	9402	Noise flag - sodar automatically invalidated data
8/30/2015 16:15	NOISE > 8750	8804	8704	9002	Noise flag - data is consistent with adjacent periods - data is valid
8/30/2015 16:30	NOISE > 8750	8904	8704	9002	Noise flag - data is consistent with adjacent periods - data is valid
8/31/2015 23:15	NOISE > 8750	8604	8704	9002	Noise flag - sodar automatically invalidated data
9/1/2015 23:30	NOISE > 8750	8604	8504	8802	Noise flag - data is consistent with adjacent periods - data is valid
9/13/2015 17:15	NOISE > 8750	8804	8804	8702	Noise flag - data is consistent with adjacent periods - data is valid
9/21/2015 16:15	NOISE > 8750	8704	8604	8902	Noise flag - sodar automatically invalidated data
10/6/2015 13:15	NOISE > 8750	8404	8504	8802	Noise flag - data is consistent with adjacent periods - data is valid
10/7/2015 8:00	NOISE > 8750	8804	8704	9102	Noise flag - data is consistent with adjacent periods - data is valid
10/7/2015 8:15	NOISE > 8750	8604	8604	9002	Noise flag - data is consistent with adjacent periods - data is valid
10/18/2015 20:45	NOISE > 8750	8704	8604	8902	Noise flag - data is consistent with adjacent periods - data is valid
10/21/2015 7:00	NOISE > 8750	8604	8604	8902	Noise flag - sodar automatically invalidated data
10/21/2015 7:15	NOISE > 8750	8804	8804	9102	Noise flag - sodar automatically invalidated data
10/21/2015 7:30	NOISE > 8750	8704	8804	9002	Noise flag - sodar automatically invalidated data
10/29/2015 15:00	NOISE > 8750	9003	9103	9302	Noise flag - sodar automatically invalidated data
10/30/2015 7:00	NOISE > 8750	8404	8304	8802	Noise flag - sodar automatically invalidated data
11/15/2015 6:15	NOISE > 8750	8804	8704	9102	Noise flag - sodar automatically invalidated data
11/16/2015 7:15	NOISE > 8750	8803	8603	8602	Noise flag - sodar automatically invalidated data
11/16/2015 8:15	NOISE > 8750	8704	9104	8902	Noise flag - sodar automatically invalidated data

Date/Time	QCCODE	Value	*Comment*
6/11/2015 23:15	FEMAX > 600	1609	Elevated ground clutter but data is valid and reasonable
6/11/2015 23:30	FEMAX > 600	1609	Elevated ground clutter but data is valid and reasonable
6/11/2015 23:45	FEMAX > 600	1609	Elevated ground clutter but data is valid and reasonable
6/12/2015 0:00	FEMAX > 600	1609	Elevated ground clutter but data is valid and reasonable
6/12/2015 0:15	FEMAX > 600	1609	Elevated ground clutter but data is valid and reasonable
6/12/2015 0:30	FEMAX > 600	1609	Elevated ground clutter but data is valid and reasonable
6/13/2015 0:45	FEMAX > 600	1924	Elevated ground clutter but data is valid and reasonable
6/13/2015 1:00	FEMAX > 600	1924	Elevated ground clutter but data is valid and reasonable
6/14/2015 0:45	FEMAX > 600	1924	Elevated ground clutter but data is valid and reasonable
6/14/2015 1:00	FEMAX > 600	1924	Elevated ground clutter but data is valid and reasonable
6/14/2015 23:00	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/14/2015 23:15	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/14/2015 23:30	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/14/2015 23:45	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/15/2015 23:00	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/15/2015 23:15	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/15/2015 23:30	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/15/2015 23:45	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/16/2015 23:00	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/16/2015 23:15	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/16/2015 23:30	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/16/2015 23:45	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/17/2015 23:15	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/17/2015 23:30	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/18/2015 23:15	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/18/2015 23:30	FEMAX > 600	1435	Elevated ground clutter but data is valid and reasonable
6/20/2015 23:00	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/20/2015 23:15	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable

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6/21/2015 23:00	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/21/2015 23:15	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/25/2015 22:45	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/25/2015 23:00	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/26/2015 17:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/26/2015 17:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/26/2015 17:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/26/2015 17:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/26/2015 18:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/26/2015 18:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/26/2015 18:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/26/2015 18:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/26/2015 23:00	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/26/2015 23:15	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/27/2015 17:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/27/2015 17:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/27/2015 17:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/27/2015 17:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/27/2015 18:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/27/2015 18:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/27/2015 18:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/27/2015 18:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/27/2015 23:00	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/27/2015 23:15	FEMAX > 600	2365	Elevated ground clutter but data is valid and reasonable
6/28/2015 17:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/28/2015 17:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/28/2015 17:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/28/2015 17:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/28/2015 18:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/28/2015 18:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/28/2015 18:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/28/2015 18:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/28/2015 19:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/29/2015 17:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/29/2015 17:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/29/2015 17:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/29/2015 18:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/29/2015 18:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/29/2015 18:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/29/2015 18:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/29/2015 19:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/30/2015 16:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/30/2015 17:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/30/2015 17:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/30/2015 17:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/30/2015 17:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/30/2015 18:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/30/2015 18:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
6/30/2015 18:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 16:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 17:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 17:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 17:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 17:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 18:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 18:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 18:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/1/2015 23:00	FEMAX > 600	1612	Elevated ground clutter but data is valid and reasonable
7/1/2015 23:15	FEMAX > 600	1612	Elevated ground clutter but data is valid and reasonable
7/2/2015 17:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/2/2015 17:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/2/2015 17:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/2/2015 17:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/2/2015 18:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/2/2015 18:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/2/2015 18:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/2/2015 18:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable

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7/3/2015 17:00	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/3/2015 17:15	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/3/2015 17:30	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/3/2015 17:45	FEMAX > 600	2374	Elevated ground clutter but data is valid and reasonable
7/3/2015 18:00	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/3/2015 18:15	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/3/2015 18:30	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/3/2015 18:45	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/4/2015 18:15	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/4/2015 18:30	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/4/2015 18:45	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/4/2015 19:00	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/5/2015 18:15	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/5/2015 18:30	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/5/2015 18:45	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/5/2015 19:00	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/6/2015 18:15	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/6/2015 18:30	FEMAX > 600	3014	Elevated ground clutter but data is valid and reasonable
7/8/2015 17:00	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/8/2015 17:15	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/8/2015 17:30	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/8/2015 17:45	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/8/2015 18:00	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/8/2015 18:15	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/9/2015 17:00	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/9/2015 17:15	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/9/2015 17:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/9/2015 17:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/9/2015 18:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/9/2015 18:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/9/2015 18:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/9/2015 18:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/10/2015 17:00	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/10/2015 17:15	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/10/2015 17:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/10/2015 17:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/10/2015 18:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/10/2015 18:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/10/2015 18:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/10/2015 18:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/11/2015 17:15	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/11/2015 17:30	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/11/2015 17:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/11/2015 18:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/11/2015 18:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/11/2015 18:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/11/2015 18:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/11/2015 19:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/12/2015 17:15	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/12/2015 17:30	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/12/2015 17:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/12/2015 18:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/12/2015 18:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/12/2015 18:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/12/2015 18:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/12/2015 19:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/13/2015 17:15	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/13/2015 17:30	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/13/2015 17:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/13/2015 18:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/13/2015 18:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/13/2015 18:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/13/2015 18:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/13/2015 19:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/14/2015 17:30	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/14/2015 17:45	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/14/2015 18:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable

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7/14/2015 18:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/14/2015 18:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/14/2015 18:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/14/2015 19:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/14/2015 19:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/15/2015 17:00	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/15/2015 17:15	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/15/2015 17:30	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/15/2015 17:45	FEMAX > 600	684	Elevated ground clutter but data is valid and reasonable
7/15/2015 18:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/15/2015 18:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/15/2015 18:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/15/2015 18:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/16/2015 17:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/16/2015 17:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/16/2015 18:00	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/16/2015 18:15	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/16/2015 18:30	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/16/2015 18:45	FEMAX > 600	3484	Elevated ground clutter but data is valid and reasonable
7/31/2015 23:30	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
7/31/2015 23:45	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/1/2015 0:00	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/1/2015 0:15	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/1/2015 23:30	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/1/2015 23:45	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/2/2015 23:30	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/2/2015 23:45	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/3/2015 23:45	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/4/2015 0:00	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/4/2015 23:45	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/5/2015 0:00	FEMAX > 600	1559	Elevated ground clutter but data is valid and reasonable
8/13/2015 8:30	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/13/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/14/2015 8:30	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/14/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/15/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/15/2015 9:00	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/16/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/16/2015 9:00	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/17/2015 8:15	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/17/2015 8:30	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/17/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/17/2015 9:00	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/18/2015 8:30	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/18/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/18/2015 9:00	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/18/2015 9:15	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/19/2015 8:30	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/19/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/20/2015 8:30	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/20/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/21/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/21/2015 9:00	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/22/2015 8:45	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/22/2015 9:00	FEMAX > 600	1078	Elevated ground clutter but data is valid and reasonable
8/24/2015 6:45	FEMAX > 600	1649	Elevated ground clutter but data is valid and reasonable
8/24/2015 7:00	FEMAX > 600	1649	Elevated ground clutter but data is valid and reasonable
8/24/2015 7:15	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/24/2015 7:30	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/24/2015 7:45	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/24/2015 8:00	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/24/2015 8:15	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/24/2015 8:30	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/24/2015 8:45	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/25/2015 0:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/25/2015 0:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/25/2015 1:00	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable

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8/25/2015 1:15	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/25/2015 1:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/25/2015 1:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/25/2015 7:00	FEMAX > 600	1649	Elevated ground clutter but data is valid and reasonable
8/25/2015 7:15	FEMAX > 600	1649	Elevated ground clutter but data is valid and reasonable
8/25/2015 7:30	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/25/2015 7:45	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/25/2015 8:00	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/25/2015 8:15	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/25/2015 8:30	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/25/2015 8:45	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/26/2015 0:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/26/2015 0:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/26/2015 1:00	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/26/2015 1:15	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/26/2015 1:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/26/2015 1:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/26/2015 7:00	FEMAX > 600	1649	Elevated ground clutter but data is valid and reasonable
8/26/2015 7:15	FEMAX > 600	1649	Elevated ground clutter but data is valid and reasonable
8/26/2015 7:30	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/26/2015 7:45	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/26/2015 8:00	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/26/2015 8:15	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/27/2015 0:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/27/2015 0:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/27/2015 1:00	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/27/2015 1:15	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/27/2015 1:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/27/2015 1:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/27/2015 6:30	FEMAX > 600	1649	Elevated ground clutter but data is valid and reasonable
8/27/2015 6:45	FEMAX > 600	1649	Elevated ground clutter but data is valid and reasonable
8/27/2015 7:00	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/27/2015 7:15	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/27/2015 7:30	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/27/2015 7:45	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/27/2015 8:00	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/27/2015 8:15	FEMAX > 600	1550	Elevated ground clutter but data is valid and reasonable
8/27/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/27/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/27/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/28/2015 0:15	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/28/2015 0:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/28/2015 0:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/28/2015 1:00	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/28/2015 1:15	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/28/2015 1:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/28/2015 1:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/28/2015 2:00	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/28/2015 7:15	FEMAX > 600	716	Elevated ground clutter but data is valid and reasonable
8/28/2015 7:30	FEMAX > 600	716	Elevated ground clutter but data is valid and reasonable
8/28/2015 7:45	FEMAX > 600	716	Elevated ground clutter but data is valid and reasonable
8/28/2015 8:00	FEMAX > 600	716	Elevated ground clutter but data is valid and reasonable
8/28/2015 8:15	FEMAX > 600	716	Elevated ground clutter but data is valid and reasonable
8/28/2015 8:30	FEMAX > 600	716	Elevated ground clutter but data is valid and reasonable
8/28/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/28/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/29/2015 0:15	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/29/2015 0:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/29/2015 0:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/29/2015 1:00	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/29/2015 1:15	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/29/2015 1:30	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/29/2015 1:45	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/29/2015 2:00	FEMAX > 600	673	Elevated ground clutter but data is valid and reasonable
8/29/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/29/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/29/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable

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8/29/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/29/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/29/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/30/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/30/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/30/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/30/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/31/2015 7:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/31/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/31/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/31/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/31/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
8/31/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/1/2015 7:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/1/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/1/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/1/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/1/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/1/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/2/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/2/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/2/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/2/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/2/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/2/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/3/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/3/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/3/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/3/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/3/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/3/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/4/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/4/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/4/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/4/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/4/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/5/2015 7:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/5/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/5/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/5/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/5/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/5/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/6/2015 7:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/6/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/6/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/6/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/6/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/6/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/7/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/7/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/7/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/7/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/7/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/7/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/8/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/8/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/8/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/8/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/8/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/8/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/9/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/9/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/9/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/9/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/9/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/9/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/9/2015 21:15	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable

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9/9/2015 21:30	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
9/9/2015 21:45	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
9/9/2015 22:00	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
9/9/2015 22:15	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
9/9/2015 22:30	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
9/9/2015 22:45	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
9/9/2015 23:00	FEMAX > 600	748	Elevated ground clutter but data is valid and reasonable
9/10/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/10/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/10/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/10/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/10/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/10/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/11/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/11/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/11/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/11/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/11/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/11/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/11/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/11/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/11/2015 18:00	FEMAX > 600	849	Elevated ground clutter but data is valid and reasonable
9/11/2015 18:15	FEMAX > 600	849	Elevated ground clutter but data is valid and reasonable
9/11/2015 18:30	FEMAX > 600	1238	Elevated ground clutter but data is valid and reasonable
9/11/2015 18:45	FEMAX > 600	1238	Elevated ground clutter but data is valid and reasonable
9/12/2015 7:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/12/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/12/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/12/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/12/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/12/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/12/2015 16:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/12/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/12/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/12/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/12/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/12/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/12/2015 18:00	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/12/2015 18:15	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/13/2015 7:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/13/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/13/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/13/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/13/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/13/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/13/2015 16:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/13/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/13/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/13/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/13/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/13/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/13/2015 18:00	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/13/2015 18:15	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/14/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/14/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/14/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/14/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/14/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/14/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/14/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/14/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/14/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/14/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/14/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/14/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/14/2015 18:15	FEMAX > 600	633	Elevated ground clutter but data is valid and reasonable
9/14/2015 18:30	FEMAX > 600	633	Elevated ground clutter but data is valid and reasonable

ASARCO June-Nov 2015 Sodar QC Screening Report - 15-Minute Data

9/15/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/15/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/15/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/15/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/15/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/15/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/15/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/15/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/15/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/15/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/15/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/15/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/15/2015 18:15	FEMAX > 600	1114	Elevated ground clutter but data is valid and reasonable
9/15/2015 18:30	FEMAX > 600	1114	Elevated ground clutter but data is valid and reasonable
9/16/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/16/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/16/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/16/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/16/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/16/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/16/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/16/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/16/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/16/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/16/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/16/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/16/2015 18:15	FEMAX > 600	1114	Elevated ground clutter but data is valid and reasonable
9/16/2015 18:30	FEMAX > 600	1114	Elevated ground clutter but data is valid and reasonable
9/17/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/17/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/17/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/17/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/17/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/17/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/17/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/17/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/17/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/17/2015 18:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/18/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/18/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/18/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/18/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/18/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/18/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/18/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/18/2015 7:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/18/2015 7:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/18/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/18/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/18/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/18/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/18/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/18/2015 16:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/18/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/18/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/18/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/18/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/18/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/18/2015 18:00	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/18/2015 18:15	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/19/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/19/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/19/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/19/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/19/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/19/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/19/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable

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9/19/2015 7:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/19/2015 7:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/19/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/19/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/19/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/19/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/19/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/19/2015 16:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/19/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/19/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/19/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/19/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/19/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/19/2015 18:00	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/19/2015 18:15	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/20/2015 5:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/20/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/20/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/20/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/20/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/20/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/20/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/20/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/20/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/20/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/20/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/20/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/20/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/20/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/20/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/20/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/20/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/20/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/20/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/20/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/20/2015 18:15	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/20/2015 18:30	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/21/2015 5:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/21/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/21/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/21/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/21/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/21/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/21/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/21/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/21/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/21/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/21/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/21/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/21/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/21/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/21/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/21/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/21/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/21/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/21/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/21/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/22/2015 5:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/22/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/22/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/22/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/22/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/22/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/22/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/22/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/22/2015 7:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/22/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable

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9/22/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/22/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/22/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/22/2015 9:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/22/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/22/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/22/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/22/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/22/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/22/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/23/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/23/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/23/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/23/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/23/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/23/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/23/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/23/2015 7:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/23/2015 8:00	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/23/2015 8:15	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/23/2015 8:30	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/23/2015 8:45	FEMAX > 600	683	Elevated ground clutter but data is valid and reasonable
9/23/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/23/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/23/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/23/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/23/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/23/2015 18:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/24/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/24/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/24/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/24/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/24/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/24/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/24/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/24/2015 7:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/24/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/24/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/24/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/24/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/24/2015 18:00	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/24/2015 18:15	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/25/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/25/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/25/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/25/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/25/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/25/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/25/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/25/2015 7:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/25/2015 16:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/25/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/25/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/25/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/25/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/25/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/25/2015 18:00	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/25/2015 18:15	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/26/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/26/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/26/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/26/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/26/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/26/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/26/2015 7:00	FEMAX > 600	1128	Elevated ground clutter but data is valid and reasonable
9/26/2015 7:15	FEMAX > 600	1128	Elevated ground clutter but data is valid and reasonable
9/26/2015 16:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable

ASARCO June-Nov 2015 Sodar QC Screening Report - 15-Minute Data

9/26/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/26/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/26/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/26/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/26/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/26/2015 18:00	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/26/2015 18:15	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/26/2015 18:30	FEMAX > 600	784	Elevated ground clutter but data is valid and reasonable
9/27/2015 5:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/27/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/27/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/27/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/27/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/27/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/27/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/27/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/27/2015 16:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/27/2015 17:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/27/2015 17:15	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/27/2015 17:30	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/27/2015 17:45	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/27/2015 18:00	FEMAX > 600	693	Elevated ground clutter but data is valid and reasonable
9/28/2015 5:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/28/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/28/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/28/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/28/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/28/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/28/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/28/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/29/2015 5:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/29/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/29/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/29/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/29/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/29/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/29/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/29/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/30/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/30/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/30/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/30/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/30/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/30/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/30/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
9/30/2015 7:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/1/2015 5:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/1/2015 5:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/1/2015 6:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/1/2015 6:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/1/2015 6:30	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/1/2015 6:45	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/1/2015 7:00	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/1/2015 7:15	FEMAX > 600	1914	Elevated ground clutter but data is valid and reasonable
10/2/2015 5:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/2/2015 5:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/2/2015 6:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/2/2015 6:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/2/2015 6:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/2/2015 6:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/3/2015 5:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/3/2015 5:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/3/2015 5:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/3/2015 6:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/3/2015 6:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/3/2015 6:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/3/2015 6:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable

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10/3/2015 7:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 5:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 5:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 5:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 6:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 6:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 6:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 6:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 7:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/4/2015 22:45	FEMAX > 600	1014	Elevated ground clutter but data is valid and reasonable
10/4/2015 23:00	FEMAX > 600	1014	Elevated ground clutter but data is valid and reasonable
10/5/2015 5:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/5/2015 5:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/5/2015 5:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/5/2015 6:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/5/2015 6:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/5/2015 6:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/5/2015 6:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/5/2015 7:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/6/2015 5:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/6/2015 5:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/6/2015 6:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/6/2015 6:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/6/2015 6:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/6/2015 6:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/6/2015 7:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/6/2015 7:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/7/2015 5:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/7/2015 5:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/7/2015 6:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/7/2015 6:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/7/2015 6:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/7/2015 6:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/7/2015 7:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/7/2015 7:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/8/2015 5:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/8/2015 5:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/8/2015 5:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/8/2015 5:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/8/2015 6:00	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/8/2015 6:15	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/8/2015 6:30	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
10/8/2015 6:45	FEMAX > 600	998	Elevated ground clutter but data is valid and reasonable
11/4/2015 21:00	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/4/2015 21:15	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/4/2015 21:30	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/4/2015 21:45	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/4/2015 22:00	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/4/2015 22:15	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/5/2015 21:00	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/5/2015 21:15	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/5/2015 21:30	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/5/2015 21:45	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/5/2015 22:00	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable
11/5/2015 22:15	FEMAX > 600	700	Elevated ground clutter but data is valid and reasonable

Date/Time	QCCODE	Value	*Comment*
6/2/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
6/18/2015 13:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
6/29/2015 18:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/1/2015 0:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/5/2015 19:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/8/2015 22:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/10/2015 13:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/17/2015 3:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/17/2015 13:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable

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7/19/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/19/2015 19:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/22/2015 23:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/24/2015 13:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/26/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/26/2015 22:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
7/30/2015 23:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
8/4/2015 10:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
8/4/2015 21:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
8/7/2015 2:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
8/16/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
8/18/2015 6:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
8/21/2015 17:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
8/22/2015 8:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
8/29/2015 0:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
9/13/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
9/20/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
9/21/2015 14:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
9/21/2015 21:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
9/21/2015 22:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
9/29/2015 2:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
10/8/2015 1:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
10/11/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
10/29/2015 4:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
10/30/2015 7:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
11/1/2015 16:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
11/9/2015 12:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
11/15/2015 1:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
11/22/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
11/27/2015 10:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
11/29/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable

Date/Time	QCCODE	SPU1	SPU2	SPU3	*Comment*
6/1/2015 20:15	SPU > 7	2	4	8	Potential spurious noise source but data is valid and reasonable
6/4/2015 20:15	SPU > 7	1	8	0	Potential spurious noise source but data is valid and reasonable
6/6/2015 15:30	SPU > 7	2	8	1	Potential spurious noise source but data is valid and reasonable
6/11/2015 3:45	SPU > 7	2	8	1	Potential spurious noise source but data is valid and reasonable
6/21/2015 19:45	SPU > 7	1	8	0	Potential spurious noise source - sodar invalidated data
6/21/2015 20:00	SPU > 7	0	8	1	Potential spurious noise source - sodar invalidated data
6/26/2015 5:00	SPU > 7	1	8	0	Potential spurious noise source but data is valid and reasonable
6/30/2015 1:45	SPU > 7	1	8	1	Potential spurious noise source but data is valid and reasonable
7/1/2015 9:15	SPU > 7	1	10	0	Potential spurious noise source but data is valid and reasonable
7/1/2015 9:30	SPU > 7	0	8	0	Potential spurious noise source but data is valid and reasonable
7/4/2015 7:15	SPU > 7	0	8	0	Potential spurious noise source but data is valid and reasonable
7/10/2015 1:00	SPU > 7	2	8	0	Potential spurious noise source but data is valid and reasonable
7/10/2015 1:15	SPU > 7	1	9	1	Potential spurious noise source - sodar invalidated data
7/10/2015 16:30	SPU > 7	8	3	0	Potential spurious noise source but data is valid and reasonable
7/16/2015 7:00	SPU > 7	2	8	0	Potential spurious noise source but data is valid and reasonable
7/16/2015 10:00	SPU > 7	3	8	0	Potential spurious noise source but data is valid and reasonable
7/16/2015 23:15	SPU > 7	3	8	0	Potential spurious noise source but data is valid and reasonable
7/21/2015 11:15	SPU > 7	1	8	1	Potential spurious noise source but data is valid and reasonable
7/24/2015 22:15	SPU > 7	0	4	8	Potential spurious noise source but data is valid and reasonable
7/26/2015 3:45	SPU > 7	0	8	0	Potential spurious noise source but data is valid and reasonable
7/26/2015 23:30	SPU > 7	1	2	8	Potential spurious noise source but data is valid and reasonable
7/30/2015 21:15	SPU > 7	1	8	1	Potential spurious noise source but data is valid and reasonable
7/30/2015 21:30	SPU > 7	2	10	0	Potential spurious noise source but data is valid and reasonable
7/31/2015 22:15	SPU > 7	1	8	0	Potential spurious noise source but data is valid and reasonable
8/2/2015 17:30	SPU > 7	1	8	2	Potential spurious noise source but data is valid and reasonable
8/13/2015 11:30	SPU > 7	1	1	8	Potential spurious noise source but data is valid and reasonable
8/18/2015 22:15	SPU > 7	2	8	1	Potential spurious noise source but data is valid and reasonable
8/20/2015 18:45	SPU > 7	2	8	0	Potential spurious noise source but data is valid and reasonable
8/21/2015 0:00	SPU > 7	1	8	1	Potential spurious noise source but data is valid and reasonable
8/21/2015 0:15	SPU > 7	0	8	1	Potential spurious noise source but data is valid and reasonable
8/23/2015 13:30	SPU > 7	1	8	0	Potential spurious noise source but data is valid and reasonable
8/23/2015 13:45	SPU > 7	0	8	0	Potential spurious noise source but data is valid and reasonable

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8/26/2015 23:30	SPU > 7	2	8	0	Potential spurious noise source but data is valid and reasonable
8/28/2015 11:15	SPU > 7	0	8	0	Potential spurious noise source but data is valid and reasonable
8/29/2015 8:15	SPU > 7	2	8	1	Potential spurious noise source but data is valid and reasonable
9/4/2015 6:30	SPU > 7	1	8	1	Potential spurious noise source but data is valid and reasonable
9/5/2015 19:15	SPU > 7	2	8	1	Potential spurious noise source but data is valid and reasonable
9/11/2015 14:15	SPU > 7	3	8	0	Potential spurious noise source but data is valid and reasonable
9/13/2015 0:15	SPU > 7	0	8	0	Potential spurious noise source but data is valid and reasonable
9/13/2015 0:30	SPU > 7	1	10	1	Potential spurious noise source but data is valid and reasonable
9/14/2015 14:45	SPU > 7	0	8	1	Potential spurious noise source but data is valid and reasonable
9/18/2015 12:30	SPU > 7	2	10	4	Potential spurious noise source but data is valid and reasonable
9/19/2015 22:30	SPU > 7	0	8	1	Potential spurious noise source but data is valid and reasonable
9/23/2015 17:15	SPU > 7	2	8	0	Potential spurious noise source but data is valid and reasonable
9/28/2015 10:45	SPU > 7	8	4	0	Potential spurious noise source but data is valid and reasonable
10/1/2015 22:45	SPU > 7	2	8	1	Potential spurious noise source but data is valid and reasonable
10/4/2015 22:30	SPU > 7	1	8	0	Potential spurious noise source but data is valid and reasonable
10/6/2015 5:00	SPU > 7	2	10	0	Potential spurious noise source but data is valid and reasonable
10/6/2015 5:15	SPU > 7	0	8	0	Potential spurious noise source but data is valid and reasonable
10/12/2015 14:30	SPU > 7	5	8	2	Potential spurious noise source but data is valid and reasonable
10/12/2015 16:00	SPU > 7	3	8	0	Potential spurious noise source but data is valid and reasonable
10/22/2015 16:45	SPU > 7	1	8	0	Potential spurious noise source but data is valid and reasonable
11/10/2015 23:00	SPU > 7	0	8	3	Potential spurious noise source but data is valid and reasonable
11/28/2015 9:30	SPU > 7	8	2	1	Potential spurious noise source but data is valid and reasonable

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Date/time beginning	QCCODE	Test Condition	at Gate Ht	Comment
6/20/2015 18:00	Hour to Hour WS	> 9.0 m/s at gate	400	Data is reasonable and valid
6/23/2015 18:00	Hour to Hour WS	> 9.0 m/s at gate	400	Data is reasonable and valid
8/11/2015 19:00	Hour to Hour WS	> 9.0 m/s at gate	50	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 19:00	Hour to Hour WS	> 9.0 m/s at gate	100	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 19:00	Hour to Hour WS	> 9.0 m/s at gate	150	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 19:00	Hour to Hour WS	> 9.0 m/s at gate	200	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 19:00	Hour to Hour WS	> 9.0 m/s at gate	250	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	50	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	100	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	150	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	200	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	250	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	300	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
8/11/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	350	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
9/19/2015 14:00	Hour to Hour WS	> 9.0 m/s at gate	100	Data is reasonable and valid
9/19/2015 14:00	Hour to Hour WS	> 9.0 m/s at gate	150	Data is reasonable and valid
9/19/2015 14:00	Hour to Hour WS	> 9.0 m/s at gate	200	Data is reasonable and valid
9/19/2015 14:00	Hour to Hour WS	> 9.0 m/s at gate	250	Data is reasonable and valid
9/19/2015 14:00	Hour to Hour WS	> 9.0 m/s at gate	300	Data is reasonable and valid
9/29/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	50	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
9/29/2015 20:00	Hour to Hour WS	> 9.0 m/s at gate	100	Unreasonable WS, do not see jump in 10m WS, hour 20 (0-23) invalidated
10/24/2015 22:00	Hour to Hour WS	> 9.0 m/s at gate	350	Data is reasonable and valid
11/22/2015 19:00	Hour to Hour WS	> 9.0 m/s at gate	350	Data is reasonable and valid
11/27/2015 12:00	Hour to Hour WS	> 9.0 m/s at gate	400	Data is reasonable and valid
6/18/2015 18:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	250	Data is reasonable and valid
6/20/2015 13:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	150	
9/30/2015 4:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	50	
10/25/2015 2:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	100	
10/26/2015 1:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	150	
11/6/2015 5:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	350	
11/6/2015 13:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	300	
11/13/2015 22:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	100	
11/20/2015 5:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	300	
6/4/2015 5:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200	
7/8/2015 5:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	100	
7/17/2015 12:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250	
7/19/2015 4:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50	
7/31/2015 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50	
8/10/2015 14:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	150	
8/15/2015 15:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	100	
9/5/2015 3:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	100	
9/5/2015 5:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50	
9/5/2015 19:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200	
9/8/2015 13:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	350	
9/28/2015 15:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250	
9/30/2015 14:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	100	
10/11/2015 17:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	150	
10/26/2015 17:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250	
10/30/2015 19:00	Hourly WS difference	< 0.5 for >= 12 hours at gate	200	
11/2/2015 2:00	Hourly WS difference	< 0.5 for >= 12 hours at gate	250	
11/2/2015 7:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250	
11/8/2015 18:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	150	
11/28/2015 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200	

Other manual reviews that required data invalidation (time is in 0-23 time format)

6/1/2015 20:00	
6/18/2015 17:00	
7/8/2015 20:00	
8/11/2015 20:00	
9/29/2015 20:00	
11/27/2015 16:00	

6/2/2015 0:00	WD ROC > 90	112	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
6/2/2015 2:00	WD ROC > 90	162	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/3/2015 0:00	WD ROC > 90	165	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/5/2015 22:00	WD ROC > 90	133	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/5/2015 23:00	WD ROC > 90	90	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
6/6/2015 11:00	WD ROC > 90	94	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/7/2015 3:00	WD ROC > 90	91	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/8/2015 0:00	WD ROC > 90	96	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/8/2015 1:00	WD ROC > 90	135	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/8/2015 2:00	WD ROC > 90	107	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/10/2015 1:00	WD ROC > 90	160	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/10/2015 8:00	WD ROC > 90	152	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/11/2015 0:00	WD ROC > 90	160	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/11/2015 1:00	WD ROC > 90	147	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/11/2015 4:00	WD ROC > 90	162	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/11/2015 23:00	WD ROC > 90	128	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
6/12/2015 0:00	WD ROC > 90	114	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/12/2015 14:00	WD ROC > 90	150	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
6/12/2015 23:00	WD ROC > 90	142	at gate	300	Data is valid, occurs during transitional period and/or lower speeds

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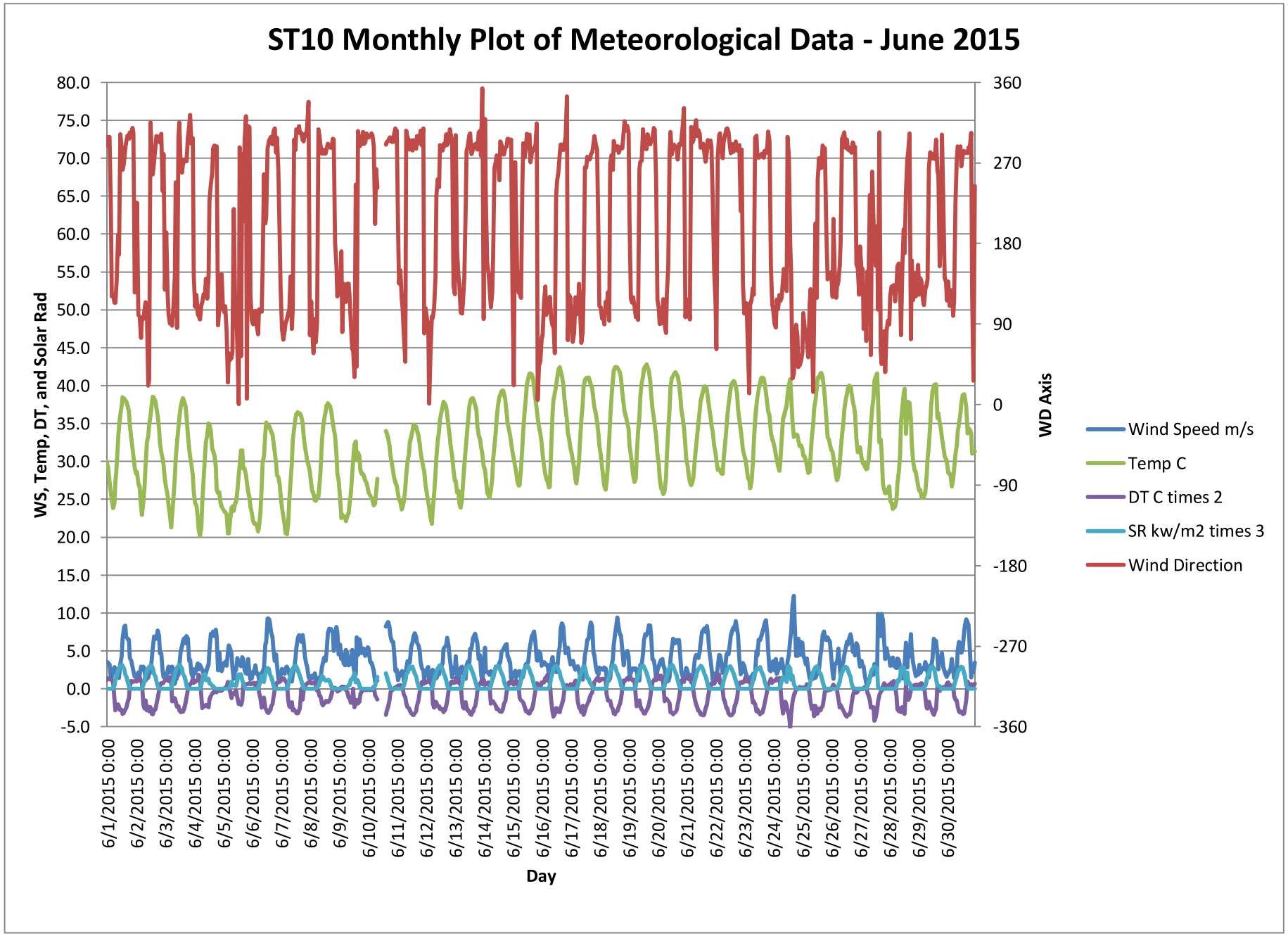
Date/time beginning	QCCODE	Test Condition	at Gate Ht		Comment
6/13/2015 4:00	WD ROC > 90	108	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/13/2015 9:00	WD ROC > 90	148	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/15/2015 5:00	WD ROC > 90	125	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/15/2015 6:00	WD ROC > 90	153	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
6/15/2015 21:00	WD ROC > 90	109	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/18/2015 9:00	WD ROC > 90	100	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
6/19/2015 10:00	WD ROC > 90	151	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/20/2015 0:00	WD ROC > 90	149	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/21/2015 1:00	WD ROC > 90	113	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
6/21/2015 2:00	WD ROC > 90	148	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
6/22/2015 0:00	WD ROC > 90	152	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
6/25/2015 13:00	WD ROC > 90	98	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/29/2015 9:00	WD ROC > 90	155	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/30/2015 0:00	WD ROC > 90	157	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
6/30/2015 1:00	WD ROC > 90	164	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
7/1/2015 6:00	WD ROC > 90	165	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
7/3/2015 23:00	WD ROC > 90	120	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
7/6/2015 2:00	WD ROC > 90	120	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
7/6/2015 5:00	WD ROC > 90	153	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
7/8/2015 3:00	WD ROC > 90	127	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
7/8/2015 11:00	WD ROC > 90	151	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
7/9/2015 7:00	WD ROC > 90	143	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
7/11/2015 2:00	WD ROC > 90	139	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
7/12/2015 5:00	WD ROC > 90	155	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
7/14/2015 13:00	WD ROC > 90	176	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
7/14/2015 20:00	WD ROC > 90	157	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
7/17/2015 1:00	WD ROC > 90	107	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
7/17/2015 4:00	WD ROC > 90	121	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
7/18/2015 0:00	WD ROC > 90	100	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
7/18/2015 1:00	WD ROC > 90	103	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
7/18/2015 4:00	WD ROC > 90	164	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
7/19/2015 0:00	WD ROC > 90	105	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
7/20/2015 6:00	WD ROC > 90	93	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
7/21/2015 0:00	WD ROC > 90	120	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
7/21/2015 2:00	WD ROC > 90	136	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
7/21/2015 10:00	WD ROC > 90	174	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
7/22/2015 0:00	WD ROC > 90	118	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
7/23/2015 23:00	WD ROC > 90	100	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
7/24/2015 4:00	WD ROC > 90	151	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
7/26/2015 10:00	WD ROC > 90	172	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
7/27/2015 22:00	WD ROC > 90	135	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
7/29/2015 2:00	WD ROC > 90	174	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
8/1/2015 17:00	WD ROC > 90	178	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
8/2/2015 10:00	WD ROC > 90	104	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
8/2/2015 22:00	WD ROC > 90	157	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
8/8/2015 22:00	WD ROC > 90	155	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
8/11/2015 1:00	WD ROC > 90	131	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
8/12/2015 16:00	WD ROC > 90	174	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
8/20/2015 1:00	WD ROC > 90	118	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
8/21/2015 2:00	WD ROC > 90	150	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
8/21/2015 5:00	WD ROC > 90	107	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
8/21/2015 6:00	WD ROC > 90	155	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
8/25/2015 18:00	WD ROC > 90	175	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
8/28/2015 23:00	WD ROC > 90	116	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
8/29/2015 15:00	WD ROC > 90	174	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
8/31/2015 1:00	WD ROC > 90	176	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
8/31/2015 18:00	WD ROC > 90	113	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
8/31/2015 19:00	WD ROC > 90	144	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
9/5/2015 0:00	WD ROC > 90	123	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
9/5/2015 21:00	WD ROC > 90	126	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
9/7/2015 0:00	WD ROC > 90	110	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
9/9/2015 0:00	WD ROC > 90	95	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
9/9/2015 22:00	WD ROC > 90	141	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
9/10/2015 0:00	WD ROC > 90	141	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
9/10/2015 1:00	WD ROC > 90	109	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
9/10/2015 3:00	WD ROC > 90	92	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
9/10/2015 9:00	WD ROC > 90	107	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
9/10/2015 10:00	WD ROC > 90	105	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
9/10/2015 22:00	WD ROC > 90	174	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
9/10/2015 23:00	WD ROC > 90	132	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
9/11/2015 23:00	WD ROC > 90	93	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
9/12/2015 0:00	WD ROC > 90	116	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
9/12/2015 14:00	WD ROC > 90	104	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
9/14/2015 3:00	WD ROC > 90	97	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
9/14/2015 20:00	WD ROC > 90	159	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
9/15/2015 2:00	WD ROC > 90	101	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
9/15/2015 3:00	WD ROC > 90	110	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
9/16/2015 11:00	WD ROC > 90	157	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
9/17/2015 0:00	WD ROC > 90	110	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
9/17/2015 3:00	WD ROC > 90	100	at gate	150	Data is valid, occurs during transitional period and/or lower speeds

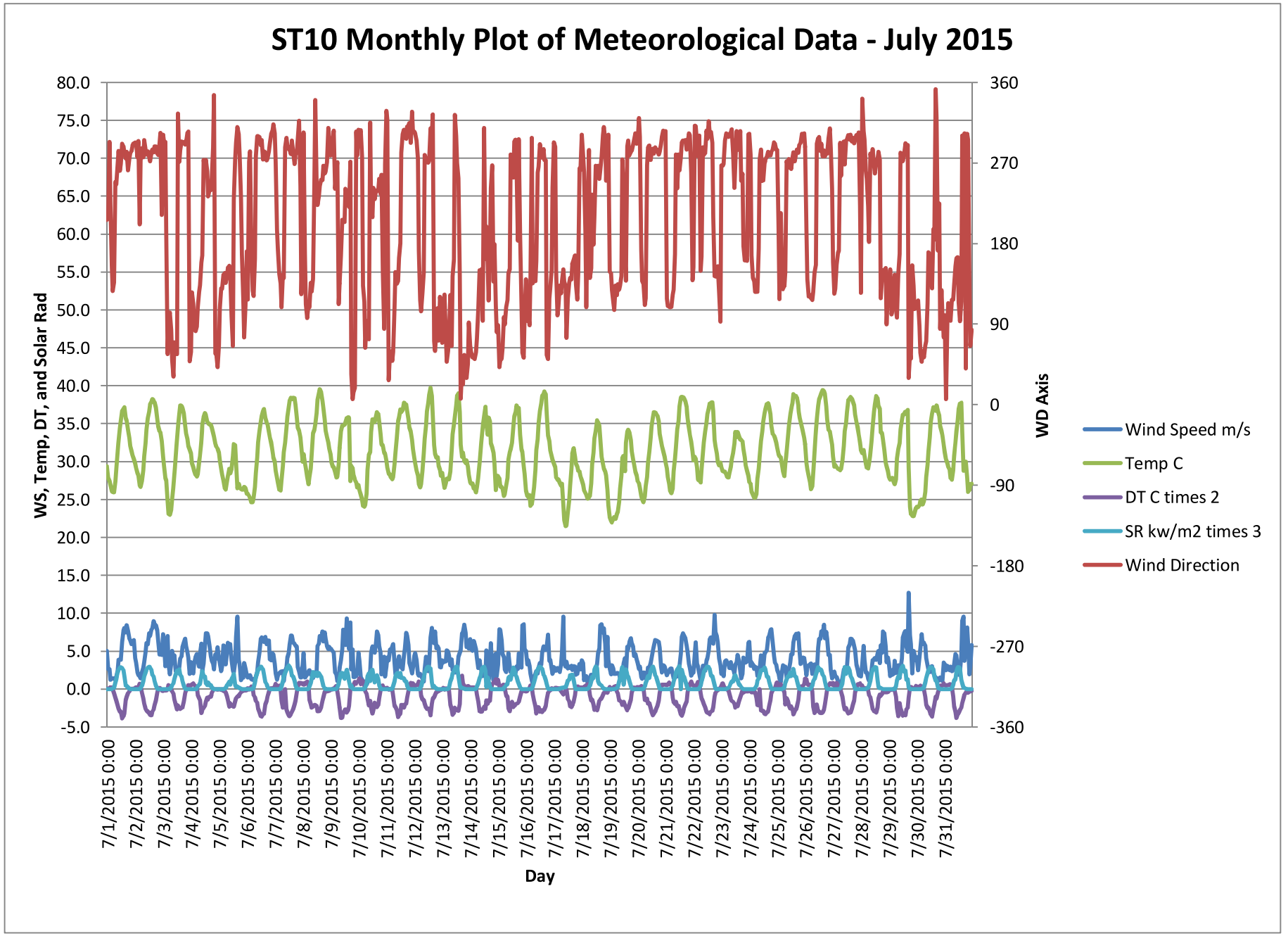
ASARCO June-Nov 2015 Sodar QC Screening Report - Hourly Data

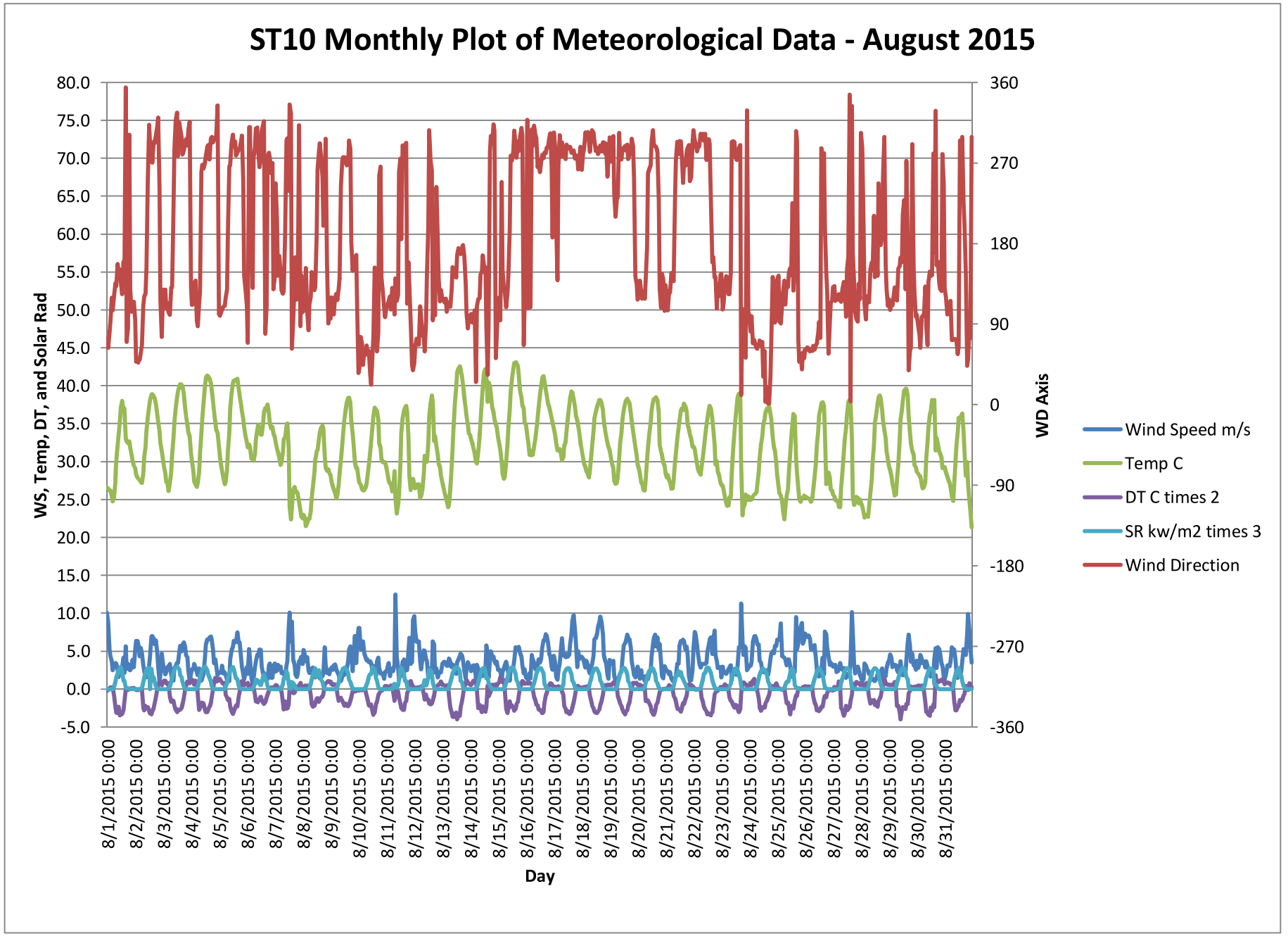
Date/time beginning	QCCODE	Test Condition	at Gate Ht		Comment
9/17/2015 4:00	WD ROC > 90	117	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
9/17/2015 22:00	WD ROC > 90	117	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
9/18/2015 10:00	WD ROC > 90	93	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
9/21/2015 3:00	WD ROC > 90	179	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
9/21/2015 22:00	WD ROC > 90	119	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
9/21/2015 23:00	WD ROC > 90	177	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
9/22/2015 16:00	WD ROC > 90	91	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
9/22/2015 21:00	WD ROC > 90	98	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
9/23/2015 10:00	WD ROC > 90	162	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
9/24/2015 15:00	WD ROC > 90	148	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
10/3/2015 3:00	WD ROC > 90	146	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
10/4/2015 21:00	WD ROC > 90	132	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
10/5/2015 7:00	WD ROC > 90	142	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/5/2015 22:00	WD ROC > 90	130	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/6/2015 3:00	WD ROC > 90	178	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/6/2015 23:00	WD ROC > 90	133	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
10/7/2015 1:00	WD ROC > 90	96	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
10/7/2015 2:00	WD ROC > 90	151	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/8/2015 22:00	WD ROC > 90	97	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/11/2015 21:00	WD ROC > 90	164	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
10/11/2015 23:00	WD ROC > 90	154	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
10/13/2015 10:00	WD ROC > 90	92	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
10/14/2015 12:00	WD ROC > 90	96	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/19/2015 11:00	WD ROC > 90	91	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/19/2015 20:00	WD ROC > 90	143	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
10/19/2015 23:00	WD ROC > 90	158	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/23/2015 11:00	WD ROC > 90	96	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/23/2015 22:00	WD ROC > 90	137	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
10/27/2015 21:00	WD ROC > 90	96	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
10/28/2015 14:00	WD ROC > 90	170	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
10/28/2015 16:00	WD ROC > 90	120	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
10/29/2015 5:00	WD ROC > 90	117	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/29/2015 15:00	WD ROC > 90	115	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/30/2015 20:00	WD ROC > 90	135	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
10/31/2015 0:00	WD ROC > 90	108	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
10/31/2015 2:00	WD ROC > 90	153	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
10/31/2015 3:00	WD ROC > 90	150	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
10/31/2015 11:00	WD ROC > 90	149	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
10/31/2015 21:00	WD ROC > 90	94	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
11/1/2015 13:00	WD ROC > 90	164	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
11/1/2015 19:00	WD ROC > 90	108	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
11/5/2015 14:00	WD ROC > 90	101	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
11/6/2015 10:00	WD ROC > 90	146	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
11/9/2015 15:00	WD ROC > 90	153	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
11/15/2015 4:00	WD ROC > 90	133	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
11/18/2015 8:00	WD ROC > 90	92	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
11/18/2015 11:00	WD ROC > 90	107	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
11/25/2015 17:00	WD ROC > 90	95	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
11/27/2015 3:00	WD ROC > 90	126	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
11/27/2015 4:00	WD ROC > 90	153	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
11/28/2015 11:00	WD ROC > 90	176	at gate	400	Data is valid, occurs during transitional period and/or lower speeds

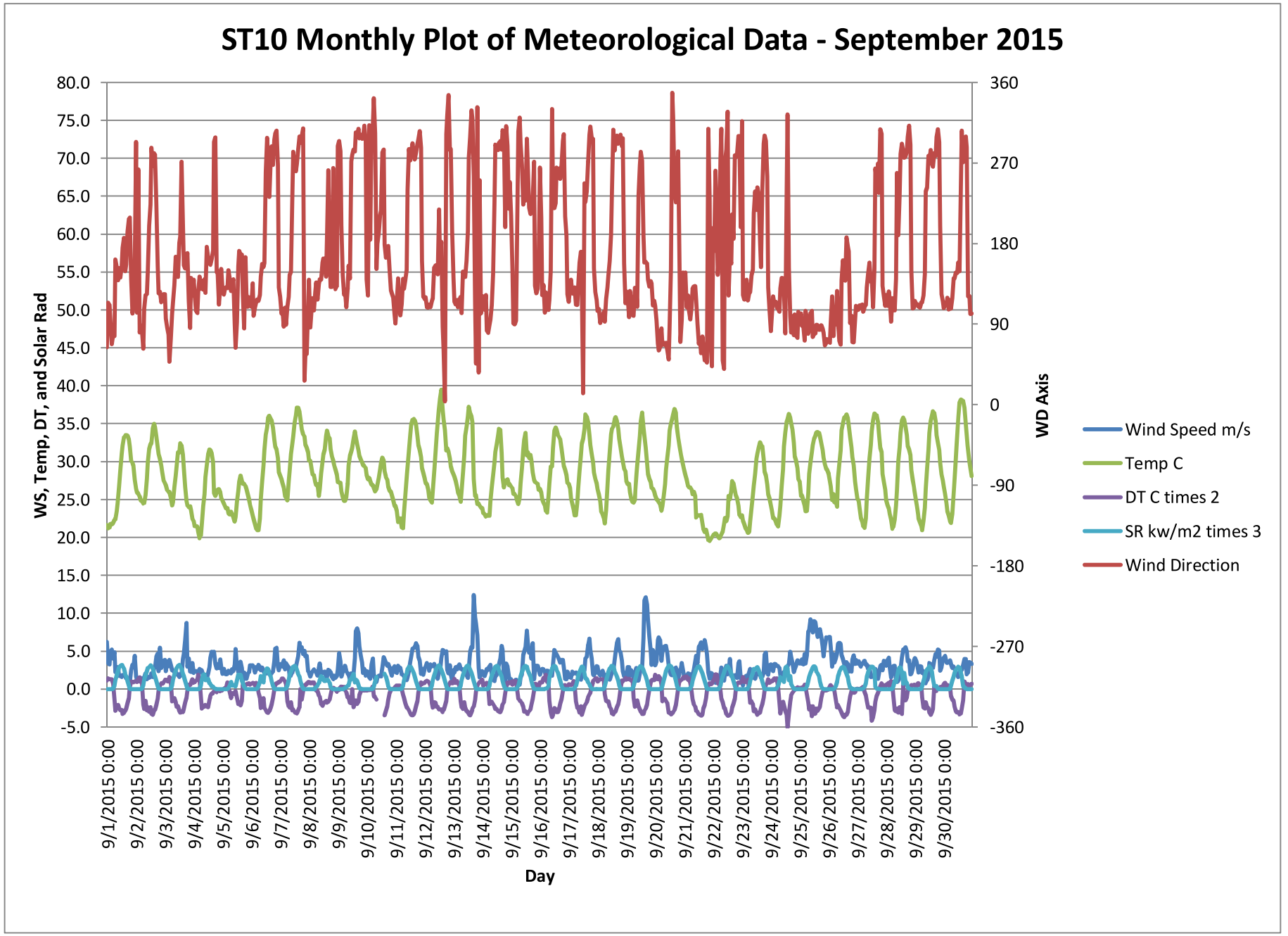
APPENDIX B

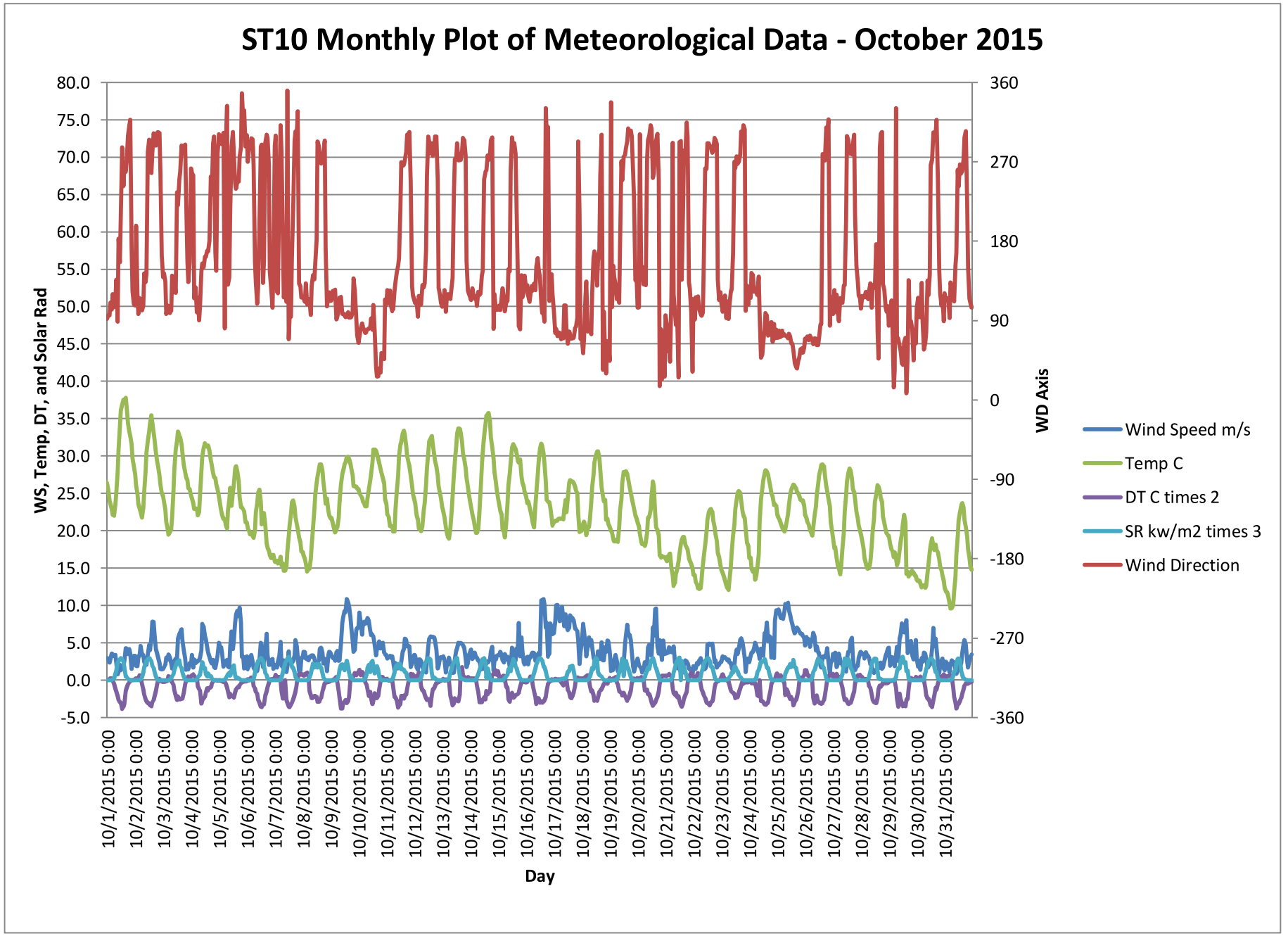
Monthly Data Plots and Tables

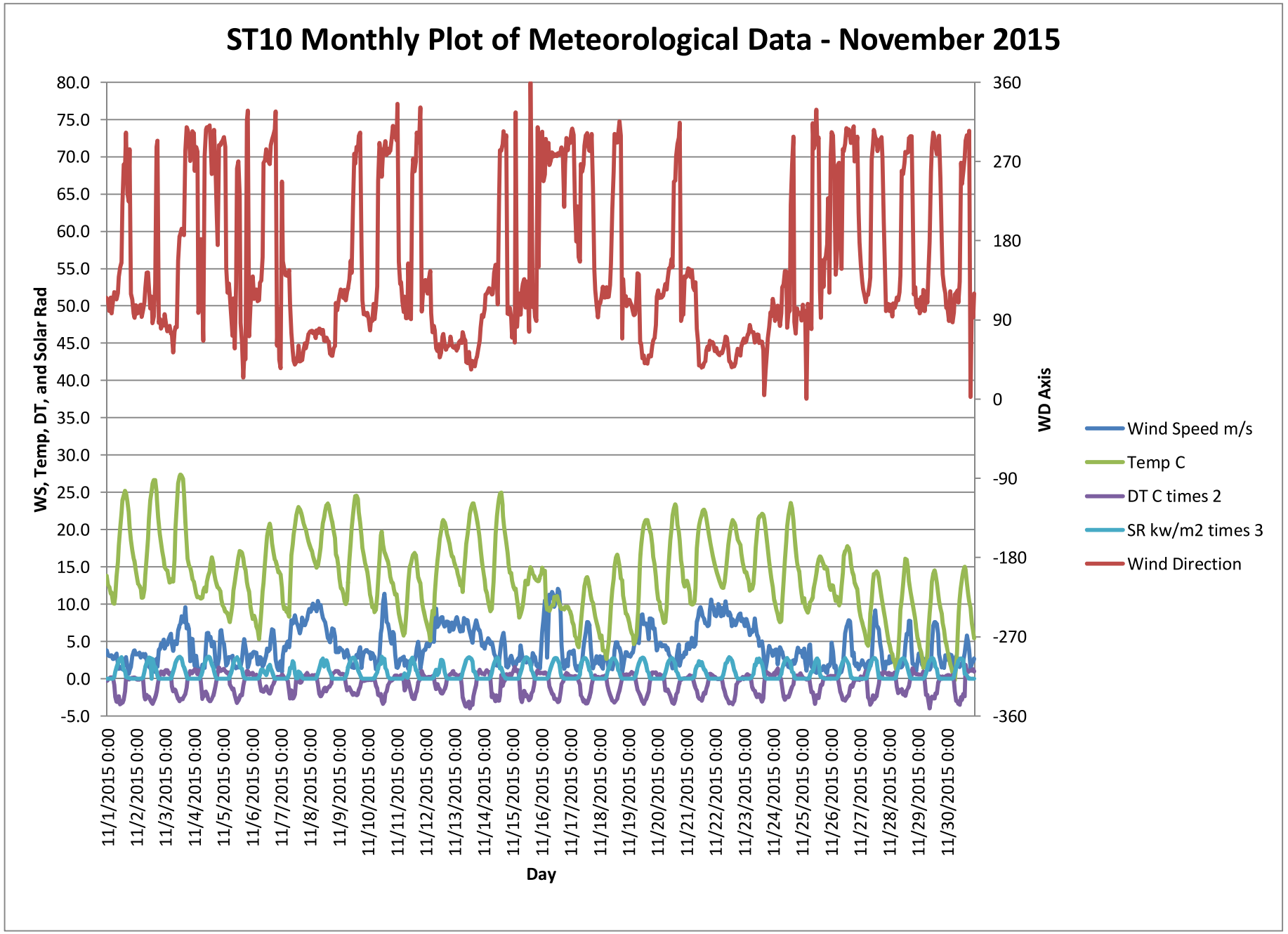

ST10 Monthly Plot of Meteorological Data - June 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
6/1/2015 0:00
6/2/2015 0:00
6/3/2015 0:00
6/4/2015 0:00
6/5/2015 0:00
6/6/2015 0:00
6/7/2015 0:00
6/8/2015 0:00
6/9/2015 0:00
6/10/2015 0:00
6/11/2015 0:00
6/12/2015 0:00
6/13/2015 0:00
6/14/2015 0:00
6/15/2015 0:00
6/16/2015 0:00
6/17/2015 0:00
6/18/2015 0:00
6/19/2015 0:00
6/20/2015 0:00
6/21/2015 0:00
6/22/2015 0:00
6/23/2015 0:00
6/24/2015 0:00
6/25/2015 0:00
6/26/2015 0:00
6/27/2015 0:00
6/28/2015 0:00
6/29/2015 0:00
6/30/2015 0:00
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - July 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
7/1/2015 0:00
7/2/2015 0:00
7/3/2015 0:00
7/4/2015 0:00
7/5/2015 0:00
7/6/2015 0:00
7/7/2015 0:00
7/8/2015 0:00
7/9/2015 0:00
7/10/2015 0:00
7/11/2015 0:00
7/12/2015 0:00
7/13/2015 0:00
7/14/2015 0:00
7/15/2015 0:00
7/16/2015 0:00
7/17/2015 0:00
7/18/2015 0:00
7/19/2015 0:00
7/20/2015 0:00
7/21/2015 0:00
7/22/2015 0:00
7/23/2015 0:00
7/24/2015 0:00
7/25/2015 0:00
7/26/2015 0:00
7/27/2015 0:00
7/28/2015 0:00
7/29/2015 0:00
7/30/2015 0:00
7/31/2015 0:00
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - August 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
8/1/2015 0:00
8/2/2015 0:00
8/3/2015 0:00
8/4/2015 0:00
8/5/2015 0:00
8/6/2015 0:00
8/7/2015 0:00
8/8/2015 0:00
8/9/2015 0:00
8/10/2015 0:00
8/11/2015 0:00
8/12/2015 0:00
8/13/2015 0:00
8/14/2015 0:00
8/15/2015 0:00
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8/19/2015 0:00
8/20/2015 0:00
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8/23/2015 0:00
8/24/2015 0:00
8/25/2015 0:00
8/26/2015 0:00
8/27/2015 0:00
8/28/2015 0:00
8/29/2015 0:00
8/30/2015 0:00
8/31/2015 0:00
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - September 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
9/1/2015 0:00
9/2/2015 0:00
9/3/2015 0:00
9/4/2015 0:00
9/5/2015 0:00
9/6/2015 0:00
9/7/2015 0:00
9/8/2015 0:00
9/9/2015 0:00
9/10/2015 0:00
9/11/2015 0:00
9/12/2015 0:00
9/13/2015 0:00
9/14/2015 0:00
9/15/2015 0:00
9/16/2015 0:00
9/17/2015 0:00
9/18/2015 0:00
9/19/2015 0:00
9/20/2015 0:00
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9/22/2015 0:00
9/23/2015 0:00
9/24/2015 0:00
9/25/2015 0:00
9/26/2015 0:00
9/27/2015 0:00
9/28/2015 0:00
9/29/2015 0:00
9/30/2015 0:00
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - October 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
10/1/2015 0:00
10/2/2015 0:00
10/3/2015 0:00
10/4/2015 0:00
10/5/2015 0:00
10/6/2015 0:00
10/7/2015 0:00
10/8/2015 0:00
10/9/2015 0:00
10/10/2015 0:00
10/11/2015 0:00
10/12/2015 0:00
10/13/2015 0:00
10/14/2015 0:00
10/15/2015 0:00
10/16/2015 0:00
10/17/2015 0:00
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10/23/2015 0:00
10/24/2015 0:00
10/25/2015 0:00
10/26/2015 0:00
10/27/2015 0:00
10/28/2015 0:00
10/29/2015 0:00
10/30/2015 0:00
10/31/2015 0:00
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - November 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
11/1/2015 0:00
11/2/2015 0:00
11/3/2015 0:00
11/4/2015 0:00
11/5/2015 0:00
11/6/2015 0:00
11/7/2015 0:00
11/8/2015 0:00
11/9/2015 0:00
11/10/2015 0:00
11/11/2015 0:00
11/12/2015 0:00
11/13/2015 0:00
11/14/2015 0:00
11/15/2015 0:00
11/16/2015 0:00
11/17/2015 0:00
11/18/2015 0:00
11/19/2015 0:00
11/20/2015 0:00
11/21/2015 0:00
11/22/2015 0:00
11/23/2015 0:00
11/24/2015 0:00
11/25/2015 0:00
11/26/2015 0:00
11/27/2015 0:00
11/28/2015 0:00
11/29/2015 0:00
11/30/2015 0:00
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.6	3.5	3.2	1.4	1.6	2.4	2.9	2.5	1.9	1.6	1.5	3.3	4.3	6.7	8.0	8.3	6.8	6.6	6.5	4.1	3.8	2.9	2.3	1.6	3.8
2	1.8	1.1	2.2	1.8	2.9	2.7	2.9	2.3	1.1	1.7	1.5	2.0	2.1	4.0	5.4	6.9	6.6	6.6	7.7	6.9	4.7	4.6	2.3	1.6	3.5
3	2.0	1.7	2.4	2.9	2.1	2.3	2.9	1.4	0.7	1.2	1.4	1.8	3.0	4.9	5.6	6.2	6.7	6.0	7.0	6.7	3.7	3.8	2.0	1.5	3.3
4	2.6	2.0	2.6	3.3	2.6	3.1	2.8	2.5	2.0	1.8	2.1	2.7	3.2	5.1	7.3	7.0	7.5	7.0	7.8	6.9	2.5	4.8	3.3	2.4	3.9
5	3.0	3.4	3.6	3.1	4.8	5.7	5.3	4.5	2.7	1.3	2.4	2.5	4.1	3.2	3.4	3.0	4.2	3.9	2.5	2.0	2.0	3.9	1.8	1.3	3.2
6	1.4	2.3	2.5	3.1	2.0	2.0	1.2	1.1	2.1	2.2	2.7	5.9	6.2	9.3	9.2	8.8	7.4	6.8	5.2	3.7	4.5	3.1	1.4	0.9	4.0
7	1.8	2.7	2.3	2.0	2.5	2.9	2.6	2.0	2.1	1.0	1.8	2.7	4.0	5.4	6.6	7.1	6.5	6.2	7.1	6.3	4.2	3.3	2.9	1.6	3.6
8	1.2	1.5	1.7	1.5	2.0	1.4	1.5	0.8	1.4	1.6	2.9	3.4	4.1	3.7	4.7	7.3	7.9	7.9	7.9	7.5	5.0	6.3	8.2	7.5	4.1
9	4.5	5.8	4.0	4.6	3.3	3.1	5.2	4.5	3.1	3.2	3.6	5.2	3.3	2.2	1.9	6.8	4.5	6.5	6.0	4.7	5.1	5.3	4.4	4.4	4.4
10	5.5	5.0	3.6	3.4	3.1	2.3	0.9	1.2	1.1	***	***	***	***	***	***	8.2	8.4	8.8	8.0	6.9	6.2	6.2	4.9	2.4	4.8
11	2.5	1.1	1.6	1.8	2.3	2.3	1.0	1.1	2.7	3.6	3.4	3.5	5.5	6.2	6.9	7.3	6.8	6.1	5.8	5.0	3.5	2.7	2.4	1.1	3.6
12	2.4	2.5	2.9	0.9	1.4	2.1	2.5	2.1	1.3	1.4	1.9	1.9	2.9	3.0	3.4	5.3	5.6	5.8	6.7	5.7	4.0	3.0	1.5	2.8	3.0
13	2.2	4.3	1.7	1.2	1.5	2.8	2.9	2.1	2.0	1.3	3.1	3.5	3.2	5.2	6.0	6.6	6.8	7.3	6.5	5.9	3.9	4.4	2.2	1.0	3.7
14	2.9	5.4	2.3	2.2	2.2	1.8	2.4	1.8	1.4	2.2	2.9	2.8	2.9	3.4	3.5	4.9	5.0	5.3	5.7	5.9	4.4	3.9	3.3	1.2	3.3
15	1.5	2.1	2.4	1.5	2.0	2.3	2.3	1.5	1.4	1.7	2.6	3.3	3.2	3.6	5.2	6.0	7.0	7.3	7.6	6.2	3.8	3.7	5.0	4.6	3.6
16	3.0	3.4	3.5	3.3	3.1	3.2	1.7	3.1	3.2	4.2	2.9	3.2	2.2	2.2	4.5	5.5	7.9	8.6	8.2	6.4	4.7	4.9	5.4	4.1	4.3
17	3.2	3.4	3.7	3.0	2.5	2.6	3.0	2.2	1.8	1.8	1.2	2.4	4.5	5.4	6.4	6.6	8.2	8.7	8.2	4.7	4.4	3.0	2.2	1.9	4.0
18	2.8	2.6	2.7	2.5	2.8	2.7	1.6	1.6	1.1	1.3	3.1	3.8	5.8	7.2	8.5	9.4	8.1	7.1	7.0	5.2	3.1	4.1	4.4	5.0	4.3
19	4.2	1.5	2.2	2.6	2.7	2.5	2.7	2.3	1.2	1.1	3.2	3.1	4.7	6.4	7.2	7.1	7.3	8.4	8.3	6.9	3.9	3.8	3.0	1.2	4.1
20	2.4	3.0	3.3	3.8	3.9	3.1	2.6	1.0	1.0	1.0	1.6	3.9	5.4	6.6	6.1	6.0	6.4	6.1	6.4	4.0	2.3	1.7	0.9	2.1	3.5
21	2.8	2.2	1.2	1.9	0.9	1.3	2.1	3.9	4.5	4.3	4.1	4.9	6.0	7.5	7.8	8.0	7.5	8.3	7.5	5.2	3.8	2.8	1.2	2.0	4.2
22	2.0	1.4	2.8	4.4	4.4	3.5	2.1	2.5	2.3	4.3	4.7	4.6	5.9	7.0	7.6	8.1	7.9	8.9	7.8	7.1	3.9	1.9	2.1	3.4	4.6
23	3.0	2.1	1.8	1.1	1.0	1.6	1.5	2.0	1.2	2.1	4.9	4.4	6.5	6.5	6.8	7.4	8.0	8.6	9.1	7.2	5.1	2.5	2.4	2.7	4.1
24	3.6	2.5	3.9	2.0	2.4	3.3	2.8	3.9	3.0	2.3	1.5	2.0	3.7	4.5	6.6	7.5	11.1	12.3	8.6	4.3	4.4	6.6	4.4	6.2	4.7
25	6.1	4.4	3.9	3.2	4.0	2.5	1.4	1.9	2.0	1.3	2.3	1.5	1.9	2.7	2.6	4.4	5.2	7.1	7.5	6.8	6.4	6.8	6.4	6.3	4.1
26	4.2	2.2	1.3	3.2	3.5	3.4	5.3	2.9	1.6	3.2	3.6	4.4	5.3	6.2	5.8	6.6	7.2	6.6	4.9	5.7	4.4	6.0	5.7	3.6	4.4
27	3.0	3.7	3.0	2.9	1.6	0.7	1.1	0.7	1.5	1.8	2.0	1.9	3.3	2.6	2.5	9.9	8.5	7.0	9.9	9.1	5.8	3.9	5.4	4.3	4.0
28	4.1	3.0	3.1	4.1	3.1	3.0	2.8	4.0	3.8	2.9	2.3	1.4	2.6	3.2	6.1	2.8	5.0	4.3	7.2	4.9	3.4	2.5	1.7	1.9	3.5
29	1.9	3.2	2.1	2.6	2.8	2.6	3.5	2.7	2.2	1.5	3.1	2.7	4.0	6.6	6.3	6.3	4.4	2.6	4.2	4.1	4.7	2.8	2.3	1.8	3.4
30	1.5	1.9	2.3	2.6	3.9	2.3	1.5	1.4	2.3	5.1	6.2	5.3	4.8	5.2	7.3	8.4	9.1	8.7	8.4	5.1	1.5	3.1	2.2	3.4	4.3
HRAVE	2.9	2.8	2.7	2.6	2.6	2.6	2.5	2.3	2.0	2.2	2.8	3.2	4.1	5.0	5.8	6.8	7.0	7.0	7.0	5.7	4.1	4.0	3.3	2.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.8	3.5	3.3	3.9	3.2	4.0	3.6	4.1	4.4	4.8	3.6	3.0	3.7	3.3	3.6	4.3	4.0	4.3	4.1	3.5	4.2	4.6	4.1	4.7	4.1
MAX	8.3	7.7	7.0	7.8	5.7	9.3	7.1	8.2	6.8	8.8	7.3	6.7	7.3	5.9	7.6	8.6	8.7	9.4	8.4	6.6	8.3	8.9	9.1	12.3	7.5
MIN	1.4	1.1	0.7	1.8	1.3	0.9	1.0	0.8	1.9	0.9	1.0	0.9	1.0	1.2	1.4	1.7	1.2	1.1	1.1	0.9	0.9	1.4	1.0	1.5	1.3

DAY	26	27	28	29	30	31
AVE	4.4	4.0	3.5	3.4	4.3	***
MAX	7.2	9.9	7.2	6.6	9.1	***
MIN	1.3	0.7	1.4	1.5	1.4	***

MONTHLY AVERAGE = 3.9 MONTHLY MAXIMUM = 12.3 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	290	299	299	217	121	122	114	114	140	190	168	302	285	262	270	286	294	301	297	304	299	309	304	126	301
2	138	226	100	98	74	97	96	107	114	103	21	28	315	279	257	272	288	300	299	296	293	303	238	280	183
3	128	192	125	102	91	95	88	110	144	248	86	298	315	267	259	268	274	274	272	298	312	324	291	298	348
4	145	109	123	101	100	95	111	114	123	123	141	118	144	228	246	258	286	290	276	289	89	108	131	146	210
5	107	103	110	82	25	57	50	52	59	218	110	111	64	1	287	54	280	205	295	322	6	311	309	122	309
6	95	90	91	105	87	78	107	106	104	152	257	202	209	286	294	296	299	291	305	309	282	298	262	185	333
7	130	85	73	82	91	95	103	101	143	85	108	296	284	308	304	311	303	304	296	294	303	300	311	338	274
8	78	115	85	58	96	70	91	308	301	288	280	285	281	281	286	292	288	288	287	297	296	181	156	121	2
9	136	123	171	81	135	121	115	135	135	123	90	62	62	31	246	42	306	293	289	292	305	292	293	303	8
10	300	299	300	303	301	288	202	263	242	***	***	***	***	***	***	291	293	295	298	299	293	294	302	309	101
11	306	193	136	150	118	107	74	48	306	299	295	285	295	284	295	293	286	300	292	299	306	290	309	79	76
12	108	96	89	1	59	98	97	109	142	233	252	243	290	286	284	291	289	302	290	295	307	302	295	133	241
13	124	301	171	144	135	103	102	114	141	215	283	290	300	303	280	285	290	291	292	285	304	306	278	353	286
14	96	319	225	158	146	132	109	124	165	264	271	278	271	251	294	290	286	280	287	288	297	297	293	296	216
15	130	22	271	213	134	125	124	119	245	292	277	286	302	299	301	271	280	283	285	289	314	5	44	49	164
16	74	78	113	132	100	111	109	120	96	88	90	57	233	249	259	280	290	291	284	290	299	344	72	122	266
17	119	87	70	80	120	101	102	135	108	69	81	129	266	265	277	276	274	278	281	291	300	291	285	187	209
18	110	109	96	102	90	115	104	125	94	270	278	262	295	285	287	289	282	286	288	287	305	317	306	312	20
19	304	205	119	114	120	110	98	109	95	263	271	273	308	290	286	285	302	295	291	295	298	309	308	254	247
20	118	107	90	91	104	118	89	80	124	153	280	305	280	288	291	288	285	274	291	290	295	311	331	98	354
21	107	99	118	95	310	293	296	310	317	300	307	302	287	289	292	282	272	283	295	288	295	288	226	150	144
22	114	62	277	300	303	288	275	293	301	308	308	304	289	281	291	283	287	294	284	286	290	216	285	134	154
23	102	112	113	62	13	112	117	130	123	298	301	278	276	278	279	280	276	284	281	288	305	295	155	112	99
24	107	91	86	117	107	123	116	120	140	151	141	127	299	277	179	147	29	35	55	89	76	42	44	50	23
25	58	102	86	79	70	53	110	129	88	14	98	203	119	252	275	264	265	290	287	286	199	140	145	143	247
26	148	120	208	143	120	132	138	156	182	297	300	304	287	296	285	284	287	282	293	287	288	157	152	123	146
27	177	152	151	85	133	71	149	145	234	55	260	204	176	155	200	107	304	59	46	64	82	36	83	94	237
28	90	122	132	131	133	116	131	154	158	133	77	153	196	169	238	274	282	303	73	161	117	147	121	136	272
29	156	123	141	137	116	111	129	134	140	265	282	275	276	280	274	296	261	258	155	195	302	227	142	137	79
30	116	137	110	111	128	99	117	226	275	288	284	288	267	279	283	281	282	281	287	288	304	123	27	244	85

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JUNE - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	8	7	7	23	12	9	8	13	22	39	56	35	31	23	18	14	16	12	12	9	5	7	31	12	18
2	20	38	11	9	14	8	8	15	47	28	58	48	55	31	26	26	15	15	12	8	6	8	22	54	24
3	41	40	7	7	9	12	12	30	59	43	60	53	45	25	22	23	25	19	13	9	11	11	12	20	25
4	10	12	10	10	17	10	11	11	22	30	30	27	41	21	15	19	11	11	10	11	35	10	13	11	17
5	17	10	13	40	26	13	15	19	35	33	32	68	15	33	50	25	43	28	51	48	50	11	37	26	31
6	15	9	12	11	20	40	41	32	17	31	48	27	25	18	14	13	16	16	16	12	5	7	27	36	21
7	11	11	22	24	9	9	9	17	18	54	50	33	34	19	18	17	17	18	13	8	9	16	11	47	21
8	53	16	28	24	12	22	13	50	39	17	17	14	11	12	11	11	10	9	8	7	24	25	10	10	19
9	17	25	37	21	25	21	18	42	26	19	14	16	22	38	49	14	26	12	10	7	7	8	7	8	20
10	7	7	7	7	7	17	18	26	64	***	***	***	***	***	***	13	13	12	13	11	8	8	9	9	14
11	8	34	8	21	9	9	29	47	22	22	33	46	21	22	20	19	17	15	11	10	6	8	9	38	20
12	12	10	9	50	23	9	10	12	27	50	40	51	42	39	48	21	21	17	12	9	6	10	25	11	23
13	33	15	16	20	20	7	9	13	21	53	25	22	35	22	25	16	19	12	13	8	6	5	36	34	20
14	34	12	36	10	11	11	14	16	41	28	28	41	35	34	31	22	19	17	11	7	6	4	9	23	21
15	40	38	16	62	13	9	7	15	38	35	29	30	29	31	21	20	15	13	11	8	8	23	12	11	22
16	13	13	9	10	10	10	26	13	20	27	36	31	38	50	25	23	19	12	9	8	7	15	20	18	19
17	16	15	10	14	14	12	9	14	28	33	68	39	22	17	13	13	10	10	8	8	7	7	21	31	18
18	10	9	11	12	10	20	18	15	45	33	17	21	21	16	18	15	16	13	12	8	7	8	6	5	15
19	7	27	9	11	16	10	9	17	33	48	21	29	22	23	19	20	16	13	10	9	7	8	8	37	18
20	10	7	8	9	7	13	13	33	53	50	41	25	30	22	18	15	13	15	13	9	5	10	25	34	20
21	9	51	59	26	29	22	11	10	14	22	21	24	23	19	15	11	13	11	11	9	8	4	19	5	19
22	12	30	26	8	17	21	37	21	23	19	22	20	15	18	16	11	14	12	10	8	6	46	36	11	19
23	10	17	15	34	37	56	26	15	33	31	18	17	16	19	16	15	10	11	8	7	7	52	16	40	22
24	12	12	14	23	25	7	21	17	22	36	59	35	48	29	24	24	14	12	16	19	13	12	28	11	22
25	10	14	27	13	8	20	37	16	31	52	39	66	56	44	46	27	15	13	10	7	30	10	10	9	25
26	12	17	30	11	11	16	11	15	44	26	22	23	18	18	16	15	13	13	14	12	7	18	12	14	17
27	20	10	16	14	16	41	20	50	31	57	57	70	36	61	74	28	18	30	16	18	30	36	18	22	33
28	17	18	11	9	9	9	14	8	9	20	42	68	48	30	30	24	14	19	23	19	13	11	13	11	20
29	38	13	12	11	8	9	7	14	18	47	20	31	24	19	17	19	24	31	18	18	22	22	13	10	19
30	14	15	9	8	11	24	30	37	22	18	15	21	25	19	15	11	9	7	10	8	24	13	22	19	17
HRAVE	18	18	17	18	15	17	17	22	31	35	35	36	30	27	25	18	17	15	13	11	13	14	18	21	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	18	24	25	17	31	21	21	19	20	14	20	23	20	21	22	19	18	15	18	20	19	19	22	22	25
MAX	56	58	60	41	68	48	54	53	49	64	47	51	53	41	62	50	68	45	48	53	59	46	56	59	66
MIN	5	6	7	10	10	5	8	7	7	7	6	6	5	4	7	7	7	5	7	5	4	6	7	7	7

DAY	26	27	28	29	30	31
AVE	17	33	20	19	17	***
MAX	44	74	68	47	37	***
MIN	7	10	8	7	7	***

MONTHLY AVERAGE = 20.8 MONTHLY MAXIMUM = 74.1 MONTHLY MINIMUM = 4.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JUNE - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	30.0	29.0	27.3	25.9	24.9	23.9	24.6	27.3	29.9	32.4	34.6	36.3	37.3	38.5	38.3	38.1	38.0	37.3	36.6	34.9	33.2	31.8	30.7	29.1	32.1
2	28.4	28.6	27.1	26.6	24.0	23.0	24.5	26.9	29.4	32.5	33.4	34.8	36.0	37.6	38.5	38.3	38.0	37.1	36.0	34.3	32.4	31.2	30.4	29.5	31.6
3	27.6	26.5	25.5	24.2	23.0	21.3	23.0	25.1	27.9	30.4	32.6	34.5	35.8	37.2	37.9	38.3	37.8	37.2	35.9	33.6	31.6	30.6	29.5	28.2	30.6
4	26.0	24.5	24.2	22.7	21.0	20.1	21.3	24.6	27.7	30.7	32.5	33.4	35.0	34.8	34.0	31.7	31.4	30.8	29.3	26.3	25.8	26.0	24.7	24.0	27.6
5	23.7	23.4	23.3	23.1	20.5	20.5	22.3	23.9	24.0	23.5	24.5	24.6	26.1	28.2	29.5	31.4	31.5	29.0	29.1	28.3	27.2	25.9	25.2	24.0	25.5
6	23.2	22.1	21.8	21.8	21.6	20.7	21.3	23.1	26.7	29.8	30.7	33.7	35.2	34.6	34.7	34.4	33.9	33.5	32.7	31.2	29.8	28.2	27.9	26.9	28.3
7	25.6	23.9	22.8	21.6	20.5	20.4	21.9	24.6	27.2	29.8	32.8	34.3	35.7	36.3	36.5	36.3	36.3	35.9	35.1	33.5	32.0	30.9	30.0	29.6	29.7
8	28.6	27.0	26.1	25.8	24.8	24.8	25.4	25.4	26.7	29.1	32.8	34.4	35.5	36.6	37.4	37.7	37.4	37.2	36.5	35.0	34.3	33.4	31.0	28.4	31.3
9	27.5	25.2	22.6	23.0	22.7	22.6	22.1	22.8	23.2	24.2	25.8	28.3	30.0	32.2	32.6	30.2	31.1	30.7	28.9	28.4	28.4	28.0	27.5	27.2	26.9
10	26.3	25.8	25.5	25.2	24.9	24.2	24.5	25.9	27.7	***	***	***	***	***	***	34.0	33.7	33.0	32.0	30.8	29.8	28.6	27.9	27.2	28.2
11	26.7	25.6	25.0	24.7	23.7	24.0	24.8	26.5	28.2	30.0	31.0	32.5	33.2	34.1	34.8	34.7	34.6	34.0	33.5	32.3	31.2	30.1	29.2	28.6	29.7
12	26.8	25.8	24.6	23.9	22.5	21.8	23.7	25.7	28.4	30.5	32.7	34.1	35.5	36.4	37.3	37.8	37.6	37.0	36.2	34.5	33.1	31.9	30.8	28.9	30.7
13	27.5	27.4	25.9	26.1	24.5	23.9	25.0	27.1	29.5	31.4	33.0	35.2	37.2	37.8	38.3	38.3	38.0	37.5	36.7	34.7	33.5	32.9	32.0	31.0	31.9
14	29.4	28.9	27.7	25.9	25.5	25.2	26.1	27.7	30.2	32.0	33.9	35.8	37.4	38.6	38.8	39.3	39.3	39.0	38.2	36.5	35.2	34.2	33.3	32.5	32.9
15	31.2	30.3	29.3	28.6	27.4	26.8	27.0	29.1	32.0	34.1	36.5	38.5	40.1	40.9	41.5	41.6	41.4	40.8	39.8	38.2	36.9	35.8	34.5	33.7	34.8
16	32.3	30.9	29.5	28.3	27.8	27.3	26.6	26.7	31.6	36.3	38.1	39.0	39.9	40.9	42.0	42.4	41.9	41.2	40.2	38.5	36.9	35.4	33.8	32.9	35.0
17	31.7	30.9	30.1	29.2	27.6	27.1	28.6	30.3	32.7	35.5	37.5	39.8	40.8	41.0	40.9	41.1	40.5	40.1	39.7	38.1	37.1	36.4	35.3	33.6	35.2
18	32.0	31.0	29.2	28.4	26.8	26.3	27.2	29.5	33.0	35.7	38.4	40.5	42.0	42.4	42.4	42.4	42.1	41.7	40.9	39.1	37.5	36.6	36.0	35.1	35.7
19	34.2	32.1	30.8	29.2	28.2	27.3	27.8	30.9	33.9	35.9	38.5	40.3	41.2	42.2	42.5	42.8	42.4	41.9	40.7	38.9	37.0	35.8	34.8	33.4	36.0
20	31.0	29.7	27.9	26.5	26.1	25.7	26.1	27.8	30.8	34.1	37.0	39.8	41.0	41.2	41.5	41.8	41.5	41.3	40.2	38.5	36.9	35.8	34.4	32.2	34.5
21	30.3	29.5	28.0	27.3	26.9	27.3	28.0	30.2	32.0	33.3	35.1	36.7	38.0	38.7	39.4	39.9	39.9	39.4	38.5	37.0	35.9	34.8	33.8	32.1	33.8
22	31.2	30.1	28.9	29.0	28.9	28.4	28.4	30.3	32.2	34.1	35.8	37.5	38.9	39.8	40.3	40.6	40.5	39.9	38.9	36.9	35.5	34.2	33.2	31.5	34.4
23	30.7	30.1	29.2	27.8	27.6	26.5	27.4	29.8	32.5	35.3	37.4	38.5	39.6	40.3	40.9	41.1	40.9	40.4	39.1	37.6	36.6	36.0	33.8	33.0	34.7
24	32.6	31.9	30.9	30.2	29.4	28.8	30.0	32.8	35.6	35.9	36.7	37.4	38.8	40.1	40.9	38.7	35.3	33.2	33.4	33.5	33.5	32.8	32.0	32.1	34.0
25	31.6	30.8	30.6	30.0	29.4	28.5	28.6	30.4	33.3	34.9	36.9	38.1	39.7	41.1	41.0	41.5	41.7	41.1	39.6	38.3	35.9	33.2	32.9	32.3	35.1
26	31.5	31.3	30.5	29.2	28.0	27.5	28.1	29.8	31.5	33.5	35.1	36.7	38.0	39.0	39.5	40.0	39.9	39.1	37.9	37.1	36.2	32.9	31.2	31.6	34.0
27	31.9	30.6	29.8	29.9	29.2	29.0	29.0	30.2	32.2	34.7	36.9	38.5	40.7	41.2	41.6	38.3	32.5	32.9	31.2	27.0	26.2	25.8	25.9	26.2	32.1
28	26.7	24.9	24.5	23.7	23.9	24.1	24.9	27.0	28.5	30.8	35.2	37.1	39.0	39.6	33.6	36.9	37.9	37.7	35.6	32.3	30.0	29.0	28.5	27.8	30.8
29	26.8	26.1	26.2	25.2	25.2	25.4	25.9	28.0	30.3	32.2	34.9	37.5	39.2	39.9	40.1	40.2	35.7	36.3	35.2	34.1	33.1	31.9	30.7	30.3	32.1
30	29.8	28.5	28.4	28.2	26.7	27.7	29.0	31.0	32.1	33.9	35.0	36.3	37.7	38.8	38.9	38.3	37.2	33.7	34.4	34.2	33.6	31.0	31.2	31.3	32.8
HRAVE	29.1	28.1	27.1	26.4	25.4	25.0	25.8	27.7	30.0	32.3	34.3	36.0	37.4	38.3	38.5	38.3	37.7	37.0	36.1	34.5	33.2	32.0	31.1	30.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	32.1	31.6	30.6	27.6	25.5	28.3	29.7	31.3	26.9	28.2	29.7	30.7	31.9	32.9	34.8	35.0	35.2	35.7	36.0	34.5	33.8	34.4	34.7	34.0	35.1
MAX	38.5	38.5	38.3	35.0	31.5	35.2	36.5	37.7	32.6	34.0	34.8	37.8	38.3	39.3	41.6	42.4	41.1	42.4	42.8	41.8	39.9	40.6	41.1	40.9	41.7
MIN	23.9	23.0	21.3	20.1	20.5	20.7	20.4	24.8	22.1	24.2	23.7	21.8	23.9	25.2	26.8	26.6	27.1	26.3	27.3	25.7	26.9	28.4	26.5	28.8	28.5

DAY	26	27	28	29	30	31
AVE	34.0	32.1	30.8	32.1	32.8	***
MAX	40.0	41.6	39.6	40.2	38.9	***
MIN	27.5	25.8	23.7	25.2	26.7	***

MONTHLY AVERAGE = 32.1 MONTHLY MAXIMUM = 42.8 MONTHLY MINIMUM = 20.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JUNE - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.6	0.7	0.6	0.6	0.6	0.4	-0.7	-1.4	-1.1	-1.0	-1.2	-1.4	-1.4	-1.6	-1.6	-1.4	-1.3	-0.9	-0.6	0.1	0.5	0.5	0.4	0.5	-0.4
2	0.5	0.5	0.7	0.8	0.5	0.4	-1.0	-1.3	-0.8	-1.4	-1.2	-1.5	-1.2	-1.6	-1.7	-1.4	-1.4	-1.0	-0.6	-0.1	0.3	0.4	0.3	0.4	-0.5
3	0.6	0.6	0.5	0.5	0.8	0.5	-0.8	-0.7	-0.6	-0.9	-1.2	-1.1	-1.4	-1.5	-1.5	-1.5	-1.3	-0.9	-0.6	-0.1	0.3	0.3	0.4	0.6	-0.4
4	0.4	0.4	0.6	0.6	0.9	0.6	-0.5	-1.3	-1.2	-1.2	-1.1	-1.1	-1.2	-0.7	-0.5	-0.3	-0.3	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.3
5	0.0	0.0	0.1	0.1	0.4	0.1	-0.2	-0.6	-0.3	-0.2	-0.3	-0.1	-0.6	-1.0	-0.9	-1.1	-0.8	0.3	0.1	0.3	0.3	0.3	0.4	0.3	-0.1
6	0.3	0.4	0.4	0.2	0.4	0.3	-0.2	-0.6	-1.2	-1.1	-0.6	-1.3	-1.4	-1.6	-1.6	-1.5	-1.2	-1.0	-0.6	0.0	0.3	0.4	0.4	0.5	-0.4
7	0.5	0.6	0.7	0.6	0.5	0.4	-0.8	-1.1	-1.2	-0.9	-1.4	-1.4	-1.5	-1.6	-1.6	-1.4	-1.2	-1.0	-0.7	-0.2	0.2	0.3	0.4	0.4	-0.5
8	0.5	0.4	0.4	0.4	0.4	0.2	-0.1	-0.1	-0.4	-0.5	-1.0	-1.1	-1.0	-0.8	-0.8	-0.9	-0.8	-0.7	-0.4	0.0	0.1	0.1	-0.1	-0.2	-0.3
9	-0.1	-0.1	0.1	0.2	0.1	0.1	-0.1	-0.2	-0.6	-0.6	-0.9	-0.9	-1.0	-1.2	-0.9	-0.8	-1.0	-0.9	-0.4	-0.2	-0.1	-0.1	-0.1	-0.1	-0.4
10	-0.1	-0.1	-0.1	-0.1	0.0	0.2	-0.4	-0.5	-0.7	***	***	***	***	***	***	-1.7	-1.5	-1.1	-0.7	-0.3	-0.1	-0.1	0.0	0.1	-0.4
11	0.1	0.2	0.2	0.2	0.2	0.0	-0.4	-0.6	-0.9	-1.2	-1.3	-1.4	-1.6	-1.7	-1.7	-1.6	-1.5	-1.1	-0.8	-0.2	0.2	0.4	0.3	0.4	-0.6
12	0.4	0.5	0.6	0.5	0.4	0.2	-0.9	-1.2	-0.9	-0.9	-1.2	-1.2	-1.3	-1.3	-1.4	-1.5	-1.4	-1.1	-0.8	-0.1	0.3	0.4	0.5	0.4	-0.5
13	0.4	0.7	0.4	0.5	0.4	0.2	-0.8	-1.2	-1.3	-0.9	-1.2	-1.5	-1.5	-1.6	-1.7	-1.5	-1.4	-1.2	-0.7	-0.2	0.2	0.4	0.5	0.5	-0.5
14	0.6	0.2	0.3	0.3	0.4	0.2	-1.0	-0.9	-0.8	-1.0	-1.1	-1.3	-1.3	-1.5	-1.5	-1.5	-1.3	-1.0	-0.9	-0.2	0.1	0.4	0.4	0.4	-0.5
15	0.5	0.3	0.5	0.5	0.5	0.1	-0.6	-0.8	-0.8	-0.9	-1.2	-1.5	-1.5	-1.6	-1.6	-1.5	-1.4	-1.0	-0.6	-0.1	0.4	0.3	0.1	0.1	-0.5
16	0.4	0.4	0.4	0.7	0.6	0.9	0.5	0.4	-0.8	-1.5	-1.8	-1.7	-1.3	-1.3	-1.5	-1.5	-1.3	-1.0	-0.7	-0.1	0.2	0.2	0.1	0.2	-0.4
17	0.3	0.3	0.2	0.3	0.5	0.3	-0.8	-1.2	-1.2	-1.5	-1.1	-1.7	-1.4	-1.1	-1.0	-0.9	-0.6	-0.4	-0.2	0.2	0.4	0.6	0.7	0.7	-0.4
18	0.5	0.6	0.6	0.6	0.6	0.6	-0.3	-0.8	-0.8	-0.8	-1.2	-1.3	-1.6	-1.7	-1.5	-1.5	-1.2	-1.0	-0.7	0.0	0.5	0.5	0.6	0.7	-0.4
19	0.6	0.7	0.7	0.6	0.6	0.6	-0.6	-1.2	-0.9	-0.8	-1.1	-1.4	-1.5	-1.6	-1.6	-1.5	-1.3	-1.0	-0.6	-0.1	0.4	0.6	0.6	0.6	-0.4
20	0.9	0.7	0.6	0.9	0.8	0.3	-0.8	-0.6	-0.7	-0.8	-0.9	-1.5	-1.6	-1.7	-1.6	-1.5	-1.4	-1.0	-0.6	0.0	0.6	0.6	0.6	0.8	-0.3
21	0.7	0.8	0.8	0.6	0.7	0.4	-0.2	-0.7	-1.0	-1.2	-1.4	-1.5	-1.7	-1.7	-1.8	-1.7	-1.3	-1.0	-0.6	-0.1	0.2	0.4	0.3	0.3	-0.4
22	0.6	0.6	1.0	0.9	0.4	0.4	-0.1	-0.6	-0.9	-1.3	-1.3	-1.6	-1.8	-1.8	-1.7	-1.5	-1.2	-1.0	-0.6	-0.1	0.4	0.4	0.4	0.4	-0.4
23	0.5	0.8	0.5	0.5	0.5	0.6	-0.2	-0.9	-0.8	-1.0	-1.5	-1.4	-1.6	-1.7	-1.6	-1.6	-1.3	-1.0	-0.6	-0.1	0.3	0.4	0.6	0.4	-0.4
24	0.5	0.5	0.5	0.7	0.6	0.7	0.1	-0.9	-1.6	-1.1	-0.9	-1.1	-1.5	-1.7	-2.5	-1.6	-0.9	-0.4	-0.3	-0.1	0.0	0.0	0.1	0.1	-0.4
25	0.1	0.1	0.1	0.2	0.3	0.1	-0.4	-0.9	-1.3	-1.1	-1.8	-1.1	-1.6	-1.6	-1.3	-1.4	-1.3	-1.1	-0.6	-0.2	-0.1	-0.1	-0.1	0.0	-0.6
26	-0.1	0.1	0.3	0.2	0.0	-0.1	-0.7	-1.2	-1.0	-1.2	-1.4	-1.5	-1.8	-1.8	-1.7	-1.7	-1.5	-1.0	-0.5	-0.2	0.0	-0.2	-0.2	0.0	-0.7
27	0.0	0.0	0.0	0.1	0.1	0.1	-0.2	-0.4	-0.8	-1.2	-1.2	-1.2	-2.1	-1.8	-1.4	-0.8	-0.4	-0.3	-0.1	0.2	0.4	0.3	0.2	0.1	-0.4
28	0.3	0.3	0.4	0.2	0.5	0.2	-0.5	-1.4	-1.5	-1.3	-1.5	-1.2	-1.5	-1.6	0.3	-0.7	-0.7	-0.5	-0.1	0.0	0.1	0.2	0.2	0.3	-0.4
29	0.2	0.1	0.3	0.4	0.2	0.3	-0.5	-1.2	-1.3	-0.9	-1.2	-1.3	-1.5	-1.7	-1.5	-1.3	0.2	0.0	-0.1	0.1	0.1	0.1	0.1	0.2	-0.4
30	0.3	0.4	0.2	0.2	0.2	0.1	-0.5	-0.7	-0.8	-1.2	-1.5	-1.6	-1.5	-1.7	-1.6	-1.3	-0.7	0.5	0.3	0.3	0.3	0.1	0.3	0.3	-0.4
HRAVE	0.4	0.4	0.4	0.4	0.4	0.3	-0.5	-0.8	-0.9	-1.0	-1.2	-1.3	-1.4	-1.5	-1.4	-1.3	-1.1	-0.8	-0.5	-0.1	0.2	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.4	-0.5	-0.4	-0.3	-0.1	-0.4	-0.5	-0.3	-0.4	-0.4	-0.6	-0.5	-0.5	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.6
MAX	0.7	0.8	0.8	0.9	0.4	0.5	0.7	0.5	0.2	0.2	0.4	0.6	0.7	0.6	0.5	0.9	0.7	0.7	0.7	0.9	0.8	1.0	0.8	0.7	0.3
MIN	-1.6	-1.7	-1.5	-1.3	-1.1	-1.6	-1.6	-1.1	-1.2	-1.7	-1.7	-1.5	-1.7	-1.5	-1.6	-1.8	-1.7	-1.7	-1.6	-1.7	-1.8	-1.8	-1.7	-2.5	-1.8

DAY	26	27	28	29	30	31
AVE	-0.7	-0.4	-0.4	-0.4	-0.4	***
MAX	0.3	0.4	0.5	0.4	0.5	***
MIN	-1.8	-2.1	-1.6	-1.7	-1.7	***

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = -2.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JUNE - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	704	704	704	704	704	705	705	705	705	705	705	704	704	703	703	703	702	702	702	702	703	703	704	704	704
2	704	704	704	704	704	705	705	705	705	705	704	704	703	702	702	701	701	701	701	701	702	702	702	703	703
3	703	703	703	703	703	703	703	703	703	703	703	702	702	701	700	700	699	699	699	700	700	701	701	701	701
4	701	701	701	701	702	702	702	703	702	702	702	702	701	701	701	702	702	702	703	703	703	703	703	703	702
5	703	703	703	703	703	703	703	703	703	704	704	704	703	703	702	701	700	700	700	701	701	701	702	702	702
6	702	702	702	702	702	702	703	703	703	703	702	702	701	701	701	701	701	701	701	701	701	702	702	703	702
7	703	703	703	703	703	703	703	704	704	704	703	703	703	702	702	702	702	701	702	702	703	703	703	703	703
8	703	703	703	703	704	704	704	704	704	704	704	703	703	702	702	701	701	701	701	701	702	703	704	704	703
9	704	705	705	705	705	705	705	705	705	704	704	704	703	702	701	701	701	701	701	702	702	703	703	703	703
10	703	702	702	702	702	703	703	703	703	***	***	***	***	***	***	***	700	700	700	700	700	701	701	701	701
11	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	700	700	699	700	700	700	700	700	700	701
12	700	700	700	700	701	701	701	702	702	702	701	701	700	699	699	699	698	698	698	699	699	699	700	700	700
13	700	700	700	700	700	701	701	701	701	701	701	700	699	699	698	698	698	698	698	698	699	699	699	699	699
14	699	699	700	700	700	701	701	701	701	701	701	701	700	699	699	698	698	698	698	699	699	700	700	700	700
15	700	701	701	701	701	702	702	702	703	702	702	702	701	701	700	700	700	700	700	700	701	702	702	702	701
16	702	703	703	703	703	704	704	704	705	704	704	704	703	702	702	701	701	701	701	701	702	702	703	704	703
17	704	704	704	704	704	704	704	705	705	704	704	704	703	703	702	701	701	701	701	701	702	702	702	702	703
18	703	703	703	703	703	704	704	704	704	704	704	704	703	703	702	702	701	701	701	702	702	702	702	702	703
19	702	702	702	702	703	703	704	704	704	703	703	703	702	702	701	701	700	700	700	700	701	702	702	702	702
20	702	702	702	702	702	703	703	704	704	704	703	703	703	702	702	701	701	701	701	701	701	702	702	702	702
21	702	703	703	704	704	705	705	705	706	705	705	705	704	704	703	703	702	702	702	702	703	703	703	703	703
22	704	704	704	704	705	705	705	706	706	705	705	705	704	704	703	702	702	702	702	702	703	704	704	704	704
23	704	704	704	704	705	705	705	705	705	705	704	704	703	703	702	701	701	701	700	701	701	702	702	702	703
24	703	702	702	703	703	704	704	704	704	704	704	704	703	703	702	702	702	703	703	703	703	703	704	704	703
25	704	704	704	704	704	705	705	706	706	705	705	705	704	703	702	702	701	701	701	702	702	703	704	704	704
26	704	704	704	704	705	705	706	706	706	706	705	705	704	704	703	702	702	702	702	703	703	704	705	705	704
27	706	706	706	705	706	706	707	707	707	706	706	705	705	704	703	703	703	705	706	707	706	705	706	706	705
28	706	706	705	706	706	706	706	706	706	706	706	705	704	704	703	703	702	702	703	704	704	705	705	705	705
29	705	705	705	705	705	705	705	705	705	705	705	704	704	703	702	702	702	702	702	703	703	704	704	704	704
30	704	704	704	704	705	705	705	705	705	705	704	704	703	703	702	701	701	701	701	701	702	702	703	704	703
HRAVE	703	703	703	703	703	704	704	704	704	704	704	703	703	702	702	701	701	701	701	701	702	702	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	704	703	701	702	702	702	703	703	703	701	701	700	699	700	701	703	703	703	702	702	703	704	703	703	704
MAX	705	705	703	703	704	703	704	704	705	703	702	702	701	701	703	705	705	704	704	704	706	706	705	704	706
MIN	702	701	699	701	700	701	701	701	701	700	699	698	698	698	700	701	701	701	700	701	702	702	700	702	701

DAY	26	27	28	29	30	31
AVE	704	705	705	704	703	***
MAX	706	707	706	705	705	***
MIN	702	703	702	702	701	***

MONTHLY AVERAGE = 702.5 MONTHLY MAXIMUM = 706.9 MONTHLY MINIMUM = 697.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	15	15	17	20	23	23	21	18	15	10	7	6	4	0	1	2	3	4	5	7	9	11	12	14	11
2	16	15	18	20	20	21	18	16	12	11	11	10	8	6	4	5	6	7	9	10	12	12	12	13	12
3	15	16	17	18	20	24	19	17	12	9	7	6	5	2	2	2	3	3	3	7	10	10	9	12	10
4	12	17	15	16	19	20	17	14	10	7	6	6	8	12	12	17	12	11	20	34	35	36	41	45	18
5	48	51	51	52	75	73	64	56	58	66	60	62	51	41	37	29	33	46	41	44	47	52	57	63	52
6	70	72	72	70	71	75	69	61	46	31	29	20	17	21	21	21	20	19	18	20	21	23	22	23	39
7	28	31	34	36	39	37	31	27	22	18	15	15	13	13	13	13	13	14	15	16	18	20	22	23	22
8	25	27	28	29	30	31	28	30	27	21	15	12	12	11	9	10	11	12	13	14	15	17	28	39	21
9	45	59	77	77	78	79	83	79	76	71	65	52	44	37	37	44	42	44	52	55	55	54	54	55	59
10	60	62	63	65	67	70	67	61	52	***	***	***	***	***	***	33	34	34	36	39	42	46	49	51	52
11	52	56	58	59	63	63	55	50	42	35	30	25	22	19	17	17	18	19	20	22	23	24	26	28	35
12	29	33	33	37	40	40	34	31	23	16	15	14	11	9	8	7	7	8	9	10	12	15	18	19	20
13	23	21	23	24	25	26	22	19	16	12	12	12	9	7	5	5	6	7	10	14	17	19	20	25	16
14	25	25	26	28	30	31	28	24	21	18	17	15	13	11	10	10	9	9	11	14	16	17	18	20	19
15	22	23	24	26	27	28	26	23	19	16	14	12	9	7	7	6	5	5	7	8	10	15	20	21	16
16	22	25	25	26	28	28	30	28	23	19	15	13	10	7	6	6	6	5	6	8	11	16	22	24	17
17	27	29	30	31	35	34	31	28	23	17	14	9	7	5	5	4	4	4	5	7	9	10	12	15	16
18	18	19	20	21	23	23	22	19	13	11	8	6	5	4	4	3	4	4	5	6	9	11	11	13	12
19	13	16	19	19	21	22	20	15	11	9	7	5	4	4	3	3	3	4	5	5	6	7	7	8	10
20	12	13	15	17	16	16	15	15	10	5	3	2	1	0	0	0	0	1	2	3	6	8	10	12	8
21	13	14	16	16	17	19	24	27	28	26	23	19	17	14	12	11	11	12	13	16	18	20	22	24	18
22	29	30	30	30	32	33	34	33	29	26	22	19	16	14	12	10	7	7	7	8	10	12	13	16	20
23	19	19	20	23	23	23	21	17	15	17	15	14	11	10	9	8	8	8	10	11	11	12	15	18	15
24	17	19	19	21	22	23	25	25	24	25	23	22	18	14	14	19	25	30	26	25	25	26	29	29	23
25	29	31	31	32	34	36	34	28	23	24	19	16	12	11	11	12	13	13	16	17	21	28	30	33	23
26	36	36	37	42	49	51	50	44	36	32	27	23	21	18	17	17	17	18	20	22	24	33	38	37	31
27	36	38	42	42	45	47	44	39	34	28	23	20	16	13	12	16	35	33	37	58	61	64	64	61	38
28	55	68	69	75	71	69	64	59	51	42	25	22	19	17	35	25	22	22	25	33	43	47	50	51	44
29	55	60	59	62	64	61	56	49	39	33	28	20	17	18	17	17	32	29	30	33	35	38	45	46	39
30	48	52	53	53	58	55	45	37	36	34	32	29	25	22	21	24	25	39	33	33	36	49	47	41	39
HRAVE	30	33	35	36	39	39	36	33	28	24	20	17	15	13	12	13	14	16	17	20	22	25	27	29	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	11	12	10	18	52	39	22	21	59	52	35	20	16	19	16	17	16	12	10	8	18	20	15	23	23
MAX	23	21	24	45	75	75	39	39	83	70	63	40	26	31	28	30	35	23	22	17	28	34	23	30	36
MIN	0	4	2	6	29	17	13	9	37	33	17	7	5	9	5	5	4	3	3	0	11	7	8	14	11

DAY	26	27	28	29	30	31
AVE	31	38	44	39	39	***
MAX	51	64	75	64	58	***
MIN	17	12	17	17	21	***

MONTHLY AVERAGE = 24.9 MONTHLY MAXIMUM = 82.9 MONTHLY MINIMUM = 0.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JUNE - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.39	0.61	0.80	0.94	1.01	1.06	1.01	0.91	0.64	0.57	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.61
2	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.40	0.62	0.78	0.92	0.96	1.04	1.00	0.90	0.65	0.56	0.34	0.14	0.01	0.00	0.00	0.00	0.00	8.50
3	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.41	0.62	0.80	0.93	1.02	1.06	1.00	0.89	0.67	0.57	0.36	0.15	0.01	0.00	0.00	0.00	0.00	8.67
4	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.41	0.62	0.65	0.38	0.39	0.45	0.25	0.23	0.12	0.12	0.05	0.01	0.00	0.00	0.00	0.00	0.00	3.86
5	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.32	0.14	0.17	0.16	0.12	0.37	0.63	0.57	0.64	0.37	0.27	0.09	0.00	0.00	0.00	0.00	0.00	4.00
6	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.30	0.56	0.46	0.30	0.70	0.79	0.91	0.87	0.66	0.54	0.34	0.15	0.01	0.00	0.00	0.00	0.00	6.74
7	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.40	0.60	0.77	0.90	0.99	1.02	0.97	0.84	0.67	0.56	0.35	0.16	0.01	0.00	0.00	0.00	0.00	8.41
8	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.13	0.25	0.38	0.56	0.54	0.40	0.36	0.36	0.41	0.38	0.28	0.10	0.00	0.00	0.00	0.00	0.00	4.25
9	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.10	0.14	0.16	0.40	0.42	0.53	0.68	0.28	0.41	0.34	0.17	0.03	0.01	0.00	0.00	0.00	0.00	3.72
10	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.33	0.52	***	***	***	***	***	***	0.67	0.55	0.33	0.14	0.01	0.00	0.00	0.00	0.00	2.68
11	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.38	0.58	0.69	0.88	0.99	0.90	0.97	0.84	0.68	0.55	0.34	0.15	0.01	0.00	0.00	0.00	0.00	8.14
12	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.38	0.59	0.76	0.90	0.99	1.04	0.98	0.84	0.69	0.56	0.36	0.16	0.01	0.00	0.00	0.00	0.00	8.42
13	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.39	0.60	0.77	0.90	1.00	1.04	0.99	0.84	0.70	0.57	0.36	0.16	0.01	0.00	0.00	0.00	0.00	8.49
14	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.58	0.75	0.89	0.98	1.01	0.97	0.82	0.69	0.56	0.35	0.15	0.02	0.00	0.00	0.00	0.00	8.30
15	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.58	0.75	0.89	0.98	1.02	0.98	0.83	0.69	0.56	0.35	0.15	0.02	0.00	0.00	0.00	0.00	8.33
16	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.14	0.49	0.71	0.88	0.97	1.01	0.97	0.85	0.73	0.50	0.36	0.16	0.02	0.00	0.00	0.00	0.00	7.83
17	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.37	0.58	0.74	0.89	0.98	0.96	0.67	0.48	0.45	0.28	0.20	0.12	0.01	0.00	0.00	0.00	0.00	6.88
18	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.38	0.59	0.75	0.90	0.99	1.03	0.98	0.79	0.70	0.55	0.37	0.17	0.01	0.00	0.00	0.00	0.00	8.35
19	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.38	0.59	0.76	0.90	0.99	1.01	0.97	0.83	0.71	0.57	0.36	0.14	0.01	0.00	0.00	0.00	0.00	8.36
20	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.40	0.61	0.79	0.93	1.01	1.05	1.00	0.86	0.72	0.58	0.37	0.17	0.02	0.00	0.00	0.00	0.00	8.66
21	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.56	0.74	0.87	0.96	1.01	0.96	0.82	0.69	0.55	0.34	0.14	0.02	0.00	0.00	0.00	0.00	8.16
22	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.55	0.73	0.86	0.95	1.00	0.95	0.82	0.68	0.55	0.35	0.16	0.01	0.00	0.00	0.00	0.00	8.10
23	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.56	0.70	0.88	0.87	0.88	0.96	0.82	0.68	0.54	0.34	0.14	0.01	0.00	0.00	0.00	0.00	7.87
24	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.35	0.52	0.43	0.44	0.31	0.93	0.99	0.90	0.40	0.57	0.23	0.12	0.02	0.00	0.00	0.00	0.00	6.36
25	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.34	0.54	0.71	0.86	0.95	1.00	0.94	0.76	0.69	0.56	0.32	0.11	0.01	0.00	0.00	0.00	0.00	7.92
26	0.00	0.00	0.00	0.00	0.00	0.02	0.12	0.31	0.54	0.72	0.85	0.94	0.98	0.94	0.82	0.66	0.51	0.27	0.06	0.02	0.00	0.00	0.00	0.00	7.76
27	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.26	0.52	0.72	0.84	0.94	0.98	0.96	0.87	0.09	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	6.30
28	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.35	0.31	0.53	0.83	0.95	0.94	0.73	0.22	0.71	0.34	0.27	0.08	0.01	0.00	0.00	0.00	0.00	6.40
29	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.55	0.72	0.86	0.95	1.00	0.92	0.74	0.43	0.14	0.13	0.12	0.01	0.00	0.00	0.00	0.00	7.05
30	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.37	0.56	0.72	0.85	0.93	0.98	0.94	0.70	0.56	0.14	0.07	0.01	0.00	0.00	0.00	0.00	0.00	6.98
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.34	0.52	0.66	0.78	0.85	0.91	0.88	0.73	0.60	0.46	0.29	0.12	0.01	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	8.61	8.50	8.67	3.86	4.00	6.74	8.41	4.25	3.72	2.68	8.14	8.42	8.49	8.30	8.33	7.83	6.88	8.35	8.36	8.66	8.16	8.10	7.87	6.36	7.92
MAX	1.06	1.04	1.06	0.65	0.64	0.91	1.02	0.56	0.68	0.67	0.99	1.04	1.04	1.01	1.02	1.01	0.98	1.03	1.01	1.05	1.01	1.00	0.96	0.99	1.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	7.76	6.30	6.40	7.05	6.98	***
MAX	0.98	0.98	0.95	1.00	0.98	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.12
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.02
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.02	0.11	0.03	0.01	***
MAX	0.00	0.01	0.11	0.03	0.01	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.30 MONTHLY MAXIMUM = 0.11 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.0	2.7	2.6	1.2	1.4	1.4	1.4	1.2	1.6	2.3	3.8	3.9	3.8	6.2	7.7	8.1	7.4	8.4	7.6	6.7	6.5	5.9	6.2	6.5	4.6
2	4.1	3.5	2.2	1.9	1.7	1.4	2.2	2.8	3.6	4.9	6.1	5.9	7.3	7.0	7.8	8.0	8.9	8.5	8.4	7.7	6.4	4.5	4.9	4.5	5.2
3	7.2	6.0	3.0	4.4	7.0	3.2	2.0	3.3	5.1	3.8	4.4	2.3	2.7	2.1	2.9	4.0	4.3	5.5	6.1	6.6	5.7	4.9	4.2	2.0	4.3
4	3.6	2.5	2.0	3.3	4.2	4.6	3.7	2.9	4.7	6.0	2.3	3.4	5.8	7.3	7.3	6.9	5.7	4.3	3.8	3.4	2.6	4.6	4.0	5.5	4.4
5	4.1	3.3	2.4	2.9	5.8	5.6	3.3	4.8	6.1	5.3	5.9	3.8	2.5	2.2	3.5	6.9	9.5	3.8	3.3	1.2	1.6	1.5	3.5	2.7	4.0
6	1.8	1.5	1.7	1.8	1.3	1.2	1.3	1.1	1.6	2.2	3.5	4.8	6.6	6.8	6.7	6.2	6.9	5.9	6.4	6.4	3.9	3.8	4.7	4.6	3.9
7	3.3	2.1	1.2	1.8	2.0	2.3	2.3	2.3	1.1	2.3	2.9	4.2	4.8	5.9	7.0	7.0	6.1	6.0	5.8	5.6	3.0	2.4	1.5	1.5	3.5
8	3.2	4.8	1.5	1.7	1.9	2.2	2.5	1.9	2.0	1.5	2.2	1.8	2.3	5.7	6.0	7.0	6.6	7.6	6.3	7.5	6.6	5.7	5.3	5.6	4.1
9	5.3	5.2	4.9	4.8	2.2	1.9	1.1	1.3	2.8	3.8	5.3	7.8	6.0	5.8	9.3	6.5	5.2	8.8	2.6	5.2	1.6	1.6	1.7	2.2	4.3
10	4.8	3.8	1.6	1.3	1.1	1.0	0.5	0.6	0.9	1.7	2.3	4.8	5.6	5.2	4.8	6.2	7.6	7.1	5.7	4.8	2.0	2.5	4.3	1.6	3.4
11	3.0	4.2	3.8	5.2	5.0	5.6	5.9	3.5	2.0	2.2	3.8	4.3	3.1	2.8	2.6	4.4	5.3	7.4	7.0	5.8	3.5	2.9	2.1	2.9	4.1
12	4.3	4.7	3.8	2.0	1.8	2.0	1.7	1.4	1.0	2.7	4.3	3.2	2.3	3.3	6.8	8.0	6.4	6.0	7.6	5.4	5.6	5.4	2.9	2.9	4.0
13	3.8	3.5	3.6	3.7	5.1	4.9	4.4	3.2	3.9	2.5	2.5	2.2	2.8	2.2	4.2	4.8	5.1	7.4	7.5	8.5	7.4	5.6	5.7	5.3	4.6
14	6.6	5.4	5.0	6.3	5.9	5.2	4.1	2.8	3.8	2.9	2.3	1.7	2.2	1.9	5.1	3.6	1.2	3.8	6.0	2.6	1.1	4.1	4.7	1.7	3.7
15	3.2	7.9	7.8	6.4	4.6	4.2	2.6	2.2	3.5	4.8	3.1	2.2	2.3	1.9	2.2	2.2	3.0	2.6	4.7	4.4	2.8	8.4	8.6	5.2	4.2
16	5.0	3.2	3.8	3.0	2.0	1.1	0.8	1.6	2.0	2.4	2.1	2.8	3.4	3.2	4.8	5.6	5.2	5.1	5.5	7.2	3.7	3.9	2.7	2.0	3.4
17	2.9	2.4	2.4	2.8	2.5	2.2	3.2	4.9	9.5	3.5	3.0	3.6	2.7	3.0	2.8	3.1	2.5	3.0	2.9	1.9	2.0	2.6	3.3	2.6	3.1
18	3.8	3.4	1.2	1.6	1.7	0.8	1.3	1.5	1.9	1.3	1.8	1.9	2.5	3.3	4.7	5.3	8.3	8.6	7.4	8.0	6.0	3.0	6.9	3.8	3.8
19	2.7	1.9	3.1	2.7	2.0	2.0	2.0	2.1	2.0	1.4	1.3	2.1	3.4	4.1	1.8	5.5	5.3	6.2	6.7	6.0	5.6	4.4	4.6	3.8	3.5
20	3.5	2.7	3.0	1.7	1.4	2.2	2.1	1.4	1.6	2.8	2.8	3.5	4.1	5.1	5.7	6.4	6.4	6.3	6.2	5.4	3.0	2.2	3.1	3.0	3.6
21	2.5	1.8	2.2	2.2	2.6	2.7	2.0	1.5	1.6	1.6	1.7	1.7	3.0	4.7	6.8	7.3	7.1	6.7	5.7	4.9	3.3	2.8	1.8	2.2	3.4
22	2.2	4.6	6.2	3.3	2.9	2.0	1.0	1.1	3.1	3.0	2.4	3.7	4.1	5.1	6.5	6.8	6.4	6.0	9.8	7.5	7.0	6.2	4.0	3.1	4.5
23	2.0	2.7	1.7	3.6	3.8	3.4	3.2	2.8	3.5	2.7	2.8	2.0	3.2	3.6	4.5	3.7	2.3	1.4	2.1	4.1	3.9	3.5	3.6	6.0	3.2
24	6.2	3.1	3.5	3.3	2.7	3.0	2.9	1.8	1.9	2.5	4.5	3.8	2.8	4.7	4.9	5.1	6.7	6.9	7.6	7.9	6.2	4.3	3.5	3.2	4.3
25	2.6	2.0	1.4	0.9	2.4	3.1	2.6	3.0	1.5	1.8	2.5	3.5	4.5	4.6	6.2	7.0	7.3	6.7	7.3	5.5	3.3	3.8	4.1	4.1	3.8
26	3.2	1.8	2.9	3.1	3.1	3.4	2.0	2.6	3.2	2.0	2.2	5.4	6.6	6.6	7.6	7.3	8.5	6.7	7.5	6.6	4.5	4.5	2.5	1.4	4.4
27	1.8	2.3	1.7	1.6	1.1	0.8	0.8	0.7	1.4	2.5	2.6	2.6	2.9	5.4	5.9	6.6	6.6	6.4	5.6	5.1	3.3	2.5	1.9	1.7	3.1
28	1.7	3.3	5.7	3.8	2.2	2.2	1.4	1.1	1.5	2.7	3.8	3.8	4.1	3.8	4.7	5.0	3.4	5.7	4.8	7.6	7.3	5.6	3.6	4.2	3.9
29	3.4	1.7	2.5	1.9	2.0	3.7	2.1	2.7	3.1	1.5	2.7	4.0	6.8	7.3	7.6	5.7	4.9	12.7	7.1	5.9	2.0	5.1	4.5	3.8	4.4
30	4.2	2.5	4.1	5.3	7.2	6.0	6.1	5.8	4.1	3.1	2.5	2.2	2.8	3.0	2.1	1.8	1.5	1.5	1.0	1.2	1.5	1.1	1.1	3.5	3.1
31	3.3	2.5	3.1	2.9	2.5	2.9	2.3	2.5	3.2	4.6	4.4	2.4	1.9	2.3	4.4	8.9	9.6	3.7	5.8	8.1	6.0	1.9	2.9	5.8	4.1
HRAVE	3.7	3.3	3.1	3.0	3.0	2.8	2.4	2.3	2.9	2.9	3.2	3.4	3.8	4.4	5.3	5.8	5.9	6.0	5.9	5.6	4.2	3.9	3.8	3.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.6	5.2	4.3	4.4	4.0	3.9	3.5	4.1	4.3	3.4	4.1	4.0	4.6	3.7	4.2	3.4	3.1	3.8	3.5	3.6	3.4	4.5	3.2	4.3	3.8
MAX	8.4	8.9	7.2	7.3	9.5	6.9	7.0	7.6	9.3	7.6	7.4	8.0	8.5	6.6	8.6	7.2	9.5	8.6	6.7	6.4	7.3	9.8	6.0	7.9	7.3
MIN	1.2	1.4	2.0	2.0	1.2	1.1	1.1	1.5	1.1	0.5	2.0	1.0	2.2	1.1	1.9	0.8	1.9	0.8	1.3	1.4	1.5	1.0	1.4	1.8	0.9

DAY	26	27	28	29	30	31
AVE	4.4	3.1	3.9	4.4	3.1	4.1
MAX	8.5	6.6	7.6	12.7	7.2	9.6
MIN	1.4	0.7	1.1	1.5	1.0	1.9

MONTHLY AVERAGE = 3.9 MONTHLY MAXIMUM = 12.7 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	206	211	294	224	156	127	137	249	246	268	283	261	269	291	289	281	275	282	262	275	281	283	289	292	83
2	293	292	276	295	201	273	287	276	296	285	280	283	278	272	281	285	282	289	288	281	279	292	304	212	77
3	301	294	293	189	56	95	103	83	50	31	70	58	56	325	272	284	294	292	293	291	293	304	305	48	169
4	59	125	113	87	82	88	109	126	133	159	167	273	261	273	261	233	240	240	253	287	346	57	58	42	239
5	66	108	130	129	145	147	136	145	153	155	147	99	66	229	274	292	310	302	279	231	168	119	75	111	23
6	171	118	271	283	180	128	121	163	277	299	300	299	290	296	274	283	282	273	276	283	292	302	306	313	171
7	303	272	196	173	146	136	109	145	141	288	298	290	285	285	280	295	282	269	279	282	296	317	244	123	311
8	184	304	169	113	97	112	109	136	126	140	249	340	246	223	233	244	251	251	267	258	261	271	309	298	250
9	279	281	294	306	241	261	271	112	136	166	206	205	204	241	234	234	221	271	34	6	14	19	305	278	312
10	307	300	307	277	133	115	64	93	76	73	315	216	210	242	230	239	239	240	252	236	257	148	85	269	192
11	328	319	27	58	59	49	59	108	148	135	139	164	180	281	302	307	303	297	311	312	314	292	327	304	300
12	305	303	295	275	172	117	104	124	148	279	273	272	270	273	309	303	324	71	60	82	108	72	120	110	326
13	69	108	123	78	48	60	80	122	65	144	162	324	300	270	253	144	7	39	23	56	45	30	46	92	60
14	66	59	53	53	51	59	74	106	150	139	152	94	309	163	199	156	117	174	242	267	138	179	111	81	67
15	89	42	50	51	63	98	90	109	117	146	151	279	265	254	293	296	268	183	297	189	113	59	52	100	262
16	140	94	101	89	144	298	135	143	138	161	260	266	291	279	276	285	274	273	56	51	119	131	151	243	212
17	293	288	149	100	109	133	124	138	151	137	132	75	119	136	142	140	157	162	167	134	118	145	264	262	116
18	302	278	260	193	109	214	285	142	153	234	179	210	267	265	267	252	262	277	301	310	296	250	290	302	267
19	149	147	128	115	106	133	122	134	129	133	144	274	241	169	138	289	295	278	282	283	291	295	303	291	246
20	294	320	299	173	139	135	112	119	267	286	290	273	281	286	281	288	284	284	280	283	291	299	306	298	46
21	306	119	111	110	109	109	123	129	168	280	242	280	262	277	292	295	294	296	285	292	303	300	259	139	355
22	153	311	311	293	278	301	150	166	287	279	281	306	297	316	304	305	293	210	143	143	149	155	126	93	30
23	268	267	269	295	303	300	299	302	303	307	281	242	269	305	292	284	306	250	258	177	161	166	161	301	62
24	303	279	167	142	138	126	126	126	174	273	285	250	250	270	274	277	283	279	278	282	285	293	291	284	267
25	285	198	118	214	142	129	132	148	272	265	275	269	264	276	282	272	281	285	281	290	293	303	299	303	33
26	288	195	140	121	123	119	117	126	147	156	291	297	299	284	291	278	284	277	282	280	298	309	287	241	265
27	160	124	129	156	169	172	292	256	289	294	268	294	296	301	296	302	294	298	292	296	301	296	304	222	98
28	125	342	306	296	261	252	222	182	280	272	285	268	258	270	275	283	273	119	142	150	148	153	90	128	10
29	118	151	101	107	135	145	106	97	146	168	281	277	272	280	292	284	290	30	57	51	155	133	107	111	207
30	114	116	88	58	48	60	53	66	71	113	170	167	148	130	196	184	352	320	172	224	85	128	101	75	299
31	100	6	91	113	98	94	117	118	134	155	163	165	115	94	115	301	292	303	40	303	296	138	65	84	264

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JULY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	23	38	22	47	16	9	11	34	34	32	25	25	25	17	14	18	14	11	11	10	7	7	8	7	19
2	9	8	16	16	26	35	13	14	19	19	16	24	15	15	20	18	14	12	10	8	7	7	9	25	16
3	14	10	14	33	17	20	22	36	17	31	19	27	27	38	30	27	28	14	11	8	7	8	6	26	20
4	16	12	12	8	15	18	10	16	12	12	48	40	18	18	19	13	13	17	18	11	24	9	11	11	17
5	11	20	12	12	13	10	15	13	12	14	10	19	21	35	19	18	11	15	10	27	13	17	9	12	15
6	30	36	17	13	17	14	18	30	35	32	35	29	18	22	19	18	14	14	8	7	7	9	9	8	19
7	9	14	43	8	11	10	14	15	50	37	31	26	27	19	20	19	18	18	14	8	7	9	26	36	20
8	31	17	40	11	16	12	9	14	20	38	39	54	66	22	25	20	24	16	13	11	11	11	13	15	23
9	9	6	8	10	22	40	49	18	32	30	23	18	18	22	17	21	26	19	50	24	52	46	45	14	26
10	6	6	19	31	41	43	54	46	46	38	36	55	25	21	22	20	19	19	14	11	33	32	17	50	29
11	41	17	15	13	13	14	11	19	27	42	39	42	39	27	23	19	21	14	11	10	8	8	40	17	22
12	8	9	13	25	13	7	10	24	40	25	16	22	33	34	19	16	46	24	14	20	15	11	19	15	20
13	15	10	12	11	13	12	13	14	13	25	40	41	33	47	37	29	39	14	13	12	14	20	14	22	21
14	10	14	13	13	12	10	13	17	14	23	35	49	42	50	30	33	31	10	17	46	40	39	17	28	25
15	21	11	10	10	10	13	20	13	15	13	24	36	31	41	45	48	29	30	41	34	19	12	12	19	23
16	18	12	11	13	27	50	36	18	21	27	25	28	24	37	24	25	16	15	32	15	30	11	14	35	24
17	11	15	11	9	8	6	10	11	10	16	18	11	18	15	17	19	25	19	9	10	8	24	24	23	14
18	10	8	41	25	12	50	8	14	18	58	35	66	45	32	23	15	15	12	11	10	14	16	17	14	24
19	37	35	6	11	19	12	14	10	20	38	54	39	22	12	45	18	18	14	10	7	6	6	8	7	20
20	8	14	11	21	15	7	14	19	27	22	25	26	26	20	26	17	18	12	10	7	5	8	7	5	15
21	11	29	11	11	11	17	14	20	26	39	45	56	45	34	14	19	16	15	10	8	7	7	26	6	21
22	28	16	9	10	16	9	34	25	23	23	32	26	36	25	18	20	17	33	9	9	10	9	10	24	20
23	35	11	27	5	7	7	7	14	13	29	26	36	35	46	18	21	45	32	13	11	10	11	17	18	21
24	8	23	8	9	10	10	13	22	32	28	24	23	44	25	24	26	15	14	9	7	6	7	4	3	16
25	4	20	21	48	9	11	13	13	38	37	28	26	17	19	17	13	14	13	8	8	5	7	7	6	17
26	16	19	8	9	10	7	10	9	14	34	47	24	20	17	17	16	12	14	8	7	7	7	12	28	15
27	19	13	10	15	17	18	18	26	19	24	41	38	42	24	21	21	15	14	13	11	7	6	9	18	19
28	12	35	9	10	20	10	18	35	33	26	21	28	23	27	21	15	44	16	11	10	10	10	14	11	20
29	11	21	13	14	16	9	13	29	19	45	32	27	16	16	15	17	21	20	13	12	37	11	9	11	19
30	15	25	15	10	11	8	13	8	15	24	29	38	35	28	58	41	63	53	20	26	27	27	40	9	27
31	16	24	13	10	7	8	11	9	13	15	14	41	51	43	23	41	9	26	26	20	8	34	17	13	20
HRAVE	17	18	16	16	15	16	17	19	24	29	30	34	30	27	24	22	23	18	15	14	15	14	16	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19	16	20	17	15	19	20	23	26	29	22	20	21	25	23	24	14	24	20	15	21	20	21	16	17
MAX	47	35	38	48	35	36	50	66	52	55	42	46	47	50	48	50	25	66	54	27	56	36	46	44	48
MIN	7	7	6	8	9	7	7	9	6	6	8	7	10	10	10	11	6	8	6	5	6	9	5	3	4

DAY	26	27	28	29	30	31
AVE	15	19	20	19	27	20
MAX	47	42	44	45	63	51
MIN	7	6	9	9	8	7

MONTHLY AVERAGE = 20.2 MONTHLY MAXIMUM = 65.8 MONTHLY MINIMUM = 2.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JULY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	29.4	27.8	27.4	26.9	26.1	26.0	25.9	27.4	29.2	31.0	32.9	34.4	35.4	36.7	37.0	37.2	35.8	35.4	34.2	33.1	32.1	31.4	30.8	30.4	31.4
2	29.7	29.2	28.5	28.2	26.9	26.7	27.4	28.8	30.7	32.4	34.2	35.7	36.6	37.5	37.8	38.2	38.0	37.8	37.1	35.6	34.7	34.0	33.8	32.7	33.0
3	30.6	29.5	27.8	27.5	24.8	23.1	23.0	23.7	25.0	27.1	28.0	30.6	33.0	34.6	36.3	37.4	37.3	37.0	36.3	34.7	33.7	32.9	32.1	31.6	30.7
4	31.1	29.8	29.2	28.8	28.3	28.0	28.4	30.0	30.7	32.8	34.8	35.8	36.4	36.1	35.3	35.1	34.9	34.8	34.5	33.8	33.2	32.3	32.0	31.7	32.4
5	31.2	30.1	29.0	28.3	27.5	26.5	26.3	27.4	28.1	29.0	28.4	29.0	30.7	32.3	32.2	29.9	26.5	27.1	26.7	26.3	26.3	26.3	26.7	26.5	28.3
6	25.8	25.8	25.5	25.2	24.6	24.7	25.2	26.6	28.5	30.5	32.6	34.0	35.3	36.0	36.7	36.9	35.8	35.2	34.9	33.9	33.2	32.5	31.3	30.5	30.9
7	30.0	28.8	27.9	27.2	26.3	26.2	27.5	29.4	31.2	32.5	34.5	35.9	37.1	38.0	38.4	38.3	38.4	38.3	37.5	35.8	34.5	34.0	33.2	31.9	33.0
8	30.0	31.0	29.8	29.1	27.9	27.0	28.0	29.1	31.0	33.7	34.2	34.9	36.4	38.2	39.0	39.5	39.1	38.0	37.0	35.5	34.1	33.2	32.5	31.7	33.3
9	30.9	29.9	29.3	29.3	28.7	27.9	28.0	29.6	31.8	34.0	34.7	34.8	34.8	35.1	35.8	35.9	35.7	27.4	29.5	29.1	28.2	27.6	27.2	26.6	30.9
10	26.9	26.2	25.6	25.0	24.1	24.0	24.3	25.8	28.9	30.9	31.3	33.9	35.6	35.6	35.2	36.0	36.5	36.2	35.3	33.7	32.3	32.1	31.2	31.0	30.7
11	30.1	29.2	28.4	28.3	27.9	27.7	28.0	29.6	31.1	33.1	35.3	35.8	36.9	36.5	36.8	37.7	37.6	37.5	36.7	35.6	34.5	34.0	32.8	31.6	33.0
12	30.4	29.7	28.8	28.2	27.0	26.6	27.0	28.7	31.1	33.0	34.7	36.7	37.8	38.8	39.7	38.7	36.1	32.2	31.1	30.5	30.6	29.5	28.9	28.2	31.8
13	28.5	27.6	26.6	27.2	27.7	27.8	27.7	28.7	31.4	33.6	34.9	35.9	37.4	38.7	39.0	36.5	32.3	30.6	31.2	30.0	29.8	30.1	29.3	28.2	31.3
14	27.3	27.1	27.1	26.5	26.5	25.9	26.6	27.9	30.0	31.2	33.2	34.7	36.0	37.2	34.9	33.6	35.8	35.2	32.4	31.9	31.1	29.7	26.3	28.2	30.7
15	28.1	27.8	26.7	26.6	26.4	25.5	25.8	26.9	27.8	30.3	31.2	31.6	32.5	34.6	35.9	36.5	37.4	36.9	37.0	33.6	31.6	31.2	29.4	28.4	30.8
16	26.2	25.5	25.3	25.6	24.1	24.4	25.1	26.6	28.9	31.5	33.0	35.0	36.7	37.7	38.6	38.8	39.2	38.9	36.4	33.4	32.6	31.5	30.7	30.2	31.5
17	29.7	29.3	27.9	27.6	27.6	27.2	26.9	27.1	24.3	22.2	21.5	21.6	23.3	24.9	26.8	29.0	31.0	31.8	30.6	29.8	29.3	28.8	28.7	28.1	27.3
18	27.5	27.0	26.2	25.9	25.7	25.1	25.3	25.5	27.1	29.6	31.2	33.0	34.1	35.4	35.2	34.7	33.0	30.6	29.7	29.1	28.7	28.1	26.2	24.2	29.1
19	22.6	22.2	22.0	22.3	22.7	22.4	23.1	23.4	24.7	26.4	28.1	30.4	30.7	28.8	32.5	33.9	34.2	33.8	32.8	31.4	30.3	29.7	28.7	28.1	27.7
20	27.4	27.1	26.5	25.5	25.0	24.6	25.4	26.7	28.0	29.8	31.3	33.1	34.7	35.9	36.5	36.5	36.3	36.0	35.3	33.7	32.7	32.1	31.4	30.6	30.9
21	29.9	29.1	28.0	27.0	26.2	25.8	26.5	28.7	30.4	31.8	34.2	35.4	37.3	38.4	38.5	38.5	38.4	37.9	37.2	35.7	34.4	33.5	32.6	31.3	32.8
22	30.1	30.6	30.4	29.2	27.6	27.5	27.3	29.0	31.1	32.5	34.0	35.2	36.3	37.0	37.6	37.8	37.8	36.6	32.8	32.0	31.0	30.0	29.5	29.9	32.2
23	29.3	28.7	28.6	28.7	28.3	28.0	27.9	28.5	29.3	30.3	31.1	32.3	33.9	33.2	33.9	33.4	32.9	32.9	32.7	31.6	30.6	29.5	28.8	28.2	30.5
24	27.3	27.1	26.0	25.6	25.2	25.2	25.7	27.7	29.1	30.7	32.7	34.0	35.2	36.4	36.9	37.6	37.7	37.2	36.3	34.8	33.7	33.5	33.1	32.5	31.7
25	31.8	31.0	30.7	30.6	29.5	28.7	28.0	29.7	31.6	33.3	34.5	36.2	36.9	37.7	38.9	38.7	38.6	38.4	37.4	36.1	35.2	34.6	33.9	33.1	34.0
26	32.3	29.8	29.0	28.1	27.2	26.3	26.8	28.4	31.3	34.1	35.5	37.4	38.2	38.6	39.0	39.4	39.2	38.9	37.3	35.6	34.2	34.0	33.3	32.2	33.6
27	30.7	29.3	29.5	29.3	29.0	29.0	28.8	29.0	30.2	32.1	34.0	35.1	36.5	38.1	38.4	38.5	38.3	37.9	37.4	36.2	35.2	34.5	33.6	32.5	33.5
28	31.5	31.1	31.5	30.7	29.7	29.2	29.1	29.7	31.0	33.1	34.8	36.3	37.5	38.6	38.3	37.3	36.9	33.9	33.7	32.9	31.5	29.9	29.4	28.7	32.8
29	28.0	27.6	27.7	27.8	27.3	27.0	27.7	30.4	31.6	32.4	34.2	35.4	36.2	36.2	36.6	36.3	36.8	29.3	24.0	23.1	22.8	22.8	23.2	23.9	29.5
30	24.0	24.0	24.2	24.8	25.0	24.3	24.8	26.0	28.0	29.6	31.3	33.3	35.1	36.4	37.2	37.0	36.7	37.4	36.7	36.0	34.7	34.0	33.4	32.1	31.1
31	31.3	30.2	29.8	29.4	29.0	27.9	27.6	28.8	30.8	32.5	34.0	35.4	36.9	37.7	37.8	34.0	28.8	28.9	30.0	27.9	26.0	26.2	27.0	27.1	30.6
HRAVE	29.0	28.4	27.8	27.4	26.8	26.3	26.6	27.9	29.5	31.2	32.6	34.0	35.2	36.0	36.5	36.4	35.9	34.8	33.9	32.7	31.7	31.1	30.4	29.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	31.4	33.0	30.7	32.4	28.3	30.9	33.0	33.3	30.9	30.7	33.0	31.8	31.3	30.7	30.8	31.5	27.3	29.1	27.7	30.9	32.8	32.2	30.5	31.7	34.0
MAX	37.2	38.2	37.4	36.4	32.3	36.9	38.4	39.5	35.9	36.5	37.7	39.7	39.0	37.2	37.4	39.2	31.8	35.4	34.2	36.5	38.5	37.8	33.9	37.7	38.9
MIN	25.9	26.7	23.0	28.0	26.3	24.6	26.2	27.0	26.6	24.0	27.7	26.6	26.6	25.9	25.5	24.1	21.5	24.2	22.0	24.6	25.8	27.3	27.9	25.2	28.0

DAY	26	27	28	29	30	31
AVE	33.6	33.5	32.8	29.5	31.1	30.6
MAX	39.4	38.5	38.6	36.8	37.4	37.8
MIN	26.3	28.8	28.7	22.8	24.0	26.0

MONTHLY AVERAGE = 31.3 MONTHLY MAXIMUM = 39.7 MONTHLY MINIMUM = 21.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JULY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.0	0.0	0.1	0.1	0.1	0.0	-0.3	-0.6	-0.8	-1.1	-1.3	-1.5	-1.5	-1.9	-1.8	-1.6	-0.7	-0.5	-0.3	-0.2	0.0	0.0	0.0	0.0	-0.6
2	0.0	0.1	0.1	0.1	0.3	0.2	-0.2	-0.6	-1.0	-1.3	-1.4	-1.5	-1.6	-1.7	-1.7	-1.5	-1.3	-1.1	-0.7	-0.2	0.0	0.1	0.0	-0.1	-0.6
3	-0.1	0.0	-0.1	-0.1	0.0	0.3	0.2	-0.1	-0.1	-0.3	-0.7	-1.0	-1.4	-1.1	-1.2	-1.3	-1.2	-1.2	-0.8	-0.3	-0.1	0.0	0.2	0.2	-0.4
4	0.2	0.3	0.4	0.3	0.2	0.2	-0.4	-0.6	-0.7	-1.6	-1.4	-1.2	-1.1	-0.8	-0.6	-0.7	-0.5	-0.5	-0.3	-0.1	0.0	0.0	0.0	-0.1	-0.4
5	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.2	-0.5	-0.8	-1.2	-0.9	-1.1	-1.1	-1.2	-0.8	-0.6	-0.5	-0.5	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	-0.4
6	-0.1	0.0	0.0	0.0	0.2	0.1	-0.4	-0.6	-0.8	-0.9	-1.3	-1.5	-1.8	-1.8	-1.7	-1.6	-1.0	-0.8	-0.5	-0.2	0.0	0.1	0.0	0.1	-0.6
7	0.1	0.3	0.2	0.2	0.2	-0.1	-0.8	-1.2	-0.8	-1.0	-1.3	-1.5	-1.7	-1.8	-1.7	-1.5	-1.3	-1.0	-0.8	-0.2	0.2	0.4	0.4	0.3	-0.6
8	0.4	0.3	0.3	0.4	0.5	0.3	-0.7	-1.0	-1.2	-1.2	-1.1	-1.1	-1.1	-1.5	-1.5	-1.4	-1.2	-0.8	-0.5	-0.2	-0.1	-0.1	-0.1	-0.1	-0.5
9	-0.1	0.0	0.0	0.0	0.1	0.2	-0.2	-0.7	-1.2	-1.9	-1.9	-1.5	-1.4	-1.3	-1.5	-1.4	-1.1	0.0	0.0	0.2	0.3	0.5	0.3	0.5	-0.5
10	0.5	0.7	0.3	0.5	0.5	0.2	-0.1	-0.3	-0.6	-1.1	-0.8	-1.2	-1.6	-1.4	-0.9	-1.1	-1.2	-1.0	-0.6	-0.1	0.2	0.2	0.1	0.1	-0.4
11	0.0	0.1	-0.1	-0.1	0.0	-0.1	-0.5	-1.1	-1.1	-1.4	-1.9	-1.7	-1.6	-1.1	-1.1	-1.2	-1.0	-1.0	-0.6	-0.1	0.2	0.4	0.2	0.4	-0.6
12	0.3	0.2	0.3	0.3	0.5	0.2	-0.4	-0.7	-0.7	-1.0	-1.2	-1.3	-1.3	-1.3	-1.7	-1.0	-0.6	-0.6	-0.4	-0.2	-0.2	-0.2	-0.1	-0.1	-0.5
13	0.0	0.1	-0.1	0.1	0.0	0.0	-0.1	-1.0	-1.4	-1.7	-1.6	-1.2	-1.4	-1.3	-1.4	-1.0	0.6	0.9	0.4	0.2	0.2	0.2	0.2	0.2	-0.4
14	0.1	0.1	0.1	0.1	0.1	0.1	-0.4	-0.8	-1.5	-1.5	-1.5	-1.3	-1.2	-1.3	-0.7	-0.9	-0.8	-0.8	-0.1	0.3	0.4	0.4	0.6	0.3	-0.4
15	0.6	0.2	0.1	0.1	0.2	0.3	0.0	-0.4	-0.5	-1.3	-1.5	-1.0	-0.9	-1.2	-1.1	-1.0	-1.0	-0.9	-0.8	-0.5	-0.2	-0.1	-0.1	-0.1	-0.5
16	-0.2	-0.1	0.0	0.1	0.2	0.1	-0.3	-0.8	-1.1	-1.6	-1.2	-1.2	-1.5	-1.4	-1.5	-1.4	-1.4	-1.1	-0.7	-0.3	-0.1	-0.1	0.1	0.0	-0.6
17	0.0	0.1	0.1	0.0	0.1	0.1	-0.2	-0.2	-0.4	-0.3	-0.1	0.0	-0.7	-0.8	-1.1	-1.2	-1.0	-0.8	-0.4	0.1	0.2	0.2	0.1	0.1	-0.3
18	0.1	0.1	0.1	0.2	0.2	0.3	0.0	-0.4	-0.8	-0.7	-1.0	-1.4	-1.3	-1.4	-1.2	-0.8	-0.7	-0.6	-0.4	-0.2	-0.2	-0.1	-0.2	0.0	-0.4
19	0.2	0.0	0.1	0.1	0.2	0.2	-0.2	-0.3	-0.7	-0.8	-0.8	-1.0	-0.8	-1.1	-1.2	-1.4	-1.3	-1.0	-0.7	-0.2	0.1	0.1	0.1	0.1	-0.4
20	0.1	0.1	0.2	0.2	0.2	0.1	-0.7	-0.7	-0.6	-0.9	-0.9	-1.2	-1.5	-1.7	-1.6	-1.5	-1.3	-1.1	-0.8	-0.2	0.1	0.3	0.3	0.3	-0.5
21	0.3	0.3	0.3	0.4	0.3	0.3	-0.6	-0.9	-1.0	-0.9	-1.1	-1.1	-1.4	-1.7	-1.8	-1.5	-1.2	-1.0	-0.8	-0.2	0.2	0.3	0.5	0.3	-0.5
22	0.2	0.2	0.2	0.3	0.5	0.4	-0.3	-0.6	-0.8	-1.0	-1.2	-1.5	-1.5	-1.6	-1.7	-1.5	-1.4	-1.2	-0.5	-0.3	-0.1	-0.1	0.0	0.1	-0.6
23	0.2	0.4	0.2	0.1	0.0	0.0	-0.1	-0.3	-0.7	-0.8	-0.8	-0.9	-1.2	-1.0	-1.1	-0.8	-0.6	-0.4	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.4
24	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.6	-1.0	-1.1	-1.0	-1.4	-1.4	-1.4	-1.6	-1.7	-1.6	-1.5	-1.1	-0.7	-0.3	-0.1	0.0	0.0	0.3	-0.7
25	0.4	0.3	0.2	0.3	0.2	0.0	-0.2	-1.0	-0.6	-0.8	-1.1	-1.3	-1.1	-1.3	-1.7	-1.5	-1.3	-1.1	-0.7	-0.1	0.2	0.2	0.2	0.3	-0.5
26	0.7	0.6	0.4	0.3	0.2	0.3	-0.2	-1.2	-1.6	-1.4	-1.0	-1.5	-1.5	-1.6	-1.6	-1.5	-1.4	-1.0	-0.4	0.0	0.2	0.4	0.3	0.3	-0.5
27	0.4	0.2	0.2	0.4	0.2	0.2	0.1	-0.2	-0.5	-1.1	-1.3	-1.3	-1.4	-1.6	-1.6	-1.5	-1.3	-1.0	-0.8	-0.2	0.1	0.3	0.3	0.4	-0.5
28	0.3	0.2	0.1	0.0	0.0	0.1	-0.1	-0.4	-0.5	-1.0	-1.3	-1.5	-1.5	-1.5	-1.2	-0.6	-0.4	-0.5	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.5
29	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.5	-1.2	-1.8	-0.9	-1.3	-1.5	-1.8	-1.6	-1.7	-1.4	-1.2	-0.6	0.1	0.2	0.1	0.0	0.1	0.2	-0.6
30	0.2	0.1	0.1	0.2	0.1	0.2	0.0	-0.5	-1.0	-1.2	-1.2	-1.5	-1.7	-1.8	-1.3	-1.0	-0.5	-0.6	-0.2	0.0	0.2	0.2	0.2	0.4	-0.4
31	0.2	0.2	0.3	0.2	0.3	0.3	0.1	-0.5	-1.1	-1.5	-1.9	-1.6	-1.6	-1.4	-1.2	-0.9	-0.6	-0.4	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.5
HRAVE	0.2	0.2	0.1	0.2	0.2	0.1	-0.3	-0.7	-0.9	-1.1	-1.2	-1.3	-1.4	-1.4	-1.4	-1.2	-1.0	-0.8	-0.5	-0.1	0.0	0.1	0.1	0.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.6	-0.6	-0.4	-0.4	-0.4	-0.6	-0.6	-0.5	-0.5	-0.4	-0.6	-0.5	-0.4	-0.4	-0.5	-0.6	-0.3	-0.4	-0.4	-0.5	-0.5	-0.6	-0.4	-0.7	-0.5
MAX	0.1	0.3	0.3	0.4	0.0	0.2	0.4	0.5	0.5	0.7	0.4	0.5	0.9	0.6	0.6	0.2	0.2	0.3	0.2	0.3	0.5	0.5	0.4	0.3	0.4
MIN	-1.9	-1.7	-1.4	-1.6	-1.2	-1.8	-1.8	-1.5	-1.9	-1.6	-1.9	-1.7	-1.7	-1.5	-1.5	-1.6	-1.2	-1.4	-1.4	-1.7	-1.8	-1.7	-1.2	-1.7	-1.7

DAY	26	27	28	29	30	31
AVE	-0.5	-0.5	-0.5	-0.6	-0.4	-0.5
MAX	0.7	0.4	0.3	0.2	0.4	0.3
MIN	-1.6	-1.6	-1.5	-1.8	-1.8	-1.9

MONTHLY AVERAGE = -0.5 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = -1.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	705	705	705	705	705	705	705	706	705	705	705	704	704	703	703	702	702	702	703	703	703	704	704	705	704
2	705	705	705	705	705	705	705	705	705	705	705	704	704	703	703	702	701	701	701	702	702	703	703	703	704
3	703	703	703	705	706	707	707	706	705	705	705	704	704	703	702	702	701	700	701	701	701	702	702	702	703
4	702	702	702	702	702	702	703	703	704	704	703	703	703	702	702	702	702	702	702	702	703	703	703	703	702
5	703	703	704	704	704	705	705	706	706	706	706	706	706	705	704	705	705	705	705	705	705	705	706	706	705
6	706	706	706	706	706	707	707	707	707	706	706	706	705	705	704	703	703	703	703	703	704	704	704	704	705
7	704	704	704	704	705	705	705	706	705	705	705	704	703	703	702	***	***	***	***	***	***	***	***	***	704
8	***	***	***	***	***	698	699	699	699	699	699	698	697	697	696	695	695	695	695	695	696	697	697	698	697
9	698	698	698	698	698	698	699	699	699	699	699	699	698	698	697	697	696	697	697	697	698	698	699	699	698
10	699	699	699	699	699	700	700	700	701	700	700	700	699	698	698	697	697	697	697	698	698	699	699	699	699
11	699	699	700	700	700	700	701	701	701	701	701	701	701	700	700	699	699	699	699	700	700	701	701	701	700
12	702	701	702	702	702	702	703	703	703	702	702	702	701	700	699	699	699	700	701	701	701	702	702	702	701
13	701	701	701	701	701	701	702	702	702	701	701	700	700	699	698	698	698	698	698	698	698	699	699	700	701	700
14	701	700	700	700	700	700	700	700	701	700	700	700	699	698	698	698	697	697	697	697	698	699	699	699	699
15	700	699	699	700	700	700	701	701	702	702	702	701	701	700	699	699	698	698	697	698	699	699	700	701	700
16	701	701	701	701	701	701	702	702	702	702	701	701	700	699	698	698	697	697	698	698	699	700	700	700	700
17	700	700	700	700	700	700	701	701	703	703	703	703	702	701	701	700	699	698	698	699	699	700	700	701	700
18	701	700	700	701	701	701	702	702	703	703	702	702	701	701	700	700	700	700	701	701	702	703	703	704	701
19	704	704	703	703	704	704	704	704	704	704	704	704	703	703	702	702	701	701	701	702	702	703	703	703	703
20	703	703	702	703	703	703	703	703	703	703	703	702	702	701	700	700	699	699	699	699	700	700	700	700	701
21	700	700	700	700	700	700	700	700	700	700	700	699	699	698	697	697	696	696	696	697	697	698	698	698	698
22	698	698	698	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	698	698	699	700	700	699
23	700	700	700	701	701	701	702	702	702	702	702	702	702	701	701	701	701	701	701	702	702	702	702	702	701
24	702	702	702	702	703	703	703	704	704	703	703	703	702	702	701	700	700	700	700	700	701	701	701	701	702
25	701	701	701	701	701	702	702	702	702	702	702	701	701	700	699	699	698	698	698	698	698	699	699	699	700
26	699	698	698	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	698	698
27	698	698	698	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	698	698
28	699	699	699	699	699	700	700	701	701	700	700	700	699	699	698	697	697	698	698	699	700	701	701	702	699
29	701	701	701	701	701	702	702	702	702	702	702	702	701	701	701	700	700	701	703	703	704	704	704	703	702
30	703	703	703	703	703	703	704	704	704	704	704	704	703	702	702	701	700	700	700	701	701	702	702	702	702
31	702	702	702	702	702	702	703	703	703	703	703	703	702	701	700	700	701	701	702	702	703	703	703	702	702
HRAVE	701	701	701	701	701	702	702	702	702	702	702	702	701	701	700	699	699	699	699	700	700	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	704	704	703	702	705	705	704	697	698	699	700	701	700	699	700	700	700	701	703	701	698	699	701	702	700
MAX	706	705	707	704	706	707	706	699	699	701	701	703	702	701	702	702	703	704	704	703	700	700	702	704	702
MIN	702	701	700	702	703	703	702	695	696	697	699	699	698	697	697	697	698	700	701	699	696	697	700	700	698

DAY	26	27	28	29	30	31
AVE	698	698	699	702	702	702
MAX	700	700	702	704	704	703
MIN	697	697	697	700	700	700

MONTHLY AVERAGE = 701.0 MONTHLY MAXIMUM = 706.8 MONTHLY MINIMUM = 695.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.1% OPERATIONAL RECOVERY RATE = 98.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JULY - 2015

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	50	56	57	58	60	60	60	54	47	41	36	33	30	28	27	25	28	28	32	34	36	38	41	42	42
2	43	45	47	48	51	53	47	42	37	34	30	27	25	24	22	22	22	22	23	26	27	26	27	31	33
3	38	42	51	53	71	86	87	83	73	60	56	42	32	26	22	20	23	24	23	27	30	32	34	38	45
4	39	44	46	46	49	49	48	42	41	39	29	26	25	24	26	27	27	27	28	30	32	37	38	38	36
5	39	41	46	48	52	59	61	57	54	50	52	52	43	36	35	46	63	59	61	63	63	64	62	62	53
6	67	67	67	68	71	72	66	60	50	42	36	34	30	26	25	25	29	31	28	27	29	36	42	44	45
7	44	49	51	53	58	57	51	44	37	34	30	27	24	21	19	***	***	***	***	***	***	***	***	***	40
8	***	***	***	***	***	38	34	32	29	22	22	23	21	17	14	10	14	15	19	25	28	29	30	30	24
9	30	31	31	32	34	35	36	35	31	25	23	23	22	23	22	21	20	53	42	45	50	55	56	59	35
10	47	43	46	48	55	54	52	48	36	34	33	27	23	23	24	24	22	20	21	24	28	30	35	37	35
11	39	38	50	50	51	52	50	43	36	31	27	26	23	24	23	22	23	22	21	22	23	23	25	25	32
12	25	26	27	28	30	35	33	30	24	21	19	16	16	15	14	16	22	34	36	38	39	43	46	50	28
13	48	50	56	55	51	48	46	46	34	29	25	23	21	18	18	23	40	42	38	42	42	39	43	48	39
14	49	48	47	52	53	58	54	46	37	34	28	25	23	18	24	28	21	23	32	35	39	44	64	50	39
15	51	49	53	52	52	56	55	50	46	35	33	32	32	25	23	22	21	21	21	30	36	36	40	45	38
16	55	59	58	56	64	63	58	52	41	32	28	25	22	19	17	16	14	15	20	30	30	34	36	36	37
17	38	39	44	47	47	48	51	51	64	81	88	86	76	67	56	45	34	33	41	46	51	54	48	49	54
18	50	52	57	59	61	64	62	63	56	42	37	31	29	26	27	28	34	44	48	50	52	55	63	76	49
19	89	94	94	93	89	90	85	84	73	61	50	43	44	61	36	34	32	33	35	37	39	41	49	54	60
20	58	61	63	67	70	71	66	58	52	47	40	34	30	26	24	24	24	24	25	29	32	34	37	39	43
21	42	44	48	51	54	55	51	43	37	33	27	23	20	17	18	18	17	14	17	21	24	27	29	31	32
22	34	32	29	30	34	34	34	30	23	20	19	18	18	17	17	18	17	21	32	35	38	44	47	46	29
23	46	48	48	46	47	45	46	47	44	40	34	28	27	28	25	27	27	26	25	28	33	41	50	54	38
24	59	60	65	67	70	70	66	55	50	42	36	32	28	26	25	22	21	21	22	25	26	26	26	28	40
25	29	30	33	32	35	38	49	47	31	24	21	18	15	14	12	12	12	13	12	13	13	13	12	13	23
26	13	20	21	24	25	27	26	24	21	14	11	8	8	9	9	8	6	6	8	11	13	13	14	16	15
27	18	23	24	24	28	30	31	30	32	32	25	22	19	17	15	14	15	17	18	20	22	24	26	28	23
28	30	31	32	36	43	46	46	45	40	33	29	26	22	20	21	23	23	30	31	34	39	46	48	50	34
29	53	53	53	52	53	53	50	41	37	33	29	28	27	27	26	26	25	49	80	86	91	91	89	80	51
30	77	80	77	69	69	71	70	64	55	48	44	37	30	23	21	21	22	21	23	27	34	36	37	42	46
31	43	49	50	51	52	58	58	52	42	38	34	30	27	23	24	34	53	52	44	55	66	65	61	60	47
HRAVE	45	47	49	50	53	54	53	48	42	37	33	30	27	25	23	23	25	28	30	34	37	39	42	43	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	42	33	45	36	53	45	40	24	35	35	32	28	39	39	38	37	54	49	60	43	32	29	38	40	23
MAX	60	53	87	49	64	72	58	38	59	55	52	50	56	64	56	64	88	76	94	71	55	47	54	70	49
MIN	25	22	20	24	35	25	19	10	20	20	21	14	18	18	21	14	33	26	32	24	14	17	25	21	12

DAY	26	27	28	29	30	31
AVE	15	23	34	51	46	47
MAX	27	32	50	91	80	66
MIN	6	14	20	25	21	23

MONTHLY AVERAGE = 38.2 MONTHLY MAXIMUM = 94.4 MONTHLY MINIMUM = 5.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.1% OPERATIONAL RECOVERY RATE = 98.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JULY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.28	0.42	0.77	0.81	0.93	0.97	0.93	0.82	0.56	0.15	0.14	0.07	0.01	0.00	0.00	0.00	0.00	6.93
2	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.55	0.72	0.85	0.94	0.99	0.94	0.84	0.63	0.55	0.35	0.16	0.02	0.00	0.00	0.00	0.00	8.02
3	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.18	0.26	0.44	0.64	0.80	0.77	0.87	0.63	0.54	0.35	0.16	0.01	0.00	0.00	0.00	0.00	5.74
4	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.19	0.24	0.58	0.80	0.55	0.55	0.25	0.17	0.29	0.16	0.17	0.07	0.00	0.00	0.00	0.00	0.00	4.12
5	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.17	0.23	0.34	0.19	0.40	0.52	0.66	0.19	0.09	0.11	0.08	0.03	0.00	0.00	0.00	0.00	0.00	3.06
6	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.29	0.54	0.71	0.84	0.90	0.99	0.94	0.86	0.64	0.31	0.21	0.08	0.01	0.00	0.00	0.00	0.00	7.39
7	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.34	0.54	0.71	0.84	0.97	1.05	0.98	0.82	0.60	0.54	0.36	0.17	0.02	0.00	0.00	0.00	0.00	8.07
8	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.27	0.45	0.75	0.57	0.68	0.72	0.56	0.71	0.64	0.55	0.29	0.13	0.03	0.00	0.00	0.00	0.00	6.47
9	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.23	0.45	0.69	0.71	0.56	0.44	0.64	0.85	0.59	0.34	0.09	0.15	0.01	0.00	0.00	0.00	0.00	5.82
10	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.26	0.54	0.68	0.36	0.78	0.85	0.64	0.29	0.55	0.61	0.41	0.17	0.01	0.00	0.00	0.00	0.00	6.24
11	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.34	0.54	0.68	0.71	0.54	0.71	0.48	0.50	0.46	0.35	0.32	0.16	0.02	0.00	0.00	0.00	0.00	5.94
12	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.34	0.49	0.69	0.80	0.93	0.98	0.95	0.89	0.28	0.10	0.12	0.07	0.02	0.00	0.00	0.00	0.00	6.76
13	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.33	0.49	0.68	0.76	0.85	0.98	0.98	0.55	0.18	0.05	0.06	0.04	0.01	0.00	0.00	0.00	0.00	6.02
14	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.25	0.46	0.58	0.86	0.94	0.98	0.79	0.09	0.52	0.33	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.05
15	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.16	0.24	0.49	0.55	0.40	0.72	0.95	0.87	0.62	0.55	0.32	0.24	0.06	0.00	0.00	0.00	0.00	6.27
16	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.32	0.52	0.70	0.84	0.93	0.98	0.95	0.88	0.63	0.57	0.40	0.20	0.02	0.00	0.00	0.00	0.00	8.06
17	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.06	0.08	0.07	0.17	0.38	0.40	0.60	0.60	0.63	0.39	0.07	0.00	0.00	0.00	0.00	0.00	3.53
18	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.14	0.36	0.53	0.49	0.84	0.98	0.92	0.36	0.21	0.20	0.15	0.05	0.00	0.00	0.00	0.00	0.00	5.29
19	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.10	0.34	0.46	0.81	0.96	0.19	0.65	0.86	0.62	0.55	0.33	0.14	0.01	0.00	0.00	0.00	0.00	6.09
20	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.27	0.43	0.56	0.49	0.83	0.86	0.98	0.87	0.62	0.54	0.34	0.15	0.01	0.00	0.00	0.00	0.00	7.07
21	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.33	0.54	0.72	0.86	0.95	0.99	1.00	0.85	0.61	0.55	0.35	0.15	0.01	0.00	0.00	0.00	0.00	8.04
22	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.33	0.54	0.72	0.85	0.94	0.98	0.96	0.89	0.59	0.57	0.40	0.16	0.02	0.00	0.00	0.00	0.00	8.08
23	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.12	0.22	0.33	0.34	0.57	0.61	0.42	0.39	0.21	0.14	0.09	0.02	0.00	0.00	0.00	0.00	0.00	3.52
24	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.33	0.45	0.60	0.82	0.82	0.86	0.94	0.85	0.55	0.53	0.33	0.14	0.01	0.00	0.00	0.00	0.00	7.36
25	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.28	0.42	0.56	0.55	0.73	0.57	0.68	0.89	0.58	0.54	0.34	0.14	0.01	0.00	0.00	0.00	0.00	6.36
26	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.32	0.43	0.64	0.79	0.96	0.85	0.87	0.82	0.63	0.54	0.33	0.08	0.00	0.00	0.00	0.00	0.00	7.39
27	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.27	0.69	0.97	0.66	0.92	0.94	0.80	0.58	0.46	0.33	0.14	0.01	0.00	0.00	0.00	0.00	6.89
28	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.37	0.72	0.84	0.91	0.96	0.94	0.40	0.10	0.04	0.05	0.02	0.00	0.00	0.00	0.00	0.00	5.54
29	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.37	0.55	0.52	0.83	0.96	1.03	0.77	0.81	0.40	0.43	0.06	0.00	0.00	0.00	0.00	0.00	0.00	6.86
30	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.29	0.49	0.69	0.83	0.92	0.96	0.94	0.86	0.58	0.36	0.36	0.08	0.01	0.00	0.00	0.00	0.00	7.44
31	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.37	0.43	0.75	0.94	0.96	0.90	0.40	0.25	0.06	0.05	0.02	0.00	0.00	0.00	0.00	0.00	5.35
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.24	0.41	0.59	0.68	0.78	0.82	0.80	0.67	0.49	0.39	0.25	0.11	0.01	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.93	8.02	5.74	4.12	3.06	7.39	8.07	6.47	5.82	6.24	5.94	6.76	6.02	6.05	6.27	8.06	3.53	5.29	6.09	7.07	8.04	8.08	3.52	7.36	6.36
MAX	0.97	0.99	0.87	0.80	0.66	0.99	1.05	0.75	0.85	0.85	0.71	0.98	0.98	0.98	0.95	0.98	0.63	0.98	0.96	0.98	1.00	0.98	0.61	0.94	0.89
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	7.39	6.89	5.54	6.86	7.44	5.35
MAX	0.96	0.97	0.96	1.03	0.96	0.96
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.02	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	***	***	***	0.00
8	***	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.05
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.15
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.05
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
19	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.06	0.08	0.00	0.00	0.41
30	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.15	0.05	0.00	0.00	0.09	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.10	0.03	0.00	0.00	0.04	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.41	0.01	0.00
MAX	0.00	0.00	0.00	0.27	0.01	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.92 MONTHLY MAXIMUM = 0.27 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.1% OPERATIONAL RECOVERY RATE = 98.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
AUGUST - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	10.1	8.8	5.2	4.3	3.7	2.5	3.2	3.4	3.3	2.5	1.6	2.7	2.3	2.9	4.2	2.2	5.6	2.6	3.3	2.6	2.5	2.8	3.8	2.9	3.7
2	5.2	6.3	6.3	5.9	4.3	5.4	4.7	3.1	2.4	1.5	1.5	2.1	3.1	4.4	6.9	7.0	6.7	5.9	6.4	4.8	3.0	0.9	2.0	4.7	4.4
3	3.2	2.6	1.9	2.2	2.9	3.0	3.3	1.9	1.2	1.1	2.8	3.1	3.4	3.4	4.9	5.7	5.0	5.8	6.1	5.5	4.4	4.2	2.4	1.0	3.4
4	2.0	2.6	2.6	3.3	2.8	2.2	1.8	2.7	2.2	1.1	1.5	2.1	4.2	5.9	6.5	6.5	6.8	6.9	6.4	5.2	3.4	3.9	3.0	1.7	3.6
5	2.1	2.1	2.3	3.1	2.1	2.2	2.0	1.2	1.2	1.0	3.9	5.1	5.5	6.3	6.2	6.3	7.5	6.1	6.2	4.3	2.9	1.9	1.2	2.2	3.5
6	2.9	2.0	5.3	4.0	1.6	0.6	1.4	2.8	3.6	4.5	4.4	5.2	5.2	2.9	2.0	2.1	1.9	1.2	1.3	3.1	3.3	1.5	1.5	3.0	2.8
7	3.4	2.3	2.4	3.2	2.6	3.0	2.1	2.1	2.2	1.5	3.1	3.7	8.1	10.1	6.3	8.9	3.9	3.2	2.0	1.6	2.0	3.7	3.9	4.2	3.7
8	3.3	5.2	4.4	3.6	4.2	2.5	2.1	2.2	2.6	2.8	2.0	1.5	1.7	2.3	2.1	1.4	1.5	1.7	2.2	5.5	3.3	2.1	2.1	1.9	2.7
9	2.6	2.8	2.5	3.1	3.3	2.5	2.2	1.9	1.2	1.0	1.7	2.3	1.9	2.3	2.7	3.7	5.2	5.6	4.5	2.4	4.1	7.0	3.4	6.1	3.2
10	8.0	8.1	5.3	5.2	6.2	4.7	4.3	3.8	3.9	3.5	3.7	3.3	2.4	3.1	2.6	1.8	3.6	4.2	2.7	2.0	2.1	2.0	1.4	2.2	3.8
11	2.3	2.7	3.4	1.7	2.6	2.7	2.4	3.3	12.5	4.3	2.8	1.2	1.6	1.9	3.6	3.9	3.2	2.4	2.5	5.0	6.7	3.3	3.5	9.1	3.7
12	9.6	7.5	6.2	6.3	6.3	3.7	2.6	3.9	5.1	5.0	4.0	3.7	1.5	2.2	2.7	2.2	6.3	5.9	2.2	2.7	1.5	1.9	2.2	2.2	4.1
13	3.2	3.5	3.6	3.4	3.1	3.0	4.0	3.5	2.9	3.2	3.2	2.4	2.0	3.5	3.9	4.3	4.7	4.4	3.8	2.4	1.4	2.6	3.5	3.3	3.3
14	2.9	2.4	2.8	3.1	2.8	1.4	3.2	2.6	1.6	1.9	2.2	1.7	2.3	2.7	5.7	4.7	1.5	3.8	5.0	4.2	4.2	3.7	3.3	3.6	3.0
15	2.6	2.5	2.4	0.9	2.3	2.7	3.1	3.6	2.7	2.0	1.1	2.6	2.7	3.0	3.8	5.5	5.2	5.2	5.5	4.7	4.3	3.1	2.0	2.6	3.2
16	1.5	1.3	1.1	2.1	1.4	4.5	3.9	3.4	2.6	3.0	3.2	3.9	3.5	4.2	5.4	6.4	6.4	7.2	7.1	6.1	4.6	4.3	2.9	2.5	3.9
17	4.4	3.4	1.7	1.2	2.4	3.4	5.5	6.7	4.4	4.6	4.2	4.6	4.3	4.5	5.9	7.3	9.0	9.7	7.7	6.0	2.9	5.0	4.0	4.2	4.9
18	4.2	4.0	3.5	2.9	3.7	3.2	2.3	2.1	3.0	3.3	4.4	6.6	6.7	7.3	8.2	8.8	9.6	8.8	7.2	4.4	3.7	3.4	1.9	1.4	4.8
19	3.8	3.4	3.3	3.7	1.8	1.1	0.8	1.0	1.7	2.0	2.2	3.8	5.6	6.0	6.3	7.2	6.7	6.6	5.4	3.6	2.7	1.8	1.5	2.2	3.5
20	3.0	1.9	1.3	2.5	1.6	1.5	1.1	1.7	1.2	1.3	2.1	2.4	4.3	5.8	6.7	7.2	5.6	6.8	5.2	5.9	3.5	1.8	1.4	3.0	3.3
21	2.7	2.4	2.4	1.9	2.2	1.4	1.1	1.4	1.1	1.8	3.3	3.4	5.7	6.3	6.2	6.5	6.4	5.3	5.6	4.6	1.6	1.1	1.1	2.5	3.3
22	5.3	7.6	7.1	5.8	4.7	3.4	2.8	3.3	3.2	3.3	3.3	3.5	5.0	5.8	6.4	6.8	4.6	6.5	7.7	4.5	3.7	2.8	2.9	2.9	4.7
23	1.5	3.0	2.2	2.2	2.0	2.3	2.6	2.8	3.1	1.2	2.3	2.7	1.9	1.9	3.0	5.5	5.6	11.2	6.4	4.5	5.6	5.5	2.5	2.8	3.5
24	3.1	3.1	3.5	6.2	6.9	7.0	6.5	5.8	5.9	3.7	3.5	2.4	2.3	2.3	2.1	2.5	1.9	2.5	4.0	4.7	5.0	4.7	5.7	5.7	4.2
25	6.5	6.5	6.5	8.6	4.3	4.2	4.1	3.9	3.2	3.9	3.9	3.1	1.9	1.6	2.0	2.2	9.5	5.2	6.1	7.4	8.2	8.7	6.0	6.5	5.2
26	7.3	6.9	7.0	7.1	6.6	6.0	5.7	5.1	5.8	4.0	2.7	2.2	1.6	1.8	2.4	4.2	1.9	7.6	7.2	5.5	4.3	3.2	3.5	3.3	4.7
27	2.9	3.1	3.2	2.2	2.4	2.6	3.4	2.8	2.5	2.8	2.0	1.5	2.0	1.7	2.2	3.9	10.1	7.4	3.1	2.1	2.7	2.9	2.5	1.8	3.1
28	1.6	1.0	1.3	3.4	3.2	2.7	2.4	2.0	2.0	1.2	1.3	1.2	1.1	1.3	2.0	1.8	1.9	2.2	2.7	1.2	1.9	1.7	2.8	3.5	2.0
29	3.7	4.6	4.0	2.9	3.1	3.2	3.1	2.5	2.2	2.8	3.7	2.1	1.8	2.0	2.1	3.9	6.1	7.2	5.7	3.6	4.7	3.1	3.3	2.5	3.5
30	3.7	2.8	3.4	4.5	4.0	3.4	3.6	2.8	3.7	3.0	2.8	2.6	1.6	2.1	1.8	4.0	5.4	2.8	5.5	5.3	4.6	3.4	3.1	1.6	3.4
31	1.3	2.0	3.1	3.1	3.0	3.6	5.5	5.1	5.2	4.0	2.3	1.5	1.7	1.8	2.5	3.6	5.2	5.0	4.5	7.3	9.9	7.7	5.4	3.5	4.1
HRAVE	3.9	3.8	3.6	3.7	3.3	3.1	3.1	3.1	3.2	2.7	2.8	2.9	3.2	3.7	4.2	4.8	5.3	5.4	4.9	4.3	3.8	3.4	2.9	3.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.7	4.4	3.4	3.6	3.5	2.8	3.7	2.7	3.2	3.8	3.7	4.1	3.3	3.0	3.2	3.9	4.9	4.8	3.5	3.3	3.3	4.7	3.5	4.2	5.2
MAX	10.1	7.0	6.1	6.9	7.5	5.3	10.1	5.5	7.0	8.1	12.5	9.6	4.7	5.7	5.5	7.2	9.7	9.6	7.2	7.2	6.5	7.7	11.2	7.0	9.5
MIN	1.6	0.9	1.0	1.1	1.0	0.6	1.5	1.4	1.0	1.4	1.2	1.5	1.4	1.4	0.9	1.1	1.2	1.4	0.8	1.1	1.1	2.8	1.2	1.9	1.6

DAY	26	27	28	29	30	31
AVE	4.7	3.1	2.0	3.5	3.4	4.1
MAX	7.6	10.1	3.5	7.2	5.5	9.9
MIN	1.6	1.5	1.0	1.8	1.6	1.3

MONTHLY AVERAGE = 3.7 MONTHLY MAXIMUM = 12.5 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
AUGUST - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	73	64	80	93	120	106	121	135	133	157	151	151	138	124	160	139	354	70	86	302	129	104	107	115	191
2	95	48	49	47	50	57	67	111	121	124	152	251	313	291	288	271	293	292	301	311	321	243	116	76	125
3	129	120	128	107	114	104	100	131	131	217	285	318	326	278	315	308	299	279	284	291	297	290	307	316	261
4	131	111	112	136	139	93	88	113	126	260	268	264	271	278	287	290	274	297	299	293	298	296	301	334	159
5	101	100	104	106	110	111	120	129	195	265	268	292	302	289	294	278	282	285	286	294	301	250	144	129	109
6	111	69	310	310	189	131	276	287	308	310	286	265	276	306	312	317	79	111	276	281	276	259	270	129	97
7	143	247	206	144	166	148	128	124	128	190	295	298	239	335	325	62	94	134	165	117	128	312	88	145	334
8	103	106	111	153	105	83	112	121	148	134	128	132	187	262	282	292	276	254	200	247	297	158	91	98	349
9	96	120	112	101	120	124	117	129	141	245	273	276	277	272	267	270	295	285	182	150	159	154	167	110	118
10	35	40	76	67	45	61	55	66	58	60	34	22	55	75	153	115	59	81	256	266	142	126	108	98	23
11	109	109	116	121	106	130	123	101	141	116	122	260	275	185	289	287	291	293	113	159	132	92	44	39	322
12	47	65	74	68	67	110	98	77	75	59	92	145	199	307	273	262	94	115	100	243	187	142	116	128	31
13	119	118	114	118	104	114	112	109	129	154	149	148	142	167	175	173	168	175	178	166	137	102	85	98	39
14	100	101	92	97	105	26	110	118	119	145	147	167	155	154	87	33	92	283	300	292	313	306	52	75	65
15	116	120	94	249	151	129	126	109	126	146	196	278	273	284	306	290	276	294	284	300	309	300	67	113	223
16	126	318	108	110	109	307	289	311	301	298	266	273	260	273	279	276	281	281	287	288	299	303	266	187	343
17	304	286	204	139	266	301	277	293	278	283	274	290	287	286	288	281	282	284	275	279	277	263	277	288	130
18	263	281	285	304	302	305	293	282	302	307	304	295	283	287	280	285	290	283	293	293	281	291	255	273	46
19	299	271	272	300	236	210	230	232	303	274	274	283	287	289	284	291	274	280	280	297	288	253	143	135	2
20	118	121	139	126	119	126	119	140	176	258	263	268	293	307	291	288	288	282	229	130	108	146	140	105	172
21	133	118	105	126	125	147	140	138	228	274	293	280	295	294	279	248	270	267	282	286	290	250	254	293	44
22	307	295	291	283	287	289	303	297	303	295	303	274	290	297	291	222	159	165	142	142	107	135	122	144	246
23	146	106	113	136	144	140	124	124	148	293	295	294	278	273	281	287	290	11	107	85	69	52	329	103	74
24	100	82	99	69	72	67	64	63	66	72	67	70	32	60	3	19	1	1	31	74	142	128	92	106	133
25	139	144	93	91	111	126	139	112	135	132	147	152	145	225	128	158	306	295	71	48	57	40	58	52	223
26	61	61	64	63	59	61	60	66	61	67	68	80	92	75	287	278	281	199	147	126	57	92	114	117	55
27	131	133	116	122	117	124	118	115	130	137	133	98	151	166	346	4	334	169	135	104	96	93	135	118	44
28	304	287	197	112	95	119	122	114	151	159	151	211	143	180	144	247	207	178	188	254	299	156	129	111	6
29	118	106	115	111	123	131	124	117	151	154	164	159	212	228	129	272	177	39	60	64	291	155	124	99	33
30	100	89	78	63	98	99	100	132	89	67	137	149	144	145	281	170	328	156	160	136	129	127	280	246	118
31	130	120	101	106	102	116	72	74	73	73	73	56	64	295	288	299	225	202	148	44	51	84	75	299	105

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	11	12	11	9	13	13	8	10	15	27	52	33	38	48	20	38	40	49	22	42	25	10	13	18	24
2	22	13	12	11	13	12	8	16	22	60	53	55	61	24	18	20	17	19	13	10	8	43	10	13	23
3	14	9	19	48	9	8	7	24	33	47	30	34	34	46	33	21	31	13	12	8	6	3	13	22	22
4	32	8	8	13	14	12	15	10	17	42	37	37	24	20	19	21	17	13	12	8	5	5	8	19	17
5	17	10	9	9	11	9	15	24	31	52	15	18	20	21	16	17	12	10	8	7	6	19	8	8	16
6	9	39	10	8	20	19	18	12	16	16	22	17	13	18	46	35	39	56	30	17	18	24	28	29	23
7	31	25	28	12	14	13	23	17	31	64	23	26	27	27	28	13	18	14	15	19	12	22	19	16	22
8	17	9	14	18	9	26	23	15	12	16	31	45	46	14	28	41	53	24	17	18	40	14	20	10	23
9	8	10	13	9	7	9	8	12	27	44	35	24	38	33	28	25	20	11	32	45	40	14	14	10	22
10	16	16	15	11	11	12	14	11	7	10	24	29	36	35	33	46	16	25	51	21	15	6	16	7	20
11	8	9	8	20	10	13	13	23	12	20	36	46	46	46	19	16	18	48	25	22	14	32	52	16	24
12	14	14	19	12	10	12	17	17	13	13	17	10	34	45	20	47	40	14	31	30	37	18	9	8	21
13	6	5	7	7	8	8	8	10	14	13	17	35	40	28	34	24	22	20	15	13	13	9	8	31	16
14	12	12	16	10	9	27	9	14	44	23	24	38	50	64	32	24	39	24	9	8	9	15	37	29	24
15	14	13	9	68	9	8	7	8	15	30	59	29	29	34	31	20	15	15	7	7	6	40	28	25	22
16	30	56	46	17	42	25	28	14	24	25	22	21	27	21	19	15	14	9	9	7	8	6	23	31	22
17	9	22	37	34	24	25	14	10	12	14	18	21	30	22	14	12	11	9	9	8	12	9	20	17	17
18	15	14	8	9	8	11	10	13	20	21	20	15	14	17	13	14	12	11	10	10	8	7	29	40	15
19	11	15	10	10	38	18	43	42	26	36	38	29	19	19	17	17	14	10	9	8	7	21	7	10	20
20	6	16	10	6	11	16	24	13	34	56	37	57	26	18	17	15	23	10	25	12	11	20	27	11	21
21	11	13	13	14	14	25	20	21	57	32	26	34	17	16	19	15	15	17	12	6	15	28	48	39	22
22	10	7	8	9	8	6	9	9	18	22	25	35	23	21	19	20	14	11	15	12	33	11	9	13	15
23	39	10	15	8	8	8	7	13	12	37	21	26	41	45	27	21	18	25	36	21	9	35	22	34	22
24	12	19	15	9	7	7	9	9	11	16	17	41	45	34	55	62	41	41	15	15	14	12	13	13	22
25	10	13	13	10	22	9	12	20	11	10	12	20	41	64	43	32	15	14	31	11	11	13	16	10	19
26	9	10	8	9	11	10	13	10	10	14	27	27	41	47	51	20	35	28	17	21	25	19	9	13	20
27	10	7	8	9	12	8	9	9	17	22	33	49	48	54	40	33	30	23	21	17	12	14	14	20	22
28	28	26	29	10	11	8	9	15	15	32	35	40	61	59	34	57	35	24	9	43	20	20	10	8	27
29	8	9	7	8	12	8	6	11	15	17	13	40	45	55	40	28	23	16	20	45	31	26	11	17	21
30	13	14	14	13	20	16	16	14	14	16	24	29	50	47	64	24	29	15	12	8	9	8	33	25	22
31	15	12	10	9	9	9	21	12	10	11	23	41	56	39	25	26	14	43	39	15	16	21	40	64	24
HRAVE	15	15	14	14	14	13	14	15	20	28	28	32	36	35	29	26	24	21	19	17	16	18	20	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	24	23	22	17	16	23	22	23	22	20	24	21	16	24	22	22	17	15	20	21	22	15	22	22	19
MAX	52	61	48	42	52	56	64	53	45	51	52	47	40	64	68	56	37	40	43	57	57	35	45	62	64
MIN	8	8	3	5	6	8	12	9	7	6	8	8	5	8	6	6	8	7	7	6	6	6	7	7	9

DAY	26	27	28	29	30	31
AVE	20	22	27	21	22	24
MAX	51	54	61	55	64	64
MIN	8	7	8	6	8	9

MONTHLY AVERAGE = 21.0 MONTHLY MAXIMUM = 68.4 MONTHLY MINIMUM = 3.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
AUGUST - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	26.6	26.5	26.2	26.2	25.5	24.7	25.3	27.3	30.2	32.1	33.4	35.4	37.1	38.0	36.8	37.0	33.1	32.6	32.4	32.6	31.8	30.9	30.2	29.5	30.9
2	29.1	28.3	27.9	27.7	27.6	27.4	27.2	28.4	30.6	31.9	34.1	35.8	37.3	38.1	38.8	38.9	38.6	38.4	37.6	36.2	35.3	34.0	32.4	31.4	33.0
3	30.1	29.4	28.4	27.3	27.0	26.1	27.1	28.6	31.0	33.1	35.2	37.0	38.5	39.2	39.9	40.2	40.2	40.0	38.9	37.1	35.8	34.9	33.9	33.3	33.8
4	31.1	30.1	28.9	27.4	27.0	26.6	27.2	28.6	31.1	33.8	35.6	37.9	40.0	41.0	41.3	41.3	41.0	40.4	39.4	38.0	36.5	35.2	34.2	33.8	34.5
5	32.0	30.7	29.4	28.8	27.8	27.0	27.4	28.9	31.5	33.7	37.0	38.9	40.3	40.7	40.7	40.8	40.9	39.6	38.7	37.6	36.7	35.6	34.5	33.4	34.7
6	32.5	31.9	32.2	31.9	30.4	30.4	30.1	31.0	32.8	34.2	34.9	34.3	33.5	33.5	35.0	36.5	37.0	37.2	37.5	36.3	35.1	34.3	34.5	33.7	33.8
7	33.2	32.5	31.7	31.3	30.5	29.6	30.0	31.2	32.9	33.2	34.6	35.0	31.8	24.1	22.4	23.9	26.2	26.7	26.1	26.0	25.7	24.7	23.5	22.7	28.7
8	22.5	23.0	22.5	21.5	21.9	22.5	22.4	23.5	25.2	26.8	28.5	30.3	31.2	31.5	32.9	33.8	34.5	34.7	34.3	30.8	29.3	28.8	29.0	28.6	27.9
9	28.2	27.4	26.7	26.4	25.9	25.2	25.7	26.9	28.5	30.2	32.3	33.8	35.8	36.5	37.7	38.3	38.4	37.7	35.4	33.7	32.4	29.9	29.2	29.2	31.3
10	27.8	27.2	26.9	26.4	26.2	26.1	26.4	27.0	28.1	29.7	31.2	32.4	34.8	36.0	37.1	36.9	36.7	35.5	32.4	31.8	30.3	29.9	29.9	29.9	30.7
11	29.2	28.5	27.5	27.0	27.0	26.1	26.2	28.7	25.2	23.1	24.3	25.6	29.5	33.8	35.8	36.7	37.0	37.3	36.6	33.2	28.0	26.2	26.6	27.7	29.5
12	26.9	26.5	26.6	27.0	27.0	25.2	25.4	26.3	28.2	30.7	30.6	30.0	32.4	35.9	37.6	38.7	37.9	32.7	33.4	32.1	30.9	29.7	29.3	28.2	30.4
13	27.3	26.8	25.9	25.3	24.8	24.0	24.3	26.6	29.2	32.0	35.2	37.8	39.8	41.7	42.3	42.6	42.1	41.2	40.3	38.4	37.1	36.0	34.8	33.7	33.7
14	33.5	33.0	32.4	31.6	31.2	29.9	29.7	31.3	33.2	35.4	38.1	39.7	41.8	42.2	41.1	37.9	40.4	39.9	38.9	37.2	36.4	35.6	34.9	34.5	35.8
15	33.2	32.2	31.5	30.0	28.4	27.7	28.0	30.0	32.3	34.6	36.8	39.2	40.9	42.3	43.0	43.1	43.0	42.6	41.4	39.3	38.4	37.4	37.0	35.2	36.2
16	34.9	33.4	32.6	30.9	31.5	30.8	30.9	31.9	33.0	34.2	35.7	37.2	38.6	40.0	40.9	41.2	40.6	39.4	38.8	37.7	37.1	36.5	35.8	35.1	35.8
17	34.4	33.4	32.5	31.5	31.6	31.7	30.9	30.2	30.5	32.0	32.6	33.9	35.8	37.3	38.4	39.2	39.1	38.2	37.1	36.0	35.4	34.7	33.7	32.4	34.3
18	31.5	30.5	29.7	29.2	28.8	28.4	27.9	28.9	30.8	32.1	34.0	35.7	36.5	37.2	37.6	38.1	38.1	37.7	36.8	35.3	34.1	33.3	32.5	31.9	33.2
19	31.5	30.4	29.8	29.1	27.5	27.1	27.2	28.0	30.5	32.3	33.7	35.4	36.7	37.6	38.0	38.3	38.1	37.7	36.3	35.1	34.1	33.0	31.9	30.7	32.9
20	29.6	29.0	28.4	27.2	27.1	26.2	26.2	27.7	30.3	31.8	33.7	35.1	36.8	37.8	38.3	38.4	38.5	38.1	36.5	32.2	31.4	30.9	29.8	29.5	32.1
21	28.5	27.9	28.2	27.5	27.3	26.4	26.5	27.5	29.6	31.4	32.9	34.3	35.4	36.7	37.0	36.8	37.7	37.3	36.6	34.9	34.2	33.6	33.0	31.9	32.2
22	32.0	31.6	30.7	29.7	29.0	28.6	28.3	29.3	30.6	31.9	33.3	34.8	35.8	36.8	37.3	36.9	35.6	34.3	32.2	29.6	30.1	28.7	28.2	27.2	31.8
23	26.9	26.8	26.2	25.3	24.6	24.2	24.2	25.3	25.3	28.2	31.4	34.0	35.5	37.0	38.4	39.0	38.9	29.5	22.9	24.0	24.4	25.6	24.9	25.4	28.7
24	24.9	25.1	25.0	25.4	25.7	25.7	26.0	27.0	28.6	30.4	32.3	33.3	34.8	35.6	36.5	36.9	37.1	37.3	36.3	35.5	33.2	31.8	31.5	29.8	31.1
25	28.2	26.7	25.8	25.5	24.8	23.5	22.4	23.9	25.4	26.4	28.6	31.1	33.0	35.0	36.3	36.0	30.4	28.5	26.4	25.1	24.7	25.2	25.2	25.5	27.6
26	25.3	25.3	25.2	25.1	25.1	24.7	25.1	26.2	27.9	29.8	32.0	33.9	36.0	36.9	37.7	37.8	37.3	33.8	27.0	27.0	28.6	27.8	26.3	26.2	29.5
27	25.7	25.4	24.9	24.9	24.7	24.0	24.0	26.5	28.7	31.2	32.9	34.5	36.1	37.8	38.1	37.9	33.0	25.3	24.2	24.6	25.3	25.2	24.5	25.0	28.5
28	24.5	24.1	23.2	22.6	22.8	22.9	22.7	24.0	25.8	27.6	30.0	32.2	35.1	36.2	37.7	38.4	38.7	38.3	36.8	35.5	34.2	33.1	31.4	30.2	30.3
29	29.4	28.8	28.0	27.0	26.3	25.5	25.7	27.6	29.6	32.8	35.6	36.7	38.0	39.3	39.6	39.6	38.6	36.0	33.8	32.4	31.4	31.0	29.5	29.2	32.1
30	28.7	28.4	28.1	28.0	27.0	26.5	26.7	27.3	30.3	32.6	34.5	36.2	36.6	38.1	37.9	38.1	31.5	33.2	32.3	31.4	31.0	30.5	29.1	29.3	31.4
31	29.3	28.6	28.0	27.6	27.2	26.6	25.4	24.8	26.9	29.8	32.0	33.8	35.7	35.8	36.0	36.4	34.0	31.4	28.2	29.9	27.0	24.8	23.6	21.3	29.3
HRAVE	29.3	28.7	28.1	27.5	27.1	26.5	26.5	27.8	29.5	31.3	33.1	34.7	36.2	37.1	37.7	37.9	37.2	35.9	34.4	33.1	32.1	31.3	30.5	29.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	30.9	33.0	33.8	34.5	34.7	33.8	28.7	27.9	31.3	30.7	29.5	30.4	33.7	35.8	36.2	35.8	34.3	33.2	32.9	32.1	32.2	31.8	28.7	31.1	27.6
MAX	38.0	38.9	40.2	41.3	40.9	37.5	35.0	34.7	38.4	37.1	37.3	38.7	42.6	42.2	43.1	41.2	39.2	38.1	38.3	38.5	37.7	37.3	39.0	37.3	36.3
MIN	24.7	27.2	26.1	26.6	27.0	30.1	22.4	21.5	25.2	26.1	23.1	25.2	24.0	29.7	27.7	30.8	30.2	27.9	27.1	26.2	26.4	27.2	22.9	24.9	22.4

DAY	26	27	28	29	30	31
AVE	29.5	28.5	30.3	32.1	31.4	29.3
MAX	37.8	38.1	38.7	39.6	38.1	36.4
MIN	24.7	24.0	22.6	25.5	26.5	21.3

MONTHLY AVERAGE = 31.8 MONTHLY MAXIMUM = 43.1 MONTHLY MINIMUM = 21.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
AUGUST - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	-0.1	-0.1	0.0	0.1	0.1	0.1	-0.4	-1.2	-1.5	-1.6	-1.2	-1.7	-1.7	-1.6	-1.4	-0.9	0.0	0.0	-0.1	0.0	0.0	0.1	0.0	0.1	-0.5
2	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	-1.2	-1.4	-1.1	-1.2	-1.2	-1.4	-1.6	-1.7	-1.5	-1.2	-0.9	-0.6	0.0	0.3	0.5	0.4	0.2	-0.6
3	0.5	0.6	0.6	0.4	0.3	0.4	-0.5	-0.9	-0.7	-0.8	-1.1	-1.4	-1.5	-1.4	-1.4	-1.4	-1.2	-1.0	-0.6	0.0	0.2	0.5	0.4	0.4	-0.4
4	0.5	0.6	0.5	0.3	0.6	0.4	-0.4	-1.4	-1.2	-0.9	-0.9	-1.0	-1.4	-1.5	-1.5	-1.4	-1.2	-0.9	-0.5	0.0	0.4	0.7	0.5	0.6	-0.4
5	0.6	0.7	0.5	0.4	0.3	0.4	-0.3	-0.6	-0.7	-0.7	-1.1	-1.4	-1.6	-1.5	-1.3	-1.1	-1.1	-0.5	-0.2	0.2	0.5	0.5	0.3	0.4	-0.3
6	0.3	0.4	0.1	0.2	0.3	0.1	0.1	-0.4	-0.8	-0.8	-0.9	-0.7	-0.5	-0.7	-0.9	-1.0	-0.9	-0.5	-0.4	-0.1	0.0	0.1	0.1	0.1	-0.3
7	0.1	0.3	0.2	0.1	0.0	0.0	-0.2	-0.9	-1.3	-0.8	-1.3	-1.3	-1.0	0.1	0.2	-0.1	-0.3	-0.2	-0.1	0.2	0.1	0.2	0.4	0.2	-0.2
8	0.1	0.1	0.2	0.1	0.2	0.2	0.1	-0.4	-1.0	-1.2	-1.1	-0.9	-0.7	-0.6	-0.8	-0.7	-0.6	-0.5	-0.3	0.3	0.4	0.4	0.5	0.5	-0.2
9	0.5	0.3	0.3	0.3	0.3	0.3	-0.3	-0.8	-0.7	-0.6	-0.8	-0.9	-1.1	-1.0	-1.1	-1.1	-1.0	-0.8	-0.5	-0.1	-0.1	-0.2	-0.1	-0.1	-0.4
10	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.4	-0.7	-1.1	-1.1	-1.0	-1.5	-1.7	-1.5	-1.0	-0.8	-0.4	-0.3	-0.2	-0.1	0.0	0.0	0.2	-0.5
11	0.2	0.2	0.1	0.1	0.2	0.2	-0.2	-0.8	-0.5	-0.1	-0.1	-0.5	-0.9	-1.3	-1.4	-1.4	-1.0	-0.8	-0.3	-0.1	0.3	0.5	0.2	0.2	-0.3
12	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	-0.3	-0.7	-0.4	-0.7	-0.7	-1.0	-1.0	-0.9	-0.7	-0.4	-0.1	0.1	0.2	0.3	0.3	0.5	-0.2
13	0.3	0.3	0.2	0.2	0.2	0.3	-0.5	-1.2	-1.6	-1.8	-1.9	-1.7	-1.5	-2.0	-1.7	-1.8	-1.2	-0.8	-0.4	0.1	0.4	0.6	0.5	0.3	-0.6
14	0.3	0.3	0.4	0.6	0.5	0.5	-0.1	-1.2	-1.0	-1.2	-1.5	-1.1	-1.4	-1.5	-1.2	0.2	-0.5	-0.3	-0.1	0.3	0.3	0.2	0.3	0.2	-0.3
15	0.3	0.5	0.8	0.5	0.5	0.6	-0.1	-1.3	-1.6	-1.3	-0.8	-1.2	-1.1	-1.2	-1.4	-1.3	-1.0	-0.9	-0.4	0.1	0.3	0.5	0.4	0.4	-0.4
16	0.4	0.4	0.3	0.4	0.4	0.3	0.0	-0.5	-0.8	-1.0	-1.1	-1.4	-1.4	-1.5	-1.6	-1.5	-0.9	-0.4	-0.3	0.0	0.2	0.4	0.3	0.2	-0.4
17	0.2	0.2	0.2	0.1	0.2	0.1	0.1	-0.2	-0.4	-1.1	-1.3	-1.5	-1.5	-1.6	-1.6	-1.5	-1.2	-0.9	-0.4	0.0	0.2	0.2	0.1	0.1	-0.5
18	0.1	0.1	0.1	0.1	0.2	0.2	0.0	-0.4	-0.8	-1.1	-1.2	-1.5	-1.5	-1.6	-1.5	-1.4	-1.1	-0.8	-0.4	0.1	0.2	0.2	0.2	0.3	-0.5
19	0.2	0.3	0.3	0.4	0.4	0.3	0.1	-0.4	-0.7	-0.9	-1.1	-1.3	-1.5	-1.7	-1.5	-1.4	-1.1	-0.9	-0.3	0.1	0.4	0.4	0.4	0.4	-0.4
20	0.3	0.2	0.3	0.2	0.2	0.2	0.0	-0.8	-0.8	-0.7	-0.9	-1.1	-1.5	-1.6	-1.7	-1.4	-1.1	-0.9	-0.5	-0.2	-0.1	0.0	0.0	0.0	-0.5
21	0.0	0.0	0.1	0.2	0.2	0.2	-0.1	-0.4	-0.6	-0.8	-1.2	-1.4	-1.4	-1.5	-1.3	-0.9	-1.0	-0.7	-0.4	0.1	0.3	0.3	0.2	0.2	-0.4
22	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.6	-0.9	-1.1	-1.3	-1.5	-1.7	-1.6	-1.6	-1.7	-1.5	-1.1	-0.4	-0.3	-0.1	-0.1	0.0	0.1	-0.6
23	0.0	0.0	0.2	0.3	0.2	0.2	-0.1	-0.6	-0.8	-0.8	-1.0	-1.2	-1.1	-1.1	-1.3	-1.5	-1.3	-0.3	0.4	0.4	0.3	0.3	0.2	0.2	-0.3
24	0.2	0.4	0.2	0.5	0.7	0.5	0.2	-0.2	-0.6	-1.2	-1.4	-1.2	-1.2	-1.2	-1.0	-0.8	-0.6	-0.4	0.1	0.2	0.1	0.2	0.2	0.4	-0.2
25	0.2	0.1	0.0	0.0	-0.1	0.0	0.1	-0.4	-0.9	-0.9	-1.2	-1.7	-1.1	-1.1	-1.3	-0.8	-0.4	-0.4	0.1	0.1	0.0	0.1	0.1	0.1	-0.4
26	0.2	0.2	0.2	0.2	0.1	0.1	0.0	-0.5	-0.9	-1.1	-1.4	-1.4	-1.5	-1.3	-1.2	-1.2	-0.6	-0.5	-0.6	-0.2	-0.1	0.0	-0.1	-0.1	-0.5
27	-0.1	0.1	0.0	0.1	0.2	0.5	0.1	-1.3	-1.4	-1.8	-1.6	-1.1	-1.4	-1.3	-1.2	-0.8	-0.4	0.3	0.1	0.3	0.5	0.4	0.4	0.3	-0.4
28	0.4	0.2	0.3	0.2	0.2	0.4	0.0	-0.6	-1.0	-0.8	-0.8	-0.7	-1.0	-0.9	-1.2	-0.8	-0.6	-0.5	0.0	0.2	0.7	0.4	0.3	0.3	-0.2
29	0.3	0.3	0.2	0.3	0.3	0.5	-0.1	-1.1	-1.1	-1.5	-2.0	-1.4	-1.2	-1.3	-1.3	-1.0	-1.0	-0.3	-0.1	0.2	0.0	0.1	0.1	0.2	-0.5
30	0.2	0.2	0.2	0.1	0.2	0.2	-0.2	-0.8	-1.5	-1.5	-1.7	-1.8	-1.2	-1.4	-1.0	-1.2	0.9	0.5	0.4	0.5	0.6	0.5	0.6	0.5	-0.3
31	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.0	-0.8	-1.4	-1.4	-1.2	-1.1	-0.7	-0.8	-0.7	-0.4	-0.3	0.2	0.1	-0.1	0.4	0.3	0.1	-0.2
HRAVE	0.2	0.2	0.2	0.2	0.2	0.2	-0.1	-0.7	-0.9	-1.0	-1.2	-1.2	-1.3	-1.3	-1.3	-1.1	-0.8	-0.5	-0.2	0.1	0.2	0.3	0.2	0.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.5	-0.6	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	-0.4	-0.5	-0.3	-0.2	-0.6	-0.3	-0.4	-0.4	-0.5	-0.5	-0.4	-0.5	-0.4	-0.6	-0.3	-0.2	-0.4
MAX	0.1	0.5	0.6	0.7	0.7	0.4	0.4	0.5	0.5	0.2	0.5	0.5	0.6	0.6	0.8	0.4	0.2	0.3	0.4	0.3	0.3	0.1	0.4	0.7	0.2
MIN	-1.7	-1.7	-1.5	-1.5	-1.6	-1.0	-1.3	-1.2	-1.1	-1.7	-1.4	-1.0	-2.0	-1.5	-1.6	-1.6	-1.6	-1.6	-1.7	-1.7	-1.5	-1.7	-1.5	-1.4	-1.7

DAY	26	27	28	29	30	31
AVE	-0.5	-0.4	-0.2	-0.5	-0.3	-0.2
MAX	0.2	0.5	0.7	0.5	0.9	0.4
MIN	-1.5	-1.8	-1.2	-2.0	-1.8	-1.4

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
AUGUST - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	702	701	701	701	701	701	701	702	702	702	701	701	700	699	699	698	698	698	698	698	699	699	699	699	700
2	700	700	700	699	699	700	700	700	700	700	700	700	699	698	698	697	697	697	697	697	697	698	698	698	699
3	698	698	698	699	699	699	700	700	700	700	700	700	699	699	698	698	697	697	697	697	698	698	698	698	699
4	698	699	699	699	700	700	700	701	701	701	700	700	700	699	699	698	698	698	698	698	699	699	699	700	699
5	700	700	700	700	700	700	701	702	702	701	701	701	700	700	699	699	698	698	698	698	699	699	699	699	700
6	699	699	699	700	700	700	701	701	702	701	701	701	701	701	700	699	698	697	697	698	698	699	699	699	700
7	699	699	699	699	699	699	700	700	700	700	700	699	699	700	700	699	699	698	698	699	699	700	700	701	699
8	701	701	701	701	701	701	701	701	701	701	701	701	700	700	699	699	698	698	698	698	699	699	700	700	700
9	700	700	700	700	700	700	701	701	701	701	701	701	700	699	699	698	698	698	699	699	700	701	701	702	700
10	702	701	700	700	700	701	701	702	702	702	701	701	700	699	699	698	697	697	698	698	699	699	700	700	700
11	700	700	700	700	700	701	701	702	703	703	703	702	701	700	700	699	699	698	699	700	701	702	703	702	701
12	702	702	702	702	702	703	703	703	703	703	703	703	703	702	701	700	700	701	701	701	702	702	702	702	702
13	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	700	699	699	699	699	700	700	700	701	701
14	701	701	701	701	701	701	702	702	702	702	702	701	701	700	700	699	699	699	698	699	700	701	701	701	700
15	701	700	700	700	700	701	701	701	701	701	701	700	700	699	698	698	697	697	697	697	698	699	699	699	699
16	699	699	699	700	700	701	701	702	702	701	701	700	700	699	698	697	697	697	697	697	697	698	698	698	699
17	698	698	699	699	700	700	701	700	701	701	701	700	699	699	698	697	697	696	696	697	698	698	699	699	699
18	699	699	699	699	699	700	700	700	700	700	699	699	699	698	697	697	696	696	696	696	697	697	697	698	698
19	698	698	698	698	698	699	699	700	700	700	700	699	699	698	698	697	697	697	697	697	697	697	698	698	698
20	698	698	698	698	699	699	700	700	700	700	700	699	699	698	697	697	697	696	697	697	698	698	698	699	698
21	699	699	699	699	699	700	700	701	701	701	701	700	699	699	698	698	697	697	697	697	698	698	698	699	699
22	699	699	699	700	700	701	701	701	701	701	701	701	700	699	699	698	698	698	699	699	701	701	701	701	700
23	701	701	701	701	701	701	702	702	703	703	702	702	701	700	699	699	698	700	701	701	702	702	702	702	701
24	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	699	699	698	699	699	700	701	701	702	701
25	702	702	702	703	703	703	703	703	703	703	703	703	702	701	700	700	700	701	702	702	702	703	703	703	702
26	703	703	702	702	702	703	703	703	704	704	703	703	702	702	701	700	700	700	702	702	703	703	703	703	702
27	703	703	703	703	702	703	703	703	704	704	704	703	702	701	700	700	700	702	702	702	702	702	702	702	702
28	702	701	701	701	701	702	702	702	702	702	702	701	700	700	699	698	698	698	698	698	699	699	699	699	700
29	699	699	699	700	700	700	701	701	701	701	701	701	700	699	698	698	698	698	698	699	700	701	701	700	700
30	700	700	700	700	700	701	701	701	701	701	701	701	700	699	698	698	698	698	698	698	699	699	699	699	700
31	699	699	699	700	700	700	701	701	701	701	701	701	700	699	698	698	698	698	699	699	701	702	703	704	700
HRAVE	700	700	700	700	700	701	701	701	702	702	701	701	700	700	699	698	698	698	698	699	699	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	699	699	699	700	700	699	700	700	700	701	702	701	700	699	699	699	698	698	698	699	700	701	701	702
MAX	702	700	700	701	702	702	701	701	702	702	703	703	703	702	701	702	701	700	700	700	701	701	703	703	703
MIN	698	697	697	698	698	697	698	698	698	697	698	700	699	698	697	697	696	696	697	696	697	698	698	698	700

DAY	26	27	28	29	30	31
AVE	702	702	700	700	700	700
MAX	704	704	702	701	701	704
MIN	700	700	698	698	698	698

MONTHLY AVERAGE = 699.9 MONTHLY MAXIMUM = 703.9 MONTHLY MINIMUM = 695.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	61	57	57	59	62	69	66	54	42	35	31	27	24	21	25	23	39	41	40	38	41	46	50	52	44
2	52	55	56	56	55	54	53	51	41	36	30	24	21	20	18	17	17	16	16	18	22	24	28	31	34
3	32	34	36	40	42	47	42	36	31	27	23	19	16	14	12	9	9	10	12	15	17	18	20	22	24
4	26	29	31	33	34	37	34	33	30	22	20	16	12	9	10	10	10	11	13	14	17	18	19	21	21
5	24	27	29	30	32	34	32	28	23	20	15	12	11	11	10	10	9	10	12	13	15	16	18	21	19
6	23	25	37	39	39	41	41	38	32	29	27	28	30	30	25	21	17	16	17	21	24	26	26	28	28
7	29	32	36	39	39	40	40	37	34	35	33	33	45	77	86	81	68	64	65	68	70	78	86	90	54
8	90	87	91	94	94	88	88	82	75	64	55	47	41	41	39	36	33	34	35	49	54	55	56	59	62
9	60	63	64	65	66	69	68	59	52	45	37	34	28	26	23	21	21	22	28	32	35	44	47	48	44
10	53	54	53	56	59	58	57	54	50	43	38	35	27	23	20	21	23	27	38	40	46	49	48	49	43
11	52	56	59	59	60	63	61	50	63	75	69	63	48	32	30	28	27	26	25	38	58	71	65	54	51
12	56	58	56	54	54	67	67	59	49	40	43	47	37	26	23	20	21	32	29	34	39	46	47	50	44
13	55	59	63	65	67	69	66	53	42	35	27	22	14	10	8	7	7	9	11	17	20	23	24	27	33
14	28	31	30	33	34	41	40	36	30	25	19	16	12	11	15	25	15	17	19	23	24	26	28	29	25
15	33	35	36	42	47	49	47	40	32	26	22	19	14	11	11	12	11	11	13	17	19	20	22	25	26
16	27	31	32	37	36	38	40	39	34	32	28	24	22	20	19	18	19	21	23	25	24	24	26	28	28
17	33	37	41	45	42	40	41	43	43	39	41	38	33	28	26	24	23	24	27	28	29	31	35	36	34
18	38	41	44	46	46	47	48	45	36	31	27	23	20	19	18	17	16	16	19	23	26	27	29	33	31
19	32	34	36	37	42	45	44	40	31	26	24	21	19	17	16	16	16	16	18	22	24	25	28	30	28
20	33	34	35	38	41	42	43	38	35	38	34	31	28	26	24	24	23	23	27	38	39	39	44	49	34
21	53	56	53	54	54	57	57	51	45	43	41	38	35	30	29	29	25	25	25	29	30	32	34	37	40
22	39	41	48	52	55	56	56	52	48	44	40	36	33	29	27	28	30	34	37	45	42	49	52	55	43
23	57	58	60	65	68	69	68	63	64	47	37	30	25	21	18	21	21	55	84	79	75	66	72	69	54
24	75	73	74	67	63	62	60	56	49	43	35	33	29	26	25	23	23	21	26	28	33	37	39	50	44
25	55	59	61	60	65	76	85	76	65	62	54	44	37	32	24	26	45	55	70	75	77	68	66	64	58
26	64	65	65	65	65	67	66	61	54	47	39	33	28	25	22	23	23	32	55	57	50	52	59	63	49
27	67	68	72	73	73	77	78	63	52	43	36	32	26	21	19	20	34	75	80	76	70	69	73	70	57
28	72	75	81	85	81	79	80	72	65	50	40	33	27	22	18	18	17	17	22	27	31	34	39	44	47
29	45	46	50	54	57	59	59	50	42	35	27	24	21	18	15	16	19	24	30	35	37	37	43	44	37
30	47	45	44	43	47	49	49	48	37	30	25	20	20	18	19	21	43	38	40	42	43	45	52	51	38
31	50	53	55	56	57	59	67	71	60	46	38	32	27	28	28	27	33	39	56	47	57	70	77	93	51
HRAVE	47	49	51	53	54	56	56	51	45	39	34	30	26	24	23	22	24	28	33	36	38	41	44	46	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	44	34	24	21	19	28	54	62	44	43	51	44	33	25	26	28	34	31	28	34	40	43	54	44	58
MAX	69	56	47	37	34	41	90	94	69	59	75	67	69	41	49	40	45	48	45	49	57	56	84	75	85
MIN	21	16	9	9	9	16	29	33	21	20	25	20	7	11	11	18	23	16	16	23	25	27	18	21	24

DAY	26	27	28	29	30	31
AVE	49	57	47	37	38	51
MAX	67	80	85	59	52	93
MIN	22	19	17	15	18	27

MONTHLY AVERAGE = 39.6 MONTHLY MAXIMUM = 94.0 MONTHLY MINIMUM = 7.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.51	0.67	0.82	0.89	0.97	0.72	0.38	0.34	0.08	0.04	0.04	0.01	0.00	0.00	0.00	0.00	5.86
2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.30	0.51	0.69	0.84	0.93	0.93	1.00	0.88	0.62	0.51	0.33	0.13	0.01	0.00	0.00	0.00	0.00	7.71
3	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.31	0.52	0.70	0.85	0.94	0.98	0.94	0.87	0.61	0.52	0.33	0.13	0.00	0.00	0.00	0.00	0.00	7.82
4	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.31	0.52	0.70	0.85	0.94	0.98	0.95	0.84	0.65	0.51	0.32	0.12	0.00	0.00	0.00	0.00	0.00	7.81
5	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.26	0.49	0.68	0.83	0.90	0.96	0.86	0.60	0.48	0.43	0.13	0.05	0.01	0.00	0.00	0.00	0.00	6.80
6	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.18	0.41	0.39	0.36	0.24	0.16	0.29	0.53	0.63	0.46	0.32	0.14	0.00	0.00	0.00	0.00	0.00	4.18
7	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.21	0.47	0.47	0.79	0.71	0.25	0.02	0.03	0.31	0.28	0.17	0.03	0.00	0.00	0.00	0.00	0.00	3.80
8	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.44	0.66	0.81	0.91	0.55	0.63	0.82	0.64	0.41	0.31	0.13	0.00	0.00	0.00	0.00	0.00	6.60
9	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.49	0.67	0.82	0.91	0.94	0.92	0.84	0.68	0.40	0.30	0.18	0.02	0.00	0.00	0.00	0.00	7.54
10	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.18	0.28	0.54	0.64	0.65	0.97	0.90	0.88	0.48	0.37	0.09	0.01	0.00	0.00	0.00	0.00	0.00	6.03
11	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.24	0.13	0.05	0.16	0.40	0.84	0.94	0.79	0.69	0.37	0.36	0.14	0.00	0.00	0.00	0.00	0.00	5.20
12	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.07	0.22	0.39	0.16	0.25	0.51	0.84	0.83	0.68	0.29	0.10	0.01	0.00	0.00	0.00	0.00	0.00	4.38
13	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.50	0.69	0.83	0.92	0.96	0.92	0.90	0.77	0.34	0.31	0.11	0.00	0.00	0.00	0.00	0.00	7.64
14	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.49	0.67	0.82	0.90	0.94	0.76	0.46	0.49	0.27	0.13	0.06	0.00	0.00	0.00	0.00	0.00	6.35
15	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.49	0.68	0.82	0.92	0.96	0.93	0.83	0.66	0.38	0.29	0.09	0.00	0.00	0.00	0.00	0.00	7.42
16	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.48	0.67	0.81	0.90	0.93	0.90	0.82	0.68	0.25	0.10	0.05	0.00	0.00	0.00	0.00	0.00	6.94
17	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.20	0.66	0.79	0.88	0.92	0.89	0.80	0.64	0.37	0.27	0.08	0.00	0.00	0.00	0.00	0.00	6.58
18	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.47	0.67	0.81	0.89	0.91	0.89	0.80	0.66	0.37	0.27	0.08	0.00	0.00	0.00	0.00	0.00	7.17
19	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.48	0.68	0.82	0.90	0.94	0.91	0.82	0.65	0.34	0.26	0.06	0.00	0.00	0.00	0.00	0.00	7.21
20	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.47	0.65	0.80	0.89	0.92	0.90	0.81	0.65	0.34	0.26	0.07	0.00	0.00	0.00	0.00	0.00	7.10
21	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.11	0.40	0.56	0.63	0.78	0.60	0.75	0.57	0.42	0.36	0.24	0.07	0.00	0.00	0.00	0.00	0.00	5.56
22	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.44	0.68	0.71	0.90	0.95	0.92	0.83	0.68	0.39	0.26	0.09	0.00	0.00	0.00	0.00	0.00	7.06
23	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.20	0.62	0.61	0.88	0.74	0.90	0.80	0.65	0.40	0.13	0.01	0.00	0.00	0.00	0.00	0.00	6.06
24	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.19	0.44	0.64	0.79	0.88	0.91	0.83	0.79	0.64	0.30	0.25	0.05	0.00	0.00	0.00	0.00	0.00	6.80
25	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.31	0.31	0.44	0.72	0.86	0.89	0.80	0.20	0.08	0.06	0.01	0.00	0.00	0.00	0.00	0.00	4.88
26	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.24	0.46	0.60	0.79	0.83	0.92	0.83	0.77	0.64	0.28	0.08	0.02	0.00	0.00	0.00	0.00	0.00	6.53
27	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.29	0.46	0.64	0.79	0.88	0.92	0.89	0.81	0.47	0.04	0.05	0.03	0.00	0.00	0.00	0.00	0.00	6.31
28	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.47	0.66	0.80	0.88	0.92	0.89	0.80	0.65	0.37	0.23	0.03	0.00	0.00	0.00	0.00	0.00	7.01
29	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.46	0.65	0.79	0.88	0.92	0.90	0.72	0.52	0.43	0.08	0.01	0.00	0.00	0.00	0.00	0.00	6.69
30	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.49	0.64	0.80	0.88	0.91	0.87	0.83	0.21	0.22	0.13	0.04	0.00	0.00	0.00	0.00	0.00	6.35
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.42	0.64	0.78	0.87	0.93	0.54	0.58	0.35	0.13	0.07	0.01	0.00	0.00	0.00	0.00	0.00	5.38
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.22	0.42	0.60	0.72	0.81	0.84	0.82	0.74	0.56	0.33	0.20	0.07	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.86	7.71	7.82	7.81	6.80	4.18	3.80	6.60	7.54	6.03	5.20	4.38	7.64	6.35	7.42	6.94	6.58	7.17	7.21	7.10	5.56	7.06	6.06	6.80	4.88
MAX	0.97	1.00	0.98	0.98	0.96	0.63	0.79	0.91	0.94	0.97	0.94	0.84	0.96	0.94	0.96	0.93	0.92	0.91	0.94	0.92	0.78	0.95	0.90	0.91	0.89
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.53	6.31	7.01	6.69	6.35	5.38
MAX	0.92	0.92	0.92	0.92	0.91	0.93
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.06	0.02	0.69
8	0.00	0.01	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.12
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.06
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.04	0.01	0.00	0.00	0.00	0.00	0.51
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
25	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.14
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.27
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
31	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.06	0.15	0.27
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.00	0.01	0.00	0.01	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.01	0.00	0.00	0.00	0.00	0.00	0.69	0.12	0.00	0.00	0.06	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.02	0.14
MAX	0.01	0.00	0.00	0.00	0.00	0.00	0.34	0.09	0.00	0.00	0.03	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.02	0.13
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.27	0.00	0.00	0.22	0.27
MAX	0.00	0.27	0.00	0.00	0.22	0.15
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 2.34 MONTHLY MAXIMUM = 0.46 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
SEPTEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	6.2	3.4	3.2	4.9	5.2	4.0	4.8	2.2	2.7	2.9	1.8	1.7	1.6	1.8	1.8	1.6	1.4	1.4	0.9	0.9	2.5	3.2	2.9	4.4	2.8
2	1.7	1.2	1.1	1.5	1.5	1.1	1.3	1.5	2.0	1.3	1.6	1.5	1.6	2.1	1.6	2.8	2.8	4.3	4.7	2.3	5.4	2.8	3.5	3.5	2.3
3	3.9	2.4	3.6	3.0	3.8	3.2	2.5	2.5	2.2	1.9	2.1	1.8	1.6	2.0	1.8	4.0	4.6	6.4	8.7	2.9	4.0	2.3	2.2	3.5	3.2
4	2.2	2.4	2.4	2.3	2.0	2.7	2.5	2.4	1.8	1.3	1.8	1.5	2.0	2.9	4.2	4.9	4.7	4.9	3.3	2.7	3.2	2.8	3.9	3.0	2.8
5	2.0	2.6	2.1	2.0	2.0	2.4	2.3	2.0	2.6	2.4	3.1	5.3	3.0	2.2	2.1	3.6	2.8	1.0	2.2	1.8	1.4	2.0	2.2	3.1	2.4
6	3.1	3.1	2.9	2.2	2.9	2.7	3.2	3.0	2.5	2.8	2.4	2.1	2.1	2.1	2.6	2.1	1.9	2.1	2.3	3.7	5.3	5.4	2.9	2.5	2.8
7	3.2	3.3	2.9	3.8	2.6	3.4	3.1	2.9	1.6	1.8	2.1	2.8	3.0	2.9	3.5	4.3	6.1	5.2	5.5	4.6	5.0	4.3	4.3	2.3	3.5
8	2.2	1.6	2.2	2.4	2.6	2.3	2.2	1.8	2.8	3.4	2.1	2.2	2.1	2.3	1.7	1.6	2.5	2.4	2.2	1.6	1.3	1.7	1.5	1.7	2.1
9	2.5	4.7	3.6	1.7	2.3	2.4	3.0	2.4	2.1	1.9	1.3	2.1	2.0	1.9	4.1	7.6	8.0	7.3	5.7	4.5	3.5	2.1	2.7	1.8	3.4
10	2.3	2.2	1.5	1.4	3.3	4.0	1.9	1.4	0.9	1.5	1.8	1.7	1.7	2.8	4.2	3.9	3.4	3.1	3.3	2.8	2.2	1.8	2.8	3.0	2.4
11	2.3	2.2	3.0	2.8	2.8	1.9	1.8	1.6	1.4	1.2	1.6	2.4	3.6	4.3	5.3	5.4	5.4	6.0	5.7	4.2	3.7	2.0	2.7	1.9	3.1
12	2.7	2.9	3.4	3.1	2.4	3.2	2.9	3.0	3.3	2.8	2.3	1.4	2.2	2.3	4.1	5.2	5.0	4.7	5.0	2.6	2.1	3.2	1.9	1.1	3.0
13	2.5	2.2	2.9	2.6	3.0	3.2	2.6	2.6	2.6	2.2	2.6	1.9	1.5	2.7	4.9	5.6	5.4	12.4	9.5	8.6	7.1	2.8	1.5	1.8	3.9
14	2.3	2.2	1.7	2.2	2.7	2.5	3.0	3.2	2.0	1.2	1.0	1.7	1.9	2.7	3.3	3.9	5.7	5.2	1.7	1.1	3.4	2.9	1.7	1.2	2.5
15	1.3	1.0	1.0	1.0	1.2	0.7	1.0	0.6	1.5	1.9	4.5	4.9	5.5	7.7	6.2	4.8	5.3	4.0	6.0	1.3	2.5	3.1	3.1	2.7	3.0
16	1.9	2.5	2.7	2.6	2.3	1.8	2.5	2.3	2.0	2.0	1.7	3.2	5.1	4.7	4.6	4.3	3.8	3.5	3.8	3.8	2.9	1.3	1.3	2.3	2.9
17	1.7	1.5	1.5	2.3	2.0	2.0	2.2	1.9	2.0	1.3	1.2	1.9	2.0	2.5	4.0	4.2	5.8	6.6	5.2	4.1	1.9	1.8	2.2	3.0	2.7
18	3.0	2.0	1.8	2.1	2.4	1.9	1.2	1.5	1.9	1.3	1.2	1.8	2.1	2.4	3.8	4.8	6.0	6.6	5.1	4.8	3.8	2.4	1.7	1.4	2.8
19	2.0	2.9	2.9	1.8	2.5	2.2	1.3	1.6	2.8	1.1	1.1	2.0	2.7	2.8	6.7	11.6	12.1	11.1	9.1	6.9	5.1	3.2	5.1	4.3	4.4
20	3.1	3.7	6.4	6.8	6.5	3.7	4.8	5.6	5.6	5.7	4.8	3.1	2.4	1.9	1.8	2.3	2.7	2.8	2.6	1.5	2.1	2.3	3.4	2.4	3.7
21	1.5	1.5	1.8	2.1	1.9	1.9	1.5	1.8	2.6	3.7	4.4	3.4	5.6	5.7	6.2	5.2	5.5	6.4	5.5	4.6	2.2	1.3	2.1	2.1	3.4
22	1.1	1.1	0.8	1.1	1.5	1.1	1.9	2.8	2.4	1.1	2.1	3.1	2.0	2.2	4.0	1.7	1.6	1.7	1.8	1.6	1.4	3.4	3.7	1.4	1.9
23	1.2	0.4	1.2	1.6	1.7	1.6	2.2	2.7	2.4	1.8	1.5	1.4	2.1	1.9	2.0	2.0	1.5	1.6	2.2	4.4	4.8	2.1	1.9	2.9	2.1
24	3.2	2.9	2.3	3.3	3.3	3.1	3.0	2.8	1.8	1.9	1.6	2.2	2.3	1.8	2.9	3.2	4.9	4.2	3.4	2.3	2.6	3.1	3.8	3.7	2.9
25	3.4	3.4	3.9	3.2	4.6	3.3	4.4	7.6	7.8	9.2	8.3	7.5	8.9	8.8	7.9	6.9	7.4	7.9	6.9	5.6	4.3	5.7	6.8	6.7	6.3
26	6.8	6.9	5.5	2.9	4.6	3.5	4.0	4.7	5.9	6.1	5.9	4.5	4.0	3.3	2.8	3.6	3.3	2.3	2.9	2.3	3.8	4.4	3.3	3.9	4.2
27	3.4	3.7	3.3	3.0	3.3	3.4	3.8	3.2	3.2	2.6	2.9	1.6	1.6	1.7	1.8	2.7	2.0	1.3	2.0	3.0	3.2	2.5	3.7	3.4	2.8
28	3.1	3.8	4.2	2.8	1.5	2.4	3.0	3.1	1.2	0.9	1.1	1.5	2.7	4.1	5.2	5.1	5.5	4.9	3.7	3.8	1.9	2.1	2.7	3.8	3.1
29	4.1	3.6	2.9	2.2	3.0	2.9	2.1	2.4	1.5	0.8	1.1	1.7	3.5	3.3	2.7	2.8	3.9	4.6	4.3	5.2	5.0	2.5	2.9	3.8	3.0
30	4.1	4.4	3.5	3.4	3.5	3.8	3.3	2.8	3.0	2.7	1.9	2.0	1.6	2.2	2.2	2.5	3.2	4.0	4.0	2.0	2.2	3.5	3.5	3.3	3.0
HRAVE	2.8	2.7	2.7	2.6	2.8	2.6	2.7	2.7	2.6	2.4	2.4	2.5	2.8	3.1	3.7	4.1	4.5	4.7	4.3	3.4	3.3	2.8	2.9	2.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.8	2.3	3.2	2.8	2.4	2.8	3.5	2.1	3.4	2.4	3.1	3.0	3.9	2.5	3.0	2.9	2.7	2.8	4.4	3.7	3.4	1.9	2.1	2.9	6.3
MAX	6.2	5.4	8.7	4.9	5.3	5.4	6.1	3.4	8.0	4.2	6.0	5.2	12.4	5.7	7.7	5.1	6.6	6.6	12.1	6.8	6.4	4.0	4.8	4.9	9.2
MIN	0.9	1.1	1.6	1.3	1.0	1.9	1.6	1.3	1.3	0.9	1.2	1.1	1.5	1.0	0.6	1.3	1.2	1.2	1.1	1.5	1.3	0.8	0.4	1.6	3.2

DAY	26	27	28	29	30	31
AVE	4.2	2.8	3.1	3.0	3.0	***
MAX	6.9	3.8	5.5	5.2	4.4	***
MIN	2.3	1.3	0.9	0.8	1.6	***

MONTHLY AVERAGE = 3.1 MONTHLY MAXIMUM = 12.4 MONTHLY MINIMUM = 0.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	64	114	111	93	68	78	77	162	154	139	153	142	155	175	186	149	157	194	208	209	140	102	114	156	157
2	293	103	263	81	89	83	63	107	122	123	149	200	223	287	267	281	279	224	155	125	126	115	120	123	71
3	124	96	86	78	48	73	102	115	134	165	144	143	181	188	271	203	156	152	163	169	116	86	142	122	7
4	139	123	105	103	126	143	129	138	129	140	125	176	164	158	156	163	172	293	299	148	149	112	132	152	129
5	128	123	128	131	130	150	141	127	133	140	91	63	92	155	172	167	168	125	85	165	124	109	120	119	6
6	109	136	100	108	115	117	116	122	143	157	153	158	260	298	279	232	273	288	268	296	303	306	268	131	344
7	121	102	107	87	108	89	109	120	145	148	232	282	266	261	268	285	300	292	300	309	27	56	57	107	223
8	140	86	108	119	105	126	136	117	135	140	139	159	163	163	143	186	262	168	132	131	264	204	129	132	134
9	289	294	283	200	145	123	128	109	130	155	141	272	279	285	283	304	300	308	297	302	297	298	312	295	290
10	140	122	312	184	308	313	342	303	152	180	192	212	217	281	285	179	164	175	177	151	128	124	120	101	275
11	91	114	141	109	100	112	141	129	139	151	240	286	273	282	292	281	274	282	292	296	306	287	161	120	357
12	118	120	109	109	112	109	115	119	153	155	152	146	218	161	182	87	61	4	302	322	346	285	286	194	258
13	142	115	112	117	109	117	121	102	149	143	142	161	194	276	299	329	320	256	113	46	332	36	251	102	80
14	110	121	106	122	83	80	89	95	111	146	224	291	288	284	293	294	285	307	301	198	311	289	219	249	116
15	211	149	91	90	95	180	305	321	292	268	224	233	228	297	267	220	213	226	230	272	133	124	130	155	23
16	265	208	122	133	103	126	110	106	117	149	330	238	219	226	265	260	264	252	268	295	302	210	189	124	163
17	115	132	139	125	124	131	112	112	133	159	171	132	13	247	227	238	272	302	311	298	297	152	126	117	213
18	105	107	91	99	94	104	93	118	131	144	161	190	239	307	284	295	301	291	295	302	289	298	158	113	157
19	126	120	98	127	114	100	99	130	128	110	234	267	282	272	189	159	160	158	139	132	138	135	111	116	246
20	110	94	68	61	65	85	67	69	67	69	61	51	87	151	348	320	240	226	231	283	158	70	95	148	152
21	133	147	109	122	105	95	109	129	132	133	117	90	68	74	58	76	64	49	50	47	308	229	70	43	246
22	198	172	261	201	145	175	274	308	49	40	270	285	327	122	167	158	213	185	279	277	281	300	300	199	79
23	317	123	117	129	139	117	125	126	144	151	214	238	218	243	234	182	153	241	292	301	294	255	131	105	85
24	82	98	121	112	115	109	107	104	130	142	141	128	80	234	324	153	99	81	99	77	101	77	74	104	354
25	97	102	88	88	72	105	97	79	85	102	105	76	80	79	89	89	84	84	89	85	80	66	69	73	329
26	72	69	92	121	77	104	90	127	92	72	67	139	161	149	139	187	177	171	91	99	70	70	94	110	285
27	106	107	111	109	112	104	109	111	131	147	159	137	143	109	152	264	248	269	237	307	302	133	121	111	125
28	123	110	127	118	93	119	116	105	141	259	189	235	280	291	283	276	278	284	299	312	290	150	107	108	249
29	116	113	111	110	108	114	114	122	146	238	243	278	272	285	269	266	281	278	299	307	293	200	124	115	308
30	108	114	112	120	106	117	107	119	141	141	148	147	159	149	244	306	271	286	299	288	121	121	101	102	224

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	15	14	13	12	13	12	11	20	9	15	23	37	44	30	36	27	27	17	16	27	13	8	15	32	20
2	53	31	32	34	14	27	57	19	18	28	26	36	32	26	68	26	20	21	8	40	12	20	14	7	28
3	9	24	12	18	14	16	17	18	16	18	22	28	26	35	49	22	14	11	12	19	11	23	8	8	19
4	16	12	12	12	9	7	8	9	22	39	33	63	41	24	15	12	23	9	16	35	11	13	10	9	19
5	13	16	10	6	9	5	9	14	11	14	12	9	22	28	25	15	12	23	20	7	17	10	10	6	13
6	12	7	9	11	8	7	8	8	13	16	21	23	45	50	35	41	40	24	10	7	6	5	15	10	18
7	7	11	13	14	14	9	11	12	22	29	27	21	21	22	21	23	13	12	8	7	18	12	11	25	16
8	9	14	21	6	12	13	12	33	10	15	18	17	19	14	24	37	20	12	13	13	51	33	9	14	18
9	31	6	11	29	7	10	9	12	14	25	35	36	27	27	22	12	9	10	9	7	7	8	9	13	16
10	32	13	40	25	13	9	58	21	34	13	15	28	34	24	12	23	12	12	10	12	11	9	13	10	20
11	10	11	13	10	8	18	13	13	23	36	38	38	22	23	20	16	12	10	8	7	6	37	35	16	19
12	10	8	9	8	10	10	10	9	14	17	26	71	47	34	43	21	15	23	9	13	41	27	52	39	23
13	9	11	9	10	10	6	7	11	15	23	24	28	67	34	17	17	9	16	26	30	27	41	51	16	21
14	32	8	23	13	8	9	8	14	27	52	47	34	32	29	20	15	22	15	38	49	17	50	37	48	27
15	34	32	62	51	54	63	36	53	32	42	25	19	19	17	12	17	14	16	13	65	44	10	24	14	32
16	45	20	8	10	11	16	10	12	18	36	53	49	20	22	27	18	18	16	11	6	5	55	31	9	22
17	8	26	17	6	9	8	9	11	19	50	55	63	51	58	28	24	20	12	10	7	16	12	9	6	22
18	8	9	10	10	10	10	26	22	19	25	51	50	42	39	19	20	14	9	8	8	6	10	34	13	20
19	16	7	8	10	9	8	22	14	15	56	42	27	27	35	31	12	9	9	10	10	7	10	10	14	17
20	16	12	7	12	7	12	10	9	11	12	18	31	44	52	45	31	24	25	12	34	30	49	11	29	23
21	34	24	10	11	8	9	12	15	14	10	12	16	16	15	19	14	17	17	15	19	20	57	46	22	19
22	67	61	43	39	17	34	33	9	37	57	27	23	29	21	12	32	34	16	9	9	17	9	27	41	29
23	22	50	30	10	7	10	9	11	15	28	36	34	36	38	34	33	25	15	8	7	5	31	9	7	21
24	7	12	20	9	8	9	9	13	19	20	25	30	29	40	28	43	17	13	9	21	17	13	14	16	18
25	10	14	17	12	11	24	14	8	9	10	12	14	16	16	17	22	17	12	10	8	17	7	7	9	13
26	8	19	14	34	23	31	15	18	12	13	14	24	17	39	29	23	19	17	18	18	8	9	14	8	19
27	7	7	8	7	6	7	7	7	10	18	15	33	35	30	58	29	30	22	18	9	35	8	7	9	18
28	8	11	12	8	15	9	7	8	44	32	52	34	24	23	18	16	8	7	7	6	11	17	8	6	16
29	7	7	8	9	9	7	12	9	20	46	33	34	16	26	27	25	17	7	6	6	4	22	10	6	15
30	7	7	7	6	10	8	9	8	12	17	20	30	44	39	54	56	49	9	13	31	17	10	9	10	20
HRAVE	19	17	17	15	12	14	16	15	18	27	29	33	31	30	29	24	19	15	13	18	17	21	19	16	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20	28	19	19	13	18	16	18	16	20	19	23	21	27	32	22	22	20	17	23	19	29	21	18	13
MAX	44	68	49	63	28	50	29	51	36	58	38	71	67	52	65	55	63	51	56	52	57	67	50	43	24
MIN	8	7	8	7	5	5	7	6	6	9	6	8	6	8	10	5	6	6	7	7	8	9	5	7	7

DAY	26	27	28	29	30	31
AVE	19	18	16	15	20	***
MAX	39	58	52	46	56	***
MIN	8	6	6	4	6	***

MONTHLY AVERAGE = 20.1 MONTHLY MAXIMUM = 70.9 MONTHLY MINIMUM = 3.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
SEPTEMBER - 2015

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	21.6	21.2	21.3	21.8	21.7	21.9	22.3	22.4	23.4	25.0	26.8	28.9	30.9	32.1	33.2	33.4	33.5	33.4	32.9	32.0	30.1	29.8	29.4	27.6	27.4
2	26.4	25.9	25.8	25.4	24.9	24.7	24.4	24.5	25.6	27.7	29.9	31.6	32.3	32.4	34.3	35.0	34.5	33.3	31.9	31.0	30.3	29.4	28.6	27.6	29.1
3	27.2	26.9	26.2	26.0	26.0	25.3	24.2	24.7	26.6	28.1	29.4	31.2	31.2	32.4	32.1	30.9	29.1	26.7	24.8	24.2	24.0	24.1	23.6	22.5	27.0
4	22.1	21.5	21.5	21.4	20.7	19.9	20.2	21.7	24.1	25.7	28.0	29.5	30.9	31.6	31.5	31.0	29.9	25.9	25.4	25.9	26.3	26.4	25.9	25.2	25.5
5	24.9	24.4	24.2	23.8	23.8	23.2	23.0	23.4	23.2	22.7	22.1	22.6	24.7	26.1	27.4	28.1	27.4	27.1	27.1	26.7	26.4	25.7	25.0	24.3	24.9
6	23.6	22.8	22.5	21.8	21.1	20.9	20.9	22.5	25.1	27.4	29.5	31.5	33.5	34.5	35.7	36.0	35.7	35.4	34.5	32.9	32.0	31.6	30.5	28.6	28.8
7	28.1	27.7	27.2	26.6	25.4	25.2	24.8	27.3	28.8	31.0	32.3	33.3	35.1	36.1	37.1	37.1	36.5	35.6	34.3	33.6	33.3	32.2	31.8	31.2	31.3
8	30.2	30.1	28.9	28.3	28.2	27.2	26.9	27.0	25.5	26.4	28.4	29.9	30.9	31.6	33.4	34.0	33.4	33.0	31.6	30.7	30.1	29.5	28.9	28.2	29.7
9	27.3	27.2	27.2	26.1	25.3	24.8	24.8	25.4	27.1	29.5	30.8	31.4	31.8	33.0	34.0	33.2	32.3	31.5	30.8	30.3	29.9	29.6	29.4	29.2	29.2
10	28.3	27.7	27.9	27.5	27.0	26.9	26.5	26.1	26.3	26.9	27.9	28.9	29.8	30.5	30.1	28.7	28.0	27.6	26.7	26.2	26.0	25.6	24.9	24.2	27.3
11	24.1	23.5	22.0	22.4	22.5	21.3	21.2	23.2	25.5	27.8	29.6	31.2	33.6	34.8	35.5	35.6	35.5	34.8	33.3	32.2	31.5	30.6	29.1	28.5	28.7
12	27.8	27.2	27.0	26.2	25.3	24.9	24.6	26.1	28.4	31.1	33.2	35.0	37.2	38.3	39.5	36.8	35.5	34.1	31.5	31.8	31.3	30.4	29.4	28.7	30.9
13	28.3	28.0	27.4	26.6	26.0	25.5	24.7	26.1	28.4	30.9	33.5	34.6	36.0	37.2	36.4	35.9	35.2	27.7	25.5	25.5	24.4	24.5	24.2	23.9	29.0
14	23.9	23.2	23.1	22.7	22.8	23.0	22.9	24.8	26.6	28.2	29.8	31.3	32.3	33.5	34.3	34.2	31.1	27.9	26.6	27.5	27.2	27.7	26.9	27.0	27.4
15	26.7	26.5	25.8	25.7	25.4	24.9	24.4	25.2	27.1	29.1	31.6	32.9	33.8	30.8	31.2	30.5	30.9	30.2	28.5	27.6	27.3	27.2	27.1	26.3	28.2
16	26.4	25.9	25.0	24.6	24.2	23.5	23.3	25.4	27.1	29.3	29.4	31.8	34.0	34.5	34.2	33.5	33.2	32.9	31.7	30.3	29.4	28.9	28.2	27.2	28.9
17	27.1	26.5	25.2	24.4	23.7	22.9	22.9	24.5	26.5	28.8	30.8	32.3	33.0	34.3	36.2	35.9	35.1	33.5	32.2	31.0	29.9	28.6	27.7	27.1	29.2
18	26.4	25.6	24.8	23.4	23.1	22.6	21.8	23.5	26.7	28.8	31.2	33.6	34.3	34.6	35.5	35.8	35.3	34.3	33.0	31.9	30.7	30.0	29.1	28.8	29.4
19	27.4	27.0	27.1	25.9	25.0	24.6	24.6	25.0	27.9	29.5	31.5	33.4	35.3	36.4	34.5	33.5	31.8	29.8	28.4	27.7	27.3	26.5	26.4	26.0	28.9
20	25.5	25.0	24.9	24.7	24.4	23.5	24.1	25.4	27.0	28.9	30.6	32.1	34.1	35.0	35.7	36.2	36.9	36.4	34.6	33.2	32.1	31.4	30.4	29.4	30.1
21	28.7	28.2	27.6	26.8	26.6	26.6	26.3	25.7	26.0	25.4	22.6	22.9	22.9	22.9	23.0	21.8	21.1	20.7	21.0	20.5	19.7	19.5	19.7	20.0	23.6
22	20.3	20.3	20.5	20.3	20.1	19.9	20.0	20.3	20.8	21.8	22.6	22.1	22.8	25.5	25.1	26.1	27.4	27.1	26.2	25.6	25.1	24.2	23.0	22.7	22.9
23	22.9	22.2	21.7	21.2	21.1	20.6	20.8	22.1	23.8	25.6	26.8	28.4	30.4	31.1	31.9	32.5	32.2	32.0	30.4	28.7	28.1	27.0	25.7	25.1	26.3
24	24.2	23.6	22.6	22.5	22.1	21.7	21.4	22.9	24.2	26.8	29.0	32.0	33.8	35.2	35.6	36.3	35.7	35.1	34.2	32.5	30.7	30.1	29.2	27.7	28.7
25	27.4	25.5	25.5	24.9	24.2	23.5	23.5	25.8	28.4	29.9	31.2	32.2	33.0	33.4	33.8	33.9	33.8	33.3	32.4	31.5	30.5	29.6	29.0	28.9	29.4
26	28.4	27.4	26.7	25.0	25.7	24.6	24.8	24.1	27.8	29.7	31.5	34.1	35.0	35.8	35.8	36.2	35.7	34.7	33.2	31.9	30.6	29.5	27.3	26.4	30.1
27	25.2	24.8	23.8	22.5	22.0	21.5	21.2	22.5	25.1	27.8	30.4	32.2	34.0	35.5	36.3	36.2	36.1	35.2	33.7	31.8	31.2	28.4	27.3	26.3	28.8
28	25.0	24.3	23.8	23.1	22.3	21.1	21.3	22.3	24.2	26.2	30.0	31.9	33.8	35.4	35.8	35.6	34.6	33.5	32.0	31.6	30.8	28.8	27.5	26.7	28.4
29	25.7	24.6	23.5	22.5	22.0	21.5	21.0	22.2	23.9	26.4	29.1	31.5	33.8	35.4	36.1	36.6	36.4	35.3	33.5	32.5	31.5	29.9	28.3	27.5	28.8
30	26.7	25.7	24.5	23.4	22.9	22.1	21.9	23.1	25.4	28.0	30.7	33.3	35.7	37.8	38.2	38.1	38.0	37.1	35.0	33.4	31.4	30.1	29.1	28.0	30.0
HRAVE	25.9	25.4	24.8	24.2	23.9	23.3	23.2	24.2	25.9	27.7	29.3	30.9	32.3	33.2	33.8	33.6	33.1	31.8	30.6	29.7	29.0	28.2	27.4	26.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	27.4	29.1	27.0	25.5	24.9	28.8	31.3	29.7	29.2	27.3	28.7	30.9	29.0	27.4	28.2	28.9	29.2	29.4	28.9	30.1	23.6	22.9	26.3	28.7	29.4
MAX	33.5	35.0	32.4	31.6	28.1	36.0	37.1	34.0	34.0	30.5	35.6	39.5	37.2	34.3	33.8	34.5	36.2	35.8	36.4	36.9	28.7	27.4	32.5	36.3	33.9
MIN	21.2	24.4	22.5	19.9	22.1	20.9	24.8	25.5	24.8	24.2	21.2	24.6	23.9	22.7	24.4	23.3	22.9	21.8	24.6	23.5	19.5	19.9	20.6	21.4	23.5

DAY	26	27	28	29	30	31
AVE	30.1	28.8	28.4	28.8	30.0	***
MAX	36.2	36.3	35.8	36.6	38.2	***
MIN	24.1	21.2	21.1	21.0	21.9	***

MONTHLY AVERAGE = 28.3 MONTHLY MAXIMUM = 39.5 MONTHLY MINIMUM = 19.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	-0.1	-0.5	-0.9	-0.8	-0.9	-0.9	-1.0	-0.9	-0.7	-0.4	-0.3	0.0	0.3	0.2	0.2	0.3	0.7	-0.2
2	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.1	-0.3	-0.7	-0.9	-0.7	-0.7	-0.5	-0.8	-0.8	-0.4	-0.1	0.1	0.3	0.2	0.3	0.3	0.4	-0.1
3	0.3	0.4	0.4	0.3	0.2	0.4	0.3	-0.2	-0.8	-0.9	-1.0	-1.1	-0.6	-1.1	-0.6	-0.3	-0.1	-0.4	-0.2	-0.2	-0.1	0.0	0.1	0.1	-0.2
4	0.2	0.1	0.2	0.3	0.5	0.4	0.2	-0.8	-1.0	-0.8	-1.2	-1.0	-1.2	-1.5	-1.4	-1.0	-0.6	-0.4	-0.2	-0.1	-0.1	0.0	0.0	0.0	-0.4
5	0.0	0.0	0.1	0.1	0.1	0.1	0.0	-0.1	0.1	0.0	0.1	0.0	-0.4	-0.9	-0.9	-0.9	-0.6	-0.2	0.2	0.2	0.3	0.4	0.5	0.2	-0.1
6	0.2	0.3	0.3	0.5	0.3	0.4	0.3	-0.9	-1.1	-1.6	-1.4	-1.3	-1.0	-1.0	-1.2	-1.0	-0.6	-0.5	-0.1	0.3	0.3	0.4	0.6	0.3	-0.3
7	0.2	0.2	0.4	0.4	0.5	0.6	0.1	-1.2	-0.9	-1.1	-1.0	-0.8	-1.1	-1.0	-1.2	-1.0	-0.9	-0.4	-0.1	0.2	0.1	0.2	0.2	0.3	-0.3
8	0.4	0.4	0.4	0.2	0.2	0.4	0.2	0.2	0.4	-0.6	-0.9	-1.0	-1.1	-1.1	-1.1	-0.7	-0.4	-0.5	0.0	0.1	0.3	0.3	0.1	0.2	-0.1
9	0.4	0.5	0.2	0.3	0.2	0.1	0.1	-0.4	-0.9	-1.2	-1.0	-0.8	-0.7	-0.9	-1.0	-0.8	-0.5	-0.2	-0.1	0.0	0.0	0.1	0.1	0.2	-0.3
10	0.1	0.0	0.2	0.1	0.1	0.2	0.2	0.1	-0.3	-0.4	-0.6	-0.6	-0.8	-0.8	-0.8	-0.7	-0.8	-0.5	-0.2	-0.1	0.1	0.2	0.2	0.1	-0.2
11	0.2	0.4	0.2	0.2	0.2	0.2	-0.1	-0.7	-0.9	-0.8	-1.1	-1.1	-1.3	-1.3	-1.5	-1.2	-0.9	-0.7	-0.1	0.3	0.4	0.4	0.3	0.2	-0.4
12	0.3	0.4	0.3	0.2	0.2	0.2	-0.2	-1.1	-1.6	-1.8	-1.5	-1.1	-1.3	-1.5	-1.5	-0.4	-0.5	-0.2	-0.1	0.2	0.5	0.4	0.4	0.3	-0.4
13	0.2	0.2	0.3	0.2	0.3	0.2	0.1	-0.9	-1.5	-1.5	-1.9	-1.4	-1.0	-1.1	-0.6	-0.6	-0.2	0.3	0.2	0.4	0.4	0.4	0.3	0.3	-0.3
14	0.3	0.3	0.4	0.4	0.4	0.5	0.2	-0.8	-1.0	-0.8	-0.7	-1.0	-1.0	-1.1	-1.3	-1.1	-0.2	0.0	0.4	0.4	0.5	0.4	0.5	0.3	-0.2
15	0.4	0.4	0.4	0.4	0.4	0.2	0.4	0.0	-0.6	-0.8	-1.3	-1.6	-1.8	-1.3	-0.7	-0.6	-0.6	-0.4	-0.2	0.1	0.1	-0.1	0.0	0.0	-0.3
16	0.1	0.2	0.1	0.2	0.3	0.2	0.0	-1.3	-1.3	-1.2	-0.7	-1.0	-1.9	-1.7	-1.4	-0.8	-0.6	-0.4	-0.1	0.2	0.4	0.2	0.3	0.2	-0.4
17	0.3	0.2	0.2	0.2	0.2	0.3	-0.3	-1.0	-1.1	-1.0	-1.0	-1.4	-1.2	-1.1	-1.7	-1.2	-1.0	-0.5	-0.1	0.2	0.5	0.3	0.3	0.3	-0.4
18	0.2	0.3	0.3	0.4	0.3	0.4	0.1	-0.7	-1.2	-0.9	-1.0	-1.2	-1.2	-1.0	-1.3	-1.1	-0.7	-0.4	0.0	0.2	0.4	0.4	0.4	0.4	-0.3
19	0.6	0.3	0.3	0.5	0.5	0.5	0.0	-0.6	-1.5	-0.8	-0.7	-0.9	-1.2	-1.2	-0.8	-1.2	-0.9	-0.5	-0.1	-0.1	0.0	0.1	0.1	0.1	-0.3
20	0.2	0.2	0.0	0.0	0.1	0.2	-0.1	-0.8	-1.1	-1.5	-1.5	-1.5	-1.7	-1.2	-1.1	-0.9	-0.9	-0.5	-0.1	0.2	0.4	0.4	0.4	0.2	-0.4
21	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	-0.1	0.0	0.3	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	-0.1	-0.1	0.0	0.0	0.1
22	0.0	0.1	0.1	-0.1	-0.2	-0.1	0.0	0.0	-0.2	-0.4	-0.5	-0.2	-0.5	-1.0	-1.0	-0.5	-0.5	-0.2	0.1	0.3	0.3	0.2	0.2	0.2	-0.2
23	0.2	0.3	0.3	0.3	0.3	0.3	0.0	-0.8	-1.0	-0.9	-0.7	-0.7	-0.9	-0.8	-0.8	-0.8	-0.3	-0.2	0.4	0.5	0.3	0.4	0.5	0.4	-0.1
24	0.6	0.5	0.4	0.2	0.3	0.4	0.1	-0.8	-0.8	-1.1	-1.0	-1.3	-1.2	-0.7	-0.8	-0.7	-0.1	0.3	0.7	0.6	0.7	0.6	0.4	0.5	-0.1
25	0.6	1.2	0.8	0.9	0.7	0.3	0.4	-0.2	-0.9	-1.2	-1.6	-1.4	-1.2	-1.0	-0.9	-0.6	-0.1	0.2	0.4	0.5	0.4	0.4	0.3	0.4	-0.1
26	0.3	0.2	0.4	0.6	0.4	0.4	0.3	-0.4	-0.9	-1.2	-1.2	-1.7	-1.9	-1.5	-1.2	-1.2	-0.7	-0.2	0.5	0.5	0.7	0.6	0.6	0.6	-0.3
27	0.4	0.4	0.4	0.4	0.4	0.4	0.1	-0.9	-1.2	-1.5	-1.7	-1.1	-1.0	-1.1	-1.0	-0.8	-0.5	-0.2	0.4	0.6	0.7	0.5	0.5	0.4	-0.2
28	0.6	0.4	0.5	0.3	0.4	0.4	0.1	-0.7	-0.7	-0.6	-0.8	-1.0	-1.0	-1.1	-1.0	-0.8	-0.3	0.0	0.4	0.6	0.6	0.4	0.4	0.5	-0.1
29	0.4	0.3	0.4	0.4	0.4	0.3	0.0	-0.9	-0.8	-0.5	-0.6	-0.8	-1.0	-1.1	-1.0	-0.9	-0.7	-0.3	0.2	0.4	0.5	0.4	0.4	0.3	-0.2
30	0.3	0.2	0.3	0.3	0.2	0.2	0.0	-1.0	-1.4	-1.6	-1.3	-1.3	-1.2	-1.1	-1.0	-0.8	-0.6	-0.3	0.5	0.6	0.8	0.7	0.5	0.6	-0.3
HRAVE	0.3	0.3	0.3	0.3	0.3	0.3	0.1	-0.6	-0.8	-0.9	-1.0	-1.0	-1.1	-1.1	-1.0	-0.8	-0.5	-0.3	0.1	0.3	0.3	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.2	-0.1	-0.2	-0.4	-0.1	-0.3	-0.3	-0.1	-0.3	-0.2	-0.4	-0.4	-0.3	-0.2	-0.3	-0.4	-0.4	-0.3	-0.3	-0.4	0.1	-0.2	-0.1	-0.1	-0.1
MAX	0.7	0.6	0.4	0.5	0.5	0.6	0.6	0.4	0.5	0.2	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.6	0.4	0.3	0.3	0.5	0.7	1.2
MIN	-1.0	-0.9	-1.1	-1.5	-0.9	-1.6	-1.2	-1.1	-1.2	-0.8	-1.5	-1.8	-1.9	-1.3	-1.8	-1.9	-1.7	-1.3	-1.5	-1.7	-0.1	-1.0	-1.0	-1.3	-1.6

DAY	26	27	28	29	30	31
AVE	-0.3	-0.2	-0.1	-0.2	-0.3	***
MAX	0.7	0.7	0.6	0.5	0.8	***
MIN	-1.9	-1.7	-1.1	-1.1	-1.6	***

MONTHLY AVERAGE = -0.2 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = -1.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	703	703	702	702	701	701	701	702	702	702	702	702	701	700	700	699	699	699	699	700	700	701	701	701	701
2	701	701	701	701	701	702	702	702	702	702	702	702	701	700	700	699	699	699	699	700	700	700	700	701	701
3	700	700	700	700	700	701	701	701	701	701	701	700	700	699	698	698	699	699	699	700	700	700	700	700	700
4	700	699	699	699	699	700	700	700	701	701	700	700	699	699	699	698	698	699	699	699	700	700	700	700	699
5	700	700	700	700	700	700	700	701	702	702	703	702	702	701	701	701	701	701	700	701	701	701	701	701	701
6	701	701	701	701	701	702	702	702	702	702	702	702	701	701	700	699	699	699	699	699	700	700	700	700	701
7	700	700	700	700	700	700	701	701	702	701	701	701	700	699	699	698	698	698	698	698	699	699	699	699	700
8	699	699	699	699	699	700	700	701	701	702	701	701	701	700	699	698	698	699	699	699	700	700	700	700	700
9	701	700	701	701	701	701	701	701	701	701	701	700	700	699	699	698	698	698	699	699	700	700	700	701	700
10	701	701	700	700	701	701	701	701	702	702	702	702	702	702	701	701	701	700	701	701	701	701	701	701	701
11	701	701	701	701	701	701	702	702	702	702	702	701	701	700	700	699	699	699	699	700	701	701	701	701	701
12	701	701	701	701	701	702	702	702	703	703	702	702	701	700	699	698	698	698	699	699	699	700	700	700	700
13	700	700	700	699	699	699	700	700	700	700	700	699	698	697	697	696	696	696	698	698	699	700	700	699	699
14	699	699	699	699	699	699	699	700	700	700	700	700	699	698	698	697	697	697	697	697	698	698	699	699	699
15	699	699	699	699	700	700	701	701	701	701	701	701	700	700	700	699	699	699	699	700	700	700	701	701	700
16	701	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	699	700	700	700	700	701
17	700	700	700	700	700	701	701	701	701	701	701	701	700	699	699	698	698	698	698	698	699	699	699	699	700
18	699	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	698	699
19	698	698	698	698	698	698	699	699	699	699	699	699	699	698	698	698	698	699	699	700	700	701	701	701	699
20	701	701	701	700	701	701	701	702	702	702	702	701	700	699	698	698	697	697	698	698	698	699	699	699	700
21	699	699	699	699	699	699	699	699	699	699	700	699	699	698	697	697	697	697	698	698	699	700	700	700	699
22	700	700	700	700	700	700	701	701	702	702	702	702	702	701	701	700	700	700	700	700	701	701	701	701	701
23	701	701	701	701	701	701	701	702	702	702	702	701	701	700	699	699	699	699	699	699	699	700	700	700	700
24	700	700	700	700	700	701	701	701	702	702	701	701	701	700	699	699	699	699	699	699	700	700	701	701	700
25	701	701	701	702	702	702	703	703	703	703	703	703	702	701	701	700	700	700	700	701	701	701	701	701	702
26	701	701	701	701	701	701	702	702	702	702	702	702	701	700	699	699	699	699	699	699	699	699	699	699	700
27	700	700	700	700	700	700	700	701	701	701	701	700	700	699	698	698	698	698	698	698	699	699	699	699	699
28	699	699	700	700	700	700	700	701	701	701	701	701	700	699	698	698	698	698	698	698	699	699	699	699	700
29	700	700	700	700	700	700	700	701	701	701	701	701	700	699	698	698	698	698	698	698	699	699	699	699	699
30	699	700	700	700	700	700	701	701	701	701	701	701	700	699	699	698	698	698	698	699	699	700	700	700	700
HRAVE	700	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	699	699	700	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	701	700	699	701	701	700	700	700	701	701	700	699	699	700	701	700	699	699	700	699	701	700	700	702
MAX	703	702	701	701	703	702	702	702	701	702	702	703	700	700	701	702	701	700	701	702	700	702	702	702	703
MIN	699	699	698	698	700	699	698	698	698	700	699	698	696	697	699	699	698	697	698	697	697	700	699	699	700

DAY	26	27	28	29	30	31
AVE	700	699	700	699	700	***
MAX	702	701	701	701	701	***
MIN	699	698	698	698	698	***

MONTHLY AVERAGE = 700.0 MONTHLY MAXIMUM = 703.2 MONTHLY MINIMUM = 695.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	91	94	92	87	86	84	80	80	75	67	58	50	43	35	31	29	28	31	34	41	54	53	52	62	60
2	70	68	68	68	71	75	76	75	69	58	45	39	37	38	28	26	27	32	38	44	45	48	49	52	52
3	50	50	51	50	50	52	60	59	52	44	40	34	34	29	34	38	49	59	62	66	67	63	66	74	51
4	73	78	78	78	81	85	83	74	60	53	43	35	33	33	35	37	39	61	59	58	58	59	60	64	59
5	66	66	67	69	69	72	74	72	77	82	90	85	73	64	60	51	54	52	56	57	61	66	68	72	68
6	75	76	79	81	83	82	81	71	59	50	43	36	31	28	26	23	25	26	30	35	35	35	38	47	50
7	50	52	53	53	59	59	62	52	47	38	36	35	29	25	23	23	26	27	29	29	30	32	33	34	39
8	38	38	41	44	47	51	53	53	66	61	52	45	41	39	28	29	34	32	36	41	44	46	49	51	44
9	55	52	51	57	63	66	66	61	50	42	34	37	37	34	33	36	38	39	41	45	48	49	50	49	47
10	53	56	56	57	60	60	63	65	64	62	56	49	46	43	45	46	48	49	53	55	56	60	64	69	56
11	72	72	78	77	76	79	80	67	56	47	41	39	35	30	28	27	28	29	31	33	35	37	40	43	49
12	46	48	50	54	58	60	61	53	45	36	30	25	22	18	15	16	20	23	32	32	33	34	37	38	37
13	39	42	44	46	48	51	54	48	39	31	26	24	22	20	22	24	25	46	56	56	61	62	64	68	42
14	68	73	76	78	79	76	77	63	48	43	36	33	32	30	28	29	40	52	58	54	56	52	55	56	54
15	57	57	62	66	68	71	73	70	58	48	37	33	29	40	38	42	39	39	46	48	52	55	57	61	52
16	61	62	67	69	71	73	75	62	52	44	44	34	25	25	27	28	29	29	32	36	39	41	44	48	47
17	49	50	53	57	59	62	62	53	45	38	34	31	30	26	19	20	23	27	29	31	34	37	39	40	39
18	42	44	47	51	52	53	55	47	37	32	26	23	22	22	20	19	18	19	22	23	25	26	28	30	33
19	31	33	33	35	37	40	39	38	32	27	23	19	15	15	23	31	36	42	46	48	49	53	54	55	36
20	57	59	59	59	60	62	60	54	49	43	37	33	27	24	22	21	20	19	24	28	30	33	33	36	40
21	40	45	49	52	54	55	56	55	56	64	89	88	84	84	80	87	90	86	82	86	94	96	96	95	73
22	95	94	93	95	96	97	96	95	91	84	83	88	83	66	73	60	56	59	68	71	75	79	76	78	81
23	78	83	86	89	89	92	92	82	72	63	58	51	40	36	31	25	20	26	34	49	52	57	63	66	60
24	68	70	77	77	78	80	81	71	62	50	42	34	27	25	23	20	18	21	26	30	36	35	37	45	47
25	47	56	51	54	54	56	52	41	36	33	31	29	27	26	25	24	24	25	28	30	33	34	35	35	37
26	36	39	41	47	44	48	47	51	39	34	31	24	22	19	16	16	16	17	20	23	24	26	33	37	31
27	42	42	44	50	50	52	52	47	39	31	26	22	17	13	12	14	14	16	21	26	26	34	36	38	32
28	42	44	44	48	52	56	55	51	41	38	28	26	27	21	19	18	20	23	25	27	29	34	38	38	35
29	41	45	49	54	56	57	59	52	45	37	31	27	24	21	19	17	18	21	25	27	28	31	36	39	36
30	42	44	48	51	52	53	53	46	39	32	27	24	19	12	12	12	12	14	17	20	24	26	28	31	31
HRAVE	56	58	60	62	63	65	66	60	53	47	43	38	34	31	30	30	31	35	39	42	44	46	49	52	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	60	52	51	59	68	50	39	44	47	56	49	37	42	54	52	47	39	33	36	40	73	81	60	47	37
MAX	94	76	74	85	90	83	62	66	66	69	80	61	68	79	73	75	62	55	55	62	96	97	92	81	56
MIN	28	26	29	33	51	23	23	28	33	43	27	15	20	28	29	25	19	18	15	19	40	56	20	18	24

DAY	26	27	28	29	30	31
AVE	31	32	35	36	31	***
MAX	51	52	56	59	53	***
MIN	16	12	18	17	12	***

MONTHLY AVERAGE = 47.2 MONTHLY MAXIMUM = 96.6 MONTHLY MINIMUM = 11.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.11	0.24	0.50	0.59	0.81	0.82	0.84	0.74	0.50	0.30	0.17	0.04	0.00	0.00	0.00	0.00	0.00	5.69
2	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.24	0.59	0.80	0.82	0.63	0.47	0.84	0.60	0.23	0.09	0.02	0.00	0.00	0.00	0.00	0.00	5.42
3	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.16	0.36	0.42	0.45	0.56	0.24	0.67	0.28	0.05	0.03	0.07	0.01	0.00	0.00	0.00	0.00	0.00	3.34
4	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.42	0.46	0.71	0.88	0.73	0.54	0.43	0.24	0.11	0.06	0.01	0.00	0.00	0.00	0.00	0.00	4.85
5	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.05	0.07	0.11	0.23	0.40	0.49	0.57	0.34	0.16	0.11	0.02	0.00	0.00	0.00	0.00	0.00	2.61
6	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.26	0.44	0.63	0.78	0.80	0.96	0.76	0.76	0.61	0.34	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.56
7	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.29	0.44	0.58	0.51	0.57	0.74	0.69	0.75	0.59	0.35	0.10	0.01	0.00	0.00	0.00	0.00	0.00	5.68
8	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.07	0.25	0.35	0.31	0.34	0.33	0.63	0.19	0.12	0.13	0.02	0.00	0.00	0.00	0.00	0.00	2.78
9	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.32	0.49	0.57	0.40	0.42	0.55	0.45	0.28	0.17	0.07	0.01	0.00	0.00	0.00	0.00	0.00	3.89
10	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.13	0.14	0.18	0.31	0.36	0.31	0.26	0.17	0.16	0.08	0.01	0.00	0.00	0.00	0.00	0.00	2.17
11	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.44	0.62	0.76	0.85	0.88	0.84	0.74	0.58	0.36	0.14	0.01	0.00	0.00	0.00	0.00	0.00	6.53
12	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.43	0.62	0.76	0.85	0.88	0.85	0.83	0.37	0.24	0.05	0.01	0.00	0.00	0.00	0.00	0.00	6.16
13	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.22	0.43	0.64	0.79	0.68	0.84	0.86	0.26	0.32	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	5.17
14	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.43	0.61	0.76	0.85	0.87	0.86	0.73	0.42	0.09	0.13	0.01	0.00	0.00	0.00	0.00	0.00	6.03
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.43	0.60	0.69	0.86	0.87	0.58	0.21	0.26	0.11	0.13	0.01	0.00	0.00	0.00	0.00	0.00	4.89
16	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.23	0.44	0.61	0.49	0.86	0.91	0.80	0.69	0.27	0.20	0.11	0.01	0.00	0.00	0.00	0.00	0.00	5.65
17	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.44	0.62	0.76	0.85	0.89	0.84	0.74	0.56	0.34	0.12	0.01	0.00	0.00	0.00	0.00	0.00	6.45
18	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.44	0.62	0.77	0.86	0.78	0.75	0.62	0.49	0.29	0.10	0.01	0.00	0.00	0.00	0.00	0.00	6.01
19	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.20	0.40	0.44	0.57	0.75	0.84	0.84	0.22	0.58	0.36	0.11	0.00	0.00	0.00	0.00	0.00	0.00	5.35
20	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.42	0.60	0.74	0.83	0.87	0.79	0.71	0.55	0.35	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.24
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.05	0.04	0.11	0.18	0.12	0.16	0.12	0.10	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.02
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.22	0.32	0.07	0.59	0.65	0.38	0.53	0.34	0.10	0.00	0.00	0.00	0.00	0.00	0.00	3.35
23	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.41	0.59	0.73	0.82	0.85	0.80	0.70	0.54	0.34	0.11	0.00	0.00	0.00	0.00	0.00	0.00	6.14
24	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.42	0.60	0.74	0.83	0.85	0.80	0.69	0.53	0.34	0.11	0.00	0.00	0.00	0.00	0.00	0.00	6.17
25	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.41	0.60	0.73	0.82	0.84	0.80	0.69	0.53	0.33	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.11
26	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.41	0.59	0.74	0.83	0.85	0.80	0.69	0.53	0.33	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.10
27	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.41	0.59	0.73	0.82	0.87	0.81	0.71	0.53	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.14
28	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.18	0.41	0.58	0.73	0.82	0.84	0.80	0.63	0.39	0.15	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.63
29	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.40	0.58	0.72	0.81	0.83	0.78	0.67	0.51	0.31	0.10	0.00	0.00	0.00	0.00	0.00	0.00	5.94
30	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.40	0.57	0.73	0.82	0.83	0.79	0.67	0.51	0.30	0.10	0.00	0.00	0.00	0.00	0.00	0.00	5.95
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.35	0.50	0.61	0.69	0.72	0.69	0.58	0.42	0.24	0.10	0.01	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.69	5.42	3.34	4.85	2.61	6.56	5.68	2.78	3.89	2.17	6.53	6.16	5.17	6.03	4.89	5.65	6.45	6.01	5.35	6.24	1.02	3.35	6.14	6.17	6.11
MAX	0.84	0.84	0.67	0.88	0.57	0.96	0.75	0.63	0.57	0.36	0.88	0.88	0.86	0.87	0.87	0.91	0.89	0.86	0.84	0.87	0.18	0.65	0.85	0.85	0.84
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.10	6.14	5.63	5.94	5.95	***
MAX	0.85	0.87	0.84	0.83	0.83	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.25
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.01	0.00	0.00	0.00	0.07
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.03	0.04	0.03	0.02	0.08	0.13	0.01	0.00	0.00	0.07	0.01	0.00	0.00	0.55
22	0.00	0.00	0.00	0.04	0.13	0.05	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.25	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.27	0.00	0.00	0.00
MAX	0.19	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 1.27 MONTHLY MAXIMUM = 0.19 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	2.9	2.9	2.4	2.8	3.5	3.4	3.3	3.3	2.3	0.8	1.2	2.0	1.3	1.8	1.9	2.6	4.3	4.2	3.5	4.1	3.6	1.5	2.4	3.3	2.7
2	3.2	1.9	1.9	3.0	3.5	4.6	3.5	3.3	2.4	2.1	2.0	3.4	4.7	4.0	5.7	7.8	7.8	6.1	4.1	3.5	3.0	2.2	1.5	1.5	3.6
3	1.5	1.7	2.0	3.0	2.7	3.4	3.0	2.3	1.5	1.5	2.4	2.8	3.0	5.5	6.1	6.3	6.8	5.2	4.0	2.9	1.4	1.7	1.4	2.3	3.1
4	2.1	3.3	1.7	2.8	2.3	2.5	2.5	2.7	3.0	4.0	7.5	7.1	5.9	5.4	4.4	3.7	3.1	2.5	2.2	2.7	1.8	1.6	2.2	3.3	3.3
5	5.0	4.5	4.4	3.6	1.8	2.5	2.2	2.7	1.8	1.7	4.5	6.5	4.2	5.2	7.7	8.7	9.3	8.6	9.7	7.7	3.1	3.1	1.6	1.8	4.7
6	3.2	1.5	1.8	2.9	3.3	2.5	1.6	1.3	1.2	1.2	1.8	2.8	5.0	4.6	1.7	2.6	4.1	6.2	3.4	2.0	2.0	2.6	2.8	1.5	2.7
7	2.0	1.9	1.7	2.4	3.2	5.1	1.9	1.6	2.7	2.2	1.1	1.8	3.9	2.2	2.5	2.3	2.5	3.2	5.4	4.5	3.1	1.2	1.2	2.9	2.6
8	3.1	3.8	3.8	2.9	2.8	2.6	3.1	3.0	3.3	3.3	2.9	2.3	2.0	2.2	2.6	4.1	4.3	3.6	2.2	2.8	2.8	1.2	3.3	3.8	3.0
9	3.6	3.3	3.0	2.9	2.6	3.8	3.9	2.6	2.7	4.8	7.7	8.5	9.2	9.1	10.8	10.3	9.9	8.5	7.0	5.3	3.8	4.0	6.7	7.0	5.9
10	7.1	9.0	7.7	6.1	7.7	7.8	7.5	7.6	8.3	7.9	6.6	6.0	6.1	5.8	4.7	3.3	4.1	4.2	5.2	4.2	4.3	5.0	3.7	3.5	6.0
11	3.3	2.9	3.1	3.3	3.0	3.2	2.5	1.3	2.3	1.8	1.6	1.6	1.8	2.5	3.7	4.2	5.6	5.4	4.5	4.6	4.5	1.8	2.3	2.9	3.1
12	3.4	3.2	1.7	1.4	2.8	2.8	2.6	1.7	1.4	1.4	1.0	2.5	4.5	5.6	5.9	5.8	5.8	5.7	5.2	4.1	1.5	2.0	2.9	3.0	3.2
13	3.0	3.2	2.7	1.0	2.0	2.1	3.0	2.2	1.9	1.0	1.0	2.8	3.9	4.3	5.0	4.9	5.0	4.8	4.7	4.3	2.9	1.7	2.4	3.3	3.0
14	3.7	4.1	2.8	3.3	3.7	3.1	3.0	2.6	2.5	1.7	1.5	1.5	1.5	2.2	2.2	2.4	2.4	2.8	3.8	4.4	1.2	2.7	2.7	3.3	2.7
15	3.4	3.3	3.8	3.3	2.7	2.3	3.5	2.8	3.1	2.8	1.7	1.7	4.3	3.9	3.9	2.6	4.2	4.5	7.7	3.2	5.7	3.9	2.4	2.1	3.4
16	2.4	3.2	2.1	3.1	3.0	3.5	3.7	3.6	2.6	2.6	3.2	3.6	3.3	10.6	10.5	10.8	10.1	7.0	7.7	3.1	3.5	7.6	6.8	6.1	5.2
17	6.3	7.8	10.0	10.0	9.1	7.9	8.6	9.8	8.3	7.2	8.8	7.3	6.7	7.0	8.7	8.1	8.3	8.0	6.9	6.8	6.6	5.3	2.2	3.7	7.5
18	5.1	7.5	6.5	4.8	3.2	4.4	5.7	4.6	5.4	4.4	3.1	2.7	2.5	2.8	3.8	3.3	2.8	5.0	2.6	2.6	4.4	3.8	5.3	5.2	4.2
19	3.9	1.2	1.3	1.4	2.7	3.4	2.5	1.2	1.7	1.3	2.0	1.5	2.2	4.8	6.0	7.4	6.3	6.1	5.3	3.8	1.8	1.1	1.9	2.5	3.1
20	2.8	2.0	1.8	1.5	1.0	1.4	2.4	1.6	2.1	4.3	4.7	3.6	3.2	7.1	6.0	9.4	9.6	4.5	3.6	5.3	3.7	2.7	5.3	3.5	3.9
21	3.7	3.6	3.6	4.4	3.9	3.7	4.0	4.5	2.3	2.6	1.6	1.9	1.4	2.3	1.3	1.0	2.4	2.6	2.5	2.3	1.5	1.6	1.2	0.6	2.5
22	1.9	1.6	1.5	2.2	2.1	2.7	2.9	2.5	2.1	1.5	1.5	1.9	4.7	4.9	4.9	4.7	4.9	4.0	2.4	2.6	1.6	2.0	2.0	2.3	2.7
23	2.4	3.2	3.0	3.1	2.8	2.7	2.8	2.3	2.3	1.7	1.3	2.0	3.2	4.1	3.5	4.3	5.4	5.6	5.0	4.2	2.9	1.1	2.8	2.9	3.1
24	2.4	3.2	3.7	3.7	4.3	5.0	4.5	4.1	3.5	2.8	4.2	3.6	3.2	6.2	5.9	7.7	5.3	5.9	5.8	3.0	3.5	3.0	7.9	9.4	4.7
25	9.3	9.5	9.0	8.3	8.6	8.2	9.2	10.2	10.0	10.3	9.4	8.6	8.1	7.4	6.8	6.3	6.7	7.0	6.8	6.5	6.2	6.2	5.9	5.6	7.9
26	4.7	5.8	5.0	5.5	4.4	5.2	5.4	6.3	5.8	4.0	4.5	3.8	3.6	2.0	1.7	3.1	3.2	3.1	3.5	4.3	2.3	0.9	2.3	2.6	3.9
27	3.5	3.4	3.6	1.8	2.3	3.5	2.7	2.2	2.1	1.5	1.3	1.2	2.9	3.8	3.9	5.2	5.6	3.3	1.2	1.3	1.8	1.9	3.0	3.5	2.8
28	3.8	3.5	3.5	2.9	3.7	3.4	3.2	3.0	2.1	2.0	1.2	0.9	1.3	1.2	1.5	1.5	2.1	2.3	1.5	1.6	2.4	3.3	3.5	4.2	2.5
29	4.4	1.9	2.8	3.1	2.8	1.9	3.4	4.4	2.6	5.5	6.0	7.6	6.7	6.4	7.3	8.0	3.6	4.3	4.3	5.2	3.3	2.7	3.5	5.4	4.5
30	2.8	1.8	2.6	1.4	3.0	2.4	3.7	3.5	2.8	1.7	1.8	2.0	2.4	4.2	7.0	4.6	5.5	4.2	2.3	0.9	2.1	2.5	2.9	1.5	2.9
31	1.3	2.5	2.2	1.8	1.1	2.0	2.6	2.1	2.4	1.4	0.8	1.3	1.5	1.9	2.4	3.6	4.9	5.4	4.7	2.4	1.6	2.6	3.1	3.5	2.5
HRAVE	3.6	3.6	3.4	3.3	3.4	3.6	3.7	3.5	3.2	3.0	3.2	3.4	3.8	4.5	4.8	5.2	5.3	5.0	4.5	3.8	3.0	2.7	3.2	3.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.7	3.6	3.1	3.3	4.7	2.7	2.6	3.0	5.9	6.0	3.1	3.2	3.0	2.7	3.4	5.2	7.5	4.2	3.1	3.9	2.5	2.7	3.1	4.7	7.9
MAX	4.3	7.8	6.8	7.5	9.7	6.2	5.4	4.3	10.8	9.0	5.6	5.9	5.0	4.4	7.7	10.8	10.0	7.5	7.4	9.6	4.5	4.9	5.6	9.4	10.3
MIN	0.8	1.5	1.4	1.6	1.6	1.2	1.1	1.2	2.6	3.3	1.3	1.0	1.0	1.2	1.7	2.1	2.2	2.5	1.1	1.0	0.6	1.5	1.1	2.4	5.6

DAY	26	27	28	29	30	31
AVE	3.9	2.8	2.5	4.5	2.9	2.5
MAX	6.3	5.6	4.2	8.0	7.0	5.4
MIN	0.9	1.2	0.9	1.9	0.9	0.8

MONTHLY AVERAGE = 3.8 MONTHLY MAXIMUM = 10.8 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	92	96	96	110	102	120	105	113	136	89	183	156	209	286	243	265	259	270	300	311	317	173	123	109	346
2	107	197	120	97	115	113	101	107	143	134	143	282	295	274	257	280	302	296	288	303	304	303	259	163	207
3	139	143	134	97	107	101	99	101	141	122	136	121	235	221	250	259	288	279	280	289	231	157	134	156	259
4	263	258	255	115	127	100	116	90	107	146	154	151	162	162	169	168	181	253	233	291	299	168	147	279	103
5	301	300	291	290	303	81	286	333	131	139	213	287	304	280	246	239	248	248	275	287	348	317	329	288	241
6	300	270	285	285	296	295	266	157	133	109	127	199	287	289	133	157	292	301	297	266	145	126	104	152	237
7	287	299	123	121	238	311	280	186	116	121	111	351	69	94	94	160	219	293	305	303	327	132	129	116	44
8	116	116	111	132	108	111	114	96	130	141	137	155	182	293	288	272	268	278	281	294	173	106	118	122	48
9	112	114	123	121	125	91	95	102	116	117	97	98	96	94	98	100	93	94	94	100	138	122	93	74	125
10	65	71	81	87	82	80	76	77	80	81	82	92	79	108	77	37	26	27	36	31	53	51	46	114	232
11	109	124	110	124	107	101	102	123	133	144	152	161	215	270	265	267	272	281	301	301	304	246	128	118	228
12	114	110	112	94	118	110	108	130	128	132	169	253	298	293	280	291	277	283	299	298	249	127	119	111	12
13	106	107	125	100	115	120	117	114	129	138	236	273	274	291	272	272	272	282	297	295	277	157	124	121	223
14	117	113	127	117	115	118	107	123	119	120	141	147	250	258	260	277	272	278	294	298	81	120	102	103	245
15	103	107	102	117	127	116	101	110	112	148	146	260	298	284	291	279	220	138	84	80	141	116	121	141	303
16	128	130	118	111	120	129	124	132	124	151	161	149	139	110	99	97	89	331	301	310	112	129	142	120	77
17	101	76	81	72	77	76	69	74	70	107	107	78	64	77	74	69	70	71	80	83	93	293	212	69	196
18	71	53	70	115	134	78	81	82	74	121	161	168	160	130	158	171	254	301	34	100	47	30	66	67	302
19	44	338	105	152	139	131	114	124	110	176	271	249	276	278	285	294	308	305	305	299	258	229	136	134	68
20	105	105	301	137	151	131	141	130	272	294	299	312	307	252	257	286	294	302	249	16	80	23	54	27	81
21	96	85	55	58	43	117	292	120	98	85	91	25	293	294	136	219	283	277	315	298	133	126	100	32	133
22	114	91	117	113	117	102	98	95	100	157	262	262	291	291	289	286	280	284	297	295	289	136	113	122	262
23	110	100	107	119	93	112	92	108	122	126	167	270	263	276	267	270	279	304	300	311	306	101	130	108	102
24	128	116	144	142	123	123	123	119	140	97	48	52	64	81	98	96	73	77	76	88	66	86	70	80	340
25	71	71	79	71	79	73	74	73	72	70	75	72	65	63	56	42	38	35	45	48	58	58	54	60	321
26	69	68	72	68	73	71	68	63	70	69	62	62	70	85	86	279	273	272	309	302	318	84	117	101	201
27	98	124	100	119	98	89	116	111	110	130	130	203	299	294	279	281	278	290	301	209	152	135	119	116	30
28	103	118	116	117	122	116	115	123	132	105	128	131	127	177	79	47	285	301	304	131	124	105	100	106	24
29	84	102	113	84	14	33	331	71	69	61	57	41	40	65	70	7	55	136	86	89	81	45	75	64	263
30	104	116	94	94	133	89	57	65	76	135	119	143	266	272	303	295	303	318	249	147	120	107	117	89	258
31	121	113	114	115	93	133	123	124	112	153	167	261	242	267	257	259	273	298	305	223	150	115	110	105	343

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
OCTOBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	12	11	12	13	7	6	8	10	24	56	37	28	51	44	48	36	21	11	5	8	24	42	42	13	24
2	21	56	25	8	9	8	9	10	13	22	43	30	20	26	23	16	12	10	8	8	6	20	32	19	19
3	35	10	8	10	10	9	9	11	16	23	27	31	44	23	17	20	12	8	5	8	48	44	34	35	21
4	52	17	37	45	19	17	22	14	18	19	14	15	18	17	18	13	15	24	18	11	36	45	19	21	23
5	11	9	9	8	25	15	43	48	43	25	36	16	24	24	16	15	14	14	7	12	26	23	26	36	22
6	9	23	20	17	9	11	33	27	39	54	51	35	24	16	30	32	19	10	22	31	18	6	10	22	24
7	7	43	30	28	17	14	27	28	21	18	29	24	15	17	24	28	17	12	7	6	36	39	30	14	22
8	9	9	10	8	9	13	11	9	12	13	17	22	36	29	29	13	10	6	9	9	37	34	11	7	15
9	9	8	9	12	22	21	19	16	17	22	14	16	17	14	14	13	13	12	10	11	10	14	9	12	14
10	14	8	11	16	10	8	9	9	10	12	16	17	16	21	23	27	15	13	11	10	12	11	15	11	13
11	8	7	8	7	8	6	7	20	13	24	27	32	44	25	14	15	10	7	7	6	8	26	9	6	14
12	10	10	13	18	12	13	10	15	23	19	49	20	15	16	11	11	11	7	7	5	33	7	7	8	15
13	10	8	8	21	9	9	9	11	16	40	46	20	18	22	15	12	10	7	6	5	19	11	9	6	14
14	8	8	10	7	7	7	8	6	13	30	27	41	41	23	23	19	14	8	7	7	36	8	9	8	16
15	8	7	7	8	10	10	11	9	12	13	20	34	11	12	13	16	23	16	19	28	15	13	19	19	15
16	14	16	19	11	14	11	13	11	13	13	12	11	32	12	12	11	10	52	8	32	22	11	13	12	16
17	19	11	10	9	10	9	10	10	13	15	14	12	13	12	11	11	9	10	9	9	38	15	34	13	14
18	16	10	12	15	16	12	9	12	14	19	18	23	25	36	15	12	22	14	59	41	25	38	12	9	20
19	21	36	28	29	11	16	13	27	14	33	21	52	31	15	16	10	12	10	10	8	38	27	12	9	21
20	12	24	19	24	19	19	10	17	29	15	16	21	47	16	15	12	10	14	23	38	42	46	14	50	23
21	21	12	23	16	16	35	32	16	16	16	29	27	32	16	51	50	16	9	9	34	12	26	46	31	25
22	23	28	28	16	15	12	7	10	18	27	23	20	15	18	15	18	12	8	8	9	27	7	12	8	16
23	8	8	8	7	7	7	10	11	15	23	38	27	15	14	17	12	8	8	6	13	6	40	12	9	14
24	16	16	5	9	10	9	7	11	9	19	23	30	32	22	17	12	15	9	8	17	21	32	8	8	15
25	10	9	9	9	8	10	9	9	10	10	11	13	10	8	13	15	13	12	11	11	12	12	14	11	11
26	10	9	12	12	9	8	9	7	9	12	17	22	20	34	41	20	10	7	7	4	13	38	10	10	15
27	8	9	9	13	10	6	7	11	12	22	31	37	24	21	20	18	7	15	13	38	30	13	7	9	16
28	10	8	9	9	6	6	8	8	24	22	42	34	42	48	46	42	12	6	23	10	8	14	10	8	19
29	10	17	11	11	29	26	37	38	42	12	13	13	16	16	29	30	25	43	24	27	20	41	20	9	23
30	20	13	15	31	16	14	15	12	11	23	34	40	30	15	12	10	11	9	23	35	11	12	11	23	19
31	19	13	9	22	50	28	25	14	20	33	44	26	35	33	26	17	8	7	7	20	13	8	9	8	21
HRAVE	15	15	14	15	14	13	15	15	18	23	27	25	26	21	22	19	13	13	13	17	23	23	17	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	24	19	21	23	22	24	22	15	14	13	14	15	14	16	15	16	14	20	21	23	25	16	14	15	11
MAX	56	56	48	52	48	54	43	37	22	27	44	49	46	41	34	52	38	59	52	50	51	28	40	32	15
MIN	5	6	5	11	7	6	6	6	8	8	6	5	5	6	7	8	9	9	8	10	9	7	6	5	8

DAY	26	27	28	29	30	31
AVE	15	16	19	23	19	21
MAX	41	38	48	43	40	50
MIN	4	6	6	9	9	7

MONTHLY AVERAGE = 17.9 MONTHLY MAXIMUM = 58.6 MONTHLY MINIMUM = 4.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
OCTOBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	26.5	25.6	24.0	23.5	22.9	22.1	22.0	23.5	25.1	27.8	30.8	34.0	36.0	36.8	37.5	37.5	37.8	36.6	34.4	33.2	32.7	31.6	29.7	28.6	30.0
2	27.5	26.0	24.9	23.5	23.0	22.5	21.7	23.0	25.2	27.8	30.5	32.0	33.3	34.4	35.5	34.5	33.1	32.2	30.5	29.2	28.5	27.3	26.1	25.1	28.2
3	24.6	23.9	22.8	21.1	20.2	19.5	19.7	20.2	21.8	25.3	28.3	30.9	32.0	33.2	32.7	32.5	31.6	30.4	28.7	27.8	27.2	26.7	25.6	25.5	26.4
4	24.7	24.3	23.7	22.9	23.0	22.9	22.0	22.5	24.7	27.9	29.9	31.0	31.7	31.5	31.2	31.4	30.7	29.4	28.8	27.8	27.2	27.1	26.2	25.5	27.0
5	24.6	23.9	22.6	22.1	21.6	21.5	20.8	20.3	22.6	24.1	25.7	23.3	25.1	26.1	28.2	28.6	27.9	26.6	24.5	23.2	23.2	22.8	22.6	21.2	23.9
6	21.1	20.4	20.0	19.5	19.7	19.3	19.1	20.0	22.5	23.7	25.0	25.5	23.9	20.8	21.3	22.4	20.7	18.3	17.7	17.3	16.8	16.4	16.7	16.7	20.2
7	15.9	15.8	16.0	15.6	15.7	16.5	15.4	15.6	14.7	14.6	15.2	17.2	19.2	20.7	22.2	23.7	24.0	23.2	21.8	20.9	20.3	19.1	18.4	17.2	18.3
8	17.1	16.7	16.2	15.6	14.5	14.8	14.9	16.2	18.0	20.4	22.8	24.8	26.4	27.2	28.2	28.8	28.8	28.0	26.5	25.0	23.6	24.3	22.6	22.0	21.8
9	21.6	21.7	20.9	20.5	19.8	20.2	20.4	21.7	24.0	26.2	27.5	28.0	28.8	29.1	29.8	29.9	29.6	29.0	28.3	27.4	26.0	25.9	25.9	25.6	25.3
10	25.5	25.0	24.7	24.4	23.9	23.5	23.2	23.2	24.4	25.5	26.7	27.6	29.1	30.9	30.9	30.7	30.2	29.6	29.0	28.3	27.8	27.1	26.3	24.2	26.7
11	23.5	22.1	21.9	20.6	20.5	20.6	19.9	19.9	22.7	25.2	27.3	30.0	31.5	31.9	32.9	33.4	32.8	31.3	30.0	29.2	28.7	27.4	26.0	24.9	26.4
12	24.2	23.6	22.1	21.5	20.3	20.4	19.9	20.6	22.8	23.7	26.1	28.3	30.4	31.9	32.3	32.6	31.6	30.3	29.3	28.6	27.3	25.9	25.0	24.4	26.0
13	23.1	22.6	21.8	20.5	19.8	19.1	18.9	20.3	22.5	25.0	27.4	29.3	31.2	33.0	33.7	33.6	33.1	31.9	30.4	29.5	28.4	27.1	25.9	24.9	26.4
14	23.9	23.2	22.2	21.4	20.6	19.7	19.7	20.2	23.0	25.3	28.2	30.6	32.7	34.2	35.3	35.6	35.7	34.7	32.5	31.2	29.6	27.9	26.6	25.5	27.5
15	24.3	23.3	22.7	22.1	20.1	20.0	19.1	20.9	23.6	26.1	27.7	29.1	31.1	31.6	31.3	30.9	30.4	29.4	29.1	29.5	27.3	26.5	25.9	25.2	26.1
16	24.6	23.7	23.9	23.1	22.6	21.8	21.0	20.4	23.5	25.0	27.4	29.1	30.9	31.6	31.4	30.4	29.1	26.6	24.1	23.9	23.8	23.1	21.8	20.6	25.1
17	21.0	21.3	21.3	21.3	21.6	21.6	21.6	21.6	21.5	22.8	24.1	22.5	24.4	26.4	26.8	26.6	26.6	26.4	25.9	25.3	25.1	22.3	19.8	19.9	23.2
18	20.0	20.9	21.2	20.4	19.4	20.2	20.5	21.5	23.8	25.9	27.4	29.1	30.0	30.5	30.6	29.8	28.2	25.8	24.6	23.9	24.1	21.5	21.5	20.9	24.2
19	20.5	20.0	19.8	18.9	18.6	18.5	18.9	18.5	20.5	22.7	24.2	26.4	27.8	27.5	28.0	27.5	26.9	26.0	24.9	24.4	23.6	22.9	22.0	21.6	22.9
20	21.1	20.5	19.6	18.5	18.2	18.2	18.0	18.4	19.7	21.7	21.9	22.8	24.7	26.6	25.9	22.3	20.5	20.1	19.4	16.7	16.4	16.6	16.5	16.4	20.0
21	16.3	15.9	16.5	16.7	16.9	15.0	14.0	12.6	13.0	14.2	14.9	15.9	16.9	18.2	18.8	19.2	19.2	18.1	17.8	17.5	16.3	16.0	15.5	14.9	16.3
22	14.1	14.0	13.2	12.8	12.3	12.2	12.3	13.4	15.3	16.8	17.9	19.8	21.5	22.4	22.7	22.9	22.5	21.4	20.5	19.5	18.6	17.1	16.5	15.4	17.3
23	14.8	14.3	14.0	13.4	12.7	12.4	12.0	13.4	15.2	17.2	19.3	20.8	22.9	24.1	24.9	25.3	25.1	24.0	22.6	22.0	21.7	20.3	18.4	17.9	18.7
24	16.4	16.4	14.9	14.5	14.8	13.4	14.1	15.1	16.8	21.1	24.2	25.7	26.7	27.7	28.1	27.9	27.4	26.7	25.9	25.0	24.5	23.4	23.6	23.3	21.6
25	22.2	21.7	21.5	21.0	20.5	20.2	19.9	20.2	21.1	22.1	23.4	24.8	25.4	25.9	26.1	26.0	25.7	25.1	25.0	24.7	24.1	24.0	24.0	23.3	23.3
26	22.1	21.7	21.2	20.9	20.0	19.8	19.4	20.4	22.0	23.2	24.8	26.2	27.4	28.2	28.8	28.9	28.6	27.4	26.0	25.3	24.2	23.2	21.1	19.9	23.8
27	19.0	17.6	17.8	16.3	15.2	14.9	14.2	15.2	17.7	19.7	22.5	24.7	26.5	27.7	28.3	28.1	27.0	25.6	25.1	24.2	22.5	21.6	20.7	20.0	21.3
28	19.5	18.6	17.5	16.3	15.6	15.1	14.9	14.9	15.8	18.0	19.9	21.6	23.9	24.8	26.1	25.9	25.3	24.4	23.8	21.9	21.0	20.1	19.6	19.4	20.2
29	19.3	18.2	17.5	17.3	16.4	17.1	16.4	15.4	15.9	17.3	18.5	19.6	20.9	22.1	21.1	14.2	14.4	13.9	14.1	14.5	14.6	14.4	14.1	13.9	16.7
30	13.5	13.3	13.3	12.9	12.4	12.6	12.7	12.3	12.6	14.4	15.5	17.2	18.2	19.0	17.9	17.4	18.1	17.5	17.1	16.1	15.2	14.7	14.1	13.3	15.1
31	12.4	11.9	11.7	11.2	10.2	9.6	9.6	10.1	11.8	13.8	16.8	19.2	21.4	22.5	23.4	23.7	23.1	21.5	20.5	19.2	17.5	16.4	15.2	14.8	16.1
HRAVE	20.8	20.3	19.7	19.1	18.5	18.2	17.9	18.4	20.1	22.1	23.9	25.4	26.8	27.7	28.1	27.8	27.3	26.2	25.1	24.3	23.5	22.6	21.8	21.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	30.0	28.2	26.4	27.0	23.9	20.2	18.3	21.8	25.3	26.7	26.4	26.0	26.4	27.5	26.1	25.1	23.2	24.2	22.9	20.0	16.3	17.3	18.7	21.6	23.3
MAX	37.8	35.5	33.2	31.7	28.6	25.5	24.0	28.8	29.9	30.9	33.4	32.6	33.7	35.7	31.6	31.6	26.8	30.6	28.0	26.6	19.2	22.9	25.3	28.1	26.1
MIN	22.0	21.7	19.5	22.0	20.3	16.4	14.6	14.5	19.8	23.2	19.9	19.9	18.9	19.7	19.1	20.4	19.8	19.4	18.5	16.4	12.6	12.2	12.0	13.4	19.9

DAY	26	27	28	29	30	31
AVE	23.8	21.3	20.2	16.7	15.1	16.1
MAX	28.9	28.3	26.1	22.1	19.0	23.7
MIN	19.4	14.2	14.9	13.9	12.3	9.6

MONTHLY AVERAGE = 22.8 MONTHLY MAXIMUM = 37.8 MONTHLY MINIMUM = 9.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
OCTOBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.8	0.6	0.7	0.5	0.6	0.4	0.2	-0.9	-1.0	-0.6	-0.7	-1.2	-0.9	-0.9	-0.9	-0.9	-0.6	-0.2	0.5	0.5	0.3	0.4	0.5	0.6	-0.1
2	0.4	0.6	0.6	0.6	0.4	0.3	0.1	-0.9	-1.1	-1.2	-1.3	-1.1	-1.2	-1.1	-1.0	-0.9	-0.6	-0.3	0.2	0.3	0.5	0.5	0.5	0.4	-0.2
3	0.4	0.3	0.4	0.5	0.4	0.5	0.2	-0.7	-0.7	-0.9	-1.5	-1.7	-1.1	-1.5	-1.2	-1.0	-0.7	-0.2	0.3	0.5	0.3	0.3	0.3	0.2	-0.3
4	0.3	0.5	0.6	0.4	0.2	0.2	0.4	0.1	-1.1	-1.7	-2.0	-1.9	-1.8	-1.3	-0.9	-0.8	-0.3	-0.2	0.0	0.2	0.2	0.2	0.1	0.1	-0.4
5	0.0	-0.1	0.3	0.3	0.3	0.3	0.3	-0.1	-0.8	-0.9	-1.1	-0.6	-0.6	-0.4	-0.9	-0.9	-0.6	-0.2	0.0	0.0	0.1	0.1	0.2	0.2	-0.2
6	0.2	0.2	0.2	0.2	0.1	0.2	0.1	-0.5	-0.7	-0.8	-1.0	-1.0	-0.6	0.2	-0.2	-0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.4	-0.1
7	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.0	-0.2	-0.3	-0.6	-0.8	-0.7	-0.7	-0.4	-0.1	0.3	0.5	0.6	0.7	0.4	0.5	0.0
8	0.3	0.2	0.2	0.3	0.4	0.3	0.1	-0.9	-1.3	-1.4	-1.5	-1.2	-1.0	-0.8	-0.8	-0.8	-0.5	-0.1	0.5	0.7	0.3	0.4	0.5	0.5	-0.2
9	0.2	0.2	0.2	0.4	0.7	0.7	0.4	-0.3	-0.9	-1.3	-1.5	-1.2	-1.1	-0.7	-0.6	-0.4	-0.1	0.1	0.3	0.4	0.5	0.4	0.4	0.3	-0.1
10	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.0	-0.4	-0.7	-0.9	-0.9	-1.2	-1.3	-0.8	-0.4	-0.1	0.2	0.2	0.4	0.3	0.2	0.3	0.5	-0.1
11	0.4	0.4	0.3	0.4	0.3	0.3	0.3	-0.4	-1.2	-1.1	-0.9	-1.1	-1.0	-0.9	-1.0	-0.8	-0.6	-0.1	0.3	0.4	0.4	0.5	0.4	0.3	-0.2
12	0.2	0.3	0.5	0.5	0.3	0.3	0.4	-0.5	-0.7	-0.6	-0.6	-0.8	-0.8	-1.0	-1.0	-1.0	-0.3	-0.1	0.2	0.5	0.6	0.4	0.3	0.5	-0.1
13	0.5	0.4	0.3	0.5	0.4	0.4	0.3	-0.7	-1.0	-0.6	-0.6	-1.0	-1.0	-1.1	-1.0	-0.9	-0.6	-0.1	0.3	0.5	0.7	0.3	0.4	0.4	-0.1
14	0.4	0.3	0.3	0.3	0.2	0.2	0.1	-0.8	-1.5	-1.2	-0.9	-1.1	-0.9	-0.9	-0.8	-0.7	-0.5	0.0	0.5	0.6	0.5	0.6	0.7	0.6	-0.2
15	0.4	0.4	0.3	0.5	0.5	0.6	0.6	-0.8	-1.1	-1.4	-1.0	-0.8	-0.7	-0.8	-0.5	-0.2	-0.1	0.0	0.0	0.2	0.0	0.1	0.2	0.2	-0.1
16	0.2	0.3	0.5	0.4	0.6	0.5	0.3	0.2	-0.9	-1.1	-1.3	-1.2	-0.9	-0.9	-0.8	-0.3	-0.2	-0.2	-0.2	-0.1	0.0	0.0	-0.1	-0.1	-0.2
17	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.5	-0.8	0.1	-0.3	-0.6	-0.4	-0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.4	0.3	-0.1
18	0.1	0.2	0.2	0.2	0.5	0.5	0.4	0.0	-0.8	-1.3	-1.5	-1.5	-1.4	-1.0	-0.9	-0.4	-0.1	0.2	0.3	0.4	0.3	0.7	0.4	0.4	-0.2
19	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.1	-0.6	-0.6	-0.8	-0.8	-0.9	-0.8	-1.0	-0.8	-0.4	0.0	0.2	0.3	0.6	0.3	0.4	0.3	-0.1
20	0.3	0.3	0.6	0.4	0.4	0.2	0.2	0.0	-0.4	-0.7	-0.6	-0.5	-0.7	-0.9	-0.6	-0.3	-0.3	-0.2	0.1	0.4	0.3	0.3	0.2	0.2	-0.1
21	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.0	0.0	-0.5	-0.3	-0.3	-0.5	-0.5	-0.5	-0.3	-0.2	0.2	0.3	0.5	0.4	0.3	0.4	0.3	0.1
22	0.4	0.3	0.3	0.3	0.3	0.4	0.4	-0.6	-1.0	-0.6	-0.6	-0.6	-0.8	-0.7	-0.7	-0.7	-0.4	0.2	0.4	0.6	0.5	0.5	0.6	0.7	0.0
23	0.5	0.5	0.5	0.4	0.4	0.3	0.3	-0.7	-1.1	-0.9	-0.8	-0.7	-0.8	-0.8	-0.8	-0.7	-0.3	0.2	0.4	0.5	0.6	0.5	0.5	0.4	-0.1
24	0.6	0.8	0.8	0.5	0.5	0.2	0.4	-0.5	-1.0	-0.9	-0.7	-0.9	-1.0	-0.8	-0.7	-0.3	0.2	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.0
25	0.3	0.2	0.3	0.2	0.3	0.2	0.2	-0.2	-0.5	-0.6	-0.7	-0.8	-0.6	-0.5	-0.3	-0.2	-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	-0.1
26	0.3	0.3	0.3	0.3	0.3	0.4	0.3	-0.1	-0.4	-0.6	-0.8	-0.9	-1.1	-0.9	-0.7	-0.5	-0.3	0.2	0.6	0.8	0.4	0.4	0.5	0.6	0.0
27	0.6	0.4	0.5	0.3	0.5	0.7	0.3	-0.6	-1.2	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.5	-0.2	0.2	0.4	0.5	0.4	0.4	0.4	0.2	-0.1
28	0.2	0.2	0.3	0.4	0.3	0.1	0.1	-0.1	-0.3	-0.8	-0.7	-0.6	-0.8	-0.6	-0.6	-0.3	0.0	0.3	0.4	0.5	0.6	0.6	0.4	0.2	0.0
29	0.3	0.3	0.5	0.2	0.2	0.3	0.5	0.5	0.1	0.0	-0.2	-0.6	-0.6	-0.7	-0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.2	0.2	0.1
30	0.3	0.3	0.2	0.2	0.1	0.3	0.2	0.1	0.1	-0.6	-0.7	-0.9	-0.7	-0.7	-0.2	-0.4	-0.2	0.1	0.3	0.3	0.4	0.4	0.4	0.3	0.0
31	0.3	0.4	0.4	0.3	0.3	0.6	0.5	-0.4	-0.9	-0.7	-0.5	-0.5	-0.6	-0.6	-0.6	-0.5	-0.1	0.5	0.6	0.6	0.5	0.6	0.7	0.6	0.1
HRAVE	0.3	0.3	0.4	0.3	0.3	0.3	0.3	-0.3	-0.7	-0.8	-0.9	-0.9	-0.9	-0.8	-0.7	-0.6	-0.3	0.0	0.3	0.4	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	-0.2	-0.3	-0.4	-0.2	-0.1	0.0	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	0.1	0.0	-0.1	0.0	-0.1
MAX	0.8	0.6	0.5	0.6	0.3	0.4	0.7	0.7	0.7	0.5	0.5	0.6	0.7	0.7	0.6	0.6	0.4	0.7	0.6	0.6	0.5	0.7	0.6	0.8	0.3
MIN	-1.2	-1.3	-1.7	-2.0	-1.1	-1.0	-0.8	-1.5	-1.5	-1.3	-1.2	-1.0	-1.1	-1.5	-1.4	-1.3	-0.8	-1.5	-1.0	-0.9	-0.5	-1.0	-1.1	-1.0	-0.8

DAY	26	27	28	29	30	31
AVE	0.0	-0.1	0.0	0.1	0.0	0.1
MAX	0.8	0.7	0.6	0.5	0.4	0.7
MIN	-1.1	-1.2	-0.8	-0.7	-0.9	-0.9

MONTHLY AVERAGE = -0.1 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	700	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	699	699	699	699	699	700	700	700	700
2	699	700	700	700	700	700	700	700	700	700	699	699	698	697	696	696	696	695	695	696	696	696	696	696	698
3	696	696	696	695	695	696	696	696	696	695	695	694	693	693	692	692	692	692	692	693	693	694	694	695	694
4	695	695	695	696	696	696	696	697	697	697	696	696	695	695	694	694	694	694	694	695	695	696	697	697	695
5	697	698	698	698	698	698	699	700	700	700	700	700	700	699	699	699	699	700	700	701	702	702	702	703	700
6	702	702	702	702	703	703	704	704	704	704	704	703	702	702	702	702	701	702	702	703	703	703	703	703	703
7	702	702	702	702	702	703	703	704	704	705	704	704	704	703	702	701	701	702	702	702	703	703	703	703	703
8	703	703	703	703	703	703	703	703	703	703	703	703	702	701	700	700	700	700	700	701	702	702	702	702	702
9	702	702	703	703	703	704	704	704	705	705	705	704	704	703	703	703	703	703	703	704	704	704	705	705	704
10	705	705	705	705	705	705	705	706	706	706	706	705	704	704	703	703	702	703	703	703	703	703	703	703	704
11	703	703	703	703	703	704	704	704	704	704	704	703	702	701	701	701	700	700	701	701	701	702	702	702	702
12	702	702	702	702	702	702	703	703	704	704	704	703	702	702	701	701	701	702	702	702	703	703	704	704	702
13	704	704	704	704	704	705	705	705	706	706	705	705	704	703	703	702	702	702	702	703	703	703	703	703	704
14	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	700	700	700	700	701	701	701	701	702
15	701	701	701	701	701	701	702	702	702	702	702	702	701	701	701	701	701	701	700	700	701	701	701	701	701
16	701	701	701	701	701	702	702	703	703	703	702	702	701	700	700	700	701	702	702	702	703	703	704	703	702
17	703	703	702	702	702	703	703	703	703	704	704	703	702	702	701	701	701	701	701	701	701	703	703	703	702
18	702	702	702	702	702	702	702	703	703	703	703	702	701	700	700	700	699	700	700	700	701	701	701	701	701
19	701	701	701	701	701	701	701	701	702	702	701	701	700	699	699	698	698	698	698	699	699	699	699	699	700
20	699	699	699	698	698	698	699	699	699	699	699	698	698	697	696	697	697	698	698	698	699	699	699	699	698
21	699	699	698	698	698	699	700	701	701	701	701	701	700	700	700	700	700	700	700	700	701	701	701	701	700
22	701	701	701	701	701	701	701	702	702	702	702	702	701	700	700	700	700	700	701	701	701	701	701	701	701
23	701	701	701	701	701	702	702	702	702	702	702	702	701	700	699	699	699	700	700	701	701	701	701	701	701
24	701	701	701	701	701	701	702	702	703	703	703	702	701	701	700	701	701	701	701	702	702	702	703	703	702
25	703	703	703	703	703	704	704	704	705	705	704	704	703	702	702	702	702	701	701	701	701	701	702	701	703
26	701	701	701	701	701	702	702	702	702	703	702	702	701	700	700	700	699	699	700	700	700	701	701	702	701
27	702	701	701	701	702	702	702	703	703	703	703	703	702	701	701	701	701	701	701	701	701	701	702	702	702
28	702	702	702	702	702	702	702	702	703	703	703	702	701	700	700	699	699	699	699	699	698	699	698	698	701
29	698	698	697	697	697	697	698	698	698	698	698	697	696	695	694	696	695	696	696	696	696	696	696	695	696
30	695	695	695	695	695	696	696	696	697	697	697	697	697	696	696	697	697	698	699	699	699	700	700	700	697
31	701	701	701	701	701	702	702	703	704	704	704	703	703	702	702	702	702	703	703	704	704	704	704	704	703
HRAVE	701	701	701	701	701	701	701	702	702	702	702	701	701	700	700	699	699	700	700	700	700	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	698	694	695	700	703	703	702	704	704	702	702	704	702	701	702	702	701	700	698	700	701	701	702	703
MAX	702	700	696	697	703	704	705	703	705	706	704	704	706	704	702	704	704	703	702	699	701	702	702	703	705
MIN	699	695	692	694	697	701	701	700	702	702	700	701	702	700	700	700	701	699	698	696	698	700	699	700	701

DAY	26	27	28	29	30	31
AVE	701	702	701	696	697	703
MAX	703	703	703	698	700	704
MIN	699	701	698	694	695	701

MONTHLY AVERAGE = 700.7 MONTHLY MAXIMUM = 706.0 MONTHLY MINIMUM = 691.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
OCTOBER - 2015

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	34	35	40	41	43	46	46	41	35	29	24	18	14	12	11	10	10	11	15	17	18	19	23	25	26
2	27	29	33	35	39	40	41	38	33	27	22	21	19	16	14	16	18	19	22	24	23	25	26	28	27
3	29	30	32	38	40	43	42	40	35	26	25	19	18	14	15	15	17	20	25	26	26	28	31	35	28
4	36	34	35	38	37	38	41	42	39	37	35	29	27	28	29	28	30	34	36	39	43	42	44	46	36
5	53	58	67	67	71	74	77	81	66	56	48	63	56	51	39	35	33	34	47	54	55	55	56	62	57
6	62	66	68	70	69	71	71	66	53	44	40	45	52	70	69	62	72	83	87	90	94	95	92	90	70
7	94	96	96	97	98	90	87	85	95	97	93	80	62	55	48	41	43	48	55	60	64	71	76	83	76
8	81	81	82	83	91	88	86	80	67	57	47	41	36	34	29	29	29	31	36	44	52	50	55	58	57
9	60	58	61	64	67	64	61	57	46	39	34	33	31	30	26	24	25	28	32	34	39	40	40	42	43
10	43	45	46	48	49	51	52	53	50	47	42	41	36	30	29	32	34	36	36	36	38	41	43	51	42
11	57	64	66	70	70	68	68	71	57	46	38	32	29	29	26	25	27	29	32	33	34	38	43	48	46
12	50	52	56	60	65	65	67	63	53	49	40	38	34	31	28	26	30	33	34	35	39	45	49	51	46
13	54	56	59	66	68	71	71	63	53	43	37	36	31	26	24	24	24	25	29	31	33	36	41	43	44
14	47	50	52	56	60	62	63	58	47	38	32	27	21	15	9	6	7	9	15	18	23	25	25	28	33
15	33	34	42	45	50	51	51	46	39	33	28	25	23	24	25	27	28	29	29	27	34	39	40	42	35
16	44	51	54	57	57	59	61	62	49	43	37	32	27	24	25	27	30	42	57	58	59	62	62	70	48
17	66	63	62	62	60	60	57	57	59	55	48	61	54	43	40	42	42	42	43	46	47	61	80	82	55
18	81	73	69	74	80	71	67	61	51	44	39	35	32	29	32	35	42	52	56	58	56	76	72	74	57
19	78	83	83	90	91	90	89	88	76	63	61	50	42	48	46	47	48	51	54	55	59	62	65	68	66
20	72	74	78	83	83	83	82	77	71	62	61	55	44	35	35	53	60	62	67	81	81	80	80	81	68
21	80	80	73	72	69	83	93	96	94	84	80	73	70	61	59	62	60	67	69	68	78	81	85	90	76
22	92	92	94	95	95	97	96	90	77	69	65	58	46	43	39	39	41	46	50	54	60	68	72	78	69
23	83	84	85	85	91	91	94	85	70	59	52	50	45	40	37	35	36	39	45	46	47	55	63	66	62
24	72	73	75	76	75	82	77	71	65	46	33	31	27	23	20	18	22	26	28	32	35	37	37	37	47
25	41	44	46	47	48	49	49	48	45	41	38	36	35	35	35	36	37	38	39	39	40	41	40	42	41
26	46	47	48	49	52	52	53	48	41	37	33	30	27	24	24	25	26	28	30	31	36	39	45	49	38
27	52	57	57	63	68	69	72	69	54	45	37	33	26	23	21	21	22	25	28	29	32	35	37	40	42
28	42	44	49	53	54	56	57	56	53	45	39	35	27	26	21	24	27	29	32	39	41	42	43	41	41
29	41	46	49	50	53	50	61	73	74	65	58	53	49	44	51	86	86	92	89	79	74	77	81	80	65
30	83	86	87	90	95	95	93	93	93	84	74	64	60	57	62	63	65	69	71	79	84	88	90	94	80
31	97	97	97	97	98	98	98	98	85	71	56	36	29	29	31	33	33	36	37	41	51	60	66	68	64
HRAVE	59	61	63	65	67	68	68	66	59	51	45	41	36	34	32	34	36	39	43	45	48	52	55	58	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	26	27	28	36	57	70	76	57	43	42	46	46	44	33	35	48	55	57	66	68	76	69	62	47	41
MAX	46	41	43	46	81	95	98	91	67	53	71	67	71	63	51	70	82	81	91	83	96	97	94	82	49
MIN	10	14	14	27	33	40	41	29	24	29	25	26	24	6	23	24	40	29	42	35	59	39	35	18	35

DAY	26	27	28	29	30	31
AVE	38	42	41	65	80	64
MAX	53	72	57	92	95	98
MIN	24	21	21	41	57	29

MONTHLY AVERAGE = 51.1 MONTHLY MAXIMUM = 98.3 MONTHLY MINIMUM = 6.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
OCTOBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.40	0.58	0.72	0.81	0.83	0.78	0.67	0.50	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.91
2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.40	0.58	0.62	0.80	0.83	0.78	0.67	0.49	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.78
3	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.41	0.59	0.73	0.81	0.83	0.78	0.66	0.50	0.29	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.86
4	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.35	0.56	0.71	0.72	0.65	0.38	0.25	0.21	0.06	0.04	0.00	0.00	0.00	0.00	0.00	0.00	3.99
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.40	0.46	0.64	0.22	0.30	0.25	0.52	0.55	0.31	0.06	0.00	0.00	0.00	0.00	0.00	0.00	3.78
6	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.46	0.41	0.54	0.50	0.27	0.09	0.19	0.11	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.19	0.34	0.44	0.52	0.58	0.48	0.21	0.06	0.00	0.00	0.00	0.00	0.00	0.00	2.88
8	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.38	0.56	0.70	0.78	0.79	0.75	0.63	0.46	0.26	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.58
9	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.38	0.55	0.70	0.63	0.63	0.44	0.57	0.46	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.87
10	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.28	0.37	0.40	0.44	0.74	0.69	0.59	0.33	0.15	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.11
11	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.34	0.52	0.67	0.75	0.76	0.71	0.59	0.43	0.23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.21
12	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.31	0.30	0.56	0.59	0.65	0.69	0.59	0.44	0.13	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.47
13	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.36	0.54	0.68	0.76	0.77	0.72	0.60	0.43	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.31
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.36	0.54	0.69	0.77	0.79	0.74	0.54	0.40	0.28	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.36
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.31	0.46	0.37	0.65	0.39	0.37	0.17	0.10	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.04
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.35	0.41	0.39	0.37	0.41	0.49	0.59	0.22	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.32
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.10	0.26	0.34	0.08	0.71	0.44	0.34	0.22	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.65
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.37	0.48	0.64	0.66	0.68	0.48	0.21	0.06	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.75
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.28	0.51	0.65	0.74	0.77	0.49	0.57	0.39	0.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.71
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.47	0.31	0.28	0.50	0.70	0.35	0.08	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.15
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.20	0.17	0.22	0.43	0.26	0.26	0.21	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.01
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.34	0.51	0.64	0.72	0.74	0.68	0.56	0.40	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.96
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.34	0.51	0.64	0.72	0.73	0.68	0.56	0.40	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.96
24	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.34	0.52	0.65	0.73	0.74	0.69	0.57	0.41	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.04
25	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.30	0.48	0.46	0.64	0.49	0.34	0.22	0.20	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.38
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.25	0.35	0.49	0.56	0.67	0.64	0.50	0.31	0.19	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.14
27	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.33	0.50	0.63	0.71	0.71	0.64	0.52	0.28	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.62
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.30	0.39	0.48	0.45	0.38	0.44	0.20	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.93
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.14	0.22	0.65	0.68	0.63	0.05	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.45	0.39	0.73	0.73	0.64	0.17	0.22	0.12	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.57
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.32	0.49	0.63	0.71	0.72	0.66	0.54	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.76
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.30	0.44	0.53	0.60	0.64	0.57	0.46	0.32	0.17	0.03	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.91	5.78	5.86	3.99	3.78	2.83	2.88	5.58	4.87	4.11	5.21	4.47	5.31	5.36	3.04	3.32	2.65	3.75	4.71	3.15	2.01	4.96	4.96	5.04	3.38
MAX	0.83	0.83	0.83	0.72	0.64	0.54	0.58	0.79	0.70	0.74	0.76	0.69	0.77	0.79	0.65	0.59	0.71	0.68	0.77	0.70	0.43	0.74	0.73	0.74	0.64
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.14	4.62	2.93	2.57	3.57	4.76
MAX	0.67	0.71	0.48	0.68	0.73	0.72
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
OCTOBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.03	0.01	0.03	0.00	0.00	0.00	0.00	0.14
7	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.17	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.05
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.07	0.02	0.00	0.00	0.10
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.06	0.00	0.00	0.00	0.01	0.14
21	0.00	0.00	0.00	0.00	0.00	0.05	0.13	0.20	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.31	0.02	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.46
30	0.00	0.00	0.00	0.00	0.03	0.02	0.05	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.03	0.14	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.10	0.00	0.14	0.40	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.01	0.06	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.07	0.00	0.07	0.20	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.46	0.16	0.00
MAX	0.00	0.00	0.00	0.31	0.05	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.74 MONTHLY MAXIMUM = 0.31 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
NOVEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.8	3.1	3.0	3.0	3.2	2.6	2.7	3.0	3.4	2.1	1.3	1.5	1.6	1.3	1.8	2.7	2.8	1.8	0.6	1.1	1.6	3.0	3.5	3.8	2.4
2	3.2	3.4	3.2	3.5	2.8	3.1	3.3	2.9	3.3	2.5	2.0	1.6	1.4	1.1	1.1	1.2	0.9	2.7	1.6	3.9	4.0	4.7	4.4	5.2	2.8
3	4.0	4.7	4.6	5.1	5.6	6.0	4.7	3.7	5.0	4.8	4.6	6.4	7.0	7.3	8.4	8.1	7.6	9.6	6.7	7.3	6.6	2.3	5.3	5.3	5.9
4	2.4	1.7	3.0	1.6	1.2	0.8	1.0	1.9	1.5	1.4	4.5	6.1	6.1	5.2	5.6	4.3	4.9	4.8	2.3	1.5	1.8	2.7	6.3	6.5	3.3
5	5.0	4.7	2.9	1.8	2.1	2.9	2.8	2.9	3.0	2.0	1.7	1.4	1.5	1.6	1.8	1.7	2.5	4.4	5.3	4.2	3.0	1.5	2.1	3.2	2.8
6	2.9	3.4	3.6	3.5	3.5	1.9	2.0	2.9	2.7	1.6	1.8	2.4	3.1	4.0	3.7	3.9	5.4	6.7	6.5	4.5	2.5	1.6	1.1	1.7	3.2
7	2.3	0.9	3.1	4.2	3.8	4.5	5.0	4.2	5.4	7.8	7.4	7.8	8.5	7.6	7.2	6.8	6.1	6.9	8.2	7.3	7.1	7.6	8.0	9.0	6.1
8	9.3	9.0	9.6	10.1	9.4	9.8	9.0	10.4	9.5	9.9	9.0	8.2	7.8	7.6	6.6	5.5	5.3	4.9	6.0	6.8	6.6	5.6	3.5	3.6	7.6
9	3.6	4.1	4.0	3.9	3.5	2.8	3.3	3.9	3.2	2.7	2.0	1.5	1.5	1.4	2.4	3.2	2.8	3.6	4.2	1.4	2.6	3.5	3.7	3.8	3.0
10	3.7	3.5	3.6	2.6	3.4	3.0	2.9	1.2	1.3	1.3	3.1	6.1	6.8	10.2	11.4	10.1	7.6	7.3	6.4	5.4	4.7	6.3	6.0	3.2	5.0
11	1.5	1.4	1.8	2.6	2.5	2.8	3.0	1.7	2.5	2.2	1.3	2.3	2.0	2.0	2.6	2.4	3.1	4.1	4.9	3.5	1.3	2.4	3.7	3.8	2.6
12	3.9	4.7	4.7	4.3	4.8	5.3	6.2	4.9	7.4	9.4	6.9	7.2	7.8	8.2	8.3	7.4	7.0	7.2	7.6	7.6	6.3	6.7	7.5	6.5	6.6
13	7.0	7.7	8.3	7.7	7.0	6.3	7.0	6.4	8.1	7.4	7.9	7.8	6.7	6.2	5.5	4.8	6.3	7.0	7.8	7.4	6.6	6.4	5.8	4.4	6.8
14	4.6	4.1	4.7	4.8	5.4	5.2	4.6	4.8	4.3	3.4	3.0	1.8	1.7	2.2	3.4	5.0	5.7	6.2	4.6	1.6	1.5	1.7	2.6	3.1	3.8
15	2.7	1.9	1.5	1.8	2.4	2.8	2.4	4.4	3.3	2.6	2.6	2.8	2.2	2.3	2.5	1.8	1.8	3.4	2.9	2.9	1.8	1.6	1.9	1.4	2.4
16	4.3	6.3	8.1	10.5	9.2	2.8	7.6	11.3	10.8	11.6	11.1	9.7	10.4	10.9	12.1	11.6	8.8	4.6	2.1	1.3	1.7	2.5	1.7	3.4	7.3
17	3.6	3.6	3.3	3.8	1.9	1.2	1.0	1.6	1.6	1.5	2.4	4.2	5.1	6.2	7.6	7.6	7.2	4.2	2.8	1.4	2.3	2.0	3.0	2.2	3.4
18	2.0	3.0	1.6	1.3	2.9	2.9	2.5	2.4	1.2	1.9	1.4	1.2	2.0	3.9	4.9	4.9	4.3	4.1	3.3	0.8	1.6	2.6	3.5	3.5	2.7
19	3.1	3.0	3.0	3.3	3.5	4.3	5.3	4.9	5.0	4.7	7.5	8.4	8.6	7.3	7.4	7.4	6.9	6.0	8.1	8.0	8.0	6.7	6.7	5.0	5.9
20	3.8	4.4	4.4	4.8	4.3	4.5	4.4	4.5	3.9	4.2	3.3	3.0	1.9	1.4	1.6	1.4	2.4	3.7	4.6	1.8	2.6	3.1	2.9	3.6	3.3
21	3.3	4.6	4.7	4.0	4.2	5.5	4.3	4.3	4.5	7.6	8.2	9.2	9.6	9.0	8.4	8.1	7.4	7.4	7.1	7.2	9.1	10.6	9.4	9.6	7.0
22	8.5	8.4	9.0	10.0	9.6	8.4	9.4	8.5	9.8	10.4	9.1	8.5	8.9	8.5	7.1	8.0	7.7	7.1	7.5	8.1	8.5	8.7	7.7	8.0	8.6
23	7.4	7.1	8.0	7.4	6.9	5.9	6.5	6.2	6.4	8.1	7.1	5.9	5.5	4.4	4.5	5.0	3.7	1.9	1.3	2.3	3.3	4.4	3.8	3.8	5.3
24	3.1	3.6	3.8	3.9	1.9	2.9	4.2	3.8	3.6	2.7	2.5	1.9	2.2	1.5	1.6	1.4	2.1	2.4	2.0	2.4	3.7	4.1	3.5	3.5	2.9
25	3.7	2.9	4.0	2.3	1.1	2.5	4.3	4.6	1.6	1.3	1.1	0.9	0.8	1.8	1.0	1.2	1.3	1.1	1.7	1.5	1.0	0.8	1.8	1.7	1.9
26	2.2	4.8	3.7	1.5	1.7	0.4	0.6	0.6	0.8	0.9	1.7	3.4	6.1	6.9	7.2	7.8	7.6	6.1	3.1	3.5	2.0	1.7	2.1	1.2	3.2
27	1.7	1.8	2.4	2.1	1.9	1.4	1.5	2.2	2.4	1.7	2.4	5.9	7.9	9.1	7.1	7.0	6.5	4.7	3.6	2.2	0.9	1.4	2.3	2.1	3.4
28	2.0	3.0	2.2	3.1	2.4	2.2	2.0	2.5	1.8	1.8	1.5	1.5	2.0	2.9	4.5	6.0	5.9	7.8	7.7	3.7	2.0	1.8	1.6	1.0	3.0
29	2.2	3.4	3.1	2.5	1.8	2.7	2.5	1.9	2.6	1.9	1.2	1.6	4.6	7.0	7.6	7.6	7.3	6.0	3.2	2.4	1.5	1.9	1.5	3.1	3.4
30	3.1	2.5	3.3	3.2	3.2	2.7	1.6	1.7	3.0	2.7	2.0	1.5	1.9	2.0	2.5	3.4	4.4	5.8	4.8	3.8	1.5	2.0	2.3	2.7	2.8
HRAVE	3.8	4.0	4.2	4.1	3.9	3.7	3.9	4.0	4.1	4.1	4.1	4.4	4.8	5.0	5.2	5.2	5.1	5.1	4.6	3.9	3.6	3.7	4.0	4.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.4	2.8	5.9	3.3	2.8	3.2	6.1	7.6	3.0	5.0	2.6	6.6	6.8	3.8	2.4	7.3	3.4	2.7	5.9	3.3	7.0	8.6	5.3	2.9	1.9
MAX	3.8	5.2	9.6	6.5	5.3	6.7	9.0	10.4	4.2	11.4	4.9	9.4	8.3	6.2	4.4	12.1	7.6	4.9	8.6	4.8	10.6	10.4	8.1	4.2	4.6
MIN	0.6	0.9	2.3	0.8	1.4	1.1	0.9	3.5	1.4	1.2	1.3	3.9	4.4	1.5	1.4	1.3	1.0	0.8	3.0	1.4	3.3	7.1	1.3	1.4	0.8

DAY	26	27	28	29	30	31
AVE	3.2	3.4	3.0	3.4	2.8	***
MAX	7.8	9.1	7.8	7.6	5.8	***
MIN	0.4	0.9	1.0	1.2	1.5	***

MONTHLY AVERAGE = 4.3 MONTHLY MAXIMUM = 12.1 MONTHLY MINIMUM = 0.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	115	112	100	115	97	111	121	120	113	120	139	150	155	221	266	265	303	235	225	284	119	113	97	92	235
2	107	97	97	106	107	93	101	110	126	143	144	127	103	116	86	94	130	286	294	87	91	80	88	84	99
3	96	86	77	82	83	74	75	53	77	81	82	157	184	188	193	189	186	282	309	306	300	271	288	304	170
4	302	259	286	281	98	110	182	111	66	276	306	309	309	311	295	256	300	306	266	208	175	288	288	291	95
5	294	298	287	150	121	131	118	95	72	115	58	132	262	270	231	87	65	25	47	45	317	328	71	107	184
6	129	140	114	122	124	111	112	131	134	161	268	271	284	274	270	267	288	295	300	306	327	61	102	45	90
7	35	247	157	148	141	141	140	147	109	75	55	44	39	42	48	60	43	44	45	55	63	57	64	74	195
8	75	77	78	75	76	69	78	75	80	78	74	78	66	66	70	66	65	51	49	49	58	60	109	101	281
9	111	118	125	120	115	124	112	122	126	136	157	144	218	279	267	286	283	299	303	174	112	96	98	95	72
10	98	91	78	89	89	108	91	105	128	247	291	275	253	282	286	293	277	284	280	282	295	310	298	304	325
11	294	335	156	131	133	111	99	116	92	92	154	99	91	255	273	259	270	303	292	305	331	100	123	123	50
12	135	127	120	137	146	98	76	83	78	58	54	62	47	53	70	74	62	56	59	60	62	71	62	58	275
13	58	61	55	57	65	67	64	76	70	67	42	41	53	44	33	43	42	37	46	48	58	66	81	95	170
14	93	102	119	120	123	126	124	119	120	144	152	152	107	224	283	282	289	304	290	299	97	97	103	93	188
15	70	86	64	326	82	109	120	96	125	131	136	104	134	125	77	359	270	105	111	94	89	309	150	296	185
16	295	304	247	255	295	283	291	266	271	280	276	278	277	276	279	278	281	286	276	218	268	297	283	294	216
17	291	304	307	300	218	179	219	162	156	267	258	267	288	300	302	289	282	282	301	239	147	124	107	93	132
18	110	109	116	128	116	115	127	116	116	130	154	216	258	301	299	291	301	316	299	69	136	111	117	106	347
19	112	113	110	106	99	95	97	117	143	141	64	63	46	50	41	43	40	49	48	49	61	66	69	84	71
20	116	123	115	119	115	117	123	131	124	136	148	150	159	150	247	248	276	290	297	314	89	97	96	140	341
21	138	141	149	148	139	146	127	124	133	80	63	38	38	36	36	41	43	55	60	56	66	64	65	62	116
22	55	58	53	51	50	53	52	57	64	71	69	57	43	42	36	39	37	41	49	57	53	49	60	65	243
23	69	64	66	73	74	84	77	76	76	64	66	73	73	64	65	65	56	4	32	53	70	82	99	95	269
24	114	105	89	92	106	94	83	98	126	130	145	145	81	99	100	220	267	298	87	75	103	97	98	97	180
25	89	107	92	100	0	108	99	104	80	313	284	291	329	292	297	124	92	158	128	158	162	176	228	121	255
26	277	303	299	247	141	154	266	269	191	148	284	282	290	308	300	306	298	291	303	310	270	281	298	212	327
27	178	152	134	125	118	110	119	119	129	139	272	290	306	298	295	282	293	295	298	275	200	140	100	108	178
28	108	100	107	94	109	104	109	115	112	121	140	259	256	268	281	279	280	297	299	299	231	119	127	108	298
29	104	113	97	116	101	124	100	122	110	139	179	258	286	303	297	287	278	285	299	251	179	142	128	120	328
30	104	102	89	122	92	87	98	119	121	124	110	134	268	245	259	274	293	300	294	305	3	113	93	120	43

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	9	8	9	13	10	11	7	9	8	28	35	27	32	50	24	15	11	13	24	31	20	9	9	8	17
2	7	8	6	9	10	6	8	9	8	16	22	32	36	45	41	30	34	13	39	7	8	7	7	7	17
3	12	8	11	6	7	7	11	29	10	16	12	15	22	21	15	17	15	12	13	12	10	35	7	9	14
4	35	49	31	45	46	31	29	20	51	48	22	13	12	14	14	21	17	8	26	45	34	10	6	6	26
5	6	8	39	21	14	13	12	10	10	25	28	63	61	32	29	47	21	15	12	13	24	41	25	14	24
6	11	6	8	6	5	9	10	6	10	33	22	16	18	12	11	9	10	6	6	7	14	23	28	22	13
7	33	49	11	4	5	6	6	11	20	10	18	16	12	13	15	13	12	10	8	9	10	11	9	7	13
8	6	6	7	8	9	10	10	9	10	10	11	16	9	9	13	10	9	11	10	10	9	15	12	9	10
9	7	6	8	6	6	7	6	6	8	14	21	29	44	36	24	20	17	7	4	31	10	8	8	6	14
10	7	7	9	9	7	10	8	17	25	37	12	15	18	11	9	8	8	8	7	7	11	10	9	9	12
11	31	43	16	9	9	10	9	15	12	26	33	35	56	50	27	24	12	6	8	11	34	12	12	10	21
12	7	7	6	5	6	13	12	11	12	12	19	18	19	15	12	13	14	12	11	11	13	11	7	10	12
13	11	9	11	10	9	10	10	12	9	12	14	14	20	19	15	19	12	11	11	11	12	8	7	15	12
14	13	16	10	5	4	6	5	6	6	9	12	24	34	28	15	11	8	7	8	20	20	16	10	7	12
15	23	33	41	41	40	20	19	14	16	19	14	18	20	17	15	29	41	19	14	14	18	47	72	44	27
16	30	9	13	13	9	16	8	11	9	9	9	12	10	10	9	10	9	11	16	29	22	20	22	7	13
17	8	9	9	24	23	42	17	17	16	26	16	13	15	11	12	11	9	7	9	36	8	12	11	18	16
18	22	14	21	39	11	8	12	13	35	18	29	40	23	20	12	12	9	7	8	63	12	8	11	9	19
19	9	8	10	8	8	7	6	6	9	20	14	15	15	18	15	14	11	12	10	11	9	9	8	13	11
20	16	7	8	6	6	6	5	5	7	11	13	16	24	35	28	21	12	6	6	28	13	10	13	11	13
21	19	9	8	10	7	7	9	6	13	12	12	15	13	12	13	14	14	13	11	13	8	7	8	8	11
22	12	11	12	13	13	14	12	13	9	9	13	17	16	16	14	12	12	12	12	11	12	12	12	6	12
23	6	8	8	7	11	19	15	13	14	9	13	13	11	13	9	8	16	36	37	29	17	11	13	11	14
24	7	9	8	7	14	8	5	6	7	14	16	28	22	30	29	32	12	7	38	18	11	8	8	8	15
25	12	13	10	31	36	32	10	10	42	53	34	18	61	27	14	24	38	57	14	38	50	55	23	30	30
26	25	6	26	24	18	45	41	43	59	45	16	14	9	12	12	12	9	8	8	5	29	18	6	25	22
27	11	11	8	6	9	15	20	9	8	39	15	11	14	12	15	11	12	8	4	22	46	22	9	8	14
28	8	9	11	9	10	9	11	7	11	16	28	30	19	16	12	9	7	7	7	7	23	8	10	24	13
29	17	8	8	9	10	10	8	14	11	17	42	37	14	13	14	11	7	7	11	25	27	9	9	9	15
30	8	11	9	7	12	7	12	54	7	14	24	46	30	30	24	15	11	6	5	5	45	9	12	7	17
HRAVE	14	14	13	14	13	14	12	14	16	21	20	22	24	22	17	17	14	12	13	19	19	16	13	13	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	17	17	14	26	24	13	13	10	14	12	21	12	12	12	27	13	16	19	11	13	11	12	14	15	30
MAX	50	45	35	51	63	33	49	16	44	37	56	19	20	34	72	30	42	63	20	35	19	17	37	38	61
MIN	7	6	6	6	6	5	4	6	4	7	6	5	7	4	14	7	7	7	6	5	6	6	6	5	10

DAY	26	27	28	29	30	31
AVE	22	14	13	15	17	***
MAX	59	46	30	42	54	***
MIN	5	4	7	7	5	***

MONTHLY AVERAGE = 16.0 MONTHLY MAXIMUM = 71.5 MONTHLY MINIMUM = 3.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	13.8	12.6	12.3	11.4	11.5	10.2	10.0	11.0	13.8	15.6	17.9	20.1	22.2	23.8	24.5	25.2	25.0	23.8	22.3	20.4	18.5	17.2	16.2	15.7	17.3
2	14.4	13.4	12.7	12.5	12.1	10.8	10.9	11.9	13.9	16.3	18.7	21.4	23.9	25.1	26.1	26.6	26.7	25.0	23.2	20.4	19.1	18.1	17.1	16.0	18.2
3	14.9	14.6	14.5	13.8	12.9	13.1	13.4	13.0	16.0	20.1	23.1	26.2	27.1	27.4	27.2	26.7	25.1	21.0	18.2	16.1	15.2	14.9	14.3	13.3	18.4
4	13.0	12.4	11.5	10.9	10.9	10.9	10.7	10.9	11.7	12.2	11.7	13.0	13.8	14.4	15.4	16.3	15.5	14.2	13.2	12.6	12.2	12.1	11.8	10.7	12.6
5	9.8	9.5	9.0	8.9	8.7	8.1	7.6	8.7	9.9	11.8	12.9	14.3	15.0	16.2	17.1	17.0	16.9	16.1	15.1	14.6	12.9	12.3	11.6	9.7	12.2
6	8.6	8.0	8.4	7.9	7.1	6.6	5.3	6.6	9.0	11.8	12.8	15.4	17.7	19.1	20.2	20.8	20.2	18.2	17.0	15.9	15.8	15.1	14.2	14.3	13.2
7	13.9	12.2	10.1	9.3	9.5	9.0	8.9	8.3	11.9	16.6	18.0	19.3	20.6	21.9	22.6	23.0	22.7	22.2	21.7	20.8	20.3	20.1	19.2	18.4	16.7
8	18.0	17.5	17.0	16.5	15.8	15.3	14.9	15.1	16.2	17.6	19.2	20.8	21.6	22.5	23.2	23.5	23.3	22.3	21.5	21.0	19.8	18.9	16.7	16.2	18.9
9	14.8	13.4	12.1	12.0	11.3	10.5	10.0	10.6	12.9	15.9	18.2	20.1	21.9	23.6	24.5	24.5	24.0	22.3	20.9	19.1	17.5	16.6	15.5	14.8	17.0
10	14.2	12.9	11.2	10.7	9.6	9.7	8.9	9.2	11.2	13.1	16.0	19.2	19.7	18.0	17.0	16.7	16.2	15.7	14.7	13.7	12.9	12.8	12.0	11.2	13.6
11	11.3	10.3	8.8	7.8	7.3	6.4	5.8	6.0	8.2	10.8	12.9	14.9	15.4	16.3	16.6	16.9	16.6	15.5	13.6	13.1	12.8	10.6	9.5	9.0	11.5
12	8.1	7.5	6.9	6.3	5.1	7.4	9.1	8.6	11.4	13.8	15.8	17.4	18.8	19.8	21.0	21.3	21.0	20.3	19.5	18.8	18.0	17.3	16.4	16.3	14.4
13	15.7	15.0	14.7	14.0	13.4	12.5	12.8	11.6	14.2	16.4	18.1	19.4	20.9	22.1	22.9	23.5	23.5	22.7	22.0	21.2	20.2	18.8	17.4	15.6	17.9
14	14.5	13.3	12.0	11.4	10.3	9.8	9.0	9.3	11.4	14.9	18.4	21.0	22.9	24.2	24.8	25.0	23.2	21.2	19.4	18.3	17.0	15.4	14.2	14.2	16.5
15	13.1	12.4	11.9	12.0	10.6	9.3	8.2	8.7	9.3	9.9	11.4	13.1	12.7	12.7	14.1	14.9	14.7	14.1	13.8	13.4	13.2	13.1	13.1	13.6	12.2
16	14.0	14.9	14.2	14.4	10.4	9.3	9.4	9.1	9.6	9.8	9.9	10.9	10.8	11.1	10.6	10.1	9.6	9.4	9.4	9.3	9.6	9.6	9.6	9.4	10.6
17	9.1	8.4	7.6	7.2	5.7	5.4	4.6	4.2	5.9	7.4	9.4	11.2	12.4	13.2	13.6	13.2	12.3	11.2	10.5	10.2	9.1	8.3	7.5	6.9	8.9
18	6.0	5.4	5.8	3.8	3.8	3.6	2.6	3.5	4.9	7.7	9.8	11.9	13.4	15.1	16.2	16.6	16.1	15.1	13.4	13.2	11.1	10.1	8.7	8.7	9.4
19	8.2	7.4	6.7	6.1	5.8	4.7	5.1	5.8	7.8	11.2	16.1	17.7	19.4	20.6	20.9	21.3	21.3	20.5	20.0	19.4	17.9	16.3	15.4	13.7	13.7
20	12.1	10.6	10.3	9.4	8.9	7.9	7.5	7.6	9.6	12.8	15.9	18.5	20.2	21.9	22.8	23.4	23.0	20.6	19.7	18.5	15.9	14.7	13.0	12.4	14.9
21	12.6	13.1	12.5	11.6	10.1	9.9	10.0	10.4	12.1	17.5	19.5	20.5	21.4	22.0	22.5	22.6	22.2	21.5	20.4	19.5	18.5	17.6	16.6	16.0	16.7
22	15.3	14.6	14.0	13.5	13.0	12.5	12.2	12.2	12.9	14.3	15.9	17.7	19.0	20.0	20.9	21.3	21.0	20.5	19.6	18.6	18.3	18.0	16.8	15.6	16.6
23	14.8	14.3	14.3	13.6	13.2	11.8	12.5	12.0	12.7	15.1	17.5	19.6	21.4	21.7	21.9	22.1	21.9	21.4	20.0	18.6	17.3	15.5	14.3	13.5	16.7
24	12.3	10.6	10.1	9.3	8.6	8.0	7.6	7.8	10.2	13.0	15.9	18.4	20.4	21.9	22.9	23.6	22.8	21.2	19.4	17.5	15.6	14.9	14.3	12.4	14.9
25	11.4	10.2	10.8	9.7	9.2	8.8	9.5	10.2	10.5	10.9	12.1	12.9	14.1	15.1	16.0	16.4	16.3	15.8	15.3	14.8	15.0	14.7	13.8	12.4	12.7
26	11.9	12.5	12.5	11.3	10.4	11.0	10.5	9.8	10.1	12.4	14.2	16.5	17.1	17.4	17.8	17.5	16.7	15.4	14.3	13.8	12.9	12.4	12.0	10.2	13.4
27	9.2	8.1	7.6	7.0	6.4	5.5	4.7	4.4	5.8	8.7	10.4	13.1	14.0	14.2	14.4	14.2	13.4	12.1	10.9	10.2	9.1	8.1	7.2	6.0	9.4
28	4.9	4.6	3.7	3.3	2.6	2.2	1.3	1.6	3.3	6.4	9.2	10.7	12.7	14.8	16.1	16.0	14.7	13.0	11.8	10.9	10.1	9.0	8.0	6.8	8.2
29	5.5	4.9	4.2	3.5	2.7	1.5	2.0	1.6	3.4	6.2	8.7	10.8	13.0	14.0	14.5	14.0	12.9	11.4	10.4	9.5	8.7	7.5	6.5	5.1	7.6
30	4.7	3.7	2.7	1.9	1.6	0.8	0.0	-0.2	1.7	5.0	8.2	10.7	12.4	13.6	14.4	15.0	14.6	12.8	11.2	10.4	9.5	7.4	6.3	5.4	7.2
HRAVE	11.7	10.9	10.3	9.7	8.9	8.4	8.2	8.3	10.1	12.5	14.6	16.6	17.9	18.8	19.4	19.6	19.1	17.9	16.8	15.8	14.8	13.9	13.0	12.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	17.3	18.2	18.4	12.6	12.2	13.2	16.7	18.9	17.0	13.6	11.5	14.4	17.9	16.5	12.2	10.6	8.9	9.4	13.7	14.9	16.7	16.6	16.7	14.9	12.7
MAX	25.2	26.7	27.4	16.3	17.1	20.8	23.0	23.5	24.5	19.7	16.9	21.3	23.5	25.0	14.9	14.9	13.6	16.6	21.3	23.4	22.6	21.3	22.1	23.6	16.4
MIN	10.0	10.8	12.9	10.7	7.6	5.3	8.3	14.9	10.0	8.9	5.8	5.1	11.6	9.0	8.2	9.1	4.2	2.6	4.7	7.5	9.9	12.2	11.8	7.6	8.8

DAY	26	27	28	29	30	31
AVE	13.4	9.4	8.2	7.6	7.2	***
MAX	17.8	14.4	16.1	14.5	15.0	***
MIN	9.8	4.4	1.3	1.5	-0.2	***

MONTHLY AVERAGE = 13.7 MONTHLY MAXIMUM = 27.4 MONTHLY MINIMUM = -0.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.5	0.6	0.6	0.3	0.5	0.5	0.3	-0.5	-1.3	-1.0	-0.8	-0.8	-0.9	-0.6	-0.6	-0.6	-0.1	0.3	0.4	0.7	0.5	0.6	0.7	0.6	0.0
2	0.6	0.6	0.5	0.5	0.4	0.5	0.4	-0.7	-1.2	-1.1	-1.0	-0.8	-0.8	-0.6	-0.6	-0.3	0.1	0.6	0.6	0.8	0.8	0.8	0.8	0.8	0.1
3	0.9	0.8	0.7	1.0	0.8	1.0	1.0	0.0	-0.4	-0.8	-1.0	-1.3	-1.1	-1.0	-0.8	-0.6	-0.1	-0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.0
4	0.1	0.2	0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.3	-0.1	-0.3	-0.3	-0.2	-0.4	-0.4	0.0	0.2	0.5	0.4	0.4	0.5	0.2	0.2	0.0
5	0.2	0.1	0.1	0.2	0.2	0.2	0.3	-0.4	-0.7	-0.9	-0.9	-0.9	-0.6	-0.6	-0.6	-0.3	0.2	0.4	0.3	0.4	0.5	0.6	0.5	0.6	-0.1
6	1.0	0.6	0.3	0.3	0.4	0.3	0.6	-0.3	-0.8	-0.8	-0.6	-0.6	-0.7	-0.6	-0.6	-0.6	-0.1	0.3	0.4	0.5	0.6	0.9	0.6	0.8	0.1
7	0.6	0.6	1.1	1.1	0.6	0.9	0.9	0.8	0.3	-0.6	-0.5	-0.5	-0.4	-0.3	-0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3
8	0.4	0.4	0.3	0.2	0.3	0.2	0.2	-0.1	-0.5	-0.7	-0.8	-1.0	-0.7	-0.5	-0.3	-0.1	0.2	0.3	0.3	0.2	0.4	0.3	0.5	0.5	0.0
9	0.7	0.8	0.9	0.6	0.7	0.7	0.7	0.0	-1.0	-1.2	-1.1	-0.8	-0.8	-0.6	-0.6	-0.5	-0.1	0.5	0.8	0.6	0.7	0.8	0.7	0.9	0.1
10	0.7	0.7	0.6	0.8	0.6	0.7	0.7	-0.1	-0.5	-0.4	-0.6	-0.8	-0.8	-0.5	-0.6	-0.6	-0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.4	0.1
11	0.3	0.3	0.3	0.3	0.4	0.4	0.6	-0.2	-1.2	-1.2	-0.8	-1.2	-1.0	-0.7	-0.7	-0.6	-0.2	0.3	0.4	0.4	0.4	0.7	0.6	0.5	-0.1
12	0.7	0.5	0.3	1.1	1.3	1.1	0.6	0.5	-0.3	-0.4	-0.6	-0.7	-0.5	-0.3	-0.2	0.0	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.3	0.2
13	0.3	0.4	0.3	0.2	0.3	0.4	0.3	0.3	-0.3	-0.5	-0.5	-0.5	-0.5	-0.4	-0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.5	0.6	0.6	0.1
14	0.6	0.9	1.1	1.1	0.6	0.6	0.6	-0.1	-0.7	-1.3	-1.4	-0.9	-0.9	-0.7	-0.6	-0.5	0.0	0.4	0.4	0.5	0.7	0.7	0.5	0.6	0.1
15	0.6	0.3	0.3	0.5	1.0	0.6	0.4	0.2	0.3	0.2	-0.4	-0.6	-0.2	-0.2	-0.4	-0.2	-0.2	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.2
16	0.3	0.1	0.3	0.3	0.0	0.1	0.2	0.1	0.2	0.0	0.0	-0.4	-0.3	-0.3	-0.3	-0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.0
17	0.2	0.3	0.3	0.4	0.5	0.4	0.4	0.0	-0.5	-0.3	-0.6	-0.6	-0.6	-0.6	-0.4	-0.4	-0.1	0.3	0.4	0.3	0.3	0.4	0.5	0.6	0.0
18	0.4	0.5	0.5	0.4	0.4	0.3	0.6	-0.3	-0.6	-0.9	-0.6	-0.6	-0.6	-0.5	-0.5	-0.4	0.1	0.5	0.9	0.4	0.6	0.5	0.7	0.4	0.1
19	0.6	0.5	0.5	0.4	0.5	0.5	0.8	0.1	-0.7	-0.9	-0.4	-0.4	-0.3	-0.2	0.0	0.1	0.3	0.3	0.3	0.2	0.4	0.6	0.5	0.5	0.2
20	0.6	1.1	0.5	0.5	0.7	1.1	0.6	0.1	-0.9	-1.2	-1.4	-1.3	-0.9	-0.6	-0.4	-0.3	0.1	0.7	1.0	0.6	0.7	0.7	0.6	0.9	0.1
21	1.7	1.4	1.0	1.4	0.7	0.6	0.4	0.3	-0.1	-0.4	-0.5	-0.3	-0.3	-0.2	0.0	0.1	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3
22	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-0.2	-0.5	-0.6	-0.5	-0.4	-0.2	-0.1	0.0	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.0
23	0.5	0.4	0.3	0.3	0.3	0.5	0.5	0.4	0.2	-0.3	-0.6	-0.8	-0.8	-0.4	-0.2	0.1	0.4	0.5	0.5	0.6	0.4	0.5	0.5	0.6	0.2
24	0.7	0.7	0.8	0.7	0.6	0.7	0.5	0.2	-0.9	-1.2	-1.1	-1.0	-1.0	-0.7	-0.4	-0.3	0.1	0.7	0.6	0.6	0.5	0.5	0.6	0.8	0.1
25	0.6	0.6	0.4	0.4	0.4	0.6	0.6	0.0	-0.2	-0.2	-0.3	-0.2	-0.3	-0.3	-0.2	-0.1	0.3	0.4	0.3	0.3	0.4	0.5	0.5	0.8	0.2
26	0.7	0.5	0.4	0.6	0.3	0.2	0.4	0.3	0.1	-0.6	-0.6	-0.9	-0.7	-0.5	-0.4	-0.5	-0.2	0.1	0.2	0.3	0.3	0.4	0.5	0.3	0.1
27	0.4	0.4	0.5	0.3	0.4	0.3	0.5	0.0	-0.6	-0.7	-0.6	-0.6	-0.6	-0.6	-0.6	-0.5	-0.1	0.2	0.5	0.5	0.6	0.4	0.5	0.5	0.1
28	0.4	0.5	0.5	0.5	0.4	0.5	0.4	-0.1	-0.8	-0.9	-0.9	-0.7	-0.6	-0.6	-0.6	-0.5	-0.1	0.2	0.2	0.4	0.4	0.4	0.4	0.3	0.0
29	0.5	0.4	0.5	0.5	0.6	0.6	0.5	0.2	-0.9	-0.9	-0.7	-0.6	-0.7	-0.5	-0.5	-0.5	-0.2	0.3	0.5	0.4	0.4	0.4	0.5	0.6	0.1
30	0.4	0.6	0.5	0.7	0.5	0.6	0.4	0.1	-0.8	-1.1	-1.1	-0.8	-0.6	-0.6	-0.5	-0.5	0.0	0.3	0.4	0.6	0.6	0.6	0.6	0.3	0.1
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	-0.5	-0.7	-0.7	-0.7	-0.6	-0.5	-0.4	-0.3	0.0	0.3	0.4	0.4	0.4	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.0	0.1	0.0	0.0	-0.1	0.1	0.3	0.0	0.1	0.1	-0.1	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.1	0.3	0.0	0.2	0.1	0.2
MAX	0.7	0.8	1.0	0.5	0.6	1.0	1.1	0.5	0.9	0.8	0.7	1.3	0.6	1.1	1.0	0.3	0.6	0.9	0.8	1.1	1.7	0.4	0.6	0.8	0.8
MIN	-1.3	-1.2	-1.3	-0.4	-0.9	-0.8	-0.6	-1.0	-1.2	-0.8	-1.2	-0.7	-0.5	-1.4	-0.6	-0.4	-0.6	-0.9	-0.9	-1.4	-0.5	-0.6	-0.8	-1.2	-0.3

DAY	26	27	28	29	30	31
AVE	0.1	0.1	0.0	0.1	0.1	***
MAX	0.7	0.6	0.5	0.6	0.7	***
MIN	-0.9	-0.7	-0.9	-0.9	-1.1	***

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.7 MONTHLY MINIMUM = -1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	704	704	704	704	704	704	705	705	706	706	705	705	704	703	703	703	702	702	702	703	703	703	703	703	704
2	702	702	702	702	702	702	702	702	702	702	702	701	700	699	698	698	698	697	697	698	698	698	698	698	700
3	698	698	698	698	698	698	698	699	699	699	698	698	697	696	696	696	695	696	697	698	698	699	699	699	698
4	699	699	699	699	699	700	700	700	701	701	701	701	700	700	700	700	700	701	701	701	702	702	702	703	700
5	703	703	704	704	704	705	706	706	707	707	707	707	706	706	705	705	705	704	704	705	705	705	705	705	705
6	705	705	705	705	705	705	705	705	705	705	705	704	704	703	702	702	702	703	703	704	704	704	704	704	704
7	704	704	704	704	704	704	705	705	705	705	705	704	703	703	702	702	702	702	702	702	703	703	703	703	704
8	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	701	701	701	701	702	702	702	702	702
9	702	702	702	702	702	702	702	702	703	703	703	702	701	701	700	700	700	700	700	701	701	701	702	702	701
10	702	702	702	701	701	702	702	702	702	702	702	702	701	701	701	701	701	701	702	703	703	704	704	705	702
11	705	705	705	706	706	706	706	707	708	708	708	708	707	706	706	705	705	705	706	706	706	706	706	706	706
12	706	706	706	705	705	705	705	705	705	705	705	704	703	702	702	702	702	702	702	702	702	703	703	703	704
13	703	703	703	703	703	703	703	704	704	704	703	703	702	701	701	701	701	701	701	701	701	702	702	702	702
14	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	700	700	700	701	702	702	702	702	702	702
15	702	702	701	702	702	702	703	702	702	702	703	702	701	700	700	699	699	698	698	698	698	698	698	697	700
16	696	696	696	695	696	696	696	696	696	697	697	697	697	697	697	697	698	699	699	700	700	700	700	700	697
17	701	701	701	701	701	702	702	703	704	704	704	704	703	703	702	702	703	703	703	703	703	703	703	703	703
18	703	703	703	703	703	703	703	703	704	704	704	703	703	702	701	701	702	702	702	702	702	703	703	703	703
19	703	703	703	703	704	704	704	704	704	704	704	703	702	701	701	701	701	701	701	701	702	702	702	702	702
20	703	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	700	701	701	702	702	703	703	703	702
21	703	703	703	703	703	703	704	704	705	705	705	704	703	703	702	702	702	702	703	703	704	704	704	704	703
22	704	704	704	704	704	704	705	705	705	705	705	704	703	702	702	702	702	702	702	702	702	702	702	703	703
23	702	702	702	702	702	702	702	703	703	703	703	702	701	701	701	700	700	701	701	701	701	702	702	702	702
24	702	702	702	702	702	702	703	703	704	704	704	703	702	701	700	700	700	700	700	700	700	700	700	700	701
25	700	699	699	699	699	699	698	699	699	699	699	699	698	697	697	697	697	697	697	698	698	699	699	699	698
26	699	699	699	699	700	700	700	700	700	701	701	700	700	699	699	699	699	700	700	700	701	701	701	701	700
27	701	701	701	701	701	701	701	702	702	702	702	701	701	701	701	701	701	701	701	702	702	702	703	703	701
28	703	703	703	702	702	702	703	703	703	703	703	703	702	701	701	701	701	701	702	702	703	703	703	703	702
29	703	703	703	703	703	703	703	704	704	704	704	703	703	702	702	703	703	703	704	704	704	704	705	705	703
30	705	705	705	705	705	705	705	706	706	706	706	705	704	704	703	703	703	703	704	704	704	704	704	704	704
HRAVE	702	702	702	702	702	702	703	703	703	703	703	703	702	701	701	701	701	701	701	702	702	702	702	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	704	700	698	700	705	704	704	702	701	702	706	704	702	702	700	697	703	703	702	702	703	703	702	701	698
MAX	706	702	699	703	707	705	705	704	703	705	708	706	704	703	703	700	704	704	704	703	705	705	703	704	700
MIN	702	697	695	699	703	702	702	701	700	701	705	702	701	700	697	695	701	701	701	700	702	702	700	700	697

DAY	26	27	28	29	30	31
AVE	700	701	702	703	704	***
MAX	701	703	703	705	706	***
MIN	699	701	701	702	703	***

MONTHLY AVERAGE = 702.0 MONTHLY MAXIMUM = 708.1 MONTHLY MINIMUM = 694.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	72	80	81	82	82	87	89	82	68	56	46	40	35	30	26	28	32	37	45	52	63	67	70	71	59
2	75	82	84	80	81	89	86	79	66	54	45	41	31	26	22	19	22	29	35	45	52	54	58	61	55
3	66	67	65	68	72	71	69	70	58	44	35	25	22	21	21	22	27	49	64	67	64	60	59	69	52
4	73	83	89	92	95	96	97	97	92	89	86	75	66	64	61	57	58	62	69	76	76	74	71	75	78
5	81	85	89	86	87	87	89	83	71	56	52	47	41	30	27	20	20	31	38	37	48	51	55	66	57
6	72	74	73	74	79	85	90	84	69	56	55	48	39	36	33	31	34	40	41	43	44	47	51	46	56
7	44	54	61	65	64	68	68	73	57	34	32	30	28	25	24	22	24	25	25	25	26	27	30	33	40
8	35	38	40	43	46	48	51	51	47	43	38	35	33	31	29	28	30	33	35	35	38	41	50	53	40
9	56	61	64	65	70	74	77	72	59	47	38	35	29	23	21	21	21	24	26	33	39	41	45	46	45
10	47	52	61	63	69	66	69	70	56	45	40	44	43	47	37	37	42	41	41	40	41	41	41	45	49
11	44	47	50	55	58	63	67	66	55	42	32	28	25	25	24	23	24	27	35	37	39	47	50	50	42
12	51	52	54	54	59	50	41	44	36	28	25	22	20	18	15	14	15	16	17	18	19	20	22	22	30
13	23	23	24	25	26	28	27	30	24	21	20	19	17	16	16	15	16	17	17	19	19	21	25	29	22
14	32	34	37	39	41	43	46	46	41	33	26	22	17	15	13	14	16	18	19	22	27	33	35	34	29
15	38	40	42	43	67	83	92	95	93	93	88	81	90	94	86	84	88	91	91	93	94	96	96	94	81
16	90	84	84	72	85	95	86	72	61	57	54	51	51	47	48	51	55	57	57	61	55	56	53	54	64
17	54	54	55	56	65	66	72	75	66	55	48	46	42	39	38	40	44	49	52	52	57	62	67	72	55
18	76	79	76	85	88	88	89	88	76	63	52	46	40	35	34	35	38	44	49	54	62	69	75	73	63
19	75	79	81	83	85	89	89	79	69	56	37	31	28	26	25	25	26	27	28	28	31	35	37	44	50
20	51	57	56	58	61	65	64	63	56	43	35	30	27	23	22	20	22	29	31	37	47	52	58	58	44
21	55	51	51	55	61	60	61	59	52	31	26	25	25	26	25	24	23	22	23	25	25	26	28	29	37
22	31	32	33	33	35	36	36	36	34	31	29	27	25	23	22	22	22	24	25	26	27	29	30	33	29
23	35	36	36	37	37	42	38	40	38	31	26	23	21	21	21	21	23	27	29	32	34	39	44	47	32
24	52	58	59	63	66	70	69	70	56	47	37	31	26	21	17	18	22	26	31	36	43	44	44	51	44
25	53	58	55	58	62	62	62	59	56	57	54	52	49	45	41	44	45	47	50	52	51	52	56	63	53
26	66	59	57	64	70	68	68	72	70	59	53	47	46	49	47	43	40	42	46	46	47	47	49	55	55
27	61	66	69	72	75	81	84	84	72	59	53	41	36	34	32	30	31	35	38	40	45	49	55	60	54
28	64	65	69	70	72	74	78	77	66	51	41	38	36	32	28	29	32	35	38	41	43	49	52	58	52
29	63	64	67	70	74	76	76	77	65	54	43	39	36	33	32	32	36	38	40	43	47	50	55	60	53
30	61	66	70	71	73	76	79	77	65	51	40	35	33	27	24	21	22	29	32	34	39	45	50	52	49
HRAVE	57	59	61	63	67	70	70	69	60	50	43	38	35	33	30	30	32	36	39	42	45	47	50	53	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	59	55	52	78	57	56	40	40	45	49	42	30	22	29	81	64	55	63	50	44	37	29	32	44	53
MAX	89	89	72	97	89	90	73	53	77	70	67	59	30	46	96	95	75	89	89	65	61	36	47	70	63
MIN	26	19	21	57	20	31	22	28	21	37	23	14	15	13	38	47	38	34	25	20	22	22	21	17	41

DAY	26	27	28	29	30	31
AVE	55	54	52	53	49	***
MAX	72	84	78	77	79	***
MIN	40	30	28	32	21	***

MONTHLY AVERAGE = 49.1 MONTHLY MAXIMUM = 96.7 MONTHLY MINIMUM = 13.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.31	0.49	0.63	0.70	0.71	0.66	0.54	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.69
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.31	0.49	0.62	0.70	0.71	0.66	0.54	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.68
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.30	0.47	0.61	0.69	0.70	0.60	0.48	0.35	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.37
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.11	0.18	0.38	0.25	0.22	0.30	0.33	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.98
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.31	0.48	0.62	0.69	0.70	0.65	0.53	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.61
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.30	0.47	0.60	0.67	0.68	0.63	0.51	0.35	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.46
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.29	0.47	0.60	0.67	0.69	0.63	0.52	0.35	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.47
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.28	0.45	0.59	0.66	0.68	0.62	0.51	0.34	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.36
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.28	0.46	0.59	0.67	0.68	0.62	0.51	0.35	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.39
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.45	0.59	0.60	0.43	0.32	0.42	0.29	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.55
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.46	0.60	0.67	0.68	0.62	0.51	0.34	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.40
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.28	0.47	0.60	0.67	0.69	0.63	0.52	0.34	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.41
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.45	0.59	0.67	0.68	0.62	0.50	0.34	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.34
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.45	0.59	0.67	0.68	0.62	0.48	0.33	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.28
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.08	0.23	0.22	0.10	0.14	0.32	0.14	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.23	0.22	0.61	0.45	0.46	0.32	0.17	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.59
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.43	0.56	0.63	0.64	0.59	0.48	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.07
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.25	0.43	0.55	0.63	0.64	0.56	0.46	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.99
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.43	0.56	0.64	0.65	0.60	0.49	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.14
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.42	0.55	0.63	0.64	0.59	0.48	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.05
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.41	0.55	0.62	0.63	0.58	0.47	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.98
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.41	0.55	0.62	0.63	0.58	0.47	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.97
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.54	0.62	0.69	0.39	0.42	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.41	0.54	0.62	0.63	0.58	0.47	0.26	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.89
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.14	0.16	0.13	0.17	0.13	0.11	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.47	0.36	0.67	0.34	0.25	0.31	0.29	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.92
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.40	0.53	0.61	0.62	0.57	0.46	0.30	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.40	0.53	0.61	0.62	0.57	0.46	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.86
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.38	0.52	0.60	0.61	0.56	0.46	0.30	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.78
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.39	0.53	0.61	0.62	0.57	0.47	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.86
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.23	0.40	0.52	0.61	0.59	0.53	0.45	0.31	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.69	4.68	4.37	1.98	4.61	4.46	4.47	4.36	4.39	3.55	4.40	4.41	4.34	4.28	1.33	2.59	4.07	3.99	4.14	4.05	3.98	3.97	3.54	3.89	1.07
MAX	0.71	0.71	0.70	0.38	0.70	0.68	0.69	0.68	0.68	0.60	0.68	0.69	0.68	0.68	0.32	0.61	0.64	0.64	0.65	0.64	0.63	0.63	0.69	0.63	0.17
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	2.92	3.85	3.86	3.78	3.86	***
MAX	0.67	0.62	0.62	0.61	0.62	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.03	0.00	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
5	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.03	0.06	0.14	0.01	0.02	0.01	0.00	0.00	0.05	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.36
16	0.00	0.00	0.06	0.00	0.04	0.06	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.69 MONTHLY MAXIMUM = 0.14 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.3	4.6	4.6	3.4	2.1	1.7	3.2	3.4	2.9	3.0	3.5	3.6	5.9	***	7.9	***	7.5	7.5	6.3	5.6	***	4.6	4.6	2.5	4.4
2	2.6	3.2	2.6	2.3	2.7	2.7	3.6	3.8	2.7	3.3	4.3	4.7	5.0	5.1	5.9	7.0	6.7	7.0	7.6	***	7.2	6.9	5.5	2.0	4.5
3	1.5	3.0	2.7	2.5	2.6	3.1	3.3	3.3	2.9	2.8	3.4	4.4	5.0	5.4	6.1	6.1	6.6	7.0	7.4	***	6.1	5.3	3.6	2.7	4.2
4	2.2	2.9	3.0	3.6	3.5	3.4	3.5	3.3	3.3	3.9	3.7	3.8	4.1	6.0	6.9	***	6.7	***	7.1	7.3	3.5	4.8	5.2	3.7	4.3
5	4.1	4.5	4.6	4.0	3.8	6.1	6.2	5.3	3.6	1.3	2.9	2.8	3.0	3.5	4.4	4.0	3.6	3.2	1.7	3.9	3.1	4.1	4.0	3.3	3.8
6	1.7	2.0	2.2	3.2	3.0	2.3	3.0	2.1	2.3	3.2	3.5	5.9	6.6	8.0	9.4	8.0	7.7	7.8	6.5	4.1	4.8	4.7	3.1	3.7	4.5
7	2.7	2.2	2.4	1.8	2.5	2.7	3.2	3.1	2.8	1.9	3.7	3.6	4.5	5.7	6.5	7.1	7.3	6.5	6.7	***	6.3	4.1	3.9	3.2	4.1
8	2.0	1.8	2.0	1.7	1.8	2.2	2.3	2.0	2.1	1.9	2.9	3.4	4.2	4.0	4.7	6.8	7.4	9.2	***	9.5	8.0	4.9	***	9.0	4.3
9	7.1	8.4	5.7	4.2	4.3	3.7	4.5	4.7	3.7	3.2	3.6	5.2	4.7	4.3	3.6	5.2	5.0	5.7	6.2	5.8	5.8	6.4	5.8	5.3	5.1
10	6.3	5.6	2.8	3.9	***	***	2.4	2.8	3.2	4.0	4.3	5.9	7.3	8.2	7.7	8.0	8.4	8.1	8.2	7.8	7.7	7.9	7.7	3.9	6.0
11	2.5	2.5	1.6	1.7	2.2	2.6	2.2	1.9	3.4	4.3	4.8	6.1	6.0	6.5	6.2	7.3	7.2	6.9	6.0	6.0	4.8	3.3	3.1	2.0	4.2
12	1.4	2.4	2.9	2.4	1.5	2.5	2.9	3.1	2.2	3.0	3.6	4.5	5.1	4.7	5.9	6.1	6.0	7.2	7.2	6.8	6.0	4.8	3.1	2.3	4.1
13	2.7	5.1	4.4	1.8	3.3	2.4	3.7	3.4	2.8	2.6	3.6	4.9	5.6	6.3	6.4	8.0	7.0	6.5	6.8	7.8	6.0	5.2	3.5	2.0	4.7
14	2.7	4.7	4.2	3.0	2.2	1.5	2.2	2.5	2.1	3.1	4.5	4.8	5.0	4.0	4.7	5.2	6.2	5.8	6.0	6.9	6.7	5.2	4.0	3.1	4.2
15	2.5	2.7	4.7	3.5	2.2	2.3	0.8	1.6	2.2	3.6	3.8	4.5	4.5	4.5	6.5	5.3	7.5	8.3	7.8	7.5	5.7	3.8	4.5	4.0	4.3
16	3.7	3.5	3.9	3.7	3.3	3.5	3.8	5.2	5.6	5.7	4.6	4.2	3.6	4.3	6.2	7.2	7.4	8.0	8.6	***	6.6	5.2	4.7	4.6	5.1
17	3.6	4.0	3.8	3.5	3.3	3.3	3.0	2.8	3.1	3.5	4.5	3.4	5.0	5.7	6.5	6.6	8.4	9.9	***	6.8	5.7	4.6	3.5	3.5	4.7
18	2.8	3.1	3.2	3.0	2.8	3.0	2.5	3.0	2.7	2.0	3.7	4.7	6.2	7.8	8.5	9.5	8.7	***	7.2	7.6	4.8	4.2	5.8	5.8	4.9
19	6.4	3.9	2.6	2.3	2.5	2.7	3.4	4.1	2.8	2.3	3.8	4.8	5.8	6.3	9.1	7.7	7.8	8.0	***	***	6.9	5.3	4.2	3.7	4.8
20	2.7	3.0	3.1	3.5	4.2	4.3	3.6	3.4	2.2	2.6	3.7	4.8	6.4	6.7	7.3	6.5	6.2	6.5	7.6	***	4.1	***	3.1	2.2	4.4
21	2.8	3.0	1.2	2.4	3.7	5.1	5.8	5.2	4.8	4.9	4.4	5.6	6.3	7.8	9.1	8.3	7.9	8.1	7.3	6.9	5.3	4.5	2.7	1.6	5.2
22	1.1	2.3	3.9	5.8	6.7	6.1	5.1	3.6	3.4	4.0	5.9	5.9	5.9	7.5	8.0	8.1	7.9	8.1	6.9	8.8	6.6	3.7	5.0	4.3	5.6
23	3.0	2.6	2.3	2.2	2.0	2.1	0.9	1.8	1.7	2.8	4.9	5.4	6.6	6.4	7.7	7.0	8.0	8.2	9.1	9.0	7.3	5.1	1.9	3.1	4.6
24	3.5	3.0	4.2	3.1	3.2	3.3	4.2	4.8	4.0	3.5	4.0	3.2	3.9	6.1	5.4	6.6	***	***	***	4.7	4.2	6.4	4.7	6.3	4.4
25	6.7	5.3	6.0	4.8	4.5	3.4	2.2	3.1	3.3	3.2	4.5	3.8	4.3	5.2	4.7	4.3	6.2	7.9	8.0	***	7.2	9.4	6.6	7.3	5.3
26	6.5	4.2	2.8	3.4	5.2	5.5	7.6	3.7	2.7	4.3	4.6	5.5	6.3	6.0	6.4	6.7	7.2	7.1	6.1	3.6	6.0	8.5	8.0	5.2	5.6
27	3.8	5.8	5.8	3.7	2.7	1.9	1.5	0.7	2.0	3.2	3.9	3.6	5.0	4.9	4.2	9.4	4.9	5.6	***	***	6.9	2.3	4.7	5.4	4.2
28	5.4	4.0	3.5	3.8	3.6	4.0	4.6	4.4	3.6	3.8	3.9	3.8	4.6	4.6	4.2	3.6	5.1	5.0	4.9	6.3	4.4	2.7	2.6	1.6	4.1
29	3.1	5.0	3.3	2.7	2.7	3.4	3.7	3.7	3.2	3.0	3.6	4.6	4.8	6.6	7.6	7.3	5.5	4.7	4.4	4.7	6.1	4.9	2.8	2.2	4.3
30	1.5	1.6	2.0	2.4	4.7	5.2	3.1	2.4	2.7	5.6	6.5	6.4	6.1	5.1	7.0	9.1	9.0	7.3	8.5	6.1	3.8	3.3	3.2	4.7	4.9
HRAVE	3.4	3.7	3.4	3.1	3.2	3.3	3.4	3.3	3.0	3.3	4.1	4.6	5.2	5.8	6.5	6.9	6.9	7.1	6.8	6.5	5.8	5.0	4.3	3.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.4	4.5	4.2	4.3	3.8	4.5	4.1	4.3	5.1	6.0	4.2	4.1	4.7	4.2	4.3	5.1	4.7	4.9	4.8	4.4	5.2	5.6	4.6	4.4	5.3
MAX	7.9	7.6	7.4	7.3	6.2	9.4	7.3	9.5	8.4	8.4	7.3	7.2	8.0	6.9	8.3	8.6	9.9	9.5	9.1	7.6	9.1	8.8	9.1	6.6	9.4
MIN	1.7	2.0	1.5	2.2	1.3	1.7	1.8	1.7	3.2	2.4	1.6	1.4	1.8	1.5	0.8	3.3	2.8	2.0	2.3	2.2	1.2	1.1	0.9	3.0	2.2

DAY	26	27	28	29	30	31
AVE	5.6	4.2	4.1	4.3	4.9	***
MAX	8.5	9.4	6.3	7.6	9.1	***
MIN	2.7	0.7	1.6	2.2	1.5	***

MONTHLY AVERAGE = 4.6 MONTHLY MAXIMUM = 9.9 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.5% OPERATIONAL RECOVERY RATE = 96.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.1	4.6	4.9	4.0	2.5	1.8	2.8	3.3	2.9	4.3	4.8	5.2	5.1	***	7.7	***	7.7	7.7	5.4	6.9	***	4.4	5.1	3.6	4.8
2	3.4	3.5	3.0	2.9	2.7	2.3	3.5	4.1	2.8	4.3	5.6	5.6	6.1	6.1	5.9	5.2	8.6	9.5	5.8	***	7.1	6.7	5.1	2.8	4.9
3	1.8	3.2	2.8	2.9	3.0	3.0	3.1	3.2	3.2	3.3	3.1	3.6	5.9	6.2	7.3	7.2	6.1	6.8	8.9	***	6.2	5.0	8.3	3.2	4.7
4	2.4	2.6	3.0	3.9	3.3	3.2	2.7	2.9	3.3	3.2	3.8	3.7	5.1	6.6	7.1	***	8.6	***	8.3	8.0	3.6	4.7	4.6	2.7	4.4
5	4.0	5.2	4.8	3.0	2.7	5.8	7.0	6.2	4.9	2.2	3.4	2.9	2.8	3.3	4.1	4.3	4.3	3.0	2.0	3.9	2.1	5.1	3.9	3.1	3.9
6	3.3	2.8	3.1	2.8	2.6	2.4	2.8	2.1	2.6	4.5	3.5	6.3	9.1	7.4	11.3	8.6	7.4	7.9	4.2	4.5	4.9	5.2	3.9	4.1	4.9
7	3.4	4.6	2.7	3.2	2.7	2.7	3.3	3.5	3.6	2.5	4.2	4.3	5.4	4.6	6.3	8.2	10.2	8.1	7.2	***	6.9	3.6	4.6	4.4	4.8
8	4.0	1.4	2.1	3.5	4.1	2.1	2.0	2.0	2.4	2.6	3.2	3.1	4.4	3.8	5.0	7.4	7.8	8.7	***	8.7	8.1	6.9	***	10.4	4.7
9	8.2	5.8	4.7	6.2	5.0	4.1	4.1	5.5	4.1	3.8	4.3	4.8	3.7	4.7	4.4	5.2	5.1	4.5	7.0	6.8	6.5	6.3	4.7	5.4	5.2
10	7.5	3.2	3.4	3.8	***	***	2.6	3.0	2.1	3.6	3.5	6.2	6.8	6.7	8.8	11.6	10.7	9.7	8.5	7.4	6.9	8.2	8.8	4.7	6.3
11	2.8	1.2	3.5	2.8	1.2	2.1	1.1	1.4	2.8	4.5	5.7	4.4	6.4	6.6	5.2	8.2	5.7	4.2	6.4	7.4	5.4	2.9	3.7	1.6	4.1
12	3.6	2.7	2.5	2.6	2.2	2.0	2.3	3.1	2.8	2.9	3.3	4.8	3.6	4.7	2.3	7.0	6.2	7.0	8.4	6.6	7.1	7.3	4.5	2.1	4.2
13	1.9	5.8	4.4	2.3	2.3	2.0	3.0	3.5	3.2	3.0	5.1	4.7	5.7	5.9	7.2	6.7	7.3	7.9	8.1	8.8	6.2	5.1	2.9	2.7	4.8
14	3.0	5.2	5.4	3.5	3.0	2.0	1.1	1.3	2.7	3.3	5.2	5.4	4.5	5.6	5.6	4.4	5.0	6.3	6.4	7.4	7.3	5.7	3.8	3.4	4.4
15	3.2	3.8	5.4	3.8	2.8	0.9	2.3	2.8	2.7	2.6	3.9	4.2	3.9	5.8	4.9	5.1	6.9	6.8	6.9	6.2	5.9	4.3	5.2	4.7	4.4
16	4.2	3.6	4.1	3.5	4.0	4.5	4.7	5.6	6.1	7.4	6.0	5.0	3.4	3.6	6.1	5.9	7.1	9.3	9.4	***	7.0	5.3	4.2	5.0	5.4
17	6.1	6.7	4.3	3.4	3.3	3.7	2.9	3.0	4.4	4.3	4.5	5.8	6.1	5.3	7.4	6.8	8.7	8.2	***	8.0	6.4	5.4	3.7	3.5	5.3
18	2.8	1.7	2.5	2.8	2.7	2.1	2.1	2.8	3.3	2.8	4.7	5.0	7.3	6.8	5.8	8.4	8.2	***	9.9	8.4	5.4	4.3	5.5	6.4	4.9
19	6.2	4.5	3.7	2.7	2.9	3.3	3.3	4.5	3.5	2.7	3.1	4.4	4.9	7.7	8.6	6.5	6.4	8.5	***	***	6.7	5.3	3.8	3.8	4.9
20	2.0	2.6	2.8	3.4	3.9	4.5	4.5	3.9	2.1	3.3	2.9	6.3	6.8	7.1	6.2	4.9	6.0	6.6	8.6	***	4.6	***	2.7	1.5	4.4
21	2.5	2.2	2.7	3.0	4.3	6.0	6.7	5.1	4.7	4.8	5.3	4.9	6.8	6.4	9.6	8.4	7.8	10.9	7.6	7.0	4.9	4.3	3.2	1.6	5.4
22	0.7	1.8	4.7	6.6	6.6	7.0	5.2	3.8	2.9	3.6	5.7	5.0	7.3	7.2	8.9	9.9	9.1	10.2	7.7	9.6	7.2	3.9	5.2	3.3	6.0
23	2.9	2.2	2.0	1.8	2.5	2.4	1.4	1.9	1.4	3.9	5.5	5.6	6.3	6.4	7.8	7.2	6.7	8.8	12.4	9.9	8.2	5.6	2.2	3.4	4.9
24	3.2	2.8	5.0	3.8	3.3	2.9	5.3	6.1	3.9	3.9	3.8	4.3	5.0	6.6	6.3	7.5	***	***	***	7.1	5.7	6.6	6.2	8.2	5.1
25	8.1	5.4	6.1	4.5	3.4	3.1	1.8	3.2	3.0	3.7	3.7	4.4	5.0	4.9	5.5	4.9	5.9	6.4	7.5	***	7.0	8.9	7.3	7.1	5.2
26	6.6	3.0	2.1	3.0	4.0	5.2	7.3	3.3	1.7	4.5	4.3	4.6	4.5	6.2	5.4	5.9	6.9	7.2	5.6	3.3	7.3	7.6	9.3	4.6	5.1
27	4.6	5.5	6.2	4.1	2.2	1.5	2.1	2.4	1.7	3.5	4.6	3.6	4.5	4.2	5.2	10.3	3.8	5.4	***	***	9.1	2.9	5.3	5.9	4.5
28	6.0	4.2	4.9	4.4	3.7	4.7	5.1	5.1	4.6	5.1	3.9	4.0	5.2	6.6	4.9	3.2	4.7	4.3	4.7	5.6	3.5	2.7	2.4	1.2	4.4
29	1.0	2.1	1.6	1.6	2.3	2.6	3.0	3.0	2.6	1.0	2.8	4.3	5.5	5.7	6.3	5.2	5.2	5.1	3.8	4.8	6.3	4.6	1.7	2.0	3.5
30	2.3	1.9	1.5	2.5	4.7	6.5	4.4	2.3	2.2	4.2	4.9	5.4	5.7	5.9	6.3	9.0	9.7	6.3	11.5	7.3	3.9	2.8	2.5	5.4	5.0
HRAVE	3.9	3.5	3.7	3.4	3.2	3.3	3.5	3.5	3.1	3.6	4.3	4.7	5.4	5.8	6.4	6.9	7.0	7.2	7.3	7.0	6.1	5.2	4.6	4.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.8	4.9	4.7	4.4	3.9	4.9	4.8	4.7	5.2	6.3	4.1	4.2	4.8	4.4	4.4	5.4	5.3	4.9	4.9	4.4	5.4	6.0	4.9	5.1	5.2
MAX	7.7	9.5	8.9	8.6	7.0	11.3	10.2	10.4	8.2	11.6	8.2	8.4	8.8	7.4	6.9	9.4	8.7	9.9	8.6	8.6	10.9	10.2	12.4	8.2	8.9
MIN	1.8	2.3	1.8	2.4	2.0	2.1	2.5	1.4	3.7	2.1	1.1	2.0	1.9	1.1	0.9	3.4	2.9	1.7	2.7	1.5	1.6	0.7	1.4	2.8	1.8

DAY	26	27	28	29	30	31
AVE	5.1	4.5	4.4	3.5	5.0	***
MAX	9.3	10.3	6.6	6.3	11.5	***
MIN	1.7	1.5	1.2	1.0	1.5	***

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 12.4 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.5% OPERATIONAL RECOVERY RATE = 96.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.9	***	***	4.6	3.6	***	***	4.6	3.1	5.1	5.7	7.5	4.2	***	8.9	***	9.1	***	***	8.8	***	***	5.2	3.7	5.7
2	***	***	***	3.0	2.7	3.8	4.0	6.1	3.4	4.1	5.8	5.7	5.2	8.4	6.2	5.7	8.7	9.0	***	***	***	***	5.8	***	5.5
3	2.6	***	***	***	***	3.0	***	3.6	***	2.2	***	4.1	7.6	5.4	7.6	7.2	***	***	***	***	7.1	***	***	***	5.0
4	4.5	***	***	4.1	6.4	3.8	3.1	3.0	2.4	1.5	4.4	***	5.2	5.9	7.4	***	***	***	***	***	2.7	5.3	4.9	3.0	4.2
5	3.8	4.7	5.3	2.6	3.4	5.8	6.9	6.4	5.1	2.0	3.4	2.5	3.0	2.3	3.7	4.6	3.7	2.9	2.3	3.9	2.4	4.7	3.4	3.3	3.8
6	2.7	4.3	2.7	3.2	2.5	3.6	2.8	2.1	3.7	4.6	4.4	5.2	10.4	8.9	***	9.0	9.9	8.2	4.4	***	***	***	5.7	5.2	5.2
7	4.1	4.3	2.1	3.8	2.7	3.1	3.3	4.5	3.3	3.0	3.7	4.7	6.2	5.0	4.5	7.7	10.2	8.0	***	***	***	3.9	5.1	3.1	4.6
8	3.2	1.3	2.8	2.9	3.5	3.6	3.7	3.0	4.1	3.3	3.2	3.3	4.3	4.3	4.8	6.2	***	***	***	8.5	7.9	7.3	***	***	4.3
9	8.1	5.9	4.5	7.0	5.0	3.8	3.7	5.8	3.8	4.0	3.4	3.9	3.8	5.3	4.0	7.2	6.1	6.0	***	***	***	***	***	***	5.1
10	***	3.3	2.7	3.4	***	***	2.7	3.4	1.6	3.0	3.1	5.3	6.5	7.0	10.9	12.4	9.7	10.2	9.3	***	***	***	***	4.4	5.8
11	2.2	3.3	4.3	3.1	1.2	2.7	1.3	1.1	3.9	6.2	5.8	5.5	8.8	7.8	6.8	8.8	6.6	5.1	6.6	***	***	3.0	3.8	1.1	4.5
12	3.7	2.0	2.2	2.9	2.2	3.3	2.5	3.6	3.4	2.8	2.7	2.7	3.2	4.9	2.3	6.5	6.1	7.0	***	***	7.1	7.7	4.7	4.3	4.0
13	3.0	7.6	***	2.3	2.9	2.2	2.5	4.2	3.1	3.1	5.2	4.8	6.1	6.4	6.7	7.4	6.7	8.9	***	***	6.0	***	***	2.6	4.8
14	3.2	5.5	4.3	3.4	2.9	1.8	4.2	2.6	4.1	3.4	5.4	5.5	4.4	5.5	6.4	4.5	5.8	6.5	6.2	***	***	***	***	***	4.5
15	2.8	3.7	5.2	4.0	4.0	3.0	1.6	2.8	3.0	3.8	3.9	4.3	3.9	5.8	5.1	6.8	6.9	6.6	6.8	7.8	***	6.8	6.3	4.6	4.7
16	6.5	3.6	4.3	5.9	4.4	5.3	4.5	5.1	6.1	7.6	6.8	5.8	3.5	4.7	5.0	6.1	6.0	9.9	***	***	6.9	5.7	5.3	5.6	5.7
17	6.1	6.6	4.4	3.3	3.1	3.8	2.9	3.3	4.4	4.7	4.2	4.5	6.4	7.1	6.6	***	4.7	***	***	8.0	6.3	6.8	***	3.3	5.0
18	4.7	2.1	2.6	2.9	3.1	2.1	2.9	2.9	3.3	4.1	4.2	5.9	7.1	6.2	6.4	9.1	8.8	***	7.8	8.0	5.2	4.3	6.1	***	5.0
19	***	4.1	3.8	3.3	4.7	2.4	3.9	4.8	3.3	2.5	2.4	5.2	4.9	7.5	9.9	7.2	6.5	***	***	***	6.3	***	***	***	4.9
20	2.4	4.5	***	***	***	4.6	8.4	4.8	2.4	3.1	3.8	5.5	8.9	7.4	7.4	4.8	7.7	8.4	11.2	***	***	***	1.7	1.5	5.5
21	2.0	2.0	1.5	3.6	4.4	4.8	6.7	5.6	4.8	7.3	4.5	4.0	6.5	6.5	9.1	9.7	6.7	10.6	***	7.5	***	***	***	***	5.7
22	1.2	1.4	4.5	6.2	6.9	***	4.7	3.3	5.1	3.3	5.8	4.8	6.8	9.4	11.3	9.7	9.5	12.2	***	***	7.2	***	***	4.1	6.2
23	3.7	2.4	2.1	2.0	2.7	2.4	1.5	2.0	3.0	5.7	6.1	5.2	6.2	6.2	6.5	5.7	6.7	8.7	12.9	***	***	***	2.0	3.9	4.7
24	3.3	2.3	4.3	4.1	5.2	3.2	4.8	6.6	4.3	3.3	3.2	4.3	5.2	7.8	7.3	8.2	***	***	***	7.2	5.4	***	5.9	8.2	5.2
25	8.0	6.7	6.8	4.7	3.7	4.0	1.9	3.2	2.5	3.2	4.0	3.9	6.4	3.8	5.7	5.3	5.6	5.6	7.2	***	***	9.9	7.0	7.6	5.3
26	6.4	3.4	2.6	3.0	3.8	4.6	5.9	3.2	2.0	4.4	4.5	4.1	5.8	8.6	6.5	7.0	6.7	6.4	***	***	***	8.1	8.4	5.0	5.3
27	4.9	4.9	5.2	3.9	2.2	1.9	2.4	2.9	2.8	3.7	3.6	3.0	4.2	3.6	5.5	11.8	3.7	3.6	***	***	***	3.6	5.4	5.1	4.2
28	6.4	4.4	4.8	4.7	4.0	5.0	5.5	5.3	4.5	5.9	5.0	3.9	5.1	5.6	6.7	3.0	5.8	4.6	3.9	5.2	3.7	2.4	2.5	1.1	4.5
29	1.4	3.3	2.0	1.9	2.4	2.9	3.6	3.6	2.6	1.7	2.0	3.4	5.8	6.1	7.1	6.1	***	4.8	4.1	5.1	6.2	4.7	2.2	2.7	3.7
30	1.5	1.8	3.1	2.6	5.2	5.6	4.5	2.4	2.3	4.4	5.8	5.3	6.1	6.7	6.1	8.9	11.4	***	9.4	***	3.8	2.7	2.6	5.7	4.9
HRAVE	4.0	3.8	3.7	3.7	3.7	3.6	3.8	3.9	3.5	3.9	4.3	4.6	5.7	6.2	6.6	7.3	7.2	7.3	7.1	7.0	5.6	5.4	4.7	4.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.7	5.5	5.0	4.2	3.8	5.2	4.6	4.3	5.1	5.8	4.5	4.0	4.8	4.5	4.7	5.7	5.0	5.0	4.9	5.5	5.7	6.2	4.7	5.2	5.3
MAX	9.1	9.0	7.6	7.4	6.9	10.4	10.2	8.5	8.1	12.4	8.8	7.7	8.9	6.5	7.8	9.9	8.0	9.1	9.9	11.2	10.6	12.2	12.9	8.2	9.9
MIN	3.1	2.7	2.2	1.5	2.0	2.1	2.1	1.3	3.4	1.6	1.1	2.0	2.2	1.8	1.6	3.5	2.9	2.1	2.4	1.5	1.5	1.2	1.5	2.3	1.9

DAY	26	27	28	29	30	31
AVE	5.3	4.2	4.5	3.7	4.9	***
MAX	8.6	11.8	6.7	7.1	11.4	***
MIN	2.0	1.9	1.1	1.4	1.5	***

MONTHLY AVERAGE = 4.9 MONTHLY MAXIMUM = 12.9 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 82.1% OPERATIONAL RECOVERY RATE = 82.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
JUNE - 2015

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	305	295	288	286	293	69	112	114	99	164	180	273	277	***	266	***	286	287	286	292	***	279	283	315	34
2	343	252	74	134	87	93	110	107	100	104	69	358	21	267	263	264	279	280	287	***	285	285	286	256	55
3	142	317	174	128	98	95	97	103	106	242	112	321	275	265	261	261	263	269	266	***	286	294	287	267	31
4	220	158	111	109	103	98	88	84	86	90	161	130	136	221	228	***	262	***	270	280	168	134	153	165	345
5	159	143	117	96	332	54	58	44	22	94	71	44	28	340	349	76	359	247	189	283	353	297	229	352	250
6	10	73	65	77	78	80	71	71	86	136	245	210	195	221	288	285	280	284	283	301	275	270	288	24	84
7	12	81	91	76	81	80	84	95	119	158	73	278	271	278	287	303	302	285	284	***	290	289	290	306	219
8	328	51	76	6	66	86	77	356	346	344	312	274	277	280	283	283	285	284	***	282	286	237	***	141	182
9	150	153	134	83	83	85	131	89	98	109	84	75	77	40	134	78	328	285	289	287	289	283	281	282	272
10	286	277	274	282	***	***	289	288	269	269	281	281	280	288	283	286	287	294	285	288	289	283	283	275	114
11	278	294	329	343	142	118	81	61	332	275	273	274	282	281	285	277	279	292	282	282	298	330	293	298	48
12	74	104	95	99	39	92	99	103	108	175	267	268	251	297	311	277	278	283	283	285	291	293	288	208	239
13	120	279	281	245	193	129	108	109	143	213	275	279	276	278	284	284	279	279	285	282	284	289	338	313	222
14	326	279	295	289	276	228	140	104	117	267	271	265	269	244	263	267	279	272	273	280	282	290	294	289	169
15	318	310	288	296	250	153	135	0	307	274	271	274	287	274	279	273	274	276	279	284	282	311	67	52	23
16	80	82	87	77	89	86	78	70	78	84	85	68	174	241	261	271	282	280	279	***	290	329	76	103	312
17	140	137	87	91	82	90	93	95	84	86	11	99	245	264	274	277	277	280	***	281	285	284	282	292	133
18	144	127	111	108	92	87	86	100	108	299	289	268	273	281	276	286	274	***	280	281	283	286	287	291	67
19	292	286	328	123	110	102	99	119	129	243	274	269	281	283	286	278	282	293	***	***	290	293	281	286	40
20	204	107	101	101	109	118	104	101	88	148	243	276	285	269	277	276	286	276	280	***	288	***	280	319	119
21	99	81	86	316	303	295	300	294	329	280	276	285	276	278	282	275	271	280	281	280	293	288	278	245	107
22	156	73	297	295	296	299	313	303	301	277	290	283	279	273	287	279	280	292	279	277	288	279	287	228	316
23	152	115	128	75	11	312	25	72	102	269	280	279	269	270	267	271	272	279	280	280	288	302	273	177	322
24	128	119	79	80	75	79	85	97	98	91	176	172	108	275	222	157	***	***	***	66	93	63	56	63	60
25	65	76	71	74	68	56	56	84	86	30	85	277	190	276	269	265	268	277	286	***	282	155	158	163	149
26	156	161	174	173	161	159	153	163	172	278	276	283	280	273	279	277	279	279	278	274	284	151	156	164	314
27	175	161	162	154	111	114	9	2	222	324	155	219	182	170	184	138	274	9	***	***	75	213	98	75	81
28	65	81	80	96	90	79	71	86	95	86	78	41	199	199	226	270	274	291	8	165	167	136	116	153	354
29	158	155	150	123	118	108	116	151	147	175	273	281	274	272	270	273	267	272	251	201	269	270	159	167	53
30	101	120	163	103	135	147	137	176	276	278	279	279	276	272	279	280	283	289	273	286	291	180	226	278	274

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.5% OPERATIONAL RECOVERY RATE = 96.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	298	304	285	270	300	32	116	97	103	159	192	262	313	***	287	***	283	286	292	286	***	270	290	317	347
2	155	253	237	167	100	91	129	108	115	108	93	17	16	255	260	272	266	278	296	***	283	282	283	256	332
3	22	321	154	131	105	105	100	98	115	265	60	6	267	260	257	253	262	266	263	***	270	284	265	276	132
4	218	195	112	95	98	90	92	81	71	100	135	121	122	196	222	***	259	***	266	265	198	150	120	121	272
5	164	152	137	157	27	60	63	55	67	39	60	45	52	14	18	97	358	258	146	305	297	278	132	128	248
6	310	52	87	81	77	80	82	78	117	166	223	205	190	232	281	285	282	287	298	301	273	272	329	21	338
7	331	104	76	113	82	84	81	85	88	148	84	251	278	283	310	312	304	287	302	***	291	283	290	16	256
8	179	216	303	87	186	100	50	353	19	13	348	287	273	279	284	294	289	283	***	284	278	230	***	141	261
9	157	168	131	87	64	81	151	80	90	88	80	73	64	72	99	85	328	288	300	289	288	278	280	256	121
10	269	116	225	102	***	***	313	290	11	272	274	276	290	276	279	290	300	281	290	291	282	287	285	275	129
11	313	125	358	324	296	108	113	1	354	298	316	272	269	276	280	280	261	279	279	275	302	313	312	236	23
12	285	20	95	95	13	5	104	107	103	133	251	258	273	272	304	287	279	289	291	278	276	294	276	294	231
13	73	304	285	295	291	148	107	118	134	30	289	287	283	283	274	279	277	263	274	282	279	287	350	295	92
14	287	267	313	290	292	299	186	54	352	283	269	282	224	255	269	266	276	278	269	279	282	293	291	290	69
15	316	316	286	290	282	275	291	320	321	303	274	282	273	266	291	273	274	273	279	278	280	36	67	59	329
16	88	78	82	76	84	81	71	71	79	76	80	61	197	180	260	269	283	293	296	***	290	337	68	106	178
17	142	152	102	84	95	99	87	81	67	87	57	95	258	263	261	278	307	279	***	274	295	286	287	299	113
18	119	130	112	130	114	81	96	112	166	213	284	267	272	277	274	279	277	***	288	289	288	287	307	288	134
19	292	278	325	151	151	151	126	151	163	169	203	271	265	278	268	256	275	304	***	***	290	304	278	286	227
20	13	124	105	104	108	145	110	103	66	122	239	320	284	278	274	258	269	277	272	***	288	***	294	320	190
21	89	98	271	300	309	298	294	295	302	277	295	337	265	267	273	276	275	277	284	283	292	286	319	223	197
22	147	316	281	297	293	296	312	308	293	288	314	290	284	281	287	287	287	313	270	277	283	271	292	206	128
23	151	100	99	41	351	320	320	39	356	281	290	262	263	277	257	269	269	284	297	278	287	302	335	176	156
24	141	89	81	81	74	80	96	97	96	92	161	141	77	283	199	160	***	***	***	30	84	63	58	64	319
25	71	85	62	79	81	70	50	78	76	312	102	302	110	315	275	279	269	271	283	***	299	155	156	170	168
26	158	177	197	195	173	161	157	160	192	280	280	287	268	278	269	283	273	275	276	285	289	157	155	181	65
27	173	165	161	148	118	221	326	319	224	354	112	189	162	178	208	130	242	285	***	***	73	173	89	69	41
28	63	78	62	79	80	71	73	72	75	67	77	70	161	167	208	281	274	286	350	164	185	92	89	89	25
29	169	161	151	94	101	96	91	135	101	26	258	274	277	278	271	266	263	275	219	230	263	265	205	176	187
30	296	302	197	130	132	153	155	99	285	287	271	282	278	280	277	272	269	258	276	278	302	171	242	281	217

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.5% OPERATIONAL RECOVERY RATE = 96.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
JUNE - 2015

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	308	***	***	272	304	***	***	84	98	154	190	250	330	***	281	***	283	***	***	270	***	***	290	314	251
2	***	***	***	165	93	78	142	97	115	100	86	60	15	245	264	278	265	286	***	***	***	***	286	***	322
3	210	***	***	***	***	101	***	113	***	245	***	358	268	247	265	250	***	***	***	***	283	***	***	***	182
4	231	***	***	98	83	95	88	97	53	110	135	***	125	191	196	***	***	***	***	***	192	155	97	119	340
5	161	154	116	194	343	57	60	61	68	58	64	11	51	14	28	86	8	259	55	290	304	283	162	283	13
6	332	70	135	89	54	77	93	89	223	163	216	103	189	226	***	298	292	289	307	***	***	***	31	1	231
7	309	103	85	40	85	79	79	94	101	184	88	244	281	291	324	323	290	311	***	***	***	287	292	101	327
8	160	49	60	111	179	114	54	351	41	358	336	286	274	279	282	286	***	***	***	275	272	220	***	***	26
9	151	170	124	79	70	86	145	86	101	93	93	77	83	54	73	60	324	296	***	***	***	***	***	***	64
10	***	111	168	93	***	***	311	279	218	217	291	277	293	278	274	289	299	284	294	***	***	***	***	276	58
11	154	106	8	307	241	124	105	6	25	302	307	255	256	281	275	280	271	296	278	***	***	324	317	110	57
12	108	74	94	106	20	4	102	98	108	166	253	290	294	283	222	275	275	290	***	***	269	287	234	127	194
13	50	263	***	292	238	145	78	112	127	47	282	281	296	282	267	273	278	264	***	***	280	***	***	253	318
14	279	258	325	301	291	321	194	7	9	293	262	283	232	231	267	264	280	281	269	***	***	***	***	***	108
15	324	320	290	294	300	133	284	328	344	342	247	311	276	248	286	281	286	276	271	276	***	49	75	59	155
16	103	87	78	67	86	88	70	76	77	85	86	89	207	162	270	279	287	292	***	***	289	348	79	110	31
17	137	154	95	79	61	99	87	81	75	94	76	83	260	271	263	***	351	***	***	273	288	290	***	314	158
18	126	106	113	117	93	86	78	117	164	61	279	266	269	279	264	281	280	***	290	288	283	284	314	***	95
19	***	282	320	120	172	139	147	151	160	192	59	247	267	285	277	262	258	***	***	***	287	***	***	***	286
20	195	161	***	***	***	133	121	95	69	112	261	307	285	271	275	250	265	278	278	***	***	***	332	110	219
21	145	166	242	349	318	300	296	295	306	265	304	339	264	264	274	271	263	274	***	278	***	***	***	***	152
22	108	342	272	293	289	***	316	321	272	290	313	301	301	262	291	279	291	322	***	***	279	***	***	189	255
23	153	110	104	29	355	320	325	56	357	293	304	266	254	281	265	258	279	277	294	***	***	***	328	187	35
24	132	86	65	88	93	83	96	99	116	106	161	149	44	293	197	160	***	***	***	36	84	***	65	63	24
25	66	92	60	78	79	86	60	77	81	358	101	340	107	218	273	288	272	262	280	***	***	150	156	168	46
26	158	165	195	189	176	170	161	159	181	277	292	291	267	283	258	282	274	277	***	***	***	157	157	180	192
27	186	168	169	128	135	2	328	312	234	49	78	150	163	188	216	114	280	306	***	***	***	143	95	73	80
28	69	81	72	91	81	70	71	81	77	70	87	63	145	150	196	275	279	278	339	185	192	71	85	107	218
29	193	178	134	97	118	92	86	124	95	11	267	268	270	281	274	263	***	280	219	223	261	264	184	166	55
30	168	238	194	107	133	144	152	95	286	285	277	268	278	284	279	274	273	***	264	***	307	186	243	281	148

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 82.1% OPERATIONAL RECOVERY RATE = 82.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
JUNE - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.47	***	0.22	0.41	0.09	0.01	0.08	0.16	0.47	0.79	1.04	1.09	1.10	***	1.08	***	0.77	0.87	1.10	0.25	***	0.83	0.36	0.40	0.58
2	0.48	0.55	0.31	0.36	0.41	0.26	0.25	0.30	0.35	0.87	1.30	1.28	1.38	1.25	1.27	0.93	1.12	0.89	0.99	***	0.52	0.49	0.33	0.49	0.71
3	0.35	0.42	0.33	0.31	0.35	0.19	0.15	0.28	0.85	0.87	1.08	1.34	1.36	1.24	1.01	1.08	1.25	0.80	0.70	***	0.41	0.54	0.48	0.48	0.69
4	0.42	0.35	0.34	0.33	0.45	0.40	0.40	0.36	0.51	0.88	0.85	0.64	0.93	0.95	0.79	***	0.81	***	0.90	0.60	0.60	0.62	0.61	0.47	0.60
5	0.37	0.37	0.42	0.40	0.51	0.63	0.76	0.87	0.94	0.38	0.39	0.60	0.50	0.66	0.72	0.90	1.00	0.76	0.39	0.57	0.40	0.40	0.49	0.59	0.58
6	0.41	0.15	0.34	0.40	0.45	0.23	0.29	0.32	0.45	0.63	0.82	0.94	0.91	0.98	0.98	0.91	1.11	0.97	0.92	0.71	0.44	0.41	0.51	0.61	0.62
7	0.51	0.43	0.37	0.46	0.31	0.05	0.19	0.28	0.36	0.75	0.88	1.04	1.10	1.18	0.98	1.08	1.15	1.05	0.90	***	0.59	0.41	0.34	0.67	0.66
8	0.57	0.41	0.44	0.38	0.37	0.14	0.12	0.14	0.12	0.20	0.46	0.55	0.72	0.53	0.52	0.83	0.72	0.65	***	0.66	0.62	0.82	***	***	0.47
9	0.80	0.79	0.66	0.52	0.51	0.29	0.45	0.62	0.36	0.40	0.43	0.82	0.92	1.15	0.95	0.76	0.80	0.65	0.61	0.28	0.22	***	0.44	0.62	0.61
10	0.62	0.23	***	***	***	***	0.17	0.57	0.91	0.91	0.99	1.02	1.03	1.11	1.07	0.99	1.06	0.94	0.76	***	0.54	0.56	0.44	0.54	0.76
11	0.51	0.55	0.51	0.42	0.16	0.13	0.20	0.42	0.78	0.97	1.09	1.29	1.10	1.26	1.05	1.06	1.15	1.01	0.85	0.69	***	0.35	0.23	0.57	0.71
12	0.53	0.40	0.33	0.33	0.13	0.01	0.02	0.07	0.38	0.91	0.91	1.14	1.32	1.10	0.98	1.31	1.13	0.84	0.92	0.47	0.55	0.48	0.62	0.51	0.64
13	0.42	0.55	0.40	0.27	0.35	0.03	0.17	0.30	0.66	0.84	0.72	1.10	1.25	1.04	1.14	0.86	1.25	0.98	0.90	0.69	0.52	0.32	0.43	0.18	0.64
14	0.29	0.55	0.66	0.25	0.07	0.01	0.01	0.07	0.44	0.76	0.92	1.08	1.07	1.16	1.14	1.20	1.06	0.96	0.83	0.76	0.40	0.39	0.31	0.35	0.61
15	0.48	0.44	0.28	0.26	0.26	0.17	0.04	0.21	0.46	0.83	0.97	1.09	1.26	1.20	1.09	0.96	0.87	0.75	0.69	0.80	0.49	0.72	0.46	0.59	0.64
16	0.58	0.38	0.46	0.46	0.26	0.33	0.29	0.28	0.58	0.76	1.12	0.87	0.89	1.10	1.23	0.97	1.03	1.10	1.20	***	0.41	0.51	0.54	0.76	0.70
17	0.74	0.56	0.44	0.41	0.22	0.08	0.06	0.24	0.46	0.88	0.95	1.16	1.19	0.94	0.78	0.69	0.68	0.57	***	0.58	0.63	0.38	***	0.33	0.59
18	0.37	0.33	0.20	0.07	0.10	0.25	0.24	0.18	0.35	0.79	0.83	0.94	1.14	1.21	0.97	1.09	1.17	***	0.96	1.12	0.48	0.43	0.54	0.39	0.62
19	0.51	0.44	0.26	0.25	0.10	0.12	0.16	0.37	0.60	0.92	0.89	0.90	1.31	1.08	1.00	1.11	***	1.03	***	***	0.64	0.25	0.61	0.47	0.62
20	0.31	0.37	0.29	0.25	0.35	0.38	0.32	0.34	0.30	0.80	1.00	1.07	0.97	0.94	***	0.93	1.03	0.94	0.62	***	0.34	***	0.25	0.63	0.59
21	0.35	0.26	0.29	0.27	0.22	0.34	0.33	0.38	0.73	0.94	0.91	1.05	0.99	0.93	1.24	0.96	0.77	1.09	1.01	0.60	0.49	0.17	0.33	0.29	0.62
22	0.17	0.53	0.34	0.44	0.65	0.47	0.40	0.41	0.68	0.88	0.92	1.10	1.08	1.08	1.18	1.07	0.83	0.86	0.72	1.15	0.36	0.44	0.37	0.39	0.69
23	0.26	0.42	0.33	0.25	0.16	0.03	0.02	0.08	0.21	0.90	0.94	0.95	0.87	1.06	1.07	1.03	0.91	0.75	***	0.60	0.43	0.30	0.25	0.28	0.53
24	0.34	0.39	0.56	0.58	0.30	0.23	0.41	0.56	0.68	0.82	1.04	0.87	0.95	0.90	0.84	0.88	***	***	***	0.65	0.49	0.48	0.72	0.53	0.63
25	0.55	0.60	0.63	0.52	0.47	0.32	0.21	0.18	0.43	0.87	1.04	1.09	1.02	1.23	1.22	1.07	0.92	1.03	0.73	***	0.76	0.57	0.51	0.43	0.71
26	0.40	0.45	0.43	0.32	0.42	0.53	0.71	0.47	0.58	1.02	1.23	1.15	1.10	1.12	1.18	0.96	0.80	0.82	0.72	0.78	0.41	0.74	0.55	0.47	0.72
27	0.49	0.45	0.42	0.33	0.29	0.16	0.26	0.32	0.74	0.89	0.76	1.10	1.18	1.34	1.36	0.91	0.86	1.00	***	***	0.62	0.51	0.65	0.48	0.69
28	0.57	0.39	0.23	0.22	0.16	0.25	0.35	0.35	0.39	0.52	0.67	1.21	1.32	1.31	0.82	0.57	0.73	0.77	0.96	0.82	0.44	0.15	0.30	0.09	0.57
29	0.12	0.47	0.32	0.04	0.10	0.13	0.16	0.30	0.69	0.81	0.78	1.08	1.13	1.01	0.85	1.03	0.75	0.42	0.55	0.67	0.76	0.38	0.17	0.01	0.53
30	0.35	0.12	0.01	0.01	0.25	0.28	0.37	0.53	0.58	0.81	0.94	0.92	1.15	1.19	1.05	0.81	0.89	0.63	***	0.58	0.29	0.37	0.39	0.58	0.57
HRAVE	0.44	0.43	0.37	0.33	0.29	0.22	0.25	0.33	0.53	0.79	0.90	1.02	1.07	1.08	1.02	0.96	0.95	0.86	0.82	0.67	0.49	0.46	0.44	0.46	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.58	0.71	0.69	0.60	0.58	0.62	0.66	0.47	0.61	0.76	0.71	0.64	0.64	0.61	0.64	0.70	0.59	0.62	0.62	0.59	0.62	0.69	0.53	0.63	0.71
MAX	1.10	1.38	1.36	0.95	1.00	1.11	1.18	0.83	1.15	1.11	1.29	1.32	1.25	1.20	1.26	1.23	1.19	1.21	1.31	1.07	1.24	1.18	1.07	1.04	1.23
MIN	0.01	0.25	0.15	0.33	0.37	0.15	0.05	0.12	0.22	0.17	0.13	0.01	0.03	0.01	0.04	0.26	0.06	0.07	0.10	0.25	0.17	0.17	0.02	0.23	0.18

DAY	26	27	28	29	30	31
AVE	0.72	0.69	0.57	0.53	0.57	***
MAX	1.23	1.36	1.32	1.13	1.19	***
MIN	0.32	0.16	0.09	0.01	0.01	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 94.9% OPERATIONAL RECOVERY RATE = 94.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
JUNE - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.57	***	0.30	0.23	0.09	0.01	0.21	0.22	0.43	0.73	0.93	0.71	***	***	***	***	0.98	0.98	***	***	***	***	0.39	0.38	0.48
2	0.52	0.61	0.30	0.42	0.59	0.20	0.18	0.26	0.32	0.85	1.25	1.10	1.62	1.38	1.15	0.86	0.95	0.79	***	***	0.43	0.46	0.36	0.46	0.68
3	0.35	0.51	0.39	0.31	0.27	0.17	0.11	0.25	0.93	0.84	1.10	1.13	1.44	1.14	1.13	***	***	0.49	0.60	***	0.37	0.47	0.35	0.62	0.62
4	***	0.47	0.34	0.35	0.43	0.33	0.28	0.32	0.52	0.96	0.90	***	0.62	0.81	***	***	***	***	***	0.58	0.66	0.81	0.84	0.44	0.57
5	0.30	0.35	0.51	0.74	0.61	0.60	0.57	0.61	0.89	0.35	0.54	0.64	0.62	0.72	0.74	0.87	0.93	0.59	0.68	0.66	0.52	0.43	0.62	0.68	0.62
6	0.58	0.56	0.37	0.34	0.24	0.12	0.33	0.21	0.17	0.58	0.88	1.04	1.08	***	1.12	0.79	1.23	1.16	0.82	0.72	***	***	0.40	0.47	0.63
7	0.53	0.53	0.39	0.59	0.36	0.07	0.44	0.39	0.40	0.68	0.87	1.01	0.94	0.78	0.90	1.10	1.11	1.02	1.19	***	***	0.43	0.23	0.57	0.66
8	0.60	0.51	0.60	0.47	0.51	0.20	0.10	0.22	0.19	0.15	0.58	0.28	0.46	0.34	0.49	0.79	0.79	0.57	***	0.56	***	0.65	***	***	0.45
9	0.53	0.90	0.51	0.36	0.37	0.31	0.37	0.53	0.38	0.49	0.54	0.73	0.95	1.19	0.81	0.87	0.70	0.83	0.67	0.18	0.26	***	0.46	***	0.59
10	0.80	0.69	***	***	***	***	0.18	0.47	0.82	0.81	1.03	1.05	1.09	***	1.09	1.05	1.30	***	0.86	***	***	***	0.47	0.50	0.81
11	0.71	0.55	0.52	0.41	0.13	0.14	0.07	0.38	0.80	0.94	1.11	1.22	1.21	1.30	1.10	0.90	1.02	1.17	0.80	***	***	0.46	0.26	0.71	0.72
12	0.61	0.56	0.39	0.47	0.34	0.14	0.08	0.09	0.23	0.76	0.94	1.07	1.28	1.09	0.82	1.20	1.06	0.78	0.80	***	0.88	***	0.63	0.61	0.67
13	0.52	0.68	0.52	0.46	0.35	0.11	0.07	0.27	0.52	0.78	0.79	1.15	1.17	1.10	1.17	0.86	1.06	0.81	***	***	0.58	***	0.52	0.18	0.65
14	0.21	0.53	0.66	0.33	0.06	0.07	0.01	0.03	0.49	0.78	0.78	1.13	1.11	1.29	1.19	1.54	0.74	0.91	0.80	***	***	***	***	0.41	0.65
15	0.29	0.53	0.17	0.30	0.53	0.23	0.04	0.24	0.45	0.87	0.85	0.89	0.92	1.42	1.15	1.01	0.83	0.71	***	***	0.30	0.67	0.48	0.70	0.62
16	0.70	0.52	0.46	0.37	0.18	0.19	0.33	0.34	0.62	0.87	1.11	0.76	0.76	0.96	1.44	0.74	0.98	***	***	***	0.48	0.44	0.53	0.82	0.65
17	0.70	0.58	0.53	0.44	0.24	0.21	0.11	0.01	0.52	0.83	1.19	1.05	1.06	0.88	0.72	0.74	***	***	***	0.59	0.53	0.35	***	0.14	0.57
18	0.35	0.34	0.29	0.10	0.15	0.19	0.20	0.26	0.45	0.61	0.72	0.83	1.02	1.35	1.25	***	***	***	***	***	0.33	0.30	0.48	***	0.51
19	0.81	0.48	0.22	0.29	0.11	0.31	0.17	0.43	0.50	0.78	0.94	0.80	1.33	1.11	1.17	0.92	***	***	***	***	0.64	***	***	0.41	0.63
20	0.30	0.38	0.29	0.25	0.42	0.43	0.33	0.32	0.32	0.76	1.15	1.02	0.98	0.74	***	***	***	0.87	***	***	***	***	0.65	0.59	0.58
21	0.14	0.28	0.37	0.32	0.39	0.37	0.25	0.35	0.87	0.95	1.01	1.05	1.16	0.66	1.45	0.89	0.59	1.44	1.06	***	***	***	***	0.29	0.69
22	0.23	0.54	0.30	0.31	0.49	0.51	0.48	0.42	0.66	0.91	0.98	1.09	1.10	1.07	0.85	0.88	0.86	***	***	***	0.33	0.44	0.47	0.54	0.64
23	0.18	0.39	0.39	0.29	0.11	0.09	0.10	0.03	0.21	0.63	1.12	1.01	0.82	0.98	1.06	1.16	0.88	***	***	***	0.44	0.28	0.36	0.49	0.52
24	0.33	0.52	0.65	0.38	0.13	0.22	0.31	0.69	0.80	0.81	1.00	1.07	0.93	0.86	0.94	0.89	***	***	***	0.81	0.50	0.65	0.75	0.56	0.66
25	0.51	0.65	0.64	0.55	0.34	0.36	0.14	0.29	0.32	0.75	1.03	1.27	0.89	1.34	1.33	1.15	0.50	0.78	0.74	***	0.63	0.57	0.59	0.34	0.68
26	0.33	0.30	0.54	0.35	0.32	0.36	0.56	0.23	0.39	1.19	1.07	1.30	1.08	1.09	0.97	0.74	0.79	0.93	0.78	0.87	***	0.73	0.50	0.48	0.69
27	0.53	0.46	0.41	0.26	0.07	0.22	0.37	0.39	0.63	0.97	0.74	1.24	1.32	1.35	1.40	***	0.88	0.89	***	***	***	0.41	0.36	0.41	0.67
28	0.47	0.48	0.37	0.18	0.18	0.15	0.25	0.19	0.33	0.41	0.63	1.24	1.23	1.27	0.75	0.61	0.71	***	***	0.64	0.34	0.14	0.22	0.19	0.50
29	0.12	0.12	0.05	0.03	0.05	0.05	0.05	0.04	0.25	0.52	0.66	1.11	1.07	1.21	0.80	1.06	0.86	0.38	0.68	0.60	0.73	0.41	0.14	0.01	0.46
30	0.21	0.11	0.04	0.05	0.19	0.37	0.46	0.45	0.53	0.93	1.08	0.95	1.13	1.13	1.05	***	0.82	***	***	***	0.23	0.32	0.30	0.59	0.55
HRAVE	0.45	0.49	0.40	0.34	0.28	0.23	0.24	0.30	0.50	0.75	0.92	1.00	1.05	1.06	1.04	0.94	0.89	0.85	0.81	0.62	0.48	0.47	0.45	0.47	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.48	0.68	0.62	0.57	0.62	0.63	0.66	0.45	0.59	0.81	0.72	0.67	0.65	0.65	0.62	0.65	0.57	0.51	0.63	0.58	0.69	0.64	0.52	0.66	0.68
MAX	0.98	1.62	1.44	0.96	0.93	1.23	1.19	0.79	1.19	1.30	1.30	1.28	1.17	1.54	1.42	1.44	1.19	1.35	1.33	1.15	1.45	1.10	1.16	1.07	1.34
MIN	0.01	0.18	0.11	0.28	0.30	0.12	0.07	0.10	0.18	0.18	0.07	0.08	0.07	0.01	0.04	0.18	0.01	0.10	0.11	0.25	0.14	0.23	0.03	0.13	0.14

DAY	26	27	28	29	30	31
AVE	0.69	0.67	0.50	0.46	0.55	***
MAX	1.30	1.40	1.27	1.21	1.13	***
MIN	0.23	0.07	0.14	0.01	0.04	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 85.4% OPERATIONAL RECOVERY RATE = 85.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
JUNE - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	***	***	***	***	***	***	0.17	0.40	0.70	***	0.73	***	***	***	***	***	***	***	***	***	***	***	***	0.50
2	***	***	***	***	0.72	0.01	0.16	0.26	0.17	***	***	***	***	1.49	***	***	***	***	***	***	***	***	***	***	0.47
3	***	***	***	***	***	***	***	0.27	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.27
4	***	***	***	***	***	***	0.21	0.30	***	***	***	***	***	***	***	***	***	***	***	***	0.65	***	0.87	0.47	0.50
5	0.28	***	***	0.99	***	***	0.51	0.52	***	0.41	0.52	0.68	0.65	0.72	0.74	0.87	0.91	***	0.66	0.61	0.53	0.46	0.62	0.59	0.63
6	0.53	0.46	0.37	0.26	0.28	0.13	0.30	0.28	0.14	0.58	0.88	***	***	***	***	***	1.19	***	***	***	***	***	0.48	0.43	0.45
7	0.52	0.55	0.41	0.59	0.38	0.06	0.44	0.40	0.40	0.65	0.82	0.99	0.90	0.74	***	***	1.16	***	***	***	***	***	***	0.64	0.60
8	0.60	0.52	0.62	0.48	***	0.14	0.11	0.23	0.19	0.15	0.54	0.29	0.47	0.37	***	***	***	***	***	***	***	***	***	***	0.36
9	0.43	0.89	***	0.34	0.44	0.29	0.36	0.47	0.36	0.52	0.51	0.67	1.08	1.27	0.79	0.91	0.63	1.03	***	***	***	***	***	***	0.65
10	***	0.71	***	***	***	***	0.20	0.46	0.78	0.95	1.08	0.98	1.03	***	1.10	***	1.37	***	***	***	***	***	***	0.53	0.84
11	0.77	0.59	0.51	0.37	0.11	0.13	0.07	0.39	0.77	0.88	1.13	1.17	1.17	1.33	***	***	***	1.37	***	***	***	***	0.20	0.74	0.69
12	0.62	0.56	0.38	0.44	0.29	0.12	0.07	0.07	0.22	0.73	0.93	1.10	1.52	1.32	0.68	***	***	***	***	***	***	***	***	***	0.60
13	0.55	0.81	***	0.45	0.37	0.12	0.06	0.25	0.56	***	0.83	***	1.23	***	***	***	***	***	***	***	***	***	***	0.19	0.49
14	0.26	0.58	0.65	0.36	0.06	0.08	***	0.03	0.52	0.76	0.74	1.05	1.08	1.09	1.19	1.73	0.71	0.83	***	***	***	***	***	***	0.69
15	***	0.52	0.16	0.32	0.60	0.24	0.06	0.24	0.47	0.93	0.81	0.91	0.79	1.43	***	0.96	0.92	***	***	***	***	***	***	***	0.62
16	0.53	0.51	0.31	0.38	0.19	0.19	0.31	0.33	0.58	0.87	***	0.73	0.82	0.75	1.39	0.46	***	***	***	***	***	***	***	***	0.56
17	0.72	0.58	0.61	0.45	0.25	0.20	0.10	0.01	0.50	0.91	1.25	1.04	0.99	***	***	***	***	***	***	***	***	***	***	***	0.59
18	0.41	0.32	0.28	0.11	0.16	0.23	0.23	0.27	0.49	0.62	***	0.91	***	***	1.26	***	***	***	***	***	***	***	***	***	0.44
19	***	***	0.18	0.38	***	0.30	0.19	0.41	0.52	0.64	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.37
20	***	***	***	***	***	***	***	0.26	***	***	***	***	0.93	***	***	***	***	***	***	***	***	***	***	***	0.60
21	***	***	0.38	0.28	0.44	0.39	0.26	***	***	0.94	1.01	***	1.19	***	***	***	***	***	***	***	***	***	***	***	0.61
22	***	0.47	0.31	***	***	***	0.63	***	***	0.90	0.95	1.27	1.20	0.99	0.87	0.86	***	***	***	***	***	***	***	0.55	0.82
23	0.15	0.36	***	0.30	0.05	0.10	0.09	0.03	0.31	***	1.16	1.03	0.84	1.11	***	***	***	***	***	***	***	***	***	***	0.46
24	0.35	0.55	0.66	0.25	0.12	0.23	0.30	0.72	***	0.76	1.01	1.24	***	0.89	1.05	***	***	***	***	0.90	***	***	***	0.79	0.65
25	***	***	0.60	0.55	0.33	0.37	0.14	0.42	0.32	0.78	1.18	1.22	0.88	1.34	1.30	1.17	0.54	0.59	***	***	***	0.55	0.59	0.36	0.70
26	0.33	0.34	0.57	0.36	0.32	0.25	0.54	0.24	0.41	***	1.10	1.32	1.06	***	0.92	0.70	0.70	0.93	***	***	***	0.72	0.67	0.46	0.63
27	0.55	0.50	0.37	0.26	0.08	0.21	0.43	0.42	0.59	1.02	***	1.36	1.41	1.29	1.42	***	***	0.86	***	***	***	0.44	0.33	0.39	0.66
28	0.52	0.47	0.36	0.20	0.20	0.17	0.24	0.21	0.34	0.44	0.62	1.39	1.29	1.19	0.80	0.61	0.69	***	***	***	0.46	0.10	0.21	0.19	0.51
29	0.13	0.15	0.05	0.27	0.05	0.03	0.06	0.07	0.25	0.50	0.61	1.19	1.06	1.09	0.79	***	***	0.31	0.64	0.65	0.86	0.23	0.14	0.01	0.42
30	0.23	0.13	0.04	0.05	0.19	0.38	0.44	0.39	0.56	0.94	0.91	0.92	1.25	0.95	1.08	***	***	***	***	***	***	0.33	0.31	0.62	0.54
HRAVE	0.45	0.50	0.39	0.37	0.27	0.19	0.25	0.29	0.43	0.72	0.89	1.01	1.04	1.08	1.03	0.92	0.88	0.85	0.65	0.72	0.62	0.40	0.44	0.46	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.50	0.47	0.27	0.50	0.63	0.45	0.60	0.36	0.65	0.84	0.69	0.60	0.49	0.69	0.62	0.56	0.59	0.44	0.37	0.60	0.61	0.82	0.46	0.65	0.70
MAX	0.73	1.49	0.27	0.87	0.99	1.19	1.16	0.62	1.27	1.37	1.37	1.52	1.23	1.73	1.43	1.39	1.25	1.26	0.64	0.93	1.19	1.27	1.16	1.24	1.34
MIN	0.17	0.01	0.27	0.21	0.28	0.13	0.06	0.11	0.29	0.20	0.07	0.07	0.06	0.03	0.06	0.19	0.01	0.11	0.18	0.26	0.26	0.31	0.03	0.12	0.14

DAY	26	27	28	29	30	31
AVE	0.63	0.66	0.51	0.42	0.54	***
MAX	1.32	1.42	1.39	1.19	1.25	***
MIN	0.24	0.08	0.10	0.01	0.04	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 54.4% OPERATIONAL RECOVERY RATE = 54.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.2	4.1	3.0	2.9	1.8	1.2	1.0	1.9	3.0	3.6	4.9	5.9	6.1	5.6	7.2	8.4	8.2	8.0	***	***	***	7.8	8.0	***	4.9
2	5.8	5.1	4.4	3.6	3.1	3.6	4.1	3.7	3.7	5.2	6.4	7.1	7.2	6.8	7.0	8.1	8.5	8.4	9.2	8.8	8.0	6.2	5.8	5.7	6.1
3	7.7	7.8	4.8	3.2	6.6	3.9	2.6	3.8	5.8	4.1	4.6	3.6	3.8	3.8	4.3	4.6	5.1	5.3	6.3	6.7	7.1	6.8	***	2.6	5.0
4	3.8	3.5	2.3	3.7	5.0	6.4	5.0	3.9	5.0	6.0	5.0	4.0	6.1	7.4	6.8	7.3	7.3	5.6	5.5	4.1	3.1	3.8	3.6	5.1	5.0
5	5.4	3.8	4.7	5.6	7.0	8.8	6.8	6.1	7.1	6.8	6.4	4.8	3.7	3.6	4.0	4.8	8.7	4.2	2.6	2.1	2.1	2.3	3.1	3.1	4.9
6	2.2	1.2	1.9	6.1	0.9	1.0	2.1	1.7	2.2	3.5	4.5	5.9	6.7	7.7	6.6	6.8	7.1	7.1	5.5	***	5.3	4.2	5.5	5.4	4.4
7	4.9	3.2	2.7	2.1	2.0	2.3	2.8	2.7	2.0	3.7	4.2	4.9	6.0	6.4	7.3	7.0	6.3	6.0	6.0	6.6	5.1	3.1	2.5	1.8	4.2
8	3.6	5.5	3.5	1.3	2.1	2.9	3.0	3.0	3.0	2.9	3.2	3.5	3.9	6.8	7.4	6.6	8.2	8.9	6.8	7.9	***	7.5	***	***	4.8
9	5.8	5.6	6.0	5.7	4.0	2.3	2.5	1.3	2.8	4.5	5.9	8.0	8.1	7.0	7.3	8.8	6.4	6.7	3.5	3.3	2.9	2.0	1.5	3.1	4.8
10	4.7	5.3	2.7	1.7	1.6	1.4	1.7	1.7	2.6	3.9	4.2	3.7	7.6	6.1	5.9	7.4	8.3	8.8	7.9	6.0	4.9	3.5	4.4	3.8	4.6
11	3.1	3.9	4.8	5.2	5.3	6.0	6.0	4.7	2.8	3.9	4.4	5.5	4.7	3.8	3.8	4.4	4.8	7.9	7.0	***	4.2	3.1	3.5	3.9	4.6
12	5.9	6.8	5.9	4.4	2.6	1.6	2.5	2.6	1.8	3.6	4.8	4.3	3.8	4.4	6.5	7.7	8.4	8.1	5.4	5.6	6.3	5.9	3.9	3.4	4.8
13	4.5	3.7	4.0	4.5	5.4	5.5	5.4	4.0	4.1	3.9	4.0	4.3	4.3	4.8	5.3	5.3	4.7	6.1	6.7	10.4	7.3	7.6	3.4	6.2	5.2
14	7.0	6.2	5.6	7.0	7.3	5.9	4.8	3.4	3.4	4.0	3.9	3.9	4.3	4.2	4.5	6.3	2.7	3.2	6.4	5.0	1.4	2.7	5.7	4.6	4.7
15	3.4	7.5	9.2	7.5	5.6	4.8	3.7	3.5	3.4	5.5	4.1	3.4	3.6	3.7	3.8	3.9	4.2	4.4	4.3	5.7	4.6	5.1	9.4	6.1	5.0
16	6.7	4.6	4.4	3.5	3.1	2.9	2.0	2.0	2.6	3.1	3.6	4.1	4.0	5.1	6.0	4.4	6.0	6.9	5.4	6.9	5.8	4.4	3.1	3.5	4.3
17	4.1	3.5	2.5	3.5	2.7	2.9	4.3	6.3	10.2	6.6	3.7	***	3.1	3.3	3.2	3.4	3.3	3.6	3.5	2.8	2.6	3.0	4.3	4.0	3.9
18	4.1	4.6	2.7	1.9	1.9	1.7	1.7	1.2	1.8	2.5	3.3	3.7	4.6	5.5	5.7	6.2	6.9	8.9	7.8	7.8	7.3	3.9	5.7	6.5	4.5
19	3.6	2.2	3.0	2.8	2.2	2.4	2.2	2.2	2.5	2.8	2.6	3.9	4.2	4.4	3.8	5.3	5.7	6.5	6.9	6.7	6.7	6.2	6.3	5.9	4.2
20	5.6	4.2	4.3	3.1	1.9	1.5	1.9	2.1	2.0	3.6	4.0	4.6	5.2	5.3	6.2	6.7	7.4	7.0	6.2	6.5	5.0	3.6	4.1	4.1	4.4
21	3.9	2.6	1.8	2.3	2.7	3.2	3.4	2.9	2.6	3.4	3.5	4.4	4.9	7.4	7.3	7.5	6.3	6.4	6.0	***	4.8	3.7	2.6	1.2	4.1
22	2.9	4.4	6.7	5.4	4.3	3.3	2.3	1.6	3.1	4.0	4.0	5.2	4.7	5.8	6.2	7.8	6.4	6.5	5.8	***	***	8.3	7.2	4.9	5.0
23	3.2	3.8	3.7	4.1	***	4.9	4.4	3.5	3.4	3.9	3.7	3.5	4.6	5.3	5.1	4.9	4.0	2.9	3.0	4.2	5.3	5.0	5.3	4.2	4.2
24	***	4.4	3.3	3.8	4.2	4.3	4.3	2.6	2.6	3.4	5.4	5.1	4.9	5.2	6.5	6.1	6.3	7.0	7.4	***	8.2	6.5	4.7	4.0	5.0
25	3.4	3.1	2.1	2.5	2.0	3.4	5.8	4.2	2.5	3.2	3.7	4.8	5.4	4.7	6.1	7.1	7.5	6.8	7.2	6.8	5.0	5.2	5.9	5.7	4.8
26	4.8	3.8	2.7	3.0	3.9	3.2	3.4	3.2	4.2	3.6	3.2	5.0	6.6	7.3	7.2	8.6	6.7	7.4	7.7	7.8	7.2	5.4	4.9	4.2	5.2
27	2.9	2.3	1.9	2.1	2.3	1.9	1.6	1.8	2.2	3.4	4.3	4.8	4.4	4.6	6.2	6.8	6.5	6.5	6.2	6.6	4.9	4.3	3.1	2.6	3.9
28	1.2	0.9	6.2	5.3	4.3	3.1	2.6	2.0	2.5	3.6	4.6	4.6	4.9	5.3	5.1	5.6	4.6	5.2	5.0	7.9	6.5	7.6	4.4	5.3	4.5
29	5.6	3.1	3.0	3.0	3.1	5.0	3.6	2.8	3.5	3.3	4.1	5.2	6.9	6.7	7.1	6.3	5.6	5.7	***	***	***	5.1	6.0	4.3	4.7
30	4.9	3.7	4.2	6.1	7.5	6.6	6.8	6.2	5.1	3.8	3.3	3.7	4.0	4.0	4.1	4.0	2.8	3.8	2.8	1.7	2.0	1.8	1.6	2.9	4.1
31	3.9	2.4	3.1	3.6	3.0	3.2	3.1	3.0	3.3	3.9	4.7	4.2	4.5	4.9	4.7	6.4	10.6	5.2	5.1	5.5	7.3	2.8	2.9	4.5	4.4
HRAVE	4.5	4.1	3.9	3.9	3.6	3.6	3.5	3.1	3.4	4.0	4.3	4.6	5.1	5.4	5.7	6.3	6.3	6.3	5.8	6.0	5.2	4.8	4.6	4.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.9	6.1	5.0	5.0	4.9	4.4	4.2	4.8	4.8	4.6	4.6	4.8	5.2	4.7	5.0	4.3	3.9	4.5	4.2	4.4	4.1	5.0	4.2	5.0	4.8
MAX	8.4	9.2	7.8	7.4	8.8	7.7	7.3	8.9	8.8	8.8	7.9	8.4	10.4	7.3	9.4	6.9	10.2	8.9	6.9	7.4	7.5	8.3	5.3	8.2	7.5
MIN	1.0	3.1	2.6	2.3	2.1	0.9	1.8	1.3	1.3	1.4	2.8	1.6	3.4	1.4	3.4	2.0	2.5	1.2	2.2	1.5	1.2	1.6	2.9	2.6	2.0

DAY	26	27	28	29	30	31
AVE	5.2	3.9	4.5	4.7	4.1	4.4
MAX	8.6	6.8	7.9	7.1	7.5	10.6
MIN	2.7	1.6	0.9	2.8	1.6	2.4

MONTHLY AVERAGE = 4.7 MONTHLY MAXIMUM = 10.6 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 97.3% OPERATIONAL RECOVERY RATE = 97.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.3	2.1	2.3	4.6	2.8	1.8	2.0	2.2	2.9	2.9	4.6	6.7	6.4	6.6	7.8	8.7	8.3	9.4	***	***	***	7.8	7.8	***	5.2
2	5.8	5.2	4.9	3.7	3.3	3.8	4.8	3.2	4.7	5.7	6.2	5.9	7.1	6.7	6.5	8.1	12.7	8.9	10.2	8.8	8.0	6.4	5.9	5.7	6.3
3	8.1	8.4	5.5	3.2	7.0	5.0	3.3	3.3	5.8	5.5	4.7	4.1	4.0	4.0	4.3	4.9	5.1	4.7	6.2	7.3	7.4	7.9	***	3.6	5.4
4	4.5	3.9	2.2	3.4	5.0	7.0	5.0	4.9	6.0	6.8	3.3	4.1	6.2	6.6	6.7	8.0	7.3	6.1	5.1	4.1	2.9	3.7	4.2	6.5	5.1
5	5.2	3.5	4.6	4.7	6.0	10.0	8.0	6.8	8.5	7.3	6.8	4.2	4.3	3.4	4.6	5.3	13.6	6.2	3.0	1.9	2.7	3.0	1.8	2.9	5.4
6	2.8	1.3	2.2	3.7	1.5	1.8	1.1	1.4	2.3	4.5	4.8	5.7	6.1	8.1	6.4	8.1	6.1	7.2	5.3	***	5.6	3.9	4.9	5.1	4.3
7	4.2	4.4	3.2	2.0	1.9	1.7	2.4	2.3	1.9	4.1	5.1	4.9	4.6	5.1	6.7	9.2	7.8	5.9	6.4	7.2	5.6	3.3	3.8	3.6	4.5
8	3.8	5.6	2.4	0.8	1.2	2.4	2.0	3.0	3.7	3.8	3.4	4.1	5.2	4.8	5.6	6.6	8.8	10.6	6.2	9.9	***	8.0	***	***	4.9
9	5.5	5.6	5.7	5.1	3.2	2.8	2.8	2.0	3.3	4.3	6.7	8.1	8.2	5.5	7.7	9.1	6.0	8.4	6.6	3.7	3.7	3.3	2.8	5.2	5.2
10	3.9	6.1	3.9	2.7	2.3	1.9	1.8	2.4	2.6	4.2	4.1	3.9	7.0	6.3	4.2	6.1	9.3	11.4	7.1	6.5	5.2	6.1	2.8	3.4	4.8
11	5.2	4.9	5.0	5.1	5.1	6.7	6.2	5.4	2.9	4.6	7.3	6.4	5.8	4.0	3.6	4.6	5.0	6.1	6.7	***	4.5	3.2	4.0	4.2	5.1
12	7.2	6.9	6.0	4.7	2.6	1.8	1.9	2.4	1.0	2.6	4.4	4.0	4.7	5.5	7.5	8.5	7.9	10.5	8.0	7.5	6.7	5.9	4.2	3.4	5.2
13	4.6	4.1	4.6	4.9	5.5	6.5	6.0	4.3	4.4	2.9	3.8	5.1	4.3	3.8	5.0	5.7	6.9	7.7	7.2	11.3	10.9	7.0	3.6	6.1	5.7
14	8.2	8.3	5.5	9.0	9.0	8.3	4.5	3.3	3.4	3.6	3.5	4.4	3.5	3.7	4.1	6.6	4.0	3.2	9.7	5.7	2.7	3.5	5.2	5.6	5.4
15	3.6	7.8	6.2	6.1	6.1	5.3	4.0	4.8	6.3	6.0	4.7	3.4	3.7	3.4	4.2	4.1	4.6	3.5	3.6	5.1	4.2	4.4	11.2	6.9	5.1
16	7.7	5.5	4.0	2.5	3.2	2.7	2.2	2.2	2.0	2.4	3.3	4.1	3.7	5.5	6.0	4.8	5.8	6.2	4.8	8.4	6.9	5.3	3.1	3.4	4.4
17	4.4	3.4	2.7	3.6	1.8	2.8	4.1	6.3	11.9	9.1	5.7	***	2.9	3.0	2.9	3.1	3.0	3.3	2.6	2.4	2.1	4.8	2.6	4.8	4.0
18	3.9	2.4	3.4	5.8	2.1	1.5	2.5	2.3	2.6	2.5	2.2	4.0	5.9	5.2	4.8	5.3	8.8	9.1	8.4	7.2	7.6	4.5	6.2	7.4	4.8
19	2.0	3.0	3.4	3.4	3.0	3.2	3.1	1.8	2.2	3.1	2.9	4.1	4.1	4.2	3.0	6.1	6.2	5.8	6.8	6.4	7.1	5.9	5.7	4.8	4.2
20	5.5	4.4	3.8	3.9	2.7	1.8	0.9	1.1	2.3	3.8	3.8	4.8	5.1	5.7	7.2	6.8	8.6	7.5	7.2	7.2	5.7	4.1	4.3	4.4	4.7
21	2.1	3.3	2.1	1.9	1.7	3.1	3.0	3.0	1.9	1.9	3.5	5.4	4.1	5.9	7.2	8.0	9.1	6.3	6.8	***	5.7	4.8	4.3	4.5	4.3
22	4.2	4.3	7.0	5.7	4.6	3.6	2.2	3.5	3.4	4.4	4.6	6.4	6.2	5.1	5.1	4.9	5.0	5.7	5.3	***	***	9.3	7.1	5.2	5.1
23	3.5	4.3	4.1	4.2	***	5.2	5.3	3.0	4.0	4.2	4.5	3.0	4.5	5.7	5.1	5.4	3.9	2.0	2.8	4.1	4.6	5.6	4.2	4.8	4.3
24	***	3.2	3.5	2.7	3.5	4.1	4.8	3.0	2.6	4.7	5.5	4.0	3.8	4.8	5.3	6.2	7.3	7.0	6.3	***	8.1	6.8	4.9	6.0	4.9
25	2.6	2.3	2.5	3.5	2.3	2.8	4.6	3.4	2.7	3.6	3.2	4.9	5.4	4.8	4.4	6.6	8.5	7.1	7.0	7.4	5.5	5.5	5.9	5.7	4.7
26	5.1	4.7	2.1	3.0	3.6	2.9	2.5	2.6	4.6	4.3	2.9	7.0	5.7	6.4	7.5	8.6	7.7	5.8	8.0	8.2	7.7	6.5	5.3	4.8	5.3
27	3.5	3.5	3.0	3.0	2.8	2.4	2.0	2.2	2.9	3.2	4.7	5.2	4.9	5.5	4.9	5.8	9.1	6.5	5.3	6.0	5.5	4.2	1.6	3.1	4.2
28	2.1	2.8	6.6	5.3	4.0	3.6	3.0	2.3	2.8	4.2	4.7	5.3	4.7	4.5	5.6	5.5	5.4	5.7	4.8	7.5	7.4	8.4	5.3	5.1	4.8
29	4.4	4.1	2.1	4.0	5.0	6.1	3.6	3.1	2.8	3.7	5.8	4.2	6.1	6.0	6.2	7.3	5.1	6.5	***	***	***	4.6	6.3	5.8	4.9
30	5.5	3.8	4.8	5.5	7.4	6.2	7.0	6.8	5.0	4.3	3.3	3.1	3.9	4.2	5.8	3.7	3.8	3.5	3.5	2.5	2.7	4.2	3.8	3.3	4.5
31	3.9	3.0	3.6	3.6	2.2	3.1	3.5	4.3	4.0	3.9	3.9	3.3	6.0	5.6	5.3	6.7	10.7	5.2	5.5	5.7	8.0	2.5	3.1	4.7	4.6
HRAVE	4.6	4.4	4.0	4.1	3.7	3.9	3.6	3.3	3.8	4.3	4.4	4.8	5.1	5.1	5.5	6.4	7.1	6.6	6.1	6.3	5.7	5.3	4.7	4.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.2	6.3	5.4	5.1	5.4	4.3	4.5	4.9	5.2	4.8	5.1	5.2	5.7	5.4	5.1	4.4	4.0	4.8	4.2	4.7	4.3	5.1	4.3	4.9	4.7
MAX	9.4	12.7	8.4	8.0	13.6	8.1	9.2	10.6	9.1	11.4	7.3	10.5	11.3	9.7	11.2	8.4	11.9	9.1	7.1	8.6	9.1	9.3	5.7	8.1	8.5
MIN	1.8	3.2	3.2	2.2	1.8	1.1	1.7	0.8	2.0	1.8	2.9	1.0	2.9	2.7	3.4	2.0	1.8	1.5	1.8	0.9	1.7	2.2	2.0	2.6	2.3

DAY	26	27	28	29	30	31
AVE	5.3	4.2	4.8	4.9	4.5	4.6
MAX	8.6	9.1	8.4	7.3	7.4	10.7
MIN	2.1	1.6	2.1	2.1	2.5	2.2

MONTHLY AVERAGE = 4.9 MONTHLY MAXIMUM = 13.6 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 97.3% OPERATIONAL RECOVERY RATE = 97.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
JULY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	6.3	4.2	3.0	4.6	3.1	1.6	1.9	2.8	2.7	2.3	5.0	6.3	5.7	7.1	8.2	8.9	8.4	***	***	***	***	***	***	***	4.8
2	***	***	***	***	3.3	3.9	5.2	3.3	5.8	6.2	6.1	5.2	5.1	6.3	10.1	8.1	13.1	9.0	9.4	***	8.0	6.9	***	8.0	6.8
3	8.2	7.4	5.1	2.4	7.7	***	3.4	3.7	6.7	6.4	4.5	4.1	3.6	3.7	4.1	4.9	4.9	4.7	5.8	***	***	***	***	3.6	5.0
4	4.6	4.9	2.8	3.9	4.6	7.2	5.1	5.0	6.0	6.7	4.8	6.2	6.1	6.0	***	***	9.4	6.4	4.6	***	3.7	4.4	4.4	***	5.3
5	6.7	3.5	4.6	4.3	4.7	9.6	8.2	6.6	9.7	7.6	7.1	5.0	5.1	3.9	4.0	4.1	12.3	5.4	3.1	1.9	3.5	6.3	3.6	3.3	5.6
6	4.0	2.3	5.2	3.3	***	2.4	1.3	2.0	3.3	4.1	3.0	5.6	5.7	8.4	7.5	7.6	5.9	7.5	5.0	***	***	***	***	***	4.7
7	***	***	3.1	1.9	1.6	1.1	2.5	2.4	3.1	4.2	5.2	4.9	4.5	5.0	5.5	8.2	7.8	6.7	6.6	***	5.5	3.5	***	3.5	4.3
8	3.8	6.8	2.5	1.0	1.5	2.9	1.9	3.3	4.6	4.2	3.3	3.1	4.3	6.9	6.1	7.3	8.6	9.6	4.9	***	***	9.6	***	***	4.8
9	***	***	6.5	***	3.6	3.0	2.9	2.7	4.1	6.1	8.1	8.6	8.4	7.2	9.0	***	6.0	8.1	7.4	4.7	3.5	3.8	2.6	6.2	5.6
10	***	***	2.9	2.8	2.6	2.1	2.4	2.0	2.2	3.7	4.1	3.9	8.4	6.0	4.8	6.6	8.5	***	***	***	6.4	7.1	2.8	4.9	4.4
11	5.2	5.1	4.9	4.9	***	***	6.1	6.2	2.5	5.1	7.4	7.0	4.3	4.1	3.6	4.2	5.3	5.4	5.5	***	***	***	4.6	5.0	5.1
12	7.6	7.0	***	3.9	***	2.8	2.6	2.2	1.4	3.8	5.3	3.6	4.0	4.3	9.3	11.4	***	***	8.2	8.4	7.2	5.9	3.3	3.3	5.3
13	4.4	4.5	5.1	4.6	6.1	7.2	6.0	4.1	4.7	3.9	5.1	5.4	4.6	2.2	6.7	6.9	7.7	***	7.3	9.9	***	5.9	2.4	6.8	5.5
14	8.4	7.4	5.3	8.9	9.8	11.9	3.6	3.5	3.3	3.5	3.3	3.7	3.5	4.6	5.4	6.2	4.1	4.1	8.5	5.0	3.8	3.8	4.5	6.2	5.5
15	4.5	7.3	6.6	6.5	6.3	4.2	4.3	4.9	5.8	5.8	4.6	3.7	3.3	3.3	5.0	4.8	4.8	3.1	3.0	5.5	4.6	5.4	***	5.1	4.9
16	7.4	4.5	3.9	2.6	3.2	2.8	1.9	3.2	2.5	2.7	3.4	4.0	2.5	5.5	6.3	5.0	5.9	7.2	4.5	7.8	***	5.4	2.7	2.8	4.2
17	3.8	2.0	3.2	3.0	2.2	***	4.8	6.0	***	10.3	6.5	***	3.6	3.0	2.9	3.1	3.3	3.7	2.7	***	2.2	4.7	4.6	4.9	4.0
18	4.5	0.8	3.5	6.4	0.9	1.5	***	1.8	2.7	2.3	3.2	3.4	6.4	5.5	5.0	5.5	***	***	***	***	***	3.7	4.8	***	3.6
19	2.3	4.4	3.9	4.0	2.1	2.9	4.3	1.8	2.2	3.4	2.5	3.5	3.7	4.5	2.6	4.8	6.8	7.4	10.0	***	7.9	***	***	***	4.2
20	5.0	5.2	4.5	3.3	2.8	2.3	1.8	1.3	1.7	4.1	3.9	4.7	3.6	5.2	7.7	5.0	8.4	8.4	***	***	6.1	3.4	4.5	4.2	4.4
21	2.2	2.8	3.9	2.4	2.0	3.6	2.8	2.3	1.6	2.5	2.6	5.8	3.9	5.5	7.9	7.5	8.7	5.0	6.5	***	***	***	4.9	4.3	4.2
22	3.6	4.5	***	5.7	4.5	***	1.9	4.4	4.0	4.4	4.4	5.1	6.0	5.6	4.3	4.8	5.2	5.8	5.8	***	***	9.7	6.9	5.5	5.1
23	6.6	3.8	3.8	3.7	***	***	6.3	3.7	***	4.4	4.3	2.2	4.4	4.7	4.7	6.1	3.8	2.5	***	***	5.0	4.9	3.3	2.1	4.2
24	***	3.4	4.3	2.8	4.3	4.5	4.8	3.9	2.7	5.0	4.3	3.7	4.1	4.9	4.2	6.0	6.9	6.9	6.0	***	8.2	8.2	***	***	5.0
25	2.4	2.1	2.2	3.2	1.8	3.5	3.4	4.0	3.8	3.8	3.6	3.8	5.2	6.1	5.9	6.5	7.1	7.7	9.1	***	5.5	5.5	5.1	5.4	4.6
26	5.6	5.8	2.5	4.1	4.6	3.9	2.3	3.0	5.4	4.7	3.0	7.3	6.2	6.7	9.0	9.4	10.2	***	8.8	***	***	***	***	5.3	5.7
27	3.7	3.6	2.9	3.7	3.1	2.3	2.2	2.2	4.1	3.7	4.1	5.1	5.7	6.0	6.6	6.1	7.7	6.4	5.9	***	***	***	***	3.3	4.4
28	1.6	2.0	5.9	***	4.0	3.3	***	***	3.5	3.8	4.5	4.6	3.5	4.4	4.7	5.5	5.7	5.9	4.3	7.5	7.6	6.7	4.8	4.9	4.7
29	3.3	4.5	1.6	3.0	5.5	6.7	3.3	3.4	3.4	2.9	4.5	4.8	6.5	6.0	6.5	7.8	4.2	6.4	***	***	***	4.7	6.2	5.5	4.8
30	5.4	3.2	5.6	5.7	7.3	6.7	7.7	7.6	6.2	5.3	3.5	3.3	4.6	2.6	6.1	3.8	4.7	3.5	3.6	2.8	2.3	4.1	3.7	3.3	4.7
31	5.0	4.7	3.7	4.8	1.9	3.3	3.4	4.7	4.5	3.5	3.9	3.9	6.1	5.6	5.2	4.5	***	5.2	5.2	5.7	8.4	2.7	3.9	4.8	4.5
HRAVE	4.8	4.4	4.0	4.0	3.9	4.1	3.7	3.6	3.9	4.5	4.5	4.7	4.9	5.2	6.0	6.2	7.0	6.1	6.1	5.9	5.5	5.5	4.2	4.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.8	6.8	5.0	5.3	5.6	4.7	4.3	4.8	5.6	4.4	5.1	5.3	5.5	5.5	4.9	4.2	4.0	3.6	4.2	4.4	4.2	5.1	4.2	5.0	4.6
MAX	8.9	13.1	8.2	9.4	12.3	8.4	8.2	9.6	9.0	8.5	7.4	11.4	9.9	11.9	7.3	7.8	10.3	6.4	10.0	8.4	8.7	9.7	6.6	8.2	9.1
MIN	1.6	3.3	2.4	2.8	1.9	1.3	1.1	1.0	2.6	2.0	2.5	1.4	2.2	3.3	3.0	1.9	2.0	0.8	1.8	1.3	1.6	1.9	2.1	2.7	1.8

DAY	26	27	28	29	30	31
AVE	5.7	4.4	4.7	4.8	4.7	4.5
MAX	10.2	7.7	7.6	7.8	7.7	8.4
MIN	2.3	2.2	1.6	1.6	2.3	1.9

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 13.1 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 85.5% OPERATIONAL RECOVERY RATE = 85.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
JULY - 2015

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	225	195	243	308	266	13	148	305	279	263	268	261	267	281	286	281	273	272	***	***	***	280	282	***	38
2	287	286	288	296	281	286	289	273	278	277	276	272	269	274	282	283	277	283	288	283	275	281	290	207	152
3	259	294	286	288	96	86	123	78	65	12	73	85	81	40	271	271	273	281	287	285	290	290	***	11	359
4	69	75	74	75	70	72	118	102	141	155	164	225	262	263	257	250	247	252	254	254	331	43	66	60	101
5	64	87	155	157	153	150	155	157	154	156	154	108	86	161	266	279	288	297	283	256	101	181	85	82	109
6	148	119	335	153	335	127	114	143	257	296	291	286	279	284	270	279	274	274	272	***	275	284	293	292	309
7	294	288	272	278	194	164	138	114	127	271	292	284	266	275	277	277	272	265	276	277	272	276	292	3	230
8	147	282	275	60	111	93	92	140	130	120	212	324	273	244	234	248	253	256	263	262	***	264	***	***	65
9	277	280	276	286	287	280	268	28	137	172	189	199	208	246	246	241	216	249	242	93	202	133	303	266	320
10	299	310	308	354	37	45	68	70	80	101	310	213	198	224	250	250	248	249	255	253	238	197	153	159	358
11	226	6	39	77	73	68	67	75	133	123	171	162	174	267	262	279	301	288	297	***	305	299	292	287	62
12	285	289	287	287	289	79	88	83	123	269	274	273	264	267	327	289	293	75	83	81	107	75	88	133	160
13	76	90	114	109	69	69	68	82	83	135	175	253	272	269	278	166	80	71	26	42	61	56	7	110	233
14	86	74	70	71	68	65	70	90	138	166	168	161	358	91	181	176	121	158	199	251	185	141	170	141	270
15	86	51	57	60	65	79	92	96	117	160	167	228	265	266	272	272	267	194	235	205	189	85	58	115	323
16	157	167	126	106	88	70	78	74	104	157	241	267	264	268	272	268	268	273	285	64	120	165	176	222	266
17	262	285	206	157	122	122	148	152	152	150	99	***	94	100	115	154	169	172	168	170	170	150	266	256	140
18	291	296	276	254	115	106	288	332	83	160	220	195	264	254	270	255	270	265	300	298	287	253	260	278	233
19	134	91	100	114	122	118	101	102	151	153	161	269	269	181	175	274	280	274	274	281	282	285	286	290	60
20	280	281	287	277	307	71	105	99	222	278	268	271	265	275	278	281	282	278	277	279	281	274	281	284	77
21	286	328	82	94	104	112	124	99	153	271	236	274	271	271	274	285	282	281	282	***	291	290	284	315	213
22	202	272	300	298	291	281	290	340	293	275	272	292	285	295	290	292	281	260	183	***	***	153	154	159	305
23	225	267	257	282	***	294	289	302	323	278	274	265	258	285	292	274	292	286	266	185	171	159	165	200	311
24	***	165	171	157	153	153	158	142	159	265	277	261	262	269	269	268	275	276	277	***	278	284	286	291	264
25	235	283	280	315	241	163	156	161	213	271	266	265	262	265	273	268	274	283	281	287	284	283	286	287	51
26	292	288	277	147	157	150	110	103	157	165	258	295	285	279	282	279	274	273	276	275	275	288	293	289	118
27	277	232	291	271	272	284	292	314	300	272	271	271	279	275	287	292	286	283	278	281	289	286	281	276	237
28	300	350	296	288	288	281	288	273	282	271	273	260	269	267	269	276	269	129	162	160	165	161	134	122	70
29	154	156	106	98	106	149	126	81	173	177	265	274	266	279	275	281	280	277	***	***	***	112	130	88	93
30	80	98	79	64	62	65	69	74	85	85	157	174	174	135	135	196	213	270	223	212	98	192	300	72	51
31	85	65	83	104	134	109	98	93	117	156	163	172	189	79	93	89	294	306	4	336	290	267	91	87	21

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 97.3% OPERATIONAL RECOVERY RATE = 97.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	247	235	254	298	314	332	341	315	272	259	289	271	268	270	280	283	265	268	***	***	***	283	282	***	238
2	284	286	295	289	276	282	288	272	288	273	267	273	282	261	273	281	271	275	285	274	278	278	290	218	30
3	248	296	299	281	80	71	161	92	52	6	69	88	55	3	288	264	293	289	286	288	293	291	***	76	89
4	69	73	74	81	74	80	108	108	142	142	170	213	264	265	262	256	252	258	238	249	4	31	77	81	134
5	68	89	145	163	162	153	154	159	151	152	157	133	90	190	270	274	273	271	290	288	76	180	32	112	215
6	142	99	3	182	281	343	41	282	269	329	317	294	282	266	256	278	269	267	267	***	271	281	284	286	47
7	290	287	282	289	301	271	140	105	121	296	353	323	251	254	272	286	275	282	261	278	271	278	282	41	235
8	172	278	258	243	121	82	26	130	150	117	221	20	274	237	241	259	262	251	264	253	***	253	***	***	244
9	281	278	279	280	284	288	264	188	125	162	195	204	216	253	232	232	211	235	225	100	222	174	175	230	111
10	269	307	42	12	40	36	60	72	81	101	18	256	207	239	236	255	257	250	256	250	241	190	117	112	99
11	174	349	178	79	67	63	74	77	102	155	147	126	162	266	269	289	295	287	313	***	306	305	290	277	87
12	283	290	288	286	288	341	72	79	101	267	283	280	278	278	312	279	281	95	89	82	140	74	84	132	262
13	87	93	110	115	72	81	76	91	82	106	173	12	280	271	284	156	87	71	55	56	72	52	3	129	65
14	93	96	88	73	79	63	79	93	122	155	130	108	310	52	161	177	101	140	220	229	187	146	172	154	330
15	118	49	54	76	69	84	95	125	145	149	168	234	271	272	286	343	259	143	180	181	192	115	76	115	156
16	151	166	157	99	86	54	68	50	77	157	219	272	286	277	277	269	277	270	235	67	125	176	190	238	163
17	251	186	161	148	123	122	139	150	148	150	109	***	89	84	95	111	164	171	144	157	173	210	339	252	259
18	97	269	243	205	287	10	279	329	344	114	198	185	254	228	277	261	263	261	300	286	288	140	236	281	23
19	346	85	80	97	85	90	96	92	97	99	218	280	254	187	209	271	278	271	266	277	288	286	279	304	335
20	262	284	313	282	288	305	93	71	295	285	264	272	259	280	278	289	275	278	292	280	278	274	278	272	285
21	160	94	226	16	75	111	125	122	158	308	72	277	271	265	274	275	273	270	280	***	286	296	340	12	184
22	215	270	298	293	289	278	304	344	310	287	283	298	305	313	279	301	276	248	173	***	***	155	158	163	10
23	235	277	254	217	***	294	290	321	337	295	307	233	263	309	291	280	288	1	268	187	171	138	211	196	189
24	***	248	165	131	164	157	160	165	169	284	286	266	245	276	271	278	278	265	264	***	278	276	298	344	238
25	184	225	261	323	277	179	163	157	301	275	269	272	262	269	266	269	276	282	282	280	289	283	282	295	137
26	296	287	238	138	159	139	113	107	157	162	48	323	303	279	276	283	282	266	260	275	271	284	294	279	199
27	278	291	305	287	300	307	298	315	299	272	283	273	286	290	298	303	296	287	272	283	288	292	309	281	309
28	293	301	319	286	283	282	291	263	289	284	261	263	259	268	268	283	284	139	164	160	174	159	132	123	155
29	140	162	178	126	111	149	127	89	143	176	276	269	273	279	269	271	277	291	***	***	***	106	145	85	191
30	79	103	74	71	59	65	77	101	92	88	117	157	140	137	149	173	247	285	244	212	89	205	37	75	20
31	76	42	54	103	108	83	88	92	94	122	150	178	155	91	82	81	294	329	13	304	291	244	136	99	65

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 97.3% OPERATIONAL RECOVERY RATE = 97.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	237	278	294	295	314	332	308	315	275	287	300	278	245	273	280	279	262	***	***	***	***	***	***	***	103
2	***	***	***	***	265	282	290	272	306	269	268	271	268	256	268	283	273	283	286	***	279	277	***	188	180
3	252	287	298	274	85	***	155	96	28	6	74	90	63	27	296	276	307	298	282	***	***	***	***	68	135
4	67	80	77	84	71	76	108	109	150	130	134	264	264	265	***	***	244	252	248	***	0	16	73	***	219
5	72	94	146	167	154	154	153	156	149	150	160	124	85	269	259	262	289	283	294	293	73	159	313	112	77
6	171	33	21	210	***	336	8	331	274	306	330	295	288	264	248	267	277	267	261	***	***	***	***	***	353
7	***	***	291	329	314	206	143	104	152	308	355	341	255	231	288	288	271	272	263	***	271	227	***	61	155
8	156	274	229	61	114	90	26	131	163	107	229	175	234	235	241	259	255	249	234	***	***	246	***	***	295
9	***	***	286	***	271	309	266	160	125	169	200	201	208	248	233	***	198	219	218	145	231	190	256	227	220
10	***	***	352	19	40	39	51	71	61	106	18	238	201	240	257	261	264	***	***	***	232	184	117	50	180
11	174	331	165	76	***	***	79	85	114	159	153	126	149	234	262	286	297	277	303	***	***	***	287	271	292
12	282	287	***	282	***	156	81	89	105	279	279	284	263	281	309	276	***	***	89	85	110	77	124	132	120
13	100	91	113	111	69	88	75	93	79	97	139	2	295	275	279	156	121	***	50	49	***	43	23	123	112
14	92	94	85	72	73	54	89	97	127	115	140	101	270	204	172	167	108	146	230	223	187	163	180	151	348
15	110	49	47	82	70	95	94	125	144	140	170	209	250	254	284	339	242	159	144	166	183	109	***	150	199
16	148	165	153	129	90	65	64	65	109	146	198	270	302	273	272	261	273	267	232	75	***	177	197	254	306
17	253	182	152	172	8	***	153	143	***	150	107	***	81	73	99	153	152	169	142	***	172	218	137	255	58
18	286	43	289	197	41	17	***	353	339	45	119	165	244	232	267	264	***	***	***	***	***	117	180	***	138
19	202	106	45	85	48	91	84	91	107	91	226	259	258	185	212	258	275	273	259	***	295	***	***	***	296
20	237	279	203	229	289	245	347	70	275	278	283	278	278	278	272	289	274	288	***	***	276	250	284	283	220
21	276	145	231	8	91	99	135	117	158	329	95	280	268	272	277	278	282	272	281	***	***	***	338	9	326
22	79	270	***	294	289	***	315	347	284	286	278	298	301	315	286	293	270	246	184	***	***	150	158	167	243
23	176	275	249	172	***	***	288	351	***	289	300	141	258	322	304	276	290	284	***	***	175	135	116	94	146
24	***	264	160	124	324	155	159	150	167	281	278	298	242	288	234	273	282	273	259	***	280	264	***	***	328
25	156	115	261	316	253	81	164	150	27	276	253	278	267	265	270	265	278	268	288	***	286	279	283	292	259
26	299	284	253	126	153	150	116	99	148	171	35	333	290	274	271	281	299	***	256	***	***	***	***	284	338
27	281	250	324	296	312	320	308	321	315	277	320	276	284	303	313	286	293	289	277	***	***	***	***	266	178
28	284	318	328	***	283	280	***	***	273	289	260	267	258	267	274	283	286	121	157	155	170	165	145	137	259
29	152	163	47	143	115	152	134	85	97	176	269	251	273	284	278	269	278	287	***	***	***	106	133	90	262
30	85	96	84	60	58	63	76	97	85	82	122	137	135	101	149	139	310	294	291	218	64	211	28	70	333
31	71	46	60	91	107	90	81	87	90	124	179	133	158	78	85	101	***	333	17	316	292	234	162	98	321

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 85.5% OPERATIONAL RECOVERY RATE = 85.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
JULY - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.91	0.75	0.55	0.68	0.15	0.02	0.04	0.31	0.76	0.80	0.99	1.14	1.22	1.08	1.05	0.89	0.84	0.65	***	***	***	0.52	0.46	***	0.69
2	0.38	0.38	0.29	0.23	0.33	0.26	0.36	0.44	0.61	0.94	0.88	0.88	0.97	0.87	0.97	1.06	0.84	0.95	0.97	0.86	0.68	0.39	0.38	0.44	0.64
3	0.74	0.41	0.29	0.44	0.97	0.05	0.29	0.41	0.70	0.85	0.81	0.61	0.78	1.06	1.05	1.01	0.91	0.96	0.93	0.73	0.37	***	***	0.57	0.68
4	0.53	0.36	0.12	0.15	0.39	0.52	0.44	0.44	0.83	0.81	0.83	1.06	0.78	0.79	0.99	0.67	0.75	0.69	0.89	0.73	0.62	0.49	0.71	0.57	0.63
5	0.66	0.52	0.39	0.46	0.63	0.49	0.57	0.61	0.75	0.77	0.69	0.72	0.72	1.13	0.86	0.76	***	0.65	0.30	0.18	0.34	0.51	0.56	0.63	0.60
6	0.50	0.39	0.57	0.68	0.28	0.09	0.13	0.52	0.72	0.88	1.15	1.02	0.84	1.16	0.92	0.90	0.92	0.80	0.61	***	0.57	***	0.38	***	0.67
7	***	0.56	0.30	0.18	0.04	0.02	0.17	0.27	0.74	1.16	1.10	1.23	1.20	1.24	1.09	1.03	1.06	0.89	0.65	0.70	0.39	0.38	0.57	0.25	0.66
8	0.46	0.55	0.45	0.24	0.06	0.21	0.13	0.27	0.34	0.83	0.98	0.97	1.22	0.93	1.14	0.75	0.85	0.74	0.93	0.87	***	0.59	***	***	0.64
9	0.85	0.39	0.46	0.53	0.50	0.44	0.42	0.30	0.73	0.86	0.93	1.14	0.96	0.96	0.95	1.09	1.00	0.85	1.00	0.71	0.44	0.41	0.48	0.58	0.71
10	***	0.50	0.52	0.30	0.22	0.16	0.28	0.41	0.61	1.03	0.78	0.78	1.16	1.27	0.89	0.88	0.99	1.03	0.95	0.67	0.51	0.58	0.65	0.76	0.69
11	0.82	***	0.75	0.76	0.56	0.64	0.76	0.86	0.72	1.08	1.11	1.01	1.09	0.96	0.80	1.01	1.04	0.98	0.97	***	0.44	0.64	0.36	0.43	0.81
12	0.43	0.33	0.55	0.54	0.34	0.35	0.24	0.49	0.54	0.83	0.84	0.70	0.89	1.02	1.27	1.15	0.73	0.93	0.93	0.74	0.85	0.60	0.37	0.46	0.67
13	0.43	0.46	0.38	0.38	0.54	0.62	0.31	0.37	0.66	1.04	0.93	1.05	1.09	1.16	1.08	0.75	0.73	0.68	0.63	0.93	0.85	0.71	0.64	0.70	0.71
14	0.63	0.63	0.54	0.64	0.57	0.38	0.55	0.53	0.55	0.67	0.95	1.25	1.26	1.15	0.87	0.60	0.70	0.49	0.61	0.61	0.24	0.55	0.64	0.47	0.67
15	0.69	0.66	0.77	0.56	0.53	0.38	0.46	0.46	0.42	0.66	0.66	0.81	0.68	1.03	1.20	1.04	0.99	0.73	0.80	0.85	0.35	0.45	0.85	0.76	0.70
16	0.40	0.37	0.36	0.37	0.27	0.28	0.14	0.19	0.52	0.52	0.84	0.87	1.00	1.08	1.07	1.09	0.96	0.87	0.68	0.51	0.57	0.37	0.47	0.48	0.59
17	0.33	0.45	0.40	0.32	0.19	0.07	0.32	0.59	0.71	0.76	0.47	***	0.39	0.55	0.54	0.63	0.59	0.85	0.48	0.30	0.33	0.56	0.51	0.69	0.48
18	0.47	0.57	0.40	0.67	0.24	0.15	0.27	0.05	0.24	0.90	0.99	0.96	1.22	1.20	0.98	0.74	0.74	0.80	0.95	0.77	0.74	0.74	0.69	0.57	0.67
19	0.46	0.60	0.46	0.42	0.37	0.34	0.33	0.12	0.37	0.74	0.79	1.03	0.82	0.58	0.87	1.01	1.21	0.93	0.83	0.65	0.46	0.51	0.52	0.49	0.62
20	0.47	0.30	0.22	0.48	0.28	0.14	0.01	0.14	0.56	0.79	0.99	1.00	1.12	1.01	1.15	1.20	0.97	0.89	0.94	0.53	0.35	0.21	0.18	0.41	0.60
21	0.44	0.44	0.35	0.23	0.22	0.09	0.26	0.30	0.53	0.79	1.18	1.20	1.20	1.28	1.01	1.14	1.03	0.95	0.89	***	0.37	***	0.58	0.36	0.67
22	0.34	0.61	0.52	0.40	0.28	0.26	0.40	0.39	0.60	0.86	1.00	1.16	1.05	1.21	1.17	1.03	1.34	1.18	1.10	***	***	0.69	0.42	0.55	0.75
23	0.58	0.40	0.41	0.35	***	0.22	0.30	0.37	0.60	0.80	0.98	0.80	0.99	0.82	0.99	0.79	0.79	0.56	0.31	0.34	0.43	0.57	0.44	0.52	0.58
24	***	0.67	0.35	0.34	0.32	0.30	0.32	0.58	0.58	0.84	1.00	1.00	1.09	0.87	1.15	0.99	0.99	0.80	0.77	***	0.70	0.39	0.14	0.06	0.65
25	0.46	0.47	0.38	0.53	0.22	0.19	0.40	0.34	0.68	0.98	0.87	0.83	1.04	1.09	1.01	1.00	0.98	0.95	1.02	0.58	0.27	0.28	0.48	0.42	0.64
26	0.34	0.60	0.34	0.36	0.31	0.22	0.13	0.05	0.45	0.53	0.91	0.87	1.14	1.02	1.13	0.99	1.07	0.94	0.97	0.81	0.67	0.37	0.46	0.48	0.63
27	0.40	0.45	0.38	0.26	0.40	0.05	0.07	0.19	0.34	1.01	0.97	1.13	1.03	1.07	1.25	1.11	1.13	0.87	0.78	0.63	0.19	0.15	0.37	0.32	0.61
28	0.24	0.32	0.49	0.36	0.23	0.20	0.24	0.23	0.58	0.80	1.06	1.12	1.28	1.24	0.95	0.73	0.64	0.78	0.55	0.53	0.56	0.57	0.56	0.60	0.62
29	0.52	0.36	0.28	0.44	0.35	0.37	0.35	0.47	0.69	0.92	1.17	1.05	1.12	0.95	1.04	1.11	0.96	0.89	***	***	***	0.54	0.50	0.49	0.69
30	0.63	0.43	0.41	0.47	0.54	0.47	0.41	0.46	0.59	0.78	0.85	0.79	1.02	0.94	1.13	1.13	0.98	1.00	0.72	0.41	0.44	0.63	0.30	0.36	0.66
31	0.53	0.41	0.37	0.30	0.26	0.17	0.31	0.15	0.34	0.60	0.69	0.91	1.09	1.13	***	0.97	0.79	0.38	0.63	0.72	0.50	0.34	0.36	0.54	0.54
HRAVE	0.52	0.48	0.42	0.42	0.35	0.26	0.30	0.36	0.58	0.83	0.92	0.97	1.01	1.03	1.02	0.94	0.92	0.83	0.79	0.64	0.49	0.49	0.48	0.50	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.69	0.64	0.68	0.63	0.60	0.67	0.66	0.64	0.71	0.69	0.81	0.67	0.71	0.67	0.70	0.59	0.48	0.67	0.62	0.60	0.67	0.75	0.58	0.65	0.64
MAX	1.22	1.06	1.06	1.06	1.13	1.16	1.24	1.22	1.14	1.27	1.11	1.27	1.16	1.26	1.20	1.09	0.85	1.22	1.21	1.20	1.28	1.34	0.99	1.15	1.09
MIN	0.02	0.23	0.05	0.12	0.18	0.09	0.02	0.06	0.30	0.16	0.36	0.24	0.31	0.24	0.35	0.14	0.07	0.05	0.12	0.01	0.09	0.26	0.22	0.06	0.19

DAY	26	27	28	29	30	31
AVE	0.63	0.61	0.62	0.69	0.66	0.54
MAX	1.14	1.25	1.28	1.17	1.13	1.13
MIN	0.05	0.05	0.20	0.28	0.30	0.15

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 96.1% OPERATIONAL RECOVERY RATE = 96.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.87	0.71	0.56	0.65	0.26	0.21	0.13	0.29	0.71	0.65	0.78	1.15	0.97	1.03	1.02	0.91	0.73	***	***	***	***	0.53	***	***	0.68
2	***	***	0.16	0.12	0.30	0.30	0.30	0.37	0.67	0.91	1.07	1.15	1.20	0.72	0.96	1.25	0.88	0.83	0.90	***	***	0.23	***	0.50	0.67
3	0.64	***	0.28	0.38	0.65	0.19	0.21	0.23	0.81	0.76	0.76	0.54	0.70	1.25	1.19	1.12	0.85	0.93	0.88	***	***	***	***	0.62	0.68
4	0.52	0.34	0.17	0.15	0.36	0.59	0.49	0.40	0.76	0.78	0.97	1.09	0.87	0.73	0.98	0.69	0.70	0.66	0.77	***	0.90	0.44	0.74	0.60	0.64
5	0.48	0.67	0.28	0.27	0.73	0.51	0.59	0.59	0.71	0.79	0.44	0.70	0.62	1.16	0.82	0.73	***	0.61	0.35	0.33	0.18	***	0.54	0.65	0.58
6	0.50	0.45	0.42	0.78	0.37	0.30	0.10	0.21	0.63	0.97	1.10	1.20	0.95	1.13	0.86	1.08	0.89	0.78	0.55	***	***	***	***	***	0.70
7	***	0.57	0.42	0.30	0.22	0.18	0.04	0.07	0.61	1.23	1.25	1.06	1.13	1.21	1.04	1.03	1.15	1.16	0.65	***	***	0.30	0.58	0.34	0.69
8	0.59	0.61	0.52	0.31	0.01	0.07	0.11	0.18	0.34	0.72	0.93	1.01	1.28	1.05	0.85	0.83	0.78	0.63	***	***	***	***	***	***	0.60
9	***	0.32	0.38	***	0.55	0.51	0.38	0.26	0.60	0.99	1.00	1.02	1.09	0.92	1.00	1.08	1.25	0.89	1.05	0.72	0.49	0.48	0.67	0.59	0.74
10	***	***	0.72	0.47	0.20	0.28	0.19	0.22	0.42	1.17	0.77	0.87	1.57	1.21	1.21	1.01	0.89	0.86	1.00	***	0.40	0.66	0.96	0.68	0.75
11	0.87	***	0.73	0.85	***	0.55	0.74	0.80	0.69	1.11	1.11	1.06	1.05	0.94	0.83	1.22	1.10	0.84	***	***	***	***	0.38	0.53	0.86
12	0.49	0.35	0.56	0.44	0.23	0.31	0.01	0.16	0.37	0.66	0.99	0.81	0.91	1.24	1.00	***	***	0.80	***	0.63	***	0.72	0.46	0.44	0.58
13	0.46	0.49	0.17	0.37	0.50	0.46	0.24	0.15	0.81	0.82	0.90	1.05	1.19	1.34	1.23	0.68	***	0.57	0.59	***	***	0.63	0.78	0.63	0.67
14	0.64	0.56	0.46	0.45	0.54	0.32	0.44	0.59	0.51	0.62	0.94	1.08	1.14	1.13	1.02	0.57	0.63	0.58	0.66	0.59	0.27	0.46	0.69	0.34	0.63
15	0.90	0.79	1.10	0.47	0.46	0.41	0.42	0.38	0.42	0.57	0.65	0.66	0.65	1.05	1.11	1.07	1.00	0.88	0.74	0.96	0.49	0.23	0.75	0.61	0.70
16	0.39	0.40	0.49	0.36	0.19	0.29	0.06	0.21	0.16	0.27	0.85	0.71	0.98	0.98	1.12	1.23	0.96	0.85	0.98	0.62	0.63	0.46	0.68	0.55	0.60
17	0.43	0.58	0.53	0.37	0.23	0.08	0.23	0.56	***	0.94	0.66	***	0.21	0.18	0.22	0.43	0.59	0.84	0.44	***	0.41	0.66	0.67	0.66	0.47
18	0.59	0.55	0.64	0.72	0.44	0.19	0.30	0.20	0.33	0.93	0.87	0.80	1.14	1.07	1.00	0.71	0.64	0.67	1.09	***	***	0.78	0.95	0.92	0.71
19	0.51	0.64	0.57	0.40	0.52	0.15	0.32	0.03	0.13	0.63	0.70	1.20	0.96	0.49	0.52	0.89	1.21	0.76	0.68	***	***	0.49	0.63	0.14	0.57
20	0.46	0.29	0.29	0.50	0.21	0.25	0.02	0.14	0.47	0.72	1.01	1.05	1.27	1.10	0.98	1.01	1.10	0.85	0.84	0.71	0.32	0.18	0.30	0.61	0.61
21	0.50	0.60	0.68	0.46	0.13	0.06	0.11	0.17	0.25	0.75	1.01	1.35	1.29	1.26	1.00	1.27	0.89	0.80	0.79	***	***	***	***	0.68	0.70
22	0.46	0.78	***	0.41	0.27	0.28	0.46	0.70	0.70	0.74	0.99	1.16	1.27	1.36	1.35	1.20	1.51	1.06	0.96	***	***	0.55	0.53	0.50	0.82
23	0.69	0.47	0.49	***	***	***	***	0.36	0.64	0.67	0.80	0.68	0.87	0.83	1.22	0.92	0.68	0.57	0.33	0.41	0.54	0.54	0.55	0.59	0.64
24	***	0.76	0.59	0.60	0.78	0.09	0.28	0.34	0.52	0.65	0.96	1.08	1.03	1.11	1.34	1.09	0.88	0.84	0.73	***	0.41	0.49	***	***	0.73
25	***	0.64	0.79	0.56	0.39	0.38	0.36	0.37	0.76	0.92	0.84	0.99	1.03	0.87	0.87	1.08	1.06	1.07	0.94	***	***	0.20	***	0.40	0.73
26	***	0.55	0.38	0.47	0.27	0.14	0.46	0.14	0.50	0.59	0.84	0.86	1.21	1.12	0.98	0.86	0.96	0.67	0.76	***	0.54	0.54	0.37	0.48	0.62
27	0.44	0.30	0.40	0.30	0.34	0.20	0.22	0.56	0.25	0.93	1.25	1.38	1.07	1.18	1.22	1.19	1.23	1.03	0.89	***	***	***	***	0.26	0.73
28	0.39	0.28	***	0.32	0.23	0.20	0.36	0.44	0.72	0.99	1.11	0.82	1.10	1.38	1.02	0.74	0.79	0.59	0.56	0.63	0.58	0.43	0.53	0.71	0.65
29	0.56	0.36	0.26	0.37	0.36	0.31	0.23	0.66	0.94	0.80	1.16	1.41	1.15	0.91	1.09	0.91	0.89	0.87	***	***	***	0.49	0.61	0.84	0.72
30	0.62	0.49	0.58	0.36	0.58	0.40	0.28	0.26	0.52	0.83	0.79	0.87	1.27	0.94	1.01	1.20	1.18	1.18	0.82	0.43	0.34	0.78	0.45	0.42	0.69
31	0.52	0.35	0.31	0.14	0.13	0.17	0.42	0.19	0.27	0.37	0.45	0.85	1.17	1.14	***	***	0.73	0.42	0.61	***	***	0.29	0.35	0.56	0.47
HRAVE	0.56	0.51	0.48	0.43	0.36	0.28	0.28	0.33	0.54	0.79	0.90	0.99	1.04	1.03	1.00	0.97	0.93	0.80	0.75	0.60	0.46	0.48	0.60	0.55	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.68	0.67	0.68	0.64	0.58	0.70	0.69	0.60	0.74	0.75	0.86	0.58	0.67	0.63	0.70	0.60	0.47	0.71	0.57	0.61	0.70	0.82	0.64	0.73	0.73
MAX	1.15	1.25	1.25	1.09	1.16	1.20	1.25	1.28	1.25	1.57	1.22	1.24	1.34	1.14	1.11	1.23	0.94	1.14	1.21	1.27	1.35	1.51	1.22	1.34	1.08
MIN	0.13	0.12	0.19	0.15	0.18	0.10	0.04	0.01	0.26	0.19	0.38	0.01	0.15	0.27	0.23	0.06	0.08	0.19	0.03	0.02	0.06	0.27	0.33	0.09	0.20

DAY	26	27	28	29	30	31
AVE	0.62	0.73	0.65	0.72	0.69	0.47
MAX	1.21	1.38	1.38	1.41	1.27	1.17
MIN	0.14	0.20	0.20	0.23	0.26	0.13

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 87.8% OPERATIONAL RECOVERY RATE = 87.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
JULY - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.84	0.74	0.61	0.89	0.29	0.21	0.14	0.21	0.69	0.67	0.78	1.06	0.97	0.90	1.00	***	***	***	***	***	***	***	***	***	0.67
2	***	***	***	***	0.33	0.32	0.32	0.31	0.66	0.88	1.08	1.13	***	0.69	0.94	1.26	***	0.80	***	***	***	***	***	0.51	0.71
3	0.57	***	0.26	0.37	0.46	***	0.19	0.19	0.79	0.70	***	0.56	***	1.27	1.34	1.21	0.94	***	***	***	***	***	***	0.61	0.68
4	0.50	0.35	0.15	0.12	0.39	0.59	0.52	0.44	0.78	***	1.01	1.09	0.87	***	***	***	0.72	***	0.65	***	0.76	0.45	0.75	***	0.60
5	***	0.60	0.32	0.28	0.67	0.50	0.61	0.62	0.84	0.77	0.43	0.58	0.70	1.17	0.76	0.82	***	0.68	0.39	0.34	0.18	***	0.56	0.73	0.60
6	0.52	0.44	0.41	***	***	0.41	0.08	0.06	0.55	0.93	1.20	1.41	***	***	0.88	1.13	0.91	***	***	***	***	***	***	***	0.69
7	***	***	0.57	0.28	0.27	0.21	0.05	0.06	0.65	1.28	1.20	***	1.07	***	0.98	1.07	1.10	1.13	***	***	***	***	***	***	0.71
8	0.63	***	0.57	0.29	0.01	0.07	0.11	0.18	0.37	0.78	0.94	***	1.36	***	0.77	***	0.72	***	***	***	***	***	***	***	0.52
9	***	***	***	***	0.60	0.53	0.59	0.28	0.53	1.03	1.13	***	***	0.97	***	***	1.32	0.92	1.00	***	0.50	0.50	0.68	0.53	0.74
10	***	***	0.80	0.52	0.22	0.29	0.21	0.21	0.41	1.30	0.66	0.90	1.47	1.31	1.26	***	***	***	***	***	***	0.71	0.91	0.63	0.74
11	0.93	***	***	***	***	***	0.60	0.87	0.67	1.07	1.22	1.10	1.12	0.95	0.84	1.17	1.22	***	***	***	***	***	***	0.45	0.94
12	***	***	***	***	***	0.31	0.01	0.12	0.38	0.67	0.87	0.75	0.89	1.26	0.99	***	***	***	***	0.53	***	0.69	0.43	0.44	0.60
13	0.47	0.46	0.39	0.33	0.44	0.45	0.35	0.16	0.74	0.89	0.95	1.08	1.15	1.37	1.15	***	***	***	***	***	***	***	0.88	***	0.70
14	***	0.59	0.43	0.40	0.55	***	***	0.53	0.51	0.61	0.97	1.01	1.16	1.16	1.25	0.58	0.64	0.62	0.81	0.67	0.29	0.48	0.38	0.40	0.67
15	0.96	0.84	1.01	0.48	0.47	***	0.42	0.36	0.43	***	***	0.65	0.71	0.93	1.02	1.09	1.05	1.00	***	1.19	0.51	0.23	***	0.47	0.73
16	0.40	0.38	0.52	0.38	0.19	0.29	0.05	0.17	0.17	0.31	0.83	0.74	1.02	***	1.07	***	1.16	***	1.07	***	***	0.48	0.67	0.61	0.55
17	***	***	0.67	0.44	***	***	0.21	0.52	***	***	0.77	***	0.41	0.27	0.17	0.49	0.67	0.90	0.47	***	***	0.68	0.62	0.64	0.53
18	0.57	***	0.78	0.78	0.53	0.20	***	0.22	0.40	0.80	0.90	0.82	1.09	1.05	1.09	***	***	***	***	***	***	0.84	1.12	***	0.75
19	0.57	0.66	0.59	0.43	0.52	0.15	***	0.03	0.12	0.43	0.73	1.19	0.86	0.54	0.54	0.90	1.31	0.70	***	***	***	***	***	***	0.60
20	***	0.29	***	0.47	0.21	0.24	0.02	0.19	0.52	0.71	1.10	1.11	1.23	1.12	0.99	***	1.16	***	***	***	***	***	***	***	0.67
21	***	0.63	0.69	0.45	0.11	0.06	0.11	0.21	0.29	0.77	0.98	1.43	1.30	1.36	1.04	1.26	***	***	***	***	***	***	***	0.77	0.72
22	0.47	0.76	***	***	***	***	0.33	0.68	0.62	0.60	0.97	1.18	1.43	1.32	***	***	***	0.86	***	***	***	0.56	0.59	0.47	0.77
23	0.71	0.49	0.43	***	***	***	***	***	***	0.69	0.72	0.65	0.83	***	1.38	***	0.66	***	***	***	0.69	***	0.58	0.64	0.71
24	***	***	0.60	0.61	0.75	0.10	0.31	0.32	0.53	0.68	0.94	1.10	0.98	1.07	1.44	1.20	***	1.15	***	***	***	***	***	***	0.79
25	***	0.74	0.75	0.54	0.40	0.37	0.37	0.34	0.74	0.98	0.77	1.21	1.02	0.88	***	***	***	***	***	***	***	***	***	***	0.70
26	***	***	0.43	0.47	0.27	0.12	0.43	0.13	0.47	0.65	0.90	***	***	***	0.82	***	***	***	***	***	***	***	***	***	0.47
27	0.50	0.31	0.41	0.27	0.35	0.19	0.23	0.60	***	0.99	1.21	1.44	1.08	***	1.24	***	***	1.07	0.76	***	***	***	***	***	0.71
28	0.43	0.26	***	***	0.23	0.19	***	***	0.73	0.96	1.14	0.81	1.07	1.50	0.99	***	***	0.42	0.56	***	0.61	0.30	0.66	0.69	0.68
29	0.53	0.47	0.33	0.42	0.38	0.32	0.24	0.68	0.94	0.70	1.15	1.52	1.16	0.98	1.11	0.81	0.82	***	***	***	***	0.48	0.61	0.81	0.72
30	0.64	0.48	0.58	0.33	***	***	***	0.25	0.48	0.90	0.82	0.91	1.27	0.98	0.98	1.32	***	1.18	1.15	***	0.31	0.82	0.49	***	0.77
31	0.46	0.37	0.34	0.17	0.10	0.16	0.27	0.17	0.42	0.45	0.37	0.87	0.90	1.14	***	***	***	0.40	0.31	***	***	0.28	0.49	0.54	0.43
HRAVE	0.59	0.52	0.53	0.42	0.36	0.27	0.27	0.31	0.55	0.79	0.92	1.01	1.04	1.05	1.00	1.02	0.96	0.84	0.72	0.68	0.48	0.54	0.65	0.58	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.67	0.71	0.68	0.60	0.60	0.69	0.71	0.52	0.74	0.74	0.94	0.60	0.70	0.67	0.73	0.55	0.53	0.75	0.60	0.67	0.72	0.77	0.71	0.79	0.70
MAX	1.06	1.26	1.34	1.09	1.17	1.41	1.28	1.36	1.32	1.47	1.22	1.26	1.37	1.25	1.19	1.16	0.90	1.12	1.31	1.23	1.43	1.43	1.38	1.44	1.21
MIN	0.14	0.31	0.19	0.12	0.18	0.06	0.05	0.01	0.28	0.21	0.45	0.01	0.16	0.29	0.23	0.05	0.17	0.20	0.03	0.02	0.06	0.33	0.43	0.10	0.34

DAY	26	27	28	29	30	31
AVE	0.47	0.71	0.68	0.72	0.77	0.43
MAX	0.90	1.44	1.50	1.52	1.32	1.14
MIN	0.12	0.19	0.19	0.24	0.25	0.10

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 64.9% OPERATIONAL RECOVERY RATE = 64.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	8.7	8.0	5.4	4.5	4.5	3.7	3.3	3.7	4.0	3.3	3.5	4.2	4.4	4.1	4.5	3.8	3.7	1.1	3.5	3.1	2.8	3.9	5.2	5.4	4.3
2	5.3	6.5	6.8	6.8	5.5	6.6	5.4	3.5	3.5	3.8	3.8	3.7	4.8	4.8	7.3	8.0	7.1	6.5	6.3	***	4.1	2.7	1.7	4.1	5.2
3	4.4	3.0	2.8	3.1	3.4	3.7	3.5	2.9	2.5	3.0	4.5	4.1	5.6	5.2	5.6	6.3	6.1	5.7	6.3	6.6	6.4	***	3.8	3.0	4.4
4	2.3	2.3	2.6	4.3	3.6	3.9	3.0	3.5	3.3	2.3	2.8	3.6	5.4	6.5	7.2	7.6	7.7	6.2	6.7	6.7	4.8	4.8	4.4	3.3	4.5
5	2.1	2.3	2.4	3.2	3.2	2.7	2.3	2.4	2.0	2.3	4.1	5.8	6.6	7.0	6.6	7.0	6.9	6.8	7.4	6.1	4.6	2.5	2.1	1.8	4.2
6	2.4	2.8	4.8	5.3	2.9	1.7	2.8	3.7	3.6	4.5	5.4	5.9	5.4	4.2	3.8	4.2	4.4	4.0	2.7	3.6	5.4	3.3	2.4	3.3	3.9
7	4.4	3.5	3.2	3.8	4.8	4.9	2.8	2.8	2.9	3.9	3.6	4.8	5.1	***	***	7.5	5.1	3.1	2.2	1.9	2.0	3.5	3.5	4.2	3.8
8	5.4	6.0	5.4	3.8	5.4	3.8	3.5	3.4	3.0	3.0	2.9	2.9	3.7	2.9	3.5	3.9	4.0	3.7	2.8	4.6	4.3	2.4	3.5	3.1	3.8
9	2.8	3.9	4.5	4.8	4.7	3.1	2.5	2.3	2.1	2.8	3.1	3.7	3.8	4.5	4.2	4.7	5.0	6.4	4.6	4.0	5.1	6.8	5.3	5.5	4.2
10	***	8.0	5.4	6.2	7.1	5.4	4.6	4.0	3.8	3.6	3.6	4.0	4.2	4.1	3.9	4.0	4.1	4.2	5.4	3.1	3.2	3.0	3.9	4.6	4.5
11	4.2	3.3	4.2	4.4	3.4	3.2	2.7	3.7	4.1	6.5	4.6	2.4	1.2	3.5	3.7	3.9	3.8	3.9	3.6	5.2	***	4.1	4.0	7.4	4.0
12	9.9	9.0	7.7	7.4	6.6	5.5	4.0	5.4	5.8	5.0	4.9	3.7	2.8	3.8	3.7	3.9	3.0	4.8	3.2	2.9	2.6	3.8	2.9	2.8	4.8
13	3.2	3.8	4.3	4.8	4.1	3.5	5.1	4.6	3.4	3.3	3.2	2.8	4.0	4.4	5.4	5.6	5.8	4.7	4.3	4.7	3.2	2.7	3.4	3.7	4.1
14	3.6	3.8	3.3	3.2	3.1	2.3	3.6	3.7	2.8	2.1	3.0	3.8	3.9	4.9	4.8	3.8	3.2	3.3	4.2	4.8	5.1	5.2	4.2	4.2	3.8
15	3.4	2.9	3.1	2.3	2.1	3.1	3.4	4.1	3.7	2.8	3.2	4.0	4.4	4.9	5.4	5.7	5.8	5.8	5.8	6.9	6.1	3.6	3.5	3.6	4.2
16	3.1	1.7	1.2	2.7	2.1	4.0	6.2	4.3	3.0	3.6	4.3	4.5	4.9	5.1	6.1	6.8	7.0	8.1	***	7.8	7.5	6.2	4.6	2.7	4.7
17	6.1	5.7	3.5	3.0	3.3	4.2	5.8	8.1	***	4.7	5.0	5.7	6.2	4.5	5.5	7.8	9.0	10.0	***	8.0	5.7	5.1	6.0	4.3	5.8
18	4.8	4.4	4.5	5.2	4.5	4.2	3.9	2.8	3.3	4.0	4.1	6.2	7.1	7.6	6.9	9.1	10.2	***	7.8	5.7	5.3	5.9	4.1	2.9	5.4
19	3.9	4.7	3.9	4.3	3.8	2.7	3.1	3.6	2.8	4.1	4.5	4.8	6.4	6.3	6.1	6.8	7.0	7.5	6.7	5.6	4.5	3.3	2.3	4.1	4.7
20	3.0	2.2	2.3	1.9	1.4	2.0	2.2	2.2	2.2	3.0	3.5	4.2	4.5	5.8	6.0	5.5	7.0	7.1	6.8	7.2	4.9	4.1	3.7	3.8	4.0
21	4.2	3.8	3.5	3.4	3.3	2.1	1.9	1.3	2.1	2.7	3.8	4.3	5.1	7.6	7.5	7.2	7.2	6.2	6.5	6.4	3.8	3.0	2.9	2.6	4.3
22	5.1	7.8	***	6.9	5.0	4.3	4.1	3.7	3.8	4.3	4.4	4.3	5.7	6.4	6.9	5.8	4.7	4.2	7.5	6.4	5.0	3.2	2.4	3.4	5.0
23	3.3	3.6	3.4	3.7	2.7	3.2	3.4	3.4	4.2	2.5	2.8	4.0	3.8	4.5	5.0	5.1	6.3	6.2	6.7	5.0	4.5	4.9	2.4	2.9	4.1
24	3.4	3.5	4.8	6.3	7.8	7.8	7.9	6.9	6.5	4.1	4.0	3.9	4.4	4.0	4.5	4.8	4.1	3.7	4.0	5.2	5.7	5.6	4.7	5.7	5.1
25	7.1	7.6	6.1	8.4	5.9	4.2	4.0	4.5	3.3	3.7	4.0	3.4	3.0	4.2	3.5	3.7	7.3	6.2	3.4	7.9	7.6	10.4	7.0	7.0	5.6
26	8.0	8.1	7.8	7.4	7.5	7.0	6.9	6.6	6.0	5.0	4.0	3.5	3.6	4.0	4.2	4.8	3.9	3.4	10.4	8.2	5.8	4.3	3.5	4.6	5.8
27	3.4	3.1	3.4	2.8	3.1	3.1	3.6	3.5	2.6	3.4	3.6	3.7	4.5	4.2	4.8	5.1	6.3	***	4.9	3.3	3.7	3.8	2.8	3.0	3.7
28	2.6	2.0	1.5	2.9	4.6	3.8	2.9	2.7	2.5	2.1	2.8	3.5	3.6	3.9	4.1	4.3	4.4	3.6	3.4	2.8	3.5	3.0	2.1	3.5	3.2
29	4.9	5.9	5.5	4.1	4.1	3.4	3.5	2.9	3.2	3.2	3.6	3.8	4.0	4.8	4.2	4.3	5.3	5.7	5.7	2.6	4.7	3.7	3.8	3.8	4.2
30	4.1	3.7	3.7	5.3	5.4	5.0	5.0	4.3	3.8	3.6	4.1	4.3	4.1	4.6	4.7	4.4	5.2	4.2	6.7	8.1	7.2	6.2	5.2	3.9	4.9
31	2.2	2.8	3.7	3.5	4.1	4.4	4.8	5.8	5.7	3.4	3.1	3.4	4.3	3.9	3.2	3.9	4.7	7.8	4.3	5.0	***	8.5	5.4	***	4.5
HRAVE	4.4	4.5	4.2	4.5	4.3	3.9	3.9	3.9	3.5	3.5	3.8	4.1	4.5	4.9	5.1	5.5	5.7	5.3	5.3	5.3	4.8	4.5	3.8	3.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.3	5.2	4.4	4.5	4.2	3.9	3.8	3.8	4.2	4.5	4.0	4.8	4.1	3.8	4.2	4.7	5.8	5.4	4.7	4.0	4.3	5.0	4.1	5.1	5.6
MAX	8.7	8.0	6.6	7.7	7.4	5.9	7.5	6.0	6.8	8.0	7.4	9.9	5.8	5.2	6.9	8.1	10.0	10.2	7.5	7.2	7.6	7.8	6.7	7.9	10.4
MIN	1.1	1.7	2.5	2.3	1.8	1.7	1.9	2.4	2.1	3.0	1.2	2.6	2.7	2.1	2.1	1.2	3.0	2.8	2.3	1.4	1.3	2.4	2.4	3.4	3.0

DAY	26	27	28	29	30	31
AVE	5.8	3.7	3.2	4.2	4.9	4.5
MAX	10.4	6.3	4.6	5.9	8.1	8.5
MIN	3.4	2.6	1.5	2.6	3.6	2.2

MONTHLY AVERAGE = 4.5 MONTHLY MAXIMUM = 10.4 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.1% OPERATIONAL RECOVERY RATE = 98.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
AUGUST - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	10.6	8.2	5.7	5.7	4.9	4.3	4.2	5.0	5.1	4.0	4.0	5.1	5.3	5.0	5.5	4.8	4.7	2.0	4.3	3.5	2.5	4.4	5.9	6.8	5.1
2	5.9	6.4	8.1	6.4	6.2	6.4	5.1	3.7	3.9	3.8	3.6	4.7	5.6	5.8	7.9	6.2	6.7	6.8	5.2	***	4.4	2.9	1.2	5.6	5.3
3	4.4	3.4	3.2	3.3	3.9	3.0	3.0	3.1	4.3	2.1	3.9	4.4	4.9	6.1	6.3	6.2	6.7	6.8	7.1	6.8	6.4	***	3.8	3.6	4.6
4	3.1	1.2	1.4	2.6	2.8	3.0	2.5	3.0	3.4	2.1	3.1	4.0	5.0	6.7	8.1	8.0	7.1	5.7	6.8	5.3	4.6	5.0	5.0	3.4	4.3
5	1.4	2.0	0.9	1.8	2.5	2.7	2.2	3.1	2.8	2.9	5.2	5.9	5.4	6.8	5.8	5.8	9.0	7.4	8.2	6.5	5.1	2.5	2.5	1.8	4.2
6	1.6	3.9	5.7	5.9	3.2	2.4	2.9	3.9	2.9	4.7	4.5	4.8	6.9	5.2	3.1	3.6	5.4	4.7	3.7	4.2	5.2	4.0	3.4	5.0	4.2
7	4.8	3.4	4.0	3.5	5.2	5.5	3.1	2.4	1.7	4.6	4.8	4.6	6.0	***	8.4	6.1	5.2	4.0	2.7	2.2	2.3	2.2	3.3	4.7	4.1
8	6.2	6.7	7.6	4.3	5.3	4.9	3.8	3.7	3.3	3.1	3.0	3.0	2.2	2.1	2.8	2.3	4.0	3.4	3.2	4.5	5.3	3.0	1.6	4.0	3.9
9	3.5	4.0	3.3	4.0	5.4	4.0	2.4	2.5	3.0	2.0	3.1	3.2	3.5	4.5	4.5	4.4	5.7	6.7	6.4	4.7	6.1	5.7	7.7	6.5	4.4
10	***	9.3	6.6	5.3	6.1	5.1	4.7	3.5	4.1	4.7	4.5	4.7	5.2	5.1	5.2	4.7	4.6	4.2	7.4	4.0	3.0	4.1	3.9	4.4	5.0
11	3.6	3.4	4.0	5.1	3.7	3.5	3.4	4.3	5.1	7.8	5.2	3.7	3.4	3.2	3.1	3.8	4.4	3.7	3.4	6.0	***	4.3	5.7	7.8	4.4
12	11.3	12.3	9.1	8.2	7.5	6.2	4.2	5.9	6.2	5.4	5.9	3.9	3.4	5.3	3.6	3.3	4.0	7.9	4.6	3.6	3.2	3.0	4.2	2.9	5.6
13	3.6	3.0	2.9	3.2	3.7	3.2	3.9	3.6	4.0	3.6	3.6	3.4	4.2	5.5	6.4	6.6	6.8	6.0	3.8	5.0	3.6	3.0	4.4	3.5	4.2
14	3.5	4.2	4.5	3.0	2.7	2.3	3.0	4.0	3.3	2.8	2.5	4.2	4.4	5.4	5.6	4.2	3.6	4.2	3.8	5.1	6.1	5.2	4.2	4.1	4.0
15	3.4	2.9	2.1	2.6	2.1	3.1	3.1	3.1	3.2	2.1	2.1	3.1	4.4	3.9	5.8	6.2	5.2	7.0	6.1	7.3	6.2	4.2	4.2	3.8	4.1
16	2.5	1.0	1.9	2.5	2.8	3.9	5.8	4.4	3.1	3.4	4.1	5.4	5.8	5.0	5.8	6.6	7.3	8.1	***	8.3	8.3	5.8	4.9	4.2	4.8
17	6.1	5.6	4.4	3.5	3.6	4.4	4.8	8.1	***	4.4	4.9	4.7	6.5	5.3	6.3	7.1	8.1	9.3	***	7.9	5.5	5.3	5.0	4.2	5.7
18	5.0	4.7	4.4	4.1	6.0	5.0	3.7	3.0	3.8	4.3	3.4	5.5	8.0	7.1	7.6	10.4	12.5	***	8.7	7.2	5.6	5.7	4.3	3.5	5.8
19	4.1	4.2	4.6	4.4	3.3	3.1	5.5	4.1	3.2	3.8	2.7	4.8	5.6	7.0	6.4	6.1	7.4	7.3	6.4	5.8	4.9	6.0	6.2	5.9	5.1
20	4.9	2.0	4.0	3.7	3.1	3.7	3.5	3.6	3.6	2.0	2.8	5.6	6.7	6.6	5.6	5.5	8.3	8.3	7.7	7.3	4.8	4.1	3.9	4.1	4.8
21	3.3	3.3	1.1	2.2	3.0	2.3	2.1	2.8	3.0	3.2	4.8	4.7	6.3	7.1	6.3	7.3	6.7	5.4	5.9	6.4	3.4	3.8	4.0	4.2	4.3
22	5.9	8.1	***	7.3	4.2	4.7	4.4	4.5	4.3	4.3	3.2	5.0	7.6	7.2	9.5	8.0	4.3	4.1	8.3	6.1	5.4	4.1	3.3	4.0	5.6
23	3.9	4.9	4.8	3.9	3.4	3.1	2.6	3.3	3.5	1.9	2.2	4.1	3.7	4.4	3.8	5.6	7.0	7.9	5.9	5.4	5.0	6.0	2.7	3.4	4.3
24	3.5	3.6	4.9	7.3	8.9	8.7	9.0	7.1	7.3	4.4	5.2	3.8	6.0	3.6	5.0	4.0	4.3	4.6	4.9	5.4	5.1	5.6	5.8	7.7	5.7
25	6.6	9.1	7.1	9.2	6.7	5.4	4.9	5.5	4.3	4.7	4.6	3.6	3.6	5.4	4.9	4.7	9.6	7.9	3.0	8.2	7.9	10.0	7.7	6.9	6.3
26	7.8	8.7	9.7	8.7	7.4	7.7	8.1	7.5	6.4	4.4	4.0	3.6	5.1	5.4	4.3	4.2	4.4	4.0	11.6	7.9	5.7	4.2	4.5	4.6	6.2
27	3.8	3.4	3.2	2.8	2.2	2.6	3.4	2.8	3.1	3.4	2.9	4.3	5.3	5.4	5.6	5.2	8.5	***	5.0	3.8	4.3	4.9	4.1	2.5	4.0
28	4.7	3.1	2.0	3.1	4.6	3.5	2.6	2.5	2.2	2.0	1.1	1.7	4.0	4.7	6.2	5.2	4.5	4.4	3.8	3.4	3.5	2.8	2.8	1.0	3.3
29	2.8	6.0	4.1	3.2	4.8	3.7	3.9	3.2	5.2	4.5	3.4	3.5	3.5	5.2	5.8	5.2	4.8	5.1	6.1	2.9	5.2	2.1	4.6	4.5	4.3
30	4.6	3.6	3.4	5.7	6.7	5.4	6.2	5.0	4.4	3.5	3.2	4.4	5.0	4.3	6.0	4.8	5.4	4.9	5.8	8.2	6.9	6.4	6.5	4.2	5.2
31	4.0	4.3	3.7	4.3	4.7	3.6	4.6	6.0	6.0	3.6	2.8	4.5	5.3	3.3	3.7	4.2	5.4	7.5	4.5	3.5	***	8.5	7.0	***	4.8
HRAVE	4.7	4.8	4.4	4.6	4.5	4.2	4.1	4.1	4.0	3.7	3.7	4.2	5.1	5.3	5.6	5.5	6.2	5.8	5.7	5.6	5.0	4.6	4.5	4.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.1	5.3	4.6	4.3	4.2	4.2	4.1	3.9	4.4	5.0	4.4	5.6	4.2	4.0	4.1	4.8	5.7	5.8	5.1	4.8	4.3	5.6	4.3	5.7	6.3
MAX	10.6	8.1	7.1	8.1	9.0	6.9	8.4	7.6	7.7	9.3	7.8	12.3	6.8	6.1	7.3	8.3	9.3	12.5	7.4	8.3	7.3	9.5	7.9	9.0	10.0
MIN	2.0	1.2	2.1	1.2	0.9	1.6	1.7	1.6	2.0	3.0	3.1	2.9	2.9	2.3	2.1	1.0	3.5	3.0	2.7	2.0	1.1	3.2	1.9	3.5	3.0

DAY	26	27	28	29	30	31
AVE	6.2	4.0	3.3	4.3	5.2	4.8
MAX	11.6	8.5	6.2	6.1	8.2	8.5
MIN	3.6	2.2	1.0	2.1	3.2	2.8

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 12.5 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
AUGUST - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	8.4	6.6	5.0	5.8	3.7	4.7	5.8	5.0	3.7	3.8	5.0	4.8	7.1	6.5	5.3	4.3	4.2	4.9	3.5	2.1	4.7	5.6	7.1	5.1
2	5.3	5.8	***	6.6	8.2	6.5	5.3	3.8	3.8	3.3	3.0	4.8	4.6	5.5	7.5	7.7	7.4	5.9	4.8	***	***	***	2.1	6.0	5.4
3	5.1	4.4	2.9	2.8	3.7	2.6	3.6	3.3	4.3	2.0	2.7	3.5	3.9	6.4	5.3	6.4	5.3	5.3	7.6	***	7.2	***	***	3.1	4.4
4	2.5	0.9	1.5	2.1	2.9	3.4	2.7	3.4	3.5	2.6	3.4	4.6	3.7	7.2	8.2	8.1	7.7	5.3	8.0	***	***	***	***	***	4.3
5	1.2	2.2	2.2	3.0	3.0	3.2	3.1	3.3	3.2	3.1	5.3	5.9	3.9	6.9	7.0	6.4	9.2	7.4	8.8	***	***	***	5.2	1.2	4.5
6	2.1	3.3	6.0	***	***	2.6	3.3	3.6	3.1	3.8	4.8	5.5	7.3	5.9	2.6	3.1	4.6	4.4	3.8	4.3	***	3.3	3.9	5.0	4.1
7	5.1	2.7	5.3	4.2	5.6	5.4	2.6	2.8	2.2	4.2	5.1	5.1	5.8	***	***	6.2	5.6	4.9	3.5	2.8	2.4	3.4	2.4	4.4	4.2
8	6.0	6.3	7.5	4.0	4.8	5.7	3.8	3.4	3.3	3.3	3.1	3.4	1.5	2.0	3.0	2.7	3.6	3.0	3.3	6.0	5.5	3.7	3.4	2.4	3.9
9	4.2	3.5	3.2	4.0	5.0	4.0	3.4	3.2	4.1	3.0	3.0	2.9	4.5	4.8	4.1	3.4	5.1	6.1	6.3	5.2	4.8	5.8	8.9	7.3	4.6
10	***	9.2	6.9	3.9	5.5	5.2	5.6	3.7	3.7	4.2	4.2	4.6	5.4	5.0	6.4	5.5	3.8	4.5	8.1	4.8	4.5	4.5	5.2	4.0	5.2
11	4.3	5.8	3.6	4.4	3.4	3.1	2.9	4.3	6.5	8.3	5.4	4.6	4.8	3.0	2.9	3.6	4.7	3.8	3.6	7.8	***	***	5.4	7.2	4.7
12	10.7	***	9.0	7.9	7.5	6.5	4.5	6.9	5.8	5.0	5.6	4.3	3.5	5.9	3.6	3.3	3.8	7.9	5.0	3.9	3.1	4.0	3.1	3.6	5.4
13	3.2	3.3	2.3	3.2	3.3	3.5	3.1	3.2	3.6	3.8	3.4	3.1	3.7	6.8	7.3	6.5	6.8	5.7	5.1	5.0	3.3	3.0	4.6	3.2	4.2
14	3.4	4.7	5.1	3.2	3.2	2.7	3.6	4.1	4.2	3.5	3.0	4.7	3.9	5.2	5.3	***	3.6	3.9	***	4.9	8.0	5.3	4.6	5.4	4.3
15	3.8	2.9	2.1	2.8	2.3	4.7	3.3	4.0	3.3	2.0	2.1	4.4	2.8	2.6	5.5	5.9	5.6	6.7	6.2	7.2	6.2	3.8	3.8	3.3	4.1
16	2.9	1.5	1.8	2.3	3.0	4.1	6.5	5.4	3.0	4.2	4.0	4.5	6.1	6.6	5.9	5.4	8.1	6.2	***	8.5	***	5.7	4.4	4.5	4.7
17	6.5	5.8	4.3	4.9	3.8	***	5.3	***	***	5.0	4.6	4.0	6.6	5.3	7.0	8.3	7.9	9.6	***	***	4.1	5.1	5.8	***	5.8
18	5.6	4.8	4.5	***	4.9	5.4	***	***	4.1	4.1	4.4	5.2	7.9	6.3	6.9	***	***	***	***	***	5.3	6.3	4.4	4.9	5.3
19	4.0	4.1	4.2	***	3.8	3.1	6.0	3.8	3.1	4.1	3.2	4.5	5.6	6.3	6.9	6.6	7.1	7.6	6.4	***	***	***	6.0	5.8	5.1
20	6.3	2.9	4.6	4.9	2.5	3.7	3.0	5.8	4.0	2.5	2.1	5.2	6.4	6.3	5.7	5.7	8.7	9.2	***	6.4	5.0	4.0	3.9	5.2	5.0
21	3.8	3.5	3.5	2.2	2.8	2.7	2.4	3.2	3.5	3.1	5.7	5.2	6.5	8.8	5.1	7.1	5.9	6.3	***	***	***	3.7	4.2	3.3	4.4
22	5.1	***	***	6.9	***	5.1	4.8	***	4.7	3.1	3.4	5.2	5.3	5.7	8.8	8.3	4.7	6.3	8.6	5.7	7.1	5.2	4.3	3.9	5.6
23	3.0	4.2	3.7	4.9	3.0	3.1	2.3	3.8	3.2	2.2	3.1	3.5	3.4	3.2	3.9	6.0	7.4	7.5	***	6.1	3.5	6.5	4.8	2.7	4.1
24	3.7	4.3	4.9	7.9	8.9	9.1	9.5	7.1	7.2	5.1	6.1	3.8	6.3	4.5	5.5	3.6	5.2	4.3	5.3	5.3	3.8	4.8	6.0	8.6	5.9
25	7.5	8.2	6.5	7.6	5.0	5.0	4.7	5.5	4.6	6.0	4.5	4.1	4.1	6.6	4.8	5.4	9.5	7.7	2.9	***	8.1	***	***	8.8	6.1
26	***	9.2	10.4	8.6	8.1	7.7	8.4	7.4	6.3	4.1	3.9	4.1	5.3	6.0	4.2	3.4	4.5	4.6	11.4	7.9	6.3	4.4	4.3	4.4	6.3
27	3.4	3.4	3.0	3.8	1.3	3.1	3.0	2.6	3.8	3.3	3.6	5.4	4.6	5.9	6.2	5.9	7.8	***	3.8	3.9	4.5	5.2	4.2	2.6	4.1
28	***	3.4	1.9	3.0	3.0	3.6	2.7	3.0	2.0	2.4	2.8	3.3	5.2	5.0	6.4	4.2	3.4	4.5	5.6	4.3	***	2.4	1.9	2.0	3.5
29	3.8	6.0	4.1	2.9	4.3	3.6	3.7	3.1	6.7	5.2	3.3	4.2	4.2	5.4	5.9	4.2	4.7	6.8	6.8	3.0	5.9	5.2	4.1	4.8	4.7
30	4.9	3.2	2.9	5.8	7.3	5.2	6.0	5.5	4.5	3.6	3.7	4.7	4.5	4.7	6.1	4.3	6.9	8.4	***	7.2	7.1	6.4	7.2	4.4	5.4
31	4.5	7.0	4.2	***	4.8	5.5	6.5	6.4	6.0	3.4	4.4	4.2	5.8	3.5	4.0	4.3	5.2	6.9	5.1	2.1	***	***	6.4	***	5.0
HRAVE	4.5	4.7	4.4	4.6	4.5	4.4	4.3	4.3	4.2	3.8	3.9	4.4	4.9	5.5	5.6	5.4	5.9	6.0	5.9	5.3	5.1	4.6	4.7	4.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.1	5.4	4.4	4.3	4.5	4.1	4.2	3.9	4.6	5.2	4.7	5.4	4.2	4.3	4.1	4.7	5.8	5.3	5.1	5.0	4.4	5.6	4.1	5.9	6.1
MAX	8.4	8.2	7.6	8.2	9.2	7.3	6.2	7.5	8.9	9.2	8.3	10.7	7.3	8.0	7.2	8.5	9.6	7.9	7.6	9.2	8.8	8.8	7.5	9.5	9.5
MIN	2.1	2.1	2.0	0.9	1.2	2.1	2.2	1.5	2.9	3.7	2.9	3.1	2.3	2.7	2.0	1.5	3.8	4.1	3.1	2.1	2.2	3.1	2.2	3.6	2.9

DAY	26	27	28	29	30	31
AVE	6.3	4.1	3.5	4.7	5.4	5.0
MAX	11.4	7.8	6.4	6.8	8.4	7.0
MIN	3.4	1.3	1.9	2.9	2.9	2.1

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 11.4 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 90.9% OPERATIONAL RECOVERY RATE = 90.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	96	87	82	81	102	147	142	105	105	164	189	173	181	115	158	167	118	67	86	335	173	162	147	155	51
2	125	66	61	61	60	58	68	91	100	136	136	162	321	296	281	268	282	282	292	***	316	338	103	76	82
3	72	85	94	101	127	120	92	94	108	221	274	334	344	270	290	321	290	272	276	286	287	***	283	282	207
4	299	87	100	134	134	114	105	110	125	144	273	268	272	270	277	271	271	285	287	285	288	289	284	292	234
5	9	86	92	104	110	96	97	108	86	293	282	271	292	277	280	272	282	285	285	287	287	272	279	331	0
6	113	214	291	309	299	312	302	273	301	279	276	262	266	276	288	314	62	88	294	267	268	253	250	163	143
7	153	220	251	173	162	171	174	164	158	183	269	278	275	***	***	57	83	103	107	138	121	179	344	105	202
8	158	131	123	112	134	93	72	71	89	111	147	120	136	265	272	268	265	267	234	224	276	244	183	81	261
9	104	128	155	155	145	131	107	112	156	206	281	274	266	263	265	269	278	278	221	175	167	166	167	124	83
10	***	23	72	79	68	72	73	75	67	70	60	23	51	83	135	162	77	73	231	272	187	171	108	350	34
11	29	122	155	149	140	105	89	79	112	150	101	44	81	180	272	269	269	275	129	159	***	103	52	45	70
12	53	62	69	69	67	95	93	64	66	73	72	112	84	341	272	270	156	148	106	256	273	202	108	82	173
13	98	110	118	149	146	141	154	140	110	131	121	129	136	176	178	177	180	176	173	177	175	137	99	108	18
14	116	128	87	87	92	81	108	146	126	110	170	173	171	182	156	66	100	190	295	299	285	277	3	77	248
15	103	104	101	48	39	89	105	128	124	151	167	264	266	267	276	286	272	280	279	285	287	308	36	94	350
16	97	77	58	159	176	279	282	291	298	280	271	268	267	258	270	279	276	283	***	283	286	293	292	260	300
17	290	290	240	180	243	277	262	272	***	275	267	277	276	310	278	277	274	285	***	277	282	275	277	271	220
18	271	266	278	326	294	295	311	288	301	273	275	278	275	282	278	278	284	***	285	291	286	279	274	270	263
19	298	294	281	293	314	290	312	315	304	277	272	273	282	280	279	276	272	276	279	289	287	213	264	98	108
20	103	149	323	286	257	262	302	331	342	276	268	273	280	283	287	276	273	278	251	164	143	163	161	156	76
21	156	160	159	155	151	118	108	60	336	293	267	272	276	286	282	260	258	269	276	281	274	263	291	293	54
22	308	287	***	274	284	284	286	279	299	301	276	269	277	286	281	279	171	168	157	155	104	149	144	112	85
23	163	147	106	141	128	148	132	123	154	186	280	271	271	216	265	274	273	274	93	114	88	57	11	243	11
24	97	83	70	72	81	73	71	70	71	79	82	80	89	43	16	63	7	358	22	74	136	152	116	92	297
25	138	153	127	84	91	98	87	86	92	93	101	156	157	185	168	169	236	295	43	62	61	54	65	64	91
26	61	69	68	67	62	67	69	68	68	75	83	83	90	91	142	276	269	269	155	142	73	79	113	123	94
27	111	86	107	105	76	81	106	136	131	154	174	94	129	173	351	356	5	***	107	141	157	99	97	85	86
28	41	3	61	111	142	119	105	81	93	137	174	198	192	161	179	195	184	175	179	188	285	289	34	150	63
29	149	149	145	143	135	96	112	143	80	91	162	173	179	220	166	182	269	96	54	28	276	155	158	96	60
30	85	86	78	74	80	83	74	85	87	86	105	168	190	134	242	177	168	157	163	155	151	153	219	265	79
31	196	168	152	130	137	135	80	66	76	85	93	87	108	274	270	307	252	191	143	70	***	79	91	***	77

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.1% OPERATIONAL RECOVERY RATE = 98.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	96	82	77	65	93	107	83	83	95	95	107	167	166	138	163	160	155	143	85	259	182	167	157	156	215
2	122	79	63	58	65	60	66	98	111	132	170	126	343	299	274	270	289	286	275	***	337	318	358	65	34
3	65	77	87	101	109	112	93	108	154	246	275	293	334	291	325	333	285	268	279	283	287	***	281	284	265
4	293	21	79	116	144	137	111	115	118	99	282	266	264	274	285	270	266	288	277	279	290	289	284	276	145
5	26	88	140	111	127	120	149	140	115	336	299	287	317	267	305	268	286	264	280	287	289	289	297	322	333
6	119	231	279	323	298	327	312	278	315	324	283	262	271	279	238	336	67	78	230	276	274	225	246	175	50
7	158	249	238	156	156	176	189	170	142	157	239	273	284	***	19	63	80	81	96	113	70	200	346	121	181
8	155	143	113	92	142	112	83	68	79	97	114	83	125	242	271	242	336	319	254	220	263	279	24	345	79
9	182	169	161	156	144	146	116	117	151	205	290	276	271	275	270	274	285	279	222	168	127	166	159	115	259
10	***	58	49	76	71	84	84	86	73	64	74	44	58	92	131	125	71	58	199	267	195	159	156	358	227
11	348	339	158	156	150	111	105	98	124	160	101	72	78	158	280	265	270	301	143	154	***	117	69	52	80
12	46	56	78	74	59	95	100	72	69	72	66	84	63	24	266	283	3	147	164	250	282	277	209	73	273
13	78	107	111	121	118	97	94	98	92	81	80	84	132	171	174	174	173	169	194	169	174	143	90	111	82
14	129	122	94	85	98	85	121	155	126	111	142	115	173	174	159	48	77	180	305	304	287	263	82	70	14
15	104	80	110	40	44	79	86	116	115	108	257	273	288	287	273	276	275	282	280	289	292	284	20	106	46
16	106	90	12	180	224	276	272	277	304	292	270	279	281	267	277	275	277	293	***	286	279	291	288	279	6
17	279	281	264	183	223	271	276	281	***	252	260	273	272	273	260	273	287	281	***	273	270	271	283	260	303
18	213	233	272	302	276	294	311	308	350	312	315	277	266	270	270	277	278	***	287	285	294	279	269	245	180
19	251	299	286	311	314	280	275	312	326	277	285	279	285	286	270	267	284	278	268	282	288	98	298	94	34
20	103	214	323	318	313	294	300	312	339	277	261	273	276	285	276	278	276	280	253	167	163	166	163	168	83
21	169	173	309	151	163	311	301	331	305	279	274	276	280	274	270	264	259	271	285	277	249	269	277	266	154
22	284	286	***	259	260	284	286	280	308	323	284	287	281	288	293	271	177	169	163	165	103	101	209	110	285
23	156	170	170	129	94	151	141	150	141	154	281	305	264	254	263	271	276	286	114	118	101	61	9	214	149
24	88	105	83	85	90	85	90	80	79	86	83	69	77	38	8	49	4	0	23	82	128	159	112	108	282
25	151	153	129	84	85	74	87	78	72	77	78	93	108	161	109	136	230	296	207	59	64	58	63	72	321
26	71	77	80	81	74	72	84	83	77	75	84	92	108	117	159	279	306	287	151	149	84	87	90	112	343
27	108	96	95	93	86	86	99	108	90	130	142	101	133	159	16	1	44	***	103	93	155	119	114	75	198
28	66	43	64	94	141	143	125	93	90	130	93	263	160	116	147	162	165	165	202	175	266	291	297	181	14
29	141	153	113	118	132	78	85	84	79	80	102	119	166	221	136	188	277	87	42	24	270	252	101	92	135
30	75	94	75	75	91	98	80	90	86	96	112	148	172	100	251	176	170	147	162	156	148	157	219	267	119
31	211	23	159	160	155	112	85	69	78	92	122	77	101	296	278	281	248	185	228	186	***	85	92	***	360

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
AUGUST - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	85	78	56	91	113	84	89	97	111	116	149	162	127	165	155	158	151	79	253	155	172	164	155	358
2	146	82	***	61	88	70	64	105	105	155	114	116	319	320	278	277	294	296	268	***	***	***	80	71	155
3	83	92	93	101	111	111	91	107	153	239	271	330	352	290	319	351	296	280	282	***	291	***	***	281	189
4	279	29	78	127	124	132	110	108	120	190	274	265	242	268	286	278	265	279	276	***	***	***	***	***	299
5	17	81	120	110	122	78	123	125	105	347	300	281	314	275	312	275	287	259	285	***	***	***	338	59	50
6	120	233	278	***	***	324	310	277	312	305	281	268	258	273	223	311	54	80	226	275	***	214	282	176	79
7	150	253	227	156	156	179	216	170	69	165	260	319	293	***	***	75	94	82	93	116	77	58	14	119	205
8	160	149	118	89	147	110	85	78	85	98	112	71	97	251	287	255	281	333	265	251	259	262	48	267	33
9	154	164	165	159	153	145	128	116	146	208	286	254	272	277	279	282	283	280	209	177	134	169	157	120	267
10	***	60	45	93	86	80	90	88	80	62	65	66	69	96	126	90	79	59	191	259	176	150	104	286	325
11	16	216	138	160	154	106	96	95	131	155	100	70	67	184	273	279	273	312	120	157	***	***	44	22	304
12	29	***	79	85	71	92	90	69	69	76	64	83	85	30	264	286	339	143	154	255	281	320	213	84	89
13	80	104	113	123	118	103	81	86	97	78	77	85	127	167	171	172	176	172	176	171	180	149	97	118	15
14	120	121	94	88	98	81	124	154	140	110	147	127	174	171	171	***	82	157	***	300	288	267	82	73	154
15	124	87	116	28	43	105	98	119	129	94	344	277	272	325	274	271	269	281	283	289	294	293	26	99	91
16	96	105	43	194	220	267	275	272	334	315	273	278	280	270	265	269	278	291	***	287	***	288	284	280	236
17	273	279	247	172	231	***	283	***	***	266	245	270	279	271	257	264	286	284	***	***	275	269	292	***	312
18	192	231	277	***	288	292	***	***	349	309	322	275	269	270	265	***	***	***	***	***	297	288	272	244	159
19	298	302	282	***	322	271	271	311	314	269	351	284	287	281	264	267	280	271	265	***	***	***	305	95	202
20	89	93	318	347	302	286	306	321	338	260	223	277	282	285	274	270	281	280	***	158	160	166	162	167	0
21	161	168	211	254	168	306	319	320	289	283	268	274	281	282	285	266	263	264	***	***	***	270	288	275	102
22	282	***	***	255	***	277	284	***	295	318	285	277	290	285	288	272	182	161	167	169	93	129	107	122	130
23	129	167	143	129	170	165	138	151	143	96	313	267	268	269	272	262	275	280	***	110	95	67	9	258	56
24	91	107	98	82	88	83	92	79	70	96	86	45	64	48	24	78	355	352	14	84	136	161	109	90	321
25	154	156	136	110	88	77	82	78	75	75	81	98	92	154	107	142	241	292	182	***	67	***	***	67	55
26	***	76	78	78	75	78	89	85	77	75	94	72	105	107	136	272	304	315	153	149	89	84	110	78	303
27	101	95	97	98	73	78	101	106	85	118	104	104	123	179	24	8	31	***	100	106	159	121	117	77	359
28	***	31	74	103	140	127	120	89	81	128	89	188	144	123	152	131	129	169	203	187	***	293	321	319	127
29	146	147	134	127	138	83	89	89	91	85	94	123	158	226	132	199	275	107	45	42	268	217	115	101	227
30	69	89	89	73	91	92	84	87	86	95	127	126	132	64	251	172	196	170	***	154	147	158	226	269	227
31	236	34	152	***	150	122	91	72	78	83	96	78	108	357	263	281	247	183	246	205	***	***	93	***	302

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 90.9% OPERATIONAL RECOVERY RATE = 90.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.96	0.96	0.57	0.36	0.49	0.36	0.22	0.17	0.45	0.68	1.14	1.31	1.28	1.07	0.79	0.75	0.75	0.38	0.46	0.52	0.34	0.28	0.38	0.51	0.63
2	0.60	0.65	0.67	0.42	0.47	0.47	0.45	0.45	0.75	1.05	0.95	1.02	1.09	1.08	0.94	1.05	1.05	0.93	0.95	***	***	0.38	0.39	0.56	0.74
3	0.49	0.31	0.07	0.17	0.33	0.10	0.27	0.22	0.40	0.81	0.99	1.13	1.14	1.25	1.17	1.14	0.95	0.85	0.57	0.67	0.40	***	***	0.30	0.62
4	0.20	0.16	0.12	0.33	0.30	0.26	0.13	0.22	0.31	0.61	0.77	0.95	0.95	0.94	1.06	1.08	0.90	0.89	0.87	0.32	0.18	***	0.55	***	0.55
5	0.24	0.10	0.11	0.07	0.07	0.01	0.01	0.04	0.21	0.61	0.79	0.89	1.17	1.04	1.17	0.88	0.81	0.69	0.44	0.42	0.25	0.13	0.52	0.26	0.46
6	0.22	0.33	0.47	0.47	0.21	0.14	0.21	0.31	0.50	0.72	0.75	0.64	0.85	0.64	0.92	0.89	1.02	1.13	0.78	0.54	0.47	0.28	0.52	0.62	0.57
7	0.54	0.70	0.65	0.54	0.30	0.36	0.21	0.25	0.60	1.14	0.92	1.01	0.97	***	***	0.64	0.47	0.36	0.27	0.11	0.15	0.42	0.59	0.65	0.54
8	0.51	0.57	***	0.51	0.44	0.42	0.41	0.33	0.26	0.64	0.93	0.90	1.16	0.69	0.81	0.93	1.20	0.95	0.72	0.75	0.39	0.46	0.53	0.62	0.66
9	0.63	0.47	0.51	0.37	0.24	0.08	0.25	0.22	0.34	0.87	0.90	0.84	0.97	1.14	0.95	1.10	0.92	0.83	0.88	0.98	1.02	0.76	0.47	0.63	0.68
10	***	0.72	0.89	0.77	0.58	0.51	0.45	0.43	0.47	0.62	1.07	0.98	1.25	1.14	0.87	1.13	0.98	0.79	0.82	0.61	0.37	0.53	0.53	0.74	0.75
11	0.67	0.61	0.40	0.33	0.15	0.34	0.30	0.46	0.59	0.63	0.66	0.43	0.51	1.05	0.90	0.65	0.80	0.98	0.83	0.54	***	***	0.68	0.97	0.61
12	0.93	0.70	0.95	0.82	0.93	0.44	0.36	0.42	0.68	0.63	0.66	0.25	0.38	0.81	0.57	0.86	1.04	0.71	0.42	0.38	0.31	0.45	0.56	0.36	0.61
13	0.27	0.22	0.27	0.29	0.12	0.13	0.22	0.37	0.33	0.34	0.53	0.49	0.97	1.15	1.09	1.17	1.05	0.89	0.66	0.47	0.19	0.22	0.27	0.37	0.50
14	0.41	0.46	0.39	0.40	0.30	0.15	0.12	0.22	0.45	0.44	0.63	1.02	1.24	1.25	1.27	0.63	0.67	0.55	0.41	0.27	0.34	0.55	0.59	0.70	0.56
15	0.49	0.33	0.18	0.21	0.21	0.05	0.04	0.26	0.39	0.56	1.01	0.99	1.21	1.21	1.13	1.10	0.79	0.95	0.67	0.34	0.45	***	0.58	0.49	0.59
16	0.48	0.37	0.27	0.24	0.37	0.47	0.59	0.52	0.72	0.97	1.01	0.95	1.20	1.12	1.15	0.98	1.03	0.70	***	0.56	0.43	0.43	0.38	0.51	0.67
17	0.47	0.31	0.39	0.53	0.52	0.92	0.51	0.57	***	0.78	0.89	1.08	1.19	1.17	1.05	1.07	0.99	0.99	***	0.47	0.36	0.35	0.53	0.71	0.72
18	0.77	0.74	0.39	0.46	***	***	0.29	0.17	0.67	0.74	1.04	0.98	1.04	0.95	0.80	0.97	0.79	***	0.70	0.43	0.36	0.33	0.31	0.70	0.65
19	0.51	0.39	0.26	0.48	0.46	0.19	0.24	0.35	0.48	0.88	1.11	1.17	1.25	1.19	1.09	1.22	0.76	0.81	0.44	0.50	0.35	0.56	0.55	0.42	0.65
20	0.30	0.39	0.44	0.34	0.15	0.11	0.30	0.30	0.55	0.81	1.25	1.10	1.19	1.09	0.99	0.86	1.15	0.97	0.82	0.61	0.58	0.51	0.39	0.46	0.65
21	0.56	0.36	0.28	0.42	0.30	0.20	0.15	0.20	0.37	0.84	1.18	1.09	1.23	1.03	1.13	1.15	1.12	0.75	0.80	0.51	0.36	0.25	0.50	0.62	0.64
22	0.72	0.70	***	0.77	0.51	0.44	0.41	0.38	0.75	0.92	1.02	1.14	1.09	1.27	1.23	1.23	0.64	0.47	0.56	0.47	0.62	0.53	0.26	0.49	0.72
23	0.33	0.45	0.46	0.64	0.45	0.16	0.17	0.24	0.37	0.57	0.66	0.92	0.79	1.10	1.16	0.92	1.03	1.01	***	0.78	0.62	0.87	0.59	0.32	0.64
24	0.41	0.53	0.46	0.54	0.54	0.51	0.56	0.71	0.94	0.71	0.81	0.96	1.22	1.10	1.14	1.08	1.04	0.94	0.77	0.67	0.53	0.60	0.65	0.61	0.75
25	0.59	0.70	0.67	0.83	0.66	0.55	0.54	0.61	0.34	0.22	0.36	0.60	0.86	1.15	1.17	0.82	0.97	0.49	0.47	0.60	0.77	0.65	0.77	0.65	0.67
26	0.69	0.51	0.62	0.65	0.46	0.50	0.47	0.55	0.54	0.68	0.67	0.91	0.86	1.14	1.13	1.01	0.99	0.72	0.75	0.74	0.67	0.48	0.26	0.32	0.68
27	0.12	0.13	0.26	0.33	0.21	0.13	0.08	0.25	0.49	0.75	0.89	1.07	1.05	1.12	1.00	1.07	1.19	***	0.50	0.33	0.45	0.29	0.23	0.31	0.53
28	0.34	0.29	0.05	0.24	0.36	0.32	0.05	0.19	0.19	0.60	0.72	0.92	0.94	1.05	1.06	1.12	1.07	0.72	0.41	0.53	0.35	0.38	0.31	0.21	0.52
29	0.28	0.37	0.35	0.19	0.19	0.20	0.15	0.13	0.38	0.45	0.62	0.72	1.11	1.22	0.98	0.85	0.64	0.82	0.77	0.60	0.90	0.61	0.49	0.52	0.56
30	0.53	0.38	0.52	0.50	0.45	0.46	0.56	0.33	0.48	0.74	0.94	0.85	1.01	1.20	1.03	0.92	0.71	0.36	0.44	0.46	0.40	0.19	0.36	0.38	0.59
31	0.08	0.11	0.27	0.30	0.34	0.29	0.52	0.71	0.59	0.51	0.62	0.81	0.84	0.98	0.95	1.00	0.61	0.66	0.96	0.76	***	0.70	0.41	***	0.59
HRAVE	0.48	0.45	0.41	0.44	0.37	0.31	0.30	0.34	0.49	0.69	0.85	0.91	1.03	1.08	1.02	0.98	0.91	0.77	0.65	0.53	0.45	0.45	0.47	0.52	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.63	0.74	0.62	0.55	0.46	0.57	0.54	0.66	0.68	0.75	0.61	0.61	0.50	0.56	0.59	0.67	0.72	0.65	0.65	0.65	0.64	0.72	0.64	0.75	0.67
MAX	1.31	1.09	1.25	1.08	1.17	1.13	1.14	1.20	1.14	1.25	1.05	1.04	1.17	1.27	1.21	1.20	1.19	1.04	1.25	1.25	1.23	1.27	1.16	1.22	1.17
MIN	0.17	0.38	0.07	0.12	0.01	0.14	0.11	0.26	0.08	0.37	0.15	0.25	0.12	0.12	0.04	0.24	0.31	0.17	0.19	0.11	0.15	0.26	0.16	0.41	0.22

DAY	26	27	28	29	30	31
AVE	0.68	0.53	0.52	0.56	0.59	0.59
MAX	1.14	1.19	1.12	1.22	1.20	1.00
MIN	0.26	0.08	0.05	0.13	0.19	0.08

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 96.8% OPERATIONAL RECOVERY RATE = 96.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	1.00	0.96	0.63	0.33	0.39	0.28	0.20	0.32	0.38	0.46	1.13	1.41	1.32	1.20	0.87	0.72	0.65	0.72	0.48	0.50	0.43	0.35	0.38	0.58	0.65
2	0.43	0.52	0.57	0.54	0.36	0.28	0.35	0.19	0.54	0.89	1.06	1.21	1.24	1.31	0.80	0.90	0.99	0.99	0.85	***	***	0.21	0.52	0.54	0.69
3	0.39	0.23	0.14	0.23	0.35	0.10	0.27	0.05	0.18	0.39	0.86	1.04	0.84	1.29	1.18	1.02	0.99	0.83	0.86	***	***	***	***	0.26	0.57
4	0.61	0.13	0.12	0.20	0.23	0.34	0.12	0.11	0.16	0.50	0.66	0.92	0.97	1.09	1.10	1.10	0.86	0.86	1.07	***	***	***	***	***	0.59
5	0.38	0.12	0.10	0.16	0.04	0.04	0.07	0.16	0.20	0.47	0.73	0.86	1.12	0.95	1.23	0.93	0.73	0.92	***	***	***	***	0.30	0.19	0.48
6	0.29	0.34	0.52	0.54	0.37	0.26	0.28	0.42	0.58	0.78	0.91	0.66	0.78	0.55	1.05	0.87	0.91	1.10	0.72	0.63	***	0.26	0.44	0.75	0.61
7	0.74	1.09	0.64	0.44	0.39	0.41	0.28	0.36	0.36	0.94	0.93	0.96	0.94	***	***	0.55	0.51	0.32	0.24	0.22	0.19	0.54	0.54	0.66	0.56
8	0.59	0.57	***	0.54	0.44	0.16	0.41	0.25	0.18	0.37	0.69	0.61	1.04	0.61	0.77	1.20	1.27	0.96	0.77	0.98	0.63	0.56	0.67	0.55	0.64
9	0.50	0.51	0.62	0.40	0.15	0.16	0.09	0.03	0.26	0.45	0.90	0.80	0.99	1.25	0.88	1.07	0.81	0.64	0.93	1.01	1.02	0.71	0.44	0.58	0.63
10	***	***	1.17	0.62	0.52	0.55	0.41	0.40	0.46	0.61	0.83	0.86	1.27	1.11	0.81	1.07	1.06	0.82	0.78	0.70	0.54	0.78	0.64	0.84	0.77
11	0.69	0.62	0.33	0.27	0.12	0.27	0.36	0.26	0.38	0.12	0.42	0.34	0.44	0.82	0.88	0.49	0.90	0.88	0.79	0.49	***	***	0.62	0.87	0.52
12	***	0.64	0.79	0.74	0.86	0.42	0.19	0.38	0.60	0.50	0.54	0.29	0.29	0.90	0.79	0.85	0.98	0.53	0.46	0.52	0.47	0.51	0.67	0.46	0.58
13	0.42	0.18	0.06	0.20	0.01	0.06	0.23	0.34	0.22	0.16	0.28	0.43	0.87	1.16	1.23	0.85	1.07	0.83	0.65	0.53	0.08	0.03	0.29	0.27	0.44
14	0.26	0.36	0.34	0.38	0.16	0.20	0.11	0.13	0.40	0.37	0.67	0.81	0.96	0.99	1.01	0.59	0.67	0.54	0.36	0.26	0.33	0.76	0.77	0.75	0.51
15	0.58	0.32	0.32	0.22	0.28	0.16	0.08	0.14	0.21	0.35	0.68	0.58	1.03	1.39	1.33	1.08	0.59	0.96	0.71	0.40	0.29	***	0.64	0.50	0.56
16	0.48	0.45	0.36	0.37	0.46	0.59	0.56	0.41	0.70	1.07	0.95	0.94	1.40	1.14	1.19	0.83	1.11	***	***	***	0.47	0.44	0.24	0.50	0.70
17	0.52	0.39	0.55	0.60	0.59	1.04	0.49	***	***	0.82	0.79	1.30	0.99	1.21	1.21	1.20	0.93	***	***	0.30	0.37	0.39	0.52	0.85	0.75
18	0.75	0.83	0.42	0.55	***	***	***	***	***	0.75	0.82	1.23	1.01	1.05	0.86	0.97	1.02	0.77	***	***	***	0.39	0.37	0.34	0.73	0.76
19	0.62	0.56	0.28	***	0.65	0.14	0.13	0.37	0.45	0.90	1.03	1.03	1.31	1.12	1.06	1.21	0.76	0.77	***	***	0.25	***	0.59	0.65	0.69
20	0.53	0.60	0.68	0.62	0.33	0.19	0.13	0.37	0.82	0.92	1.10	1.00	1.26	1.12	0.86	***	1.00	0.98	***	0.62	0.60	0.34	0.42	0.33	0.67
21	0.46	0.31	0.29	0.36	0.44	0.30	0.08	0.19	0.33	0.78	1.06	0.92	1.27	0.96	1.03	0.84	1.20	0.69	0.92	***	0.30	0.29	0.47	0.73	0.62
22	0.86	0.83	***	***	***	0.54	0.36	0.42	0.77	1.03	0.72	1.09	1.26	1.16	1.12	1.08	0.81	0.57	0.59	0.34	0.40	0.48	0.48	0.44	0.73
23	0.55	0.56	0.43	0.45	0.57	0.15	0.03	0.34	0.05	0.19	0.56	0.88	0.72	1.09	1.25	1.03	1.08	1.07	***	0.74	0.73	0.81	0.57	0.36	0.62
24	0.43	0.51	0.27	0.60	0.48	0.66	0.47	0.75	0.87	0.74	0.92	1.08	1.35	1.13	1.25	1.18	1.14	1.11	0.76	0.68	0.61	0.75	0.62	0.72	0.80
25	***	0.76	0.63	0.60	0.57	0.48	0.68	0.55	0.24	0.27	0.32	0.32	0.51	1.00	1.04	0.65	0.65	0.42	0.45	***	0.50	0.64	0.77	0.61	0.58
26	0.67	0.45	0.58	0.44	0.44	0.44	0.49	0.54	0.37	0.56	0.86	0.92	0.99	1.10	1.10	1.00	1.00	0.65	0.76	0.58	0.66	0.43	0.33	0.40	0.66
27	0.28	0.23	0.20	0.10	0.18	0.06	0.01	0.06	0.30	0.44	0.85	0.98	1.02	1.16	***	1.19	***	***	0.44	0.27	0.49	0.27	0.18	0.31	0.43
28	0.40	0.35	0.23	0.29	0.32	0.22	0.01	0.10	0.04	0.29	0.37	0.57	0.99	1.28	1.07	1.30	1.04	0.88	0.59	0.44	0.38	0.49	0.38	0.21	0.51
29	0.18	0.38	0.26	0.06	0.26	0.20	0.06	0.23	0.26	0.35	0.34	0.51	0.90	1.06	1.06	1.00	0.50	0.75	0.82	0.80	0.91	0.60	0.51	0.32	0.51
30	0.33	0.19	0.46	0.55	0.40	0.30	0.39	0.34	0.45	0.76	0.88	0.75	1.27	1.25	1.13	1.18	0.84	0.40	0.33	0.40	0.25	0.31	0.43	0.49	0.59
31	0.50	0.24	0.19	0.18	0.19	0.18	0.38	0.56	0.41	0.39	0.56	0.69	0.85	0.95	1.04	0.95	0.61	0.60	1.02	0.81	***	0.46	0.95	***	0.58
HRAVE	0.52	0.47	0.42	0.40	0.36	0.31	0.26	0.30	0.40	0.57	0.77	0.83	1.01	1.07	1.05	0.97	0.88	0.77	0.68	0.56	0.47	0.47	0.51	0.53	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.65	0.69	0.57	0.59	0.48	0.61	0.56	0.64	0.63	0.77	0.52	0.58	0.44	0.51	0.56	0.70	0.75	0.76	0.69	0.67	0.62	0.73	0.62	0.80	0.58
MAX	1.41	1.31	1.29	1.10	1.23	1.10	1.09	1.27	1.25	1.27	0.90	0.98	1.23	1.01	1.39	1.40	1.30	1.23	1.31	1.26	1.27	1.26	1.25	1.35	1.04
MIN	0.20	0.19	0.05	0.11	0.04	0.26	0.19	0.16	0.03	0.40	0.12	0.19	0.01	0.11	0.08	0.24	0.30	0.34	0.13	0.13	0.08	0.34	0.03	0.27	0.24

DAY	26	27	28	29	30	31
AVE	0.66	0.43	0.51	0.51	0.59	0.58
MAX	1.10	1.19	1.30	1.06	1.27	1.04
MIN	0.33	0.01	0.01	0.06	0.19	0.18

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 92.3% OPERATIONAL RECOVERY RATE = 92.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
AUGUST - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	0.86	0.61	0.34	0.36	0.45	0.46	0.38	0.39	0.42	1.15	1.40	1.44	1.13	1.17	***	***	0.69	0.52	0.52	0.39	0.37	0.41	0.56	0.67
2	0.40	***	***	0.64	0.39	0.30	0.33	0.18	0.58	0.90	1.04	***	1.31	1.28	0.85	0.77	***	***	***	***	***	***	***	***	0.69
3	0.35	0.24	0.14	0.22	0.38	0.11	0.28	0.06	0.22	0.38	0.93	1.00	0.80	1.28	1.22	***	***	***	***	***	***	***	***	0.29	0.49
4	0.66	0.15	0.11	0.20	0.23	0.36	0.32	0.10	0.14	0.49	0.68	0.95	0.96	1.04	1.02	***	***	***	***	***	***	***	***	***	0.49
5	0.47	0.16	0.12	0.18	0.03	0.05	0.05	0.16	0.19	0.46	0.84	0.84	***	0.95	1.07	***	***	***	***	***	***	***	***	0.19	0.38
6	0.32	0.34	***	***	***	0.50	0.41	0.35	0.68	0.83	0.95	***	***	0.44	1.04	0.93	***	***	0.71	***	***	0.21	0.49	0.75	0.60
7	0.89	1.14	0.68	0.40	0.39	0.43	0.27	0.33	0.35	0.93	0.92	0.98	0.95	***	***	0.46	0.52	0.32	0.27	0.21	0.22	0.52	0.53	***	0.56
8	0.62	***	***	0.58	0.48	0.14	0.45	0.21	0.20	0.41	0.59	0.65	1.03	0.66	0.66	1.18	1.25	0.90	0.76	***	0.72	0.64	0.71	0.56	0.64
9	0.51	0.50	0.67	0.51	0.04	0.07	0.07	0.04	0.27	0.47	0.84	0.77	1.02	1.30	0.85	1.09	0.77	***	0.84	1.04	1.04	***	0.40	0.52	0.62
10	***	***	1.52	***	***	***	0.40	***	***	0.54	0.85	0.87	1.54	1.24	0.82	1.22	1.05	1.00	0.76	0.67	0.51	0.76	0.69	0.79	0.90
11	0.80	0.60	0.28	0.27	***	***	0.34	0.28	0.39	0.36	0.41	0.29	0.50	0.71	0.91	0.50	0.91	0.93	0.80	***	***	***	0.64	0.95	0.57
12	***	***	***	***	***	0.54	0.19	0.41	0.55	***	0.44	0.34	0.29	***	0.81	0.87	***	0.47	0.47	0.55	0.49	0.48	0.65	0.47	0.50
13	0.40	0.18	0.03	0.21	0.06	0.08	0.36	0.39	0.26	0.24	0.41	0.42	0.91	1.28	1.25	0.89	***	***	***	***	***	0.01	0.27	0.26	0.42
14	0.23	0.33	0.33	0.36	0.14	0.19	0.04	0.13	0.37	0.38	0.69	0.91	0.95	0.78	0.94	***	***	***	***	***	***	0.79	0.76	0.73	0.50
15	0.62	0.33	0.34	0.24	0.28	0.15	0.09	0.19	0.20	0.37	0.73	0.51	0.93	1.35	1.41	1.14	0.48	***	***	***	***	***	***	0.49	0.55
16	0.51	0.48	***	0.36	0.45	0.55	0.58	0.42	***	1.09	0.90	0.84	1.44	1.17	1.22	***	***	***	***	***	***	***	***	0.52	0.75
17	***	***	0.56	0.60	0.62	***	***	***	***	0.83	0.81	1.37	0.99	1.20	***	***	***	***	***	***	***	0.34	***	***	0.81
18	0.70	0.66	***	***	***	***	***	***	***	0.87	1.20	***	***	***	***	***	***	***	***	***	***	***	0.36	0.70	0.75
19	***	0.56	0.29	***	***	0.06	0.06	0.37	0.45	1.02	1.08	0.95	***	***	1.13	1.15	***	***	***	***	***	***	0.62	0.58	0.64
20	0.47	0.56	0.66	0.60	0.31	0.17	0.12	0.38	0.93	0.86	1.25	1.03	1.07	1.02	***	***	1.01	***	***	0.58	0.63	0.35	0.35	0.38	0.64
21	0.50	0.55	0.36	0.43	0.47	0.30	0.08	0.20	0.34	0.83	1.08	1.01	1.36	0.90	***	0.68	1.31	***	***	***	***	0.28	0.46	0.82	0.63
22	0.78	***	***	***	***	***	***	***	***	1.05	0.79	1.06	1.27	1.14	1.20	1.06	0.89	0.55	0.55	0.36	0.42	0.47	0.50	0.53	0.79
23	0.56	0.52	0.45	0.34	0.57	0.12	0.03	0.33	0.04	0.15	0.58	0.92	0.73	1.18	1.39	1.05	***	1.09	***	0.74	0.76	***	0.61	0.34	0.60
24	0.48	0.50	0.24	0.67	***	***	0.50	0.75	***	0.73	0.95	1.00	1.24	1.23	1.27	1.09	1.15	1.12	***	***	0.56	0.93	***	***	0.85
25	***	***	0.67	***	0.45	0.50	0.66	0.54	0.29	0.28	0.27	0.46	0.52	1.04	1.01	0.54	0.59	0.58	0.48	***	0.43	***	***	***	0.55
26	***	***	***	0.42	0.51	***	0.48	0.58	0.34	0.58	0.92	0.90	1.04	***	1.11	1.04	0.97	***	0.70	0.56	0.68	0.41	0.36	0.46	0.67
27	0.25	0.33	0.40	0.29	0.25	0.09	0.04	0.05	0.33	0.44	0.86	0.87	1.15	1.37	***	1.12	***	***	0.40	0.25	0.66	***	0.18	***	0.49
28	***	0.36	0.32	0.34	***	0.05	0.01	0.08	0.04	0.30	0.36	0.48	0.98	1.33	1.10	1.32	***	0.93	***	0.47	***	0.46	0.40	0.20	0.50
29	0.16	0.36	0.24	0.05	0.30	0.25	0.31	0.29	0.36	0.33	0.35	0.40	0.89	1.08	1.09	0.94	0.46	***	0.78	0.88	0.87	0.68	***	0.33	0.52
30	0.34	0.21	0.50	0.58	0.40	0.33	0.43	0.32	0.35	0.84	0.87	0.74	1.31	1.00	1.16	1.17	0.95	0.45	***	***	0.19	0.31	0.45	0.37	0.60
31	0.54	***	***	***	0.18	0.16	0.38	0.59	0.42	0.36	0.59	0.65	***	1.00	0.91	0.91	0.60	0.60	1.15	0.81	***	***	0.88	***	0.63
HRAVE	0.50	0.45	0.43	0.38	0.33	0.25	0.28	0.30	0.35	0.59	0.78	0.81	1.02	1.08	1.06	0.96	0.86	0.74	0.66	0.59	0.57	0.47	0.51	0.51	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.67	0.69	0.49	0.49	0.38	0.60	0.56	0.64	0.62	0.90	0.57	0.50	0.42	0.50	0.55	0.75	0.81	0.75	0.64	0.64	0.63	0.79	0.60	0.85	0.55
MAX	1.44	1.31	1.28	1.04	1.07	1.04	1.14	1.25	1.30	1.54	0.95	0.87	1.28	0.95	1.41	1.44	1.37	1.20	1.15	1.25	1.36	1.27	1.39	1.27	1.04
MIN	0.34	0.18	0.06	0.10	0.03	0.21	0.21	0.14	0.04	0.40	0.27	0.19	0.01	0.04	0.09	0.36	0.34	0.36	0.06	0.12	0.08	0.36	0.03	0.24	0.27

DAY	26	27	28	29	30	31
AVE	0.67	0.49	0.50	0.52	0.60	0.63
MAX	1.11	1.37	1.33	1.09	1.31	1.15
MIN	0.34	0.04	0.01	0.05	0.19	0.16

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 71.9% OPERATIONAL RECOVERY RATE = 71.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
SEPTEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	6.9	4.4	3.3	5.2	4.9	3.8	4.7	3.6	2.8	2.9	2.5	3.1	3.6	3.3	3.7	2.9	3.2	2.5	1.9	***	3.0	2.8	3.3	4.3	3.6
2	3.4	1.6	1.9	1.6	2.2	1.9	1.8	1.7	2.3	2.2	2.7	2.9	2.7	3.5	3.5	4.1	4.1	4.4	6.0	3.8	5.7	4.0	4.3	5.1	3.2
3	6.0	4.2	3.9	4.1	3.8	3.3	3.9	3.9	3.1	2.4	2.9	3.5	2.9	3.3	4.0	4.5	4.9	6.8	7.4	5.6	5.0	4.0	3.0	4.4	4.2
4	3.9	3.7	3.3	2.9	2.3	2.4	2.3	2.7	2.7	3.1	3.2	4.1	3.9	4.0	4.5	4.9	6.1	5.1	3.3	4.1	6.7	4.6	3.9	3.9	3.8
5	3.1	3.2	2.9	2.7	2.6	2.6	2.6	2.6	2.6	3.2	***	5.2	4.6	3.2	3.3	4.1	3.6	1.9	2.6	2.2	2.2	2.5	2.8	3.0	3.0
6	3.7	3.0	3.0	3.0	3.2	3.5	3.8	3.6	3.0	2.8	3.3	2.6	3.4	4.5	3.8	3.7	3.8	3.6	3.2	***	6.1	***	4.1	2.1	3.5
7	3.1	3.9	4.0	3.5	3.2	3.2	3.3	3.1	2.5	2.2	3.0	3.3	4.1	4.4	4.6	4.7	5.9	5.4	5.7	***	5.4	5.4	5.1	3.7	4.0
8	2.6	2.2	3.2	2.9	2.8	3.0	2.4	2.5	3.0	5.3	3.7	2.3	2.5	2.7	2.7	3.0	3.1	3.2	2.9	1.8	3.1	3.5	2.0	1.9	2.8
9	3.2	4.9	4.9	3.2	2.0	2.7	2.6	3.4	3.0	2.5	3.1	3.2	3.6	3.4	4.8	7.0	8.3	7.5	***	5.6	***	3.5	2.8	3.1	4.0
10	4.5	3.7	2.5	1.7	3.0	4.6	2.5	1.7	1.1	0.7	1.3	2.5	3.4	3.7	4.5	4.7	4.1	2.6	3.3	3.3	3.2	2.6	3.1	4.2	3.0
11	3.2	2.7	2.5	2.9	3.4	2.8	2.9	2.3	2.0	2.7	3.4	3.9	4.8	5.0	5.6	5.6	6.0	6.5	***	5.9	5.0	3.5	3.2	2.5	3.8
12	1.6	2.9	3.7	3.8	4.7	4.9	4.0	3.3	2.8	2.6	3.2	3.7	4.2	4.4	3.8	4.2	3.8	3.5	5.7	3.7	2.0	4.2	4.6	3.4	3.7
13	2.7	2.7	3.6	3.5	3.0	3.5	3.5	3.0	2.8	3.1	3.7	3.8	4.1	4.6	4.5	6.3	5.9	11.3	***	6.1	8.6	3.4	2.7	1.3	4.2
14	1.8	2.2	2.8	2.2	2.8	3.1	3.6	4.2	3.1	2.8	3.5	3.4	4.2	3.8	4.2	4.6	4.1	4.4	3.0	2.4	2.5	3.8	3.6	3.1	3.3
15	2.5	3.0	2.2	1.9	2.0	2.4	2.0	2.0	2.5	3.6	5.0	6.8	6.4	7.2	7.4	6.1	5.1	6.4	6.6	3.7	3.5	3.2	3.2	3.0	4.1
16	3.1	3.3	3.1	3.4	2.3	2.2	2.7	2.7	2.8	3.5	2.8	4.2	6.4	6.1	5.6	5.2	4.8	4.6	5.0	5.2	4.4	3.5	2.7	1.8	3.8
17	2.4	1.8	1.4	0.9	1.7	2.1	2.4	2.9	2.8	2.3	3.3	4.2	4.4	4.3	5.6	5.1	6.0	6.6	***	5.9	3.8	2.2	1.3	2.7	3.3
18	3.0	2.8	2.4	2.4	2.9	3.0	2.4	2.5	2.6	2.2	2.8	4.0	4.6	4.3	4.3	4.9	6.6	6.6	6.5	6.3	5.5	4.2	2.3	1.4	3.8
19	2.4	2.8	3.3	2.8	2.7	3.0	2.9	2.9	3.8	2.6	2.9	3.7	4.2	4.5	3.5	***	***	12.9	***	***	6.4	3.9	4.1	5.3	4.0
20	4.0	3.7	5.7	6.8	7.2	5.7	5.7	5.7	5.5	5.6	4.7	4.5	4.0	4.2	4.0	3.6	3.8	3.6	4.7	4.2	2.2	2.6	3.4	3.9	4.5
21	1.9	1.3	1.9	2.1	2.3	2.5	2.3	2.6	2.7	4.4	***	4.0	6.4	6.0	***	***	***	6.8	7.1	6.7	3.7	2.2	1.8	2.0	3.5
22	1.7	2.1	1.6	2.2	2.0	1.7	2.2	3.1	2.4	1.4	2.0	2.8	2.8	3.2	3.9	2.8	1.8	1.9	1.8	3.2	6.2	3.9	4.0	2.1	2.6
23	1.3	2.0	1.7	2.0	2.2	2.5	2.7	3.2	2.9	2.4	2.8	2.7	3.3	3.8	4.1	3.9	3.1	2.5	***	4.2	5.0	3.5	1.9	2.4	2.9
24	2.5	3.4	3.3	3.6	4.3	4.1	4.0	3.6	3.1	3.1	3.0	2.8	3.5	4.0	3.7	3.9	4.9	4.8	4.0	3.4	4.0	4.6	5.6	4.6	3.8
25	3.9	4.3	5.2	4.4	4.7	4.8	5.6	8.0	8.0	8.1	8.3	7.0	7.8	8.8	7.6	7.7	7.8	***	***	6.5	5.5	5.4	6.6	8.3	6.6
26	8.3	8.9	6.0	6.2	7.0	6.4	6.2	6.0	6.3	6.1	6.4	5.9	4.7	4.7	3.7	4.6	4.2	3.3	3.2	3.8	4.0	4.0	4.6	4.3	5.4
27	3.7	4.0	3.8	3.3	3.6	3.5	4.3	4.3	3.9	3.2	2.9	2.8	3.5	3.8	3.8	4.8	3.5	3.4	3.2	2.8	4.4	2.2	3.4	3.7	3.6
28	4.5	5.0	4.8	2.8	2.7	2.9	3.4	3.9	3.7	1.9	2.2	3.1	3.5	4.8	5.6	5.4	5.5	6.1	5.8	4.6	3.4	2.3	2.2	3.9	3.9
29	5.0	5.1	4.3	3.7	3.7	4.2	3.5	3.4	2.5	1.1	1.7	2.8	4.0	4.6	4.4	4.1	4.1	5.2	5.2	5.8	***	3.5	2.4	3.1	3.8
30	4.0	5.2	4.9	4.4	5.5	5.8	5.2	3.7	3.0	2.8	2.8	2.6	3.3	3.9	4.6	4.7	4.6	4.6	***	3.3	2.1	3.3	3.7	4.0	4.0
HRAVE	3.5	3.5	3.4	3.2	3.4	3.4	3.4	3.4	3.2	3.1	3.3	3.7	4.2	4.4	4.5	4.7	4.7	5.1	4.5	4.4	4.4	3.5	3.4	3.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.6	3.2	4.2	3.8	3.0	3.5	4.0	2.8	4.0	3.0	3.8	3.7	4.2	3.3	4.1	3.8	3.3	3.8	4.0	4.5	3.5	2.6	2.9	3.8	6.6
MAX	6.9	6.0	7.4	6.7	5.2	6.1	5.9	5.3	8.3	4.7	6.5	5.7	11.3	4.6	7.4	6.4	6.6	6.6	12.9	7.2	7.1	6.2	5.0	5.6	8.8
MIN	1.9	1.6	2.4	2.3	1.9	2.1	2.2	1.8	2.0	0.7	2.0	1.6	1.3	1.8	1.9	1.8	0.9	1.4	2.4	2.2	1.3	1.4	1.3	2.5	3.9

DAY	26	27	28	29	30	31
AVE	5.4	3.6	3.9	3.8	4.0	***
MAX	8.9	4.8	6.1	5.8	5.8	***
MIN	3.2	2.2	1.9	1.1	2.1	***

MONTHLY AVERAGE = 3.8 MONTHLY MAXIMUM = 12.9 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.8% OPERATIONAL RECOVERY RATE = 96.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
SEPTEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	10.5	6.2	3.5	5.8	5.7	3.7	5.0	3.8	3.6	3.7	2.9	2.8	3.7	3.0	4.9	3.0	3.3	2.9	2.0	***	4.9	2.4	2.7	4.2	4.1
2	2.9	1.2	2.7	2.3	2.9	1.8	1.7	1.8	2.0	1.8	2.0	3.5	2.9	3.2	3.4	5.0	3.9	4.7	5.5	4.7	7.1	6.3	4.0	5.2	3.4
3	5.8	4.7	4.1	4.1	3.8	3.9	3.9	3.5	2.7	2.0	3.0	4.1	2.8	3.0	3.3	4.5	5.7	6.5	6.9	6.5	4.2	4.1	4.0	4.0	4.2
4	5.0	3.6	3.0	3.2	2.3	2.3	2.5	2.6	2.5	2.8	3.8	4.3	3.8	4.4	4.6	5.5	6.3	4.7	3.5	6.4	6.5	3.1	3.3	2.0	3.8
5	3.3	4.7	3.5	3.7	2.2	3.1	3.0	3.1	2.8	3.1	***	5.5	5.0	2.1	2.8	3.9	3.2	2.7	3.0	3.5	3.9	2.5	3.6	3.0	3.4
6	4.0	3.4	3.3	3.5	3.7	4.4	4.0	3.5	3.3	3.5	3.1	3.0	3.7	3.7	4.4	4.1	2.8	3.8	3.0	***	6.1	***	4.9	3.5	3.8
7	2.1	4.0	4.9	4.3	3.3	3.0	2.8	2.8	2.1	2.8	2.2	2.1	3.7	4.2	4.8	4.6	6.7	5.0	6.4	***	4.9	5.1	4.5	3.8	3.9
8	3.4	1.7	3.3	2.6	2.8	2.4	2.2	2.9	3.3	5.0	4.1	2.4	1.7	2.7	2.3	3.1	3.3	3.1	2.7	1.7	3.7	4.1	3.6	4.6	3.0
9	3.0	6.1	5.5	4.0	3.2	2.0	1.9	3.5	3.7	3.2	2.9	3.3	2.7	3.7	5.0	6.0	9.0	7.5	***	6.1	***	4.1	4.8	4.0	4.3
10	4.6	2.8	3.9	3.2	3.0	4.6	3.2	0.9	1.0	1.2	2.0	2.2	3.0	4.6	4.0	2.9	2.9	2.5	2.4	2.6	3.5	3.5	3.8	2.2	2.9
11	2.4	2.8	2.7	2.4	2.8	2.2	2.5	2.2	1.4	2.7	3.7	4.0	4.7	4.9	5.9	4.1	5.5	5.1	***	6.0	5.1	3.9	2.9	2.4	3.6
12	1.8	2.7	3.6	3.9	4.3	4.3	3.2	3.7	4.2	3.7	3.3	4.0	4.5	4.9	3.8	4.8	4.2	4.3	5.1	3.3	1.3	5.2	4.7	3.9	3.9
13	3.6	1.8	3.0	3.5	3.0	2.8	2.8	3.1	3.3	2.8	3.7	3.4	4.8	3.5	4.6	5.5	5.3	9.8	***	7.1	7.8	3.7	2.8	3.1	4.1
14	3.6	4.9	4.0	4.1	3.2	2.5	3.4	4.8	3.2	2.8	2.9	2.7	3.6	3.8	4.6	4.0	5.1	4.2	3.3	2.0	3.0	3.8	3.0	4.2	3.6
15	3.6	3.9	2.5	2.9	3.3	1.6	2.1	2.5	2.7	3.6	5.4	5.7	6.0	6.3	7.9	5.9	5.8	7.0	7.0	5.5	5.8	3.4	4.0	3.3	4.5
16	3.6	4.7	2.1	2.9	3.5	3.0	3.5	3.9	2.6	3.7	3.7	4.1	6.2	7.4	5.7	5.6	4.8	4.1	5.2	6.2	4.7	4.4	3.7	3.2	4.3
17	2.7	4.3	3.2	2.9	2.5	1.7	1.6	2.2	2.1	2.1	4.5	5.0	5.5	4.6	5.7	5.9	6.1	7.7	***	5.9	4.7	3.3	4.1	3.9	4.0
18	2.3	2.7	2.4	2.9	3.3	2.9	2.5	2.5	2.0	1.9	2.2	4.6	5.1	4.7	4.2	5.7	5.6	6.3	5.8	5.9	6.1	3.6	2.7	2.7	3.8
19	3.7	3.4	4.1	2.2	2.7	3.2	2.7	2.1	2.7	3.1	3.8	3.8	3.9	4.4	3.0	***	***	14.3	***	***	7.8	4.1	5.4	6.9	4.4
20	4.4	3.8	5.7	8.1	8.8	6.3	6.8	5.9	5.7	6.4	5.4	7.9	5.4	4.6	4.9	4.7	3.3	2.5	4.0	4.5	2.7	4.9	4.1	4.3	5.2
21	3.0	3.7	3.6	3.4	2.2	3.2	2.1	2.4	2.8	4.9	***	3.6	6.9	6.8	***	***	***	8.6	9.0	7.3	4.6	2.0	1.6	1.4	4.2
22	3.0	3.0	2.4	3.5	3.1	2.0	2.4	3.4	3.7	2.1	2.2	2.1	2.9	3.6	2.9	2.1	1.1	1.7	3.2	5.8	6.3	3.9	4.8	2.7	3.1
23	2.8	2.5	3.1	2.4	2.4	2.9	3.8	3.5	2.8	2.7	2.7	3.0	4.1	3.8	4.1	4.0	2.6	2.5	***	6.6	4.8	5.2	5.3	1.8	3.5
24	2.1	3.6	3.6	4.0	3.1	3.2	3.2	3.7	3.8	3.3	2.6	3.4	4.0	4.0	4.1	4.8	5.3	4.1	4.4	3.2	4.6	5.1	4.9	5.1	3.9
25	4.1	3.9	5.0	3.7	4.0	4.8	7.3	10.2	9.6	8.4	9.7	7.4	8.8	10.9	9.5	8.4	7.3	***	***	6.2	6.7	5.7	8.1	11.3	7.3
26	11.0	10.6	8.7	7.3	7.5	7.6	6.6	7.8	7.6	6.8	7.0	7.2	5.4	4.1	4.6	4.8	4.6	3.7	4.5	4.3	3.6	3.4	4.2	4.0	6.1
27	4.0	3.6	3.5	3.9	3.9	3.4	3.3	4.2	4.6	3.8	3.1	2.8	4.5	5.0	4.9	4.9	3.3	3.4	4.4	3.5	4.1	2.3	2.8	2.9	3.7
28	3.6	4.4	4.6	3.3	2.4	2.9	4.0	5.2	3.8	1.8	1.9	2.3	3.8	4.1	5.6	6.4	6.7	6.2	6.2	5.6	3.8	2.8	1.7	2.7	4.0
29	3.8	4.4	3.3	2.3	3.4	3.7	2.1	1.5	1.2	1.1	1.6	2.1	4.5	3.9	5.1	4.6	3.7	5.6	5.6	6.1	***	3.7	2.4	2.6	3.4
30	4.2	4.9	3.3	2.7	2.9	2.6	2.4	2.7	3.3	3.2	3.0	3.0	2.4	4.8	4.5	4.4	5.1	7.7	***	3.5	3.6	3.0	3.8	4.9	3.7
HRAVE	3.9	3.9	3.7	3.6	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.8	4.3	4.5	4.7	4.8	4.7	5.2	4.7	5.0	4.9	3.9	3.9	3.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.1	3.4	4.2	3.8	3.4	3.8	3.9	3.0	4.3	2.9	3.6	3.9	4.1	3.6	4.5	4.3	4.0	3.8	4.4	5.2	4.2	3.1	3.5	3.9	7.3
MAX	10.5	7.1	6.9	6.5	5.5	6.1	6.7	5.0	9.0	4.6	6.0	5.2	9.8	5.1	7.9	7.4	7.7	6.3	14.3	8.8	9.0	6.3	6.6	5.3	11.3
MIN	2.0	1.2	2.0	2.0	2.1	2.8	2.1	1.7	1.9	0.9	1.4	1.3	1.8	2.0	1.6	2.1	1.6	1.9	2.1	2.5	1.4	1.1	1.8	2.1	3.7

DAY	26	27	28	29	30	31
AVE	6.1	3.7	4.0	3.4	3.7	***
MAX	11.0	5.0	6.7	6.1	7.7	***
MIN	3.4	2.3	1.7	1.1	2.4	***

MONTHLY AVERAGE = 4.0 MONTHLY MAXIMUM = 14.3 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.8% OPERATIONAL RECOVERY RATE = 96.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	6.8	4.2	4.8	6.0	3.6	5.2	3.5	4.5	4.6	3.2	3.6	4.0	3.3	3.8	3.0	4.6	2.7	***	***	6.1	3.3	4.9	4.1	4.3
2	3.3	3.0	3.0	4.6	3.1	2.1	1.5	2.4	***	2.5	1.9	3.1	3.7	3.2	2.1	5.3	3.8	4.4	5.7	5.5	9.1	7.9	2.7	5.7	3.9
3	5.8	5.2	4.2	5.1	4.9	***	4.6	4.5	3.1	3.4	3.5	3.9	2.8	3.1	2.7	4.9	***	6.4	7.0	6.4	4.1	4.9	5.1	4.4	4.5
4	6.3	3.2	3.3	3.1	3.6	3.3	2.5	2.7	2.4	3.1	3.5	3.7	4.3	4.7	5.1	6.5	6.7	5.6	3.3	4.8	7.6	3.0	3.9	3.4	4.1
5	3.8	5.3	3.2	3.6	1.9	3.5	3.5	2.8	3.2	***	***	***	4.4	3.4	3.5	3.4	3.3	3.9	4.1	4.2	5.8	3.2	4.4	4.1	3.7
6	4.7	3.3	3.3	3.5	3.8	4.4	3.9	3.6	3.2	3.4	3.3	3.0	5.0	3.0	4.4	4.0	4.4	3.5	2.7	***	5.7	***	***	4.7	3.9
7	3.4	4.7	4.8	4.2	3.0	2.6	2.6	2.2	3.0	2.3	2.3	2.5	3.6	3.5	4.5	4.8	6.2	***	***	***	***	5.5	4.6	4.4	3.7
8	3.5	1.7	4.2	2.4	2.7	2.2	2.4	3.8	3.0	4.2	4.4	2.2	1.6	3.7	3.7	3.7	3.1	2.7	3.6	2.8	3.7	4.1	4.5	4.1	3.3
9	3.5	***	4.7	4.2	4.4	2.2	2.3	4.2	4.4	3.1	3.2	3.8	3.0	4.1	5.6	***	***	***	***	***	***	4.3	3.7	3.9	3.8
10	3.8	3.9	5.4	4.7	4.0	***	3.2	0.8	1.0	***	2.2	2.1	4.2	4.7	***	3.7	2.8	2.2	2.4	3.2	6.3	3.9	4.3	3.7	3.5
11	1.7	2.8	3.0	2.7	2.8	2.5	2.6	2.2	2.0	2.0	2.9	3.7	4.8	4.7	6.2	4.7	6.6	5.2	***	***	***	3.2	4.7	4.4	3.6
12	2.5	3.0	3.2	3.4	3.0	5.3	3.5	3.4	5.4	3.6	3.6	3.2	5.3	4.5	3.6	3.4	3.9	3.5	6.8	3.2	1.6	4.8	5.3	4.9	3.9
13	4.8	1.8	3.5	3.7	3.8	2.9	2.8	2.4	3.0	3.5	4.0	3.8	4.8	3.9	4.6	5.3	5.3	***	***	***	10.2	3.7	3.3	2.5	4.0
14	5.4	6.9	5.1	4.2	4.6	***	***	5.2	3.5	3.1	3.1	3.3	3.9	4.0	4.7	3.5	4.1	3.5	3.4	3.9	5.1	4.1	4.5	4.9	4.3
15	3.8	4.5	4.2	4.2	4.0	2.6	2.1	2.8	1.9	3.3	6.3	6.8	6.1	7.8	8.0	5.7	6.1	7.8	7.2	5.9	6.7	4.3	4.4	4.9	5.1
16	4.5	5.9	4.9	4.6	3.2	4.0	3.1	3.3	3.7	4.6	3.7	4.1	5.6	6.9	6.2	6.7	***	3.6	5.8	6.8	4.6	4.7	3.7	3.2	4.7
17	2.5	4.9	4.1	3.1	2.2	3.3	2.0	2.1	1.5	3.2	3.8	5.6	4.9	4.4	5.9	5.7	5.9	***	***	5.2	***	3.9	3.5	4.9	3.9
18	3.0	3.3	3.0	3.7	5.0	3.2	2.4	2.5	2.9	4.0	2.9	2.7	3.7	4.3	4.4	5.8	6.1	***	***	***	***	***	3.2	4.3	3.7
19	2.8	3.2	4.2	2.7	4.0	2.8	4.3	2.6	3.1	2.5	4.2	4.1	4.5	5.0	4.6	***	***	***	***	***	8.5	3.8	5.9	7.2	4.2
20	6.0	3.5	6.1	7.7	8.2	6.4	7.2	***	6.3	7.0	5.6	7.0	5.8	3.4	5.2	5.4	2.8	3.0	4.5	4.3	2.4	3.7	4.7	4.0	5.2
21	3.1	4.2	3.5	5.4	2.8	3.7	2.3	2.5	2.5	***	***	***	***	***	***	***	***	***	***	7.9	7.9	4.7	2.9	4.7	3.7	4.1
22	3.0	3.0	2.5	3.7	***	2.6	2.3	***	3.2	2.4	2.5	2.2	3.1	3.9	3.1	2.1	1.5	1.9	2.9	5.8	6.8	4.0	***	4.7	3.2
23	4.8	2.2	3.5	2.3	3.8	3.0	3.8	4.9	3.5	3.5	2.4	1.8	2.2	3.6	2.9	3.4	2.1	3.3	***	***	***	6.2	3.7	1.4	3.3
24	2.0	4.0	4.3	3.7	2.9	2.7	2.9	3.7	3.6	3.5	2.6	3.9	4.1	2.9	3.2	5.7	5.7	***	***	2.8	4.9	5.0	5.3	4.6	3.8
25	4.0	3.8	6.7	4.5	4.0	4.7	6.6	10.3	11.1	***	***	8.0	5.7	9.8	9.9	9.1	***	***	***	***	6.7	6.3	8.6	10.6	7.2
26	10.9	11.4	6.4	5.9	7.2	8.1	7.0	9.1	8.1	8.4	6.8	7.6	5.8	3.9	5.4	4.3	4.3	3.8	4.8	4.6	3.9	3.9	4.2	3.8	6.2
27	4.2	2.8	3.1	4.1	3.8	3.3	3.4	4.6	4.0	4.0	3.2	2.6	4.1	4.1	5.0	4.9	2.3	3.5	***	***	***	2.8	3.8	3.0	3.6
28	3.7	4.0	4.8	4.4	3.1	2.8	3.4	5.5	3.6	2.6	3.5	2.4	4.1	4.3	6.0	6.5	***	***	6.0	5.8	***	2.0	3.4	3.0	4.0
29	4.0	4.4	3.2	2.3	5.1	5.8	2.3	2.3	1.4	2.0	2.3	2.3	3.9	3.5	5.3	5.4	4.2	***	***	***	***	3.6	1.8	3.0	3.4
30	3.1	4.3	3.7	2.8	2.0	2.5	2.4	2.4	3.5	3.5	4.7	2.7	4.1	4.5	5.4	5.6	4.9	7.2	***	***	2.6	3.3	4.3	7.0	3.9
HRAVE	4.1	4.2	4.1	4.0	3.9	3.6	3.4	3.6	3.6	3.6	3.5	3.8	4.2	4.4	4.8	4.9	4.4	4.1	4.9	4.9	5.6	4.2	4.3	4.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.3	3.9	4.5	4.1	3.7	3.9	3.7	3.3	3.8	3.5	3.6	3.9	4.0	4.3	5.1	4.7	3.9	3.7	4.2	5.2	4.1	3.2	3.3	3.8	7.2
MAX	6.8	9.1	7.0	7.6	5.8	5.7	6.2	4.5	5.6	6.3	6.6	6.8	10.2	6.9	8.0	6.9	5.9	6.1	8.5	8.2	7.9	6.8	6.2	5.7	11.1
MIN	2.7	1.5	2.7	2.4	1.9	2.7	2.2	1.6	2.2	0.8	1.7	1.6	1.8	3.1	1.9	3.1	1.5	2.4	2.5	2.4	2.3	1.5	1.4	2.0	3.8

DAY	26	27	28	29	30	31
AVE	6.2	3.6	4.0	3.4	3.9	***
MAX	11.4	5.0	6.5	5.8	7.2	***
MIN	3.8	2.3	2.0	1.4	2.0	***

MONTHLY AVERAGE = 4.1 MONTHLY MAXIMUM = 11.4 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 88.3% OPERATIONAL RECOVERY RATE = 88.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
SEPTEMBER - 2015

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	64	99	133	115	87	74	72	86	91	108	109	142	131	187	173	175	177	181	191	***	163	115	106	141	49
2	297	254	331	18	89	64	61	56	84	96	156	210	213	273	270	275	274	251	162	165	128	99	104	116	36
3	144	114	86	84	73	71	67	69	79	152	160	156	115	183	266	250	173	164	167	177	159	112	170	155	315
4	122	156	158	133	99	88	83	90	137	167	168	180	178	178	168	165	159	285	301	157	162	147	308	209	261
5	113	150	120	151	144	92	87	94	108	131	***	73	78	174	176	170	160	131	86	87	85	85	87	93	124
6	142	119	135	104	111	114	109	124	113	146	171	143	255	272	267	223	226	271	275	***	290	***	289	251	181
7	151	122	113	94	86	88	105	157	135	126	196	272	269	265	261	274	286	283	285	***	10	51	66	78	272
8	88	91	84	103	105	133	119	95	101	156	148	163	175	179	170	183	265	187	168	190	301	297	218	215	197
9	234	301	290	285	252	149	99	138	121	126	175	253	268	270	272	292	288	301	***	292	***	279	354	54	237
10	174	159	198	21	285	325	10	284	324	233	209	257	194	273	277	219	172	188	177	172	160	161	129	150	341
11	141	132	92	108	106	94	78	85	144	166	180	272	274	268	286	281	271	278	***	285	282	289	291	173	359
12	136	102	105	119	155	149	149	129	137	146	150	139	222	107	175	121	71	358	300	297	259	315	294	286	142
13	268	154	119	113	92	110	151	130	106	160	169	174	175	246	270	339	332	348	***	72	253	298	296	318	96
14	40	83	359	91	99	100	106	109	127	109	226	284	282	273	275	272	281	297	316	54	341	283	280	277	267
15	277	258	74	139	152	175	218	289	299	261	248	237	246	272	263	238	242	223	248	224	211	140	171	173	20
16	200	251	158	163	159	104	144	132	97	141	297	268	216	248	258	263	270	256	261	286	287	284	328	54	18
17	106	29	305	62	79	97	99	108	136	119	119	175	70	265	211	242	255	284	***	296	287	278	120	106	102
18	100	99	91	86	98	100	88	96	147	169	153	129	220	286	274	281	290	287	289	292	290	283	289	28	78
19	93	99	107	101	101	106	106	113	152	143	184	272	274	266	253	***	***	149	***	***	140	152	111	100	183
20	90	91	83	79	77	69	69	73	79	78	80	90	134	132	229	39	248	244	230	247	206	125	90	157	322
21	163	89	106	106	155	157	106	87	97	146	***	79	62	68	***	***	***	60	60	59	13	36	41	67	96
22	291	322	316	318	284	310	304	302	346	41	282	285	343	91	163	119	205	207	263	32	85	300	316	82	270
23	9	6	47	73	80	85	90	101	142	155	215	253	205	261	262	196	168	209	***	275	288	303	340	80	26
24	84	76	80	105	148	135	147	140	160	168	165	100	71	267	299	224	112	90	101	90	63	66	63	82	332
25	90	81	74	84	71	79	92	102	99	99	102	87	94	84	98	105	100	***	***	96	92	96	93	91	40
26	88	78	89	84	72	75	73	85	79	75	71	114	164	173	147	177	183	181	115	89	76	72	69	75	260
27	137	146	129	109	112	139	133	106	101	101	132	125	170	153	109	265	262	268	283	273	292	356	101	116	226
28	122	133	129	105	102	112	115	128	153	207	232	208	271	272	273	271	278	277	272	275	286	291	111	106	273
29	117	119	117	137	153	151	155	156	152	215	192	320	273	272	268	263	275	276	279	291	***	287	222	123	51
30	111	124	125	145	153	153	152	146	115	145	101	157	173	173	169	292	269	277	***	293	347	101	115	103	255

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.8% OPERATIONAL RECOVERY RATE = 96.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
SEPTEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	64	97	116	139	99	64	71	81	77	79	95	95	124	161	120	161	143	182	184	***	226	162	104	132	204
2	295	265	315	49	35	52	56	45	69	39	107	171	219	265	180	276	278	272	169	191	143	107	132	126	202
3	134	121	98	96	82	89	75	76	76	96	144	157	105	156	280	251	167	158	159	172	173	110	177	78	261
4	116	161	135	159	116	93	98	92	137	145	162	168	179	165	166	164	156	274	277	154	169	214	268	309	39
5	306	183	138	165	129	96	98	91	104	128	***	77	100	128	130	162	127	151	92	68	97	13	129	81	359
6	178	105	85	78	77	71	76	84	83	85	89	81	275	278	267	260	168	252	320	***	283	***	328	290	273
7	205	136	147	112	88	76	124	157	123	91	177	272	277	267	259	276	286	279	279	***	3	49	64	59	328
8	68	194	89	133	144	105	78	70	89	139	147	99	109	164	170	136	247	203	180	215	289	292	315	26	237
9	191	295	282	287	288	232	112	136	123	119	165	260	244	331	278	278	293	308	***	289	***	322	95	132	153
10	171	275	277	295	307	315	21	70	0	345	295	309	146	282	282	149	219	263	205	184	159	184	330	89	194
11	145	170	88	113	159	103	80	80	163	176	188	275	278	263	275	272	272	263	***	289	282	185	326	354	170
12	235	103	120	160	156	146	98	82	81	83	92	142	242	107	187	125	67	10	296	299	283	299	304	301	49
13	284	231	110	112	102	90	83	78	88	142	140	155	183	253	280	343	358	337	***	80	290	279	292	208	315
14	100	104	324	264	149	112	124	126	149	134	225	298	267	274	322	266	262	317	297	29	306	271	301	285	40
15	274	262	293	168	217	223	257	261	257	229	246	261	243	266	268	218	242	207	230	234	231	149	180	184	43
16	236	253	183	171	180	137	163	165	139	169	281	48	237	252	260	262	260	245	259	286	282	281	271	281	131
17	279	350	290	288	338	51	77	96	136	103	97	107	76	280	218	237	257	278	***	291	303	278	186	168	310
18	79	97	104	96	93	100	98	93	113	139	146	98	202	311	276	290	274	282	283	285	296	281	302	3	157
19	82	105	175	98	91	124	108	110	154	158	180	277	274	277	257	***	***	148	***	***	143	111	94	96	74
20	86	101	74	76	79	67	60	73	83	76	68	82	97	133	1	105	204	228	231	245	217	90	89	213	177
21	269	344	158	235	199	163	112	101	101	139	***	95	53	57	***	***	***	45	47	64	21	107	243	284	217
22	258	274	269	265	263	324	316	287	288	354	351	343	343	96	119	108	189	266	338	54	84	43	309	47	49
23	27	30	340	62	49	66	69	82	91	72	139	274	241	266	239	176	112	250	***	263	282	297	323	26	189
24	30	79	72	83	84	104	151	159	154	155	96	76	86	249	295	119	106	80	105	76	72	73	75	86	60
25	83	90	80	89	74	91	100	99	103	105	110	91	92	92	96	105	104	***	***	87	103	97	98	94	29
26	94	79	101	93	81	84	85	90	93	70	67	100	158	143	103	175	175	173	109	94	78	78	72	79	46
27	90	101	109	88	86	90	90	88	80	83	84	115	173	152	108	269	209	284	282	276	297	323	94	93	253
28	123	145	130	109	90	106	142	149	166	118	142	243	277	291	258	271	275	277	276	268	281	292	110	112	65
29	138	125	115	101	144	153	148	123	151	117	172	301	275	276	261	251	312	276	283	290	***	290	286	170	163
30	164	129	106	96	139	132	100	80	80	86	97	146	91	140	72	322	265	256	***	305	340	99	103	102	293

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 96.8% OPERATIONAL RECOVERY RATE = 96.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
SEPTEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	98	115	152	104	63	72	82	72	79	85	96	126	162	116	134	141	179	***	***	229	134	107	125	310
2	295	201	315	88	9	33	69	91	***	18	115	141	248	264	212	274	279	272	178	189	138	101	117	126	240
3	126	121	160	78	77	***	69	79	79	85	117	168	120	182	298	252	***	156	157	167	173	166	106	324	10
4	114	221	131	146	42	91	99	88	136	163	162	162	207	160	161	154	157	275	274	157	160	174	303	331	92
5	292	173	206	185	144	101	151	107	123	***	***	***	105	97	117	174	125	145	103	72	103	51	161	87	64
6	170	91	89	75	79	70	74	82	82	79	68	94	271	340	266	236	150	260	298	***	278	***	***	305	217
7	108	113	145	107	79	86	118	120	114	113	150	233	275	275	266	276	290	***	***	***	***	59	62	26	196
8	66	138	100	116	142	102	74	66	81	139	150	122	133	150	153	135	253	247	193	289	313	285	344	56	70
9	95	***	279	243	290	240	122	146	145	118	151	212	232	314	281	***	***	***	***	***	***	0	86	125	207
10	38	279	244	288	283	***	27	43	45	***	278	4	145	286	***	75	203	210	194	180	171	172	305	300	228
11	141	159	91	110	140	106	85	83	138	179	199	263	290	293	276	272	271	265	***	***	***	182	62	3	289
12	351	143	113	140	155	140	107	92	76	78	84	129	228	111	80	124	65	52	266	292	297	288	304	285	313
13	257	217	102	110	107	98	90	92	91	114	135	152	180	244	277	346	354	***	***	***	257	281	312	155	16
14	95	84	327	240	143	***	***	116	159	153	156	308	268	265	332	291	257	344	300	10	201	286	324	309	168
15	251	258	311	14	263	236	253	265	296	213	225	242	239	278	271	227	242	199	223	213	204	153	187	122	200
16	258	240	205	172	194	105	166	165	159	160	269	102	223	243	246	256	***	241	255	284	283	287	268	279	334
17	211	5	274	282	98	92	89	93	120	102	93	111	67	269	200	231	259	***	***	290	***	255	160	150	89
18	70	98	106	90	93	102	98	97	105	171	207	140	219	327	280	291	273	***	***	***	***	***	307	336	332
19	114	102	157	88	98	116	117	115	158	145	206	277	267	275	254	***	***	***	***	***	141	133	92	96	285
20	80	107	68	77	77	67	60	***	80	74	71	91	110	136	286	100	206	215	233	235	244	124	83	210	57
21	297	24	75	40	220	156	116	108	95	***	***	***	***	***	***	***	***	***	66	63	51	151	224	309	212
22	244	177	247	252	***	342	324	***	335	358	1	331	9	89	103	108	180	287	331	49	98	34	***	24	340
23	18	346	2	80	78	82	72	80	92	57	120	247	255	260	261	168	98	214	***	***	***	314	322	27	291
24	19	89	63	80	82	118	132	150	153	145	90	72	74	279	320	125	102	***	***	39	80	70	70	87	190
25	89	86	71	74	86	85	91	98	101	***	***	89	74	88	94	104	***	***	***	***	104	101	96	89	314
26	102	86	88	87	82	87	86	87	93	74	69	103	157	129	109	152	174	171	101	95	74	69	71	81	159
27	90	105	107	89	103	93	94	99	78	91	75	118	172	159	105	257	215	304	***	***	***	323	101	96	283
28	115	134	112	110	116	107	151	158	163	126	130	319	265	308	272	277	***	***	275	269	***	288	89	114	193
29	152	126	112	103	138	151	144	125	168	143	178	301	271	294	274	253	330	***	***	***	***	307	238	141	134
30	127	124	120	99	116	122	105	73	84	84	84	129	109	153	78	331	257	264	***	***	19	104	106	93	357

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 88.3% OPERATIONAL RECOVERY RATE = 88.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	0.50	0.40	0.37	0.51	0.43	0.38	0.65	0.21	0.28	0.52	0.79	0.83	1.00	0.91	0.84	0.64	0.39	0.33	***	0.61	0.28	0.40	0.39	0.53
2	0.44	0.34	0.28	0.45	0.38	0.17	0.06	0.10	0.15	0.36	0.73	0.88	0.83	0.90	1.04	1.15	0.89	0.68	0.37	0.30	1.06	0.60	0.53	0.48	0.55
3	0.38	0.42	0.30	0.50	0.44	0.50	0.51	0.33	0.39	0.50	0.56	0.86	0.61	0.66	1.09	0.48	0.44	0.60	***	0.60	0.33	0.57	0.68	0.48	0.53
4	0.27	0.39	0.44	0.50	0.41	0.03	0.08	0.11	0.29	0.78	0.60	1.20	1.11	1.01	0.91	0.78	0.58	0.28	0.30	0.48	0.44	0.64	0.74	0.61	0.54
5	0.52	0.48	0.32	0.21	0.42	0.15	0.01	0.03	0.13	0.22	***	0.45	0.62	0.75	0.84	0.67	0.34	0.09	0.36	0.43	0.44	0.69	0.57	0.42	0.40
6	0.50	0.41	0.28	0.31	0.09	0.06	0.12	0.10	0.29	0.38	0.52	0.62	0.90	0.96	0.94	1.09	1.05	0.91	0.54	***	0.28	***	***	0.31	0.51
7	0.28	0.41	0.53	0.35	0.23	0.18	0.18	0.25	0.46	0.62	0.62	0.77	0.92	0.93	0.88	1.00	1.00	0.77	0.52	***	***	0.60	0.75	0.55	0.58
8	0.35	0.53	0.50	0.15	0.29	0.24	0.04	0.18	0.15	0.46	0.36	0.33	0.43	0.36	0.61	0.74	0.44	0.39	0.12	0.12	0.30	0.40	0.37	0.34	0.34
9	0.52	0.58	0.35	0.26	0.23	0.10	0.13	0.25	0.34	0.52	0.77	0.75	0.69	0.94	0.89	1.01	1.12	***	***	***	***	***	0.65	0.74	0.57
10	0.62	0.26	0.23	0.55	0.34	***	0.50	0.25	0.20	0.33	0.17	0.53	0.74	0.77	0.77	0.69	0.50	0.48	0.32	0.26	0.28	0.39	0.58	0.42	0.44
11	0.33	0.39	0.30	0.24	0.24	0.23	0.24	0.06	0.26	0.76	0.92	0.72	0.98	1.05	1.04	0.99	0.82	0.93	***	0.53	0.34	0.49	0.48	0.38	0.55
12	0.22	0.20	0.36	0.25	0.15	0.18	0.22	0.27	0.28	0.55	0.75	1.07	1.11	1.16	1.04	0.82	0.61	0.62	0.43	0.22	0.38	0.49	0.49	0.48	0.51
13	0.26	0.16	0.21	0.15	0.28	0.22	0.19	0.13	0.29	0.59	0.78	0.93	1.11	1.28	0.89	0.75	0.61	***	***	0.81	0.80	0.59	0.35	0.27	0.53
14	0.43	0.42	0.28	0.30	0.33	0.23	0.26	0.49	0.58	0.77	0.86	1.01	1.13	1.04	0.86	0.82	0.76	0.61	0.47	0.17	0.34	0.62	0.47	0.40	0.57
15	0.43	0.46	0.45	0.41	0.50	0.34	0.24	0.26	0.58	0.79	0.80	0.88	0.82	0.88	0.67	0.66	0.40	0.58	0.74	0.59	0.78	0.56	0.61	0.66	0.59
16	0.68	0.74	0.47	0.43	0.48	0.24	0.18	0.20	0.41	0.77	0.86	1.14	1.04	1.01	1.06	0.88	0.70	0.79	0.45	0.36	0.41	0.58	0.37	0.35	0.61
17	0.48	0.60	0.48	0.34	0.22	0.01	0.01	0.01	0.33	0.67	0.94	1.15	1.12	1.19	1.12	0.81	0.82	0.80	***	0.30	0.36	0.36	0.34	0.26	0.55
18	0.32	0.25	0.39	0.27	0.09	0.12	0.19	0.17	0.27	0.54	0.78	1.21	1.05	0.92	0.86	0.90	0.82	0.74	0.64	0.48	0.39	0.49	0.33	0.34	0.52
19	0.54	0.25	0.18	0.26	0.16	0.05	0.01	0.01	0.22	0.66	0.73	0.76	0.79	0.94	0.86	***	***	***	***	***	0.61	0.47	0.52	0.77	0.46
20	0.62	0.58	0.65	0.49	0.50	0.42	0.54	0.63	0.72	0.96	1.18	1.23	1.07	1.12	1.07	1.07	0.90	0.61	0.41	0.32	0.16	0.45	0.40	0.40	0.69
21	0.50	0.63	0.57	0.30	0.51	0.21	0.15	0.27	0.20	0.36	***	0.51	0.32	***	***	***	***	0.93	1.00	0.61	0.62	0.53	0.35	0.40	0.47
22	0.41	0.48	0.58	0.66	***	0.46	0.34	0.41	0.45	0.59	0.55	0.36	0.59	0.87	0.51	0.32	0.54	0.31	0.12	0.44	0.77	0.65	0.40	0.27	0.48
23	0.41	0.46	0.37	0.40	0.43	0.10	0.19	0.15	0.26	0.44	0.81	0.72	1.08	1.11	1.10	0.86	0.85	0.51	***	***	***	0.36	0.37	0.16	0.53
24	0.32	0.28	0.33	0.28	0.36	0.29	0.31	0.39	0.23	0.50	0.67	0.66	0.81	0.87	0.88	0.85	0.71	0.56	0.47	0.44	0.40	0.40	0.44	0.50	0.50
25	0.60	0.24	0.59	0.43	0.50	0.80	0.59	0.40	0.47	0.74	0.96	0.98	1.02	1.24	1.17	1.04	1.10	***	***	0.45	0.53	0.52	0.55	0.57	0.70
26	0.51	0.66	0.76	0.67	0.74	0.64	0.57	0.85	0.71	0.98	1.00	0.85	0.86	0.92	1.00	0.90	0.76	0.59	0.55	0.39	0.44	0.38	0.31	0.36	0.68
27	0.34	0.36	0.29	0.16	0.20	0.23	0.31	0.21	0.15	0.39	0.42	0.65	0.92	1.09	1.23	1.05	0.86	0.82	0.45	0.45	0.32	0.33	0.13	0.12	0.48
28	0.08	0.34	0.41	0.09	0.05	0.03	0.09	0.13	0.24	0.45	0.64	0.91	0.81	0.89	1.04	0.76	0.81	0.78	0.50	0.26	0.04	0.23	0.12	0.25	0.41
29	0.19	0.20	0.05	0.12	0.14	0.10	0.15	0.03	0.03	0.63	0.58	0.72	0.89	0.73	0.98	1.04	0.84	0.55	0.40	0.17	***	0.40	0.20	0.14	0.40
30	0.28	0.37	0.31	0.28	0.22	0.23	0.30	0.19	0.16	0.28	0.47	0.89	0.99	1.10	0.96	0.99	0.95	0.48	***	***	0.44	0.30	0.34	0.32	0.49
HRAVE	0.41	0.41	0.39	0.34	0.33	0.24	0.24	0.25	0.31	0.56	0.70	0.82	0.87	0.95	0.94	0.86	0.74	0.61	0.45	0.40	0.46	0.48	0.44	0.40	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.53	0.55	0.53	0.54	0.40	0.51	0.58	0.34	0.57	0.44	0.55	0.51	0.53	0.57	0.59	0.61	0.55	0.52	0.46	0.69	0.47	0.48	0.53	0.50	0.70
MAX	1.00	1.15	1.09	1.20	0.84	1.09	1.00	0.74	1.12	0.77	1.05	1.16	1.28	1.13	0.88	1.14	1.19	1.21	0.94	1.23	1.00	0.87	1.11	0.88	1.24
MIN	0.21	0.06	0.30	0.03	0.01	0.06	0.18	0.04	0.10	0.17	0.06	0.15	0.13	0.17	0.24	0.18	0.01	0.09	0.01	0.16	0.15	0.12	0.10	0.23	0.24

DAY	26	27	28	29	30	31
AVE	0.68	0.48	0.41	0.40	0.49	***
MAX	1.00	1.23	1.04	1.04	1.10	***
MIN	0.31	0.12	0.03	0.03	0.16	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 94.7% OPERATIONAL RECOVERY RATE = 94.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
SEPTEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	0.65	0.42	0.38	0.62	0.51	0.44	0.58	0.20	0.18	0.31	0.73	0.76	0.92	1.13	0.89	0.69	0.40	0.40	***	0.62	0.46	0.33	0.39	0.55
2	0.43	0.28	0.44	0.42	0.44	0.31	0.12	0.02	0.07	0.19	0.39	0.92	0.84	0.63	1.12	1.10	0.79	0.66	0.36	0.40	***	0.78	0.46	0.49	0.51
3	0.40	0.32	0.29	0.52	0.49	0.39	0.58	0.33	0.46	0.32	0.41	0.63	0.49	0.77	1.19	0.52	0.47	0.76	***	0.68	0.64	0.68	0.60	0.57	0.54
4	0.38	0.26	0.25	0.34	0.14	0.09	0.01	0.04	0.21	0.52	0.57	1.23	1.27	1.14	0.95	0.64	0.58	0.41	0.29	0.36	0.42	0.81	0.78	0.57	0.51
5	0.55	0.66	0.54	0.23	0.34	0.36	0.29	0.11	0.02	0.05	***	***	0.53	0.52	0.65	0.52	0.29	0.07	0.29	0.50	0.65	0.74	0.76	0.59	0.42
6	0.74	0.41	0.40	0.31	0.27	0.19	0.14	0.06	0.14	0.24	0.33	0.62	0.95	1.24	0.98	1.28	0.94	0.99	0.60	***	***	***	***	0.47	0.56
7	0.36	0.34	0.44	0.42	0.40	0.36	0.12	0.14	0.31	0.41	0.42	0.66	0.87	1.04	1.02	0.87	0.96	0.75	***	***	***	0.54	0.57	0.72	0.56
8	0.54	0.81	0.55	0.37	0.46	0.21	0.34	0.34	0.14	0.46	0.44	0.33	0.24	0.34	0.50	0.74	0.36	0.35	0.09	0.23	0.83	0.53	0.56	0.44	0.42
9	0.62	0.75	***	0.49	0.39	0.23	0.09	0.16	0.24	0.42	0.62	0.77	0.61	1.03	0.83	0.90	***	***	***	***	***	***	0.73	0.69	0.56
10	0.58	0.63	0.70	0.48	0.46	***	0.58	0.19	0.16	0.20	0.31	0.61	0.71	0.72	0.66	0.85	0.51	0.46	0.36	0.36	0.70	0.56	0.73	0.50	0.52
11	0.61	0.49	0.39	0.25	0.30	0.06	0.02	0.33	0.12	0.57	0.80	0.63	0.90	1.05	1.05	1.16	0.88	1.07	***	***	***	0.62	0.74	0.42	0.59
12	0.55	0.54	0.31	0.14	0.11	0.16	0.16	0.38	0.23	0.32	0.36	0.86	1.03	1.07	1.02	0.81	0.64	0.70	0.59	0.18	0.51	0.58	0.46	0.55	0.51
13	0.23	0.14	0.31	0.31	0.36	0.12	0.17	0.12	0.16	0.36	0.62	0.75	0.92	1.04	0.96	0.75	0.62	***	***	0.78	0.53	0.60	0.53	0.52	0.50
14	0.54	0.61	0.59	0.62	0.55	0.27	0.16	0.68	0.47	0.71	1.04	1.04	1.13	1.00	0.93	1.05	0.71	0.56	0.35	0.20	0.48	0.74	0.93	0.62	0.67
15	0.69	0.59	0.61	0.66	0.74	0.67	0.36	0.16	0.59	0.67	0.96	0.99	1.03	0.89	0.66	0.74	0.47	0.52	0.67	0.64	0.84	0.82	0.78	0.82	0.69
16	0.82	0.79	0.60	0.58	0.72	0.34	0.20	0.19	0.32	0.62	0.76	1.00	0.91	1.03	0.95	0.96	0.72	0.81	0.45	0.32	***	0.41	0.49	0.71	0.64
17	0.62	0.66	0.54	0.42	0.43	0.32	0.01	0.02	0.17	0.43	1.05	1.17	0.96	1.18	1.24	0.89	0.76	0.83	***	***	0.23	0.61	0.62	0.42	0.62
18	0.54	0.39	0.32	0.33	0.25	0.16	0.10	0.31	0.16	0.28	0.67	1.21	1.21	1.02	0.91	0.86	0.97	***	***	***	0.61	0.82	0.53	0.43	0.58
19	0.66	0.48	0.31	0.35	0.36	0.16	0.01	0.01	0.07	0.38	0.65	0.71	0.83	0.82	1.04	***	***	***	***	***	0.36	0.46	0.56	0.89	0.48
20	0.68	0.43	0.61	0.51	0.61	0.56	0.60	0.63	0.70	0.85	1.14	1.12	0.98	1.08	1.14	1.26	0.83	0.66	0.36	0.31	0.29	0.54	0.53	0.45	0.70
21	0.66	0.69	0.63	0.50	0.57	0.35	0.13	0.19	0.06	***	***	0.46	0.15	***	***	***	***	0.93	***	0.60	0.55	0.63	0.25	0.48	0.46
22	0.58	0.52	0.65	0.76	***	0.40	0.30	0.35	0.35	0.61	0.37	0.32	0.44	0.77	0.41	0.13	0.56	0.20	0.20	0.51	0.63	0.62	0.43	0.37	0.46
23	0.29	0.44	0.42	0.29	0.43	0.44	0.20	0.03	0.09	0.25	0.58	0.76	0.91	0.84	0.78	0.84	0.74	0.43	***	***	***	0.65	0.62	0.30	0.49
24	0.31	0.19	0.25	0.27	0.14	0.09	0.09	0.30	0.10	0.11	0.34	0.47	0.83	0.77	0.86	1.12	0.86	***	***	0.30	0.53	0.23	0.32	0.36	0.40
25	0.43	0.47	0.56	0.44	0.44	0.64	0.49	0.51	0.40	***	0.95	0.90	1.14	1.01	0.95	0.99	0.91	***	***	0.47	0.46	0.49	0.60	0.73	0.67
26	0.54	0.73	1.00	0.69	0.79	0.75	0.72	0.78	0.54	0.58	1.04	0.99	1.05	0.94	1.10	0.90	0.76	0.63	***	0.46	0.42	0.37	0.34	0.33	0.72
27	0.39	0.38	0.26	0.18	0.10	0.06	0.11	0.21	0.15	0.26	0.28	0.53	0.79	0.90	0.96	0.99	0.79	0.81	***	0.60	***	0.27	0.18	0.18	0.43
28	0.19	0.19	0.23	0.03	0.04	0.01	0.01	0.04	0.02	0.21	0.44	0.61	0.67	0.82	1.10	0.89	***	***	0.49	0.28	0.14	0.60	0.13	0.18	0.33
29	0.20	0.14	0.06	0.09	0.10	0.01	0.01	0.01	0.16	0.25	0.20	0.34	0.72	0.87	0.90	0.88	0.96	0.99	***	***	***	0.37	0.11	0.09	0.36
30	0.41	0.27	0.21	0.19	0.13	0.07	0.04	0.21	0.21	0.26	0.34	0.66	0.96	0.96	0.89	0.97	1.06	0.83	***	***	0.45	0.20	0.49	0.35	0.46
HRAVE	0.50	0.48	0.44	0.39	0.39	0.29	0.22	0.25	0.23	0.38	0.59	0.76	0.83	0.91	0.93	0.87	0.72	0.64	0.39	0.43	0.52	0.56	0.52	0.49	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.55	0.51	0.54	0.51	0.42	0.56	0.56	0.42	0.56	0.52	0.59	0.51	0.50	0.67	0.69	0.64	0.62	0.58	0.48	0.70	0.46	0.46	0.49	0.40	0.67
MAX	1.13	1.12	1.19	1.27	0.76	1.28	1.04	0.83	1.03	0.85	1.16	1.07	1.04	1.13	1.03	1.03	1.24	1.21	1.04	1.26	0.93	0.77	0.91	1.12	1.14
MIN	0.18	0.02	0.29	0.01	0.02	0.06	0.12	0.09	0.09	0.16	0.02	0.11	0.12	0.16	0.16	0.19	0.01	0.10	0.01	0.29	0.06	0.13	0.03	0.09	0.40

DAY	26	27	28	29	30	31
AVE	0.72	0.43	0.33	0.36	0.46	***
MAX	1.10	0.99	1.10	0.99	1.06	***
MIN	0.33	0.06	0.01	0.01	0.04	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 91.2% OPERATIONAL RECOVERY RATE = 91.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
SEPTEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	0.61	0.48	0.38	0.65	0.46	0.48	0.40	0.28	0.08	0.65	0.76	0.79	0.92	1.28	0.97	0.65	***	***	***	0.62	0.52	0.30	0.42	0.58
2	***	0.31	0.47	0.40	0.44	0.32	0.11	0.02	***	0.21	0.36	1.00	0.77	0.62	1.08	1.09	0.89	0.44	***	0.49	***	0.76	0.49	0.50	0.54
3	0.44	0.36	0.36	0.55	0.51	***	0.53	0.33	0.44	0.45	0.62	0.63	0.51	0.71	1.13	0.67	***	0.77	***	0.71	0.61	0.67	0.71	0.60	0.59
4	0.42	0.26	0.21	***	0.06	0.09	0.01	0.04	0.23	0.53	0.56	1.24	1.22	1.07	0.95	0.62	***	0.46	0.30	0.40	0.41	0.77	0.57	0.53	0.50
5	0.75	0.65	0.59	0.37	0.22	0.48	0.36	0.16	0.01	***	***	***	0.55	0.49	0.61	0.55	0.26	0.07	0.28	0.55	0.78	0.65	0.78	0.61	0.47
6	0.72	0.51	0.45	0.30	0.25	0.29	0.17	0.30	0.47	0.33	0.35	0.69	0.97	1.23	1.05	1.22	0.99	0.99	***	***	***	***	***	***	0.45	0.62
7	0.39	0.35	0.42	0.42	0.41	0.61	0.11	0.16	0.29	0.60	0.42	0.65	0.87	1.00	0.96	0.90	***	***	***	***	***	***	***	0.79	0.55
8	0.54	0.92	0.53	0.37	0.49	0.21	0.32	0.36	0.14	0.43	0.42	0.29	0.18	***	0.54	0.78	0.34	***	0.05	***	0.81	0.48	0.61	0.60	0.45
9	0.57	***	***	0.52	0.34	0.25	0.08	0.12	0.24	0.44	0.66	0.81	0.65	1.00	0.84	***	***	***	***	***	***	***	0.71	0.70	0.53
10	0.56	0.62	0.73	0.51	0.54	***	0.57	0.24	***	***	0.37	0.66	0.77	0.72	***	0.85	0.57	0.41	0.37	0.40	0.62	0.52	0.62	0.53	0.56
11	0.65	0.54	0.40	0.25	0.30	0.10	0.01	0.33	0.12	0.55	0.82	0.67	0.85	1.03	1.10	1.16	0.91	***	***	***	***	***	0.68	0.48	0.58
12	0.55	0.56	0.33	0.16	0.11	0.17	0.36	0.41	0.48	0.31	0.34	0.80	1.06	1.07	1.05	***	***	0.68	0.59	0.18	0.59	0.60	0.52	0.62	0.52
13	0.26	0.13	0.28	0.29	0.34	0.10	0.62	0.10	0.20	0.34	0.67	0.79	1.03	1.03	1.02	***	***	***	***	***	0.55	0.62	0.60	0.55	0.50
14	0.55	0.74	0.62	0.65	0.58	***	***	0.66	0.51	0.66	1.01	1.06	1.10	0.93	0.97	1.09	***	***	0.33	0.24	0.45	0.83	1.09	0.83	0.75
15	0.79	0.61	0.67	0.61	0.75	0.67	0.36	0.19	0.57	0.73	0.90	0.78	0.95	***	***	0.86	0.50	0.56	***	0.66	0.84	0.86	0.91	0.97	0.70
16	0.97	0.77	0.64	0.69	0.76	0.36	0.19	0.20	0.32	0.58	0.73	1.01	0.94	1.02	1.01	***	***	***	***	***	***	0.40	0.54	0.79	0.66
17	0.66	0.72	0.54	0.50	0.44	0.31	0.01	0.10	0.16	0.46	1.16	1.18	***	1.20	1.32	0.90	0.81	***	***	***	***	0.60	0.63	0.49	0.64
18	0.49	0.40	0.33	0.37	0.24	0.17	0.16	0.43	0.13	0.25	0.69	1.21	1.18	1.00	0.94	0.93	1.02	***	***	***	***	***	0.58	0.41	0.58
19	0.70	0.49	0.31	0.34	0.36	0.18	0.01	0.01	0.07	0.38	0.61	0.65	0.84	0.72	1.05	***	***	***	***	***	0.28	0.48	0.60	0.87	0.47
20	0.68	0.40	***	0.54	***	0.59	0.72	***	0.67	0.77	1.11	1.29	1.04	1.10	1.47	1.22	0.80	0.64	***	***	0.32	0.56	0.57	0.58	0.79
21	0.63	0.70	0.68	0.50	***	0.41	0.14	0.16	0.05	***	***	***	***	***	***	***	***	***	***	0.56	0.62	0.60	0.25	0.49	0.45
22	0.61	0.53	0.72	0.73	***	0.35	0.32	***	0.34	0.56	0.38	0.33	0.45	0.74	0.39	0.10	0.61	0.19	0.13	0.60	0.62	0.62	***	0.43	0.46
23	0.29	0.52	0.58	0.45	0.47	0.51	0.18	0.03	0.11	0.24	0.54	0.85	0.93	0.87	0.75	0.84	0.77	***	***	***	***	***	0.65	0.30	0.52
24	0.30	0.21	0.29	0.54	0.30	0.10	0.08	0.29	0.05	0.15	0.36	0.49	0.85	0.69	0.87	1.06	***	***	***	0.29	0.48	0.21	0.29	0.33	0.39
25	0.30	0.47	0.54	0.47	***	0.68	0.48	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.49
26	***	***	1.00	0.70	0.82	0.82	0.73	0.74	0.52	0.56	1.08	1.14	1.13	1.04	1.18	0.85	0.83	0.86	***	0.55	0.47	***	0.37	0.35	0.79
27	0.37	0.38	0.22	0.24	0.09	0.07	0.07	0.22	0.23	0.23	0.42	0.58	0.85	0.86	***	1.04	0.86	***	***	***	0.20	0.17	0.23	0.39
28	0.21	0.16	0.23	0.05	0.08	0.01	0.01	0.04	0.06	0.19	0.45	0.56	0.69	0.89	0.98	0.93	***	***	***	***	***	0.60	0.11	0.18	0.34
29	0.21	0.14	0.06	0.23	0.13	0.01	0.01	0.01	0.12	0.23	0.22	0.54	0.81	0.90	0.97	0.88	1.01	***	***	***	***	***	0.12	0.09	0.35
30	0.36	0.23	0.26	0.22	0.16	0.02	0.07	0.19	0.28	0.27	0.33	0.62	0.96	1.05	***	1.10	1.10	0.83	***	***	0.45	0.19	0.52	0.36	0.46
HRAVE	0.52	0.47	0.46	0.43	0.38	0.31	0.25	0.23	0.26	0.41	0.60	0.79	0.85	0.92	0.98	0.90	0.76	0.57	0.29	0.47	0.56	0.56	0.54	0.52	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.58	0.54	0.59	0.50	0.47	0.62	0.55	0.45	0.53	0.56	0.58	0.52	0.50	0.75	0.70	0.66	0.64	0.58	0.47	0.79	0.45	0.46	0.52	0.39	0.49
MAX	1.28	1.09	1.13	1.24	0.78	1.23	1.00	0.92	1.00	0.85	1.16	1.07	1.03	1.10	0.97	1.02	1.32	1.21	1.05	1.47	0.70	0.74	0.93	1.06	0.68
MIN	0.08	0.02	0.33	0.01	0.01	0.17	0.11	0.05	0.08	0.24	0.01	0.11	0.10	0.24	0.19	0.19	0.01	0.13	0.01	0.32	0.05	0.10	0.03	0.05	0.30

DAY	26	27	28	29	30	31
AVE	0.79	0.39	0.34	0.35	0.46	***
MAX	1.18	1.04	0.98	1.01	1.10	***
MIN	0.35	0.07	0.01	0.01	0.02	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 79.0% OPERATIONAL RECOVERY RATE = 79.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
OCTOBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	3.8	3.6	2.8	3.3	3.5	4.5	4.7	4.8	2.9	2.2	2.3	2.5	3.1	4.0	3.6	4.4	4.5	5.7	5.0	4.6	4.7	2.6	3.6	3.2	3.7
2	4.5	3.3	2.3	3.1	3.9	5.8	5.5	4.9	3.2	2.9	3.5	4.0	5.8	5.0	6.0	7.7	8.0	7.4	5.5	5.4	4.2	3.5	3.6	2.7	4.7
3	2.4	1.1	1.7	2.5	2.8	3.4	3.8	3.5	2.8	2.5	3.5	4.1	4.5	7.0	6.9	6.8	7.4	5.6	5.1	4.7	3.9	3.5	3.4	3.8	4.0
4	4.7	5.5	4.2	4.2	4.1	3.0	3.2	3.5	3.7	4.3	7.7	6.9	6.4	5.4	5.0	4.9	4.6	3.5	4.7	4.1	3.0	3.0	3.0	4.1	4.4
5	5.4	5.7	4.8	4.2	2.7	3.3	3.2	2.7	3.0	2.5	3.0	5.8	4.4	5.1	8.3	9.5	9.1	***	9.6	***	4.6	4.1	2.9	2.9	4.9
6	4.5	2.8	2.8	3.8	6.0	3.8	2.4	1.5	2.5	3.8	3.8	3.6	3.5	4.9	2.7	2.8	3.7	6.4	4.2	2.2	1.9	2.5	3.4	3.8	3.5
7	2.1	1.1	2.0	3.0	3.0	5.3	2.7	3.3	2.0	***	2.5	2.5	4.0	3.1	3.4	3.3	3.2	2.5	***	***	4.8	1.8	4.2	1.6	2.9
8	3.0	4.5	5.7	4.8	3.6	4.2	4.0	3.7	3.2	3.1	3.0	3.0	3.6	4.0	4.0	4.7	4.8	3.8	***	***	2.9	1.9	2.8	3.6	3.7
9	4.0	3.7	3.3	3.4	3.7	4.6	5.5	3.9	3.4	4.0	6.9	8.2	9.2	8.6	8.9	9.5	***	***	***	6.9	4.5	5.0	6.8	7.5	5.8
10	6.4	7.9	8.1	6.2	7.4	8.0	8.1	8.4	8.3	8.3	7.0	6.8	6.6	6.5	4.9	4.6	4.5	4.3	5.1	5.3	5.1	6.2	5.3	4.3	6.4
11	3.9	3.7	3.8	3.4	3.4	3.4	3.3	2.8	3.0	2.3	2.1	2.4	4.2	4.3	4.2	4.9	5.3	6.2	5.7	5.9	5.8	3.3	1.9	2.5	3.8
12	3.3	3.5	2.7	2.5	3.2	3.2	3.7	2.9	2.7	2.8	2.4	3.3	4.5	6.0	6.3	6.0	5.9	6.3	6.9	5.3	4.0	1.5	1.8	2.7	3.9
13	3.2	3.6	3.9	3.5	3.2	3.4	2.7	3.3	3.2	2.2	3.2	3.9	4.4	5.2	5.6	6.1	5.6	5.7	5.7	5.1	3.8	2.7	1.8	2.5	3.9
14	3.8	4.5	4.2	3.7	5.1	4.6	3.8	3.5	3.2	2.6	2.4	2.8	3.5	3.6	3.3	3.2	3.0	3.1	***	4.6	3.2	2.4	2.6	3.1	3.5
15	4.0	3.9	4.5	3.9	3.3	3.2	3.9	3.5	3.6	3.1	2.3	2.5	3.8	4.1	4.1	3.6	4.0	6.1	5.3	4.6	6.3	5.6	4.8	3.4	4.1
16	2.9	3.5	3.0	2.4	4.0	3.7	4.3	3.8	3.6	2.9	3.5	4.2	3.8	7.3	10.0	8.7	***	4.6	8.0	3.9	4.1	5.7	9.4	7.0	5.0
17	4.6	5.4	***	***	7.2	7.8	***	***	7.4	6.6	7.5	***	6.9	7.3	8.4	8.8	***	***	7.1	6.8	8.0	5.9	5.0	3.2	6.7
18	5.4	8.3	8.4	6.3	4.6	5.4	7.1	6.4	5.6	6.0	4.0	3.5	3.3	3.7	4.5	4.0	3.1	4.6	4.2	3.7	4.5	3.5	4.2	4.6	5.0
19	3.6	2.1	2.1	1.5	3.1	3.6	3.2	2.4	2.2	1.9	1.6	3.0	3.6	4.2	5.8	6.7	6.9	6.1	6.7	4.4	2.1	1.4	2.0	2.6	3.4
20	3.5	2.9	2.0	2.5	2.4	2.0	1.9	1.6	3.2	4.9	5.1	4.4	2.8	7.4	7.0	5.8	***	6.0	2.9	3.7	4.6	2.5	4.6	3.2	3.8
21	4.3	4.4	5.2	5.3	5.8	5.7	***	***	2.7	2.9	2.7	2.9	2.7	2.7	1.3	2.4	2.8	3.0	2.9	3.3	1.6	2.1	1.7	1.7	3.2
22	1.9	2.5	2.4	2.4	3.0	2.7	2.8	2.7	2.6	2.5	2.0	3.1	4.5	5.4	5.0	5.4	5.4	5.0	3.3	3.8	3.4	2.2	2.2	2.3	3.3
23	2.6	3.6	3.8	3.8	3.1	3.3	3.1	3.0	3.1	2.2	2.1	2.9	3.8	4.4	4.2	4.6	5.2	***	***	5.7	3.1	2.5	2.1	2.5	3.4
24	3.1	3.9	4.9	4.5	4.4	5.2	4.6	4.5	4.3	4.2	5.0	5.2	5.4	6.2	6.0	7.2	7.2	6.1	6.7	4.8	3.9	4.4	6.5	7.8	5.3
25	9.2	10.4	8.3	9.4	7.9	9.0	10.6	***	***	***	***	7.9	7.4	7.5	***	6.4	6.2	8.0	7.7	7.4	6.9	7.1	6.9	6.8	7.9
26	6.1	6.3	6.5	6.5	6.5	6.2	6.7	6.7	7.1	5.8	5.3	4.7	4.1	3.8	3.2	3.6	3.9	4.2	3.9	4.5	4.2	3.0	2.0	2.1	4.9
27	3.3	3.4	3.7	4.1	2.9	3.5	3.7	2.7	3.0	2.5	1.9	2.5	3.0	4.6	4.5	5.7	***	5.2	2.4	2.0	1.6	0.9	2.5	3.2	3.2
28	3.9	4.0	4.6	4.4	3.8	4.0	3.6	3.0	2.9	2.3	2.5	2.1	2.6	2.2	2.2	2.9	2.1	***	***	1.9	2.8	3.2	3.9	5.2	3.2
29	5.1	3.3	2.8	3.3	3.1	2.1	1.3	4.0	3.0	4.9	6.5	8.6	6.7	6.4	5.9	3.8	3.6	3.5	4.7	4.7	4.4	4.2	4.6	5.9	4.4
30	4.4	2.2	3.4	2.2	3.4	2.6	3.5	3.5	3.0	2.7	3.0	3.3	3.9	4.3	5.9	5.6	5.4	5.2	3.0	1.5	1.0	2.2	2.7	2.2	3.3
31	2.2	2.4	2.1	2.5	2.3	2.3	3.0	2.6	2.5	1.5	1.6	2.3	3.0	3.3	3.5	4.1	4.7	6.0	5.6	3.9	2.2	1.3	3.2	3.7	3.0
HRAVE	4.0	4.1	4.0	3.9	4.1	4.3	4.1	3.7	3.6	3.5	3.7	4.1	4.5	5.1	5.2	5.4	5.0	5.2	5.3	4.5	3.9	3.3	3.7	3.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.7	4.7	4.0	4.4	4.9	3.5	2.9	3.7	5.8	6.4	3.8	3.9	3.9	3.5	4.1	5.0	6.7	5.0	3.4	3.8	3.2	3.3	3.4	5.3	7.9
MAX	5.7	8.0	7.4	7.7	9.6	6.4	5.3	5.7	9.5	8.4	6.2	6.9	6.1	5.1	6.3	10.0	8.8	8.4	6.9	7.4	5.8	5.4	5.7	7.8	10.6
MIN	2.2	2.3	1.1	3.0	2.5	1.5	1.1	1.9	3.3	4.3	1.9	1.5	1.8	2.4	2.3	2.4	3.2	3.1	1.4	1.6	1.3	1.9	2.1	3.1	6.2

DAY	26	27	28	29	30	31
AVE	4.9	3.2	3.2	4.4	3.3	3.0
MAX	7.1	5.7	5.2	8.6	5.9	6.0
MIN	2.0	0.9	1.9	1.3	1.0	1.3

MONTHLY AVERAGE = 4.2 MONTHLY MAXIMUM = 10.6 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.7% OPERATIONAL RECOVERY RATE = 95.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.3	3.5	3.2	2.9	3.0	3.2	2.4	2.6	2.5	2.1	2.9	2.8	4.8	4.7	4.4	3.7	5.1	6.0	5.2	5.8	3.9	3.5	2.8	3.5	3.7
2	4.8	3.7	2.4	2.5	3.5	4.9	5.4	4.8	2.7	4.5	4.3	3.7	5.5	6.3	4.6	5.9	9.7	8.4	5.8	5.8	4.1	3.5	4.0	3.8	4.8
3	2.9	2.1	2.8	1.6	1.9	3.1	3.2	3.0	2.5	2.6	3.7	5.7	5.2	5.6	5.7	6.0	6.3	6.3	6.5	4.9	5.0	5.0	5.9	6.5	4.3
4	5.5	6.3	5.9	5.1	3.6	3.1	3.8	4.9	5.9	5.3	8.3	9.0	6.5	7.3	3.8	4.7	5.7	3.4	4.8	4.8	5.1	2.9	4.7	3.8	5.2
5	4.8	5.3	4.7	3.9	2.4	4.2	4.0	3.1	3.5	3.3	3.6	5.5	6.3	4.8	10.1	11.1	8.0	***	10.5	***	3.8	3.0	3.5	5.4	5.2
6	3.9	3.9	2.7	2.9	4.3	3.8	2.2	1.9	2.4	3.2	4.5	4.2	2.5	6.2	3.3	2.8	3.5	5.7	3.6	2.7	3.5	3.6	2.9	3.1	3.5
7	4.4	3.5	4.2	3.9	2.8	4.8	2.7	2.9	3.1	***	3.1	3.3	4.1	3.3	3.5	3.0	3.6	2.3	***	***	4.3	5.4	6.5	3.4	3.7
8	3.0	2.9	5.7	4.8	3.7	3.4	2.9	2.8	3.5	3.3	3.4	3.5	3.5	4.2	4.3	4.9	5.1	5.2	***	***	3.4	2.6	2.8	4.2	3.8
9	4.6	3.9	3.6	4.5	5.2	5.4	6.5	3.7	4.2	4.9	9.9	7.7	8.5	8.8	9.6	11.1	***	***	***	7.9	5.6	5.5	7.3	9.1	6.5
10	7.7	7.6	8.3	7.9	7.9	8.3	9.0	7.7	9.4	7.9	10.3	7.3	8.8	6.5	6.3	6.6	5.8	5.6	5.9	6.3	5.0	5.4	3.3	4.2	7.0
11	3.4	4.6	4.2	3.5	3.2	2.6	2.3	3.1	3.8	3.1	2.0	2.1	4.2	5.0	5.0	5.2	6.3	8.0	6.5	5.8	5.8	4.9	3.4	4.3	4.3
12	3.4	2.8	3.0	2.6	3.3	2.8	3.2	3.4	2.7	2.3	2.1	3.7	4.4	4.4	6.3	7.4	6.1	7.0	7.2	5.3	4.7	3.0	6.4	4.6	4.3
13	4.5	3.8	3.1	3.2	2.0	2.6	2.4	2.8	2.4	2.3	2.5	2.6	4.3	5.0	6.0	5.0	6.1	5.3	6.7	5.8	4.5	3.9	3.0	3.0	3.9
14	2.8	3.1	3.8	2.8	3.1	2.7	2.3	2.6	2.7	2.6	2.1	2.1	3.1	3.7	3.5	3.3	3.0	2.3	***	4.3	2.9	2.7	2.4	2.5	2.9
15	3.2	3.4	3.9	3.9	2.9	4.0	4.0	3.7	3.3	4.1	2.0	2.1	4.2	3.9	3.8	3.7	4.8	6.8	6.2	6.1	5.9	8.2	6.1	4.3	4.4
16	3.5	3.8	3.1	3.5	4.2	3.9	5.1	5.0	3.8	3.9	5.1	5.6	4.6	6.4	9.3	8.3	***	4.0	6.4	3.0	4.2	6.3	10.4	9.3	5.3
17	4.8	6.3	***	***	8.6	8.2	***	***	10.8	7.2	7.0	***	7.4	8.2	8.5	9.8	***	***	7.8	8.5	8.9	6.4	4.5	4.3	7.5
18	4.7	8.8	8.0	7.9	5.2	5.7	7.5	6.7	6.8	9.2	4.6	3.1	2.6	3.9	4.4	3.7	3.3	3.8	4.4	3.7	4.0	4.8	4.4	3.8	5.2
19	3.9	2.5	2.0	1.9	2.8	3.1	2.9	2.3	1.9	1.9	2.0	2.1	3.4	4.8	5.6	5.8	7.4	7.0	8.8	5.8	2.9	4.8	3.0	4.1	3.9
20	3.4	2.2	3.3	3.1	3.8	3.2	2.3	2.9	3.7	5.0	5.6	5.4	4.7	6.6	6.0	7.5	***	6.3	3.8	5.4	6.2	3.2	5.7	3.5	4.5
21	5.5	5.3	6.2	6.6	7.2	5.5	***	***	3.0	3.3	3.4	3.1	3.0	2.6	1.5	1.9	3.2	2.3	4.8	4.9	3.5	3.8	1.8	1.7	3.8
22	1.8	2.6	2.1	2.2	3.3	2.9	2.5	2.0	2.0	2.3	2.4	2.0	5.0	6.1	5.7	4.8	6.1	3.7	3.8	3.9	4.1	2.5	1.7	1.6	3.2
23	2.2	2.8	3.9	3.2	2.7	2.5	2.4	1.9	2.0	1.8	2.4	1.1	2.8	3.9	4.5	4.7	4.8	***	***	6.4	4.8	2.9	1.3	2.2	3.0
24	3.7	5.0	5.8	5.8	5.1	5.6	5.3	4.6	5.3	6.0	6.5	6.6	6.8	7.7	7.0	9.1	7.6	7.9	7.5	5.3	4.6	5.3	7.3	8.0	6.2
25	9.8	13.8	9.2	10.7	9.4	11.9	12.0	***	***	***	***	7.0	8.4	9.4	***	7.0	7.6	7.7	7.7	9.6	7.0	8.0	6.6	7.1	8.9
26	7.5	6.8	7.3	7.5	7.1	6.8	7.4	7.5	8.2	6.2	4.8	4.0	3.8	3.9	3.7	4.3	4.3	4.4	4.4	4.7	4.8	2.9	2.5	1.8	5.3
27	1.0	3.0	4.6	4.3	2.6	2.8	2.6	2.2	2.0	2.4	2.7	2.2	2.7	4.7	4.1	4.2	***	4.6	2.3	2.2	2.1	1.7	1.8	2.6	2.8
28	3.3	4.4	5.3	3.9	2.5	2.9	2.8	2.2	3.1	1.7	2.3	1.9	2.3	2.2	2.9	3.8	2.5	***	***	2.3	2.6	2.8	3.8	4.9	3.0
29	5.1	3.1	2.7	3.0	2.9	2.6	2.0	3.2	3.6	3.7	7.1	8.1	7.8	6.4	8.9	2.1	4.1	5.4	6.6	6.2	5.2	5.9	3.5	6.5	4.8
30	5.6	1.9	2.8	2.3	3.2	3.3	4.0	2.7	2.8	2.7	3.1	2.8	3.2	4.2	5.6	7.2	4.1	5.8	2.5	2.4	2.5	2.0	1.5	1.3	3.3
31	1.3	1.1	1.0	0.9	1.5	2.1	2.0	1.9	2.3	1.5	0.9	1.2	2.8	2.8	3.8	5.1	4.6	6.1	6.6	3.9	3.4	2.7	2.2	4.0	2.7
HRAVE	4.2	4.3	4.3	4.1	4.0	4.3	4.0	3.5	3.9	3.8	4.2	4.0	4.8	5.3	5.4	5.6	5.3	5.4	5.9	5.1	4.5	4.2	4.1	4.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.7	4.8	4.3	5.2	5.2	3.5	3.7	3.8	6.5	7.0	4.3	4.3	3.9	2.9	4.4	5.3	7.5	5.2	3.9	4.5	3.8	3.2	3.0	6.2	8.9
MAX	6.0	9.7	6.5	9.0	11.1	6.2	6.5	5.7	11.1	10.3	8.0	7.4	6.7	4.3	8.2	10.4	10.8	9.2	8.8	7.5	7.2	6.1	6.4	9.1	13.8
MIN	2.1	2.4	1.6	2.9	2.4	1.9	2.3	2.6	3.6	3.3	2.0	2.1	2.0	2.1	2.0	3.0	4.3	2.6	1.9	2.2	1.5	1.6	1.1	3.7	6.6

DAY	26	27	28	29	30	31
AVE	5.3	2.8	3.0	4.8	3.3	2.7
MAX	8.2	4.7	5.3	8.9	7.2	6.6
MIN	1.8	1.0	1.7	2.0	1.3	0.9

MONTHLY AVERAGE = 4.5 MONTHLY MAXIMUM = 13.8 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.7% OPERATIONAL RECOVERY RATE = 95.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.3	2.6	3.4	3.0	3.1	3.5	2.4	1.9	2.5	2.3	3.0	2.0	4.9	5.1	8.0	3.6	4.9	***	5.0	8.9	***	4.2	3.2	2.7	3.8
2	5.8	4.5	2.3	2.1	4.2	4.0	5.9	4.6	2.6	5.2	3.6	3.2	4.9	6.1	6.0	5.1	***	***	***	5.7	***	***	4.4	3.9	4.4
3	3.2	1.7	3.2	1.4	2.0	2.8	3.3	3.0	3.2	3.8	2.8	7.0	4.7	5.0	6.1	5.2	6.1	***	***	5.2	4.6	5.5	4.7	6.7	4.1
4	6.7	5.9	5.9	5.9	4.7	2.7	3.2	5.6	6.9	5.4	7.4	9.9	6.5	7.7	4.4	5.4	5.9	3.2	4.5	4.3	5.8	4.2	5.1	6.5	5.6
5	5.0	***	***	4.2	1.8	4.1	4.2	3.2	4.1	3.2	4.5	6.8	7.8	4.8	9.9	11.1	***	***	12.8	***	4.3	3.0	4.1	5.8	5.5
6	4.7	3.3	3.5	3.3	3.8	3.1	***	2.0	1.9	2.0	4.8	3.0	2.8	5.7	3.2	2.7	2.7	***	4.9	4.0	4.8	3.5	4.2	5.0	3.6
7	3.5	3.6	4.5	5.9	5.8	***	2.9	3.4	3.5	***	3.5	3.2	4.5	4.4	3.3	3.0	3.3	2.5	***	***	***	5.8	6.5	4.7	4.1
8	3.3	2.3	4.2	4.7	4.7	4.0	3.4	2.7	3.0	4.0	4.3	4.0	3.8	3.7	4.8	4.7	5.2	5.5	***	***	3.1	2.8	3.1	4.3	3.9
9	3.7	4.4	3.7	4.8	5.9	6.1	6.8	4.6	4.3	5.5	11.5	7.9	9.4	***	***	***	***	***	***	***	5.3	4.7	7.2	10.2	6.2
10	8.1	***	***	***	***	8.6	***	***	***	***	10.6	7.1	8.6	6.4	5.7	5.7	5.8	***	***	***	5.1	6.0	4.2	5.3	6.7
11	4.7	4.4	4.1	3.9	3.4	2.6	2.4	3.0	3.4	2.9	1.6	4.0	3.2	4.7	5.3	5.6	6.5	6.9	***	***	***	4.2	2.6	6.1	4.1
12	5.3	3.3	2.5	3.0	2.9	2.5	2.8	3.2	2.2	2.6	2.6	3.8	4.9	4.5	5.6	6.6	6.2	***	***	***	3.8	3.8	5.6	3.6	3.9
13	4.7	4.2	2.9	3.4	2.1	2.2	2.8	2.6	2.8	3.1	2.6	2.6	5.0	5.5	6.6	5.6	5.8	***	***	***	***	5.3	4.2	4.7	3.9
14	2.3	4.0	3.6	4.6	3.2	2.2	2.0	3.0	2.8	1.3	2.3	2.6	3.8	3.9	3.5	3.6	3.4	***	***	***	***	3.1	2.3	3.6	3.1
15	4.4	3.3	4.6	4.1	3.9	3.4	4.3	4.0	3.3	4.5	3.1	1.9	3.9	4.8	***	***	6.9	7.2	5.4	5.0	6.3	9.0	7.3	5.3	4.8
16	4.4	3.7	3.6	3.2	4.3	3.9	4.9	5.7	3.4	4.4	5.3	5.3	4.6	7.2	***	***	***	3.7	***	2.7	5.4	5.7	10.4	8.3	5.0
17	5.5	8.4	***	***	***	***	***	***	***	***	7.9	***	7.0	9.0	***	***	***	***	***	***	9.2	6.2	5.3	3.5	6.9
18	6.2	9.7	8.3	9.7	5.4	5.5	7.2	6.3	7.2	9.6	4.6	2.9	2.2	3.5	4.4	4.0	3.4	3.0	4.2	3.8	4.1	5.5	4.4	3.9	5.4
19	3.8	3.0	2.4	2.9	3.4	3.4	2.4	2.1	2.0	2.0	2.6	2.7	3.3	5.1	4.6	4.7	***	***	***	***	2.8	3.4	3.7	4.6	3.2
20	4.1	3.7	2.3	4.1	4.4	5.5	2.9	3.1	3.5	4.9	4.7	4.8	4.9	***	***	***	***	***	4.5	***	6.2	4.7	6.0	2.4	4.3
21	5.7	6.5	4.7	7.0	7.4	6.4	***	***	***	3.9	3.7	3.8	3.7	2.7	2.4	2.6	2.8	***	5.3	5.2	6.3	5.1	2.1	1.6	4.4
22	1.9	2.7	1.8	2.9	3.3	2.7	3.0	2.2	2.4	2.5	2.9	2.5	5.7	5.8	5.8	5.6	6.1	6.4	***	***	4.3	2.7	2.3	1.0	3.5
23	2.0	2.8	4.1	2.9	2.6	2.8	3.0	2.0	2.4	1.4	1.6	2.0	2.4	3.9	4.7	4.8	3.3	***	***	***	4.8	3.0	2.5	3.7	3.0
24	4.1	4.3	6.2	5.7	5.8	5.5	4.8	4.9	5.4	6.0	6.5	7.4	6.9	7.9	6.8	9.6	7.9	***	7.9	5.5	4.3	4.8	6.7	***	6.1
25	***	***	***	11.4	***	***	***	***	***	***	***	***	***	***	***	6.8	***	***	***	***	***	***	5.8	***	8.0
26	7.4	6.8	7.2	7.3	7.0	7.2	7.0	7.5	8.1	5.4	4.2	4.1	4.1	4.1	5.0	5.0	4.3	***	***	***	4.7	2.6	2.5	1.6	5.4
27	0.8	3.1	4.2	4.1	2.9	3.3	2.9	1.7	1.9	2.0	3.9	3.4	2.8	4.3	3.2	3.6	***	***	***	2.8	2.0	3.9	1.8	3.2	2.9
28	4.4	4.6	5.9	6.5	2.8	3.0	3.0	3.1	2.7	2.4	2.3	2.2	2.9	2.5	3.4	7.0	3.2	***	***	2.5	2.7	3.0	5.1	4.6	3.6
29	4.9	3.2	2.5	3.2	4.4	3.5	3.0	3.4	4.0	3.5	7.2	***	8.5	6.2	***	***	4.2	5.9	6.2	6.1	5.7	5.9	3.3	6.7	4.8
30	6.4	2.9	2.6	2.0	2.7	***	4.3	***	***	2.6	3.2	2.3	2.5	4.7	6.1	6.9	4.9	***	2.4	4.1	3.0	2.3	2.7	0.9	3.5
31	1.6	2.3	2.6	1.2	2.3	2.5	2.9	2.7	2.9	1.9	0.9	2.0	3.5	5.6	4.2	5.4	***	***	***	3.4	4.1	3.2	2.3	4.7	3.0
HRAVE	4.4	4.1	4.0	4.4	3.9	4.0	3.7	3.5	3.5	3.6	4.3	4.1	4.8	5.2	5.1	5.3	4.9	4.9	5.7	4.6	4.7	4.4	4.4	4.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.8	4.4	4.1	5.6	5.5	3.6	4.1	3.9	6.2	6.7	4.1	3.9	3.9	3.1	4.8	5.0	6.9	5.4	3.2	4.3	4.4	3.5	3.0	6.1	8.0
MAX	8.9	6.1	7.0	9.9	12.8	5.7	6.5	5.5	11.5	10.6	6.9	6.6	6.6	4.6	9.0	10.4	9.2	9.7	5.1	6.2	7.4	6.4	4.8	9.6	11.4
MIN	1.9	2.1	1.4	2.7	1.8	1.9	2.5	2.3	3.7	4.2	1.6	2.2	2.1	1.3	1.9	2.7	3.5	2.2	2.0	2.3	1.6	1.0	1.4	4.1	5.8

DAY	26	27	28	29	30	31
AVE	5.4	2.9	3.6	4.8	3.5	3.0
MAX	8.1	4.3	7.0	8.5	6.9	5.6
MIN	1.6	0.8	2.2	2.5	0.9	0.9

MONTHLY AVERAGE = 4.4 MONTHLY MAXIMUM = 12.8 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.7% OPERATIONAL RECOVERY RATE = 81.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	100	103	91	99	107	133	148	149	136	98	127	164	146	279	268	271	266	250	282	275	328	338	159	139	278
2	155	126	99	98	145	151	136	119	100	119	167	250	282	276	257	270	287	287	282	279	284	281	279	289	125
3	308	229	150	105	98	99	109	108	96	91	148	143	213	238	252	270	271	278	271	268	258	258	204	204	204
4	239	217	229	203	166	113	93	101	106	159	160	158	167	178	175	178	171	217	193	247	251	168	172	248	317
5	314	306	292	297	332	71	32	354	95	156	160	282	274	280	249	240	251	***	263	***	316	281	353	285	277
6	285	271	274	301	314	286	303	355	95	295	104	194	283	281	257	168	262	288	318	302	77	125	103	82	143
7	61	346	77	92	84	301	331	211	160	***	75	21	79	85	88	149	191	269	***	***	326	91	258	65	34
8	115	137	150	152	129	143	149	139	132	143	111	147	176	250	267	265	273	279	***	***	289	199	82	91	84
9	108	112	106	88	93	78	76	81	88	93	96	97	91	97	94	104	***	***	***	96	110	123	106	95	164
10	80	77	81	86	88	85	82	82	87	84	92	90	87	97	90	5	12	9	31	35	47	56	51	74	110
11	97	98	110	126	134	131	128	102	95	128	140	164	185	269	269	266	272	275	283	285	286	286	344	101	306
12	110	120	90	85	117	149	126	100	99	101	76	276	283	284	276	280	276	270	286	290	308	328	108	95	197
13	103	104	117	118	113	104	95	107	118	107	193	269	270	275	272	270	271	276	282	287	283	286	16	95	132
14	109	115	117	132	150	149	152	145	142	111	141	143	263	265	265	263	274	275	***	294	300	12	99	98	96
15	105	109	138	133	99	91	107	134	107	97	158	227	284	277	283	273	237	167	94	86	127	132	125	118	199
16	111	95	130	128	109	107	110	96	113	111	93	111	147	100	92	90	***	282	294	316	81	116	150	131	82
17	118	136	***	***	91	92	***	***	75	96	118	***	67	67	82	81	***	***	84	87	107	276	252	102	122
18	70	55	61	101	103	84	88	90	84	103	118	174	174	131	152	166	179	297	2	73	82	71	77	71	304
19	64	27	69	47	74	77	91	93	105	96	314	298	271	275	279	287	295	297	290	271	293	307	68	98	183
20	138	112	44	352	3	56	86	17	310	284	284	302	312	251	260	250	***	297	298	84	78	58	44	351	207
21	74	73	68	59	61	74	***	***	105	95	80	33	328	334	171	244	275	278	271	329	32	78	70	9	242
22	59	96	97	86	100	96	95	100	97	95	242	273	278	281	282	280	281	280	285	283	298	340	83	87	312
23	85	103	106	122	117	110	134	145	152	117	150	263	274	277	274	271	276	***	***	293	341	331	59	114	2
24	102	81	79	93	100	118	103	125	83	73	66	77	79	79	94	104	81	83	87	89	83	85	84	91	17
25	73	90	78	78	77	79	80	***	***	***	***	79	69	69	***	62	32	45	58	63	67	70	69	68	205
26	65	67	67	67	66	64	66	67	68	70	69	69	79	82	103	269	273	271	275	290	286	286	329	87	31
27	104	107	112	114	105	116	134	127	132	87	96	176	264	281	276	274	***	276	289	324	90	119	103	109	186
28	125	105	134	147	127	141	133	122	149	139	93	75	94	119	170	52	287	***	***	39	81	88	102	128	219
29	117	103	89	80	79	313	138	322	31	70	65	61	62	68	72	23	50	88	111	126	110	39	57	65	142
30	92	91	69	44	84	72	79	82	79	79	89	132	222	271	282	284	288	299	314	302	178	138	109	100	221
31	91	102	112	104	87	94	118	152	140	70	161	232	266	270	269	264	269	285	289	282	289	101	104	114	173

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.7% OPERATIONAL RECOVERY RATE = 95.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	100	106	102	95	128	111	94	106	151	115	98	103	142	292	285	255	261	250	286	272	348	342	184	161	347
2	180	163	155	94	157	156	143	121	93	131	173	258	294	287	264	272	280	284	281	277	281	277	268	281	116
3	304	318	310	171	87	105	114	113	96	109	160	132	124	207	269	283	267	273	256	259	236	249	240	236	346
4	228	211	214	186	159	109	105	135	154	144	154	144	148	147	173	163	165	219	196	227	233	81	172	279	322
5	343	301	286	331	70	73	43	114	101	128	161	237	236	280	241	243	261	***	256	***	264	305	157	285	42
6	273	158	133	44	307	263	306	349	27	249	108	178	342	293	249	184	255	280	332	315	199	185	142	34	4
7	78	153	269	90	331	301	33	208	156	***	58	36	79	70	84	135	179	278	***	***	351	124	179	121	327
8	97	104	157	151	140	134	132	125	87	83	81	106	156	294	312	273	282	295	***	***	304	280	189	82	156
9	99	89	79	77	88	77	74	92	95	108	90	87	90	91	83	103	***	***	***	100	101	107	97	101	247
10	93	89	84	96	91	87	80	85	90	81	85	82	85	89	85	67	27	27	27	63	36	49	101	92	348
11	86	79	78	90	98	93	87	83	74	77	104	137	171	282	275	268	267	263	273	282	283	294	315	84	70
12	96	114	97	81	85	142	144	125	103	105	38	298	293	279	283	282	271	269	292	291	314	3	168	104	27
13	81	106	136	112	130	123	163	137	124	148	12	265	280	277	275	283	270	276	284	287	287	9	293	95	110
14	108	112	126	122	124	102	95	90	92	82	186	100	154	277	274	262	287	291	***	306	318	346	79	102	31
15	93	96	125	158	96	75	87	78	81	75	85	309	280	272	280	270	214	155	123	97	137	147	147	118	69
16	139	95	104	152	120	117	120	99	107	95	79	103	110	105	80	80	***	279	291	35	92	113	147	139	326
17	122	153	***	***	102	90	***	***	78	102	116	***	80	67	82	81	***	***	82	96	118	281	264	122	299
18	70	57	66	106	98	85	90	102	82	89	100	133	147	103	118	148	182	280	50	83	99	91	104	91	315
19	80	84	94	53	71	77	84	79	82	87	92	214	283	273	287	300	297	296	295	275	162	79	57	241	187
20	119	170	158	85	194	265	297	320	313	277	274	282	271	255	258	251	***	309	343	103	76	74	40	19	192
21	62	75	28	62	70	78	***	***	112	97	85	23	6	6	252	283	340	296	226	76	57	76	53	18	186
22	358	78	78	93	105	100	129	139	98	47	325	289	282	279	280	303	268	271	280	289	309	333	49	75	108
23	68	104	97	96	108	118	88	113	104	89	63	66	300	290	272	272	270	***	***	290	339	285	342	76	243
24	75	68	66	76	80	83	82	80	78	61	53	66	87	81	81	91	68	78	84	90	103	90	71	93	17
25	82	91	89	89	76	83	83	***	***	***	***	61	68	67	***	59	33	54	59	64	72	76	82	77	264
26	74	69	73	72	68	69	72	73	72	71	77	81	62	72	85	289	270	268	281	285	285	311	309	345	42
27	49	110	121	135	129	134	117	83	88	92	97	166	226	272	264	299	***	277	284	310	337	340	109	101	302
28	120	116	143	133	96	85	103	118	142	122	60	84	143	96	116	81	321	***	***	106	85	86	109	139	345
29	117	109	91	84	89	146	183	323	50	77	72	60	70	78	95	106	51	84	109	135	130	24	47	67	312
30	81	141	71	46	73	72	56	76	84	70	88	127	244	269	279	280	311	295	317	312	327	33	99	6	279
31	81	163	158	101	11	99	88	19	82	53	97	40	211	252	283	273	270	282	291	292	302	342	69	102	210

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.7% OPERATIONAL RECOVERY RATE = 95.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	92	117	90	101	127	115	95	101	169	125	103	56	134	297	295	283	270	***	312	256	***	332	181	144	174
2	180	172	162	97	158	162	139	121	95	130	159	232	286	285	263	269	***	***	***	295	***	***	269	285	211
3	306	313	304	333	86	111	114	118	90	91	145	133	140	193	265	276	263	***	***	254	244	246	232	237	162
4	226	209	211	184	154	125	119	128	157	113	161	147	157	125	181	164	158	219	194	224	232	312	189	288	162
5	347	***	***	307	70	75	26	105	106	125	182	249	214	276	243	246	***	***	245	***	264	292	84	285	176
6	280	148	132	321	274	227	***	5	64	234	105	161	319	290	244	199	216	***	333	295	236	188	172	261	105
7	46	183	282	72	315	***	76	187	155	***	66	49	75	67	34	118	170	251	***	***	***	120	185	174	95
8	203	100	134	140	135	113	91	81	92	78	79	117	132	315	311	267	281	291	***	***	281	284	318	69	337
9	99	91	80	86	94	79	75	95	92	118	98	86	82	***	***	***	***	***	***	***	97	107	99	98	79
10	89	***	***	***	***	98	***	***	***	***	81	75	86	92	88	80	37	***	***	***	39	56	90	87	119
11	80	72	75	92	98	93	81	83	78	85	115	128	111	297	273	263	265	257	***	***	***	113	291	265	343
12	133	133	104	70	71	119	134	123	97	128	55	294	293	262	271	284	271	***	***	***	329	359	154	93	283
13	94	89	154	128	126	125	164	143	129	176	326	281	290	267	277	269	270	***	***	***	***	27	323	83	182
14	97	150	159	182	129	108	96	84	96	22	196	91	139	266	276	267	285	***	***	***	***	336	86	94	298
15	101	92	145	166	112	74	78	78	76	68	84	283	271	265	***	***	154	149	140	93	134	151	165	124	265
16	167	68	87	129	118	114	116	93	111	89	86	98	118	93	***	***	***	285	***	35	81	118	151	138	84
17	112	146	***	***	***	***	***	***	***	***	121	***	82	65	***	***	***	***	***	***	125	283	352	105	187
18	82	52	64	110	90	82	96	103	79	92	99	137	124	111	116	147	187	267	49	84	92	90	109	83	340
19	78	96	171	95	52	82	85	83	77	99	91	156	311	277	283	291	***	***	***	***	152	59	33	268	279
20	130	171	149	158	164	278	282	306	319	270	280	282	271	***	***	***	***	***	11	***	66	6	38	67	129
21	34	72	357	61	58	77	***	***	***	99	90	23	11	352	254	201	330	***	226	118	64	99	64	30	96
22	4	80	64	65	103	106	112	139	97	42	358	293	286	286	279	325	260	248	***	***	343	337	8	100	28
23	64	111	100	108	110	119	90	115	112	139	37	84	280	284	266	267	260	***	***	***	339	277	136	70	251
24	67	73	65	70	77	81	80	78	68	58	48	63	85	82	69	93	68	***	83	87	114	105	74	***	111
25	***	***	***	93	***	***	***	***	***	***	***	***	***	***	***	46	***	***	***	***	***	***	86	***	91
26	74	69	73	74	68	68	62	72	71	77	82	80	69	64	103	271	281	***	***	***	290	318	309	18	149
27	39	124	128	132	135	135	116	90	104	80	97	144	247	280	266	285	***	***	***	305	337	78	72	101	344
28	125	99	143	144	99	89	101	123	115	95	35	86	108	109	110	97	50	***	***	139	124	84	146	134	354
29	114	107	89	79	94	169	150	323	70	73	73	***	66	72	***	***	58	85	121	132	134	25	75	66	273
30	69	167	87	55	72	***	52	***	***	72	68	108	264	292	278	278	331	***	323	318	290	302	133	54	311
31	106	281	301	312	354	79	61	26	51	14	116	42	190	288	283	273	***	***	***	324	282	325	32	96	89

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.7% OPERATIONAL RECOVERY RATE = 81.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
OCTOBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.32	0.31	0.15	0.01	0.09	0.25	0.29	0.20	0.13	0.56	0.69	0.61	0.96	1.14	0.96	1.04	0.77	0.89	0.48	0.39	0.74	0.50	0.59	0.51	0.52
2	0.78	0.48	0.41	0.24	0.23	0.35	0.31	0.24	0.18	0.47	0.78	0.88	1.03	0.94	0.93	0.86	0.87	0.77	0.39	0.23	***	0.32	0.21	0.29	0.53
3	0.42	0.37	0.12	0.15	0.02	0.21	0.24	0.02	0.13	0.38	0.66	0.94	1.12	1.20	0.90	0.87	0.83	0.63	0.61	0.35	0.56	0.65	0.55	0.67	0.53
4	0.45	0.43	0.35	0.68	0.47	0.23	0.41	0.26	0.55	0.73	1.03	0.79	0.91	1.09	0.78	0.73	0.46	0.33	0.37	0.37	0.44	0.73	0.53	0.55	0.57
5	0.53	***	0.50	0.55	0.57	0.45	0.47	0.62	0.47	0.59	0.83	0.79	0.78	0.75	0.91	0.99	1.09	***	1.03	***	0.80	0.84	0.81	0.58	0.71
6	0.49	0.47	0.53	0.65	0.61	0.40	0.27	0.26	0.64	1.00	1.21	1.02	0.79	0.50	0.19	0.28	0.47	0.37	0.31	0.39	0.52	0.51	0.39	0.63	0.54
7	0.53	0.37	0.53	0.59	0.51	0.28	0.63	0.34	***	***	0.32	0.52	0.68	0.60	0.88	0.79	0.60	0.30	***	***	0.48	0.48	0.36	0.39	0.51
8	0.45	0.45	0.45	0.36	0.35	0.31	0.25	0.18	0.08	0.41	0.39	0.51	0.91	0.93	1.12	0.85	0.65	0.45	***	***	0.65	0.40	0.52	0.38	0.50
9	0.24	0.25	0.28	0.30	0.41	0.50	0.40	0.38	0.40	0.93	1.18	0.98	0.89	1.06	1.10	1.24	***	***	***	0.68	0.37	0.52	0.73	0.64	0.64
10	1.16	0.51	0.73	0.97	0.82	0.65	0.54	0.72	0.80	0.90	0.91	0.85	0.86	0.83	1.05	1.00	0.93	0.95	0.82	0.44	0.69	0.46	0.52	0.32	0.77
11	0.06	0.05	0.24	0.14	0.13	0.10	0.12	0.01	0.09	0.49	0.43	0.70	0.97	0.93	0.73	0.75	0.66	0.38	0.23	0.36	0.44	0.57	0.36	0.35	0.39
12	0.18	0.23	0.21	0.11	0.17	0.24	0.09	0.01	0.14	0.18	0.49	0.48	0.67	0.90	0.98	0.81	0.83	0.44	***	0.53	0.36	0.27	0.49	0.20	0.39
13	0.18	0.18	0.14	0.19	0.17	0.15	0.08	0.18	0.01	0.40	0.95	0.85	0.73	1.13	1.10	1.05	0.66	0.63	0.13	0.42	***	0.25	0.30	0.43	0.45
14	0.11	0.24	0.21	0.22	0.32	0.17	0.16	0.10	0.20	0.48	0.56	0.60	1.01	0.77	0.59	0.76	0.65	0.61	***	0.56	0.29	0.30	0.30	0.23	0.41
15	0.10	0.27	0.37	0.36	0.29	0.21	0.14	0.16	0.19	0.31	0.32	0.51	0.61	0.56	0.61	0.48	0.39	0.50	0.70	0.79	0.60	0.60	0.51	0.38	0.41
16	0.44	0.38	0.50	0.35	0.38	0.23	0.30	0.17	0.24	0.25	0.36	0.39	0.59	***	***	0.78	***	0.80	***	0.47	0.61	0.74	0.75	0.91	0.48
17	0.78	0.70	***	***	***	0.71	***	***	0.72	0.75	1.01	***	0.66	0.81	1.10	***	***	***	0.77	0.85	0.92	0.72	0.50	0.51	0.77
18	0.65	0.57	0.54	0.74	0.38	0.45	0.42	0.51	0.62	0.68	0.77	0.72	0.71	1.05	0.75	0.43	0.45	0.36	0.49	0.45	0.58	0.70	0.66	0.60	0.59
19	0.55	0.44	0.39	0.34	0.36	0.36	0.28	0.15	0.05	0.43	0.47	0.90	0.94	0.55	0.86	0.87	0.76	0.80	0.55	0.53	0.44	0.47	0.43	0.61	0.52
20	0.34	0.48	0.50	0.44	0.50	0.56	0.35	0.19	0.36	0.45	0.92	0.79	0.76	1.10	1.03	0.73	***	0.42	0.58	0.80	0.59	0.60	0.61	0.66	0.60
21	0.66	0.49	0.48	0.45	0.75	0.92	***	***	0.27	0.44	0.42	0.75	0.72	0.63	0.50	0.39	0.45	0.12	0.63	0.28	0.22	0.35	0.26	0.23	0.47
22	0.12	0.21	0.28	0.23	0.32	0.16	0.09	0.03	0.20	0.38	0.44	0.50	0.74	0.97	0.81	0.79	0.80	0.66	***	***	0.40	0.42	0.06	0.14	0.40
23	0.24	0.33	0.24	0.47	0.23	0.17	0.03	0.08	0.11	0.35	0.52	0.72	0.77	0.66	0.70	0.76	0.60	***	***	***	0.52	0.60	0.31	0.32	0.42
24	0.30	0.31	0.24	0.23	0.25	0.35	0.34	0.31	0.26	0.41	0.94	1.09	1.13	1.13	1.05	1.06	0.96	0.72	0.37	0.46	0.78	0.67	0.77	0.61	0.61
25	0.80	0.71	0.72	0.77	0.67	1.09	***	***	***	***	***	0.70	0.76	0.66	***	0.87	0.79	0.82	0.78	0.66	0.63	0.56	0.66	0.67	0.74
26	0.65	0.54	0.55	0.64	0.49	0.57	0.52	0.63	0.55	0.52	0.83	0.99	0.90	0.88	0.85	0.72	0.84	0.53	0.54	***	0.55	0.28	0.13	0.19	0.60
27	0.34	0.13	0.23	0.25	0.16	0.26	0.21	0.03	0.20	0.37	0.52	0.85	0.72	0.87	1.05	0.99	***	0.46	0.32	0.32	0.36	0.16	0.03	0.11	0.39
28	0.36	0.26	0.18	0.16	0.21	0.17	0.14	0.09	0.19	0.18	0.36	0.53	0.78	0.56	0.69	0.57	0.44	***	***	0.35	0.33	0.27	0.29	0.39	0.34
29	0.51	0.26	0.20	0.44	0.40	0.42	0.42	0.56	0.64	0.48	0.71	0.87	0.88	1.21	1.08	0.90	0.61	0.45	0.83	0.90	0.52	0.51	0.59	0.50	0.62
30	0.76	0.38	0.36	0.33	0.38	0.60	0.67	0.66	0.51	0.52	0.73	0.95	0.81	0.69	0.94	0.44	0.74	0.44	0.47	0.47	0.31	0.29	0.15	0.18	0.53
31	0.17	0.12	0.02	0.19	0.26	0.17	0.13	0.23	0.32	0.44	0.47	0.50	0.78	0.95	0.78	0.76	0.59	0.33	0.41	0.52	0.27	0.20	0.13	0.16	0.37
HRAVE	0.44	0.36	0.35	0.38	0.36	0.38	0.30	0.26	0.32	0.50	0.67	0.74	0.82	0.87	0.86	0.79	0.69	0.54	0.54	0.50	0.52	0.48	0.44	0.43	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.52	0.53	0.53	0.57	0.71	0.54	0.51	0.50	0.64	0.77	0.39	0.39	0.45	0.41	0.41	0.48	0.77	0.59	0.52	0.60	0.47	0.40	0.42	0.61	0.74
MAX	1.14	1.03	1.20	1.09	1.09	1.21	0.88	1.12	1.24	1.16	0.97	0.98	1.13	1.01	0.79	0.91	1.10	1.05	0.94	1.10	0.92	0.97	0.77	1.13	1.09
MIN	0.01	0.18	0.02	0.23	0.45	0.19	0.28	0.08	0.24	0.32	0.01	0.01	0.01	0.10	0.10	0.17	0.50	0.36	0.05	0.19	0.12	0.03	0.03	0.23	0.56

DAY	26	27	28	29	30	31
AVE	0.60	0.39	0.34	0.62	0.53	0.37
MAX	0.99	1.05	0.78	1.21	0.95	0.95
MIN	0.13	0.03	0.09	0.20	0.15	0.02

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 93.7% OPERATIONAL RECOVERY RATE = 93.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
OCTOBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.28	0.33	0.32	0.08	0.09	0.09	0.07	0.14	0.25	0.23	0.45	0.70	0.92	0.91	1.15	1.04	0.77	***	0.53	0.39	***	0.61	0.76	0.69	0.49
2	0.84	0.52	0.42	0.19	0.17	0.15	0.26	0.22	0.44	0.39	0.71	0.91	1.35	1.14	0.96	0.78	0.86	***	0.37	0.23	***	0.46	0.29	0.34	0.55
3	0.30	0.30	0.20	0.14	0.13	0.20	0.17	0.22	0.17	0.40	0.72	0.97	1.09	1.19	1.12	0.79	0.79	0.45	0.61	0.37	0.59	0.48	0.67	0.51	0.52
4	0.50	0.49	0.44	0.83	0.55	0.37	0.42	0.38	0.65	0.79	0.85	0.84	1.03	1.00	0.75	0.90	0.51	0.46	0.49	0.60	0.46	0.91	0.86	0.77	0.66
5	0.60	***	0.52	***	0.73	0.52	0.57	0.61	0.44	0.32	0.72	0.98	0.84	0.78	0.84	0.88	***	***	***	***	0.89	0.79	0.66	0.60	0.68
6	0.64	0.72	0.62	0.71	0.53	0.36	0.40	0.09	0.52	0.66	1.19	1.11	0.87	***	0.24	0.25	0.52	0.40	0.55	0.73	0.56	0.60	0.71	0.49	0.59
7	0.71	0.58	0.64	0.63	0.56	0.44	0.66	0.53	***	***	0.12	0.52	0.78	0.55	0.92	0.79	0.72	0.32	***	***	0.58	0.48	0.64	0.62	0.59
8	0.60	0.52	0.68	0.21	0.17	0.05	0.26	0.14	0.03	0.15	0.37	0.48	0.80	0.97	1.18	0.78	0.61	0.51	***	***	0.75	0.53	0.63	0.27	0.49
9	0.35	0.64	0.37	0.30	0.51	0.54	0.37	0.46	0.56	0.77	1.46	1.09	0.78	0.93	***	***	***	***	***	0.64	0.51	0.65	0.62	0.75	0.65
10	1.29	0.69	0.81	***	***	0.72	0.60	0.49	0.80	0.97	0.74	1.01	0.97	0.99	1.01	1.12	0.99	1.05	0.52	0.53	0.53	0.61	0.73	0.45	0.80
11	0.31	0.33	0.29	0.19	0.12	0.05	0.01	0.01	0.06	0.39	0.33	0.73	1.00	0.98	1.01	0.84	0.83	***	***	0.37	0.63	0.57	0.59	0.63	0.47
12	0.51	0.32	0.20	0.27	0.12	0.14	0.18	0.01	0.28	0.04	0.19	0.37	0.52	0.86	0.94	0.60	0.69	***	***	***	0.38	0.60	0.56	0.52	0.40
13	0.42	0.49	0.39	0.24	0.16	0.15	0.06	0.03	0.21	0.43	0.62	0.76	0.58	1.12	0.90	0.86	0.77	***	***	***	***	0.72	0.56	0.56	0.50
14	0.48	0.31	0.26	0.31	0.20	0.07	0.03	0.01	0.04	0.28	0.29	0.51	0.91	0.69	0.63	0.82	0.78	0.59	***	***	0.33	0.47	0.38	0.49	0.40
15	0.24	0.20	0.49	0.45	0.10	0.24	0.18	0.29	0.19	0.28	0.30	0.57	0.65	0.60	0.51	0.42	0.39	0.41	0.68	0.78	0.57	0.51	0.52	0.53	0.42
16	0.57	0.60	0.54	0.50	0.54	0.25	0.19	0.23	0.20	0.33	0.51	0.50	0.73	***	***	***	***	0.78	***	0.36	0.69	0.69	0.80	0.43	0.50
17	0.68	0.36	***	***	***	0.96	***	***	0.74	0.74	0.86	***	0.73	1.05	1.08	***	***	***	1.08	***	1.03	0.82	0.56	0.66	0.81
18	0.64	0.51	0.47	0.63	0.40	0.48	0.28	0.49	0.59	0.70	0.78	0.68	0.68	1.09	0.87	0.51	0.43	0.43	0.47	0.52	0.61	0.70	0.62	0.67	0.59
19	0.76	0.59	0.46	0.46	0.36	0.35	0.29	0.12	0.01	0.35	0.34	0.53	0.85	0.63	0.80	0.85	0.85	***	***	***	0.76	0.66	0.56	0.62	0.53
20	0.62	0.56	0.57	0.58	0.65	0.66	0.22	0.29	0.41	0.58	1.06	0.74	0.45	1.00	1.06	***	***	***	0.66	***	0.70	0.87	0.72	0.57	0.65
21	0.65	0.58	0.48	0.55	0.73	0.73	***	***	0.33	0.40	0.40	0.50	0.53	0.70	0.39	0.56	0.46	***	***	1.02	0.57	0.66	0.41	0.55	0.56
22	0.22	0.30	0.46	0.44	0.69	0.44	0.77	0.46	0.05	0.26	0.22	0.33	0.77	0.95	0.80	0.78	0.81	0.74	***	***	0.60	0.37	0.22	0.51
23	0.27	0.49	0.36	0.70	***	0.16	0.32	0.03	0.02	0.12	0.35	0.42	0.57	0.67	0.53	0.80	0.69	***	***	***	0.41	0.73	0.29	0.32	0.41
24	0.31	0.35	0.26	0.31	0.47	0.59	0.54	0.43	0.35	0.44	0.97	1.08	1.20	1.21	1.11	1.17	***	0.67	0.49	0.68	0.82	0.63	0.79	0.77	0.68
25	***	0.73	***	0.63	0.72	0.89	***	***	***	***	***	0.52	0.90	0.55	***	0.95	0.82	***	***	0.74	0.51	0.52	0.69	0.53	0.69
26	0.45	0.45	0.50	0.39	0.36	0.46	0.47	0.63	0.59	0.43	0.69	0.83	1.03	0.90	0.79	0.76	0.95	0.49	0.57	***	0.63	0.42	0.12	0.04	0.56
27	0.07	0.05	0.26	0.18	0.04	0.44	0.17	0.13	0.01	0.02	0.33	0.44	0.64	0.91	0.94	1.13	***	***	0.35	0.44	0.47	0.31	0.38	0.10	0.35
28	0.34	0.32	0.30	0.32	0.23	0.23	0.11	0.05	0.18	0.08	0.30	0.43	0.60	0.43	0.82	0.56	0.53	***	***	0.55	0.43	0.29	0.36	0.44	0.36
29	0.41	0.17	0.10	0.33	0.40	0.47	0.73	***	0.73	0.38	0.51	0.84	0.91	1.00	1.30	1.05	0.65	0.25	1.11	0.89	0.47	0.71	0.79	0.57	0.64
30	0.87	0.50	0.76	0.46	0.55	0.68	0.62	0.63	0.55	0.35	0.73	0.81	0.88	0.71	0.83	0.44	0.80	***	0.76	0.64	0.57	0.47	0.47	0.07	0.62
31	0.14	0.35	0.25	0.24	0.27	0.25	0.29	0.25	0.40	0.50	0.18	0.39	0.77	1.02	0.76	0.54	0.57	***	0.32	0.54	0.59	0.36	0.26	0.32	0.42
HRAVE	0.50	0.45	0.43	0.40	0.38	0.39	0.33	0.27	0.34	0.41	0.58	0.69	0.82	0.88	0.87	0.78	0.70	0.54	0.60	0.58	0.59	0.59	0.56	0.49	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.49	0.55	0.52	0.66	0.68	0.59	0.59	0.49	0.65	0.80	0.47	0.40	0.50	0.40	0.42	0.50	0.81	0.59	0.53	0.65	0.56	0.51	0.41	0.68	0.69
MAX	1.15	1.35	1.19	1.03	0.98	1.19	0.92	1.18	1.46	1.29	1.01	0.94	1.12	0.91	0.78	0.80	1.08	1.09	0.85	1.06	1.02	0.95	0.80	1.21	0.95
MIN	0.07	0.15	0.13	0.37	0.32	0.09	0.12	0.03	0.30	0.45	0.01	0.01	0.03	0.01	0.10	0.19	0.36	0.28	0.01	0.22	0.33	0.05	0.02	0.26	0.51

DAY	26	27	28	29	30	31
AVE	0.56	0.35	0.36	0.64	0.62	0.42
MAX	1.03	1.13	0.82	1.30	0.88	1.02
MIN	0.04	0.01	0.05	0.10	0.07	0.14

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 88.3% OPERATIONAL RECOVERY RATE = 88.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
OCTOBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.39	0.36	0.28	0.11	0.03	0.10	0.07	0.22	0.24	0.18	0.44	0.71	0.85	0.75	***	0.95	***	***	***	***	***	***	0.79	0.66	0.42
2	0.82	0.47	0.41	0.21	0.16	0.15	0.24	0.21	0.40	0.38	0.81	0.91	1.43	1.08	1.12	***	***	***	***	***	***	***	***	0.32	0.57
3	0.27	0.29	0.24	0.16	0.12	0.20	0.19	0.34	0.16	0.41	0.65	0.92	***	***	***	***	***	***	***	***	0.64	0.51	0.74	0.57	0.40
4	0.52	0.50	0.43	0.89	0.61	0.34	0.42	0.35	0.79	0.81	0.89	0.83	1.13	1.04	0.72	1.09	***	0.56	***	0.69	0.46	0.84	0.93	0.79	0.71
5	0.59	***	***	***	0.70	0.52	0.52	0.61	0.43	0.36	0.66	0.93	0.90	***	***	0.87	***	***	***	***	0.90	0.72	0.75	0.77	0.68
6	0.77	0.67	0.62	0.81	***	***	***	0.09	0.50	0.94	1.27	1.08	0.89	***	0.23	0.28	0.46	***	0.58	0.77	0.62	0.66	0.68	0.64	0.66
7	0.67	0.69	0.65	0.63	0.62	***	0.59	0.66	***	***	0.12	0.56	0.88	0.52	0.96	0.81	0.70	***	***	***	***	0.51	0.65	0.66	0.64
8	0.68	0.53	0.69	0.27	0.14	0.03	0.15	0.05	0.30	0.48	0.59	0.48	0.80	1.08	1.17	0.76	0.55	***	***	***	0.78	0.50	0.70	0.27	0.52
9	0.34	0.62	0.37	0.31	0.51	0.53	0.37	0.43	0.50	0.73	***	***	***	***	***	***	***	***	***	***	0.51	0.65	***	***	0.49
10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.97	1.19	1.05	***	***	***	***	***	0.80	0.49	0.90
11	0.37	0.41	0.35	0.14	0.13	0.03	0.02	0.04	0.31	0.63	0.31	0.71	1.01	0.94	0.91	0.82	***	***	***	***	***	0.61	0.59	0.72	0.48
12	0.54	0.33	0.23	0.32	0.19	0.25	0.12	0.01	0.26	0.13	0.24	0.37	0.54	0.89	0.87	0.55	***	***	***	***	***	0.71	0.54	0.59	0.40
13	0.44	0.49	0.40	0.22	0.15	0.15	0.05	0.02	0.19	0.40	0.65	0.67	0.62	1.12	0.79	0.80	***	***	***	***	***	***	0.52	0.74	0.47
14	0.45	0.23	0.24	0.34	0.24	0.13	0.02	0.01	0.04	0.25	0.28	0.53	0.90	0.66	0.63	0.93	***	***	***	***	***	0.51	0.35	0.48	0.38
15	0.25	0.15	0.45	0.44	0.13	0.20	0.17	0.36	0.29	0.28	0.40	0.60	0.56	***	***	***	***	***	***	0.74	0.55	0.49	0.52	0.57	0.40
16	0.56	0.62	0.56	0.52	0.50	0.23	0.13	0.24	0.23	0.35	0.46	0.74	0.66	***	***	***	***	***	***	0.44	0.78	0.65	***	0.47	0.48
17	0.62	0.33	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.82	***	0.76	0.63
18	0.66	***	0.45	0.65	0.40	0.45	0.34	0.45	***	0.84	0.81	0.65	0.63	1.18	***	***	0.48	0.43	0.62	0.48	0.62	***	0.62	0.69	0.60
19	0.71	0.59	0.51	0.54	0.67	0.51	0.32	0.11	0.01	0.38	0.33	0.57	0.86	0.68	0.74	***	***	***	***	***	0.78	0.59	0.59	0.68	0.54
20	0.63	0.67	0.59	0.66	0.80	0.62	0.21	0.25	0.42	0.57	1.04	0.60	0.44	***	***	***	***	***	0.62	***	0.77	0.96	0.69	0.61	0.62
21	0.67	0.56	***	0.57	***	***	***	***	***	***	***	0.53	0.58	0.64	0.42	0.52	0.46	***	***	1.02	0.57	0.65	0.52	0.61	0.59
22	0.43	0.32	0.44	0.45	0.64	0.48	0.76	0.45	0.06	0.24	0.23	0.33	0.72	1.07	0.85	0.82	***	***	***	***	***	0.60	0.34	0.23	0.50
23	0.32	0.76	***	***	***	***	0.54	0.03	0.03	0.13	0.43	0.44	0.57	0.64	0.50	0.85	***	***	***	***	***	0.79	0.33	0.40	0.45
24	0.31	0.35	0.25	0.29	0.43	0.59	0.50	0.55	0.38	0.46	0.94	1.07	1.11	***	***	***	***	***	***	0.90	***	0.66	0.67	***	0.59
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	0.41	0.42	0.50	0.30	0.36	0.46	***	***	***	***	***	0.77	0.97	0.97	0.79	0.65	***	***	***	***	***	0.43	0.12	0.03	0.51
27	0.08	0.07	0.23	0.19	0.01	0.40	0.22	0.26	0.01	0.01	0.43	0.47	0.59	0.93	0.73	***	***	***	***	0.59	0.51	0.40	0.41	0.14	0.33
28	0.34	0.33	0.33	0.31	0.34	0.29	0.14	0.04	0.19	0.08	0.32	0.40	0.61	0.45	0.82	***	***	***	***	0.55	0.42	0.32	0.48	0.48	0.36
29	0.39	0.12	0.08	0.35	0.37	0.46	0.76	***	0.59	0.29	***	***	***	1.08	***	***	0.63	0.24	1.05	1.12	0.48	0.83	0.81	0.57	0.57
30	0.93	0.53	0.77	0.49	0.58	***	0.65	***	***	0.32	0.72	0.79	0.89	0.73	0.86	***	***	***	0.73	0.62	0.67	0.50	0.46	0.05	0.63
31	0.26	0.39	0.26	0.47	0.40	0.26	0.47	0.37	0.44	0.52	0.19	0.40	0.81	0.94	0.82	0.43	***	***	***	0.50	0.55	0.37	0.26	0.33	0.45
HRAVE	0.50	0.44	0.41	0.41	0.37	0.32	0.32	0.26	0.29	0.41	0.55	0.66	0.80	0.87	0.78	0.77	0.62	0.41	0.72	0.70	0.62	0.61	0.57	0.51	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.42	0.57	0.40	0.71	0.68	0.66	0.64	0.52	0.49	0.90	0.48	0.40	0.47	0.38	0.40	0.48	0.63	0.60	0.54	0.62	0.59	0.50	0.45	0.59	***
MAX	0.95	1.43	0.92	1.13	0.93	1.27	0.96	1.17	0.73	1.19	1.01	0.89	1.12	0.93	0.74	0.78	0.82	1.18	0.86	1.04	1.02	1.07	0.85	1.11	***
MIN	0.03	0.15	0.12	0.34	0.36	0.09	0.12	0.03	0.31	0.49	0.02	0.01	0.02	0.01	0.13	0.13	0.33	0.34	0.01	0.21	0.42	0.06	0.03	0.25	***

DAY	26	27	28	29	30	31
AVE	0.51	0.33	0.36	0.57	0.63	0.45
MAX	0.97	0.93	0.82	1.12	0.93	0.94
MIN	0.03	0.01	0.04	0.08	0.05	0.19

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 67.9% OPERATIONAL RECOVERY RATE = 67.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	4.3	4.0	3.4	4.5	4.7	3.8	2.7	3.1	2.9	3.0	1.9	2.2	3.0	3.0	3.0	3.3	3.1	2.5	1.9	2.6	2.8	1.9	3.2	4.1	3.1
2	4.6	4.3	4.0	3.8	4.3	4.0	3.9	3.9	3.5	3.1	2.8	3.0	3.4	2.8	3.0	2.5	2.3	1.3	1.8	2.3	3.0	4.6	5.2	5.3	3.4
3	4.3	4.2	4.2	4.6	4.4	5.1	4.4	3.9	5.3	5.1	4.1	6.3	8.5	7.4	7.7	11.1	9.7	***	7.1	8.6	7.7	4.5	6.1	6.6	6.1
4	4.2	2.7	3.5	2.2	1.2	1.4	1.1	1.8	2.2	2.0	2.9	5.4	6.3	5.7	5.6	5.2	5.1	5.6	3.8	2.4	2.9	4.8	6.4	8.4	3.9
5	7.3	6.0	5.1	2.4	3.0	4.6	5.1	3.6	3.4	3.1	3.5	3.9	3.9	3.7	3.6	3.3	3.4	4.3	6.3	5.7	3.7	2.9	2.0	4.4	4.1
6	4.7	4.2	4.6	3.8	3.5	3.2	3.2	3.8	3.7	2.7	1.5	2.5	3.5	4.2	4.0	4.0	4.9	6.7	6.9	5.3	3.1	3.0	3.4	3.8	3.9
7	4.6	3.5	4.1	4.4	4.2	4.5	4.9	5.9	7.6	8.4	8.6	9.4	8.3	7.3	6.8	7.1	6.2	7.0	8.5	7.9	7.4	7.6	7.6	8.4	6.7
8	8.9	9.2	10.0	10.2	9.6	10.4	9.6	10.8	11.6	***	***	9.1	7.2	7.2	6.5	5.5	5.3	5.4	6.7	7.0	6.8	7.1	6.0	4.6	7.9
9	3.7	3.6	4.3	3.9	3.9	3.6	3.8	4.3	4.0	3.3	2.4	3.0	2.2	3.3	3.5	3.6	3.6	4.1	5.0	2.9	2.2	3.1	2.8	3.0	3.5
10	2.8	2.8	3.2	3.0	3.5	3.9	3.9	3.4	2.9	1.8	2.3	5.9	6.1	10.3	***	***	***	***	7.7	7.0	7.4	6.9	7.9	5.6	4.9
11	3.3	1.9	1.8	1.4	2.6	2.8	2.9	3.1	3.0	3.1	2.7	3.4	3.9	3.7	3.9	4.0	3.8	3.3	5.8	4.8	3.0	2.4	3.6	4.1	3.3
12	3.8	5.0	4.9	5.3	6.2	7.0	8.9	8.0	8.5	9.1	7.7	7.5	6.8	9.4	8.1	7.7	6.8	7.4	8.3	9.3	7.6	7.2	7.2	7.2	7.3
13	7.8	8.4	9.2	9.2	8.9	7.7	7.8	8.0	8.5	7.7	9.1	8.7	***	6.5	6.5	5.9	6.4	7.4	8.7	8.6	7.8	7.5	7.4	7.3	7.9
14	7.2	7.4	5.9	4.9	4.7	5.1	4.9	5.0	4.5	4.0	3.4	2.7	3.2	3.7	3.9	5.0	5.5	7.0	6.6	4.0	2.0	1.8	2.6	3.0	4.5
15	2.7	2.7	2.3	2.0	2.1	2.2	***	5.7	5.7	3.6	3.2	3.4	2.9	3.0	2.7	3.0	1.8	3.1	3.4	3.2	2.1	2.7	2.6	2.5	3.0
16	4.2	6.2	8.5	12.2	***	4.6	4.7	***	***	***	***	***	***	***	***	***	***	***	4.1	3.0	2.8	3.3	2.6	3.6	5.0
17	4.9	4.3	4.6	4.4	3.3	2.1	1.9	2.3	0.8	1.6	3.2	4.5	5.8	5.4	6.8	7.3	8.7	5.8	4.3	3.3	1.8	2.2	2.1	2.6	3.9
18	2.5	3.0	2.4	1.9	2.9	3.0	3.2	3.2	2.0	2.1	2.1	2.0	2.8	4.1	5.3	5.2	4.5	***	***	3.0	1.9	1.8	2.7	3.9	3.0
19	3.8	4.0	3.4	4.0	4.5	4.7	5.1	5.4	5.1	4.9	6.9	8.9	9.2	8.4	8.9	8.6	7.3	7.4	8.4	8.8	8.8	7.8	7.2	7.5	6.6
20	6.8	5.3	5.3	4.8	4.8	4.9	4.7	4.8	4.7	4.1	3.3	3.4	2.5	2.7	2.2	2.2	2.3	4.5	4.7	2.9	1.3	2.5	3.4	5.9	3.9
21	5.8	5.1	4.1	3.7	4.1	4.3	5.1	5.0	5.8	6.5	***	***	***	8.9	***	7.8	***	7.7	7.8	8.9	8.4	***	***	9.7	6.4
22	10.0	9.5	10.8	11.4	11.2	10.1	10.3	10.7	10.0	***	7.6	7.5	10.2	8.6	7.8	6.5	***	7.9	11.2	12.1	9.5	9.6	9.0	8.6	9.6
23	8.2	7.7	8.4	9.2	8.8	8.2	7.7	8.0	9.1	8.5	8.5	6.3	5.4	4.1	3.1	3.5	3.3	3.7	2.9	2.6	2.7	4.8	5.2	4.4	6.0
24	3.2	3.4	4.0	3.8	3.3	3.1	4.2	4.2	4.2	3.8	3.0	2.8	3.1	3.2	2.9	3.0	2.2	2.3	1.6	2.1	2.8	4.4	4.2	3.4	3.3
25	3.3	3.5	3.8	3.0	2.5	3.5	4.6	5.2	3.8	3.0	2.2	2.2	2.0	2.2	2.0	2.3	1.5	1.1	0.6	0.7	1.8	1.8	2.6	3.0	2.6
26	3.2	5.8	6.1	4.0	2.2	1.5	0.8	1.6	1.6	1.5	1.8	2.7	4.8	7.0	7.5	7.5	7.1	6.9	5.2	4.1	3.7	2.2	2.2	2.6	3.9
27	2.5	2.1	1.8	1.6	1.3	2.0	2.0	2.6	2.8	2.3	2.3	5.3	6.6	8.8	7.4	6.7	***	***	5.4	3.9	2.9	1.9	1.9	2.1	3.5
28	2.8	3.0	3.2	3.3	3.5	3.2	3.6	3.3	3.0	2.7	2.5	2.1	2.8	3.2	4.2	5.4	6.3	***	***	5.5	2.6	1.7	2.1	2.2	3.3
29	2.6	3.6	3.7	3.5	3.0	3.1	3.0	2.7	3.7	2.5	1.6	1.3	3.9	6.2	7.9	7.9	7.9	7.6	5.1	4.2	2.8	1.4	1.8	2.1	3.9
30	2.7	2.6	3.2	4.0	2.9	2.7	2.6	2.3	3.6	4.1	3.1	3.0	3.6	3.7	3.9	4.0	4.7	5.9	***	***	2.7	2.2	2.4	2.9	3.3
HRAVE	4.7	4.6	4.8	4.7	4.3	4.3	4.5	4.7	4.7	4.0	3.9	4.6	4.9	5.4	5.1	5.3	5.0	5.2	5.6	5.1	4.2	4.0	4.3	4.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.1	3.4	6.1	3.9	4.1	3.9	6.7	7.9	3.5	4.9	3.3	7.3	7.9	4.5	3.0	5.0	3.9	3.0	6.6	3.9	6.4	9.6	6.0	3.3	2.6
MAX	4.7	5.3	11.1	8.4	7.3	6.9	9.4	11.6	5.0	10.3	5.8	9.4	9.2	7.4	5.7	12.2	8.7	5.3	9.2	6.8	9.7	12.1	9.2	4.4	5.2
MIN	1.9	1.3	3.9	1.1	2.0	1.5	3.5	4.6	2.2	1.8	1.4	3.8	5.9	1.8	1.8	2.6	0.8	1.8	3.4	1.3	3.7	6.5	2.6	1.6	0.6

DAY	26	27	28	29	30	31
AVE	3.9	3.5	3.3	3.9	3.3	***
MAX	7.5	8.8	6.3	7.9	5.9	***
MIN	0.8	1.3	1.7	1.3	2.2	***

MONTHLY AVERAGE = 4.7 MONTHLY MAXIMUM = 12.2 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 94.7% OPERATIONAL RECOVERY RATE = 94.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	3.7	3.0	2.3	4.0	4.5	2.6	2.4	2.8	2.8	2.8	1.7	2.0	2.0	1.2	2.0	4.6	3.3	2.7	1.8	2.6	3.5	2.7	3.8	3.1	2.8
2	3.8	3.7	2.9	3.3	3.3	3.2	3.5	3.2	3.3	3.3	3.4	3.2	3.4	3.8	2.7	2.8	2.3	1.8	5.3	4.4	3.4	4.5	5.0	5.7	3.6
3	5.0	4.8	4.4	5.2	4.9	5.7	4.8	5.0	6.4	7.8	4.8	6.4	7.6	8.0	10.6	13.4	13.1	***	7.4	7.6	9.9	5.4	4.5	6.2	6.9
4	4.2	3.5	3.6	2.7	1.8	2.1	2.6	2.0	3.0	2.3	3.1	6.5	5.5	7.6	7.0	5.0	5.1	5.7	4.0	3.0	3.8	5.2	6.1	9.3	4.4
5	7.9	6.1	5.7	2.5	2.2	3.6	4.5	4.0	3.6	3.4	4.7	6.0	4.3	4.2	4.4	3.7	2.9	4.7	6.9	7.0	3.6	3.1	3.2	5.7	4.5
6	5.0	4.8	4.3	3.8	3.6	3.6	3.9	4.7	4.8	4.2	3.4	3.3	3.1	3.5	4.1	4.3	6.0	6.3	6.8	4.5	3.3	3.1	5.0	3.7	4.3
7	3.8	4.5	5.4	5.4	5.2	7.3	7.1	6.7	8.8	9.5	7.9	9.1	6.5	7.7	7.3	6.8	6.2	7.8	9.6	9.1	7.4	7.8	9.0	9.6	7.3
8	9.3	10.2	11.1	10.5	12.1	12.9	13.2	15.1	13.5	***	***	10.2	9.8	7.0	6.7	6.6	4.9	6.9	6.9	7.7	8.4	7.4	5.9	4.7	9.1
9	4.3	3.7	4.7	4.5	4.0	3.3	4.1	5.0	4.2	3.3	3.0	3.2	3.1	4.4	3.6	3.3	3.3	4.1	5.2	2.9	3.3	3.9	3.5	1.9	3.7
10	2.9	3.8	2.4	2.5	3.6	3.5	3.5	3.9	2.7	2.4	2.0	5.8	6.8	10.0	***	***	***	***	6.6	7.4	8.2	7.9	10.5	5.9	5.1
11	4.0	2.2	2.4	2.3	1.4	2.1	2.4	2.8	2.5	3.1	2.6	4.1	5.3	3.5	4.8	3.9	4.2	3.6	7.4	5.2	2.4	4.4	4.9	4.5	3.6
12	4.2	5.3	4.5	4.8	6.4	6.7	8.1	7.6	8.4	9.1	6.6	8.4	5.8	10.4	9.5	7.8	6.1	7.7	9.8	9.0	8.5	7.0	7.2	8.1	7.4
13	8.8	7.2	8.9	9.6	10.8	8.8	7.9	10.0	9.6	7.5	11.0	10.2	***	8.2	6.5	6.6	6.8	9.1	10.4	8.9	8.7	7.7	8.0	8.2	8.7
14	8.5	7.6	7.0	4.8	4.7	4.5	4.8	4.5	5.2	5.2	4.7	3.1	4.5	4.7	4.8	5.3	5.8	7.6	6.9	3.8	1.9	5.3	3.0	2.9	5.0
15	2.5	3.3	3.8	2.7	1.6	3.4	***	4.6	5.5	4.0	2.7	3.3	3.2	2.9	3.1	3.1	2.3	3.0	3.6	4.3	3.9	3.6	3.5	3.9	3.4
16	6.1	5.2	9.2	13.1	***	5.2	5.8	***	***	***	***	***	***	***	***	***	***	***	3.7	3.2	3.9	4.0	3.0	3.0	5.4
17	4.7	5.0	4.9	4.0	3.2	2.2	3.3	3.9	2.2	2.0	3.6	5.0	6.1	6.3	6.7	8.0	8.0	5.8	3.8	3.2	2.2	1.9	1.6	1.8	4.1
18	1.6	2.6	2.5	2.0	2.9	2.1	1.6	2.5	1.6	1.7	2.1	0.8	2.1	3.7	4.9	5.0	4.8	***	***	2.7	2.2	1.4	2.5	3.0	2.6
19	3.7	3.6	2.7	2.9	2.9	3.9	4.8	6.9	7.2	7.6	9.4	9.7	9.5	8.6	8.6	8.4	6.6	7.4	9.1	10.7	9.5	7.7	7.0	7.3	6.9
20	6.7	6.7	5.7	5.8	5.4	5.8	5.7	5.1	5.2	4.6	4.1	4.2	3.9	2.8	2.7	2.1	2.5	3.4	4.3	3.2	2.3	2.5	3.8	6.9	4.4
21	6.3	6.2	4.6	4.8	4.4	6.1	5.7	5.2	5.5	8.0	***	***	***	11.4	***	8.9	***	8.6	11.7	10.8	10.0	***	***	9.0	7.5
22	10.6	11.0	11.1	11.1	11.8	10.6	13.1	11.2	10.2	***	10.5	9.8	11.9	9.7	7.3	7.4	***	9.3	12.9	13.8	8.1	10.8	8.3	8.9	10.4
23	8.4	8.6	9.3	10.6	11.6	10.4	10.1	10.8	11.7	10.6	8.1	8.8	4.9	2.9	3.2	4.1	2.6	4.0	2.8	3.3	3.5	4.8	4.7	3.6	6.8
24	2.6	3.0	3.5	4.1	3.0	3.2	4.5	4.5	4.0	4.6	3.4	2.4	3.2	3.1	2.1	2.4	2.2	2.0	1.0	1.9	3.1	4.2	3.8	2.7	3.1
25	3.2	3.3	3.3	3.3	3.3	3.7	4.4	4.2	3.9	3.6	2.9	2.1	1.6	1.4	1.8	3.2	2.0	2.0	1.4	2.1	3.0	2.5	2.8	3.2	2.8
26	3.4	6.3	6.8	4.0	2.6	2.0	2.2	1.5	1.6	1.1	1.9	2.6	4.3	5.8	7.3	7.7	7.0	8.4	5.9	5.1	4.3	2.5	2.7	2.6	4.2
27	3.2	2.7	2.8	2.1	2.8	2.3	1.9	1.2	1.4	1.4	2.1	6.6	10.1	9.1	7.3	5.9	***	***	5.2	4.1	3.0	2.9	1.9	1.7	3.7
28	2.5	2.4	2.9	1.9	2.6	3.0	2.9	2.5	2.2	3.1	2.3	1.9	2.7	3.1	3.7	5.8	6.5	***	***	5.1	3.1	1.9	1.6	2.1	3.0
29	2.0	3.0	2.9	2.8	1.9	2.1	2.3	2.0	2.6	2.4	1.5	2.1	4.2	5.0	7.0	7.5	9.8	9.5	6.2	4.5	2.6	1.9	2.2	1.5	3.7
30	2.2	1.8	2.7	3.4	2.2	2.6	2.3	2.0	2.3	3.7	3.0	3.0	3.2	3.0	3.5	4.7	4.8	5.2	***	***	3.1	3.3	2.0	2.8	3.0
HRAVE	4.8	4.8	4.9	4.8	4.5	4.6	4.9	5.0	5.0	4.5	4.3	5.1	5.1	5.6	5.3	5.7	5.2	5.7	6.2	5.6	4.8	4.5	4.5	4.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.8	3.6	6.9	4.4	4.5	4.3	7.3	9.1	3.7	5.1	3.6	7.4	8.7	5.0	3.4	5.4	4.1	2.6	6.9	4.4	7.5	10.4	6.8	3.1	2.8
MAX	4.6	5.7	13.4	9.3	7.9	6.8	9.6	15.1	5.2	10.5	7.4	10.4	11.0	8.5	5.5	13.1	8.0	5.0	10.7	6.9	11.7	13.8	11.7	4.6	4.4
MIN	1.2	1.8	4.4	1.8	2.2	3.1	3.8	4.7	1.9	2.0	1.4	4.2	6.5	1.9	1.6	3.0	1.6	0.8	2.7	2.1	4.4	7.3	2.6	1.0	1.4

DAY	26	27	28	29	30	31
AVE	4.2	3.7	3.0	3.7	3.0	***
MAX	8.4	10.1	6.5	9.8	5.2	***
MIN	1.1	1.2	1.6	1.5	1.8	***

MONTHLY AVERAGE = 5.0 MONTHLY MAXIMUM = 15.1 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 94.7% OPERATIONAL RECOVERY RATE = 94.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
NOVEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.6	2.8	1.8	4.3	4.6	3.1	2.0	2.8	3.4	2.7	1.1	3.0	1.7	1.6	3.2	4.3	***	***	1.2	2.1	3.4	3.5	3.5	3.7	2.9
2	3.6	4.9	3.6	3.7	3.4	2.8	3.2	2.9	3.5	3.4	3.2	2.8	4.1	4.5	2.9	2.8	3.0	1.7	***	4.9	3.2	4.5	6.3	6.1	3.7
3	5.2	5.2	4.3	5.7	3.9	5.6	4.4	5.1	5.6	8.6	6.7	6.7	6.7	***	13.2	13.8	***	***	***	6.3	10.2	5.2	4.4	***	6.7
4	4.7	3.8	3.6	3.1	2.8	2.0	2.8	1.9	***	1.6	2.7	***	4.9	8.6	7.9	5.2	4.8	***	4.4	1.9	4.1	4.3	***	***	3.9
5	7.8	6.2	4.3	2.7	2.7	3.5	4.3	4.7	5.4	4.5	6.0	6.0	3.8	4.4	4.3	4.1	5.4	***	***	7.0	***	5.1	2.3	6.2	4.8
6	5.2	5.5	4.4	4.1	3.2	3.1	4.1	4.2	4.4	4.1	4.0	4.1	3.7	3.7	3.8	4.8	5.7	***	***	***	3.3	3.2	5.5	4.6	4.2
7	4.5	5.3	6.9	5.8	6.8	8.5	8.4	8.1	9.8	***	***	***	***	***	***	6.9	***	7.7	***	11.2	8.6	***	***	***	7.6
8	***	***	***	***	***	***	***	***	***	***	***	10.2	9.0	***	***	6.9	***	***	7.3	7.1	8.3	6.7	6.1	4.2	7.3
9	4.6	3.6	4.9	4.0	3.3	3.2	4.6	5.3	3.9	3.5	3.1	4.3	2.9	3.5	3.5	3.1	***	***	***	3.2	3.6	3.0	4.1	2.0	3.7
10	5.2	1.0	2.9	2.7	3.7	3.1	3.3	4.0	2.6	2.1	2.2	4.7	***	***	***	***	***	***	***	***	***	***	11.0	***	3.7
11	4.1	2.3	2.8	2.9	1.4	3.2	3.7	2.6	2.4	3.0	3.2	5.1	***	***	***	***	***	***	9.4	7.4	***	***	5.1	4.2	3.9
12	5.6	6.2	4.5	5.2	7.6	8.1	7.1	***	7.5	***	***	***	***	***	***	***	***	***	***	***	***	***	5.4	***	6.4
13	9.1	***	10.0	***	10.4	12.4	8.3	10.1	***	7.9	***	***	***	9.3	***	7.1	***	8.7	***	***	8.8	7.7	***	9.6	9.2
14	8.9	7.3	7.6	4.9	5.6	5.6	8.7	5.5	3.8	5.0	6.3	4.0	4.4	4.8	6.8	***	5.8	***	***	3.4	***	5.6	3.4	3.5	5.5
15	3.6	4.9	7.2	3.7	***	***	***	3.7	5.4	4.1	2.9	3.3	3.3	2.3	2.5	3.1	2.6	3.5	4.9	5.5	4.1	4.6	3.0	3.3	3.9
16	6.1	***	***	12.4	***	5.0	***	***	***	***	***	***	***	***	***	***	***	***	3.1	***	4.1	***	3.0	3.4	5.3
17	***	***	***	3.6	3.4	2.3	3.8	3.8	2.9	3.6	3.4	5.0	6.0	6.2	***	***	***	***	***	2.7	2.2	3.6	2.2	2.2	3.6
18	2.3	2.7	2.5	3.0	2.8	2.6	2.0	2.5	3.8	3.0	2.0	2.2	3.0	3.4	***	4.8	***	***	***	***	2.8	***	2.8	3.0	2.8
19	3.6	4.3	2.4	2.5	1.9	2.9	4.0	6.2	7.6	9.9	9.3	***	***	9.1	9.3	8.4	***	8.4	***	10.5	9.6	***	8.8	9.6	6.8
20	7.1	5.8	5.3	6.2	6.3	5.9	6.4	4.5	5.3	4.7	4.2	4.0	5.1	6.4	2.8	1.8	2.8	***	***	4.2	3.3	4.0	3.8	7.4	4.9
21	5.6	7.7	4.2	6.1	5.4	6.3	6.1	5.3	6.8	8.4	***	***	***	***	***	9.4	***	***	***	***	***	***	***	***	6.5
22	***	***	***	***	***	9.9	***	11.7	9.2	***	***	***	12.4	***	5.4	***	***	***	13.2	16.0	***	***	***	***	11.1
23	8.5	8.1	7.7	10.8	11.7	9.2	9.8	12.5	11.7	11.8	***	11.6	6.2	3.6	2.9	4.4	2.7	4.4	3.0	3.5	4.5	4.9	4.6	3.9	7.0
24	3.8	3.9	3.6	3.8	3.2	3.7	4.5	4.5	3.4	4.2	3.3	2.4	5.1	3.4	3.0	***	2.2	4.2	3.1	2.4	3.4	4.4	***	2.6	3.6
25	3.2	4.0	4.6	3.2	4.2	4.2	6.0	5.3	4.6	3.8	3.2	2.6	2.1	1.5	2.0	2.8	1.8	1.9	***	2.2	3.0	2.5	2.7	4.0	3.3
26	2.9	***	***	4.2	2.7	3.1	3.9	1.5	1.6	1.2	2.9	2.9	4.9	***	***	8.2	***	***	6.3	6.2	4.9	3.3	***	***	3.8
27	3.2	2.7	3.2	2.4	3.2	3.9	2.0	0.9	1.0	1.4	2.0	6.2	11.8	***	***	***	***	***	***	***	2.8	2.6	***	1.6	3.2
28	2.6	2.5	4.1	2.7	3.7	2.5	2.7	1.9	1.8	3.5	2.7	2.6	2.8	3.8	4.4	***	***	***	***	6.0	***	***	1.9	2.0	3.0
29	2.1	3.1	3.0	2.7	2.4	2.2	2.1	2.1	3.4	3.0	2.8	2.4	5.7	4.8	***	***	***	***	6.8	4.3	2.4	2.3	2.5	2.1	3.1
30	2.1	2.6	2.6	3.1	2.5	2.7	2.1	2.8	2.5	3.7	3.2	3.7	2.7	4.5	3.4	4.3	***	***	***	***	***	***	***	3.0	3.0
HRAVE	4.8	4.4	4.5	4.4	4.3	4.7	4.6	4.7	4.8	4.5	3.7	4.5	5.1	4.7	4.8	5.6	3.7	5.1	5.7	5.6	4.8	4.3	4.4	4.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.9	3.7	6.7	3.9	4.8	4.2	7.6	7.3	3.7	3.7	3.9	6.4	9.2	5.5	3.9	5.3	3.6	2.8	6.8	4.9	6.5	11.1	7.0	3.6	3.3
MAX	4.6	6.3	13.8	8.6	7.8	5.7	11.2	10.2	5.3	11.0	9.4	8.1	12.4	8.9	7.2	12.4	6.2	4.8	10.5	7.4	9.4	16.0	12.5	5.1	6.0
MIN	1.1	1.7	3.9	1.6	2.3	3.1	4.5	4.2	2.0	1.0	1.4	4.5	7.1	3.4	2.3	3.0	2.2	2.0	1.9	1.8	4.2	5.4	2.7	2.2	1.5

DAY	26	27	28	29	30	31
AVE	3.8	3.2	3.0	3.1	3.0	***
MAX	8.2	11.8	6.0	6.8	4.5	***
MIN	1.2	0.9	1.8	2.1	2.1	***

MONTHLY AVERAGE = 4.6 MONTHLY MAXIMUM = 16.0 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 71.5% OPERATIONAL RECOVERY RATE = 71.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	117	129	138	138	136	131	110	134	118	110	144	148	165	193	265	270	285	328	214	282	291	68	100	111	104
2	119	113	111	128	152	137	134	152	130	95	94	82	70	68	90	76	92	199	240	75	80	96	111	111	173
3	104	106	107	103	100	99	101	95	107	108	90	135	175	183	192	191	191	***	314	291	285	273	283	290	252
4	316	11	288	316	308	82	1	100	87	16	322	320	311	300	279	269	266	290	291	289	248	277	272	286	241
5	282	284	285	201	161	160	161	136	86	96	88	157	253	269	252	16	71	17	40	45	12	344	357	57	144
6	66	76	104	118	124	122	104	105	103	97	85	318	281	281	282	273	279	288	291	289	340	13	33	49	32
7	68	64	76	78	92	85	83	78	74	66	66	48	51	54	68	77	67	64	61	66	72	73	67	74	24
8	77	80	81	80	84	81	84	82	77	***	***	79	77	79	72	71	69	65	61	63	66	67	67	82	351
9	95	93	92	110	106	98	95	103	111	95	111	93	130	284	268	275	279	282	288	296	144	130	119	98	94
10	103	95	89	101	103	110	114	122	122	129	295	276	269	275	***	***	***	***	279	280	282	290	288	284	266
11	295	308	325	185	127	151	98	105	96	106	178	121	87	285	250	262	264	273	287	292	306	66	94	125	89
12	102	101	119	93	78	74	67	69	65	67	78	79	73	65	73	82	82	72	70	70	72	73	70	64	305
13	61	59	59	55	59	64	63	62	59	69	79	63	***	45	73	65	69	51	56	62	65	65	67	67	260
14	68	66	80	101	90	102	109	111	97	85	90	102	93	178	276	280	285	289	287	283	2	27	84	93	319
15	92	88	81	23	9	89	***	71	72	72	79	92	90	82	66	20	305	98	86	96	157	230	283	148	2
16	200	289	269	247	***	273	282	***	***	***	***	***	***	***	***	***	***	***	276	261	271	287	311	290	129
17	285	285	295	312	290	308	302	283	77	287	274	272	277	285	288	284	281	280	285	293	242	168	101	84	294
18	89	100	112	91	95	107	125	118	97	95	129	194	257	285	285	282	291	***	***	309	306	73	89	130	167
19	126	119	115	147	144	124	101	103	96	91	73	64	65	73	55	21	35	51	59	60	62	63	63	66	307
20	66	83	109	108	106	110	123	122	130	139	114	98	117	99	210	247	295	279	312	332	38	94	87	68	39
21	72	78	95	90	97	93	102	99	90	76	***	***	***	49	***	43	***	67	68	75	71	***	***	66	350
22	66	63	61	61	58	60	59	59	63	***	92	81	71	62	51	11	***	65	41	42	60	63	64	63	22
23	66	65	61	60	63	69	66	68	66	64	68	76	74	68	27	50	28	6	1	8	23	66	75	105	93
24	113	100	95	101	106	89	93	106	109	89	90	99	91	90	93	173	270	348	347	72	77	87	113	104	211
25	97	91	94	80	38	59	79	79	73	64	40	5	5	357	339	328	61	357	273	242	276	300	276	280	68
26	282	292	294	320	318	244	275	313	346	48	19	337	289	292	290	292	293	289	282	279	281	309	277	287	109
27	284	323	36	119	98	78	86	97	97	95	334	287	289	289	291	275	***	***	290	277	284	313	7	49	215
28	86	90	100	103	109	106	109	111	100	97	131	212	282	277	274	280	277	***	***	289	281	171	87	89	123
29	89	100	105	107	120	105	101	96	106	97	171	281	283	285	285	285	281	278	283	278	282	254	346	74	219
30	96	94	102	109	103	99	89	85	105	121	128	100	4	268	268	272	277	286	***	***	350	68	86	90	357

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 94.7% OPERATIONAL RECOVERY RATE = 94.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
NOVEMBER - 2015

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	140	116	103	143	147	146	116	85	90	122	144	140	98	106	198	272	290	323	224	88	288	351	105	108	330
2	136	112	92	82	81	83	81	87	90	92	78	74	86	84	60	60	84	168	66	37	43	97	120	143	67
3	130	151	131	125	147	124	143	156	156	150	125	139	177	188	187	186	178	***	309	281	283	274	277	291	136
4	313	1	293	356	312	101	358	33	93	61	265	313	317	295	274	257	261	287	283	290	252	270	273	287	119
5	279	284	290	261	178	169	170	138	78	80	81	136	252	272	101	89	66	38	35	61	1	335	17	62	234
6	66	69	79	80	76	71	69	69	69	67	68	30	339	277	278	277	277	281	304	308	354	99	49	51	167
7	48	53	60	71	76	66	75	75	64	46	67	61	58	61	53	77	60	69	60	75	70	87	85	81	14
8	80	85	84	79	93	77	78	83	75	***	***	80	88	85	79	71	77	61	59	57	64	64	75	81	304
9	89	84	80	79	83	86	82	82	80	85	83	85	158	289	295	313	279	282	287	304	211	153	156	146	349
10	175	203	97	102	118	120	148	139	150	144	208	270	261	257	***	***	***	***	286	282	281	292	295	279	145
11	293	298	293	289	156	164	94	107	102	117	213	118	144	293	249	270	267	274	276	306	325	97	100	103	95
12	90	86	100	90	70	66	66	72	62	56	63	67	72	35	57	85	78	80	76	82	77	67	70	68	5
13	57	61	58	47	56	62	69	64	62	66	93	68	***	22	70	57	58	47	55	62	64	68	76	72	166
14	77	69	79	89	74	91	89	83	76	68	67	83	132	171	277	273	289	291	288	282	65	80	67	83	222
15	89	95	98	51	222	133	***	67	72	75	85	82	75	70	58	35	45	80	106	169	195	244	196	154	209
16	190	286	262	248	***	274	278	***	***	***	***	***	***	***	***	***	***	***	257	235	278	287	289	283	330
17	286	290	296	323	298	308	290	299	327	302	289	274	277	296	319	301	286	278	295	300	312	175	101	66	191
18	74	102	114	69	99	111	130	128	146	150	140	3	302	314	304	279	284	***	***	308	308	41	87	133	224
19	155	124	111	106	104	98	104	69	67	68	62	65	58	62	68	25	47	74	59	67	69	63	62	67	91
20	68	69	80	75	77	73	72	73	72	77	77	74	88	84	202	239	290	265	315	325	328	96	84	64	249
21	69	75	81	71	83	80	81	93	84	81	***	***	***	46	***	32	***	74	89	74	72	***	***	67	151
22	61	59	54	60	64	56	58	61	63	***	78	90	70	56	66	23	***	64	46	42	75	67	62	68	61
23	66	69	56	66	62	65	64	68	76	73	72	82	93	22	17	46	38	10	349	11	24	65	85	103	35
24	90	91	92	88	94	75	84	84	84	74	79	81	90	135	112	169	250	294	66	44	43	79	121	103	49
25	85	82	86	76	60	62	68	79	78	60	49	20	32	9	332	303	312	6	288	265	263	273	278	284	122
26	292	294	294	319	319	295	285	285	339	29	20	340	301	294	290	297	282	276	280	279	286	282	217	297	110
27	300	321	322	304	294	330	328	14	57	59	329	294	298	290	300	273	***	***	281	281	283	313	358	16	329
28	75	84	90	87	91	101	114	103	98	117	162	291	334	291	271	269	280	***	***	286	303	232	55	81	295
29	59	101	112	127	134	97	115	130	120	91	126	277	301	281	279	287	276	283	284	278	286	282	344	47	253
30	97	85	99	103	88	89	83	61	92	115	149	91	42	245	270	274	270	282	***	***	347	42	72	95	51

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 94.7% OPERATIONAL RECOVERY RATE = 94.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
NOVEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	127	117	127	119	144	157	106	101	102	151	126	131	63	269	234	273	***	***	221	73	293	338	87	92	170
2	126	121	92	88	79	83	78	92	88	94	81	58	83	83	5	65	86	176	***	22	51	98	112	137	184
3	146	146	123	127	131	122	126	136	143	136	121	141	184	***	182	198	***	***	***	283	283	265	276	***	265
4	316	348	293	33	334	95	319	325	***	69	258	***	320	294	262	259	262	***	263	284	212	271	***	***	158
5	278	280	302	265	188	186	174	142	81	90	86	137	316	274	79	87	77	***	***	66	***	348	352	75	53
6	72	75	73	73	78	76	70	69	69	57	61	34	338	279	290	274	279	***	***	***	357	94	43	47	59
7	53	53	41	78	88	68	81	87	79	***	***	***	***	***	***	70	***	69	***	83	71	***	***	***	77
8	***	***	***	***	***	***	***	***	***	***	***	83	90	***	***	74	***	***	58	66	64	65	81	86	306
9	86	87	76	82	88	79	84	87	85	90	89	118	150	304	283	114	***	***	***	275	165	108	138	126	205
10	119	129	100	97	123	118	135	151	163	150	233	273	***	***	***	***	***	***	***	***	***	***	302	***	178
11	294	298	285	299	156	175	100	95	102	111	224	103	***	***	***	***	***	***	289	303	***	***	99	101	85
12	90	84	102	89	45	74	63	***	63	***	***	***	***	***	***	***	***	***	***	***	***	***	84	***	234
13	56	***	71	***	55	58	69	66	***	61	***	***	***	7	***	54	***	48	***	***	68	66	***	76	105
14	78	67	92	84	75	88	110	96	77	67	61	76	144	178	285	***	285	***	***	287	***	83	79	74	3
15	111	97	86	47	***	***	***	68	53	76	88	86	72	118	70	48	78	88	136	182	187	204	190	147	24
16	189	***	***	248	***	270	***	***	***	***	***	***	***	***	***	***	***	***	222	***	269	***	294	276	156
17	***	***	***	324	313	321	284	305	340	317	295	252	260	298	***	***	***	***	***	317	322	176	119	67	237
18	62	99	115	52	100	92	132	143	220	129	107	319	324	298	***	279	***	***	***	***	322	***	82	135	103
19	155	118	104	116	116	111	88	72	68	81	52	***	***	62	81	40	***	83	***	80	61	***	58	66	26
20	68	80	80	72	81	69	73	69	75	80	74	77	82	65	202	228	298	***	***	324	324	95	84	65	66
21	79	66	97	70	98	83	87	94	77	80	***	***	***	***	***	31	***	***	***	***	***	***	***	***	85
22	***	***	***	***	***	37	***	56	52	***	***	***	70	***	40	***	***	***	49	25	***	***	***	***	173
23	64	60	64	67	62	65	68	72	79	87	***	91	76	34	344	51	37	13	345	7	35	68	81	104	136
24	95	96	88	90	97	91	88	85	78	75	73	80	98	115	105	***	239	250	334	23	62	55	***	105	64
25	76	88	85	79	44	64	72	95	76	69	33	22	7	352	338	306	312	354	***	265	245	283	316	285	250
26	291	***	***	325	349	291	316	337	348	30	6	334	302	***	***	298	***	***	280	283	286	269	***	***	359
27	292	298	296	314	302	321	12	32	51	67	284	302	289	***	***	***	***	***	***	***	284	316	***	52	217
28	74	81	77	42	78	55	116	89	96	121	151	124	324	278	267	***	***	***	***	288	***	***	87	83	92
29	62	99	110	126	128	98	107	112	113	23	148	268	305	303	***	***	***	***	286	265	268	276	343	46	50
30	97	100	101	98	94	88	60	12	87	104	163	80	99	242	263	271	***	***	***	***	***	***	***	83	139

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 71.5% OPERATIONAL RECOVERY RATE = 71.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.29	0.24	0.15	0.20	0.18	0.16	0.01	0.15	0.21	0.54	0.53	0.57	0.73	0.67	0.64	0.56	0.46	0.28	0.40	0.44	0.41	0.24	0.30	0.23	0.36
2	0.20	0.15	0.07	0.16	0.29	0.07	0.18	0.20	0.22	0.32	0.19	0.44	0.88	0.93	0.87	0.68	0.45	0.22	0.46	0.40	0.35	0.29	0.28	0.36	0.36
3	0.33	0.32	0.33	0.33	0.38	0.46	0.37	0.36	0.33	0.56	0.65	0.82	0.84	0.78	0.85	0.50	0.81	***	***	0.80	0.65	0.59	0.50	0.40	0.54
4	0.52	0.38	0.48	0.32	0.42	0.31	0.27	0.12	0.19	0.41	0.52	***	0.67	0.73	0.71	0.70	0.84	***	0.41	0.55	0.35	0.35	0.60	0.53	0.47
5	0.38	0.33	0.44	0.44	0.18	0.24	0.46	0.29	0.36	0.74	0.60	1.05	1.03	0.87	1.11	0.94	0.76	0.81	0.73	0.53	0.58	0.34	0.39	0.37	0.58
6	0.28	0.22	0.24	0.23	0.23	0.15	0.06	0.06	0.11	0.33	0.48	0.42	0.70	0.56	0.59	0.40	0.60	0.47	0.38	0.38	0.31	0.61	0.37	0.50	0.36
7	0.59	0.53	0.40	0.26	0.17	0.36	0.39	0.45	0.81	0.83	***	1.07	1.04	0.76	0.98	1.01	0.94	0.69	0.81	0.62	0.83	0.94	0.90	0.82	0.70
8	0.81	0.83	0.75	0.77	***	1.29	1.14	0.72	***	***	***	***	0.96	0.88	0.77	0.71	0.49	0.49	0.48	0.68	0.60	0.66	0.58	0.32	0.73
9	0.30	0.31	0.33	0.20	0.03	0.06	0.14	0.17	0.24	0.31	0.43	0.61	0.71	1.01	0.86	0.82	0.67	0.51	0.41	0.64	0.44	0.28	0.41	0.30	0.42
10	0.25	0.37	0.40	0.36	0.18	0.23	0.18	0.10	0.09	0.49	0.35	0.77	0.91	0.97	***	***	***	***	0.61	0.63	0.53	0.57	0.55	0.33	0.44
11	0.36	0.40	0.24	0.12	0.15	0.08	0.15	0.05	0.23	0.60	0.74	1.10	0.97	1.07	0.78	1.01	0.74	***	0.47	0.50	0.35	0.23	0.26	0.28	0.47
12	0.32	0.24	0.32	0.33	0.45	0.51	0.95	0.74	0.70	***	***	1.37	1.10	1.13	1.05	0.65	0.73	0.84	0.96	0.92	0.81	0.86	0.75	0.70	0.75
13	0.77	0.78	0.82	0.62	0.66	0.91	0.77	0.99	0.96	1.06	***	0.97	***	1.22	1.07	1.12	0.83	0.72	0.69	0.98	0.79	0.62	0.63	0.69	0.85
14	0.68	0.73	0.49	0.25	0.20	0.20	0.27	0.35	0.30	0.40	0.31	0.38	0.81	0.89	0.82	0.75	0.75	0.63	0.51	0.41	0.45	0.33	0.28	0.41	0.48
15	0.32	0.28	0.27	0.25	0.40	0.46	***	0.57	0.49	0.32	0.35	0.38	0.44	0.33	0.42	0.50	0.36	0.41	0.37	0.42	0.31	0.29	0.47	0.66	0.39
16	0.51	0.57	0.71	0.94	***	0.34	0.52	***	***	***	***	***	***	***	***	***	***	***	0.42	0.29	0.40	0.42	0.31	0.28	0.48
17	0.36	0.31	0.33	0.56	0.79	0.35	0.27	0.39	0.31	0.67	0.68	0.84	0.80	0.81	0.89	0.96	0.77	0.51	0.22	0.22	0.25	0.18	0.27	0.30	0.50
18	0.17	0.03	0.02	0.12	0.10	0.02	0.02	0.08	0.05	0.19	0.54	0.62	0.64	0.66	0.86	0.95	0.76	***	***	0.50	0.15	0.05	0.15	0.37	0.32
19	0.23	0.18	0.21	0.25	0.22	0.16	0.48	0.46	0.46	0.45	1.05	1.04	1.20	1.22	1.18	1.05	0.77	0.56	0.69	0.87	0.89	0.85	0.55	0.68	0.65
20	0.55	0.42	0.39	0.41	0.31	0.38	0.24	0.38	0.31	0.28	0.21	0.52	0.58	0.64	0.78	0.66	0.23	0.60	***	0.18	0.45	0.32	0.22	0.35	0.41
21	0.48	0.71	0.55	0.32	0.37	0.36	0.64	0.55	0.48	0.93	***	***	***	0.98	***	0.82	***	0.92	0.95	1.03	0.72	***	***	0.78	0.68
22	0.72	0.86	0.71	0.68	0.55	0.81	0.81	0.94	0.74	***	***	***	1.32	0.96	1.04	1.10	***	0.84	0.72	0.82	0.92	0.80	0.87	0.43	0.83
23	0.57	0.65	0.73	0.76	0.65	0.72	0.71	0.65	0.70	0.68	0.67	1.06	1.06	0.68	0.42	0.45	0.48	0.65	0.47	0.25	0.35	0.50	0.35	0.22	0.60
24	0.07	0.15	0.26	0.15	0.06	0.24	0.28	0.23	0.29	0.48	0.40	0.59	0.78	0.73	0.79	0.70	0.54	0.54	0.17	0.27	0.34	0.34	0.29	0.32	0.38
25	0.30	0.20	0.32	0.26	0.22	0.24	0.37	0.45	0.30	0.22	0.18	0.04	0.09	0.25	0.07	0.18	0.16	0.19	0.17	0.13	0.14	0.16	0.17	0.26	0.21
26	0.15	0.39	0.58	0.44	0.15	0.01	0.02	0.12	0.16	0.32	0.47	0.34	0.48	0.76	0.81	0.78	0.84	0.56	0.38	0.30	0.20	0.33	0.21	0.20	0.37
27	0.14	0.14	0.14	0.09	0.12	0.06	0.10	0.01	0.01	0.24	0.33	0.87	0.90	0.99	1.11	0.89	***	***	0.74	0.10	0.43	0.31	0.18	0.09	0.36
28	0.09	0.01	0.09	0.26	0.09	0.10	0.11	0.01	0.11	0.32	0.54	0.71	0.52	0.51	0.71	0.74	0.85	***	***	0.52	0.20	0.53	0.26	0.04	0.33
29	0.18	0.13	0.01	0.02	0.06	0.01	0.02	0.02	0.11	0.19	0.50	0.65	0.67	1.01	1.05	0.95	0.76	0.62	0.48	0.62	0.34	0.16	0.18	0.16	0.37
30	0.01	0.17	0.32	0.23	0.20	0.21	0.20	0.28	0.26	0.39	0.64	0.77	0.94	0.96	0.81	0.82	0.76	0.64	***	***	0.46	0.29	0.11	0.20	0.44
HRAVE	0.36	0.37	0.37	0.34	0.28	0.32	0.35	0.34	0.34	0.47	0.49	0.72	0.81	0.83	0.82	0.76	0.65	0.58	0.52	0.52	0.47	0.43	0.39	0.39	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.36	0.36	0.54	0.47	0.58	0.36	0.70	0.73	0.42	0.44	0.47	0.75	0.85	0.48	0.39	0.48	0.50	0.32	0.65	0.41	0.68	0.83	0.60	0.38	0.21
MAX	0.73	0.93	0.85	0.84	1.11	0.70	1.07	1.29	1.01	0.97	1.10	1.37	1.22	0.89	0.66	0.94	0.96	0.95	1.22	0.78	1.03	1.32	1.06	0.79	0.45
MIN	0.01	0.07	0.32	0.12	0.18	0.06	0.17	0.32	0.03	0.09	0.05	0.24	0.62	0.20	0.25	0.28	0.18	0.02	0.16	0.18	0.32	0.43	0.22	0.06	0.04

DAY	26	27	28	29	30	31
AVE	0.37	0.36	0.33	0.37	0.44	***
MAX	0.84	1.11	0.85	1.05	0.96	***
MIN	0.01	0.01	0.01	0.01	0.01	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 92.8% OPERATIONAL RECOVERY RATE = 92.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.43	0.11	0.08	0.10	0.14	0.39	0.01	0.15	0.11	0.13	0.29	0.35	0.34	0.65	0.51	0.59	0.57	0.11	0.43	0.59	0.47	0.61	0.50	0.42	0.34
2	0.36	0.33	0.27	0.43	0.36	0.03	0.14	0.25	0.08	0.24	0.27	0.18	0.49	0.85	0.79	0.58	0.47	0.24	***	0.29	0.38	0.33	0.39	0.32	0.35
3	0.33	0.37	0.36	0.44	0.38	0.57	0.24	0.36	0.25	0.68	0.65	0.82	1.01	0.68	0.87	***	***	***	***	***	0.73	0.72	0.56	***	0.56
4	0.59	0.46	0.45	0.19	0.35	0.61	0.24	***	0.18	0.41	0.51	***	0.69	***	0.72	0.73	0.78	***	***	0.55	0.37	0.38	0.70	***	0.50
5	0.37	***	0.43	0.48	0.23	0.17	0.32	0.27	0.52	0.76	0.67	1.17	0.98	0.87	1.12	0.86	0.69	0.64	0.61	0.54	0.60	0.71	0.66	0.54	0.62
6	0.35	0.29	0.16	0.17	0.11	0.03	0.14	0.16	0.20	0.39	0.30	0.50	0.62	0.54	0.56	0.55	0.44	0.44	***	0.42	0.49	0.62	0.47	0.67	0.37
7	0.62	0.63	0.64	0.22	0.44	0.57	0.40	0.57	0.87	0.97	***	***	***	***	0.94	***	0.50	***	0.72	0.57	0.93	0.98	0.82	0.76	0.67
8	0.84	0.74	***	***	***	***	0.95	***	***	***	***	***	0.88	0.90	0.72	0.68	***	0.46	0.46	0.76	0.61	0.84	0.50	0.47	0.70
9	0.38	0.44	0.51	0.67	0.12	0.04	0.15	0.32	0.19	0.24	0.34	0.52	0.52	0.93	0.78	0.85	0.46	0.48	***	0.69	0.38	0.33	0.42	0.33	0.44
10	0.26	0.34	0.44	0.21	0.26	0.32	0.18	0.13	0.43	0.30	0.43	0.69	0.99	0.94	***	***	***	***	***	0.66	0.55	***	0.54	0.41	0.45
11	0.38	0.48	0.32	0.53	0.05	0.07	0.11	0.43	0.20	0.64	0.65	0.86	0.94	1.12	0.81	0.96	0.58	***	***	0.75	0.49	0.61	0.33	0.24	0.52
12	0.32	0.26	0.31	0.40	0.60	0.33	0.90	0.70	0.61	***	***	1.36	***	***	***	***	***	0.89	***	0.49	0.67	0.98	0.69	0.79	0.64
13	0.70	0.70	0.72	0.67	0.76	1.04	0.83	0.76	0.88	***	***	***	***	1.20	0.86	1.16	***	***	0.51	0.88	0.57	0.59	0.60	0.57	0.78
14	0.69	0.80	0.80	0.64	0.21	0.24	0.52	0.51	0.80	0.83	0.37	0.70	0.88	1.03	0.89	0.64	0.69	***	***	0.53	0.61	0.44	0.47	0.40	0.62
15	0.39	0.48	0.58	0.40	0.50	0.34	***	0.33	0.60	0.58	0.35	0.25	0.37	0.54	0.37	0.32	0.36	0.48	0.30	0.44	0.42	0.35	0.59	0.87	0.44
16	0.67	***	***	0.77	***	***	0.53	***	***	***	***	***	***	***	***	***	***	***	***	0.27	0.39	***	0.33	***	0.49
17	***	***	0.42	***	0.42	0.56	0.37	0.55	0.24	0.38	0.47	0.67	0.87	0.71	1.04	1.08	***	***	0.26	0.60	0.36	0.19	0.02	0.15	0.49
18	0.02	0.01	0.01	0.06	0.15	0.01	0.05	0.08	0.04	0.34	0.50	0.36	0.50	0.78	0.95	0.96	0.96	***	***	0.50	0.18	0.09	0.41	0.27	0.33
19	0.26	0.02	0.17	0.18	0.01	0.02	0.50	0.61	0.42	0.51	0.77	1.01	***	***	***	***	0.82	0.59	0.69	0.79	0.89	0.75	0.65	0.86	0.53
20	0.70	0.47	0.56	0.49	0.39	0.31	0.24	0.34	0.35	0.37	0.24	0.40	0.42	0.43	0.70	0.66	0.39	***	***	0.26	0.51	0.38	0.25	0.33	0.42
21	0.55	0.80	0.48	0.55	0.44	0.53	0.42	0.57	0.54	0.71	***	***	***	***	***	***	***	***	0.81	0.78	***	***	***	***	0.60
22	0.87	0.94	0.62	0.47	0.35	0.79	0.91	0.96	0.75	***	***	***	***	***	***	1.10	***	0.95	0.72	0.68	0.90	0.71	0.70	0.43	0.76
23	0.58	0.60	0.68	0.63	0.74	0.66	0.81	0.78	0.66	0.65	0.59	1.20	1.04	0.68	0.52	0.54	0.47	0.60	0.52	0.22	0.36	0.34	0.50	0.18	0.61
24	0.32	0.13	0.43	0.11	0.02	0.06	0.19	0.30	0.61	0.33	0.28	0.47	0.68	0.61	0.83	0.84	0.61	***	0.11	0.15	0.33	0.32	0.26	0.25	0.36
25	0.67	0.59	0.62	0.36	0.18	0.32	0.53	0.41	0.23	0.36	0.09	0.18	0.16	0.25	0.19	0.24	0.15	0.06	0.09	0.20	0.11	0.07	0.28	0.20	0.27
26	0.13	0.39	0.45	0.36	0.32	0.20	0.01	***	0.16	0.10	0.22	0.29	0.37	0.66	0.83	0.90	***	***	0.59	0.46	0.16	0.43	***	0.55	0.38
27	0.59	0.66	0.22	0.05	0.02	0.04	0.24	0.01	0.01	0.25	0.55	0.86	1.02	0.90	1.25	0.88	***	***	***	0.17	0.72	0.51	0.18	0.08	0.44
28	0.07	0.08	0.08	0.01	0.06	0.05	0.17	0.01	0.01	0.04	0.53	0.74	0.38	0.38	0.71	0.72	0.89	***	***	0.49	0.25	***	0.30	0.02	0.29
29	0.03	0.01	0.03	0.15	0.01	0.01	0.01	0.01	0.23	0.15	0.78	0.59	0.54	1.04	1.31	***	***	***	***	***	0.29	0.14	0.18	0.18	0.30
30	0.01	0.03	0.05	0.24	0.26	0.06	0.04	0.04	0.01	0.10	0.62	0.78	0.90	0.96	0.66	0.88	0.72	***	***	***	0.52	0.32	0.25	0.30	0.37
HRAVE	0.43	0.41	0.39	0.36	0.28	0.30	0.35	0.37	0.36	0.42	0.46	0.65	0.68	0.77	0.79	0.76	0.59	0.50	0.49	0.51	0.49	0.49	0.45	0.41	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.34	0.35	0.56	0.50	0.62	0.37	0.67	0.70	0.44	0.45	0.52	0.64	0.78	0.62	0.44	0.49	0.49	0.33	0.53	0.42	0.60	0.76	0.61	0.36	0.27
MAX	0.65	0.85	1.01	0.78	1.17	0.67	0.98	0.95	0.93	0.99	1.12	1.36	1.20	1.03	0.87	0.77	1.08	0.96	1.01	0.70	0.81	1.10	1.20	0.84	0.67
MIN	0.01	0.03	0.24	0.18	0.17	0.03	0.22	0.46	0.04	0.13	0.05	0.26	0.51	0.21	0.25	0.27	0.02	0.01	0.01	0.24	0.42	0.35	0.18	0.02	0.06

DAY	26	27	28	29	30	31
AVE	0.38	0.44	0.29	0.30	0.37	***
MAX	0.90	1.25	0.89	1.31	0.96	***
MIN	0.01	0.01	0.01	0.01	0.01	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 82.5% OPERATIONAL RECOVERY RATE = 82.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
NOVEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.43	0.14	0.22	0.09	0.28	0.41	0.03	0.48	0.24	0.11	0.27	0.31	0.38	0.65	0.57	***	***	***	***	0.58	0.52	0.58	0.47	0.45	0.36
2	0.34	0.36	0.35	0.52	0.68	0.17	0.15	0.73	0.27	0.23	0.57	0.27	0.51	0.89	0.84	0.65	***	***	***	***	0.36	0.35	0.42	0.34	0.45
3	0.31	0.39	0.39	0.48	0.36	0.54	0.24	0.38	0.30	0.73	0.65	0.66	***	***	***	***	***	***	***	***	***	0.75	***	***	0.48
4	0.60	0.49	***	0.19	0.38	0.64	0.21	***	***	0.39	***	***	***	***	***	0.75	***	***	***	0.52	0.45	0.25	***	***	0.44
5	***	***	0.44	0.43	0.21	0.19	0.28	***	0.53	0.86	0.64	1.18	0.98	0.80	1.14	0.76	***	***	***	***	***	0.85	0.63	***	0.66
6	0.32	0.25	0.15	0.32	0.14	0.07	0.11	0.17	0.19	0.46	0.31	0.54	0.55	0.57	0.55	0.56	***	***	***	***	***	0.89	0.52	0.70	0.39
7	***	0.66	0.61	0.22	0.40	0.51	0.44	0.60	0.86	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.54
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.87	0.53	0.46	0.62
9	0.36	0.43	0.52	0.76	0.13	0.20	0.14	0.45	0.48	0.33	0.37	0.52	0.51	0.90	0.94	***	***	***	***	0.82	0.44	0.36	***	0.37	0.48
10	0.26	0.39	***	***	***	***	***	0.13	0.39	0.27	0.41	***	***	***	***	***	***	***	***	***	***	***	***	***	0.31
11	***	***	***	0.50	***	***	***	0.37	0.19	0.61	***	0.83	***	***	***	***	***	***	***	***	***	***	0.30	0.22	0.43
12	0.34	***	***	***	0.64	0.32	***	***	0.47	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.44
13	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
14	***	***	***	***	***	0.30	0.48	0.50	0.82	0.89	0.36	0.73	***	***	***	***	***	***	***	0.64	***	***	0.54	0.41	0.57
15	0.33	0.64	0.69	0.45	***	***	***	0.36	0.55	0.53	0.22	0.14	0.33	0.54	0.40	0.35	0.37	0.63	0.33	0.51	0.62	0.52	0.62	0.88	0.48
16	0.70	***	***	0.76	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.73
17	***	***	***	***	***	0.49	0.42	0.50	0.21	0.36	0.42	***	0.93	***	***	***	***	***	***	***	***	***	***	0.15	0.44
18	0.01	***	***	***	0.16	0.01	0.04	0.06	0.04	0.34	0.46	0.39	0.51	0.67	***	***	***	***	***	***	***	***	***	0.38	***	0.26
19	***	0.01	0.12	0.19	0.01	0.05	0.53	0.59	0.37	0.86	0.54	***	***	***	***	***	***	***	***	***	***	***	***	1.06	0.39
20	***	0.55	0.50	0.50	0.35	0.34	0.20	0.37	0.45	0.46	0.18	0.45	0.40	0.42	0.80	0.69	***	***	***	***	***	0.24	0.27	0.35	0.42
21	0.53	0.99	0.47	0.49	0.45	0.60	0.43	0.58	0.60	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.57
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	0.60	***	***	***	***	***	***	***	***	***	***	***	***	***	0.69	0.51	0.20	0.36	***	0.43	0.18	0.42
24	0.27	0.13	0.44	0.14	0.06	0.11	0.14	0.20	0.80	0.50	0.30	0.71	0.70	0.60	0.75	***	***	***	0.14	0.13	***	0.30	***	0.12	0.34
25	0.60	0.52	0.59	0.37	0.21	0.32	0.50	0.40	0.26	0.33	0.10	0.17	0.19	0.24	0.18	0.24	0.13	0.05	***	***	0.12	***	0.28	***	0.29
26	***	***	***	***	0.27	0.17	***	***	***	0.11	0.25	0.47	0.46	***	***	***	***	***	***	***	***	0.40	***	***	0.30
27	0.93	0.60	0.23	0.04	***	0.03	0.24	0.01	0.01	0.22	0.58	0.97	***	***	***	***	***	***	***	***	***	***	***	***	0.35
28	***	***	0.09	0.02	0.05	0.06	0.16	0.01	0.01	0.05	0.55	0.71	0.39	0.37	***	***	***	***	***	***	***	***	***	***	0.21
29	0.04	***	***	0.20	0.01	0.01	0.01	0.01	0.22	0.16	0.77	0.59	0.49	0.89	***	***	***	***	***	***	***	***	***	***	0.28
30	***	0.01	0.05	0.20	0.28	0.04	0.04	0.04	0.01	0.10	0.58	0.75	***	0.93	0.58	***	***	***	***	***	***	***	***	***	0.28
HRAVE	0.40	0.41	0.37	0.36	0.27	0.25	0.24	0.33	0.36	0.40	0.43	0.58	0.52	0.65	0.68	0.57	0.25	0.46	0.33	0.49	0.41	0.53	0.45	0.44	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.36	0.45	0.48	0.44	0.66	0.39	0.54	0.62	0.48	0.31	0.43	0.44	***	0.57	0.48	0.73	0.44	0.26	0.39	0.42	0.57	***	0.42	0.34	0.29
MAX	0.65	0.89	0.75	0.75	1.18	0.89	0.86	0.87	0.94	0.41	0.83	0.64	***	0.89	0.88	0.76	0.93	0.67	1.06	0.80	0.99	***	0.69	0.80	0.60
MIN	0.03	0.15	0.24	0.19	0.19	0.07	0.22	0.46	0.13	0.13	0.19	0.32	***	0.30	0.14	0.70	0.15	0.01	0.01	0.18	0.43	***	0.18	0.06	0.05

DAY	26	27	28	29	30	31
AVE	0.30	0.35	0.21	0.28	0.28	***
MAX	0.47	0.97	0.71	0.89	0.93	***
MIN	0.11	0.01	0.01	0.01	0.01	***

MONTHLY AVERAGE = 0.4 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 46.8% OPERATIONAL RECOVERY RATE = 46.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

SODAR AND 10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

DECEMBER 2015 THROUGH FEBRUARY 2016

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

May 2016

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. The smelter air emissions are released to the atmosphere through a 1,000-foot (approximately 300 meter) tall stack. To help refine future AERMOD air dispersion modeling at the facility, ASARCO has been performing site-specific meteorological monitoring at Hayden. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

ASARCO supplemented the 10 meter meteorological tower with a Remtech PA-0 phased-array acoustic Sodar in late May 2014 that measures winds at elevations ranging from approximately 50 to 400 meters above ground level. Sodar (SOnic Detection And Ranging) systems are used to remotely measure the vertical turbulence structure and the wind profile of the lower layer of the atmosphere. Sodar systems are like radar systems except that sound waves rather than radio waves are used. A profile of the atmosphere as a function of height can be obtained by analyzing the return signal at a series of times following the transmission of each pulse. Three antenna beams oriented along the U, V, and W directions allow the calculation of horizontal and vertical wind speeds and directions. Phased-array Sodar systems use a single array of speaker drivers and horns (transducers), and the three antenna beams are electronically generated and steered by phasing the transducers appropriately.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the sodar and 10-meter tower data validation report for the period December 2015 through February 2016. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

The tower and sodar data was remotely collected and reviewed on a daily basis. The sodar data was also regularly compared to the tower wind data to ensure proper sodar operation. No significant operational events occurred during the period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A calibration of the ST-10 meteorological equipment was performed on December 18, 2015, and the calibration results are presented in Appendix A. The calibrations demonstrate that the meteorological systems were operating within the acceptable DQO ranges, as listed in the project's QAPP Table B-1. The QAPP does not list calibration DQOs for the parameters collected at ST-10 that are not used in AERMOD dispersion modeling, those parameters being pressure, precipitation, and relative humidity. The DQOs that were used to validate these three additional parameters are listed in Tables 0-7 and 0-8 in EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems - Volume IV: Meteorological Measurements Version 2.0* (March 2008), which list PSD measurement DQOs.

A quality assurance performance audit was also conducted on the ST-10 meteorological tower equipment on December 18, 2015, before any tower calibrations or adjustments were made. This audit was performed by independent personnel, using independent certified audit standards. The results from this audit are also presented in Appendix A, and indicate that the meteorological systems were operating within the acceptable DQO ranges.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.

- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). Additional data screening is also performed on the sodar data. The internal sodar diagnostic data, including signal to noise ratios (SNRs), the FEMAX ground clutter number, the JAM internal electronic test diagnostic value, and the number of spurious signals (SPU) are screened against manufacturer recommended values. Time series data from the Sodar are screened against rates of change and persistence criteria, and the vertical profiles of the Sodar are screened against expected rate of change with altitude criteria. If the comparisons fall outside of typical ranges, the record is flagged for further inspection. The 15-minute Sodar data are averaged into hourly data using unit vector wind direction averages and scalar wind speed averages, in accordance with Section 6.2 of EPA's Met Monitoring Guidance.

Table 1 summarizes the data screening and validation criteria used for both the 10 meter meteorological tower parameters and the sodar.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were 0.0, -1.7, and -4.1 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%
Sodar Internal Diagnostic Data	JAM > 0, FEMAX > 600, SNR % total bandwidth > 5, SPU > 7.
Sodar Time Series Rate of Change	Same range and persistence checks as listed above for wind speed and direction.
Sodar Rate of Change for Altitude Gates	WS difference more than 4.5 m/s between altitude gates, and WD difference more than 120 degrees between altitude gates.
Sodar Comparison to 10-meter Wind Data	When Wind Speed is > 2 m/s and time is between 10am and 5 pm, then: Wind Speed Average Bias < 1 m/s, WD Standard Deviation Variability < 2 m/s, Wind Direction Average Bias < 10 degrees, WD Standard Deviation Variability < 30 degrees

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, including any necessary data edits. The data review resulted in the invalidation of 8 hours of sodar data, for the hours of 12/3/2015 15:00, 12/12/2015 23:00, 12/20/2015 15:00, 1/2/2016 17:00, 1/22/2016 10:00, 1/26/2016 4:00, 2/23/2016 16:00, and 2/23/2016 20:00.

Quality control comparisons of the hourly average 100 meter sodar wind speed and direction data to the hourly average 10 meter meteorological measurements are also performed for the quarter. These tests are performed only when the atmosphere is well mixed and the 10 meter surface winds should be coupled to the Sodar height winds, which occurs during daytime periods (between 10 am and 5 pm) with moderate wind speeds (greater than 2 m/s). The average difference and standard deviation of differences for wind speed and wind direction were computed and compared to the same DQOs EPA recommends for sodar audits against nearby

meteorological towers (even though for an audit, the sodar and tower measurement heights are at the same height, and therefore should agree better than 10 meter tower and 100 meter sodar data). Table 2 presents the results of this quality control comparison for the quarter, and demonstrates that the sodar agrees with the 10-meter tower within the EPA recommended DQO criteria.

Table 2 – Sodar QC Comparisons to 10m Tower Wind Data

Parameter	EPA DQOs	Dec 2015 to February 2016 Performance
Wind Speed Average Difference (m/s)	$< \pm 1$	0.46
Wind Speed Std Dev Difference (m/s)	< 2	0.95
Wind Direction Average Difference (degrees)	$< \pm 10$	-2.7
Wind Direction Std Dev Difference (degrees)	< 30	22.6

Note: The 100m level of hourly averaged sodar wind data was compared to 10m tower wind data.

3.3 Data Capture Statistics

Based on the review of data from calibrations, audits, and the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 3 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis, and the quarterly data capture rates are well above 90% for each month for all parameters except the 400 m level sodar winds and the sigma W data. This is not unexpected, as sodars have difficulty collecting data at altitudes greater than approximately 300 meters, especially in hot and dry locations such as the ST-10 site. EPA also notes in Section 9.8 of the Met Monitoring Guidance that "data capture for wind direction and wind speed from a sodar is defined somewhat differently than for more conventional instruments", and "an averaging period (e.g., hourly) is considered valid if there are at least three valid levels of data for the period (independent of height)". The data capture rates for all sodar levels equal to and below 300 meters in height all meet the data completeness DQO, and therefore the sodar data capture rates meet EPA requirements.

In summary, all meteorological data collected during the quarter meets the DQO completeness goal for all parameters.

Table 3 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip	100m WS/WD	300m WS/WD	400m WS/WD	100m SW	300m SW	400m SW
Jun-15	99.2	99.2	99.2	99.2	99.2	99.2	99.2	96.5	96.5	82.1	94.9	85.4	54.4
Jul-15	100.0	100.0	100.0	100.0	98.1	98.1	98.1	97.3	97.3	85.5	96.1	87.8	64.9
Aug-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.1	98.3	90.9	96.8	92.3	71.9
Sep-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.8	96.8	88.3	94.7	91.2	79.0
Oct-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	95.7	81.7	93.7	88.3	67.9
Nov-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.7	94.7	71.5	92.8	82.5	46.8
Dec-15	99.3	99.3	99.3	99.3	99.3	99.3	99.3	96.2	96.5	74.7	95.0	88.3	45.2
Jan-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0	86.7	87.0	64.7	84.8	78.5	37.4
Feb-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0	89.9	90.4	52.6	89.1	78.0	25.7
Mar-16													
Apr-16													
May-16													
Quarter 1	99.7	99.7	99.7	99.7	99.1	99.1	99.1	97.3	97.4	86.2	95.9	88.5	63.8
Quarter 2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	95.7	80.5	93.7	87.3	64.6
Quarter 3	99.8	99.8	99.8	99.8	99.8	99.8	99.8	91.0	91.3	64.4	89.7	81.7	36.4
Quarter 4													
Total	99.9	99.9	99.9	99.9	99.5	99.5	99.5	96.5	96.6	83.4	94.8	87.9	64.2

Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and year to date.

4.0 DATA RESULTS

Appendix B presents plots of various monthly data summaries and data tables for the reporting period (these tables include sodar data for the 100, 300, and 400 meter levels). Also submitted with this report are 15-minute and hourly data files in a format designed for AERMET data processing (all sodar altitude levels are included in these data files).

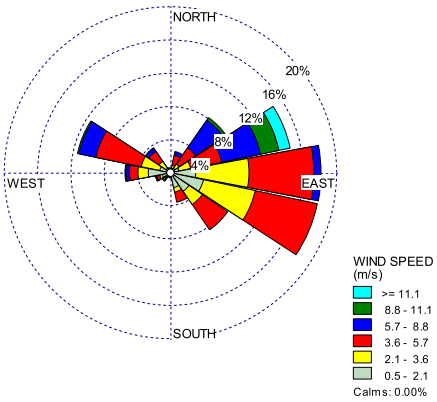
Figure 1 presents plots of the quarterly wind speed and wind direction data at selected heights of 10, 100, and 300 meters above ground, in a format called a "wind rose" plot. These wind roses indicated that there are two predominate wind directions at the site; one from the east (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours). As expected, the wind speeds at 100 and 300 meter levels are higher than the 10 meter winds, with fewer hourly observations in the lower wind speed ranges (gray and yellow bars in the wind roses).

The review of the wind data indicates that there is a diurnal flow pattern at the site, with winds frequently from the east and southeast directions in the morning and evening hours with light to moderate speeds, followed by afternoons with moderate to strong winds. This pattern is evident in the wind roses, and can also be seen in an example of the daily wind data profiles shown in Figure 2 with light easterly and southeasterly flows in the morning followed by stronger westerly wind flows during the afternoon hours. This pattern repeats itself for the majority of the days, and results in the observed bi-modal wind rose distributions.

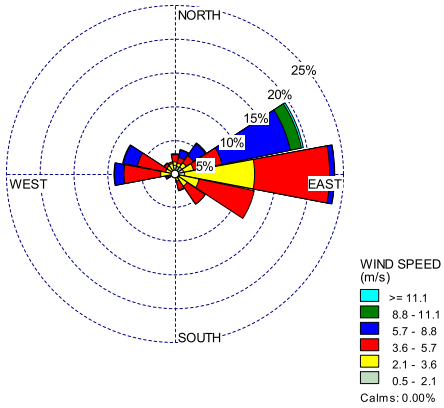
The three-month digital data base in an ASCII format suitable for AERMET processing is included with this data report. It is recommended that Sodar data only up to 400m be used for AERMET processing, for the following reasons. First, this altitude extends 100m taller than the main stack height, which will allow AERMOD to properly simulate stack tip downwash, plume rise, and plume transport. Second, the data capture rates at altitudes above 400m are lower than at altitudes below 400m, and there is an increased number of data screening flags (which indicates that data from higher elevations may not be as reliable as data from 400m and lower altitudes). Therefore, it is not likely that data from these higher Sodar altitudes would add to the accuracy of the AERMET data profile. The included AERMET Stage 1 input file for the onsite data is setup to only process Sodar data up to 400m altitude.

Figure 1 –Wind Rose Plots

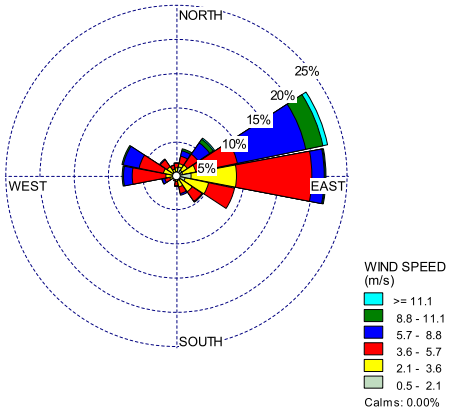
10-Meter Wind Rose



100-Meter Wind Rose

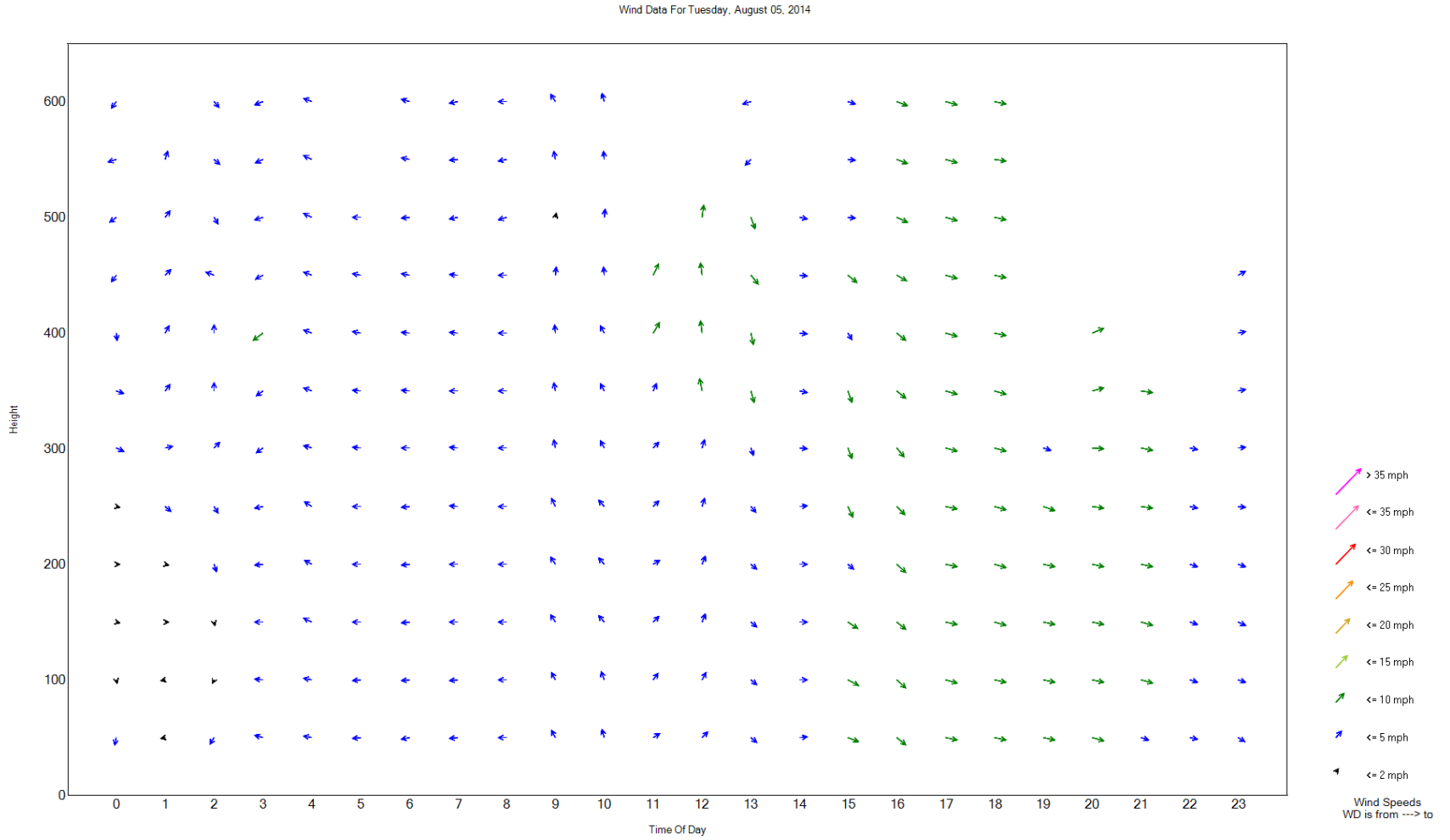


300-Meter Wind Rose



Wind directions are the direction the wind is blowing FROM.

Figure 2 – Example of Typical Diurnal Wind Flow Patterns



Note: Arrows are wind flow vectors and point to the direction the wind is blowing to.

APPENDIX A

Data Screening and Validation Results

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 12/18/2015 By: Rebecca Moore

RM Young Wind Monitor AQ Sensor SN :	126168
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Met One 083 SN N3538
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN 4015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Oakton 4 Thermistor SN 86818
Relative Humidity Standard	Extech RH390 SN 130327978

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.2	0.2	NA
300	3.4	3.4	0.0	0.9%
900	10.3	10.3	0.0	0.1%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.5 mph (0.2 mps) or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.4 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	1	0
45	41	41	0
90	86	87	1
135	131	131	0
180	176	176	0
225	221	220	-1
270	266	265	-1
315	311	310	-1

Note: Readings adjusted for data logger offset

Magnetic Deviation (east is positive) =	10.3
Vane alignment rod (magnetic) =	347
Alignment (true) =	357
Data Logger Offset =	-4

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 9 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.0	0.1	0.1	0.0	0.0	-0.04
20.4	20.5	0.1	20.4	0.0	-0.10
41.3	41.2	-0.1	41.3	0.0	0.04

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
30.1	32.6	2.5

For RH the DQO limit is ± 7%

BAROMETRIC PRESSURE SENSOR

Standard (mm Hg)	Logger (mm Hg)	Difference (mm Hg)
705.8	706.14	0.3

Acceptable tolerance is 2.3 mm Hg

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.19	0.20	0.01

Note: Input 100 ml for a target of 0.20 inches (20 tips).
The water must be input over at least 5 minutes.

Comments:

Calibration starts 09:15, is over 12:00

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 12/18/2015 Auditor: John Podrez

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 126168
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Wind Speed Audit Standard:	RM Young 18820 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton SN M100608

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.2	0.2	NA
300	3.4	3.4	0.0	0.9%
900	10.3	10.3	0.0	0.1%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.5 mph (0.2 mps) or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.5 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	3	2
45	41	42	1
90	86	88	2
135	131	131	0
180	176	177	1
225	221	221	0
270	266	266	0
315	311	310	-1

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic) = 346

Alignment (true) = 356

Note - Data Logger program has offset of -4 degrees

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 8 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	0.1	0.0	0.0	-0.1	-0.04
20.5	20.5	0.0	20.4	-0.1	-0.10
41.3	41.2	-0.1	41.3	0.0	0.04

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.59	0.57	-0.02	-1%

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

(Note - sensor mV readings are converted to kw/m2 by multiplying 0.1025)

Comments:

Audit starts 09:15, is over 12:00

Sodar alignment at 300 mag along left side of enclosure, so true alignment is 310.

This is converted to system azimuth by subtracting 180 degrees.

Therefore, Audit alignment is 130 and Sodar system is at 133.

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Dec 2015 ti Feb 2016 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	15120214	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	15122605	WIND SPD TOO CONSTANT 3 HR	0.11	Light morning winds, WD does vary - WS is valid
4	WS	16010212	WIND SPD TOO CONSTANT 3 HR	0.11	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16010902	WIND SPD TOO CONSTANT 3 HR	0.11	Light morning winds, WD does vary - WS is valid
4	WS	16012216	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16012406	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16013102	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16020416	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16020419	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16020820	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16021006	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16021007	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16021008	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16021205	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16021301	WIND SPD TOO CONSTANT 3 HR	0.09	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16022106	WIND SPD TOO CONSTANT 3 HR	0.13	WD does vary and Sigma Theta is low to moderate - WS is valid
6	WD	16010212	WIND DIR TOO CONSTANT 18 HR	9.1	WS does vary and Sigma Theta is low to moderate - WD is valid
6	WD	16010213	WIND DIR TOO CONSTANT 18 HR	9.1	WS does vary and Sigma Theta is low to moderate - WD is valid
6	WD	16010311	WIND DIR TOO CONSTANT 18 HR	9.9	WS does vary and Sigma Theta is low to moderate - WD is valid
6	WD	16010312	WIND DIR TOO CONSTANT 18 HR	8.9	WS does vary and Sigma Theta is low to moderate - WD is valid
6	WD	16010313	WIND DIR TOO CONSTANT 18 HR	8.9	WS does vary and Sigma Theta is low to moderate - WD is valid
6	WD	16010314	WIND DIR TOO CONSTANT 18 HR	9.5	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15120705	WIND DIR TOO CONSTANT 3 HR	0.44	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	15120900	WIND DIR TOO CONSTANT 3 HR	0	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	16010121	WIND DIR TOO CONSTANT 3 HR	0.15	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	16010300	WIND DIR TOO CONSTANT 3 HR	0.7	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	16010320	WIND DIR TOO CONSTANT 3 HR	0.39	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	16010511	WIND DIR TOO CONSTANT 3 HR	0.52	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	16012307	WIND DIR TOO CONSTANT 3 HR	0.4	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	16012802	WIND DIR TOO CONSTANT 3 HR	0.8	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	16020715	WIND DIR TOO CONSTANT 3 HR	0.41	WS does vary and Sigma Theta is low to moderate - WD is valid
7	WD	16022917	WIND DIR TOO CONSTANT 3 HR	0.3	WS does vary and Sigma Theta is low to moderate - WD is valid
11	TP	16020101	HIGH RATE OF C CHANGE	5.68	During precipitation event - Data is Valid
11	TP	16020101	HIGH RATE OF C CHANGE	5.99	During precipitation event - Data is Valid
11	TP	16021508	HIGH RATE OF C CHANGE	6.05	During wind shift at morning transition - Data is Valid
11	TP	16021508	HIGH RATE OF C CHANGE	5.7	During wind shift at morning transition - Data is Valid
11	TP	16021509	HIGH RATE OF C CHANGE	5.1	During wind shift at morning transition - Data is Valid
11	TP	16022509	HIGH RATE OF C CHANGE	5.49	During wind shift at morning transition - Data is Valid
11	TP	16022509	HIGH RATE OF C CHANGE	5.19	During wind shift at morning transition - Data is Valid
11	TP	16022609	HIGH RATE OF C CHANGE	5.73	During wind shift at morning transition - Data is Valid
12	TP	15121208	TEMP C TOO CONSTANT 12Hr	0.39	Stable temperature overnight - moderate WS - data is Valid
12	TP	15122300	TEMP C TOO CONSTANT 12Hr	0.39	Stable temperature overnight - moderate WS - data is Valid
12	TP	15122301	TEMP C TOO CONSTANT 12Hr	0.39	Stable temperature overnight - moderate WS - data is Valid
12	TP	15122301	TEMP C TOO CONSTANT 12Hr	0.5	Stable temperature overnight - moderate WS - data is Valid
12	TP	15122302	TEMP C TOO CONSTANT 12Hr	0.5	Stable temperature overnight - moderate WS - data is Valid
12	TP	15122302	TEMP C TOO CONSTANT 12Hr	0.5	Stable temperature overnight - moderate WS - data is Valid
12	TP	15122303	TEMP C TOO CONSTANT 12Hr	0.43	Stable temperature overnight - moderate WS - data is Valid
12	TP	15122303	TEMP C TOO CONSTANT 12Hr	0.43	Stable temperature overnight - moderate WS - data is Valid
12	TP	16010504	TEMP C TOO CONSTANT 12Hr	0.44	Stable temperature overnight - moderate WS - data is Valid
12	TP	16010802	TEMP C TOO CONSTANT 12Hr	0.33	Stable temperature overnight - high RH - data is Valid
12	TP	16010803	TEMP C TOO CONSTANT 12Hr	0.39	Stable temperature overnight - high RH - data is Valid
12	TP	16010803	TEMP C TOO CONSTANT 12Hr	0.47	Stable temperature overnight - high RH - data is Valid
12	TP	16010804	TEMP C TOO CONSTANT 12Hr	0.47	Stable temperature overnight - high RH - data is Valid
12	TP	16010804	TEMP C TOO CONSTANT 12Hr	0.47	Stable temperature overnight - high RH - data is Valid
12	TP	16010805	TEMP C TOO CONSTANT 12Hr	0.46	Stable temperature overnight - high RH - data is Valid
12	TP	16010806	TEMP C TOO CONSTANT 12Hr	0.49	Stable temperature overnight - high RH - data is Valid
12	TP	16020118	TEMP C TOO CONSTANT 12Hr	0.44	Steady winds - data is valid
12	TP	16020119	TEMP C TOO CONSTANT 12Hr	0.44	Steady winds - data is valid
15	D1	15120305	DT LARGE READING	2.12	Steady winds - no precip - early morning, likely clear sky - DT is valid
15	D1	15120306	DT LARGE READING	2.14	Steady winds - no precip - early morning, likely clear sky - DT is valid
15	D1	15120604	DT LARGE READING	2.17	Steady winds - no precip - early morning, likely clear sky - DT is valid
15	D1	15120605	DT LARGE READING	2.03	Steady winds - no precip - early morning, likely clear sky - DT is valid
15	D1	16012707	DT LARGE READING	2.23	Steady winds - no precip - early morning, likely clear sky - DT is valid
15	D1	16020703	DT LARGE READING	2.51	Steady winds - no precip - early morning, likely clear sky - DT is valid
15	D1	16021000	DT LARGE READING	2.05	Steady winds - no precip - early morning, likely clear sky - DT is valid
15	D1	16021001	DT LARGE READING	2.16	Steady winds - no precip - early morning, likely clear sky - DT is valid
16	D1	15120215	DT + During Daytime	0.12	Just outside of Screening Limit - Data is valid
16	D1	15120615	DT + During Daytime	0.11	Just outside of Screening Limit - Data is valid
16	D1	15121114	DT + During Daytime	0.16	Just outside of Screening Limit - Data is valid
16	D1	15121815	DT + During Daytime	0.17	Just outside of Screening Limit - Data is valid
16	D1	15121915	DT + During Daytime	0.16	Just outside of Screening Limit - Data is valid
16	D1	16010711	DT + During Daytime	0.28	Just outside of Screening Limit - Data is valid
17	D1	16020101	DT - During Nighttime	-0.11	Just outside of Screening Limit - Data is valid
19	RH	15121203	OUT OF LIMITS	95.9	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121204	OUT OF LIMITS	96.6	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121205	OUT OF LIMITS	96.4	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121300	OUT OF LIMITS	96.8	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121301	OUT OF LIMITS	97.7	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121302	OUT OF LIMITS	98	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121303	OUT OF LIMITS	98	High RH in evening/morning hours with cool temperatures - data is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Dec 2015 ti Feb 2016 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	15121304	OUT OF LIMITS	98.2	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121305	OUT OF LIMITS	98.5	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121306	OUT OF LIMITS	98.7	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121307	OUT OF LIMITS	98.8	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121308	OUT OF LIMITS	98.8	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121309	OUT OF LIMITS	98.9	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121310	OUT OF LIMITS	98.3	High RH with cool temperatures and light winds - data is valid
19	RH	15121505	OUT OF LIMITS	95.6	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121506	OUT OF LIMITS	95.8	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15121507	OUT OF LIMITS	95.8	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122221	OUT OF LIMITS	96.6	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122222	OUT OF LIMITS	97.5	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122223	OUT OF LIMITS	97.5	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122300	OUT OF LIMITS	97.7	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122301	OUT OF LIMITS	97.5	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122302	OUT OF LIMITS	97.5	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122303	OUT OF LIMITS	97.9	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122304	OUT OF LIMITS	97.6	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122305	OUT OF LIMITS	97.8	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122306	OUT OF LIMITS	95.8	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122307	OUT OF LIMITS	96.8	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122309	OUT OF LIMITS	95.5	High RH with cool temperatures and some precip - data is valid
19	RH	15122401	OUT OF LIMITS	96.9	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122402	OUT OF LIMITS	97.4	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122404	OUT OF LIMITS	96.7	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122405	OUT OF LIMITS	97	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122407	OUT OF LIMITS	96.1	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	15122408	OUT OF LIMITS	96.7	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	16010603	OUT OF LIMITS	96.3	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	16010716	OUT OF LIMITS	96.2	High RH with recent precipitation - data is valid
19	RH	16010717	OUT OF LIMITS	96.4	High RH with recent precipitation - data is valid
19	RH	16010718	OUT OF LIMITS	96.8	High RH with recent precipitation - data is valid
19	RH	16010723	OUT OF LIMITS	95.6	High RH with recent precipitation - data is valid
19	RH	16010800	OUT OF LIMITS	96.5	High RH with recent precipitation - data is valid
19	RH	16010801	OUT OF LIMITS	96.6	High RH with recent precipitation - data is valid
19	RH	16010802	OUT OF LIMITS	97.1	High RH with recent precipitation - data is valid
19	RH	16010803	OUT OF LIMITS	97	High RH with recent precipitation - data is valid
19	RH	16010804	OUT OF LIMITS	96.5	High RH with recent precipitation - data is valid
19	RH	16010805	OUT OF LIMITS	96.7	High RH with recent precipitation - data is valid
19	RH	16010806	OUT OF LIMITS	96.7	High RH with recent precipitation - data is valid
19	RH	16010807	OUT OF LIMITS	96.3	High RH with recent precipitation - data is valid
19	RH	16010903	OUT OF LIMITS	95.6	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	16010904	OUT OF LIMITS	96.6	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	16010905	OUT OF LIMITS	96.5	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	16010906	OUT OF LIMITS	96.9	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	16010907	OUT OF LIMITS	97.3	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	16010908	OUT OF LIMITS	97.5	High RH in evening/morning hours with cool temperatures - data is valid
19	RH	16010909	OUT OF LIMITS	97.5	High RH in evening/morning hours with cool temperatures - data is valid
20	SR	16013113	SR OUT OF MAX/MIN	0.7	Just outside of Screening Limit - Data is valid
20	SR	16022612	SR OUT OF MAX/MIN	0.82	Just outside of Screening Limit - Data is valid
20	SR	16022712	SR OUT OF MAX/MIN	0.82	Just outside of Screening Limit - Data is valid
20	SR	16022812	SR OUT OF MAX/MIN	0.83	Just outside of Screening Limit - Data is valid
21	PR	16010714	OUT OF LIMITS	0.25	High Precitation events over multiple hours - also observed at Safford and Coolidge AZMET - data is valid

AZMET and ST10 Reported Precipitation Totals
(inches/month)

Month	Coolidge	Safford	ST-10
Jun-15	0.22	1.12	0.30
Jul-15	0.52	0.84	0.92
Aug-15	1.44	4.44	2.34
Sep-15	2.52	3.10	1.27
Oct-15	0.96	0.77	1.74
Nov-15	0.34	0.19	0.69
Dec-15	0.13	0.46	0.94
Jan-16	1.57	1.17	1.29
Feb-16	0.01	0.17	0.09
Mar-16			
Apr-16			
May-16			
Totals	**6.13**	**10.92**	**8.20**

ASARCO Dec 2015-Feb 2016 Sodar QC Screening Report - Hourly Data

Date/time beginning	QCCODE	Test Condition	at Gate	Ht	Comment
12/10/2015 15:00	Hour to Hour WS	> 9.0 m/s at gate		350	Unreasonable WS, do not see jump in 10m WS, hour 16 invalidated > 300m
12/10/2015 16:00	Hour to Hour WS	> 9.0 m/s at gate		350	Unreasonable WS, do not see jump in 10m WS, hour 16 invalidated > 300m
12/18/2015 11:00	Hour to Hour WS	> 9.0 m/s at gate		400	Data is reasonable and valid
1/22/2016 8:00	Hour to Hour WS	> 9.0 m/s at gate		250	Unreasonable WS in later hour, do not see jump in 10m WS, hour 10 is invalidated
1/22/2016 8:00	Hour to Hour WS	> 9.0 m/s at gate		300	Unreasonable WS in later hour, do not see jump in 10m WS, hour 10 is invalidated
2/15/2016 8:00	Hour to Hour WS	> 9.0 m/s at gate		400	Data is reasonable and valid
2/22/2016 14:00	Hour to Hour WS	> 9.0 m/s at gate		400	Data is reasonable and valid
2/23/2016 18:00	Hour to Hour WS	> 9.0 m/s at gate		350	Data is reasonable and valid
2/23/2016 20:00	Hour to Hour WS	> 9.0 m/s at gate		350	Data is reasonable and valid
2/23/2016 20:00	Hour to Hour WS	> 9.0 m/s at gate		400	Data is reasonable and valid
12/2/2015 22:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		400	Data is reasonable and valid
12/3/2015 22:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		200	Data is reasonable and valid
12/3/2015 23:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		50	Data is reasonable and valid
12/3/2015 23:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		150	Data is reasonable and valid
12/15/2015 13:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		150	Data is reasonable and valid
12/16/2015 3:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		200	Data is reasonable and valid
1/6/2016 10:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		50	Data is reasonable and valid
2/6/2016 4:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		150	Data is reasonable and valid
2/9/2016 1:00	Hourly WD difference	< 1.0 for >= 3 hours at gate		150	Data is reasonable and valid
12/2/2015 5:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		200	Data is reasonable and valid
12/5/2015 9:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		50	Data is reasonable and valid
12/21/2015 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		200	Data is reasonable and valid
12/21/2015 10:00	Hourly WS difference	< 0.5 for >= 12 hours at gate		50	Data is reasonable and valid
12/21/2015 14:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		50	Data is reasonable and valid
12/22/2015 18:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		300	Data is reasonable and valid
12/29/2015 1:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		50	Data is reasonable and valid
12/29/2015 8:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		150	Data is reasonable and valid
12/31/2015 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		100	Data is reasonable and valid
12/31/2015 3:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		150	Data is reasonable and valid
1/10/2016 21:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		50	Data is reasonable and valid
1/15/2016 10:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		50	Data is reasonable and valid
1/16/2016 4:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		250	Data is reasonable and valid
1/18/2016 1:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		150	Data is reasonable and valid
1/22/2016 3:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		150	Data is reasonable and valid
1/28/2016 1:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		50	Data is reasonable and valid
1/30/2016 18:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		100	Data is reasonable and valid
2/3/2016 4:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		50	Data is reasonable and valid
2/11/2016 1:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		50	Data is reasonable and valid
2/13/2016 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		100	Data is reasonable and valid
2/13/2016 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		150	Data is reasonable and valid
2/24/2016 19:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		100	Data is reasonable and valid
2/25/2016 21:00	Hourly WS difference	< 0.1 for >= 3 hours at gate		100	Data is reasonable and valid
12/10/2015 16:00	WS ROC > 4.5		5.2	300	Unreasonable WS, do not see jump in 10m WS, hour 16 invalidated > 300m
2/23/2016 20:00	WS ROC > 4.5		6	350	Unreasonable WS, do not see jump in 10m WS, hour 16 invalidated

12/1/2015 11:00	WD ROC > 90	108	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
12/1/2015 21:00	WD ROC > 90	92	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
12/4/2015 19:00	WD ROC > 90	113	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
12/9/2015 14:00	WD ROC > 90	162	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
12/10/2015 14:00	WD ROC > 90	111	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
12/11/2015 23:00	WD ROC > 90	180	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
12/12/2015 21:00	WD ROC > 90	142	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
12/12/2015 23:00	WD ROC > 90	177	at gate	100	Data is invalidated
12/13/2015 2:00	WD ROC > 90	163	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
12/16/2015 11:00	WD ROC > 90	138	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
12/16/2015 16:00	WD ROC > 90	131	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
12/16/2015 22:00	WD ROC > 90	113	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
12/17/2015 12:00	WD ROC > 90	152	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
12/17/2015 15:00	WD ROC > 90	162	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
12/19/2015 22:00	WD ROC > 90	178	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
12/22/2015 15:00	WD ROC > 90	131	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
12/23/2015 2:00	WD ROC > 90	166	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
12/23/2015 3:00	WD ROC > 90	118	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
12/23/2015 5:00	WD ROC > 90	122	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
12/23/2015 8:00	WD ROC > 90	141	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
12/23/2015 19:00	WD ROC > 90	91	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
12/24/2015 10:00	WD ROC > 90	174	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
12/24/2015 18:00	WD ROC > 90	117	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
12/24/2015 19:00	WD ROC > 90	156	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
12/27/2015 11:00	WD ROC > 90	149	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
1/5/2016 18:00	WD ROC > 90	95	at gate	500	Data is valid, occurs during transitional period and/or lower speeds
1/6/2016 0:00	WD ROC > 90	120	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
1/7/2016 3:00	WD ROC > 90	136	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
1/9/2016 2:00	WD ROC > 90	103	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
1/9/2016 4:00	WD ROC > 90	92	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
1/9/2016 5:00	WD ROC > 90	132	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
1/9/2016 6:00	WD ROC > 90	103	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
1/11/2016 5:00	WD ROC > 90	164	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
1/11/2016 6:00	WD ROC > 90	132	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
1/14/2016 6:00	WD ROC > 90	96	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
1/14/2016 12:00	WD ROC > 90	106	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
1/17/2016 1:00	WD ROC > 90	173	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
1/18/2016 21:00	WD ROC > 90	142	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
1/19/2016 12:00	WD ROC > 90	161	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
1/20/2016 1:00	WD ROC > 90	142	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
1/20/2016 2:00	WD ROC > 90	175	at gate	250	Data is valid, occurs during transitional period and/or lower speeds

ASARCO Dec 2015-Feb 2016 Sodar QC Screening Report - Hourly Data

Date/time beginning	QCCODE	Test Condition	at Gate Ht	Comment
1/20/2016 19:00	WD ROC > 90	167	at gate 250	Data is valid, occurs during transitional period and/or lower speeds
1/20/2016 23:00	WD ROC > 90	112	at gate 200	Data is valid, occurs during transitional period and/or lower speeds
1/25/2016 23:00	WD ROC > 90	180	at gate 100	Data is valid, occurs during transitional period and/or lower speeds
1/27/2016 18:00	WD ROC > 90	116	at gate 250	Data is valid, occurs during transitional period and/or lower speeds
2/14/2016 12:00	WD ROC > 90	117	at gate 300	Data is valid, occurs during transitional period and/or lower speeds
2/20/2016 18:00	WD ROC > 90	93	at gate 250	Data is valid, occurs during transitional period and/or lower speeds
2/21/2016 11:00	WD ROC > 90	119	at gate 250	Data is valid, occurs during transitional period and/or lower speeds
2/23/2016 14:00	WD ROC > 90	94	at gate 300	Data is valid, occurs during transitional period and/or lower speeds
2/23/2016 15:00	WD ROC > 90	145	at gate 400	Data is valid, occurs during transitional period and/or lower speeds
2/28/2016 21:00	WD ROC > 90	173	at gate 100	Data is valid, occurs during transitional period and/or lower speeds
2/29/2016 21:00	WD ROC > 90	173	at gate 250	Data is valid, occurs during transitional period and/or lower speeds

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Date/time beginning	QCCODE	SNR1	SNR2	SNR3	*Comment*
12/11/2015 23:15	NOISE > 8750	8504	8504	8802	Noise flag - sodar automatically invalidated data
12/12/2015 0:30	NOISE > 8750	8304	8404	8802	Noise flag - data is consistent with adjacent periods - data is valid
12/12/2015 0:45	NOISE > 8750	8604	8604	8902	Noise flag - data is consistent with adjacent periods - data is valid
12/12/2015 1:00	NOISE > 8750	8604	8604	8902	Noise flag - sodar automatically invalidated data
12/12/2015 1:15	NOISE > 8750	8604	8704	9002	Noise flag - sodar automatically invalidated data
12/12/2015 1:30	NOISE > 8750	8504	8404	8802	Noise flag - sodar automatically invalidated data
12/12/2015 4:15	NOISE > 8750	8204	8404	8802	Noise flag - data is consistent with adjacent periods - data is valid
12/12/2015 20:00	NOISE > 8750	8604	8604	8902	Noise flag - data is consistent with adjacent periods - data is valid
1/7/2016 12:45	NOISE > 8750	8404	8404	8802	Noise flag - sodar automatically invalidated data
1/7/2016 13:00	NOISE > 8750	8404	8504	8802	Noise flag - sodar automatically invalidated data
1/7/2016 13:15	NOISE > 8750	8704	8604	8902	Noise flag - sodar automatically invalidated data
1/7/2016 14:00	NOISE > 8750	8604	8604	8902	Noise flag - sodar automatically invalidated data
1/7/2016 14:15	NOISE > 8750	8804	8904	9202	Noise flag - sodar automatically invalidated data
1/7/2016 14:30	NOISE > 8750	8804	8804	9102	Noise flag - sodar automatically invalidated data
1/7/2016 15:45	NOISE > 8750	8604	8504	8802	Noise flag - sodar automatically invalidated data
1/7/2016 16:00	NOISE > 8750	8404	8404	8802	Noise flag - sodar automatically invalidated data
1/31/2016 23:30	NOISE > 8750	8504	8604	8902	Noise flag - sodar automatically invalidated data
2/1/2016 0:15	NOISE > 8750	8504	8604	9002	Noise flag - sodar automatically invalidated data
2/1/2016 0:30	NOISE > 8750	8504	8704	9002	Noise flag - sodar automatically invalidated data
2/1/2016 0:45	NOISE > 8750	9004	8704	9202	Noise flag - sodar automatically invalidated data
2/1/2016 1:15	NOISE > 8750	8504	8803	8902	Noise flag - sodar automatically invalidated data
2/1/2016 1:30	NOISE > 8750	8604	8504	8802	Noise flag - sodar automatically invalidated data
2/1/2016 2:00	NOISE > 8750	8803	9003	9302	Noise flag - sodar automatically invalidated data

Date/Time	QCCODE	Value	*Comment*
12/22/2015 17:00	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/22/2015 17:15	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/22/2015 17:30	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/22/2015 17:45	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/22/2015 18:00	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/22/2015 18:15	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/22/2015 18:30	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/22/2015 18:45	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/23/2015 16:45	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/23/2015 17:00	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/23/2015 17:15	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/23/2015 17:30	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/23/2015 17:45	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/23/2015 18:00	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/23/2015 18:15	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/23/2015 18:30	FEMAX > 600	6532	Elevated ground clutter but data is valid and reasonable
12/24/2015 16:45	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
12/24/2015 17:00	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
12/24/2015 17:15	FEMAX > 600	4213	Elevated ground clutter but data is valid and reasonable
12/24/2015 17:30	FEMAX > 600	4213	Elevated ground clutter but data is valid and reasonable
12/24/2015 17:45	FEMAX > 600	4213	Elevated ground clutter but data is valid and reasonable
12/24/2015 18:00	FEMAX > 600	4213	Elevated ground clutter but data is valid and reasonable
12/24/2015 18:15	FEMAX > 600	4213	Elevated ground clutter but data is valid and reasonable
12/24/2015 18:30	FEMAX > 600	4213	Elevated ground clutter but data is valid and reasonable
12/29/2015 16:45	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
12/29/2015 17:00	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
12/30/2015 16:45	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
12/30/2015 17:00	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
1/2/2016 9:00	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/2/2016 9:15	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/3/2016 8:30	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/3/2016 8:45	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/3/2016 9:00	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/3/2016 9:15	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/4/2016 8:30	FEMAX > 600	1079	Sodar data internally invalidated
1/4/2016 8:45	FEMAX > 600	1079	Sodar data internally invalidated
1/4/2016 9:00	FEMAX > 600	1079	Sodar data internally invalidated
1/4/2016 9:15	FEMAX > 600	1079	Sodar data internally invalidated
1/4/2016 16:45	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
1/4/2016 17:00	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
1/5/2016 8:45	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable

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1/5/2016 9:00	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/5/2016 9:15	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/5/2016 9:30	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/5/2016 16:45	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
1/5/2016 17:00	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
1/5/2016 22:15	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/5/2016 22:30	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/5/2016 22:45	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/5/2016 23:00	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/5/2016 23:15	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/5/2016 23:30	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/5/2016 23:45	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/6/2016 0:00	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/6/2016 8:45	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/6/2016 9:00	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/6/2016 9:15	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/6/2016 9:30	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/6/2016 16:45	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
1/6/2016 17:00	FEMAX > 600	6177	Elevated ground clutter but data is valid and reasonable
1/6/2016 22:15	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/6/2016 22:30	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/6/2016 22:45	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/6/2016 23:00	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/6/2016 23:15	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/6/2016 23:30	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/6/2016 23:45	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/7/2016 0:00	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/7/2016 8:45	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/7/2016 9:00	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/7/2016 9:15	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/7/2016 9:30	FEMAX > 600	1079	Elevated ground clutter but data is valid and reasonable
1/7/2016 22:30	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/7/2016 22:45	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/7/2016 23:00	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/7/2016 23:15	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/7/2016 23:30	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/7/2016 23:45	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 0:00	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 0:15	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 22:00	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 22:15	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 22:30	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 22:45	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 23:00	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 23:15	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 23:30	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/8/2016 23:45	FEMAX > 600	1110	Elevated ground clutter but data is valid and reasonable
1/15/2016 18:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/15/2016 18:15	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/15/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/15/2016 18:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/16/2016 18:15	FEMAX > 600	645	Sodar data internally invalidated
1/16/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/16/2016 18:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/16/2016 19:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/17/2016 17:45	FEMAX > 600	645	Sodar data internally invalidated
1/17/2016 18:00	FEMAX > 600	645	Sodar data internally invalidated
1/17/2016 18:15	FEMAX > 600	645	Sodar data internally invalidated
1/17/2016 18:30	FEMAX > 600	645	Sodar data internally invalidated
1/17/2016 18:45	FEMAX > 600	645	Sodar data internally invalidated
1/17/2016 19:00	FEMAX > 600	645	Sodar data internally invalidated
1/18/2016 17:45	FEMAX > 600	645	Sodar data internally invalidated
1/18/2016 18:00	FEMAX > 600	645	Sodar data internally invalidated
1/18/2016 18:15	FEMAX > 600	645	Sodar data internally invalidated
1/18/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/18/2016 18:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/18/2016 19:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable

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1/19/2016 18:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/19/2016 18:15	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/19/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/19/2016 18:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/20/2016 16:30	FEMAX > 600	1990	Elevated ground clutter but data is valid and reasonable
1/20/2016 16:45	FEMAX > 600	1990	Elevated ground clutter but data is valid and reasonable
1/20/2016 17:00	FEMAX > 600	1990	Sodar data internally invalidated
1/20/2016 17:15	FEMAX > 600	1990	Elevated ground clutter but data is valid and reasonable
1/20/2016 17:30	FEMAX > 600	1990	Elevated ground clutter but data is valid and reasonable
1/20/2016 17:45	FEMAX > 600	1990	Elevated ground clutter but data is valid and reasonable
1/20/2016 18:00	FEMAX > 600	1990	Elevated ground clutter but data is valid and reasonable
1/20/2016 18:15	FEMAX > 600	1990	Elevated ground clutter but data is valid and reasonable
1/20/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/20/2016 18:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/21/2016 18:00	FEMAX > 600	645	Sodar data internally invalidated
1/21/2016 18:15	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/21/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/21/2016 18:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/22/2016 17:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/22/2016 18:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/22/2016 18:15	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/22/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/22/2016 18:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/22/2016 19:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/23/2016 17:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/23/2016 18:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/23/2016 18:15	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/23/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/23/2016 18:45	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/23/2016 19:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/24/2016 17:45	FEMAX > 600	645	Sodar data internally invalidated
1/24/2016 18:00	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/24/2016 18:15	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
1/24/2016 18:30	FEMAX > 600	645	Elevated ground clutter but data is valid and reasonable
2/17/2016 4:30	FEMAX > 600	757	Elevated ground clutter but data is valid and reasonable
2/17/2016 4:45	FEMAX > 600	757	Elevated ground clutter but data is valid and reasonable
2/18/2016 4:30	FEMAX > 600	757	Elevated ground clutter but data is valid and reasonable
2/18/2016 4:45	FEMAX > 600	757	Elevated ground clutter but data is valid and reasonable
2/19/2016 4:45	FEMAX > 600	757	Elevated ground clutter but data is valid and reasonable
2/19/2016 5:00	FEMAX > 600	757	Elevated ground clutter but data is valid and reasonable
2/20/2016 4:45	FEMAX > 600	757	Elevated ground clutter but data is valid and reasonable
2/20/2016 5:00	FEMAX > 600	757	Elevated ground clutter but data is valid and reasonable

Date/Time	QCCODE	Value	*Comment*
12/13/2015 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
12/21/2015 8:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
12/25/2015 14:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
1/3/2016 0:00	JAM <> 0	91	Sodar data internally invalidated
1/3/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
1/7/2016 11:15	JAM <> 0	91	Sodar data internally invalidated
1/9/2016 11:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
1/10/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
1/11/2016 0:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
1/16/2016 3:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
1/27/2016 3:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
1/31/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
2/6/2016 13:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
2/12/2016 14:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
2/13/2016 22:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
2/14/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
2/16/2016 0:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
2/21/2016 0:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
2/25/2016 19:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable

Date/Time	QCCODE	SPU1	SPU2	SPU3	*Comment*
12/13/2015 21:15	SPU > 7	1	9	0	Potential spurious noise source but data is valid and reasonable

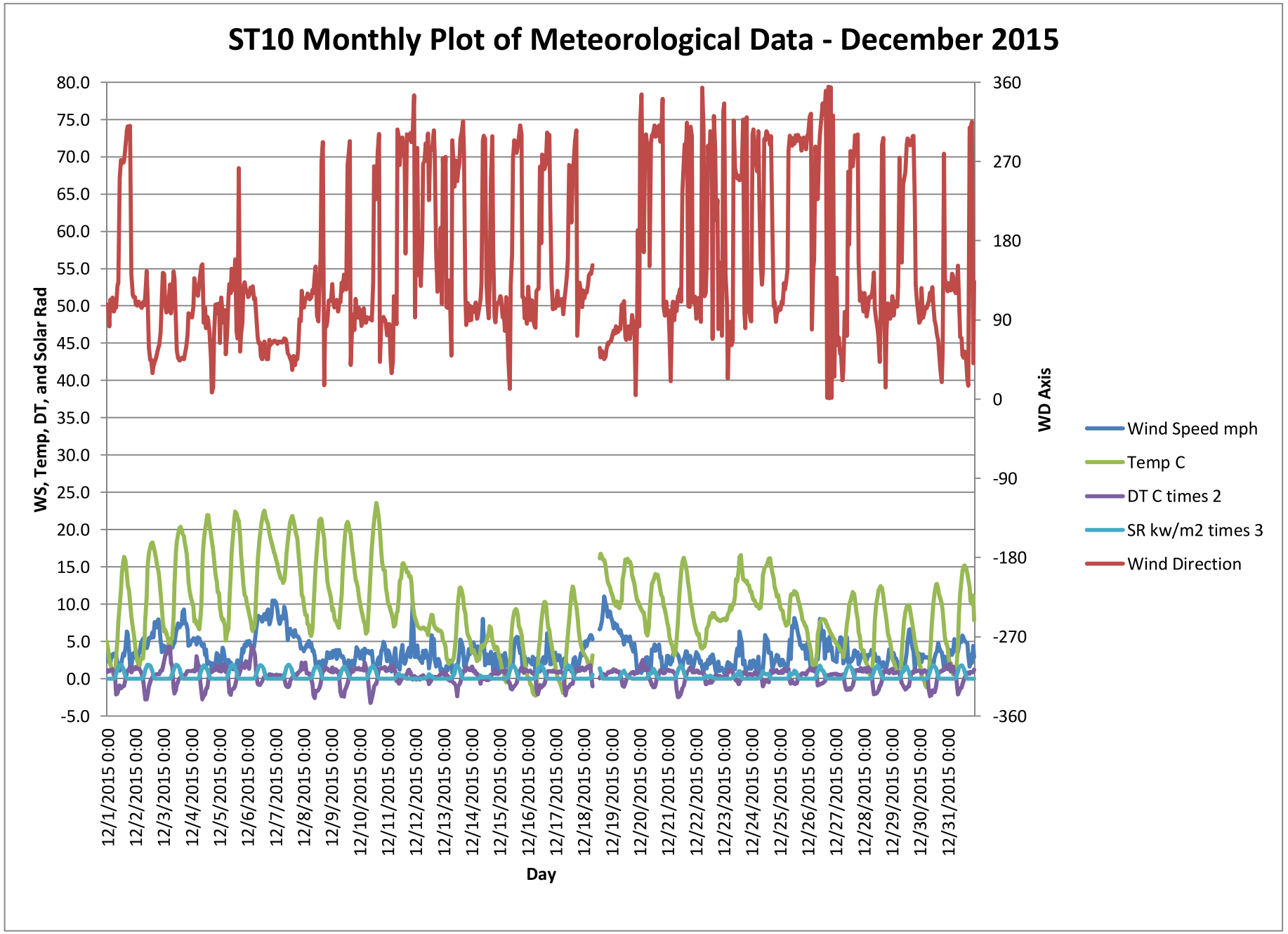
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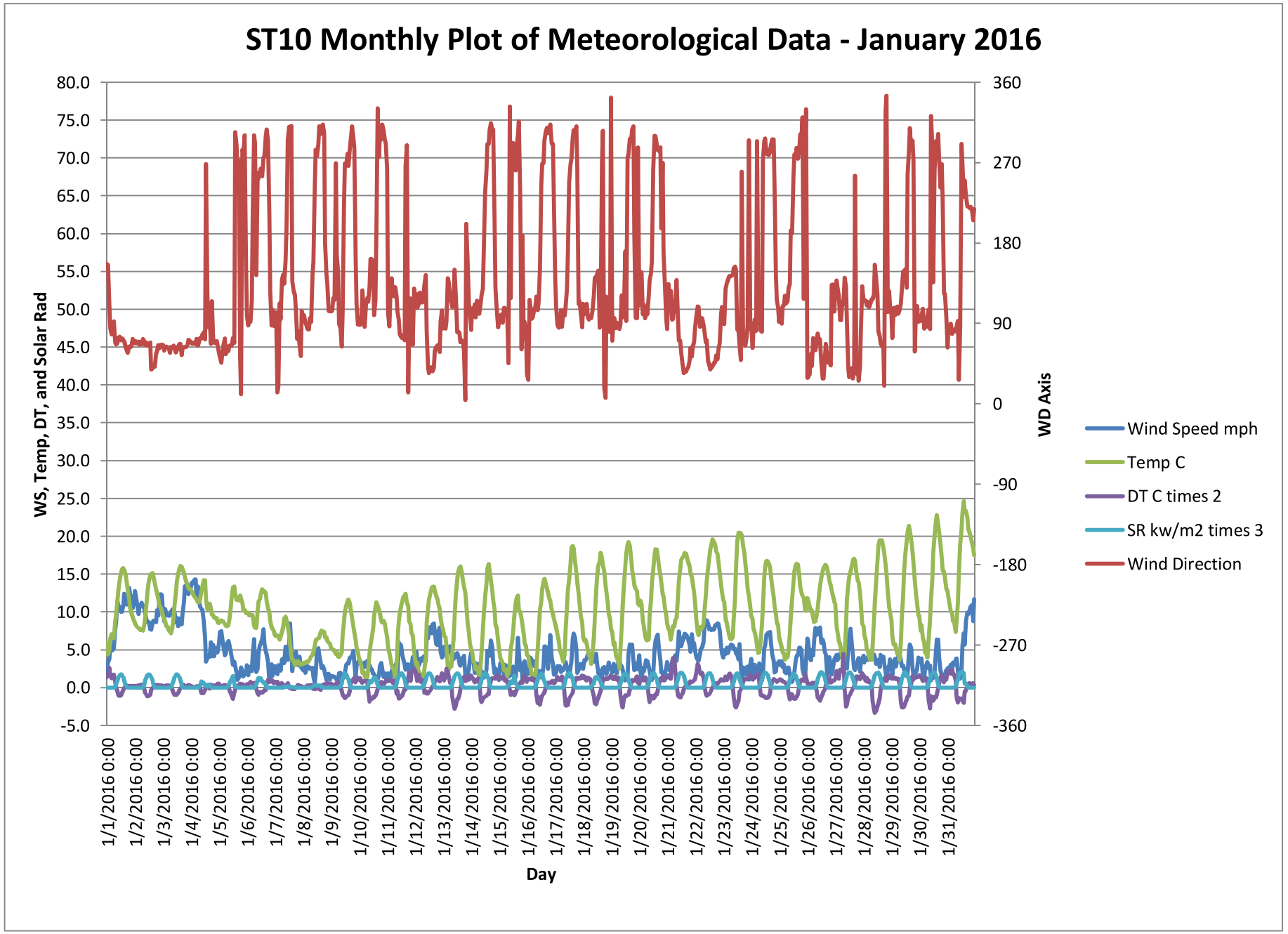
12/30/2015 8:00	SPU > 7	0	10	1	Potential spurious noise source but data is valid and reasonable
1/1/2016 0:15	SPU > 7	2	8	3	Potential spurious noise source but data is valid and reasonable
1/2/2016 9:15	SPU > 7	8	4	1	Potential spurious noise source but data is valid and reasonable
1/2/2016 9:30	SPU > 7	8	0	0	Potential spurious noise source - sodar invalidated data
1/4/2016 2:15	SPU > 7	9	1	0	Potential spurious noise source - sodar invalidated data
1/4/2016 2:30	SPU > 7	8	1	0	Potential spurious noise source - sodar invalidated data
1/16/2016 0:45	SPU > 7	4	8	0	Potential spurious noise source but data is valid and reasonable
1/18/2016 0:30	SPU > 7	1	8	1	Potential spurious noise source but data is valid and reasonable
1/28/2016 12:00	SPU > 7	2	11	0	Potential spurious noise source but data is valid and reasonable
1/30/2016 8:45	SPU > 7	1	8	4	Potential spurious noise source but data is valid and reasonable
2/26/2016 14:30	SPU > 7	0	1	8	Potential spurious noise source but data is valid and reasonable
2/28/2016 11:15	SPU > 7	1	2	8	Potential spurious noise source but data is valid and reasonable
2/28/2016 13:45	SPU > 7	1	8	3	Potential spurious noise source but data is valid and reasonable
2/29/2016 13:15	SPU > 7	0	2	9	Potential spurious noise source but data is valid and reasonable

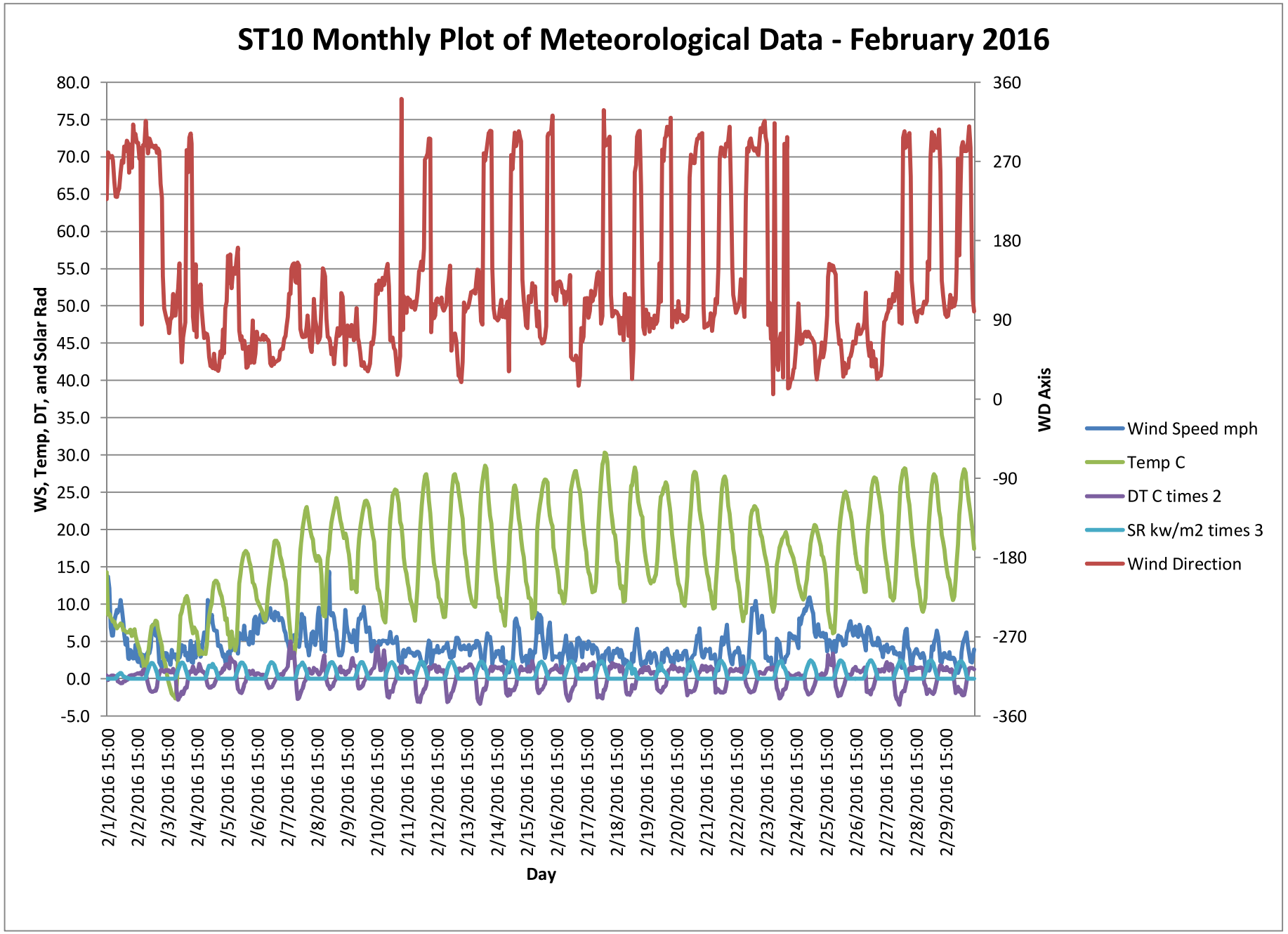
Date/Time	QCCODE	SPU1	SPU2	SPU3	*Comment*
12/18/2015 18:15	SNR < 5	6	4	9	Sodar internally invalidated data

APPENDIX B

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - December 2015
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
12/1/2015 0:00
12/2/2015 0:00
12/3/2015 0:00
12/4/2015 0:00
12/5/2015 0:00
12/6/2015 0:00
12/7/2015 0:00
12/8/2015 0:00
12/9/2015 0:00
12/10/2015 0:00
12/11/2015 0:00
12/12/2015 0:00
12/13/2015 0:00
12/14/2015 0:00
12/15/2015 0:00
12/16/2015 0:00
12/17/2015 0:00
12/18/2015 0:00
12/19/2015 0:00
12/20/2015 0:00
12/21/2015 0:00
12/22/2015 0:00
12/23/2015 0:00
12/24/2015 0:00
12/25/2015 0:00
12/26/2015 0:00
12/27/2015 0:00
12/28/2015 0:00
12/29/2015 0:00
12/30/2015 0:00
12/31/2015 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - January 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
1/1/2016 0:00
1/2/2016 0:00
1/3/2016 0:00
1/4/2016 0:00
1/5/2016 0:00
1/6/2016 0:00
1/7/2016 0:00
1/8/2016 0:00
1/9/2016 0:00
1/10/2016 0:00
1/11/2016 0:00
1/12/2016 0:00
1/13/2016 0:00
1/14/2016 0:00
1/15/2016 0:00
1/16/2016 0:00
1/17/2016 0:00
1/18/2016 0:00
1/19/2016 0:00
1/20/2016 0:00
1/21/2016 0:00
1/22/2016 0:00
1/23/2016 0:00
1/24/2016 0:00
1/25/2016 0:00
1/26/2016 0:00
1/27/2016 0:00
1/28/2016 0:00
1/29/2016 0:00
1/30/2016 0:00
1/31/2016 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - February 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
2/1/2016 15:00
2/2/2016 15:00
2/3/2016 15:00
2/4/2016 15:00
2/5/2016 15:00
2/6/2016 15:00
2/7/2016 15:00
2/8/2016 15:00
2/9/2016 15:00
2/10/2016 15:00
2/11/2016 15:00
2/12/2016 15:00
2/13/2016 15:00
2/14/2016 15:00
2/15/2016 15:00
2/16/2016 15:00
2/17/2016 15:00
2/18/2016 15:00
2/19/2016 15:00
2/20/2016 15:00
2/21/2016 15:00
2/22/2016 15:00
2/23/2016 15:00
2/24/2016 15:00
2/25/2016 15:00
2/26/2016 15:00
2/27/2016 15:00
2/28/2016 15:00
2/29/2016 15:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.5	2.6	2.3	2.0	3.2	3.0	3.3	3.0	3.2	2.1	1.5	1.0	1.8	2.5	3.3	3.1	4.2	6.3	5.9	3.8	1.8	1.5	3.3	3.2	3.0
2	3.5	2.8	2.5	3.1	3.3	4.6	4.9	5.3	5.1	4.4	4.1	4.5	5.4	5.5	5.4	6.2	5.5	7.6	6.8	7.3	7.9	7.2	5.1	3.5	5.1
3	4.5	4.4	3.7	3.9	4.4	4.3	4.3	4.0	4.2	4.7	4.8	6.1	6.6	7.4	6.8	7.2	7.3	9.0	9.3	7.6	7.4	6.6	4.4	4.5	5.7
4	4.9	5.1	5.4	5.1	5.4	4.6	5.5	5.4	5.0	4.6	4.3	4.7	3.2	3.9	1.9	2.3	2.1	2.1	1.1	1.4	2.0	2.0	3.4	3.1	3.7
5	3.1	1.9	2.4	4.2	3.8	2.7	2.1	1.8	2.5	2.3	2.2	1.7	1.3	1.7	1.3	1.9	2.4	0.8	1.0	2.5	4.1	3.5	4.6	4.3	2.5
6	5.0	4.7	5.1	4.4	4.1	3.9	4.3	5.2	6.8	8.1	8.4	8.1	8.2	7.6	8.3	8.7	7.9	8.7	9.3	7.3	7.7	8.6	10.5	10.1	7.1
7	10.5	10.2	9.2	8.1	7.3	7.8	8.4	8.0	9.6	8.8	7.8	5.2	6.6	6.7	6.2	5.9	5.6	6.5	5.8	5.7	5.6	5.3	4.1	4.2	7.0
8	3.9	3.7	4.0	4.6	4.6	5.0	4.3	4.8	3.7	3.8	3.0	1.9	1.7	2.0	2.3	1.7	1.1	2.5	1.5	1.7	2.5	3.5	2.8	2.8	3.1
9	3.5	2.8	3.7	3.3	3.8	2.7	3.6	3.9	3.2	2.9	3.0	2.5	1.6	1.2	1.3	2.5	2.1	1.0	2.4	1.8	1.9	3.1	4.2	3.9	2.7
10	3.3	2.7	3.6	3.8	2.5	4.0	3.5	3.5	3.7	3.4	3.3	3.7	1.8	1.6	1.3	1.5	2.4	2.9	1.9	3.8	3.9	4.9	4.4	3.5	3.1
11	2.3	3.8	3.3	2.4	0.9	1.8	2.8	4.1	1.6	1.7	2.0	1.2	3.4	4.5	2.8	2.0	2.4	3.1	3.8	4.2	2.9	6.3	10.2	4.2	3.2
12	2.9	3.7	4.5	2.8	2.8	2.3	2.1	3.7	2.8	3.8	3.1	3.1	1.4	2.5	5.8	5.0	5.3	2.5	1.6	2.0	2.6	2.1	1.0	1.3	2.9
13	1.1	0.9	1.0	1.7	1.1	1.8	2.4	2.1	0.8	1.2	0.7	1.8	1.7	2.1	3.6	5.2	4.7	4.0	1.9	1.1	2.2	2.8	4.0	3.2	2.2
14	4.1	3.9	4.9	4.1	4.2	3.1	4.3	4.1	3.7	4.0	8.0	5.4	1.8	2.0	3.2	3.1	2.0	3.6	2.7	1.0	2.6	3.4	2.1	1.1	3.4
15	3.2	2.4	2.9	3.1	1.2	3.4	2.3	2.3	1.5	1.3	1.8	1.6	2.3	4.6	5.4	5.6	5.5	4.3	3.5	3.5	1.6	1.3	3.0	1.8	2.9
16	2.5	2.6	2.3	2.1	1.9	2.9	2.6	1.0	2.2	2.8	1.6	0.9	1.6	2.4	2.9	2.0	2.2	6.1	5.4	4.6	2.0	2.0	2.6	3.2	2.6
17	3.5	2.5	2.5	3.1	3.1	2.0	1.5	2.3	2.7	2.7	1.5	1.3	1.4	1.5	1.0	1.8	2.7	2.9	1.9	0.9	1.7	2.3	3.5	3.1	2.2
18	3.8	4.2	5.0	4.4	5.1	5.2	5.8	5.8	5.3	***	***	***	***	***	6.6	6.9	7.7	8.8	11.1	10.1	9.7	8.3	9.1	9.0	7.0
19	8.2	7.7	6.7	7.5	6.8	7.2	6.4	6.2	6.5	5.7	5.7	4.6	5.5	5.7	5.3	5.0	5.7	4.5	4.2	3.6	4.7	3.3	1.0	0.8	5.4
20	1.4	1.7	0.8	1.6	1.2	1.1	2.8	2.9	0.6	0.9	1.5	3.9	3.8	4.6	3.7	4.3	4.3	4.5	2.8	2.9	0.9	1.6	0.8	1.9	2.4
21	3.1	3.0	2.1	1.9	2.3	3.2	3.8	3.6	3.4	3.2	2.8	2.0	1.6	1.4	2.7	2.9	3.7	3.6	2.1	3.0	3.0	1.5	1.2	2.0	2.6
22	2.7	3.5	3.2	2.9	2.1	2.4	1.4	0.9	1.6	2.0	1.4	2.5	2.0	2.9	2.2	3.2	2.4	1.3	0.9	1.3	2.3	1.0	1.4	1.4	2.0
23	1.0	0.8	0.9	1.8	2.2	2.1	1.5	1.8	1.7	1.5	1.3	2.9	4.0	3.1	6.3	5.4	4.9	1.9	2.4	1.5	1.1	1.3	1.4	2.3	2.3
24	1.3	2.0	2.5	2.0	1.3	1.7	3.0	1.2	1.3	1.2	1.2	3.4	5.8	5.4	5.0	3.5	3.4	3.5	1.2	1.9	2.2	2.7	3.2	3.0	2.6
25	2.1	1.7	2.5	2.5	2.0	1.6	1.7	1.5	2.7	5.2	2.6	7.0	6.8	8.1	7.5	7.0	6.1	5.3	4.5	4.4	4.0	4.5	4.2	2.6	4.1
26	4.7	3.3	2.5	1.2	1.1	1.2	1.0	1.6	3.2	2.6	4.5	8.0	6.3	5.4	6.4	2.7	5.3	3.7	4.7	5.6	3.7	4.2	2.5	2.4	3.7
27	2.6	2.2	4.3	3.7	5.5	5.5	5.0	2.0	2.5	5.1	5.5	2.1	1.8	2.6	2.3	2.6	3.7	3.8	3.0	3.6	1.9	2.5	2.9	3.2	3.3
28	3.6	3.2	2.8	2.4	3.2	3.0	3.2	3.8	3.6	3.4	3.4	2.4	2.3	2.8	2.1	1.5	1.7	2.2	1.6	1.3	1.6	2.5	3.9	3.9	2.7
29	3.5	2.8	3.4	2.6	2.7	2.2	1.1	1.5	1.3	0.8	1.2	1.1	2.3	3.6	5.0	6.4	6.6	5.1	4.1	3.7	1.3	2.1	2.5	3.1	2.9
30	3.4	2.5	2.2	3.2	2.8	2.8	2.9	2.8	2.7	2.5	2.1	1.6	1.7	2.8	3.4	3.6	4.7	4.2	3.7	3.5	2.7	1.4	2.9	2.8	2.9
31	1.8	2.5	3.9	3.6	3.2	3.4	5.3	3.8	3.9	3.6	4.3	5.4	4.9	5.8	5.4	5.1	4.9	4.8	3.1	1.6	3.2	2.1	4.4	2.8	3.9
HRAVE	3.5	3.3	3.4	3.3	3.2	3.3	3.5	3.4	3.3	3.3	3.3	3.4	3.4	3.8	4.1	4.1	4.2	4.2	3.7	3.5	3.3	3.4	3.7	3.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.0	5.1	5.7	3.7	2.5	7.1	7.0	3.1	2.7	3.1	3.2	2.9	2.2	3.4	2.9	2.6	2.2	7.0	5.4	2.4	2.6	2.0	2.3	2.6	4.1
MAX	6.3	7.9	9.3	5.5	4.6	10.5	10.5	5.0	4.2	4.9	10.2	5.8	5.2	8.0	5.6	6.1	3.5	11.1	8.2	4.6	3.8	3.5	6.3	5.8	8.1
MIN	1.0	2.5	3.7	1.1	0.8	3.9	4.1	1.1	1.0	1.3	0.9	1.0	0.7	1.0	1.2	0.9	0.9	3.8	0.8	0.6	1.2	0.9	0.8	1.2	1.5

DAY	26	27	28	29	30	31
AVE	3.7	3.3	2.7	2.9	2.9	3.9
MAX	8.0	5.5	3.9	6.6	4.7	5.8
MIN	1.0	1.8	1.3	0.8	1.4	1.6

MONTHLY AVERAGE = 3.5 MONTHLY MAXIMUM = 11.1 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	108	104	82	113	106	115	100	105	104	129	133	251	272	268	268	272	288	305	310	309	311	142	119	116	345
2	116	107	106	111	107	105	104	110	107	118	146	117	58	44	45	29	37	43	47	51	58	62	75	118	148
3	143	142	109	98	104	112	130	97	116	145	136	89	56	46	44	45	47	47	45	51	59	73	97	96	351
4	94	93	105	137	126	128	117	131	141	152	153	87	104	81	93	90	75	47	8	14	73	107	108	98	125
5	109	64	115	97	87	101	51	75	116	131	121	148	124	136	159	77	69	262	54	74	87	127	133	123	219
6	122	116	118	127	121	128	113	115	93	70	64	64	49	45	56	65	51	45	45	67	61	63	64	66	259
7	66	65	62	65	65	65	64	66	69	68	65	52	50	47	43	33	49	39	47	45	56	91	89	123	290
8	108	104	114	115	120	115	113	116	124	120	141	151	95	88	119	163	270	292	16	82	83	88	112	112	217
9	112	131	110	104	105	113	99	107	110	132	123	142	138	124	266	276	293	39	81	96	78	114	98	93	85
10	104	101	83	88	103	88	87	93	92	91	93	90	133	265	258	227	281	301	42	88	92	93	90	86	134
11	72	76	85	43	30	43	117	100	85	306	298	266	294	297	286	273	166	301	300	294	302	292	305	345	51
12	93	208	285	141	153	129	178	267	270	290	272	302	226	284	283	289	305	275	168	122	154	140	194	108	263
13	273	228	275	105	103	135	113	49	294	265	242	271	248	259	269	296	303	315	279	121	84	109	89	106	267
14	90	104	99	103	110	92	95	104	114	133	294	299	296	131	110	92	131	249	298	169	94	87	109	109	34
15	111	117	113	93	96	77	116	86	43	12	130	164	273	294	283	280	289	297	311	301	116	115	92	112	60
16	86	127	101	90	112	95	85	81	121	125	126	264	177	278	264	261	267	303	300	300	217	130	102	112	165
17	103	109	123	106	108	111	114	96	115	124	140	159	266	265	201	253	269	293	306	72	107	132	123	105	306
18	124	115	121	121	130	141	144	143	152	***	***	***	***	***	58	47	54	49	45	48	56	64	62	65	340
19	66	72	78	74	83	75	77	81	79	107	98	111	71	67	74	82	68	80	96	82	88	4	87	192	113
20	83	313	346	207	167	289	301	286	290	151	291	299	302	311	298	300	305	311	292	304	341	105	95	111	335
21	97	101	76	21	101	111	90	110	100	117	118	125	111	236	270	290	287	314	106	105	310	299	110	114	56
22	116	91	102	115	95	88	354	307	117	121	154	288	265	305	302	68	322	283	204	226	80	155	138	72	250
23	327	336	142	108	23	85	88	61	67	317	263	258	251	254	248	250	256	318	97	81	320	112	103	92	63
24	88	301	306	277	268	259	304	233	157	130	146	295	294	304	300	298	289	299	199	106	110	88	97	101	143
25	104	102	111	108	132	125	134	148	282	299	291	288	297	290	300	293	300	295	297	282	290	297	291	284	260
26	300	301	320	324	79	146	159	287	267	227	282	301	318	336	323	334	350	2	355	1	354	2	322	26	305
27	90	138	62	70	51	51	21	32	99	85	72	258	176	282	265	264	281	300	294	301	156	112	122	112	151
28	100	121	101	94	104	116	115	119	123	144	103	90	81	70	42	95	288	296	106	13	77	109	97	91	239
29	100	117	95	109	111	105	129	274	182	155	244	250	258	289	296	292	289	289	297	299	224	130	110	96	77
30	87	90	126	92	98	104	103	106	111	121	113	127	108	90	83	74	67	53	32	19	54	279	137	130	344
31	122	131	127	123	142	139	124	120	123	152	119	71	69	50	47	54	47	22	15	309	308	315	41	134	282

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	8	12	12	13	8	9	8	8	8	17	31	43	23	15	14	12	9	6	5	8	50	11	8	11	15
2	7	10	10	11	9	7	8	8	8	8	10	22	20	18	16	15	13	12	12	11	10	9	10	22	12
3	9	14	21	19	15	17	18	21	22	16	16	17	19	16	15	14	13	11	10	14	12	8	16	14	15
4	13	14	13	5	4	7	8	5	6	7	12	13	21	10	21	25	15	22	34	37	23	21	7	8	15
5	11	36	16	6	6	9	16	22	10	13	19	30	46	32	58	38	23	24	36	43	12	13	4	5	22
6	4	6	5	9	15	20	16	16	15	10	11	11	17	18	14	10	12	11	11	11	11	9	7	8	11
7	7	7	9	8	7	7	7	8	7	8	9	18	18	18	15	12	13	11	12	12	26	12	12	6	11
8	7	7	10	7	6	7	7	8	9	10	15	25	30	24	21	29	25	8	46	40	10	11	15	13	16
9	9	12	9	7	7	9	8	8	10	10	13	18	29	49	48	9	5	19	8	13	11	9	8	9	14
10	12	8	6	6	9	5	7	6	6	8	8	10	30	19	26	25	8	6	33	7	7	7	7	10	12
11	15	11	12	27	26	25	8	8	54	19	12	53	9	8	11	68	62	12	4	4	7	10	9	20	21
12	20	26	14	23	12	18	27	19	24	10	13	15	19	31	11	13	10	12	21	26	54	19	12	13	19
13	37	45	23	19	42	12	16	35	58	20	46	14	21	17	15	12	12	8	46	41	28	19	10	12	25
14	12	13	7	9	9	12	16	14	11	28	10	10	23	23	18	13	17	30	22	28	7	9	16	19	16
15	10	10	10	8	20	7	10	8	27	24	21	26	21	16	16	13	10	7	7	5	32	32	8	21	15
16	8	13	11	11	16	9	9	24	8	11	26	43	44	19	17	19	19	8	5	6	19	10	9	8	15
17	9	11	6	8	8	9	16	11	8	12	26	32	43	30	48	33	9	5	14	50	15	11	7	9	18
18	7	10	5	6	7	8	8	9	8	***	***	***	***	***	15	14	11	11	9	11	11	10	7	7	9
19	9	10	15	10	10	9	15	10	10	19	13	18	10	8	14	18	12	13	16	27	11	46	58	54	18
20	47	29	79	41	54	50	9	12	44	76	53	14	16	12	12	13	12	8	9	9	66	46	44	13	32
21	8	8	23	21	11	5	7	8	9	12	20	23	33	42	17	9	6	8	30	7	30	17	24	11	16
22	8	7	11	10	13	11	40	25	11	11	14	18	58	20	26	14	22	28	41	45	28	37	48	49	25
23	44	68	58	29	24	31	47	43	43	56	65	20	12	16	14	12	11	42	11	15	52	36	39	11	33
24	27	27	17	34	51	28	41	66	39	60	32	13	11	11	11	12	11	6	50	15	14	8	6	9	25
25	19	26	28	10	26	58	15	57	36	10	14	13	15	11	13	13	11	9	8	4	5	5	5	30	18
26	7	50	47	65	33	26	61	45	34	22	16	17	23	24	18	30	21	21	22	19	25	22	48	51	31
27	37	35	27	28	16	18	16	41	55	14	15	29	47	21	19	25	9	5	10	6	29	9	13	9	22
28	8	14	19	16	10	8	11	5	7	7	20	28	22	18	31	35	26	11	38	55	49	14	12	9	20
29	6	8	7	10	11	46	59	28	42	49	22	36	20	27	18	11	10	5	5	5	37	8	12	10	21
30	8	10	12	9	8	8	7	9	10	10	19	39	32	18	13	11	8	13	18	16	23	39	10	6	15
31	12	16	6	5	8	7	7	8	6	6	16	19	20	17	16	14	12	17	21	24	12	23	17	26	14
HRAVE	14	18	18	16	16	16	18	19	21	20	21	23	25	20	20	19	15	13	20	20	23	17	16	16	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15	12	15	15	22	11	11	16	14	12	21	19	25	16	15	15	18	9	18	32	16	25	33	25	18
MAX	50	22	22	37	58	20	26	46	49	33	68	54	58	30	32	44	50	15	58	79	42	58	68	66	58
MIN	5	7	8	4	4	4	6	6	5	5	4	10	8	7	5	5	5	5	8	8	5	7	11	6	4

DAY	26	27	28	29	30	31
AVE	31	22	20	21	15	14
MAX	65	55	55	59	39	26
MIN	7	5	5	5	6	5

MONTHLY AVERAGE = 18.5 MONTHLY MAXIMUM = 78.7 MONTHLY MINIMUM = 3.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
DECEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	5.0	4.1	2.5	2.1	1.2	1.0	0.4	0.6	2.8	5.2	7.7	9.8	12.0	14.2	15.8	16.3	15.8	13.9	12.5	11.7	10.3	8.3	6.9	6.1	7.8
2	4.7	3.5	2.5	1.8	1.7	2.6	2.8	2.7	5.0	8.1	11.0	15.0	16.8	17.6	18.1	18.2	17.8	17.0	16.1	15.2	14.5	13.6	11.5	9.3	10.3
3	7.6	6.3	6.5	6.0	5.4	4.6	3.1	5.3	5.4	8.3	12.8	16.9	18.3	19.4	20.2	20.4	20.0	19.4	19.1	18.1	17.3	15.2	12.9	11.8	12.5
4	10.9	10.3	9.6	7.7	7.8	7.3	7.0	6.6	7.8	10.5	14.7	18.4	20.1	20.7	22.0	21.9	20.5	19.4	18.5	17.2	16.0	14.0	13.0	11.6	13.9
5	11.4	9.6	8.4	7.8	7.9	7.0	5.1	6.1	6.7	10.4	13.8	16.8	19.1	21.3	22.4	22.1	21.6	21.1	19.1	16.6	14.4	12.7	11.2	10.9	13.5
6	10.0	9.4	8.7	7.9	6.8	6.3	6.8	7.5	11.9	15.6	17.3	19.0	20.3	21.5	22.2	22.5	21.6	21.2	20.7	19.5	18.9	18.2	17.8	17.0	15.4
7	16.7	15.9	15.3	14.5	14.0	13.5	13.4	12.9	13.1	14.8	16.7	18.5	20.0	20.9	21.5	21.8	21.1	20.3	19.5	18.9	17.4	15.3	13.6	11.2	16.7
8	10.8	9.7	8.5	8.6	7.3	7.2	6.2	5.7	6.6	9.2	12.8	15.1	17.5	19.7	21.2	21.5	21.4	19.9	18.7	16.5	14.9	13.1	12.0	11.4	13.1
9	10.8	9.2	9.4	8.1	7.7	7.5	7.0	6.8	9.3	11.4	14.4	17.4	19.2	20.5	21.0	20.7	19.8	19.4	17.4	16.1	14.8	13.2	12.9	12.1	13.6
10	11.1	10.0	9.1	8.5	7.7	7.4	6.0	6.3	8.3	11.5	14.8	17.4	20.0	21.0	22.6	23.6	22.7	21.3	19.9	17.0	15.5	14.6	14.5	12.3	14.3
11	11.1	10.2	9.8	9.1	8.7	7.9	7.0	7.2	8.6	8.9	10.8	13.0	13.4	15.4	15.5	15.1	14.9	14.2	14.3	13.7	13.7	12.9	10.0	8.7	11.4
12	8.1	7.7	7.2	6.9	6.7	6.7	6.8	6.8	6.8	6.5	6.6	5.8	6.9	7.8	8.5	8.5	7.3	6.9	6.6	6.7	6.4	6.4	6.5	6.1	7.0
13	5.1	4.9	4.3	2.8	2.4	2.0	2.2	2.3	2.4	2.8	3.7	5.4	8.8	10.5	12.0	12.2	11.8	10.9	9.5	8.8	7.3	6.0	5.5	5.3	6.2
14	4.3	3.5	3.8	3.3	3.1	2.4	2.6	2.6	3.9	4.5	4.1	4.6	4.6	4.9	5.4	6.3	7.1	6.8	5.2	4.8	4.0	4.3	4.2	3.7	4.3
15	2.9	2.5	1.8	1.1	0.8	-0.2	-0.5	-0.4	0.2	1.5	4.5	6.9	8.0	9.0	9.3	9.2	8.4	7.1	6.6	5.9	4.8	3.6	2.3	1.2	4.0
16	0.6	0.0	-0.3	-0.8	-0.9	-1.8	-2.2	-2.3	-1.0	1.2	3.7	5.2	7.6	8.6	9.9	10.3	10.1	8.1	6.9	6.4	5.4	4.4	3.3	2.6	3.5
17	1.9	1.1	0.2	-0.2	-0.5	-0.9	-1.4	-1.9	-0.3	2.2	4.2	6.2	7.9	9.8	11.4	12.3	11.8	10.6	9.6	8.8	6.7	5.5	4.7	3.9	4.7
18	3.5	3.2	3.0	2.7	2.0	1.7	1.4	1.6	3.1	***	***	***	***	***	16.1	16.7	16.3	16.0	15.9	15.1	14.1	13.0	12.7	12.2	9.0
19	11.7	11.2	10.5	10.0	9.7	10.4	9.6	9.5	10.2	10.4	13.4	14.2	16.0	15.8	16.1	15.6	15.7	15.1	13.9	13.2	12.8	11.5	10.5	10.4	12.4
20	9.9	9.6	9.2	8.9	8.9	7.5	6.2	5.8	6.8	9.1	11.4	12.6	13.1	13.6	14.0	13.8	13.9	13.0	11.9	11.2	10.9	9.8	9.3	8.3	10.4
21	7.6	6.8	5.7	4.8	4.4	3.8	3.1	3.3	5.1	7.6	10.1	12.6	14.1	15.7	16.2	15.7	15.0	14.2	12.7	11.4	10.2	9.4	8.6	7.6	9.4
22	7.1	6.4	5.8	6.0	4.9	4.2	4.0	4.3	4.2	5.2	6.6	7.0	7.8	8.4	8.2	8.8	8.8	8.2	8.2	7.9	7.9	7.7	7.8	7.9	6.8
23	7.9	8.0	7.8	8.0	8.6	8.9	9.7	9.2	10.0	9.9	11.1	13.3	13.1	14.6	16.3	16.6	15.1	13.4	13.2	13.0	13.1	12.6	12.5	11.7	11.6
24	11.7	10.9	10.6	10.4	9.8	9.7	9.9	9.4	9.5	11.3	13.9	14.6	14.9	15.2	15.6	16.1	16.2	15.3	14.2	13.4	12.3	11.8	11.0	11.2	12.5
25	10.4	9.5	9.2	9.1	7.9	7.7	7.1	7.5	7.4	10.1	11.2	11.4	11.3	11.8	11.6	11.5	10.7	9.9	9.5	8.7	7.9	7.6	7.1	7.0	9.3
26	6.2	5.2	4.5	3.6	2.4	1.3	1.5	1.9	3.1	5.9	6.8	7.7	7.9	7.9	8.0	7.9	7.6	7.2	6.8	6.5	6.0	5.9	5.5	5.3	5.5
27	5.0	4.7	4.5	4.2	3.8	3.6	3.5	2.9	4.0	6.1	7.4	8.6	9.9	10.4	11.1	11.6	11.4	10.6	9.0	7.9	6.3	5.5	4.1	3.8	6.7
28	3.8	2.8	2.3	2.0	1.7	0.8	0.4	1.0	1.6	4.5	7.7	9.9	10.9	11.8	12.1	12.4	12.1	11.1	9.9	8.7	7.8	6.1	5.4	4.9	6.3
29	3.8	2.7	2.3	1.8	1.2	0.9	1.0	0.6	1.3	3.6	6.1	7.6	8.9	9.6	9.7	9.9	9.3	8.2	7.2	6.5	5.1	4.4	3.7	2.9	4.9
30	2.0	1.5	0.4	-0.1	-0.2	-0.8	-1.2	-1.2	0.7	3.0	5.8	8.0	9.9	11.5	12.5	12.7	12.0	11.2	10.7	10.1	9.1	6.9	5.5	4.8	5.6
31	4.2	2.9	2.0	2.1	1.4	0.6	1.1	1.2	1.8	4.4	8.4	11.4	13.2	14.4	15.1	15.2	14.8	14.0	13.3	12.3	10.4	10.0	11.1	7.8	8.0
HRAVE	7.4	6.6	6.0	5.4	5.0	4.5	4.2	4.3	5.4	7.4	9.8	11.7	13.0	14.1	14.9	15.1	14.6	13.7	12.8	11.9	10.8	9.8	9.0	8.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.8	10.3	12.5	13.9	13.5	15.4	16.7	13.1	13.6	14.3	11.4	7.0	6.2	4.3	4.0	3.5	4.7	9.0	12.4	10.4	9.4	6.8	11.6	12.5	9.3
MAX	16.3	18.2	20.4	22.0	22.4	22.5	21.8	21.5	21.0	23.6	15.5	8.5	12.2	7.1	9.3	10.3	12.3	16.7	16.1	14.0	16.2	8.8	16.6	16.2	11.8
MIN	0.4	1.7	3.1	6.6	5.1	6.3	11.2	5.7	6.8	6.0	7.0	5.8	2.0	2.4	-0.5	-2.3	-1.9	1.4	9.5	5.8	3.1	4.0	7.8	9.4	7.0

DAY	26	27	28	29	30	31
AVE	5.5	6.7	6.3	4.9	5.6	8.0
MAX	8.0	11.6	12.4	9.9	12.7	15.2
MIN	1.3	2.9	0.4	0.6	-1.2	0.6

MONTHLY AVERAGE = 9.4 MONTHLY MAXIMUM = 23.6 MONTHLY MINIMUM = -2.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
DECEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.4	0.6	0.5	0.5	0.6	0.6	0.4	0.0	-1.0	-1.0	-0.8	-0.4	-0.6	-0.6	-0.5	-0.5	0.0	0.4	0.6	0.6	0.8	0.4	0.6	0.7	0.1
2	0.6	0.8	0.6	0.7	0.7	0.5	0.3	-0.1	-0.9	-1.4	-1.4	-1.1	-0.5	-0.2	0.0	0.1	0.3	0.2	0.2	0.3	0.3	0.3	0.6	0.5	0.1
3	0.8	1.2	1.5	1.8	1.9	2.1	2.1	1.1	0.8	-0.7	-1.0	-0.8	-0.4	-0.2	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.5	0.5
4	0.5	0.5	0.6	0.5	0.6	1.5	1.0	0.8	-0.1	-0.9	-1.4	-1.2	-1.1	-0.7	-0.6	-0.1	0.3	0.6	0.4	0.6	0.6	0.6	0.9	0.7	0.2
5	0.5	0.8	0.5	0.7	1.0	0.6	0.4	0.7	-0.1	-0.9	-1.1	-0.8	-0.7	-0.6	-0.5	-0.1	0.7	0.2	0.5	0.8	0.9	1.0	0.7	1.2	0.3
6	1.0	0.8	0.7	1.4	2.2	2.0	1.8	1.5	0.2	-0.3	-0.4	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.5
7	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.0	-0.4	-0.5	-0.6	-0.5	-0.2	-0.1	0.1	0.2	0.3	0.2	0.3	0.4	0.5	0.6	1.1	0.1
8	0.6	1.0	1.1	0.4	0.3	0.4	0.3	-0.1	-0.4	-1.1	-1.3	-0.8	-0.9	-0.8	-0.7	-0.3	0.0	0.5	0.5	0.7	0.7	0.7	0.6	0.6	0.1
9	0.4	0.8	0.4	0.6	0.6	0.4	0.5	0.3	-0.9	-1.2	-1.2	-1.2	-0.8	-0.6	-0.3	-0.1	0.3	0.4	0.6	0.5	0.6	0.7	0.6	0.6	0.1
10	0.7	0.6	0.6	0.7	0.5	1.1	0.7	0.4	-0.2	-1.2	-1.6	-1.3	-0.9	-0.5	-0.4	-0.4	0.1	0.6	0.7	0.7	0.7	0.7	0.8	0.5	0.2
11	0.5	0.6	0.8	0.7	0.6	0.9	0.7	0.5	-0.2	0.1	-0.3	-0.3	-0.1	0.0	0.2	0.1	0.2	0.3	0.6	0.6	0.4	0.2	-0.1	0.2	0.3
12	0.2	-0.1	0.1	0.0	-0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	-0.4	-0.2	-0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.1
13	0.4	0.2	0.4	0.2	0.2	-0.1	-0.2	0.0	-0.2	-0.3	-0.3	-0.5	-1.2	-0.5	-0.4	-0.2	0.1	0.5	0.5	0.5	0.8	0.7	0.6	0.6	0.1
14	0.6	0.8	0.5	0.5	0.3	0.3	0.2	0.2	-0.3	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.3	0.3	0.3	0.6	0.3	0.3	0.3	0.2
15	0.3	0.5	0.5	0.5	0.5	0.3	0.5	0.2	-0.2	-0.3	-0.7	-0.7	-0.6	-0.5	-0.4	-0.3	0.1	0.5	0.5	0.8	0.5	0.4	0.6	0.6	0.2
16	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.2	-0.6	-1.1	-0.8	-0.4	-0.6	-0.5	-0.4	-0.4	0.0	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.1
17	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.3	-0.6	-1.1	-0.7	-0.6	-0.5	-0.4	-0.3	-0.3	0.0	0.5	0.7	0.6	0.5	0.5	0.6	0.7	0.1
18	0.6	0.6	0.6	0.8	0.7	0.8	0.9	0.3	-0.5	***	***	***	***	***	0.0	0.2	0.3	0.3	0.2	0.2	0.2	0.4	0.4	0.5	0.4
19	0.5	0.4	0.6	0.5	0.6	0.5	0.5	0.4	0.2	-0.2	-0.5	-0.6	-0.3	-0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.2
20	0.5	0.9	1.0	1.3	0.6	0.8	0.8	0.7	0.1	-0.1	-0.2	-0.4	-0.6	-0.6	-0.4	-0.1	0.1	0.3	0.6	0.5	0.4	0.4	0.4	0.5	0.3
21	0.5	0.6	0.5	0.6	0.5	0.5	0.4	0.4	-0.7	-1.2	-1.2	-1.1	-0.9	-0.6	-0.5	-0.2	0.1	0.4	0.5	0.7	0.7	0.6	0.4	0.5	0.1
22	0.4	0.5	0.6	0.4	0.4	0.4	0.4	0.3	0.2	-0.3	-0.4	-0.2	-0.3	-0.1	-0.3	-0.2	0.0	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1
23	0.1	0.2	0.1	0.2	0.6	0.5	0.5	0.6	0.4	0.2	0.0	-0.1	-0.1	-0.4	-0.3	-0.1	0.2	0.4	0.5	0.3	0.3	0.2	0.3	0.3	0.2
24	0.3	0.2	0.3	0.4	0.4	0.2	0.4	0.4	0.1	-0.1	-0.5	-0.3	-0.2	-0.2	-0.2	-0.2	0.1	0.5	0.4	0.5	0.4	0.5	0.6	0.4	0.2
25	0.4	0.4	0.6	0.4	0.6	0.5	0.5	0.6	0.6	-0.2	-0.3	-0.1	-0.3	-0.3	-0.4	-0.3	-0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2
26	0.5	0.5	0.6	0.7	0.5	0.6	0.6	0.7	0.2	-0.5	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.2
27	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3	-0.3	-0.7	-0.8	-0.7	-0.6	-0.7	-0.6	-0.5	-0.1	0.5	0.6	0.5	0.6	0.5	0.7	0.5	0.0
28	0.5	0.7	0.7	0.4	0.8	0.5	0.6	0.5	-0.3	-1.0	-1.0	-1.0	-0.9	-0.8	-0.5	-0.4	-0.1	0.5	0.5	0.4	0.6	0.4	0.3	0.6	0.1
29	0.5	0.7	0.3	0.4	0.4	0.4	0.4	0.3	-0.1	-0.3	-0.4	-0.6	-0.7	-0.7	-0.6	-0.5	-0.1	0.3	0.4	0.4	0.6	0.5	0.5	0.5	0.1
30	0.5	0.5	0.3	0.5	0.6	0.5	0.5	0.3	-0.8	-1.2	-1.2	-0.8	-0.9	-0.9	-0.6	-0.1	0.3	0.4	0.5	0.5	0.6	0.6	0.8	0.8	0.1
31	0.6	0.8	1.0	0.5	0.6	0.8	0.3	0.3	-0.2	-1.1	-0.9	-0.7	-0.6	-0.4	-0.1	0.0	0.2	0.4	0.4	0.3	0.4	0.4	0.4	0.6	0.2
HRAVE	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.4	-0.2	-0.6	-0.7	-0.6	-0.6	-0.4	-0.3	-0.2	0.1	0.4	0.4	0.4	0.5	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.1	0.5	0.2	0.3	0.5	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.4	0.2	0.3	0.1	0.1	0.2	0.2	0.2
MAX	0.8	0.8	2.1	1.5	1.2	2.2	1.1	1.1	0.8	1.1	0.9	0.4	0.8	0.8	0.8	0.5	0.7	0.9	0.6	1.3	0.7	0.6	0.6	0.6	0.6
MIN	-1.0	-1.4	-1.0	-1.4	-1.1	-0.4	-0.6	-1.3	-1.2	-1.6	-0.3	-0.4	-1.2	-0.3	-0.7	-1.1	-1.1	-0.5	-0.6	-0.6	-1.2	-0.4	-0.4	-0.5	-0.4

DAY	26	27	28	29	30	31
AVE	0.2	0.0	0.1	0.1	0.1	0.2
MAX	0.7	0.7	0.8	0.7	0.8	1.0
MIN	-0.5	-0.8	-1.0	-0.7	-1.2	-1.1

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 2.2 MONTHLY MINIMUM = -1.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
DECEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	704	704	704	704	703	704	704	704	705	705	705	705	704	703	703	703	703	703	704	704	705	705	705	706	704
2	706	706	706	706	706	706	706	707	708	708	708	707	706	705	705	705	705	705	705	706	706	706	706	707	706
3	706	706	706	706	706	706	706	707	707	707	706	706	705	704	703	703	703	703	704	704	704	704	705	705	705
4	705	705	704	704	705	705	705	705	706	706	706	706	705	704	703	703	703	704	704	704	705	705	705	706	705
5	706	706	707	707	707	707	708	708	709	710	710	709	709	708	707	707	708	708	709	709	709	709	710	710	708
6	710	710	710	710	710	710	710	710	711	711	710	710	709	708	707	707	707	707	707	707	708	708	708	708	709
7	708	707	707	707	707	707	707	708	708	708	707	707	706	705	704	704	704	704	704	704	705	705	705	705	706
8	705	705	705	705	705	705	705	706	706	706	706	706	705	704	703	703	703	703	704	704	704	704	705	704	705
9	704	704	704	705	705	705	705	705	706	706	705	705	704	703	702	702	702	702	702	702	703	703	703	703	704
10	703	703	703	703	702	702	703	703	704	704	704	703	702	701	700	700	700	700	700	700	700	699	699	699	701
11	699	698	698	697	697	697	697	697	697	697	698	697	696	696	695	695	694	694	694	694	694	694	695	695	696
12	695	695	695	695	695	695	695	696	696	697	698	698	698	697	697	698	698	699	699	700	700	701	701	701	697
13	701	701	701	702	702	702	702	702	703	703	704	704	703	702	702	701	702	702	701	701	701	701	701	701	702
14	700	699	699	698	698	698	697	697	697	696	697	697	697	697	697	697	697	697	697	697	698	698	698	698	698
15	698	698	698	698	699	699	699	700	701	701	701	701	701	700	700	700	701	701	701	702	702	702	702	703	700
16	702	702	702	702	702	702	703	704	704	705	705	704	704	703	703	703	703	703	704	704	704	705	705	705	703
17	705	705	705	705	705	705	706	707	707	708	708	707	706	706	705	705	705	705	705	706	706	706	706	706	706
18	706	706	706	706	706	706	706	706	707	***	***	***	***	***	703	703	703	703	703	703	703	704	704	703	705
19	703	703	703	703	703	703	703	704	704	704	704	703	703	702	702	702	701	701	701	702	702	702	702	702	703
20	702	702	703	702	702	702	703	704	704	705	705	705	704	704	703	704	704	704	704	705	705	705	705	705	704
21	705	704	705	705	705	705	706	706	706	706	706	706	704	703	703	702	702	702	702	701	701	701	702	702	704
22	701	700	700	699	699	699	699	700	699	699	699	699	698	698	697	696	696	696	696	696	696	697	696	696	698
23	696	696	695	695	695	695	695	695	696	696	696	696	695	695	694	694	695	695	695	696	696	696	697	697	695
24	697	697	697	697	697	698	698	699	700	700	700	700	700	700	699	699	700	700	700	700	700	700	700	700	699
25	700	700	699	699	699	699	700	700	701	701	702	701	701	700	700	700	699	699	699	699	699	699	699	699	700
26	699	698	698	698	698	698	698	699	700	700	700	700	700	699	699	699	700	700	701	701	701	702	702	703	700
27	703	703	704	704	704	704	705	705	706	706	707	706	705	704	704	703	703	703	704	704	704	704	703	703	704
28	703	703	702	702	701	701	701	701	701	701	700	700	699	698	697	697	697	696	696	696	696	697	697	697	699
29	696	696	696	696	696	696	697	698	699	700	701	701	701	700	701	701	702	702	703	703	704	704	704	705	700
30	705	705	705	705	706	706	706	707	707	708	708	707	706	705	704	704	704	703	704	704	704	704	704	704	705
31	704	704	704	704	703	703	704	704	705	705	705	704	703	702	702	702	701	702	702	702	703	703	703	703	703
HRAVE	702	702	702	702	702	702	703	703	703	704	704	703	702	702	701	701	701	701	702	702	702	702	702	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	704	706	705	705	708	709	706	705	704	701	696	697	702	698	700	703	706	705	703	704	704	698	695	699	700
MAX	706	708	707	706	710	711	708	706	706	704	699	701	704	700	703	705	708	707	704	705	706	701	697	700	702
MIN	703	705	703	703	706	707	704	703	702	699	694	695	701	696	698	702	705	703	701	702	701	696	694	697	699

DAY	26	27	28	29	30	31
AVE	700	704	699	700	705	703
MAX	703	707	703	705	708	705
MIN	698	703	696	696	703	701

MONTHLY AVERAGE = 702.3 MONTHLY MAXIMUM = 710.7 MONTHLY MINIMUM = 693.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
DECEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	53	56	63	66	68	67	71	70	57	44	36	32	31	24	20	18	21	27	30	32	36	41	46	48	44
2	53	57	61	61	60	52	48	47	40	30	25	18	13	13	13	12	14	17	18	19	19	19	23	27	32
3	31	33	32	34	35	36	40	35	34	30	22	15	14	13	12	13	14	14	15	16	16	18	23	26	24
4	27	28	29	32	31	33	34	35	33	29	22	15	13	13	11	12	16	20	23	25	25	28	31	34	25
5	35	39	43	46	46	48	55	53	48	36	27	22	18	14	10	8	10	11	16	19	24	26	29	33	30
6	35	37	39	40	42	44	42	41	30	22	20	18	17	16	15	13	16	17	18	17	18	19	19	22	26
7	22	23	25	26	27	28	28	29	29	26	23	21	19	18	18	18	20	22	24	25	26	29	33	37	25
8	40	44	46	46	48	49	52	53	48	40	30	27	23	18	17	17	18	21	25	30	34	37	40	41	35
9	40	43	43	50	53	51	54	56	43	35	28	22	20	20	21	23	25	29	33	36	40	43	46	47	38
10	50	56	58	61	64	64	69	69	59	46	35	30	25	25	22	19	21	24	29	36	39	42	39	46	43
11	50	52	55	57	59	61	63	64	57	55	48	42	43	36	39	42	41	44	46	49	51	57	79	89	53
12	92	95	94	96	97	96	93	85	85	87	84	86	84	79	74	74	84	86	92	93	94	95	93	94	89
13	97	98	98	98	98	99	99	99	99	99	98	90	68	62	51	45	43	46	54	60	69	75	78	78	79
14	81	84	81	83	83	87	84	84	77	77	86	88	91	91	89	83	78	78	89	90	94	92	87	84	85
15	82	79	84	91	94	96	96	96	95	84	66	56	53	44	41	38	40	46	51	53	61	68	77	80	70
16	84	85	87	89	88	91	93	93	87	72	56	51	48	42	36	33	33	49	54	55	58	64	74	77	67
17	80	83	85	88	88	88	91	92	85	68	58	51	47	41	32	29	32	39	44	51	60	62	64	71	64
18	71	71	70	71	72	71	71	69	63	***	***	***	***	***	26	26	26	27	26	27	28	30	31	32	48
19	34	35	38	38	39	36	37	38	36	37	29	29	25	26	26	28	28	29	33	35	36	44	49	50	35
20	54	56	59	57	56	64	69	71	69	59	58	63	64	59	55	54	53	56	59	62	65	70	74	79	62
21	81	84	86	90	91	93	93	94	84	70	58	50	43	39	39	43	43	44	50	54	59	61	67	72	66
22	74	76	78	79	83	85	87	85	84	80	74	75	73	76	81	85	84	89	92	94	95	97	98	98	84
23	98	98	98	98	98	98	96	97	95	96	93	81	82	75	61	58	68	83	85	84	83	87	87	93	87
24	95	97	97	94	97	97	95	96	97	90	73	70	70	68	65	61	59	61	67	73	78	81	84	76	81
25	81	85	87	83	88	86	86	85	85	79	70	65	62	52	48	44	45	43	41	45	45	44	46	41	64
26	40	44	50	56	65	68	67	65	50	38	32	33	32	31	30	29	30	32	31	32	34	33	35	37	41
27	38	39	41	41	42	41	42	45	42	35	31	30	28	29	28	28	30	33	40	41	49	57	63	62	40
28	62	66	71	73	74	79	80	77	71	59	49	41	37	35	36	34	37	41	48	55	58	64	68	69	58
29	73	75	79	80	82	81	78	78	76	64	48	45	41	39	39	40	42	45	50	53	59	64	69	73	61
30	77	79	81	85	86	87	88	89	79	65	53	46	42	36	32	31	35	37	40	43	45	53	59	62	60
31	66	69	71	70	71	74	72	70	67	58	44	36	33	32	32	32	35	37	40	42	45	46	50	55	52
HRAVE	61	63	65	67	68	69	70	70	65	57	49	45	42	39	36	35	37	40	44	47	50	53	57	59	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	44	32	24	25	30	26	25	35	38	43	53	89	79	85	70	67	64	48	35	62	66	84	87	81	64
MAX	71	61	40	35	55	44	37	53	56	69	89	97	99	94	96	93	92	72	50	79	94	98	98	97	88
MIN	18	12	12	11	8	13	18	17	20	19	36	74	43	77	38	33	29	26	25	53	39	73	58	59	41

DAY	26	27	28	29	30	31
AVE	41	40	58	61	60	52
MAX	68	63	80	82	89	74
MIN	29	28	34	39	31	32

MONTHLY AVERAGE = 53.7 MONTHLY MAXIMUM = 98.9 MONTHLY MINIMUM = 8.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
DECEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.39	0.53	0.61	0.62	0.57	0.46	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.39	0.53	0.61	0.62	0.59	0.48	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.88
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.39	0.52	0.60	0.62	0.57	0.47	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.38	0.51	0.60	0.51	0.49	0.42	0.27	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.49
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.38	0.51	0.60	0.62	0.57	0.47	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.80
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.38	0.51	0.60	0.60	0.56	0.46	0.31	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.73
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.33	0.51	0.59	0.61	0.56	0.46	0.31	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.14	0.31	0.50	0.50	0.55	0.55	0.44	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.41
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.36	0.46	0.53	0.50	0.39	0.26	0.13	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.89
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.32	0.49	0.51	0.58	0.47	0.41	0.29	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.35
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.12	0.16	0.22	0.17	0.14	0.13	0.10	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.06	0.09	0.19	0.14	0.12	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.14	0.32	0.56	0.59	0.54	0.44	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.08
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.14	0.06	0.08	0.08	0.05	0.08	0.07	0.10	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.48	0.57	0.59	0.55	0.44	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.35	0.49	0.57	0.59	0.55	0.45	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.61
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.35	0.48	0.57	0.59	0.55	0.45	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.59
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	***	***	***	***	***	0.45	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.21	0.32	0.35	0.24	0.17	0.12	0.06	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.65
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.21	0.22	0.24	0.44	0.38	0.30	0.11	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.33	0.47	0.56	0.59	0.50	0.31	0.17	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.14	0.11	0.07	0.07	0.13	0.09	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.08	0.18	0.16	0.14	0.30	0.34	0.17	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.23	0.35	0.22	0.22	0.17	0.22	0.21	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.25	0.20	0.17	0.22	0.36	0.29	0.27	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.48	0.58	0.41	0.36	0.31	0.13	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.33	0.47	0.56	0.58	0.55	0.46	0.31	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.55
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.31	0.44	0.51	0.59	0.54	0.36	0.23	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.27
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.31	0.50	0.51	0.54	0.43	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.11
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.33	0.47	0.56	0.59	0.56	0.47	0.33	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.32	0.47	0.55	0.59	0.56	0.46	0.31	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.54
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.28	0.39	0.45	0.46	0.43	0.36	0.23	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.85	3.88	3.81	3.49	3.80	3.73	3.60	3.41	2.89	3.35	1.11	0.72	3.08	0.78	3.57	3.61	3.59	1.05	1.65	2.19	3.18	0.76	1.44	1.78	1.87
MAX	0.62	0.62	0.62	0.60	0.62	0.60	0.61	0.55	0.53	0.58	0.22	0.19	0.59	0.14	0.59	0.59	0.59	0.45	0.35	0.44	0.59	0.14	0.34	0.35	0.36
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	2.83	3.55	3.27	3.11	3.60	3.54
MAX	0.58	0.58	0.59	0.54	0.59	0.59
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
DECEMBER - 2015

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.08	0.13
12	0.09	0.16	0.05	0.01	0.03	0.00	0.01	0.02	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.05	0.00	0.00	0.00	0.48
13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.09
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.00	0.01	0.06
23	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.12
24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.48	0.01	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.12	0.04	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.16	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.04	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.94 MONTHLY MAXIMUM = 0.16 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
JANUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	2.1	3.4	3.8	5.3	5.6	4.9	5.2	7.6	8.6	11.4	10.8	10.7	10.0	10.0	10.8	12.4	11.8	11.0	11.8	13.2	12.4	11.8	10.5	11.1	9.0
2	12.8	12.1	10.9	9.7	10.7	10.9	11.2	10.9	10.4	9.8	8.7	8.7	8.7	7.7	7.6	8.4	8.8	8.9	8.7	10.2	9.5	11.5	12.3	12.2	10.0
3	10.3	8.8	10.4	9.6	9.6	9.5	9.5	10.0	10.3	10.3	9.9	8.7	9.2	8.1	9.1	8.4	8.3	9.9	11.3	13.4	13.5	12.5	12.4	13.5	10.3
4	13.2	13.9	13.9	14.2	14.3	11.8	13.4	11.4	10.6	10.4	10.2	8.8	6.6	3.4	3.9	4.0	4.1	6.0	4.1	5.6	4.2	5.2	4.6	4.8	8.4
5	5.9	7.3	7.5	6.2	5.3	4.3	4.4	5.9	6.1	5.7	4.8	4.1	3.0	3.4	2.9	2.0	1.0	1.3	1.9	2.7	2.2	1.5	1.9	1.8	3.9
6	2.9	1.6	2.7	2.8	2.2	4.3	6.4	3.4	2.0	2.5	4.7	5.6	5.8	6.4	7.7	5.8	4.8	4.4	3.4	0.9	1.4	3.0	1.5	2.5	3.7
7	2.8	2.2	1.8	2.9	2.7	2.2	3.7	3.8	3.3	5.4	5.4	3.7	5.9	8.5	5.2	2.2	3.8	3.9	4.8	3.2	3.0	4.1	2.8	2.5	3.7
8	2.3	2.8	2.0	2.6	2.8	2.5	2.6	2.4	2.6	1.4	0.6	1.8	4.9	5.2	4.3	3.4	2.6	2.8	2.4	1.8	1.0	1.7	1.8	1.1	2.5
9	1.5	1.5	1.5	1.4	1.2	1.0	1.2	1.9	1.9	0.9	1.2	1.3	1.9	3.0	3.2	3.2	3.9	4.0	4.2	4.8	3.2	1.3	2.9	3.2	2.3
10	3.5	3.6	3.2	3.2	2.7	3.3	2.8	3.5	2.7	3.0	2.5	2.4	1.9	1.8	1.5	1.0	1.1	1.7	2.9	3.2	2.5	1.4	1.9	1.4	2.4
11	1.0	1.9	1.5	1.2	2.1	2.6	1.6	3.0	3.3	1.7	6.0	5.7	5.6	4.3	3.7	3.1	2.4	3.0	3.1	2.1	1.0	2.5	4.0	2.8	2.9
12	3.7	4.8	3.7	2.9	3.3	3.9	3.6	4.0	4.2	3.5	6.5	6.5	7.5	8.0	7.2	8.4	8.5	7.4	5.8	5.6	7.3	8.0	4.8	4.0	5.5
13	4.8	5.4	4.8	4.1	5.0	5.2	5.5	4.6	3.7	3.8	3.9	4.4	4.6	4.2	3.2	2.9	3.9	3.8	4.2	1.6	0.9	1.6	2.5	3.6	3.8
14	4.6	3.7	3.5	2.0	3.2	3.1	1.9	3.2	2.2	2.2	1.5	1.3	1.5	2.4	4.8	4.7	4.2	6.2	5.3	3.3	1.9	2.5	2.3	2.1	3.1
15	1.8	3.2	2.8	2.9	1.8	3.0	2.9	1.4	1.5	1.5	1.8	2.3	2.7	1.8	1.4	2.9	6.6	4.8	2.3	3.2	0.9	3.1	3.5	2.7	2.6
16	1.7	1.9	3.2	4.0	3.7	3.2	2.8	3.5	2.5	1.9	1.3	2.2	1.4	1.5	2.9	5.4	5.4	4.8	2.5	4.9	6.9	4.0	3.0	1.7	3.2
17	1.8	1.9	2.8	2.5	2.8	2.0	2.6	2.3	2.6	3.4	2.6	2.3	1.5	2.7	3.5	6.4	7.1	6.6	5.0	1.9	2.3	2.6	3.1	2.8	3.1
18	2.5	3.6	3.5	3.8	4.5	4.4	4.0	4.2	3.7	3.4	4.2	4.5	3.2	1.9	2.2	1.5	1.4	2.6	2.7	2.4	1.7	2.6	3.3	2.5	3.1
19	2.5	2.0	3.1	2.2	2.8	1.9	3.2	3.6	3.0	2.8	2.3	1.4	0.9	1.0	1.5	4.5	5.7	5.2	5.7	3.5	2.3	3.2	2.4	2.8	2.9
20	4.2	2.3	1.0	2.6	2.1	2.9	3.6	3.5	2.8	2.2	1.1	1.0	1.8	5.1	6.1	6.7	7.0	5.0	3.5	2.0	2.0	1.2	1.8	2.6	3.1
21	3.4	2.7	2.3	2.5	3.2	3.9	3.8	4.3	3.5	5.3	7.4	6.2	5.5	6.1	6.6	7.1	7.0	6.8	6.3	5.7	4.7	7.1	6.0	5.8	5.1
22	4.9	4.0	3.7	3.5	4.4	5.1	5.3	6.0	7.9	8.9	8.9	8.4	7.7	7.8	7.6	7.6	7.7	8.2	8.2	8.4	8.4	7.6	5.4	4.6	6.7
23	4.0	4.9	4.4	5.3	4.6	5.1	5.3	5.7	5.6	5.1	5.1	4.6	4.4	3.8	5.8	2.8	1.4	2.6	2.5	1.7	2.6	2.8	1.0	3.1	3.9
24	3.8	2.3	1.7	3.0	1.9	1.9	2.0	3.2	1.9	0.9	1.7	5.2	5.6	7.0	7.2	7.0	7.3	5.9	4.3	3.5	2.0	2.1	3.2	3.2	3.7
25	3.5	3.0	3.5	2.7	3.0	2.0	1.9	2.5	2.7	1.8	0.9	0.8	1.4	2.0	3.6	4.2	4.3	5.3	5.3	4.9	2.5	1.7	1.4	3.4	2.8
26	6.4	6.0	4.1	3.6	4.9	4.3	6.2	7.9	7.0	7.8	7.5	7.9	5.9	6.3	5.9	4.7	4.4	1.8	2.0	4.0	3.0	1.7	2.7	3.7	5.0
27	3.9	4.3	3.6	4.4	4.0	4.4	4.3	4.7	4.2	3.6	2.5	5.2	6.7	7.8	5.7	4.4	2.5	2.3	2.7	3.5	3.9	2.1	3.2	3.7	4.1
28	4.2	3.3	3.7	3.6	4.1	3.7	4.1	4.3	4.5	4.4	4.0	3.1	3.6	3.7	2.7	4.3	3.5	4.1	3.1	2.2	0.9	2.3	2.9	3.7	3.5
29	2.8	1.6	3.2	3.8	2.8	3.6	4.1	4.3	3.6	2.8	2.9	2.5	2.0	1.5	1.8	4.6	5.7	5.1	2.5	1.7	1.6	1.9	2.4	4.0	3.0
30	3.5	3.5	3.8	1.5	1.1	2.6	3.0	3.3	2.5	2.9	1.0	2.0	1.3	2.0	4.8	6.3	6.3	4.1	2.3	1.6	1.5	1.0	1.6	2.3	2.7
31	2.5	2.6	2.6	3.0	2.5	3.3	3.0	3.6	3.8	2.1	1.2	1.2	2.1	5.5	7.2	5.7	8.9	9.9	9.7	10.1	10.6	10.9	8.8	11.7	5.5
HRAVE	4.2	4.1	4.0	4.0	4.0	4.1	4.4	4.6	4.4	4.3	4.3	4.3	4.3	4.6	4.9	5.0	5.2	5.1	4.7	4.4	3.9	4.1	3.9	4.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.0	10.0	10.3	8.4	3.9	3.7	3.7	2.5	2.3	2.4	2.9	5.5	3.8	3.1	2.6	3.2	3.1	3.1	2.9	3.1	5.1	6.7	3.9	3.7	2.8
MAX	13.2	12.8	13.5	14.3	7.5	7.7	8.5	5.2	4.8	3.6	6.0	8.5	5.5	6.2	6.6	6.9	7.1	4.5	5.7	7.0	7.4	8.9	5.8	7.3	5.3
MIN	2.1	7.6	8.1	3.4	1.0	0.9	1.8	0.6	0.9	1.0	1.0	2.9	0.9	1.3	0.9	1.3	1.5	1.4	0.9	1.0	2.3	3.5	1.0	0.9	0.8

DAY	26	27	28	29	30	31
AVE	5.0	4.1	3.5	3.0	2.7	5.5
MAX	7.9	7.8	4.5	5.7	6.3	11.7
MIN	1.7	2.1	0.9	1.5	1.0	1.2

MONTHLY AVERAGE = 4.4 MONTHLY MAXIMUM = 14.3 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	157	155	111	85	78	85	92	69	67	68	74	75	71	73	72	70	64	59	57	64	64	64	73	71	317
2	68	70	68	70	66	69	67	73	70	65	68	65	67	68	38	40	42	41	56	59	66	62	66	65	30
3	66	60	63	64	63	63	57	63	63	65	62	57	60	63	67	67	54	63	63	64	64	66	72	70	231
4	69	67	69	68	67	72	65	71	74	73	78	80	72	268	126	86	98	67	115	73	69	68	70	65	48
5	57	53	46	59	66	73	56	61	59	65	65	64	73	68	304	289	263	272	50	11	285	280	300	162	3
6	99	88	95	92	116	214	300	292	144	258	252	260	263	255	276	277	299	307	295	213	125	88	105	87	146
7	101	102	13	19	112	95	139	144	134	160	193	296	310	300	311	137	126	121	105	73	82	66	53	104	232
8	93	100	92	87	84	83	96	92	145	159	242	285	278	291	311	302	309	313	303	179	145	133	104	105	278
9	103	105	118	116	269	167	147	90	86	64	101	220	269	267	280	266	286	296	310	298	286	162	111	89	1
10	96	88	96	127	103	86	111	119	114	132	162	162	150	100	115	187	331	277	304	296	313	306	295	291	152
11	263	101	87	132	141	125	121	131	120	104	94	78	75	73	77	71	266	289	13	83	118	91	66	129	237
12	109	123	107	111	125	122	113	116	133	144	81	41	34	39	41	37	41	59	64	65	64	58	93	104	328
13	84	85	84	92	141	136	120	115	108	121	150	119	80	81	79	69	71	68	59	4	201	161	113	100	54
14	83	107	100	112	97	115	103	101	112	121	129	170	236	261	291	291	307	314	307	307	207	129	105	86	97
15	92	93	100	91	107	107	100	104	45	333	118	286	292	270	262	287	301	316	238	61	188	72	91	82	108
16	33	27	117	108	95	97	105	109	120	105	113	151	245	268	270	295	305	309	303	304	313	292	291	227	253
17	139	109	88	85	91	105	86	104	99	108	128	164	248	268	274	298	306	303	311	265	112	115	101	86	346
18	112	100	103	112	96	94	96	96	104	122	141	142	144	149	85	96	269	306	17	7	120	95	89	80	35
19	343	71	96	96	85	91	89	84	89	122	97	110	171	93	276	279	297	296	306	310	187	96	96	287	301
20	110	148	147	101	111	96	104	100	120	138	146	159	262	300	300	291	284	283	287	197	270	169	134	96	243
21	84	134	107	126	94	95	111	116	138	96	71	70	59	45	34	36	36	39	41	49	63	53	64	70	269
22	84	98	109	108	86	89	96	88	81	69	71	48	43	38	40	42	45	47	54	50	60	68	101	108	247
23	103	89	129	136	138	143	143	143	144	152	154	150	83	81	66	49	260	68	67	65	75	87	295	84	117
24	90	63	82	94	82	294	107	105	82	81	272	294	297	280	283	278	282	290	296	296	242	144	116	107	196
25	92	106	90	109	110	121	113	115	129	135	194	191	254	279	278	286	274	284	302	299	321	117	279	330	344
26	29	29	32	56	42	74	67	60	71	79	71	72	46	29	28	52	67	53	46	48	43	133	134	103	7
27	125	138	130	121	94	94	114	112	141	131	90	40	30	31	40	28	37	255	34	44	26	40	81	132	160
28	115	116	116	110	114	108	112	117	117	122	156	140	122	81	76	68	65	63	20	329	345	103	126	107	278
29	100	73	108	100	106	109	101	105	112	126	148	147	151	130	257	284	309	286	295	273	58	94	110	92	165
30	94	93	98	106	84	96	86	97	105	84	322	288	136	261	294	284	302	276	242	268	227	123	123	99	71
31	63	87	82	90	78	81	83	81	87	93	27	86	291	269	232	250	232	221	221	219	221	217	205	218	144

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	15	10	18	14	13	18	20	10	9	9	9	11	10	10	10	9	10	14	13	9	9	9	10	10	12
2	8	8	8	9	7	9	9	8	9	11	11	14	11	17	17	13	12	13	13	13	9	9	8	8	11
3	10	13	10	9	9	11	13	10	10	10	15	16	16	18	11	11	15	11	11	8	8	9	9	9	11
4	8	8	9	9	9	10	9	10	10	11	10	11	19	30	21	35	34	9	14	10	13	10	10	14	14
5	11	11	12	13	14	12	16	14	11	11	10	13	15	14	19	19	65	19	51	34	21	18	41	41	21
6	22	37	13	10	18	27	15	11	32	15	16	14	16	14	10	11	12	8	6	41	49	11	14	12	18
7	18	22	54	24	24	22	13	11	16	8	15	14	12	9	33	19	12	10	13	42	13	8	43	27	20
8	18	20	36	17	12	29	15	11	12	23	51	16	12	10	12	15	12	9	15	12	12	7	14	13	17
9	17	14	24	15	44	16	17	6	11	22	41	27	27	19	21	17	8	7	7	6	7	14	11	8	17
10	9	5	7	9	10	6	10	7	9	12	8	13	20	29	33	47	38	9	6	7	11	54	8	48	17
11	34	13	19	44	11	8	39	14	11	43	16	11	11	16	20	19	50	6	25	9	23	10	8	16	20
12	9	5	8	9	8	5	6	7	6	21	18	16	17	13	14	12	13	14	10	9	6	9	14	13	11
13	9	13	11	15	8	5	6	6	8	7	10	15	18	10	8	11	8	8	10	31	58	25	11	8	13
14	6	10	11	14	8	11	11	7	11	15	24	41	34	18	11	13	11	7	6	9	29	8	9	10	14
15	11	6	8	6	13	7	10	14	30	45	41	11	11	22	28	11	11	36	23	37	60	32	13	15	21
16	25	30	16	9	10	13	10	12	14	18	29	23	34	29	20	11	8	7	20	8	6	7	21	61	18
17	7	12	9	9	7	9	8	10	9	10	15	19	40	15	17	10	10	6	6	24	12	8	8	10	12
18	16	7	8	7	7	6	6	6	7	8	10	10	12	26	18	21	34	5	17	22	41	16	7	14	14
19	45	39	14	11	8	10	6	7	8	8	11	37	53	53	63	12	9	8	6	11	13	8	14	58	21
20	34	27	44	8	9	9	10	12	13	18	30	46	23	17	16	13	9	7	5	45	27	49	16	10	21
21	9	18	19	13	14	26	14	19	20	27	11	14	23	22	13	12	13	12	12	13	15	11	10	9	15
22	10	19	22	21	16	15	17	14	10	10	11	17	15	13	13	11	10	10	11	11	9	7	12	12	13
23	16	10	15	5	5	5	4	5	7	7	7	13	10	14	7	55	43	12	12	37	26	10	33	8	15
24	6	32	37	9	42	20	16	9	28	42	14	16	15	14	13	13	10	8	7	8	17	10	11	9	17
25	9	9	7	8	10	15	8	9	16	21	48	55	33	24	19	20	14	7	6	5	40	51	50	40	22
26	20	21	24	26	21	22	10	12	11	10	10	11	22	19	18	21	19	32	22	15	35	58	23	26	21
27	23	12	17	8	13	14	17	13	15	10	28	17	15	13	17	22	34	31	35	22	17	55	12	16	20
28	9	9	7	7	6	7	7	6	6	9	11	15	16	13	14	7	17	9	20	31	35	22	14	6	13
29	8	45	8	8	10	7	7	7	8	12	15	21	28	38	23	13	11	6	9	32	32	26	11	13	17
30	7	8	7	17	34	10	8	7	11	11	34	17	51	30	15	15	11	14	11	29	20	30	27	22	19
31	43	63	48	41	31	21	9	12	9	13	42	34	31	21	18	17	26	12	11	12	11	12	16	13	24
HRAVE	16	18	18	14	15	13	12	10	12	16	20	20	22	20	19	17	19	12	14	19	22	20	16	19	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	12	11	11	14	21	18	20	17	17	17	20	11	13	14	21	18	12	14	21	21	15	13	15	17	22
MAX	20	17	18	35	65	49	54	51	44	54	50	21	58	41	60	61	40	41	63	49	27	22	55	42	55
MIN	9	7	8	8	10	6	8	7	6	5	6	5	5	6	6	6	6	5	6	5	9	7	4	6	5

DAY	26	27	28	29	30	31
AVE	21	20	13	17	19	24
MAX	58	55	35	45	51	63
MIN	10	8	6	6	7	9

MONTHLY AVERAGE = 16.7 MONTHLY MAXIMUM = 65.3 MONTHLY MINIMUM = 4.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	5.8	4.4	5.0	6.4	7.1	6.6	6.5	8.7	9.7	11.4	12.8	14.2	15.1	15.6	15.8	15.5	15.0	13.8	12.8	11.8	10.5	9.8	9.3	9.0	10.5
2	8.5	8.2	8.0	7.9	7.8	7.6	7.6	7.5	8.4	9.5	11.2	12.8	14.1	14.8	15.0	15.1	14.6	13.8	13.0	12.5	11.7	11.0	10.6	10.1	10.9
3	9.5	9.0	8.7	8.1	8.0	7.6	7.4	7.2	7.9	9.3	10.8	12.5	13.9	15.0	15.6	16.1	15.9	15.6	15.2	14.6	14.0	13.5	13.1	13.0	11.7
4	12.9	12.7	12.3	12.0	11.8	11.6	11.3	11.3	11.8	12.8	13.3	14.2	14.2	11.7	10.4	10.5	11.1	10.4	9.7	9.6	9.2	9.1	9.2	8.6	11.3
5	8.6	8.7	8.9	8.8	8.7	8.4	8.2	8.1	8.3	8.9	10.5	11.9	13.2	13.4	12.4	11.6	11.7	11.5	12.1	11.7	11.2	10.3	10.3	9.8	10.3
6	9.9	9.9	9.6	9.6	9.6	9.5	8.2	7.9	7.9	10.1	11.4	11.7	12.3	13.0	12.7	12.8	12.5	11.4	10.5	9.9	8.8	8.0	7.8	7.4	10.1
7	7.0	6.8	6.9	6.7	6.4	6.8	7.3	8.1	9.1	9.4	8.9	8.1	7.0	5.7	4.1	3.7	3.6	3.0	3.2	3.3	3.5	3.0	3.2	3.0	5.7
8	3.1	3.2	3.3	3.4	3.4	3.5	3.7	4.1	4.3	4.7	5.5	6.2	6.4	6.5	6.6	7.2	7.5	7.3	7.4	6.7	6.6	6.2	5.9	5.8	5.4
9	5.2	5.1	5.0	4.9	4.4	4.7	4.1	4.0	4.3	4.6	6.9	8.7	10.0	10.9	11.4	11.6	11.1	10.3	9.2	8.0	7.3	6.3	5.3	4.7	7.0
10	4.0	3.4	2.7	2.0	2.0	1.6	1.2	1.4	2.5	4.6	5.6	6.7	7.8	9.5	10.6	11.3	10.8	10.2	9.8	8.9	8.6	8.8	8.4	7.7	6.2
11	6.7	5.3	4.5	3.7	2.9	2.6	2.3	1.2	3.1	5.4	8.8	9.7	10.7	11.4	11.9	12.1	12.4	11.2	10.7	8.7	8.4	7.3	6.9	4.8	7.2
12	3.8	3.0	3.3	2.1	1.9	1.5	1.1	0.9	2.4	4.0	8.6	10.4	11.6	12.4	13.1	13.3	13.3	12.8	12.1	11.7	11.0	10.4	9.1	8.1	7.6
13	7.8	6.9	6.6	5.4	2.7	2.4	2.8	2.8	4.6	6.5	9.4	12.4	14.1	15.3	15.8	16.0	15.2	14.0	13.4	12.5	11.0	8.6	7.2	5.9	9.1
14	5.0	4.8	3.4	3.2	2.4	2.7	2.6	0.9	3.0	4.9	7.3	9.9	11.9	13.6	15.6	16.3	15.5	14.1	12.8	11.5	10.3	8.4	7.8	6.1	8.1
15	5.0	3.9	3.7	3.2	2.4	2.3	2.3	1.5	1.8	3.2	5.1	6.1	7.2	9.5	11.2	11.8	12.2	10.3	10.0	9.1	8.3	7.1	5.9	5.5	6.2
16	4.3	4.2	2.8	2.6	1.7	1.8	1.2	1.6	2.7	5.1	7.1	10.2	11.4	13.0	14.0	14.4	13.7	13.0	12.5	11.8	11.4	10.3	9.7	9.1	7.9
17	8.4	8.0	7.0	6.1	5.0	4.6	4.0	3.4	4.3	7.5	10.5	12.7	14.3	16.2	18.3	18.7	18.3	16.7	15.3	13.9	12.5	11.2	9.4	8.6	10.6
18	6.7	6.2	6.3	5.8	4.8	4.2	4.1	3.1	4.7	6.4	9.5	12.5	14.4	16.1	16.6	17.8	17.1	16.2	15.4	13.5	12.6	11.1	9.7	9.1	10.2
19	7.7	7.2	5.6	5.9	4.3	4.0	3.5	2.6	4.9	7.8	11.0	13.7	15.9	17.8	18.9	19.2	18.7	17.1	15.6	14.5	13.5	13.0	12.8	11.1	11.1
20	10.9	11.5	11.0	8.9	8.2	6.8	6.4	6.2	6.3	9.4	11.5	13.8	15.6	17.6	18.3	18.2	17.4	16.0	14.9	13.9	12.4	12.0	10.6	9.5	12.0
21	8.5	7.8	7.6	6.4	7.2	8.1	8.0	8.9	9.2	11.9	14.1	15.6	16.7	17.1	17.4	17.8	17.7	17.2	16.5	16.0	15.1	14.6	13.7	12.6	12.7
22	11.2	8.9	7.4	6.9	7.7	8.0	7.8	8.4	10.1	12.1	14.0	15.8	17.2	18.3	19.0	19.6	19.3	18.8	18.0	17.7	16.7	15.2	13.5	12.6	13.5
23	11.6	11.3	9.1	8.4	7.8	6.9	6.5	6.4	6.7	9.0	11.8	15.4	19.4	20.5	20.0	20.4	20.2	18.7	17.7	16.4	14.7	13.1	12.1	10.7	13.1
24	9.5	9.1	7.8	7.3	6.4	5.4	4.6	4.6	6.1	8.4	10.6	14.5	16.0	16.7	16.6	16.4	15.8	14.7	13.2	12.0	10.7	9.7	8.6	8.2	10.5
25	6.7	5.9	5.3	4.7	4.5	3.7	3.9	4.0	4.8	7.1	9.5	11.6	13.8	15.3	16.1	16.4	16.2	14.9	13.3	12.5	12.1	11.9	10.2	10.1	9.8
26	11.8	11.4	10.7	10.1	10.2	9.2	8.6	8.8	9.7	10.7	12.0	13.4	14.5	15.3	15.8	16.1	16.2	15.8	14.9	14.1	13.5	12.9	12.1	11.3	12.5
27	11.1	8.1	7.3	6.1	5.7	4.8	3.9	3.1	4.4	8.2	11.7	13.6	14.6	15.3	16.1	16.7	17.0	16.8	15.2	14.2	13.9	12.6	11.0	8.4	10.8
28	8.1	6.9	6.2	5.0	4.8	4.2	3.7	3.7	5.3	8.4	11.3	14.1	16.6	18.7	19.5	19.5	19.5	18.5	17.8	16.2	15.1	12.5	10.6	9.9	11.5
29	9.0	6.7	5.7	5.8	5.2	4.5	4.5	3.6	5.9	9.1	12.1	15.2	17.7	19.4	20.6	21.4	20.7	19.5	18.0	16.3	14.4	12.6	11.2	9.5	12.0
30	9.5	7.5	8.2	6.5	6.0	4.6	4.4	4.0	6.5	9.1	11.6	14.2	17.8	20.0	22.0	22.8	21.5	20.6	19.0	17.1	15.5	15.3	14.6	13.1	13.0
31	12.7	11.8	10.8	10.1	9.8	8.8	8.6	7.4	8.7	11.3	15.0	18.9	20.9	23.0	24.6	23.3	23.3	22.5	21.0	20.5	19.9	19.2	18.4	17.5	16.2
HRAVE	8.1	7.4	6.8	6.3	5.8	5.4	5.2	5.0	6.1	8.1	10.3	12.3	13.8	14.8	15.4	15.6	15.3	14.4	13.6	12.6	11.8	10.8	9.9	9.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	10.5	10.9	11.7	11.3	10.3	10.1	5.7	5.4	7.0	6.2	7.2	7.6	9.1	8.1	6.2	7.9	10.6	10.2	11.1	12.0	12.7	13.5	13.1	10.5	9.8
MAX	15.8	15.1	16.1	14.2	13.4	13.0	9.4	7.5	11.6	11.3	12.4	13.3	16.0	16.3	12.2	14.4	18.7	17.8	19.2	18.3	17.8	19.6	20.5	16.7	16.4
MIN	4.4	7.5	7.2	8.6	8.1	7.4	3.0	3.1	4.0	1.2	1.2	0.9	2.4	0.9	1.5	1.2	3.4	3.1	2.6	6.2	6.4	6.9	6.4	4.6	3.7

DAY	26	27	28	29	30	31
AVE	12.5	10.8	11.5	12.0	13.0	16.2
MAX	16.2	17.0	19.5	21.4	22.8	24.6
MIN	8.6	3.1	3.7	3.6	4.0	7.4

MONTHLY AVERAGE = 10.2 MONTHLY MAXIMUM = 24.6 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JANUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.7	0.8	1.3	0.9	0.6	0.8	0.9	0.4	0.0	-0.2	-0.5	-0.6	-0.5	-0.4	-0.2	-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-0.2	-0.4	-0.5	-0.6	-0.5	-0.5	-0.2	-0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0
3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.1	-0.4	-0.5	-0.5	-0.5	-0.4	-0.2	-0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.0
4	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	-0.4	-0.4	-0.4	-0.2	0.1	0.0	0.1	-0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.0
5	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	-0.1	-0.4	-0.5	-0.8	-0.3	-0.2	0.0	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0
6	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.3	-0.1	-0.4	-0.5	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	0.2	0.5	0.4	0.4	0.5	0.4	0.3	0.1
7	0.3	0.4	0.4	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.3	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.2	0.1	0.1	0.0	0.1
8	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.2	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.2	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.1
9	0.2	0.2	0.2	0.2	0.1	0.3	0.4	0.3	0.1	-0.2	-0.5	-0.6	-0.7	-0.6	-0.6	-0.5	-0.2	0.3	0.5	0.5	0.7	0.4	0.5	0.6	0.1
10	0.5	0.6	0.4	0.3	0.4	0.4	0.4	0.4	-0.2	-0.9	-0.8	-0.8	-0.6	-0.6	-0.6	-0.4	-0.1	0.2	0.3	0.4	0.2	0.2	0.3	0.5	0.0
11	0.5	0.4	0.5	0.5	0.4	0.3	0.4	0.3	-0.4	-0.2	-0.7	-0.7	-0.6	-0.5	-0.3	-0.1	-0.1	0.4	0.6	1.0	0.4	0.9	1.1	1.2	0.2
12	1.2	0.8	0.4	0.8	0.6	0.4	0.5	0.5	-0.3	-0.2	-0.4	-0.4	-0.3	-0.2	-0.1	0.0	0.2	0.4	0.5	0.7	0.6	0.4	0.6	0.9	0.3
13	0.6	0.5	0.6	1.2	1.1	0.8	0.3	0.2	-0.6	-1.1	-1.4	-1.2	-0.8	-0.7	-0.4	-0.1	0.3	0.6	0.7	0.4	0.5	0.8	0.5	0.7	0.1
14	0.8	0.6	0.6	0.3	0.5	0.4	0.6	0.5	-0.7	-1.0	-0.8	-0.7	-0.6	-0.6	-0.5	-0.4	0.2	0.4	0.6	0.6	0.6	0.6	0.8	0.8	0.2
15	0.5	0.7	0.6	0.7	0.6	0.5	0.4	0.4	0.0	-0.1	-0.5	-0.4	-0.3	-0.5	-0.3	-0.2	0.1	0.2	0.3	0.4	0.3	0.8	0.6	0.6	0.2
16	0.4	0.6	0.6	0.5	0.6	0.5	0.6	0.3	-0.5	-1.0	-0.6	-1.1	-0.7	-0.6	-0.4	-0.3	0.0	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.0
17	0.4	0.5	0.7	0.5	0.6	0.5	0.7	0.5	-0.6	-1.1	-1.2	-1.2	-0.7	-0.6	-0.5	-0.3	0.0	0.4	0.6	0.6	0.6	0.6	0.6	0.8	0.1
18	0.6	0.7	0.6	0.5	0.6	0.6	0.6	0.3	-0.2	-0.6	-1.0	-1.1	-0.9	-0.7	-0.4	-0.2	0.1	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.2
19	0.8	0.6	0.6	0.7	0.6	0.5	0.7	0.3	-0.5	-1.1	-1.3	-0.7	-0.5	-0.6	-0.5	-0.5	-0.1	0.4	0.5	0.4	0.4	0.6	0.7	0.3	0.1
20	0.2	0.5	0.5	0.6	0.5	0.7	0.6	0.4	-0.6	-1.0	-0.5	-0.6	-0.7	-0.6	-0.5	-0.5	-0.2	0.2	0.6	0.6	0.7	0.5	0.5	0.7	0.1
21	0.7	0.8	0.7	0.6	1.6	1.9	2.0	1.1	0.2	-0.5	-0.6	-0.7	-0.6	-0.4	-0.1	0.0	0.1	0.2	0.2	0.3	0.4	0.3	0.4	0.5	0.4
22	0.6	1.0	1.6	1.5	1.0	0.9	1.0	0.6	0.1	-0.4	-0.5	-0.5	-0.4	-0.3	-0.2	0.0	0.1	0.2	0.3	0.2	0.3	0.4	0.6	0.5	0.4
23	0.5	0.5	0.8	0.5	0.6	0.9	0.9	0.8	0.1	-0.6	-1.2	-1.3	-1.1	-0.8	-0.3	-0.1	0.0	0.4	0.6	0.6	0.5	0.6	0.6	0.9	0.2
24	0.7	0.5	0.6	0.7	0.8	0.7	0.9	0.4	-0.5	-0.6	-0.6	-0.6	-0.7	-0.7	-0.6	-0.6	-0.4	0.1	0.4	0.6	0.5	0.5	0.4	0.4	0.1
25	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.1	-0.4	-0.8	-0.4	-0.4	-0.7	-0.8	-0.7	-0.6	-0.4	0.1	0.4	0.5	0.5	0.4	0.9	0.6	0.0
26	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.2	-0.3	-0.7	-0.8	-0.9	-0.6	-0.4	-0.2	-0.1	0.1	0.4	0.7	0.6	0.3	0.3	0.5	0.5	0.1
27	0.6	1.1	0.8	0.6	1.2	1.1	1.2	2.2	-0.2	-1.2	-1.1	-0.7	-0.6	-0.4	-0.3	-0.1	0.1	0.3	0.7	0.7	0.6	0.6	0.8	0.9	0.4
28	0.8	0.6	0.4	0.6	0.4	0.5	0.3	0.2	-0.9	-1.4	-1.7	-1.6	-1.2	-1.0	-0.7	-0.1	0.3	0.5	0.6	0.6	0.4	0.6	0.8	0.7	0.0
29	0.6	0.7	0.6	0.7	0.6	0.6	0.6	0.3	-0.9	-1.3	-1.3	-1.2	-1.0	-0.8	-0.6	-0.5	0.0	0.3	0.8	0.5	0.7	0.7	0.7	0.7	0.0
30	0.8	0.7	0.6	0.4	0.5	0.5	0.6	0.3	-0.9	-1.4	-0.6	-0.6	-0.9	-0.6	-0.7	-0.4	0.0	0.2	0.6	0.8	0.6	0.3	0.4	0.5	0.1
31	1.1	1.1	1.0	0.9	1.2	0.9	0.8	0.5	-0.6	-1.0	-0.7	-0.8	-0.7	-0.9	-1.0	-0.3	-0.2	0.0	0.2	0.3	0.2	0.2	0.3	0.2	0.1
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.3	-0.7	-0.7	-0.7	-0.6	-0.5	-0.4	-0.2	0.0	0.3	0.4	0.4	0.4	0.4	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.3	0.1	0.2	0.2	0.0	0.1	0.2	0.1	0.1	0.4	0.4	0.2	0.1	0.0
MAX	1.3	0.2	0.2	0.3	0.3	0.5	0.4	0.3	0.7	0.6	1.2	1.2	1.2	0.8	0.8	0.6	0.8	0.7	0.8	0.7	2.0	1.6	0.9	0.9	0.9
MIN	-0.6	-0.6	-0.5	-0.4	-0.8	-0.5	-0.1	-0.2	-0.7	-0.9	-0.7	-0.4	-1.4	-1.0	-0.5	-1.1	-1.2	-1.1	-1.3	-1.0	-0.7	-0.5	-1.3	-0.7	-0.8

DAY	26	27	28	29	30	31
AVE	0.1	0.4	0.0	0.0	0.1	0.1
MAX	0.7	2.2	0.8	0.8	0.8	1.2
MIN	-0.9	-1.2	-1.7	-1.3	-1.4	-1.0

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 2.2 MONTHLY MINIMUM = -1.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JANUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	703	703	703	703	703	704	704	705	705	705	705	704	704	704	704	704	704	705	706	706	706	707	707	704
2	706	706	707	707	706	706	707	707	707	707	707	707	706	705	705	704	704	704	705	705	706	706	706	706	706
3	706	706	706	706	706	705	706	706	706	706	706	706	704	704	703	702	702	702	702	702	702	702	702	701	704
4	701	701	701	701	700	700	700	700	701	701	701	701	700	700	700	699	700	700	700	701	701	701	701	701	700
5	701	701	701	701	701	701	701	702	702	702	702	702	701	700	700	700	700	700	700	700	700	700	700	700	701
6	700	699	699	699	699	699	700	701	701	702	702	702	702	701	701	701	701	701	702	702	702	702	702	702	701
7	701	701	701	701	700	700	700	700	700	700	700	700	699	698	698	698	698	699	698	699	699	698	698	698	699
8	698	698	698	698	698	698	698	699	699	700	701	701	700	700	701	701	701	702	702	703	703	703	704	704	700
9	704	704	704	704	704	704	705	705	706	707	707	707	706	706	705	705	705	705	705	706	706	706	706	706	705
10	705	705	705	705	705	705	706	706	706	706	707	706	705	705	704	704	704	704	704	704	705	705	705	705	705
11	705	705	705	705	705	705	706	706	707	708	708	708	707	706	706	706	706	707	707	707	707	707	708	708	706
12	707	707	707	707	707	707	707	708	708	708	708	708	706	705	705	705	705	705	705	705	705	705	705	706	706
13	705	705	705	705	705	705	705	706	706	706	706	706	705	703	703	703	703	702	703	703	703	703	703	703	704
14	703	703	702	703	703	702	703	703	704	704	704	703	703	702	701	701	701	701	702	702	702	702	702	702	702
15	702	702	702	701	701	701	701	701	701	702	702	702	701	700	700	700	700	701	702	702	703	703	703	704	701
16	704	704	704	704	704	705	705	705	706	707	707	706	705	704	704	704	704	704	704	704	704	705	705	705	705
17	705	705	705	705	705	705	706	706	707	707	707	707	706	705	705	704	705	705	706	706	706	706	706	706	706
18	706	706	706	706	706	706	706	707	707	707	708	707	706	705	704	704	704	704	704	704	704	705	705	705	705
19	705	705	705	705	705	705	706	706	707	707	707	707	706	704	704	704	704	705	705	706	706	705	706	706	705
20	705	706	705	705	706	706	706	706	706	707	707	706	705	704	704	704	704	704	705	705	706	706	706	707	705
21	707	707	708	707	707	708	708	708	709	709	709	709	708	707	707	707	707	707	707	707	707	707	708	708	708
22	707	707	707	707	707	707	707	707	708	708	707	707	706	705	704	704	704	704	704	704	704	704	705	705	706
23	704	704	704	704	704	704	704	704	704	704	704	703	702	701	700	700	700	700	700	700	700	700	700	700	702
24	700	700	700	700	700	700	700	701	701	702	702	702	701	701	701	701	701	701	701	702	702	702	702	703	701
25	702	702	702	702	702	702	703	703	703	704	704	703	703	702	701	701	701	702	702	703	703	704	704	704	703
26	705	705	705	705	705	705	706	706	707	707	708	707	707	706	706	705	705	706	706	707	707	707	708	708	706
27	708	708	708	708	708	709	709	709	710	710	710	709	709	708	707	706	706	707	707	707	707	707	707	708	708
28	708	708	708	707	707	707	708	708	708	708	708	707	706	705	704	704	704	703	704	704	704	705	705	705	706
29	705	705	704	704	704	704	704	704	705	705	705	704	703	702	702	701	701	701	702	702	702	702	702	702	703
30	702	702	702	702	702	702	702	702	702	702	702	702	701	700	699	699	699	699	699	700	700	701	701	701	701
31	701	701	701	700	700	700	700	700	701	701	701	700	699	697	696	695	695	695	694	694	694	694	693	693	698
HRAVE	704	704	704	704	704	704	704	704	705	705	705	705	704	703	703	702	702	703	703	703	703	704	704	704	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	704	706	704	700	701	701	699	700	705	705	706	706	704	702	701	705	706	705	705	705	708	706	702	701	703
MAX	707	707	706	701	702	702	701	704	707	707	708	708	706	704	704	707	707	708	707	707	709	708	704	703	704
MIN	703	704	701	699	700	699	698	698	704	704	705	705	702	701	700	704	704	704	704	704	707	704	700	700	701

DAY	26	27	28	29	30	31
AVE	706	708	706	703	701	698
MAX	708	710	708	705	702	701
MIN	705	706	703	701	699	693

MONTHLY AVERAGE = 703.7 MONTHLY MAXIMUM = 710.1 MONTHLY MINIMUM = 692.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	62	66	66	62	61	63	65	58	55	51	47	44	42	40	39	39	41	44	46	48	52	54	55	56	52
2	57	58	59	60	61	61	61	62	59	54	48	44	41	38	38	39	40	42	45	46	49	52	53	54	51
3	57	60	61	63	63	64	66	65	62	56	50	45	40	36	34	33	35	36	37	39	41	43	44	43	49
4	41	42	45	48	49	52	53	54	54	51	51	48	48	72	89	84	73	73	80	76	74	72	71	80	62
5	83	82	81	80	80	81	87	87	85	82	75	68	61	64	73	80	79	78	76	77	81	89	91	95	80
6	94	94	95	96	95	92	88	88	92	75	67	61	58	51	55	54	56	63	67	72	78	82	82	84	77
7	87	87	87	90	90	92	84	79	75	73	78	85	92	93	93	95	96	96	97	95	95	95	94	96	89
8	97	97	97	97	97	97	97	96	95	95	92	88	84	81	81	76	75	76	77	82	83	85	87	90	88
9	94	95	94	96	97	97	97	97	98	98	84	72	62	55	49	49	51	54	62	68	72	77	85	89	79
10	90	92	94	92	94	94	95	94	88	77	74	67	63	54	47	46	46	49	52	61	70	69	71	76	73
11	82	88	92	93	93	92	93	94	87	71	45	40	35	32	29	29	32	36	38	51	51	56	55	63	62
12	70	74	75	80	79	80	82	83	75	68	44	39	36	35	34	33	33	34	37	37	37	40	45	53	54
13	55	57	59	62	73	73	72	73	66	56	46	38	33	29	28	29	34	39	39	45	50	57	65	71	52
14	73	73	77	78	83	80	83	89	81	65	52	46	40	34	30	25	26	31	35	41	46	53	57	63	57
15	68	73	73	73	78	76	77	80	79	74	63	62	56	47	46	46	43	59	59	64	69	73	78	79	66
16	83	85	87	88	90	92	92	91	83	71	60	53	48	40	36	35	39	45	48	53	53	57	61	64	65
17	66	71	75	80	84	86	87	89	83	65	52	46	41	37	32	31	34	39	45	48	53	58	67	70	60
18	73	76	71	71	77	79	79	83	74	63	53	40	34	30	30	26	32	35	37	46	50	56	62	65	56
19	69	72	78	77	81	84	82	86	74	56	43	33	29	24	26	27	28	33	39	44	46	50	51	56	54
20	57	53	58	66	70	75	76	76	69	53	44	37	35	32	32	33	36	41	45	50	55	58	62	69	53
21	73	72	75	79	74	56	55	40	37	27	20	18	16	16	16	15	15	18	20	21	21	21	21	24	35
22	29	36	40	43	39	37	38	36	31	26	22	21	19	18	17	18	18	18	18	19	19	23	28	32	27
23	34	34	41	43	44	46	48	46	45	39	32	27	18	17	20	20	20	23	26	30	33	39	42	49	34
24	53	56	59	60	63	62	69	70	62	52	43	38	36	33	31	30	32	34	37	40	43	46	51	53	48
25	60	64	64	67	66	69	71	68	63	53	45	37	34	29	27	26	27	30	35	38	41	37	41	40	47
26	27	27	28	27	24	26	27	28	26	24	21	18	17	16	15	12	12	15	19	19	19	20	21	23	21
27	23	30	33	37	37	40	42	46	43	33	27	26	24	21	20	20	21	23	27	28	28	31	34	41	31
28	43	47	49	53	54	56	58	56	48	38	33	26	23	18	15	15	17	22	24	26	30	36	41	45	36
29	47	54	58	58	59	63	60	65	53	39	33	29	24	20	19	18	18	22	27	31	37	41	44	48	40
30	48	53	49	56	59	65	67	68	56	47	36	30	20	18	18	18	20	22	27	31	37	39	41	44	40
31	45	47	51	53	55	59	58	64	56	46	36	26	23	21	17	19	18	20	24	26	29	32	34	40	37
HRAVE	63	65	67	69	70	71	71	71	66	57	49	44	40	37	37	36	37	40	43	47	50	53	56	60	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	52	51	49	62	80	77	89	88	79	73	62	54	52	57	66	65	60	56	54	53	35	27	34	48	47
MAX	66	62	66	89	95	96	97	97	98	95	94	83	73	89	80	92	89	83	86	76	79	43	49	70	71
MIN	39	38	33	41	61	51	73	75	49	46	29	33	28	25	43	35	31	26	24	32	15	17	17	30	26

DAY	26	27	28	29	30	31
AVE	21	31	36	40	40	37
MAX	28	46	58	65	68	64
MIN	12	20	15	18	18	17

MONTHLY AVERAGE = 54.1 MONTHLY MAXIMUM = 97.5 MONTHLY MINIMUM = 11.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.32	0.45	0.55	0.58	0.55	0.45	0.32	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.52
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.32	0.46	0.55	0.58	0.55	0.46	0.33	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.55
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.32	0.46	0.55	0.58	0.56	0.46	0.32	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.56
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.19	0.22	0.09	0.08	0.04	0.13	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.17	0.31	0.32	0.50	0.17	0.04	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.43	0.32	0.40	0.29	0.24	0.18	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.47
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.03	0.05	0.04	0.02	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.09	0.10	0.07	0.09	0.09	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.15	0.43	0.52	0.62	0.58	0.44	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.33
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.29	0.24	0.24	0.35	0.43	0.44	0.33	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.55
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.49	0.59	0.63	0.60	0.51	0.36	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.88
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.34	0.49	0.59	0.63	0.60	0.51	0.37	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.88
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.34	0.49	0.60	0.63	0.61	0.52	0.38	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.93
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.34	0.49	0.60	0.63	0.60	0.51	0.37	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.83
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.16	0.27	0.22	0.20	0.54	0.19	0.14	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.85
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.32	0.48	0.55	0.60	0.59	0.37	0.30	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.49
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.50	0.60	0.64	0.61	0.52	0.38	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.96
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.18	0.41	0.48	0.43	0.38	0.34	0.25	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.72
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.50	0.58	0.63	0.59	0.45	0.35	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.83
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.50	0.60	0.64	0.61	0.52	0.38	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.99
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.36	0.51	0.62	0.65	0.62	0.53	0.39	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.05
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.51	0.62	0.62	0.62	0.52	0.37	0.13	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.93
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.25	0.45	0.57	0.62	0.56	0.37	0.22	0.13	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.31
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.50	0.62	0.66	0.63	0.54	0.40	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.12
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.41	0.47	0.60	0.57	0.54	0.40	0.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.73
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.37	0.53	0.64	0.68	0.65	0.57	0.43	0.23	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.34
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.37	0.52	0.63	0.67	0.65	0.56	0.42	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.28
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.38	0.54	0.63	0.61	0.66	0.57	0.41	0.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.27
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.38	0.54	0.65	0.68	0.60	0.51	0.38	0.17	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.16
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.37	0.52	0.63	0.68	0.65	0.57	0.37	0.15	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.18
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.38	0.53	0.64	0.68	0.70	0.63	0.17	0.16	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.16
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.30	0.43	0.50	0.54	0.51	0.42	0.30	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.52	3.55	3.56	1.24	1.63	2.47	0.26	0.66	3.33	2.55	3.88	3.88	3.93	3.83	1.85	3.49	3.96	2.72	3.83	3.99	4.05	3.93	3.31	4.12	3.73
MAX	0.58	0.58	0.58	0.28	0.50	0.43	0.05	0.10	0.62	0.44	0.63	0.63	0.63	0.63	0.54	0.60	0.64	0.48	0.63	0.64	0.65	0.62	0.62	0.66	0.60
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.34	4.28	4.27	4.16	4.18	4.16
MAX	0.68	0.67	0.66	0.68	0.68	0.70
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JANUARY - 2016

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.10
5	0.04	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
6	0.00	0.01	0.01	0.01	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.12	0.12	0.25	0.09	0.05	0.04	0.01	0.08	0.00	0.00	0.00	0.02	0.83
8	0.00	0.07	0.02	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
9	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.10	0.08	0.08	0.83	0.19	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.04	0.04	0.03	0.25	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.29 MONTHLY MAXIMUM = 0.25 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
FEBRUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	13.8	13.7	12.1	6.8	5.8	5.8	7.7	8.5	9.2	8.9	9.2	10.5	9.3	7.6	6.0	4.6	5.4	2.8	2.7	3.9	3.5	2.7	2.9	4.5	7.0
2	2.7	2.2	2.3	3.4	1.7	3.2	2.5	2.5	3.3	3.6	3.3	4.2	6.1	7.2	7.2	5.8	6.4	5.3	2.2	1.8	1.5	2.2	2.8	3.4	3.6
3	3.3	2.5	2.6	1.8	3.8	2.9	3.0	3.3	2.5	3.1	2.8	3.3	4.5	3.8	4.3	3.1	3.4	2.5	2.8	5.1	2.2	2.1	4.4	2.8	3.2
4	5.0	3.9	4.5	3.0	3.3	4.9	6.2	5.4	6.5	10.6	7.9	7.6	8.5	7.4	6.5	6.4	6.4	4.4	4.3	4.4	3.7	3.0	3.2	2.3	5.4
5	1.8	3.5	2.3	4.1	3.8	4.9	5.0	5.2	4.6	3.4	6.1	5.4	5.5	5.3	7.1	5.3	5.4	5.3	4.5	6.3	5.0	4.8	7.9	8.3	5.0
6	6.3	6.0	7.7	8.5	8.8	7.5	7.7	7.6	8.0	8.9	9.2	9.5	8.2	8.2	7.8	9.0	8.6	8.8	7.8	8.0	8.1	7.7	6.5	6.1	7.9
7	5.2	4.9	4.1	4.3	5.6	5.0	5.9	5.4	5.1	5.1	4.3	5.5	8.7	7.1	8.2	6.1	4.3	4.3	3.2	4.4	6.1	6.3	5.1	4.5	5.4
8	5.8	8.6	9.5	7.8	3.9	4.4	4.9	3.6	7.6	12.0	14.3	8.9	8.5	8.8	8.1	6.7	6.3	4.3	3.1	3.2	3.2	3.7	5.6	9.2	6.7
9	7.2	6.4	6.0	5.0	4.9	5.0	6.5	5.2	3.8	7.1	8.1	8.0	8.6	8.5	9.6	8.0	6.3	6.7	6.9	6.1	3.7	4.9	5.0	4.0	6.3
10	3.8	4.0	5.0	4.6	5.0	5.1	5.0	5.1	5.1	4.7	5.0	6.3	5.0	4.7	4.8	5.0	5.6	4.7	2.4	2.7	1.2	3.5	3.8	3.0	4.4
11	3.5	3.9	4.0	3.5	3.5	3.4	3.0	3.1	3.5	3.6	3.4	3.0	2.2	1.9	1.6	2.0	2.2	4.0	5.1	4.8	1.5	2.7	3.8	3.8	3.2
12	3.6	4.4	3.5	3.7	3.7	3.7	4.2	4.1	4.5	4.8	3.7	2.8	2.8	3.7	3.0	4.3	5.5	5.5	5.2	4.1	3.9	4.3	4.4	4.0	4.1
13	4.0	4.0	4.5	3.1	3.9	4.0	4.4	4.1	5.1	5.0	4.8	4.0	2.8	1.8	1.4	3.7	5.3	6.1	5.3	5.6	4.2	1.9	3.1	2.9	4.0
14	3.7	3.3	3.7	3.2	2.4	4.2	2.4	2.0	2.3	1.9	0.8	1.6	1.6	2.0	4.7	7.6	8.0	7.2	6.8	4.8	3.3	2.3	2.7	2.7	3.6
15	3.1	1.4	2.8	3.8	3.2	2.4	3.6	3.5	5.7	8.8	6.2	8.5	8.2	5.9	4.4	2.8	3.6	5.0	6.6	7.5	4.7	2.5	2.8	3.0	4.6
16	2.9	2.9	2.8	3.4	1.6	3.1	3.7	4.5	5.8	3.7	2.4	2.8	4.7	4.1	2.8	2.3	3.0	5.3	5.5	5.2	3.9	2.9	4.8	4.3	3.7
17	4.5	4.0	5.0	4.5	4.5	3.3	4.5	4.2	4.2	3.7	2.8	1.9	2.2	3.1	2.0	3.0	3.6	3.8	4.1	2.5	2.2	2.7	3.8	3.4	3.5
18	3.8	4.0	3.4	2.9	3.8	3.2	1.8	2.6	2.2	2.4	1.6	1.9	1.3	3.4	2.3	4.4	6.0	6.7	5.1	3.3	2.0	1.6	2.1	2.3	3.1
19	2.0	3.0	3.4	3.6	2.1	3.0	3.3	3.4	3.0	1.8	1.2	1.1	1.7	3.5	2.2	3.8	3.5	4.0	3.2	2.9	2.3	2.8	1.5	3.3	2.7
20	2.8	3.7	2.5	3.1	2.8	2.6	3.5	3.7	3.7	2.6	1.3	1.1	2.5	2.9	3.1	3.2	4.5	5.8	5.7	6.8	4.1	3.0	2.8	3.2	3.4
21	3.9	3.8	3.7	4.1	2.7	2.7	2.8	3.3	2.5	1.1	1.1	2.5	4.5	5.6	4.6	5.1	6.3	7.2	4.7	3.3	2.3	1.9	3.0	3.5	3.6
22	3.7	3.6	4.1	3.5	1.7	2.0	3.0	1.4	0.6	0.9	2.1	4.2	6.7	9.4	9.2	9.5	10.4	8.7	6.1	6.4	6.9	8.4	6.8	6.3	5.2
23	2.8	3.0	2.4	2.4	2.8	1.5	1.2	1.3	2.1	5.4	5.1	4.8	3.1	2.1	2.0	2.1	2.9	3.0	3.3	6.1	5.9	5.7	5.4	5.7	3.4
24	5.4	4.9	4.1	8.1	7.3	8.3	8.6	9.3	9.1	9.7	10.5	10.9	10.3	9.4	8.7	6.2	5.6	6.4	7.3	5.9	5.7	5.9	6.2	5.6	7.5
25	6.0	3.7	4.4	5.2	5.0	4.0	3.5	5.1	3.6	5.0	5.8	5.3	5.6	5.2	4.5	4.8	4.6	6.2	6.6	7.2	7.7	6.6	5.8	6.3	5.3
26	7.0	5.9	5.6	7.2	6.8	5.9	5.7	4.9	3.8	6.2	6.9	6.7	5.8	5.0	4.5	4.5	4.8	4.4	5.5	5.1	4.0	3.6	2.9	4.3	5.3
27	3.8	4.6	3.6	3.8	4.1	4.2	4.1	3.4	3.6	3.2	3.2	3.4	2.0	1.4	3.0	5.5	6.3	6.7	4.2	3.8	1.9	1.3	2.9	3.6	3.7
28	3.8	4.0	3.3	3.2	2.8	3.2	3.4	2.9	1.3	1.6	1.3	1.1	1.6	4.3	3.9	4.8	5.4	6.4	5.6	4.3	2.3	2.2	3.2	3.4	3.3
29	2.9	3.0	2.7	3.5	2.6	2.6	2.8	2.6	1.9	1.1	0.8	1.3	1.6	3.5	4.8	5.2	5.7	6.2	4.5	3.4	2.3	2.2	2.9	3.9	3.1
HRAVE	4.4	4.4	4.3	4.3	3.9	4.0	4.3	4.2	4.3	4.8	4.7	4.8	5.0	5.1	4.9	5.0	5.4	5.4	4.8	4.8	3.8	3.6	4.1	4.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.0	3.6	3.2	5.4	5.0	7.9	5.4	6.7	6.3	4.4	3.2	4.1	4.0	3.6	4.6	3.7	3.5	3.1	2.7	3.4	3.6	5.2	3.4	7.5	5.3
MAX	13.8	7.2	5.1	10.6	8.3	9.5	8.7	14.3	9.6	6.3	5.1	5.5	6.1	8.0	8.8	5.8	5.0	6.7	4.0	6.8	7.2	10.4	6.1	10.9	7.7
MIN	2.7	1.5	1.8	2.3	1.8	6.0	3.2	3.1	3.7	1.2	1.5	2.8	1.4	0.8	1.4	1.6	1.9	1.3	1.1	1.1	1.1	0.6	1.2	4.1	3.5

DAY	26	27	28	29	30	31
AVE	5.3	3.7	3.3	3.1	***	***
MAX	7.2	6.7	6.4	6.2	***	***
MIN	2.9	1.3	1.1	0.8	***	***

MONTHLY AVERAGE = 4.5 MONTHLY MAXIMUM = 14.3 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
FEBRUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	227	280	275	275	276	271	248	230	230	235	240	257	271	269	287	282	294	290	258	289	263	312	296	301	132
2	292	291	273	285	85	288	288	316	298	279	296	292	287	288	285	288	280	285	281	244	229	140	103	96	328
3	90	84	75	91	93	119	95	95	115	125	154	80	42	70	81	87	283	258	297	302	290	94	78	153	191
4	70	128	121	130	105	86	69	75	74	69	48	38	37	35	51	34	37	32	36	54	47	79	52	103	75
5	111	163	132	164	126	146	149	142	159	172	78	67	71	57	66	57	35	37	59	41	63	89	41	51	280
6	77	69	68	67	69	73	67	71	68	67	64	41	38	47	39	42	43	44	45	54	57	57	68	72	117
7	82	93	120	119	147	153	154	134	132	155	152	80	73	71	71	71	83	95	78	60	54	79	114	90	285
8	82	64	66	71	109	148	144	139	91	70	69	66	51	58	40	59	70	81	72	74	120	116	83	39	267
9	72	84	81	71	84	82	67	80	103	69	65	53	38	38	42	35	36	32	37	41	64	62	73	89	330
10	130	120	135	129	124	138	130	140	146	154	128	67	66	70	59	55	38	28	35	49	341	79	117	115	348
11	98	116	113	113	105	104	111	101	109	123	145	147	156	147	171	271	274	279	296	296	76	108	92	95	275
12	111	114	111	109	115	105	101	104	108	125	136	152	55	69	73	75	66	42	26	25	19	42	110	99	109
13	104	104	108	113	122	122	124	120	132	147	146	111	89	85	279	271	282	290	302	305	304	149	103	92	308
14	91	90	91	103	113	93	99	93	104	111	32	141	277	261	288	303	287	295	304	296	293	136	112	98	56
15	83	81	117	114	110	132	123	128	98	83	100	71	68	63	64	70	83	298	302	302	304	322	120	119	236
16	112	133	128	134	130	121	122	108	111	121	123	141	48	45	44	45	49	43	15	27	81	65	71	115	287
17	96	115	92	100	123	111	117	119	132	143	145	138	86	95	328	287	289	295	296	298	118	94	98	100	127
18	99	98	95	74	91	92	67	119	106	115	72	115	57	23	57	258	266	298	303	305	243	130	82	74	37
19	101	92	97	77	92	82	81	95	85	89	108	154	111	283	270	296	298	309	302	300	320	82	100	91	208
20	101	87	111	94	92	95	89	94	91	93	110	252	278	269	269	268	287	296	296	300	299	302	105	81	134
21	83	83	86	85	97	77	93	98	114	109	148	273	286	285	282	276	290	287	293	309	239	150	118	109	343
22	98	102	104	111	136	130	109	93	225	285	282	292	296	288	285	282	285	281	277	296	308	303	312	316	66
23	298	290	84	109	68	94	6	313	61	43	33	67	74	74	25	290	258	297	12	14	22	23	33	35	162
24	53	76	109	84	62	64	73	75	76	71	76	73	70	70	66	61	30	22	34	45	51	64	47	56	253
25	71	95	139	154	152	147	152	145	141	88	74	63	67	47	25	41	29	39	36	47	48	54	65	64	312
26	63	77	85	74	74	78	80	88	121	87	61	49	64	37	55	37	45	23	24	29	26	39	65	88	122
27	91	97	100	113	103	111	120	111	121	144	141	87	133	86	297	304	285	287	298	302	253	135	117	99	349
28	93	88	99	101	102	97	104	111	108	112	156	147	275	303	282	300	289	285	290	306	259	135	118	104	101
29	96	94	94	107	119	104	114	106	113	147	273	163	245	285	292	282	282	282	291	310	285	162	114	100	180

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	15	10	9	12	11	10	12	10	10	12	15	14	12	12	10	10	11	18	14	8	9	13	16	9	12
2	14	14	19	31	39	5	7	13	10	14	19	20	17	16	12	15	11	11	14	25	37	12	11	8	16
3	6	12	15	21	7	14	7	8	10	13	16	27	21	29	21	50	15	13	6	6	32	31	29	40	19
4	22	24	15	24	21	24	10	12	13	9	19	15	12	16	20	15	12	21	17	18	14	11	15	19	17
5	17	11	20	7	24	13	7	16	13	38	20	32	17	21	20	24	20	15	12	12	14	9	12	11	17
6	15	10	9	8	8	9	8	7	9	9	12	12	14	15	14	12	12	11	11	9	10	11	7	7	10
7	9	13	21	15	10	6	4	6	8	6	18	17	8	11	11	14	16	9	16	17	15	15	10	14	12
8	11	14	13	11	24	17	15	23	17	9	8	15	19	15	16	16	10	20	11	15	29	22	13	13	16
9	14	10	10	9	18	16	8	12	22	16	17	19	14	12	11	14	16	13	10	12	22	11	8	14	14
10	10	16	7	6	4	6	10	8	6	7	21	15	16	15	18	18	12	11	50	17	43	9	13	12	15
11	11	7	7	8	8	8	8	8	9	11	15	18	21	33	42	20	18	5	5	6	27	8	6	6	13
12	8	9	8	7	9	8	7	7	7	8	13	19	52	12	13	11	11	12	11	12	27	18	12	7	13
13	5	7	6	7	7	7	5	7	5	7	9	15	20	33	57	16	10	9	9	6	28	11	8	10	13
14	7	9	8	10	9	7	10	9	10	16	47	43	24	23	17	13	10	9	6	7	16	8	9	9	14
15	21	21	12	9	9	11	8	21	23	12	27	12	14	20	22	29	16	38	6	5	7	41	33	8	18
16	11	6	9	10	19	9	6	9	8	14	20	19	21	25	32	40	29	11	7	11	31	14	10	12	16
17	8	10	6	7	7	7	5	6	7	11	16	27	24	28	43	20	18	10	8	13	38	9	7	7	14
18	7	7	10	27	7	11	28	9	16	36	39	51	67	33	36	23	14	7	6	12	24	20	19	40	23
19	24	16	10	18	37	26	40	18	16	29	27	37	27	12	18	11	16	9	8	7	34	15	26	9	20
20	9	6	11	7	10	9	7	6	6	11	35	40	21	18	19	16	16	9	5	5	5	30	10	8	13
21	7	9	6	7	10	14	11	7	15	33	30	22	14	16	19	14	13	8	10	11	38	9	8	8	14
22	8	11	9	9	15	14	8	47	51	32	15	14	15	12	13	11	10	9	6	7	8	9	10	9	15
23	49	13	49	13	17	30	34	25	51	21	21	22	36	53	53	35	22	28	18	14	17	19	27	31	29
24	20	17	16	9	13	7	8	8	9	10	11	12	11	11	10	16	21	15	10	13	13	8	12	13	12
25	7	19	11	4	4	7	9	5	12	18	15	18	17	24	21	22	21	12	11	10	10	12	11	8	13
26	6	10	9	7	9	10	10	15	22	14	15	19	20	20	22	19	16	15	8	9	23	26	29	9	15
27	6	8	8	6	6	6	7	9	7	11	14	14	35	51	32	20	11	9	7	7	21	20	9	6	14
28	7	6	9	8	7	6	8	9	17	22	34	55	47	19	25	18	15	8	5	6	20	7	6	9	16
29	10	8	9	7	8	7	8	8	12	41	33	57	38	23	22	19	15	10	8	5	30	14	7	8	17
HRAVE	13	11	12	11	13	11	11	12	15	17	21	24	23	22	23	19	15	13	11	10	22	15	13	13	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	12	16	19	17	17	10	12	16	14	15	13	13	13	14	18	16	14	23	20	13	14	15	29	12	13
MAX	18	39	50	24	38	15	21	29	22	50	42	52	57	47	41	40	43	67	40	40	38	51	53	21	24
MIN	8	5	6	9	7	7	4	8	8	4	5	7	5	6	5	6	5	6	7	5	6	6	13	7	4

DAY	26	27	28	29	30	31
AVE	15	14	16	17	***	***
MAX	29	51	55	57	***	***
MIN	6	6	5	5	***	***

MONTHLY AVERAGE = 15.4 MONTHLY MAXIMUM = 66.7 MONTHLY MINIMUM = 3.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	14.3	8.6	8.7	8.2	7.9	7.7	7.6	7.0	6.7	6.9	7.2	7.4	7.3	6.5	6.6	6.3	6.2	6.2	6.2	6.6	5.7	6.2	6.6	5.8	7.3
2	5.1	4.5	3.9	3.3	3.1	2.3	1.1	1.4	1.9	3.2	4.8	6.2	7.0	7.1	7.3	7.8	7.6	6.7	5.9	5.1	4.2	2.8	2.5	1.7	4.4
3	0.6	-0.3	-0.8	-1.4	-2.1	-2.3	-2.2	-2.7	-0.9	2.9	5.7	8.4	8.9	9.9	10.1	10.8	11.1	10.5	9.2	7.7	7.1	6.1	6.9	6.5	4.6
4	6.3	5.1	3.2	3.7	3.6	3.3	3.4	3.3	4.6	6.7	8.4	9.4	10.1	11.7	12.9	13.1	13.1	12.7	12.1	11.4	11.0	9.8	9.5	7.9	8.2
5	8.1	5.9	6.0	4.2	6.3	5.0	4.6	3.8	4.6	8.3	12.8	14.1	15.2	16.2	16.9	17.1	17.0	16.8	15.8	15.1	14.0	12.9	12.6	12.0	11.1
6	10.7	10.4	10.0	9.6	9.2	8.5	8.0	7.8	9.0	11.3	12.8	14.0	15.5	16.8	18.2	18.5	18.5	18.2	17.5	16.5	15.8	14.9	13.8	13.1	13.3
7	12.1	10.2	7.8	6.0	4.4	3.8	2.8	4.3	6.8	9.1	13.5	17.2	18.9	20.3	21.3	22.5	23.0	22.3	21.1	19.9	19.1	18.6	17.2	16.3	14.1
8	15.8	16.5	16.3	15.9	13.9	8.9	8.4	8.3	13.3	16.2	17.4	19.2	20.9	21.9	22.8	23.5	24.2	23.5	22.4	21.2	20.8	19.8	18.9	19.5	17.9
9	18.7	17.7	16.7	14.9	12.0	12.2	13.1	12.1	11.6	16.2	18.4	20.0	21.3	22.5	23.0	23.8	23.9	23.5	22.8	21.7	20.4	19.3	18.4	16.3	18.4
10	13.9	12.1	11.7	10.5	10.1	8.5	7.9	7.5	9.4	13.1	17.9	21.3	23.1	24.5	25.0	25.4	25.2	24.5	23.5	21.0	20.5	18.4	16.3	14.8	16.9
11	14.1	12.8	12.1	10.7	10.1	9.5	8.4	7.8	10.0	13.1	16.2	19.8	22.3	24.5	26.3	27.1	27.4	26.4	23.8	22.2	20.4	17.7	15.6	14.6	17.2
12	13.7	12.9	10.9	10.6	10.0	9.1	8.3	8.3	10.6	13.9	17.6	21.0	24.4	26.2	27.2	27.4	26.6	26.1	25.0	23.9	22.5	21.4	18.3	16.7	18.0
13	15.7	13.8	12.4	11.6	10.7	10.1	9.8	9.6	10.7	14.8	18.4	22.9	24.9	26.4	27.6	28.5	28.1	26.3	23.8	21.9	20.8	18.8	16.9	14.9	18.3
14	13.3	12.2	10.9	10.7	9.1	8.9	8.0	7.1	9.8	13.1	15.9	19.4	21.4	23.8	25.6	25.9	25.2	23.2	21.5	20.4	18.8	17.3	16.3	14.4	16.3
15	13.0	12.2	10.8	10.8	10.6	8.1	8.4	8.9	15.0	20.1	22.0	23.3	24.4	25.4	26.3	26.7	26.6	26.3	23.5	21.9	20.9	20.5	17.6	16.6	18.3
16	15.3	14.5	13.1	11.6	11.7	10.7	10.1	10.4	12.2	15.6	19.6	23.0	25.4	26.3	27.2	27.8	27.9	26.9	25.8	25.1	23.2	21.5	19.7	18.0	19.3
17	17.0	15.3	14.3	13.9	12.6	11.6	11.6	11.7	12.9	17.1	20.5	23.8	26.5	28.7	29.4	30.3	30.1	29.1	26.2	25.1	22.6	21.3	19.7	19.3	20.4
18	18.2	15.8	15.2	12.6	12.1	12.4	10.3	10.4	13.5	15.7	19.0	23.3	25.9	25.9	27.2	28.3	27.5	25.3	23.7	22.9	22.1	21.7	19.0	17.1	19.4
19	15.9	14.9	14.0	13.2	12.7	13.1	13.0	13.5	14.0	15.8	18.9	22.4	24.4	24.7	25.4	25.8	26.4	25.9	24.1	22.9	21.8	19.4	17.9	16.2	19.0
20	15.1	13.9	12.8	12.2	11.5	10.3	10.1	9.7	11.5	13.8	17.5	20.5	22.9	25.8	27.2	27.7	27.6	26.3	24.1	22.6	21.4	20.5	18.4	16.7	18.3
21	15.4	14.1	13.4	12.0	11.6	10.1	9.4	9.5	12.3	14.7	18.1	20.6	23.9	25.6	26.7	27.1	26.6	25.4	23.1	22.1	20.1	19.4	17.4	16.4	18.1
22	14.8	13.3	12.8	11.6	9.6	8.6	7.7	8.9	8.8	11.3	15.0	18.9	21.7	22.5	22.7	23.1	22.9	22.6	21.1	20.1	19.4	18.9	17.8	16.7	16.3
23	16.1	15.3	13.9	12.5	10.9	9.8	8.9	9.7	12.2	15.2	16.2	17.6	18.1	18.7	18.9	19.2	19.7	19.0	18.1	17.7	17.0	16.6	16.1	15.5	15.5
24	14.9	13.8	12.7	12.3	11.6	11.0	10.6	10.9	12.3	13.3	15.5	16.7	18.0	19.1	19.9	20.6	20.5	19.9	19.2	18.5	17.7	16.6	16.3	15.5	15.7
25	14.0	11.8	9.1	8.1	6.9	7.1	6.1	6.2	9.3	14.8	17.7	19.8	21.7	23.0	24.1	24.8	25.1	24.5	23.7	22.9	22.2	21.1	19.2	17.8	16.7
26	16.7	15.5	14.7	15.0	14.6	13.5	12.8	11.6	11.7	17.4	20.4	22.0	24.1	25.5	26.5	27.0	26.9	26.2	25.2	24.3	23.0	21.9	19.4	17.6	19.7
27	16.1	15.1	13.4	12.8	10.9	11.0	10.5	10.7	13.1	16.5	20.0	23.5	25.8	27.0	27.9	28.2	28.2	26.8	24.4	23.3	21.1	19.7	17.9	16.5	19.2
28	14.9	13.8	12.6	11.8	10.1	9.3	9.0	9.6	10.9	15.0	18.2	21.4	23.8	26.0	27.1	27.4	27.1	26.0	23.8	22.5	21.5	19.3	18.4	17.3	18.2
29	16.1	14.8	13.6	13.2	12.6	11.3	10.6	11.1	13.4	15.5	17.9	22.0	24.1	26.5	27.5	28.1	27.6	26.6	24.7	23.3	22.2	20.5	19.3	17.4	19.2
HRAVE	13.7	12.3	11.2	10.4	9.6	8.7	8.2	8.2	10.0	13.1	16.0	18.6	20.4	21.7	22.6	23.1	23.0	22.2	20.7	19.6	18.5	17.3	16.0	14.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.3	4.4	4.6	8.2	11.1	13.3	14.1	17.9	18.4	16.9	17.2	18.0	18.3	16.3	18.3	19.3	20.4	19.4	19.0	18.3	18.1	16.3	15.5	15.7	16.7
MAX	14.3	7.8	11.1	13.1	17.1	18.5	23.0	24.2	23.9	25.4	27.4	27.4	28.5	25.9	26.7	27.9	30.3	28.3	26.4	27.7	27.1	23.1	19.7	20.6	25.1
MIN	5.7	1.1	-2.7	3.2	3.8	7.8	2.8	8.3	11.6	7.5	7.8	8.3	9.6	7.1	8.1	10.1	11.6	10.3	12.7	9.7	9.4	7.7	8.9	10.6	6.1

DAY	26	27	28	29	30	31
AVE	19.7	19.2	18.2	19.2	***	***
MAX	27.0	28.2	27.4	28.1	***	***
MIN	11.6	10.5	9.0	10.6	***	***

MONTHLY AVERAGE = 15.8 MONTHLY MAXIMUM = 30.3 MONTHLY MINIMUM = -2.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
FEBRUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.2	-0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.0	-0.2	-0.2	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.3	0.0
2	0.3	0.3	0.3	0.4	0.3	0.6	0.6	0.3	0.0	-0.4	-0.6	-0.9	-0.9	-0.9	-0.8	-0.8	-0.5	0.0	0.3	0.6	0.6	0.5	0.4	0.6	0.0
3	0.5	0.6	0.5	0.4	0.4	0.7	0.5	0.3	-0.9	-1.4	-1.2	-1.1	-0.9	-1.0	-0.8	-0.6	-0.6	0.0	0.4	0.5	0.4	0.8	0.6	0.3	-0.1
4	0.5	0.5	1.0	0.7	0.5	0.5	0.4	0.2	-0.2	-0.5	-0.6	-0.6	-0.5	-0.5	-0.4	-0.2	0.0	0.2	0.3	0.4	0.4	0.7	0.6	0.9	0.2
5	1.0	0.9	0.7	1.4	1.3	1.1	1.1	1.0	0.0	-0.7	-0.9	-0.9	-1.0	-0.7	-0.4	-0.2	0.1	0.3	0.5	0.3	0.3	0.5	0.3	0.2	0.3
6	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	-0.3	-0.5	-0.6	-0.6	-0.6	-0.4	-0.3	-0.2	0.0	0.2	0.2	0.3	0.3	0.2	0.5	0.6	0.0
7	0.7	0.8	1.9	2.5	1.4	1.5	1.8	0.5	-0.8	-1.4	-1.3	-1.0	-0.8	-0.7	-0.3	-0.2	0.1	0.5	0.6	0.4	0.3	0.4	0.7	0.6	0.4
8	0.6	0.3	0.3	0.4	0.5	1.1	1.6	0.9	-0.1	-0.4	-0.5	-0.7	-0.6	-0.5	-0.2	-0.1	0.1	0.5	0.7	0.8	0.4	0.5	0.5	0.2	0.3
9	0.4	0.5	0.4	0.6	1.2	1.4	0.9	0.9	0.8	-0.5	-0.7	-0.6	-0.6	-0.4	-0.2	-0.1	0.1	0.3	0.3	0.3	0.6	0.7	0.7	1.0	0.3
10	2.0	2.2	1.2	0.6	0.6	1.2	1.9	1.0	-0.4	-1.2	-1.3	-0.9	-0.8	-0.9	-0.4	-0.2	0.1	0.5	0.7	0.8	0.4	0.9	0.8	0.8	0.4
11	0.7	0.5	0.4	0.5	0.5	0.4	0.4	0.1	-1.1	-1.5	-1.5	-1.6	-1.1	-1.0	-0.7	-0.7	-0.4	0.2	0.8	0.6	0.7	0.8	0.9	0.9	-0.1
12	0.6	0.4	0.8	0.5	0.5	0.6	0.6	0.1	-1.0	-1.6	-1.5	-1.3	-1.0	-0.8	-0.6	-0.3	0.1	0.3	0.7	0.7	0.5	0.5	0.7	0.8	0.0
13	0.7	0.8	0.9	0.9	0.9	0.8	0.6	0.1	-0.2	-1.3	-1.6	-1.7	-1.4	-1.0	-0.7	-0.8	-0.4	0.1	0.5	0.6	0.8	0.5	0.7	0.8	0.0
14	0.8	0.7	0.7	0.8	0.6	0.8	0.6	0.3	-1.0	-1.2	-0.7	-1.1	-0.8	-0.8	-0.8	-0.6	-0.5	0.1	0.4	0.6	0.8	0.6	0.6	0.6	0.1
15	0.6	0.5	0.8	0.5	0.7	1.2	0.7	0.6	0.3	-0.6	-1.0	-0.9	-0.8	-0.7	-0.6	-0.4	0.1	0.1	0.4	0.5	0.6	0.6	0.6	0.7	0.2
16	0.9	0.6	0.6	0.4	0.4	0.8	0.5	-0.1	-1.0	-1.3	-1.5	-1.3	-0.9	-0.7	-0.6	-0.4	0.0	0.4	0.7	0.7	0.5	0.9	0.9	0.6	0.0
17	0.6	0.7	0.8	0.9	0.9	1.0	1.1	0.7	-0.3	-1.3	-1.2	-1.1	-1.3	-1.3	-0.8	-0.8	-0.5	0.0	0.6	0.8	0.7	1.0	1.0	0.8	0.1
18	0.9	0.8	0.9	0.5	0.8	0.8	0.4	0.1	-0.9	-1.0	-1.0	-1.1	-0.9	-0.4	-0.6	-0.7	-0.2	0.1	0.4	0.4	0.6	0.4	0.7	0.8	0.1
19	0.6	0.7	0.8	0.5	0.3	0.4	0.4	0.4	0.0	-0.7	-0.8	-0.8	-0.9	-0.8	-0.6	-0.6	-0.5	0.0	0.6	0.6	0.6	0.9	0.6	0.8	0.1
20	0.7	0.7	0.5	0.7	0.5	0.5	0.7	0.4	-0.4	-1.1	-0.9	-0.8	-0.9	-0.9	-0.9	-0.8	-0.5	0.0	0.4	0.4	0.6	0.9	0.6	0.7	0.0
21	0.8	0.5	0.8	0.6	0.8	0.7	0.6	0.0	-0.9	-0.6	-0.7	-0.8	-0.9	-0.9	-0.9	-0.9	-0.5	-0.1	0.4	0.5	0.6	0.5	0.5	0.5	0.0
22	0.6	0.6	0.5	0.6	0.4	0.5	0.7	0.3	-0.3	-0.5	-0.7	-0.9	-0.9	-0.9	-0.8	-0.8	-0.5	-0.1	0.4	0.5	0.4	0.3	0.3	0.3	0.0
23	0.5	0.6	0.7	0.7	0.6	0.7	0.7	0.6	-0.1	-0.6	-0.9	-1.3	-1.2	-1.1	-0.8	-0.7	-0.6	-0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.0
24	0.3	0.3	0.4	0.3	0.2	0.2	0.2	-0.1	-0.6	-0.8	-1.1	-1.0	-1.0	-0.9	-0.6	-0.4	-0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	-0.1
25	0.4	0.7	1.6	1.1	0.9	0.9	1.7	0.6	-0.5	-0.8	-1.2	-1.1	-1.1	-0.9	-0.6	-0.4	-0.1	0.1	0.2	0.2	0.2	0.3	0.7	0.7	0.2
26	0.8	0.5	0.6	0.5	0.4	0.5	0.6	0.8	0.3	-0.9	-0.9	-0.8	-1.0	-0.8	-0.7	-0.4	0.0	0.3	0.6	0.6	0.5	0.6	0.6	0.5	0.1
27	0.9	1.1	0.7	0.5	1.0	0.9	0.6	-0.2	-1.1	-1.4	-1.5	-1.7	-1.3	-0.9	-0.8	-0.9	-0.6	-0.2	0.5	0.7	0.7	0.6	0.6	0.8	0.0
28	0.7	0.7	0.7	0.7	0.8	0.7	0.6	-0.3	-0.5	-1.0	-0.9	-0.7	-0.9	-1.0	-1.0	-0.9	-0.6	-0.2	0.4	0.6	0.9	0.8	0.6	0.6	0.0
29	0.6	0.8	0.6	0.6	0.4	0.6	0.5	-0.2	-1.0	-0.7	-0.6	-0.9	-0.8	-1.0	-1.1	-1.1	-0.6	-0.2	0.3	0.7	0.7	0.7	0.7	0.6	0.0
HRAVE	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.3	-0.4	-0.9	-1.0	-1.0	-0.9	-0.8	-0.6	-0.5	-0.2	0.1	0.4	0.5	0.5	0.6	0.6	0.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.0	0.0	-0.1	0.2	0.3	0.0	0.4	0.3	0.3	0.4	-0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	0.2
MAX	0.3	0.6	0.8	1.0	1.4	0.6	2.5	1.6	1.4	2.2	0.9	0.8	0.9	0.8	1.2	0.9	1.1	0.9	0.9	0.9	0.8	0.7	0.7	0.4	1.7
MIN	-0.3	-0.9	-1.4	-0.6	-1.0	-0.6	-1.4	-0.7	-0.7	-1.3	-1.6	-1.6	-1.7	-1.2	-1.0	-1.5	-1.3	-1.1	-0.9	-1.1	-0.9	-0.9	-1.3	-1.1	-1.2

DAY	26	27	28	29	30	31
AVE	0.1	0.0	0.0	0.0	***	***
MAX	0.8	1.1	0.9	0.8	***	***
MIN	-1.0	-1.7	-1.0	-1.1	***	***

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 2.5 MONTHLY MINIMUM = -1.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	692	693	694	695	695	695	695	696	696	697	697	698	698	698	698	699	699	700	700	700	700	700	701	701	697
2	701	701	701	701	701	701	702	703	703	704	704	704	703	703	703	703	703	704	704	704	705	705	706	706	703
3	706	706	706	706	706	707	707	708	709	709	709	709	709	708	708	708	708	708	708	709	709	709	709	710	708
4	710	710	710	710	709	710	710	710	710	710	710	710	709	708	707	707	706	706	706	707	707	707	708	708	708
5	708	707	708	708	708	708	708	709	710	710	710	710	709	708	708	708	708	708	708	708	709	710	710	710	709
6	711	711	711	710	710	710	710	711	711	711	711	710	709	708	707	706	706	706	706	707	707	707	707	707	709
7	707	707	707	707	707	707	707	707	707	708	708	708	706	705	705	705	705	705	705	706	706	706	707	707	706
8	707	707	706	707	707	707	708	708	708	708	708	708	707	706	705	705	705	705	705	706	706	707	707	707	707
9	707	707	707	707	707	707	708	708	708	708	708	708	707	706	705	705	705	705	705	705	706	706	707	707	707
10	707	707	707	707	707	708	708	708	709	709	709	708	707	706	706	705	705	705	705	705	706	706	706	706	707
11	706	706	706	706	706	707	707	707	708	708	707	707	706	705	705	704	704	705	705	705	705	706	706	706	706
12	706	706	706	706	706	707	707	707	708	708	707	707	706	705	704	704	703	703	704	704	704	704	705	705	705
13	705	705	705	705	705	705	705	705	705	705	705	704	704	703	702	701	701	701	702	702	702	702	703	703	703
14	703	703	702	702	702	703	703	703	703	703	704	703	702	701	700	700	700	700	701	701	702	702	702	702	702
15	702	703	703	703	703	703	703	703	703	703	703	702	702	701	700	700	699	700	700	700	701	701	702	702	702
16	702	702	702	702	702	702	702	702	703	703	703	702	701	700	700	699	699	699	699	700	700	700	700	701	701
17	701	701	701	701	701	701	702	702	703	703	702	702	701	700	699	698	698	698	698	698	699	699	700	700	700
18	700	700	700	700	700	701	701	702	702	703	703	702	702	701	700	700	700	700	701	701	702	702	702	702	701
19	702	703	703	702	703	703	703	704	704	704	704	704	703	703	702	702	702	702	702	703	703	703	704	704	703
20	704	703	704	703	703	703	704	704	704	705	705	704	703	702	701	701	701	701	701	702	702	702	703	703	703
21	702	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	700	700	701	701	701	702	702	701	702
22	701	701	701	700	700	700	700	700	700	700	700	700	699	698	698	697	697	697	697	698	698	698	699	699	699
23	700	700	700	701	701	701	702	702	703	703	703	703	703	702	702	702	702	702	703	703	704	705	705	705	702
24	705	705	706	706	706	706	707	707	707	707	707	706	705	704	704	704	703	703	703	704	704	704	704	704	705
25	704	704	704	704	704	704	705	705	706	706	706	705	705	704	703	703	703	703	703	703	703	704	704	705	704
26	705	705	705	705	705	705	706	706	707	707	706	706	705	704	703	703	703	703	703	703	703	704	704	704	704
27	704	704	704	704	704	704	704	704	704	704	704	703	702	701	701	700	700	700	700	701	701	701	702	702	702
28	702	702	702	702	702	702	703	703	704	704	704	703	703	702	701	701	701	701	702	702	702	703	703	703	702
29	703	703	703	703	703	703	703	704	704	705	704	704	703	702	702	701	701	701	702	702	703	703	704	704	703
HRAVE	704	704	704	704	704	704	704	705	705	705	705	705	704	703	703	702	702	702	703	703	703	704	704	704	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	697	703	708	708	709	709	706	707	707	707	706	705	703	702	702	701	700	701	703	703	702	699	702	705	704
MAX	701	706	710	710	710	711	708	708	708	709	708	708	705	704	703	703	703	703	704	705	703	701	705	707	706
MIN	692	701	706	706	707	706	705	705	705	705	704	703	701	700	699	699	698	700	702	701	700	697	700	703	703

DAY	26	27	28	29	30	31
AVE	704	702	702	703	***	***
MAX	707	704	704	705	***	***
MIN	703	700	701	701	***	***

MONTHLY AVERAGE = 703.8 MONTHLY MAXIMUM = 711.1 MONTHLY MINIMUM = 692.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
FEBRUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	64	87	74	69	61	58	55	56	57	56	53	49	51	59	58	62	64	64	64	59	68	64	56	59	61
2	62	63	64	66	68	69	76	75	68	61	50	39	34	33	34	32	31	33	37	40	43	48	52	57	52
3	63	67	70	73	76	74	76	79	69	49	40	27	23	21	21	20	22	24	31	37	40	41	32	30	46
4	29	31	39	36	35	34	34	34	32	25	24	23	22	19	17	17	18	19	22	25	25	26	27	31	27
5	31	33	33	39	36	39	41	44	42	34	24	21	19	15	15	15	15	16	18	18	19	23	23	24	27
6	25	26	26	27	27	29	30	30	27	22	19	20	17	15	14	14	13	13	13	13	15	16	17	20	20
7	24	28	33	37	41	42	45	40	34	30	23	15	15	13	10	10	12	14	18	19	19	20	22	24	25
8	24	23	24	24	28	38	40	40	29	22	20	19	18	17	16	14	13	15	18	20	20	20	20	20	23
9	21	23	25	28	34	35	32	33	36	25	22	20	18	16	16	15	15	15	16	19	19	21	22	26	23
10	32	36	36	39	40	44	46	46	41	33	24	19	17	15	15	13	12	12	14	18	20	24	29	32	27
11	35	38	39	43	45	46	49	53	43	32	28	22	18	13	11	8	7	11	17	21	26	29	33	36	29
12	35	36	42	44	43	48	49	49	41	30	23	19	15	11	10	9	11	14	14	16	18	19	24	28	27
13	30	34	38	38	40	41	40	42	37	28	22	16	13	10	8	7	6	12	16	21	23	26	30	34	26
14	38	40	44	43	47	48	53	57	45	32	27	21	20	15	14	14	14	17	21	24	27	30	33	38	32
15	41	46	48	45	46	51	51	47	32	20	17	15	14	13	11	9	10	13	20	22	24	27	31	34	29
16	37	37	40	42	44	46	47	47	40	32	25	20	16	14	12	12	11	14	16	16	19	22	25	28	27
17	31	35	36	37	40	44	43	41	38	29	22	18	14	11	10	10	10	12	16	18	24	26	27	26	26
18	26	34	35	42	44	40	49	47	39	31	24	18	14	15	13	11	10	14	16	18	19	20	26	30	27
19	33	34	36	38	39	39	39	38	37	34	26	19	16	18	18	17	14	15	18	18	21	25	30	32	27
20	34	36	38	41	43	47	48	49	43	35	27	22	21	16	13	13	13	15	18	20	22	25	30	33	29
21	36	39	42	46	48	53	55	55	42	35	27	25	22	19	15	13	13	14	18	22	25	26	31	31	31
22	35	39	38	42	45	50	55	49	45	39	32	25	20	17	17	16	17	17	20	20	21	20	20	22	30
23	22	23	26	29	34	39	40	38	30	22	20	17	15	14	14	13	11	13	13	15	18	19	19	20	22
24	22	23	26	28	33	34	35	35	32	30	24	22	20	18	17	16	17	19	20	21	22	23	27	27	25
25	27	31	36	38	42	42	45	45	37	26	21	19	16	15	14	13	13	14	16	17	17	17	19	21	25
26	23	25	26	24	24	27	28	30	30	21	16	15	13	12	11	11	11	12	12	13	15	16	20	23	19
27	26	28	31	33	36	37	37	37	30	24	19	14	12	10	9	9	7	9	13	14	17	20	24	25	22
28	28	30	33	35	39	42	42	40	35	26	19	16	13	11	10	9	10	11	14	16	18	21	23	25	24
29	28	31	33	34	34	39	41	39	31	25	23	17	14	12	12	10	11	13	15	19	20	23	26	29	24
HRAVE	33	36	38	40	42	44	46	45	39	31	26	21	19	17	16	15	15	17	19	21	24	25	28	30	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	61	52	46	27	27	20	25	23	23	27	29	27	26	32	29	27	26	27	27	29	31	30	22	25	25
MAX	87	76	79	39	44	30	45	40	36	46	53	49	42	57	51	47	44	49	39	49	55	55	40	35	45
MIN	49	31	20	17	15	13	10	13	15	12	7	9	6	14	9	11	10	10	14	13	13	16	11	16	13

DAY	26	27	28	29	30	31
AVE	19	22	24	24	***	***
MAX	30	37	42	41	***	***
MIN	11	7	9	10	***	***

MONTHLY AVERAGE = 28.6 MONTHLY MAXIMUM = 87.3 MONTHLY MINIMUM = 6.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
FEBRUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.18	0.19	0.26	0.19	0.12	0.07	0.07	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.22
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.40	0.55	0.66	0.70	0.68	0.59	0.45	0.26	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.54
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.40	0.56	0.67	0.71	0.69	0.60	0.46	0.27	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.63
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.40	0.58	0.57	0.51	0.65	0.51	0.46	0.28	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.25
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.41	0.56	0.68	0.71	0.70	0.62	0.47	0.28	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.72
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.41	0.57	0.69	0.73	0.71	0.62	0.48	0.29	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.81
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.41	0.55	0.60	0.69	0.73	0.61	0.46	0.29	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.65
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.42	0.58	0.69	0.74	0.72	0.63	0.48	0.30	0.06	0.00	0.00	0.00	0.00	0.00	0.00	4.89
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.41	0.58	0.69	0.74	0.72	0.63	0.49	0.29	0.06	0.00	0.00	0.00	0.00	0.00	0.00	4.87
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.42	0.58	0.70	0.75	0.73	0.64	0.49	0.31	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.94
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.43	0.60	0.71	0.76	0.74	0.65	0.50	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.06
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.44	0.60	0.72	0.76	0.74	0.65	0.50	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.08
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.43	0.60	0.71	0.76	0.74	0.65	0.50	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.06
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.43	0.60	0.72	0.75	0.75	0.65	0.51	0.31	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.06
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.44	0.61	0.72	0.77	0.75	0.66	0.51	0.32	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.17
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.45	0.62	0.73	0.78	0.76	0.67	0.51	0.32	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.24
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.45	0.62	0.73	0.78	0.75	0.67	0.51	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	5.24
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.45	0.62	0.69	0.58	0.21	0.43	0.42	0.16	0.06	0.00	0.00	0.00	0.00	0.00	0.00	3.94
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.28	0.52	0.58	0.67	0.38	0.36	0.27	0.27	0.10	0.00	0.00	0.00	0.00	0.00	0.00	3.55
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.17	0.40	0.62	0.74	0.78	0.76	0.67	0.48	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.06
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.47	0.63	0.74	0.79	0.77	0.68	0.53	0.34	0.11	0.00	0.00	0.00	0.00	0.00	0.00	5.40
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.47	0.63	0.75	0.80	0.77	0.68	0.53	0.33	0.10	0.00	0.00	0.00	0.00	0.00	0.00	5.41
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.49	0.65	0.76	0.81	0.74	0.54	0.47	0.34	0.12	0.00	0.00	0.00	0.00	0.00	0.00	5.29
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.48	0.65	0.76	0.81	0.79	0.70	0.55	0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00	5.56
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.48	0.65	0.76	0.81	0.79	0.70	0.55	0.35	0.13	0.00	0.00	0.00	0.00	0.00	0.00	5.58
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.49	0.65	0.77	0.82	0.79	0.70	0.55	0.35	0.13	0.00	0.00	0.00	0.00	0.00	0.00	5.62
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.47	0.60	0.75	0.82	0.79	0.70	0.55	0.36	0.13	0.00	0.00	0.00	0.00	0.00	0.00	5.54
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.50	0.66	0.78	0.83	0.80	0.71	0.55	0.34	0.12	0.00	0.00	0.00	0.00	0.00	0.00	5.68
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.47	0.64	0.75	0.76	0.78	0.71	0.55	0.36	0.13	0.00	0.00	0.00	0.00	0.00	0.00	5.56
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.43	0.59	0.69	0.73	0.69	0.61	0.48	0.30	0.08	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	1.22	4.54	4.63	4.25	4.72	4.81	4.65	4.89	4.87	4.94	5.06	5.08	5.06	5.06	5.17	5.24	5.24	3.94	3.55	5.06	5.40	5.41	5.29	5.56	5.58
MAX	0.26	0.70	0.71	0.65	0.71	0.73	0.73	0.74	0.74	0.75	0.76	0.76	0.76	0.75	0.77	0.78	0.78	0.69	0.67	0.78	0.79	0.80	0.81	0.81	0.81
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.62	5.54	5.68	5.56	***	***
MAX	0.82	0.82	0.83	0.78	***	***
MIN	0.00	0.00	0.00	0.00	***	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
FEBRUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	***	***
MAX	0.00	0.00	0.00	0.00	***	***
MIN	0.00	0.00	0.00	0.00	***	***

MONTHLY TOTAL = 0.09 MONTHLY MAXIMUM = 0.07 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.8	4.0	3.1	2.9	3.2	3.5	4.3	3.7	4.2	3.4	2.3	2.9	2.3	2.9	3.9	3.6	4.3	5.2	6.7	4.9	3.1	2.2	2.2	3.2	3.6
2	3.2	3.6	3.3	4.1	4.9	5.9	5.8	5.7	5.8	4.9	4.2	4.4	7.2	6.6	6.3	7.0	6.1	6.8	7.9	7.4	8.6	8.4	7.3	7.2	5.9
3	6.2	5.8	7.8	7.9	8.2	8.0	7.9	8.1	9.2	7.5	5.5	5.8	9.3	8.7	8.9	***	7.9	9.7	***	7.7	8.6	7.7	7.1	6.9	7.8
4	7.3	7.5	7.5	5.7	4.9	5.1	5.5	6.1	5.5	5.1	4.7	4.7	5.0	4.0	3.3	2.6	1.7	2.0	1.8	2.0	2.3	2.8	4.1	4.6	4.4
5	4.7	3.0	3.1	4.0	3.9	3.3	3.3	2.9	3.4	3.7	3.2	3.2	3.1	2.9	2.7	3.5	3.2	2.4	2.0	2.6	5.5	5.3	4.3	4.7	3.5
6	4.9	4.8	5.4	4.9	6.8	7.5	8.1	9.3	10.4	9.9	9.6	8.9	9.4	9.1	9.1	***	8.6	***	***	8.2	9.1	8.8	***	***	8.0
7	***	9.6	9.7	9.1	8.0	8.0	8.5	8.3	8.5	***	8.1	6.3	7.0	8.8	7.3	6.3	6.2	7.3	7.1	6.7	6.0	7.3	6.1	5.2	7.5
8	4.6	4.3	5.1	5.1	5.6	6.5	4.8	5.4	5.7	4.6	3.5	2.8	3.2	3.0	2.9	2.6	2.2	1.5	2.9	1.6	1.5	2.2	3.0	3.7	3.7
9	4.4	4.3	4.7	4.4	3.9	3.6	3.9	4.3	4.4	3.8	3.7	3.1	2.2	2.3	1.8	2.2	1.8	1.5	1.9	1.6	1.8	2.3	4.0	4.2	3.2
10	3.7	3.1	2.9	3.3	3.5	3.5	3.8	3.5	3.8	3.7	3.3	3.3	2.8	2.1	2.5	2.2	2.2	***	***	2.4	3.4	4.0	5.0	4.0	3.3
11	2.7	3.5	3.7	2.7	1.5	1.9	2.3	4.1	3.1	2.1	2.5	2.6	4.9	6.2	3.7	3.3	2.7	3.0	4.4	4.7	3.7	4.4	***	4.1	3.4
12	3.4	***	***	3.4	4.7	4.8	4.4	4.7	3.7	3.9	4.0	4.2	2.7	3.6	5.9	6.4	***	4.1	2.5	1.1	1.8	2.3	1.8	***	3.7
13	1.6	1.6	1.8	1.8	1.9	2.3	2.5	2.9	1.8	1.6	1.6	1.7	2.1	2.9	3.8	5.2	5.7	4.7	2.7	1.5	1.6	2.7	4.0	3.7	2.7
14	3.3	4.0	4.7	4.4	4.5	4.0	5.0	5.1	4.4	4.4	7.7	***	3.3	3.2	3.8	3.3	3.3	4.1	3.8	1.5	1.8	3.0	2.7	2.8	3.8
15	3.4	3.3	3.2	3.4	2.9	3.0	3.4	2.9	2.8	2.3	2.8	1.8	2.5	4.5	5.6	6.4	5.8	4.8	4.5	***	2.3	1.8	2.4	2.4	3.4
16	2.7	2.9	3.3	3.2	2.6	3.2	3.3	2.2	2.8	3.6	3.0	1.8	1.5	3.2	3.6	3.5	3.3	***	6.4	5.2	3.7	1.1	1.6	3.1	3.1
17	3.9	3.8	3.8	3.4	3.5	3.4	2.8	2.7	2.9	3.2	2.4	2.2	2.5	2.9	2.9	2.7	2.9	3.0	2.5	1.5	1.4	2.9	3.7	3.9	3.0
18	4.0	4.3	4.7	4.8	5.0	5.3	6.1	5.9	5.8	5.4	5.7	6.2	8.0	6.6	6.4	7.4	7.5	8.9	***	***	10.2	9.4	9.0	9.8	6.7
19	9.9	9.6	8.7	9.4	9.1	10.1	9.5	8.1	8.4	7.9	6.4	5.5	6.7	6.1	6.5	5.5	6.8	6.2	4.3	5.2	5.5	4.5	2.6	1.8	6.8
20	1.2	2.6	3.5	3.4	2.8	3.0	4.0	5.9	5.3	3.4	2.9	3.9	4.3	4.3	3.6	***	4.2	***	4.2	4.1	2.7	1.9	1.6	2.1	3.4
21	2.8	3.4	2.6	2.5	2.5	2.7	3.1	3.6	4.0	3.8	3.2	3.1	3.3	2.5	3.3	3.1	2.9	3.6	2.4	3.2	2.9	3.2	2.8	2.2	3.0
22	2.3	2.6	2.9	3.9	3.5	3.5	2.8	1.6	1.9	2.7	2.3	2.0	2.3	2.8	3.1	2.8	3.1	2.0	1.3	1.3	2.6	2.2	2.4	2.6	2.5
23	2.1	2.2	2.2	1.9	2.1	1.0	2.1	2.3	1.2	1.6	3.3	4.5	5.7	4.3	6.8	7.5	6.1	3.9	1.5	1.2	1.8	0.9	0.6	1.9	2.9
24	1.7	2.5	3.9	4.1	3.1	2.6	3.4	3.5	3.2	2.1	2.1	2.7	5.9	5.5	6.0	4.4	3.9	3.9	2.8	1.4	2.2	2.5	3.3	3.8	3.4
25	2.7	1.5	2.2	2.5	2.2	2.0	2.0	2.4	4.0	6.6	3.7	4.0	7.9	8.5	7.7	6.8	***	***	6.3	4.9	5.2	5.4	5.9	4.1	4.5
26	4.5	***	4.2	3.3	2.3	1.8	1.3	2.1	3.4	3.8	4.3	7.0	6.8	5.9	6.9	4.5	4.8	4.5	4.7	5.7	4.8	4.7	4.1	3.5	4.3
27	4.8	3.1	4.6	6.0	5.0	6.7	5.8	3.3	3.3	4.8	5.5	3.2	3.3	3.8	3.6	3.4	4.1	***	3.4	4.1	2.8	2.0	3.4	3.7	4.1
28	4.1	4.2	3.7	3.8	3.7	3.5	4.0	4.0	4.1	4.4	4.2	4.3	3.5	3.6	3.8	3.1	3.1	3.2	1.7	1.9	1.6	2.6	4.0	4.6	3.5
29	3.5	3.4	3.6	3.4	3.4	2.8	1.8	1.9	2.1	2.1	2.5	2.4	3.5	3.9	5.8	6.4	6.8	***	5.2	4.7	2.7	1.3	2.6	3.0	3.4
30	3.2	3.2	2.7	2.7	2.9	2.9	3.4	3.8	3.5	3.3	3.1	3.4	2.8	3.4	3.6	3.6	3.4	4.3	4.9	4.8	4.7	3.5	3.6	3.4	3.5
31	3.3	3.7	4.3	4.3	4.2	4.2	5.3	5.2	4.3	4.5	4.9	6.2	5.8	5.8	5.9	5.2	4.8	5.8	5.3	3.3	3.1	3.3	5.7	5.4	4.7
HRAVE	3.8	4.0	4.2	4.2	4.1	4.2	4.3	4.4	4.4	4.1	4.1	3.9	4.5	4.7	4.9	4.4	4.5	4.4	3.9	3.7	3.8	3.8	3.8	4.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.6	5.9	7.8	4.4	3.5	8.0	7.5	3.7	3.2	3.3	3.4	3.7	2.7	3.8	3.4	3.1	3.0	6.7	6.8	3.4	3.0	2.5	2.9	3.4	4.5
MAX	6.7	8.6	9.7	7.5	5.5	10.4	9.7	6.5	4.7	5.0	6.2	6.4	5.7	7.7	6.4	6.4	3.9	10.2	10.1	5.9	4.0	3.9	7.5	6.0	8.5
MIN	2.2	3.2	5.5	1.7	2.0	4.8	5.2	1.5	1.5	2.1	1.5	1.1	1.5	1.5	1.8	1.1	1.4	4.0	1.8	1.2	2.2	1.3	0.6	1.4	1.5

DAY	26	27	28	29	30	31
AVE	4.3	4.1	3.5	3.4	3.5	4.7
MAX	7.0	6.7	4.6	6.8	4.9	6.2
MIN	1.3	2.0	1.6	1.3	2.7	3.1

MONTHLY AVERAGE = 4.2 MONTHLY MAXIMUM = 10.4 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 96.2% OPERATIONAL RECOVERY RATE = 96.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.5	3.8	2.5	2.8	3.0	2.8	3.2	2.7	3.4	2.6	2.3	3.0	2.7	3.7	3.7	3.6	4.1	5.0	8.1	7.2	6.7	2.6	1.3	2.6	3.6
2	2.1	2.6	3.0	4.0	4.4	5.3	5.4	6.0	6.5	3.8	5.4	5.1	7.6	8.4	8.9	7.8	7.0	7.5	8.9	8.1	8.8	8.9	8.3	8.6	6.4
3	8.4	6.9	8.5	8.8	9.5	9.4	8.9	8.4	8.4	10.3	7.1	7.1	7.3	9.7	10.2	***	10.3	10.3	***	6.8	8.1	7.4	10.2	7.9	8.6
4	7.6	9.0	8.7	5.5	4.1	4.7	6.6	7.7	6.6	6.0	5.1	5.5	5.7	5.3	3.7	4.2	1.7	2.1	1.9	2.0	3.7	3.4	4.1	5.4	5.0
5	4.3	2.3	2.6	3.8	3.3	3.0	3.8	4.1	3.9	4.3	4.1	3.1	2.8	4.0	2.8	3.7	4.4	3.7	1.6	3.4	7.1	6.8	4.2	4.6	3.8
6	5.4	4.7	5.5	5.0	6.4	8.1	10.4	10.0	11.2	9.1	11.6	9.5	9.1	9.7	7.5	***	9.1	***	***	7.1	9.2	8.5	***	***	8.3
7	***	10.5	10.6	8.1	6.7	8.1	8.3	8.9	9.5	***	7.7	6.2	7.9	9.8	7.5	7.8	7.0	6.9	7.4	7.4	7.2	8.3	7.5	5.6	8.0
8	4.6	4.5	4.7	4.2	5.3	6.4	4.4	4.7	3.8	3.5	3.4	2.9	2.8	3.6	4.5	2.8	2.1	1.5	3.3	2.4	3.2	1.8	3.1	3.4	3.6
9	3.9	4.3	3.5	2.8	3.4	3.2	2.7	4.2	2.6	4.1	3.6	3.4	3.6	2.9	2.6	2.6	2.1	1.4	1.4	3.9	4.1	4.3	3.5	3.7	3.2
10	3.5	3.0	2.7	2.8	2.8	2.3	3.4	4.0	4.3	3.3	2.7	2.7	3.3	1.6	0.7	2.0	10.0	***	***	1.8	3.4	4.5	4.3	3.8	3.3
11	3.7	2.7	2.8	2.6	1.4	1.7	2.2	3.1	2.6	1.9	1.8	4.4	4.7	7.2	4.3	2.7	3.4	3.0	4.6	4.6	4.4	4.6	***	3.8	3.4
12	3.3	***	***	3.0	3.6	5.3	5.5	5.7	4.2	4.7	4.6	5.9	3.8	4.8	4.9	5.8	***	4.6	2.8	1.6	1.2	1.7	1.9	***	3.9
13	1.6	2.0	1.4	2.1	1.4	0.8	1.5	2.5	2.8	2.5	2.0	1.5	2.8	3.3	4.2	4.9	5.9	5.1	1.9	1.8	2.7	2.4	4.4	3.1	2.7
14	2.8	3.3	3.9	4.2	3.9	3.7	4.4	4.2	4.3	5.2	10.3	***	3.3	3.7	4.1	3.7	3.5	4.3	4.1	1.6	2.1	2.6	1.9	2.2	3.8
15	2.8	2.3	2.9	2.8	3.1	2.6	4.0	3.5	2.9	2.4	2.7	2.0	2.4	6.1	7.1	7.0	5.3	5.2	4.8	***	2.4	1.1	1.8	2.5	3.5
16	2.0	2.6	3.2	2.9	1.8	2.1	2.5	2.2	2.6	3.2	2.2	2.1	3.2	2.3	3.6	3.1	2.4	1.9	6.8	5.6	4.0	2.4	2.0	2.0	2.9
17	2.9	3.0	2.8	2.8	2.9	2.5	1.8	2.1	2.3	2.4	1.9	1.8	1.3	2.3	2.3	3.0	2.3	3.1	2.9	1.5	2.0	3.2	3.8	4.6	2.6
18	4.6	4.7	6.2	6.9	4.9	5.3	6.6	5.7	7.5	8.6	7.9	7.1	10.0	8.1	7.4	8.1	8.3	9.2	***	***	11.9	10.7	10.7	10.2	7.7
19	12.1	9.6	10.8	8.2	12.0	10.4	10.4	10.2	10.1	10.7	8.6	6.7	9.4	7.9	7.0	6.1	7.7	7.6	4.9	5.4	4.4	4.0	2.3	1.8	7.8
20	2.4	3.2	4.4	3.5	2.9	3.8	4.6	6.3	5.5	4.6	4.2	4.7	4.9	4.9	4.2	***	3.7	***	4.5	4.3	3.5	1.6	1.1	2.1	3.9
21	2.8	2.8	1.9	2.3	2.0	2.6	2.5	3.0	3.4	3.0	3.8	4.6	3.2	3.8	3.1	2.6	2.3	4.7	2.1	2.8	2.9	3.2	2.9	2.3	2.9
22	2.1	2.2	2.2	3.0	4.1	4.5	3.3	2.7	1.8	2.6	2.4	1.9	2.8	3.8	2.5	2.2	3.2	2.6	2.4	2.3	2.5	2.3	2.9	2.7	2.7
23	2.5	2.7	2.0	2.7	2.3	3.0	3.3	3.7	2.8	3.0	4.2	5.3	6.2	6.1	5.9	7.2	7.3	4.9	2.8	2.8	5.5	1.7	3.1	1.2	3.8
24	2.2	3.2	4.4	4.0	3.8	3.9	4.8	3.6	3.7	3.5	2.2	4.0	5.9	7.0	5.4	4.6	2.7	3.8	2.6	4.3	2.2	3.2	3.2	4.2	3.9
25	2.3	2.0	2.3	2.5	3.0	3.0	2.2	3.0	4.4	7.3	3.7	3.8	9.6	10.0	7.7	5.3	***	***	6.6	4.1	5.1	5.9	7.1	3.7	4.8
26	6.0	4.6	3.1	2.8	2.0	1.3	2.2	2.0	4.4	3.3	4.8	7.0	5.5	5.3	7.9	4.9	4.7	3.3	3.4	5.1	3.8	4.6	3.6	3.4	4.1
27	4.3	3.1	4.2	6.3	5.2	7.5	6.4	2.9	3.6	5.4	5.9	1.8	2.6	4.4	4.1	4.4	3.4	***	3.8	5.0	2.7	2.2	3.6	3.8	4.2
28	5.1	3.9	3.6	3.5	4.2	4.2	4.5	4.4	5.2	5.1	4.8	4.4	5.6	4.3	3.9	3.3	2.8	3.9	2.3	3.1	2.2	3.0	4.2	4.4	4.0
29	2.9	3.0	3.7	3.5	3.2	2.8	2.0	1.2	2.8	2.8	2.0	2.7	4.3	4.1	5.0	6.0	5.7	***	5.4	4.6	2.6	1.2	1.7	2.7	3.3
30	3.0	2.5	2.4	2.6	2.9	2.1	3.2	4.3	3.1	3.3	2.6	3.5	3.0	3.7	5.0	4.1	2.9	4.3	6.0	5.2	4.3	4.6	4.3	3.5	3.6
31	4.3	4.3	4.6	4.8	5.5	6.0	5.2	4.6	4.9	5.5	5.8	6.5	6.7	7.1	5.8	4.9	5.3	6.1	6.1	3.7	3.3	3.6	6.0	5.4	5.2
HRAVE	4.0	4.0	4.2	4.0	4.0	4.3	4.5	4.6	4.7	4.6	4.6	4.3	5.0	5.4	5.1	4.6	4.8	4.6	4.2	4.1	4.4	4.1	4.1	4.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.6	6.4	8.6	5.0	3.8	8.3	8.0	3.6	3.2	3.3	3.4	3.9	2.7	3.8	3.5	2.9	2.6	7.7	7.8	3.9	2.9	2.7	3.8	3.9	4.8
MAX	8.1	8.9	10.3	9.0	7.1	11.6	10.6	6.4	4.3	10.0	7.2	5.9	5.9	10.3	7.1	6.8	4.6	11.9	12.1	6.3	4.7	4.5	7.3	7.0	10.0
MIN	1.3	2.1	6.8	1.7	1.6	4.7	5.6	1.5	1.4	0.7	1.4	1.2	0.8	1.6	1.1	1.8	1.3	4.6	1.8	1.1	1.9	1.8	1.2	2.2	2.0

DAY	26	27	28	29	30	31
AVE	4.1	4.2	4.0	3.3	3.6	5.2
MAX	7.9	7.5	5.6	6.0	6.0	7.1
MIN	1.3	1.8	2.2	1.2	2.1	3.3

MONTHLY AVERAGE = 4.4 MONTHLY MAXIMUM = 12.1 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 96.5% OPERATIONAL RECOVERY RATE = 96.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.4	4.4	2.3	2.4	3.4	2.8	3.5	4.3	3.4	2.9	2.2	4.3	3.0	4.6	4.4	4.1	***	***	8.3	9.2	9.8	1.5	1.4	3.7	4.1
2	2.6	2.7	3.2	***	5.4	5.3	5.1	6.3	8.7	3.6	5.6	5.3	***	***	***	***	6.6	***	10.4	***	***	***	9.3	10.3	6.0
3	10.8	7.5	8.5	9.7	10.7	***	8.8	***	7.6	7.1	9.2	6.5	***	***	***	***	12.2	***	***	***	***	***	8.5	10.1	9.0
4	7.8	10.3	9.9	7.2	4.6	4.3	7.6	7.7	6.4	5.9	5.8	***	***	8.7	4.7	4.8	***	***	***	4.1	4.6	3.5	6.5	6.8	6.4
5	***	***	2.5	5.9	3.1	4.8	5.7	6.0	4.0	5.7	4.0	3.0	3.6	3.8	3.3	***	***	4.2	***	4.7	7.6	9.6	5.4	4.0	4.8
6	5.8	5.9	5.9	5.3	7.3	***	10.6	9.6	9.2	6.1	***	9.6	***	***	***	***	***	***	***	***	***	***	***	***	7.5
7	***	***	***	***	8.1	***	9.7	10.0	***	***	***	***	***	***	***	***	***	6.8	***	8.0	10.0	9.5	7.9	5.8	8.4
8	4.6	4.5	4.9	4.7	4.4	6.5	4.6	4.7	3.8	3.7	6.3	3.1	3.5	3.4	4.8	5.5	3.7	***	***	***	2.5	3.6	3.6	4.1	4.3
9	3.7	4.7	3.8	3.4	3.6	2.5	3.4	4.3	2.0	4.3	4.2	3.1	3.8	6.1	2.2	2.7	***	***	***	3.8	4.0	6.2	3.5	3.7	3.8
10	5.3	3.4	3.1	3.0	2.7	2.3	3.8	4.0	4.0	4.5	2.9	2.3	3.3	2.0	1.8	2.7	11.4	***	***	***	3.7	6.5	***	5.3	3.9
11	4.8	3.0	2.5	2.5	1.7	1.7	2.5	3.1	2.5	2.4	1.3	3.8	4.1	***	***	2.6	3.6	3.2	***	***	3.8	4.1	***	***	2.9
12	***	***	***	***	4.1	5.3	6.6	6.7	4.4	5.1	5.2	5.6	4.3	4.9	***	***	***	***	2.6	2.6	1.5	1.6	***	***	4.3
13	2.5	3.8	1.4	2.3	1.4	1.7	3.8	2.5	2.3	2.2	2.0	1.5	3.3	3.0	4.4	***	***	***	2.7	2.1	3.6	2.2	4.8	5.7	2.8
14	2.8	3.6	4.0	4.1	3.7	3.9	5.1	5.2	6.6	6.1	9.6	***	***	3.4	3.6	3.8	3.9	3.6	3.8	2.9	2.1	3.9	1.8	2.7	4.1
15	2.5	1.9	3.2	2.6	3.2	3.0	3.5	2.9	2.1	2.9	4.0	1.9	2.3	6.8	7.5	***	5.5	***	***	***	***	1.1	2.5	2.7	3.3
16	2.5	3.2	3.1	2.2	1.9	2.8	2.5	2.7	3.0	3.9	3.0	2.4	4.0	2.2	4.2	3.5	2.0	***	6.7	***	***	2.9	***	***	3.1
17	2.9	3.4	3.3	3.0	2.8	2.7	1.5	2.1	2.3	2.5	1.8	1.8	1.2	2.2	2.6	3.9	3.2	***	***	***	1.7	3.1	4.4	5.1	2.7
18	5.7	4.7	5.5	6.2	5.0	5.5	6.8	6.6	8.4	8.9	8.4	3.6	***	***	***	***	***	***	***	***	***	***	***	***	6.3
19	15.0	8.4	10.7	***	14.6	11.1	***	10.5	9.9	10.9	8.8	7.9	8.8	***	7.6	6.1	7.5	7.5	8.8	5.0	6.0	5.2	3.8	2.9	8.4
20	2.9	2.5	4.5	***	2.8	3.6	3.9	5.9	5.4	4.3	3.6	4.3	4.5	5.0	***	***	***	***	***	***	3.1	1.6	0.9	3.2	3.6
21	4.4	3.8	1.7	2.3	1.5	2.6	2.5	3.3	3.2	2.8	3.4	5.9	4.4	4.6	3.1	***	***	***	2.4	2.8	3.8	***	1.6	1.9	3.1
22	2.1	2.1	2.0	3.4	3.9	3.8	3.3	2.6	1.8	2.0	1.6	1.7	2.6	3.7	2.9	1.4	3.3	2.4	2.8	2.4	2.7	3.0	2.7	2.8	2.6
23	2.2	2.8	2.8	3.4	2.9	3.4	3.4	5.0	2.8	2.8	4.8	5.2	6.7	7.0	7.2	***	***	4.0	3.0	3.5	5.0	1.6	2.9	***	3.9
24	2.3	3.6	5.3	4.7	3.6	4.4	4.9	3.8	4.2	3.9	2.7	4.2	5.6	7.6	5.6	4.8	3.6	***	1.7	4.5	4.2	3.3	3.0	4.4	4.2
25	2.6	1.6	1.7	3.3	3.2	3.3	2.9	3.3	4.6	***	3.8	***	***	***	***	***	***	***	***	***	***	***	***	***	3.0
26	***	***	***	***	***	1.0	2.2	1.5	***	4.0	6.2	7.5	***	***	7.8	***	***	4.5	***	***	***	***	***	***	4.3
27	***	***	***	***	4.0	7.7	***	3.1	4.7	6.1	5.9	2.0	1.8	5.0	4.4	4.8	3.1	***	***	***	***	2.7	4.0	4.0	4.2
28	5.1	5.2	4.0	3.7	4.9	6.2	4.6	3.9	5.6	4.8	4.9	6.3	5.7	4.8	5.1	2.8	2.9	***	***	3.9	2.4	3.7	5.6	4.2	4.6
29	3.1	4.6	3.6	3.5	3.4	2.7	2.2	1.2	3.6	3.2	2.0	2.5	4.3	3.8	***	6.6	6.0	***	***	***	2.4	1.2	2.0	***	3.3
30	2.8	2.4	2.6	2.3	2.7	1.8	3.3	4.5	3.7	4.0	2.4	2.8	2.3	3.7	5.0	***	***	***	6.9	***	4.4	6.8	5.0	4.1	3.7
31	4.8	4.0	3.9	4.5	5.2	6.0	4.8	5.1	4.0	5.6	7.3	7.4	***	***	5.2	5.4	***	6.1	6.0	3.9	3.1	4.1	5.4	6.1	5.1
HRAVE	4.4	4.2	4.1	4.0	4.3	4.0	4.6	4.8	4.6	4.6	4.6	4.3	4.0	4.6	4.6	4.1	5.2	4.7	5.1	4.2	4.2	3.9	4.2	4.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.1	6.0	9.0	6.4	4.8	7.5	8.4	4.3	3.8	3.9	2.9	4.3	2.8	4.1	3.3	3.1	2.7	6.3	8.4	3.6	3.1	2.6	3.9	4.2	3.0
MAX	9.8	10.4	12.2	10.3	9.6	10.6	10.0	6.5	6.2	11.4	4.8	6.7	5.7	9.6	7.5	6.7	5.1	8.9	15.0	5.9	5.9	3.9	7.2	7.6	4.6
MIN	1.4	2.6	6.5	3.5	2.5	5.3	5.8	2.5	2.0	1.8	1.3	1.5	1.4	1.8	1.1	1.9	1.2	3.6	2.9	0.9	1.5	1.4	1.6	1.7	1.6

DAY	26	27	28	29	30	31
AVE	4.3	4.2	4.6	3.3	3.7	5.1
MAX	7.8	7.7	6.3	6.6	6.9	7.4
MIN	1.0	1.8	2.4	1.2	1.8	3.1

MONTHLY AVERAGE = 4.4 MONTHLY MAXIMUM = 15.0 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 74.7% OPERATIONAL RECOVERY RATE = 74.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	113	120	102	83	97	105	119	117	126	124	95	252	305	281	273	274	282	287	299	303	323	340	67	101	144
2	101	103	103	105	127	148	150	151	152	135	86	88	45	19	45	29	43	53	46	61	59	62	66	67	333
3	78	79	67	65	67	70	68	66	63	73	95	93	68	65	68	***	61	59	***	66	65	67	70	66	25
4	67	67	68	90	99	87	84	79	83	82	96	83	86	82	87	100	98	61	358	13	15	52	92	109	88
5	112	98	81	82	102	110	80	68	89	97	97	93	88	84	117	89	78	18	15	42	62	64	83	103	351
6	117	120	113	90	62	63	67	71	74	71	68	72	37	68	68	***	62	***	***	70	70	70	***	***	165
7	***	73	74	70	72	68	67	65	67	***	67	70	70	37	33	17	38	54	46	56	43	68	78	94	103
8	112	102	104	142	145	144	137	152	140	115	98	95	84	89	101	162	245	303	300	7	29	67	78	96	248
9	111	112	143	133	107	141	137	105	118	106	94	94	117	135	194	309	349	354	75	46	4	60	100	108	106
10	100	89	91	101	101	120	102	99	105	100	94	87	85	275	272	203	259	***	***	80	72	94	111	107	173
11	84	85	101	94	44	15	77	87	90	47	343	330	299	301	297	313	249	269	285	281	284	275	***	1	3
12	61	***	***	213	155	156	161	243	259	273	267	264	266	271	273	277	***	291	310	123	140	152	169	***	324
13	104	84	5	38	59	77	93	95	67	20	63	69	333	278	273	279	288	315	340	46	32	80	84	111	243
14	88	77	86	86	81	74	76	75	79	93	278	***	268	170	154	150	157	193	296	318	129	133	131	161	114
15	158	152	144	107	95	86	88	96	97	92	96	75	268	278	282	285	283	281	285	***	47	54	85	73	294
16	79	77	98	94	100	105	97	88	98	127	156	257	147	261	269	268	260	***	292	288	283	288	106	104	77
17	105	105	116	110	123	136	134	116	103	131	114	121	226	275	241	209	272	279	302	5	48	75	99	108	359
18	101	109	108	104	100	105	76	99	100	94	84	72	69	65	67	56	64	52	***	***	59	62	68	66	193
19	60	62	64	63	68	66	66	71	67	70	79	93	72	68	67	69	63	64	71	68	66	35	20	331	54
20	307	277	287	275	268	276	266	294	292	284	265	272	283	333	302	***	283	***	300	289	294	26	52	82	183
21	92	97	90	88	87	93	90	90	110	125	140	142	92	104	268	273	330	343	74	82	68	301	319	352	54
22	88	88	94	121	115	102	100	80	85	91	75	351	283	285	327	68	32	1	33	24	70	52	60	67	205
23	42	41	65	71	55	193	198	178	126	257	266	250	242	252	252	256	258	268	198	58	355	351	43	108	25
24	146	315	296	289	299	296	285	285	276	310	38	271	276	288	281	282	280	275	332	60	85	92	116	151	166
25	136	120	136	163	151	189	205	270	287	290	277	278	289	286	288	285	***	***	288	280	279	285	290	281	169
26	281	***	358	353	351	339	11	349	290	261	271	281	307	355	353	315	353	354	357	357	355	6	359	6	167
27	81	114	73	53	55	66	39	13	77	75	84	273	130	268	270	229	277	***	298	289	344	36	76	96	286
28	116	75	81	84	83	87	90	87	90	84	80	84	85	83	44	88	301	282	317	38	26	46	78	96	258
29	103	101	105	96	99	120	96	60	295	324	279	244	271	265	280	283	283	***	282	283	282	341	98	100	194
30	99	98	98	92	95	105	93	105	119	102	94	91	108	88	86	77	63	49	43	15	26	59	75	83	133
31	85	76	77	79	80	77	107	126	105	90	81	71	79	70	22	18	18	16	11	347	330	356	58	66	355

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 96.2% OPERATIONAL RECOVERY RATE = 96.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	120	153	108	81	92	123	132	128	140	113	87	66	318	283	277	322	291	292	303	302	330	326	21	97	274
2	98	90	95	97	130	153	130	142	154	119	69	84	66	22	43	44	42	54	53	63	57	70	78	71	350
3	84	77	67	74	71	71	72	66	71	66	89	96	75	53	50	***	54	52	***	57	63	76	61	70	285
4	72	67	76	91	86	75	73	82	73	74	89	81	90	72	75	98	126	4	7	17	7	65	85	88	77
5	113	89	68	85	100	126	98	62	71	83	78	71	77	93	103	75	59	42	334	52	59	59	87	88	255
6	83	103	115	91	69	64	61	65	69	68	62	76	44	67	85	***	40	***	***	88	77	57	***	***	235
7	***	69	74	75	76	74	71	65	67	***	62	75	73	35	28	18	40	51	51	56	52	72	78	89	197
8	107	82	90	119	119	143	106	112	95	88	91	103	97	51	83	144	187	245	294	9	299	67	80	85	137
9	113	119	128	126	95	105	117	91	132	81	97	102	63	88	34	294	1	8	62	12	335	47	91	103	232
10	108	93	88	92	104	117	100	84	92	106	100	91	86	25	47	196	225	***	***	126	80	86	113	114	110
11	102	84	88	85	47	15	85	78	83	84	290	306	299	304	299	294	269	271	292	280	270	265	***	11	339
12	45	***	***	216	161	155	166	238	255	269	278	256	257	265	267	278	***	295	325	318	259	149	148	***	44
13	156	97	202	336	352	115	98	103	121	104	79	40	329	296	278	289	296	309	346	20	19	82	77	130	264
14	100	87	82	93	88	76	93	83	76	126	283	***	251	181	170	169	175	196	284	317	212	170	136	152	176
15	166	153	142	116	93	91	95	124	98	89	105	92	278	294	293	286	276	278	286	***	18	17	56	59	34
16	48	71	91	97	106	92	95	84	91	110	138	43	80	253	289	241	148	235	294	288	292	314	134	109	355
17	125	104	116	107	133	125	123	100	97	96	99	153	232	211	116	79	240	194	322	11	43	77	83	89	273
18	80	83	76	74	80	78	73	81	72	75	70	69	53	60	66	60	60	51	***	***	64	64	61	65	357
19	71	65	78	69	75	67	67	72	76	75	77	84	70	73	72	66	69	69	64	70	67	59	359	301	265
20	288	285	276	277	266	279	270	298	271	265	248	259	279	307	317	***	296	***	296	288	284	23	19	341	250
21	98	96	85	88	83	101	86	96	103	122	158	118	88	26	268	285	333	334	23	76	69	294	301	320	206
22	65	65	108	143	150	131	131	147	127	123	108	15	261	266	297	31	48	56	47	42	57	42	62	74	44
23	80	69	75	251	308	252	205	206	184	240	248	240	243	244	250	260	251	268	254	256	30	68	12	166	120
24	173	275	280	277	288	287	264	264	272	268	277	232	262	276	275	271	268	270	314	244	95	137	172	169	136
25	213	266	262	265	173	186	247	273	279	292	274	269	295	271	298	290	***	***	291	275	277	285	298	280	333
26	279	346	338	338	332	6	19	293	300	257	257	288	319	342	355	310	337	328	16	26	3	12	29	38	107
27	73	103	11	64	52	77	44	355	55	83	87	109	78	273	272	272	292	***	300	301	331	9	67	87	348
28	100	64	75	84	82	95	88	84	73	74	83	91	84	85	46	73	98	266	294	54	52	39	71	89	293
29	97	81	89	86	82	110	160	169	276	302	216	227	286	242	301	294	273	***	276	288	286	319	97	100	93
30	109	114	108	87	91	112	87	96	105	99	112	90	66	88	73	76	62	58	52	19	41	50	68	70	178
31	73	70	72	72	65	62	81	106	83	68	79	70	73	65	46	33	23	41	19	1	313	46	48	70	316

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 96.5% OPERATIONAL RECOVERY RATE = 96.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	122	136	103	80	86	109	123	115	131	158	84	103	318	281	268	2	***	***	300	285	316	64	47	100	348
2	102	88	112	***	136	144	122	147	155	118	78	79	***	***	***	***	48	***	53	***	***	***	86	85	32
3	85	85	66	81	81	***	73	***	61	48	102	96	***	***	***	***	52	***	***	***	***	***	63	81	73
4	77	73	62	88	97	79	73	81	77	81	52	***	***	88	71	153	***	***	***	226	356	74	91	103	345
5	***	***	62	106	100	103	109	63	77	94	44	56	88	92	121	***	***	61	***	36	57	80	91	88	152
6	84	96	117	95	69	***	49	61	77	67	***	75	***	***	***	***	***	***	***	***	***	***	***	***	147
7	***	***	***	***	75	***	66	61	***	***	***	***	***	***	***	***	***	54	***	77	60	91	89	87	38
8	108	83	93	127	126	143	100	122	97	91	109	92	104	336	77	162	173	***	***	***	327	85	78	80	326
9	123	113	121	107	96	130	120	90	129	83	104	102	72	121	29	271	***	***	***	23	352	46	96	103	283
10	97	90	84	91	100	115	101	88	95	117	89	110	102	286	296	195	214	***	***	***	76	65	***	118	277
11	109	63	91	85	57	24	84	80	89	102	356	314	293	***	***	288	248	270	***	***	259	260	***	***	241
12	***	***	***	***	167	156	161	249	257	263	276	259	256	265	***	***	***	***	329	337	266	97	***	***	0
13	183	71	10	307	344	70	105	87	120	85	53	82	315	272	279	***	***	***	345	14	49	101	79	119	192
14	117	98	84	91	85	63	93	92	72	131	231	***	***	196	181	168	179	203	295	355	182	166	141	173	26
15	171	154	138	122	95	82	89	104	75	79	79	118	274	299	294	***	268	***	***	***	***	27	75	70	95
16	59	70	91	76	100	86	92	90	91	164	97	115	77	252	284	241	221	***	300	***	***	306	***	***	303
17	135	105	118	106	126	122	113	104	98	94	97	163	25	205	165	96	181	***	***	***	59	53	88	90	51
18	78	68	72	74	81	67	76	90	88	90	74	104	***	***	***	***	***	***	***	***	***	***	***	***	105
19	91	66	75	***	64	75	***	72	77	76	76	89	72	***	74	66	68	69	54	74	60	89	180	309	334
20	294	281	275	***	245	277	264	294	268	273	259	268	313	336	***	***	***	***	***	***	302	20	29	333	128
21	101	88	79	93	90	112	80	95	100	124	161	122	78	32	267	***	***	***	24	75	93	***	307	330	113
22	62	67	111	150	125	134	132	155	139	147	159	350	279	281	290	91	65	68	57	55	21	24	59	76	188
23	70	72	222	266	300	261	214	202	294	245	255	237	242	241	245	***	***	255	240	286	52	95	49	***	322
24	162	322	274	270	288	289	262	259	274	271	231	242	265	275	265	269	281	***	90	245	116	136	178	172	8
25	200	249	238	226	177	195	282	268	273	***	270	***	***	***	***	***	***	***	***	***	***	***	***	***	141
26	***	***	***	***	***	37	11	286	***	253	244	289	***	***	0	***	***	257	***	***	***	***	***	***	135
27	***	***	***	***	47	86	***	4	26	84	90	110	100	259	276	270	284	***	***	***	***	58	37	81	184
28	114	27	75	86	86	101	87	87	78	74	81	102	100	94	61	96	107	***	***	68	54	62	76	89	140
29	93	97	91	90	84	107	172	178	294	299	219	225	219	230	***	294	273	***	***	***	284	309	107	***	332
30	103	112	107	91	88	111	84	92	115	106	111	99	124	91	72	***	***	***	62	***	51	53	70	65	34
31	67	71	79	75	66	66	80	96	75	70	91	91	***	***	62	37	***	48	22	8	297	51	19	73	29

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 74.7% OPERATIONAL RECOVERY RATE = 74.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
DECEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.29	0.13	0.24	0.23	0.01	0.03	0.07	0.12	0.17	0.29	0.48	0.76	0.56	0.59	0.63	0.83	0.56	0.45	0.49	0.61	0.65	0.48	0.12	0.17	0.37
2	0.03	0.09	0.29	0.51	0.54	0.49	0.45	0.35	0.56	0.54	0.38	0.82	1.22	1.24	1.25	1.25	0.75	0.94	0.87	0.79	0.83	0.78	0.68	0.63	0.68
3	0.69	0.60	0.82	0.62	0.71	0.60	0.58	0.74	0.79	1.00	0.77	0.87	1.22	1.08	***	***	0.88	1.17	***	0.88	0.86	0.77	0.60	0.67	0.81
4	0.60	0.59	0.63	0.46	0.37	0.40	0.35	0.41	0.35	0.48	0.53	0.61	0.93	0.93	0.62	0.75	0.63	0.46	0.30	0.29	0.41	0.33	0.22	0.30	0.50
5	0.28	0.32	0.21	0.19	0.15	0.17	0.23	0.33	0.36	0.37	0.48	0.65	0.76	0.74	0.88	0.87	0.63	0.70	0.48	0.48	0.44	0.30	0.31	0.36	0.45
6	0.36	0.29	0.39	0.41	0.42	0.56	0.69	0.69	0.66	0.68	0.66	1.01	1.18	1.13	0.95	***	1.35	***	***	0.98	0.86	0.96	***	***	0.75
7	***	0.81	0.97	0.78	0.62	0.58	0.62	0.75	0.63	***	0.83	1.11	1.31	1.32	1.11	1.22	0.92	0.61	0.52	0.45	0.65	0.51	0.49	0.48	0.79
8	0.42	0.36	0.24	0.29	0.44	0.46	0.34	0.41	0.51	0.28	0.50	0.40	0.61	0.70	0.65	0.75	0.59	0.74	0.93	0.40	0.25	0.13	0.18	0.12	0.45
9	0.24	0.26	0.27	0.32	0.22	0.29	0.21	0.27	0.21	0.11	0.39	0.46	0.68	0.71	0.75	0.33	0.13	0.13	0.23	0.20	0.09	0.11	0.13	0.07	0.28
10	0.32	0.10	0.09	0.12	0.17	0.13	0.22	0.15	0.22	0.10	0.18	0.27	0.50	0.50	0.49	0.61	0.23	***	***	0.34	0.40	0.33	0.32	0.24	0.27
11	0.32	0.24	0.24	0.25	0.18	0.18	0.10	0.18	0.17	0.10	0.05	0.20	0.54	0.73	0.32	0.52	0.70	0.35	0.16	0.23	0.15	0.36	***	***	0.28
12	0.72	***	***	***	0.40	0.39	0.38	0.96	0.65	0.39	0.60	0.72	0.25	0.49	0.66	0.66	***	0.32	0.29	0.33	0.34	0.31	***	***	0.49
13	0.26	0.12	0.07	0.21	0.21	0.25	0.18	0.11	0.25	0.31	0.28	0.28	0.26	0.36	0.72	0.88	0.75	0.48	0.62	0.33	0.31	0.26	0.35	0.24	0.34
14	0.33	0.35	0.55	0.60	0.55	0.41	0.63	0.60	0.62	0.48	0.46	***	0.40	0.38	0.39	0.44	0.29	0.39	0.39	0.21	0.18	0.23	0.21	0.32	0.41
15	0.25	0.23	0.19	0.11	0.04	0.19	0.31	0.27	0.22	0.22	0.26	0.47	0.74	0.94	1.07	0.86	0.88	0.43	***	***	0.38	0.28	0.18	0.34	0.40
16	0.24	0.28	0.06	0.15	0.05	0.11	0.15	0.06	0.01	0.17	0.49	0.69	0.72	0.77	0.76	0.86	0.82	***	0.32	***	0.76	0.30	0.18	0.10	0.37
17	0.28	0.23	0.18	0.04	0.13	0.05	0.03	0.01	0.07	0.16	0.54	0.44	0.57	0.60	0.66	0.62	0.38	***	0.43	0.18	0.22	0.17	0.08	0.16	0.27
18	0.11	0.22	0.36	0.31	0.32	0.41	0.54	0.48	0.48	0.67	0.74	1.01	1.25	0.97	0.92	0.95	0.79	0.64	***	***	0.71	0.96	0.97	0.85	0.67
19	0.79	0.70	0.70	0.71	0.56	0.58	0.66	0.74	0.66	0.81	0.74	0.78	0.90	0.58	0.46	0.50	0.77	0.68	0.48	0.65	0.55	0.55	0.24	0.13	0.62
20	0.19	0.22	0.35	0.72	0.28	0.38	0.32	0.36	0.41	0.37	0.36	0.37	0.70	0.69	0.67	***	0.60	***	0.27	0.25	0.26	0.27	0.05	0.02	0.37
21	0.28	0.19	0.15	0.29	0.05	0.01	0.15	0.20	0.16	0.19	0.57	0.79	0.83	0.78	0.73	0.46	0.35	0.75	0.18	0.20	0.27	0.29	0.18	0.19	0.34
22	0.01	0.03	0.26	0.22	0.21	0.14	0.12	0.11	0.28	0.05	0.14	0.20	0.28	0.30	0.30	0.38	0.57	0.37	0.33	0.37	0.32	0.19	0.24	0.26	0.24
23	0.34	0.43	0.51	0.27	0.17	0.44	0.29	0.30	0.34	0.24	0.43	0.53	0.54	0.46	0.70	0.60	0.45	0.19	0.12	0.25	0.66	0.28	0.27	0.22	0.38
24	0.39	0.29	0.41	0.35	0.24	0.22	0.39	0.33	0.59	0.47	0.47	0.39	0.44	0.69	0.74	0.58	0.42	***	0.41	0.36	0.30	0.28	0.11	0.35	0.40
25	0.16	0.15	0.26	0.20	0.15	0.22	0.24	0.25	0.27	0.45	0.44	0.55	0.82	0.89	0.78	0.92	***	***	0.45	0.33	0.31	0.38	0.32	0.44	0.41
26	1.03	***	***	0.50	0.37	0.33	0.32	0.65	0.88	0.69	0.80	0.93	0.99	1.15	0.95	0.84	0.89	0.86	0.96	1.16	0.89	0.81	1.06	0.92	0.82
27	0.96	0.78	1.01	1.07	0.72	0.84	0.88	0.73	0.78	0.65	0.76	0.74	0.91	0.74	0.78	0.92	0.81	***	0.59	0.60	0.27	0.23	0.21	0.23	0.70
28	0.25	0.32	0.35	0.28	0.43	0.52	0.28	0.23	0.26	0.26	0.63	0.85	0.69	0.80	0.90	0.93	0.70	0.42	0.39	0.40	0.14	0.40	0.36	0.31	0.46
29	0.33	0.08	0.15	0.13	0.12	0.23	0.35	0.19	0.18	0.31	0.41	0.67	0.75	1.06	1.14	0.83	0.57	***	0.33	0.66	0.13	0.05	0.01	0.10	0.38
30	0.26	0.14	0.08	0.18	0.08	0.08	0.27	0.14	0.19	0.13	0.55	0.67	0.84	0.71	0.79	0.75	0.70	0.56	0.55	0.45	0.50	0.56	0.28	0.29	0.41
31	0.19	0.22	0.22	0.22	0.23	0.19	0.36	0.46	0.24	0.36	0.61	0.91	1.25	1.16	0.96	0.81	0.49	0.47	0.58	0.54	0.49	0.49	0.52	0.53	0.52
HRAVE	0.36	0.30	0.35	0.36	0.29	0.32	0.35	0.37	0.39	0.38	0.50	0.64	0.76	0.78	0.76	0.75	0.64	0.55	0.45	0.46	0.44	0.40	0.32	0.32	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.37	0.68	0.81	0.50	0.45	0.75	0.79	0.45	0.28	0.27	0.28	0.49	0.34	0.41	0.40	0.37	0.27	0.67	0.62	0.37	0.34	0.24	0.38	0.40	0.41
MAX	0.83	1.25	1.22	0.93	0.88	1.35	1.32	0.93	0.75	0.61	0.73	0.96	0.88	0.63	1.07	0.86	0.66	1.25	0.90	0.72	0.83	0.57	0.70	0.74	0.92
MIN	0.01	0.03	0.58	0.22	0.15	0.29	0.45	0.12	0.07	0.09	0.05	0.25	0.07	0.18	0.04	0.01	0.01	0.11	0.13	0.02	0.01	0.01	0.12	0.11	0.15

DAY	26	27	28	29	30	31
AVE	0.82	0.70	0.46	0.38	0.41	0.52
MAX	1.16	1.07	0.93	1.14	0.84	1.25
MIN	0.32	0.21	0.14	0.01	0.08	0.19

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 95.0% OPERATIONAL RECOVERY RATE = 95.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
DECEMBER - 2015

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.25	0.17	0.02	0.03	0.01	0.23	0.36	0.27	0.16	0.21	0.61	0.82	0.47	0.44	0.57	0.65	0.46	***	***	0.87	0.83	0.56	0.25	0.16	0.38
2	0.07	0.08	0.06	0.31	0.42	0.42	0.51	0.34	0.45	0.43	0.92	0.77	1.31	1.32	1.03	1.17	***	***	***	0.80	0.83	0.90	0.73	0.90	0.66
3	0.98	0.61	0.87	0.76	0.67	0.63	0.59	0.78	0.81	0.97	1.03	1.07	***	1.04	***	***	0.88	***	***	0.86	0.95	0.82	0.75	0.74	0.83
4	0.52	0.70	0.68	0.53	0.19	0.71	0.57	0.52	0.73	0.50	0.66	0.62	1.00	0.88	0.56	0.61	0.58	0.42	0.60	0.41	0.56	0.37	0.41	0.45	0.57
5	0.43	0.64	0.21	0.14	0.08	0.15	0.18	0.41	0.75	0.72	0.81	0.35	0.51	0.66	0.95	0.73	0.56	0.74	0.42	0.52	0.38	0.40	0.63	0.38	0.49
6	0.30	0.20	0.27	0.48	0.45	0.65	0.70	0.87	0.92	***	0.72	***	***	***	***	***	***	***	***	0.95	0.76	1.00	***	***	0.64
7	***	***	0.72	0.78	0.61	0.63	0.66	0.77	***	***	0.81	1.07	1.31	***	1.05	1.03	0.85	0.65	0.55	0.47	0.68	0.55	0.54	0.65	0.76
8	0.60	0.58	0.34	0.21	0.42	0.39	0.24	0.30	0.25	0.51	0.82	0.70	0.56	0.71	0.70	0.60	0.45	0.90	1.03	0.47	0.32	0.26	0.65	0.52	0.52
9	0.40	0.58	0.35	0.29	0.10	0.14	0.26	0.25	0.53	0.65	0.46	0.36	0.70	0.65	0.60	0.28	0.14	0.12	0.36	0.44	0.21	0.15	0.14	0.14	0.35
10	0.13	0.16	0.33	0.08	0.18	0.04	0.32	0.18	0.42	0.24	0.08	0.32	0.56	0.41	0.49	0.65	0.26	***	***	0.30	0.26	0.35	0.34	0.19	0.29
11	0.54	0.14	0.51	0.38	0.52	0.37	0.07	0.27	0.58	0.47	0.15	0.57	0.76	***	***	0.46	0.81	0.43	0.18	***	0.14	***	***	***	0.41
12	0.71	***	***	***	0.69	0.54	0.43	0.98	0.69	0.62	0.53	0.58	0.51	0.39	***	***	***	***	0.43	0.35	0.44	0.17	***	***	0.54
13	0.42	0.30	0.17	0.07	0.01	0.30	0.19	0.07	0.14	0.14	0.10	0.15	0.11	0.19	0.57	0.96	0.87	***	0.56	0.37	0.52	0.14	0.26	0.14	0.29
14	0.15	0.24	0.33	0.22	0.32	0.24	0.45	0.48	0.52	0.56	0.56	***	***	0.36	0.34	0.40	0.23	0.48	0.32	0.45	0.21	0.28	0.68	0.19	0.36
15	0.14	0.21	0.14	0.10	0.01	0.09	0.22	0.19	0.16	0.11	0.56	0.53	0.55	0.97	0.96	0.73	***	***	***	***	0.39	0.18	0.14	0.47	0.34
16	0.14	0.38	0.11	0.10	0.21	0.39	0.26	0.03	0.01	0.07	0.27	0.57	0.50	0.60	0.60	0.81	0.86	***	***	***	***	0.28	0.11	0.01	0.32
17	0.18	0.18	0.11	0.01	0.14	0.04	0.01	0.01	0.01	0.05	0.52	0.48	0.39	0.51	0.73	0.67	0.58	***	0.54	0.11	0.30	0.18	0.06	0.08	0.26
18	0.30	0.36	0.58	0.41	0.41	0.50	0.52	0.70	0.61	0.89	0.75	0.87	1.27	***	0.88	***	0.83	0.64	***	***	***	0.57	0.80	1.05	0.68
19	0.80	0.75	0.71	0.73	0.50	0.65	0.82	0.70	0.60	0.83	0.58	0.68	0.86	0.57	0.48	0.47	0.82	0.64	0.49	0.50	0.46	0.44	0.10	0.11	0.60
20	0.15	0.23	0.36	0.79	0.49	0.42	0.58	0.46	0.37	0.21	0.35	0.40	0.76	0.66	***	***	0.58	***	***	***	0.27	0.21	0.07	0.13	0.39
21	0.39	0.06	0.08	0.03	0.01	0.01	0.03	0.01	0.22	0.10	0.37	0.63	0.49	0.67	0.71	0.54	0.35	0.86	0.12	0.13	0.26	0.27	0.19	0.25	0.28
22	0.09	0.22	0.06	0.23	0.14	0.13	0.10	0.18	0.21	0.06	0.15	0.18	0.39	0.36	0.27	0.24	0.50	0.48	0.34	0.39	0.41	0.25	0.17	0.25	0.24
23	0.29	0.42	0.43	0.33	0.17	0.45	0.42	0.43	0.46	0.27	0.40	0.51	0.48	0.38	0.71	0.75	0.52	0.15	0.07	0.42	0.61	0.39	0.25	0.18	0.40
24	0.28	0.37	0.44	0.26	0.22	0.20	0.36	0.34	0.60	0.55	0.47	0.44	0.43	***	***	0.48	0.47	***	0.28	0.33	0.21	0.23	0.06	0.20	0.34
25	0.16	0.16	0.42	0.34	0.11	0.24	0.33	0.32	0.38	0.45	0.37	0.59	0.83	***	0.88	***	***	***	***	0.67	***	***	***	0.58	0.43
26	1.34	***	***	0.50	0.35	0.33	0.35	0.53	0.81	0.66	0.79	1.10	***	0.99	***	0.67	0.79	0.93	***	1.09	0.96	0.87	1.12	0.79	0.79
27	0.74	0.66	0.82	0.94	0.78	0.93	1.02	0.88	0.81	0.65	0.74	0.62	0.88	0.65	0.74	0.96	0.79	***	***	0.27	0.18	0.24	0.24	0.69
28	0.33	0.59	0.38	0.25	0.47	0.46	0.21	0.23	0.35	0.38	0.61	0.85	0.81	0.81	0.83	0.87	0.77	0.33	0.30	0.41	0.12	0.50	0.48	0.26	0.48
29	0.51	0.20	0.14	0.23	0.14	0.28	0.39	0.28	0.25	0.52	0.54	0.69	0.82	0.99	0.94	0.80	0.55	***	***	***	0.23	0.35	0.01	0.11	0.43
30	0.11	0.05	0.07	0.06	0.04	0.22	0.18	0.19	0.10	0.14	0.58	0.56	0.85	0.78	0.75	0.88	0.74	0.63	0.57	0.51	0.52	0.71	0.56	0.84	0.44
31	0.55	0.35	0.20	0.13	0.20	0.17	0.44	0.44	0.21	0.43	0.66	1.10	1.06	1.10	1.07	0.86	0.54	0.47	0.54	0.54	0.37	0.38	0.44	0.48	0.53
HRAVE	0.40	0.34	0.34	0.32	0.29	0.35	0.38	0.40	0.44	0.43	0.55	0.63	0.71	0.68	0.73	0.69	0.61	0.55	0.43	0.52	0.45	0.41	0.38	0.37	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.38	0.66	0.83	0.57	0.49	0.64	0.76	0.52	0.35	0.29	0.41	0.54	0.29	0.36	0.34	0.32	0.26	0.68	0.60	0.39	0.28	0.24	0.40	0.34	0.43
MAX	0.87	1.32	1.07	1.00	0.95	1.00	1.31	1.03	0.70	0.65	0.81	0.98	0.96	0.68	0.97	0.86	0.73	1.27	0.86	0.79	0.86	0.50	0.75	0.60	0.88
MIN	0.01	0.06	0.59	0.19	0.08	0.20	0.47	0.21	0.10	0.04	0.07	0.17	0.01	0.15	0.01	0.01	0.01	0.30	0.10	0.07	0.01	0.06	0.07	0.06	0.11

DAY	26	27	28	29	30	31
AVE	0.79	0.69	0.48	0.43	0.44	0.53
MAX	1.34	1.02	0.87	0.99	0.88	1.10
MIN	0.33	0.18	0.12	0.01	0.04	0.13

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 88.3% OPERATIONAL RECOVERY RATE = 88.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
DECEMBER - 2015

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	0.01	0.02	0.01	0.21	0.34	0.22	0.13	0.20	0.56	0.93	0.48	0.28	***	***	***	***	***	***	***	***	***	***	0.28
2	***	0.08	0.05	***	***	***	***	0.34	0.40	0.42	0.95	0.64	***	***	***	***	***	***	***	***	***	***	***	***	0.41
3	***	0.80	1.00	***	***	***	***	***	0.78	***	1.09	1.11	***	***	***	***	***	***	***	***	***	***	***	***	0.96
4	***	***	***	0.45	0.18	***	0.56	0.49	0.68	0.55	0.64	***	***	***	***	***	***	***	***	0.39	0.69	0.43	0.66	***	0.52
5	***	***	***	***	***	***	0.24	0.38	0.68	0.68	0.80	0.33	0.52	0.66	***	***	***	***	***	0.44	***	***	***	***	0.53
6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.54	***	0.54
8	***	***	***	***	0.31	***	0.21	0.28	0.24	0.52	0.76	0.64	0.58	***	***	***	0.42	***	***	***	***	0.46	0.66	0.46	0.46
9	0.40	***	0.51	***	0.14	0.16	0.20	***	0.47	0.58	0.43	0.33	0.73	0.63	0.41	0.38	***	***	***	***	***	0.15	0.15	0.13	0.36
10	0.02	0.16	0.34	***	0.04	0.02	0.30	0.18	0.37	0.24	0.10	0.31	0.54	0.40	0.45	0.67	***	***	***	***	***	0.33	***	0.17	0.27
11	0.50	0.16	***	0.34	0.46	0.42	***	0.24	0.77	0.40	0.14	0.60	0.68	***	***	***	0.83	0.41	***	***	***	***	***	***	0.46
12	***	***	***	***	***	***	***	***	0.73	***	0.66	0.58	0.56	0.32	***	***	***	***	0.49	0.35	***	0.18	***	***	0.48
13	0.58	0.37	0.19	0.11	0.02	0.52	0.20	0.08	0.10	0.12	0.07	0.31	0.08	0.18	0.57	***	***	***	***	***	***	0.14	***	***	0.23
14	0.13	0.26	0.34	0.24	0.37	0.25	0.41	0.48	0.71	0.56	***	***	***	0.42	0.32	0.57	0.26	0.53	***	0.39	0.34	0.26	0.67	0.21	0.39
15	0.13	0.21	0.14	0.09	0.01	0.08	0.20	0.20	0.14	0.11	0.59	***	0.53	***	1.08	***	***	***	***	***	***	***	0.26	0.51	0.29
16	0.18	0.38	0.10	0.10	0.25	0.46	0.34	0.02	0.02	0.10	0.25	0.58	0.49	0.59	***	0.91	0.74	***	***	***	***	***	***	***	0.34
17	0.24	0.20	0.10	0.01	0.15	0.04	0.01	0.01	0.01	0.06	0.60	0.52	0.42	0.54	0.59	***	***	***	***	***	***	***	***	0.08	0.22
18	0.28	0.35	0.57	0.40	0.42	0.46	0.48	0.62	0.64	0.95	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.52
19	***	***	***	***	***	***	***	***	***	***	***	0.63	***	***	***	***	***	***	***	0.48	0.40	***	***	***	0.50
20	***	***	***	***	***	***	***	***	0.33	0.23	0.34	0.39	0.72	***	***	***	***	***	***	***	***	***	***	***	0.40
21	***	***	***	***	0.01	***	0.06	0.02	0.20	0.14	0.38	0.49	0.43	0.72	0.71	***	***	***	0.07	***	***	***	***	***	0.29
22	***	***	***	***	***	0.19	***	***	0.22	0.07	0.13	0.15	0.53	0.58	0.24	0.20	0.56	0.54	0.26	0.33	0.41	0.29	0.18	0.32	0.31
23	0.33	0.39	0.46	***	0.20	0.47	0.52	0.40	0.48	0.27	0.38	0.51	***	0.40	***	***	***	0.14	0.08	0.42	0.62	0.36	0.28	***	0.37
24	***	***	0.42	***	***	0.20	***	***	0.63	0.44	0.48	0.42	***	***	***	***	***	***	0.27	0.25	0.18	***	0.02	0.05	0.31
25	0.19	0.16	0.40	0.42	0.16	0.35	0.35	0.37	0.40	***	0.35	***	***	***	***	***	***	***	***	***	***	***	***	***	0.31
26	***	***	***	***	***	0.39	0.36	0.49	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.41
27	***	***	***	***	***	***	***	0.95	***	***	***	***	***	***	0.65	***	***	***	***	***	***	***	***	0.22	0.61
28	0.34	0.64	0.39	0.28	***	***	0.25	0.24	0.34	0.37	0.58	0.89	***	***	***	***	***	***	***	***	***	***	***	***	0.43
29	0.49	0.21	0.14	0.25	0.14	0.25	0.45	0.32	0.41	0.58	0.58	0.75	0.99	***	***	***	***	***	***	***	***	***	***	***	0.43
30	0.09	0.04	0.05	0.06	0.04	0.19	0.21	0.20	0.11	0.15	0.55	0.56	***	0.84	***	***	***	***	***	***	***	***	0.55	0.89	0.30
31	0.51	0.34	0.19	0.15	0.22	0.19	0.43	0.44	0.20	0.40	0.63	***	***	***	***	***	***	***	0.44	0.61	***	***	***	***	0.37
HRAVE	0.29	0.30	0.30	0.21	0.17	0.27	0.31	0.32	0.39	0.35	0.50	0.56	0.55	0.50	0.56	0.55	0.56	0.41	0.27	0.41	0.44	0.29	0.40	0.30	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.28	0.41	0.96	0.52	0.53	***	0.54	0.46	0.36	0.27	0.46	0.48	0.23	0.39	0.29	0.34	0.22	0.52	0.50	0.40	0.29	0.31	0.37	0.31	0.31
MAX	0.93	0.95	1.11	0.69	0.80	***	0.54	0.76	0.73	0.67	0.83	0.73	0.58	0.71	1.08	0.91	0.60	0.95	0.63	0.72	0.72	0.58	0.62	0.63	0.42
MIN	0.01	0.05	0.78	0.18	0.24	***	0.54	0.21	0.13	0.02	0.14	0.18	0.02	0.13	0.01	0.02	0.01	0.28	0.40	0.23	0.01	0.07	0.08	0.02	0.16

DAY	26	27	28	29	30	31
AVE	0.41	0.61	0.43	0.43	0.30	0.37
MAX	0.49	0.95	0.89	0.99	0.89	0.63
MIN	0.36	0.22	0.24	0.14	0.04	0.15

MONTHLY AVERAGE = 0.4 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 45.2% OPERATIONAL RECOVERY RATE = 45.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	4.1	4.3	6.4	7.8	8.2	9.2	9.3	9.7	9.3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7.6
2	***	***	***	***	***	***	***	***	***	10.4	***	7.6	8.6	8.7	9.2	***	***	***	10.1	***	***	***	***	***	9.1
3	***	11.2	11.8	11.2	9.7	10.1	10.7	11.1	11.4	12.7	***	***	7.8	9.4	***	***	6.9	***	***	***	***	***	***	***	10.3
4	***	***	***	***	***	***	***	***	***	***	***	***	***	5.9	***	4.7	2.8	4.4	4.7	5.7	4.6	4.7	5.1	4.8	4.8
5	5.3	7.2	8.1	7.8	6.7	5.7	6.2	5.8	6.2	6.6	5.4	4.8	3.7	3.8	2.9	2.2	2.0	2.0	3.0	3.3	2.5	1.6	2.2	2.0	4.5
6	2.4	2.1	2.4	3.1	3.3	3.7	4.8	3.6	2.7	3.2	4.5	6.5	6.1	7.3	8.6	6.3	5.1	***	***	2.3	0.9	2.6	2.4	2.3	3.9
7	2.4	2.7	2.8	1.5	2.9	3.5	5.8	7.2	4.1	5.6	7.8	***	***	***	***	***	***	4.5	5.3	4.5	3.0	3.6	3.5	2.9	4.1
8	3.2	2.8	2.4	3.0	3.0	3.3	2.2	2.2	3.2	3.8	2.5	2.5	3.4	***	***	***	3.3	2.9	3.5	1.8	1.1	***	2.1	1.8	2.7
9	1.5	1.8	1.3	1.8	1.3	1.7	0.8	1.8	2.2	2.3	2.6	2.5	3.0	4.0	4.3	3.8	3.9	3.9	4.6	4.2	3.8	2.7	2.3	3.0	2.7
10	3.3	3.0	3.5	3.3	3.0	2.9	3.1	3.5	3.0	3.4	3.0	2.5	3.0	3.2	2.5	3.1	3.6	2.0	***	***	3.5	2.4	2.4	2.2	3.0
11	2.5	2.4	1.8	1.4	1.5	0.6	0.9	1.6	3.0	4.2	5.2	6.0	6.3	5.3	4.4	3.9	3.0	3.4	3.4	3.2	2.8	2.5	4.8	4.5	3.3
12	4.2	4.6	4.3	4.0	3.9	3.7	3.9	4.1	4.5	6.3	6.8	7.5	7.8	***	7.0	7.3	***	***	6.7	6.4	6.6	8.3	7.1	5.5	5.7
13	6.1	7.3	7.1	6.8	6.2	5.4	5.7	5.7	5.0	4.2	3.9	4.0	5.0	4.0	2.9	2.2	2.2	2.3	3.8	3.6	2.4	2.3	2.1	3.4	4.3
14	4.5	4.7	3.9	2.8	3.1	3.7	2.9	3.4	3.3	2.8	2.5	2.2	1.4	2.9	4.7	5.2	4.3	4.6	***	***	2.7	1.9	2.6	2.8	3.3
15	2.7	3.2	3.3	3.0	2.7	3.5	4.3	2.9	2.5	1.8	2.5	2.4	2.5	2.2	2.5	4.0	5.2	6.6	2.7	3.2	0.8	1.6	3.6	2.8	3.0
16	2.5	2.6	2.7	3.6	3.8	3.6	3.5	4.2	3.3	2.4	2.5	3.0	3.0	3.1	4.2	4.8	5.6	***	2.6	2.4	***	5.9	5.0	3.4	3.5
17	1.3	1.7	2.5	2.6	2.6	3.0	2.8	2.6	3.5	4.2	3.2	2.6	2.3	3.0	3.8	5.7	6.7	***	***	2.9	1.7	2.3	2.8	3.0	3.0
18	2.9	4.1	4.3	4.4	4.7	4.4	3.8	4.2	4.2	4.4	4.5	4.3	3.7	2.6	2.8	2.6	1.5	1.8	2.0	2.2	1.5	1.0	2.5	2.5	3.2
19	2.2	2.0	2.4	2.4	2.4	3.3	3.0	3.2	3.2	3.2	2.7	2.9	1.7	2.1	3.5	4.1	4.9	6.0	6.1	5.5	2.3	3.2	3.1	3.1	3.3
20	4.3	2.2	1.4	2.2	2.3	2.9	3.9	4.3	4.1	3.8	1.9	2.2	2.2	4.1	6.0	6.6	7.5	6.1	5.0	3.3	3.6	3.4	1.4	1.9	3.6
21	2.6	2.8	2.1	3.3	4.2	5.3	5.1	4.7	4.3	4.9	7.4	6.7	7.7	6.4	6.7	7.1	***	6.7	7.6	7.2	6.5	7.5	7.4	7.4	5.7
22	6.9	6.9	7.1	7.5	7.5	7.6	7.3	8.2	7.9	***	***	***	9.9	***	8.6	6.6	7.2	8.2	8.2	8.5	8.9	8.6	7.4	5.9	7.8
23	6.6	7.0	6.9	5.7	5.4	5.0	5.2	5.7	5.8	5.5	5.0	4.5	4.4	3.5	4.0	3.3	2.0	1.9	1.5	1.9	2.0	2.5	2.2	2.3	4.2
24	2.9	2.4	2.1	3.0	2.8	2.3	1.5	2.0	2.7	2.4	2.5	4.7	6.1	6.8	7.2	7.9	7.4	6.6	5.8	5.1	4.1	2.1	3.0	3.6	4.0
25	3.3	3.1	3.5	3.9	4.1	2.5	2.5	3.4	3.1	2.4	1.3	1.9	3.0	2.7	4.5	4.5	4.6	4.8	6.1	5.4	3.7	3.1	3.0	3.8	3.5
26	6.5	7.2	5.7	5.8	***	5.3	6.2	7.3	7.5	5.6	***	5.8	6.2	6.9	6.3	6.5	5.2	3.2	2.2	4.5	5.0	3.8	3.6	5.8	5.5
27	4.5	4.6	4.9	4.9	5.1	7.1	7.6	6.6	6.7	5.0	3.5	4.7	6.5	***	6.3	5.4	4.0	3.3	3.1	4.0	5.2	4.2	3.4	4.5	5.0
28	4.3	4.7	4.5	4.6	4.2	4.2	4.7	4.7	5.4	4.5	3.9	3.0	3.6	4.3	3.4	3.1	3.9	4.6	4.7	3.9	2.3	2.1	3.2	4.3	4.0
29	4.2	3.4	3.7	4.3	4.8	3.7	4.6	4.9	4.6	3.5	3.1	3.3	2.8	2.7	3.2	3.9	5.8	5.9	***	2.4	2.0	1.8	2.2	3.2	3.7
30	3.7	3.7	3.8	3.5	2.0	2.4	3.0	3.8	4.0	2.9	2.2	1.8	1.8	2.7	4.4	5.5	***	***	3.2	3.2	3.2	3.2	2.6	3.6	3.2
31	2.9	2.9	2.4	2.5	2.9	3.4	3.2	3.1	3.3	2.9	2.4	2.8	3.4	4.8	6.5	6.1	5.5	***	***	***	***	***	8.7	***	3.9
HRAVE	3.7	4.1	4.1	4.2	4.1	4.2	4.4	4.7	4.6	4.5	3.7	4.0	4.5	4.5	5.0	4.9	4.6	4.4	4.6	4.0	3.3	3.4	3.6	3.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.6	9.1	10.3	4.8	4.5	3.9	4.1	2.7	2.7	3.0	3.3	5.7	4.3	3.3	3.0	3.5	3.0	3.2	3.3	3.6	5.7	7.8	4.2	4.0	3.5
MAX	9.7	10.4	12.7	5.9	8.1	8.6	7.8	3.8	4.6	3.6	6.3	8.3	7.3	5.2	6.6	5.9	6.7	4.7	6.1	7.5	7.7	9.9	7.0	7.9	6.1
MIN	4.1	7.6	6.9	2.8	1.6	0.9	1.5	1.1	0.8	2.0	0.6	3.7	2.1	1.4	0.8	2.4	1.3	1.0	1.7	1.4	2.1	5.9	1.5	1.5	1.3

DAY	26	27	28	29	30	31
AVE	5.5	5.0	4.0	3.7	3.2	3.9
MAX	7.5	7.6	5.4	5.9	5.5	8.7
MIN	2.2	3.1	2.1	1.8	1.8	2.4

MONTHLY AVERAGE = 4.2 MONTHLY MAXIMUM = 12.7 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 86.7% OPERATIONAL RECOVERY RATE = 86.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	5.2	6.6	7.9	8.9	10.5	10.7	11.4	10.6	11.9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9.3
2	***	***	***	***	***	***	***	***	***	15.0	***	9.0	9.2	8.8	9.1	***	***	***	9.5	***	***	***	***	***	10.1
3	***	10.1	11.3	11.9	11.0	11.0	13.7	12.3	12.4	13.2	***	***	8.8	10.6	***	***	6.6	***	***	***	***	***	***	***	11.1
4	***	***	***	***	***	***	***	***	***	***	***	***	***	6.5	***	5.0	3.7	4.6	5.9	5.6	5.2	4.8	6.0	5.1	5.2
5	5.4	7.6	9.6	8.8	7.8	6.6	5.3	7.1	7.9	7.8	7.0	5.6	4.1	3.1	2.1	2.2	2.7	3.2	4.4	3.5	2.4	1.9	2.7	3.1	5.1
6	1.9	2.7	3.4	3.8	4.6	4.7	5.0	3.8	3.5	3.7	5.0	6.0	5.5	7.1	8.8	9.3	5.3	***	***	2.3	1.1	2.2	1.5	2.0	4.2
7	2.5	2.3	2.7	2.2	4.3	4.6	6.0	7.4	3.5	4.1	7.9	***	***	***	***	***	***	5.2	5.8	5.6	2.4	4.4	3.7	3.0	4.3
8	3.2	2.6	2.9	3.2	3.5	3.8	2.7	2.2	2.9	3.7	2.7	3.5	4.5	***	***	***	3.5	3.3	4.9	2.5	2.0	***	2.5	2.0	3.1
9	1.3	1.6	1.6	1.6	1.2	1.4	0.9	1.2	2.4	2.4	2.3	1.8	3.3	4.2	5.1	4.1	4.0	4.9	***	5.0	4.4	2.5	1.9	2.6	2.7
10	3.1	2.9	3.0	3.1	2.8	2.2	2.8	3.7	3.7	3.6	3.4	3.3	3.5	3.1	3.7	2.9	3.8	2.4	***	***	3.5	2.3	2.5	2.1	3.1
11	2.5	2.6	2.6	3.3	2.2	1.8	1.2	1.2	3.4	3.6	5.6	6.3	6.6	5.7	7.5	5.8	3.8	4.7	3.4	2.9	2.3	1.8	4.4	4.4	3.7
12	4.1	3.6	3.5	4.5	4.1	3.9	4.0	4.7	5.4	6.3	6.5	8.4	11.6	***	7.2	7.8	***	11.8	7.7	6.2	6.8	8.1	8.4	6.1	6.4
13	6.8	7.4	7.4	6.9	6.4	5.9	3.4	5.4	4.8	5.3	4.3	4.7	5.1	4.1	2.9	0.8	1.6	2.2	5.2	5.2	2.8	3.2	3.2	2.6	4.5
14	4.3	4.6	3.6	2.5	2.9	2.7	2.3	2.3	3.3	2.0	2.0	1.9	1.7	2.9	4.4	7.7	4.6	4.5	***	***	2.5	1.5	2.5	2.4	3.1
15	2.3	2.2	2.0	2.8	3.6	3.5	3.5	2.3	2.3	1.7	2.8	2.8	2.4	2.6	3.6	3.9	5.5	6.1	3.2	1.3	1.7	2.2	4.1	2.5	3.0
16	2.1	2.5	2.7	3.2	3.3	3.8	3.7	3.6	3.2	2.3	2.7	2.8	1.4	2.4	3.8	5.0	4.4	***	1.5	2.4	***	7.0	4.9	3.5	3.3
17	2.5	1.7	1.7	2.3	2.3	2.6	2.0	2.4	3.3	3.5	3.1	3.6	2.4	3.1	3.5	5.4	7.0	***	***	2.8	2.1	2.1	2.7	2.7	2.9
18	3.1	3.9	4.1	3.3	3.7	4.3	3.6	4.1	4.8	5.4	5.6	5.3	4.4	3.4	3.3	2.8	2.7	2.2	1.8	2.5	1.5	2.3	3.7	2.0	3.5
19	1.6	2.4	2.0	2.0	1.5	2.6	2.8	3.7	3.2	2.5	2.0	1.3	2.0	3.1	4.0	4.1	4.9	6.3	6.3	5.6	2.0	2.2	2.5	2.9	3.1
20	5.7	2.5	1.8	1.1	2.0	2.0	3.5	3.7	3.0	2.1	2.5	1.3	1.7	3.2	5.2	5.8	8.3	6.4	5.6	2.2	4.4	3.7	3.2	2.8	3.5
21	2.1	2.7	2.2	4.8	4.8	4.8	4.9	5.2	3.5	5.9	9.8	6.0	7.2	6.7	6.1	6.6	***	5.8	8.1	8.4	6.7	6.7	6.3	7.3	5.8
22	6.9	6.7	8.0	7.7	6.7	7.7	8.2	8.3	7.9	***	***	***	11.0	8.2	9.8	7.6	8.5	9.6	9.1	11.2	9.3	9.9	8.0	7.1	8.4
23	6.3	7.3	7.1	6.5	5.3	6.4	7.1	7.1	6.3	6.5	4.9	4.9	4.0	3.3	3.8	3.8	1.9	2.9	1.4	2.1	2.3	2.8	2.4	2.2	4.5
24	2.5	1.3	2.3	2.8	2.6	2.4	2.7	2.6	1.3	0.7	3.0	5.9	5.9	8.1	7.7	7.6	8.1	7.1	5.7	5.5	3.6	2.1	2.7	3.5	4.1
25	3.6	3.2	3.0	3.5	3.2	2.2	2.0	2.3	1.9	2.0	1.6	3.0	1.9	2.7	5.2	4.7	5.9	7.7	6.1	5.9	2.9	3.0	2.9	2.6	3.5
26	4.8	6.8	6.2	4.2	***	4.9	6.2	5.9	6.1	6.2	***	6.1	6.3	8.0	7.3	5.9	4.9	3.4	2.0	4.0	5.0	3.2	3.3	7.0	5.4
27	5.1	5.1	3.8	4.7	4.7	7.4	8.5	6.4	7.4	4.1	4.1	5.5	6.8	6.0	7.0	6.6	4.1	2.9	3.5	4.9	5.0	5.8	3.2	5.0	5.3
28	4.3	3.8	3.7	4.0	3.4	4.1	4.4	4.2	4.5	4.2	4.6	4.0	4.1	4.9	3.7	2.9	3.7	4.1	4.4	3.0	2.3	1.7	3.5	5.5	3.9
29	3.3	2.3	3.4	3.7	4.3	3.5	4.1	4.3	4.5	3.7	4.0	3.1	2.8	3.1	3.8	3.7	5.5	6.1	***	3.4	1.7	1.5	1.5	3.1	3.5
30	3.8	3.4	3.2	2.9	2.2	2.3	3.2	3.2	3.3	2.5	2.2	1.8	2.5	3.1	4.4	5.6	***	***	3.5	3.1	3.7	3.9	3.0	3.4	3.2
31	3.0	3.2	1.6	2.2	2.8	3.2	2.5	2.8	3.5	2.8	4.0	3.2	3.3	5.3	6.2	5.6	4.9	***	***	***	***	***	9.0	***	3.8
HRAVE	3.7	4.0	4.1	4.2	4.2	4.4	4.5	4.6	4.7	4.5	4.2	4.3	4.8	4.9	5.4	5.1	4.8	5.1	5.0	4.3	3.4	3.6	3.8	3.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.3	10.1	11.1	5.2	5.1	4.2	4.3	3.1	2.7	3.1	3.7	6.4	4.5	3.1	3.0	3.3	2.9	3.5	3.1	3.5	5.8	8.4	4.5	4.1	3.5
MAX	11.9	15.0	13.7	6.5	9.6	9.3	7.9	4.9	5.1	3.8	7.5	11.8	7.4	7.7	6.1	7.0	7.0	5.6	6.3	8.3	9.8	11.2	7.3	8.1	7.7
MIN	5.2	8.8	6.6	3.7	1.9	1.1	2.2	2.0	0.9	2.1	1.2	3.5	0.8	1.5	1.3	1.4	1.7	1.5	1.3	1.1	2.1	6.7	1.4	0.7	1.6

DAY	26	27	28	29	30	31
AVE	5.4	5.3	3.9	3.5	3.2	3.8
MAX	8.0	8.5	5.5	6.1	5.6	9.0
MIN	2.0	2.9	1.7	1.5	1.8	1.6

MONTHLY AVERAGE = 4.4 MONTHLY MAXIMUM = 15.0 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 87.0% OPERATIONAL RECOVERY RATE = 87.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	6.2	7.1	7.3	8.8	10.2	10.6	11.0	9.9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	8.9
2	***	***	***	***	***	***	***	***	***	***	***	***	***	10.2	***	***	***	***	***	***	***	***	***	***	10.2
3	***	***	***	***	***	10.6	14.9	12.4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	12.7
4	***	***	***	***	***	***	***	***	***	***	***	***	***	6.7	***	4.2	4.1	***	5.3	5.9	5.9	***	6.5	8.1	5.8
5	***	7.6	***	8.0	8.4	***	7.8	6.1	***	***	8.0	5.4	4.0	2.9	1.8	1.9	2.4	3.2	4.8	4.8	2.5	2.0	2.2	3.2	4.6
6	2.0	6.2	5.7	3.8	5.4	4.9	***	4.5	4.9	3.9	4.1	***	***	***	***	***	***	***	***	2.0	1.2	2.2	1.9	1.3	3.6
7	2.5	2.2	3.0	3.0	4.6	4.6	5.5	6.9	3.4	4.1	***	***	***	***	***	***	***	***	5.7	6.0	2.4	3.7	3.6	3.6	4.1
8	3.5	2.6	3.0	4.2	6.5	4.7	2.8	3.1	3.3	4.0	3.0	3.9	6.8	***	***	***	***	***	3.9	2.5	1.7	***	2.5	***	3.6
9	***	***	2.7	1.9	1.7	2.0	1.4	1.2	2.4	4.1	2.2	1.2	3.1	3.8	5.0	6.0	5.1	***	***	***	***	2.6	2.2	2.7	2.8
10	3.5	3.0	2.4	3.0	3.2	2.1	2.7	3.4	4.2	3.5	3.2	2.8	5.0	3.4	3.7	2.9	4.0	2.3	***	***	***	2.5	***	***	3.2
11	***	2.7	2.6	4.9	3.6	2.5	2.4	3.9	3.8	3.6	***	***	***	***	***	***	4.3	***	3.9	***	***	2.0	4.9	4.5	3.5
12	4.2	3.8	3.4	4.3	3.7	3.7	3.5	5.1	5.3	5.9	***	***	***	***	***	***	***	***	***	***	***	***	***	6.0	4.4
13	***	7.7	7.6	7.0	7.0	6.1	2.9	8.3	4.8	6.8	4.4	5.1	***	***	***	1.1	***	***	6.9	5.4	2.9	4.1	4.2	2.3	5.3
14	4.8	5.2	3.9	2.4	2.7	3.7	2.4	3.0	3.8	2.4	2.6	3.1	2.7	3.7	5.5	8.6	***	***	***	***	1.9	1.8	2.1	3.4	3.5
15	3.0	2.2	1.7	2.4	***	4.0	4.1	6.7	2.7	2.1	2.7	3.5	3.4	5.6	3.8	4.2	***	***	3.4	***	3.9	2.1	4.8	2.5	3.4
16	2.8	2.7	2.7	3.4	4.0	4.4	4.0	3.1	3.6	4.6	3.7	2.9	2.0	2.7	***	4.8	***	***	***	***	***	***	***	***	3.4
17	2.6	1.7	***	2.3	3.8	2.7	1.8	2.4	3.6	3.3	3.2	3.8	1.7	3.2	3.5	***	***	***	***	***	2.3	2.3	2.9	2.7	2.8
18	3.0	5.1	4.5	3.7	3.5	3.3	2.9	4.3	5.3	6.0	6.0	6.4	5.3	3.3	3.5	3.8	3.2	2.3	***	***	0.4	2.6	***	2.8	3.9
19	1.5	2.9	2.3	2.8	1.7	3.5	3.1	2.7	3.3	2.5	2.1	1.3	2.0	3.6	4.2	4.2	***	***	***	4.9	2.0	1.7	***	3.1	2.8
20	7.4	5.0	1.9	1.2	2.7	3.3	***	3.6	3.7	2.9	3.2	1.4	3.8	3.0	***	***	***	***	6.1	2.5	4.6	5.7	4.2	4.0	3.7
21	2.1	3.5	2.1	5.0	4.9	***	***	***	3.6	5.0	***	***	***	***	***	***	***	***	***	***	7.5	6.1	5.6	7.2	4.8
22	7.1	6.5	***	***	9.4	8.8	9.7	9.5	8.2	***	***	***	***	***	***	***	***	11.2	***	13.6	***	9.4	8.4	8.4	9.2
23	5.9	8.1	8.5	6.5	5.3	6.9	8.1	8.2	7.9	7.3	5.1	5.5	3.7	4.0	3.8	3.8	1.9	4.0	***	2.2	3.1	3.6	3.8	2.3	5.2
24	2.7	1.3	2.2	3.0	2.9	2.2	2.3	1.5	1.1	1.0	2.5	6.0	5.2	8.1	***	***	***	***	5.6	***	3.7	3.3	2.4	4.5	3.2
25	4.0	3.4	3.2	4.2	3.6	2.3	2.1	3.5	2.8	2.7	2.8	3.6	1.7	3.7	5.4	***	6.3	***	***	***	2.4	3.6	2.8	2.1	3.3
26	***	***	***	5.8	***	***	7.6	4.5	***	***	***	***	***	***	***	***	***	4.5	2.4	***	5.1	***	***	***	5.0
27	***	5.0	4.0	4.9	4.6	7.8	8.0	7.0	7.9	4.4	5.8	9.4	***	***	***	6.9	4.7	***	***	5.2	5.5	5.7	3.2	6.7	5.9
28	5.2	4.1	4.3	3.9	3.4	4.4	3.4	4.7	3.9	5.9	6.8	4.7	4.3	5.3	6.9	***	5.2	***	4.4	3.2	4.4	***	4.8	6.1	4.7
29	3.5	1.8	5.0	4.2	5.0	3.0	3.6	4.3	4.9	3.4	4.0	2.9	2.9	6.2	4.1	***	***	***	***	***	2.1	3.2	1.5	3.3	3.6
30	4.2	6.8	2.9	2.5	2.6	4.6	***	***	3.7	2.8	3.6	3.7	3.5	4.3	4.3	***	***	***	3.6	***	5.2	4.0	6.3	4.5	4.1
31	2.7	3.4	3.3	2.6	4.3	2.8	3.1	3.0	3.4	3.0	7.7	3.5	4.4	4.7	***	***	***	***	***	***	***	***	***	***	3.7
HRAVE	3.8	4.3	3.8	4.1	4.6	4.6	4.8	5.1	4.2	4.0	4.1	4.0	3.6	4.7	4.3	4.4	4.1	4.6	4.7	4.9	3.4	3.5	3.8	4.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	8.9	10.2	12.7	5.8	4.6	3.6	4.1	3.6	2.8	3.2	3.5	4.4	5.3	3.5	3.4	3.4	2.8	3.9	2.8	3.7	4.8	9.2	5.2	3.2	3.3
MAX	11.0	10.2	14.9	8.1	8.4	6.2	6.9	6.8	6.0	5.0	4.9	6.0	8.3	8.6	6.7	4.8	3.8	6.4	4.9	7.4	7.5	13.6	8.5	8.1	6.3
MIN	6.2	10.2	10.6	4.1	1.8	1.2	2.2	1.7	1.2	2.1	2.0	3.4	1.1	1.8	1.7	2.0	1.7	0.4	1.3	1.2	2.1	6.5	1.9	1.0	1.7

DAY	26	27	28	29	30	31
AVE	5.0	5.9	4.7	3.6	4.1	3.7
MAX	7.6	9.4	6.9	6.2	6.8	7.7
MIN	2.4	3.2	3.2	1.5	2.5	2.6

MONTHLY AVERAGE = 4.2 MONTHLY MAXIMUM = 14.9 MONTHLY MINIMUM = 0.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 64.7% OPERATIONAL RECOVERY RATE = 64.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	71	68	62	64	63	65	67	62	66	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	153
2	***	***	***	***	***	***	***	***	***	44	***	72	68	69	39	***	***	***	59	***	***	***	***	***	222
3	***	64	73	67	68	65	61	63	62	62	***	***	54	92	***	***	74	***	***	***	***	***	***	***	88
4	***	***	***	***	***	***	***	***	***	***	***	***	***	254	***	83	130	103	125	103	86	78	85	83	338
5	77	74	63	67	68	72	69	71	72	72	72	74	83	68	7	321	35	30	32	54	341	351	305	320	92
6	68	138	119	101	139	176	273	291	231	246	258	258	262	257	275	275	278	***	***	284	359	90	87	95	190
7	90	93	96	18	102	154	157	165	173	165	158	***	***	***	***	***	***	115	110	135	96	82	68	75	273
8	95	90	93	92	125	147	154	162	165	170	226	280	263	***	***	***	286	323	341	299	217	***	111	93	36
9	99	92	124	96	19	357	39	96	87	84	84	149	268	270	272	270	275	278	313	323	317	295	85	101	107
10	86	96	106	112	89	99	96	85	96	100	94	99	87	89	86	191	103	251	***	***	294	307	301	324	120
11	335	343	338	334	319	124	51	93	107	80	87	80	74	80	86	70	331	276	4	55	67	53	68	71	95
12	79	105	122	94	104	127	113	107	91	70	73	53	56	***	35	47	***	***	65	66	72	70	77	77	326
13	67	68	66	63	71	91	143	150	143	118	92	94	78	82	84	84	79	94	75	40	356	290	92	91	57
14	102	112	104	94	100	135	122	102	97	115	94	83	179	270	283	283	293	321	***	***	321	19	140	94	224
15	92	103	104	113	113	109	143	125	90	57	76	2	346	339	327	291	288	305	333	69	349	30	83	86	183
16	50	7	64	87	97	101	110	131	111	93	87	117	209	277	277	281	286	***	343	304	***	296	285	301	151
17	282	140	106	91	79	84	90	91	99	113	128	143	126	294	280	284	298	***	***	312	91	93	91	94	25
18	89	100	118	124	123	115	126	108	111	100	99	102	99	109	92	85	353	331	26	62	12	77	87	89	149
19	42	358	77	83	81	76	91	95	101	106	121	95	339	133	341	273	286	284	293	289	265	132	100	331	216
20	147	123	71	85	103	97	103	113	126	155	143	151	252	281	284	286	280	277	276	318	292	288	257	129	13
21	88	79	72	78	81	75	76	93	103	86	72	79	79	61	43	36	***	35	57	59	64	66	66	65	23
22	67	65	65	67	64	65	65	69	68	***	***	***	23	***	16	43	46	51	62	62	62	65	69	78	346
23	67	63	66	86	98	94	96	92	100	106	102	98	81	85	77	24	320	340	10	37	23	72	32	40	86
24	97	89	89	107	104	13	11	107	93	95	350	294	289	276	280	278	275	280	290	283	290	277	153	137	184
25	98	101	103	110	119	108	103	137	141	89	148	178	259	276	277	277	276	273	288	289	336	39	25	180	249
26	7	13	49	43	***	75	68	60	75	83	***	71	59	19	20	55	77	79	74	35	42	68	120	77	162
27	85	87	92	103	95	60	62	70	77	126	107	72	42	***	36	17	55	281	327	46	16	17	57	63	97
28	89	108	122	124	145	133	125	128	154	135	103	142	92	80	77	73	72	64	38	5	358	27	71	97	312
29	105	108	102	105	119	120	135	108	114	107	94	95	99	100	263	275	289	286	***	318	38	26	84	92	176
30	106	118	115	127	91	88	98	107	118	101	67	5	115	311	282	276	***	***	267	260	258	223	213	184	132
31	146	79	57	56	99	102	102	94	96	89	79	87	352	271	249	265	256	***	***	***	***	***	192	***	209

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 86.7% OPERATIONAL RECOVERY RATE = 86.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	64	57	59	61	59	60	64	62	65	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	292
2	***	***	***	***	***	***	***	***	***	37	***	73	65	74	38	***	***	***	65	***	***	***	***	***	95
3	***	71	76	73	73	74	61	56	73	61	***	***	68	100	***	***	80	***	***	***	***	***	***	***	90
4	***	***	***	***	***	***	***	***	***	***	***	***	***	246	***	92	147	112	124	116	81	80	81	92	81
5	85	79	62	78	78	73	78	88	80	80	83	81	82	77	356	35	69	59	73	79	354	14	301	296	12
6	45	163	158	128	167	183	264	272	203	259	259	260	276	257	284	259	271	***	***	321	318	91	109	109	259
7	82	121	157	204	187	182	166	173	199	175	154	***	***	***	***	***	***	123	113	138	74	105	74	68	98
8	133	127	148	155	155	171	181	173	185	196	244	260	260	***	***	***	291	291	319	303	276	***	119	91	318
9	100	113	243	140	164	205	171	145	102	112	123	53	282	266	292	265	277	280	***	307	305	306	72	99	33
10	89	87	96	84	86	104	90	82	81	87	78	72	86	35	93	188	128	209	***	***	293	303	278	307	346
11	320	328	307	281	297	277	312	24	84	70	79	81	71	83	92	66	306	281	10	44	64	51	72	76	182
12	76	92	97	85	85	80	93	82	78	75	77	56	58	***	40	55	***	141	62	68	77	73	74	78	38
13	59	74	64	71	81	79	120	96	90	76	78	90	75	71	87	162	86	95	66	48	8	298	351	94	275
14	100	114	107	93	100	144	95	109	85	102	79	58	79	266	295	286	338	314	***	***	330	314	168	97	160
15	79	77	115	141	132	117	135	125	98	70	64	352	337	329	315	291	293	322	325	33	276	1	86	98	312
16	48	13	41	81	84	89	93	101	121	104	99	129	120	273	287	275	279	***	15	323	***	295	281	304	6
17	297	309	126	105	82	79	86	80	95	107	109	69	49	343	305	285	303	***	***	336	49	104	86	88	77
18	87	99	131	126	114	86	105	91	84	80	74	75	89	103	89	87	65	2	25	49	46	325	102	98	117
19	68	310	67	75	99	71	79	85	106	111	146	134	56	198	54	296	279	271	289	291	262	141	112	336	20
20	132	145	169	30	107	125	115	120	113	117	135	185	293	293	288	309	280	280	280	152	294	293	291	301	101
21	19	66	50	65	72	73	82	94	114	93	72	82	86	67	43	6	***	24	40	63	65	70	78	68	160
22	68	65	62	68	73	61	73	75	70	***	***	***	24	80	22	41	41	46	61	56	61	64	73	69	80
23	65	67	69	78	77	69	68	71	77	82	81	84	93	85	129	51	293	348	12	50	17	66	43	14	261
24	99	87	92	112	130	8	266	222	178	81	337	303	305	285	277	284	266	282	291	281	306	319	152	152	332
25	95	99	102	123	116	84	102	115	153	87	73	144	273	279	278	271	275	251	287	288	324	28	21	1	320
26	44	23	42	43	***	79	77	61	67	74	***	76	55	15	21	42	75	67	81	61	56	70	90	71	89
27	76	84	82	107	90	62	70	73	77	122	115	54	52	68	53	61	76	250	112	50	66	62	51	70	223
28	86	112	98	96	118	101	89	87	85	84	77	80	105	98	82	56	63	66	41	3	0	13	65	72	45
29	103	119	92	111	133	110	92	92	86	79	73	83	91	131	226	299	302	282	***	319	39	1	55	86	67
30	117	137	123	146	102	95	101	105	106	87	68	21	189	286	348	270	***	***	265	257	278	226	232	191	188
31	167	65	315	3	141	122	128	95	100	100	114	143	296	252	239	259	241	***	***	***	***	***	191	***	269

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 87.0% OPERATIONAL RECOVERY RATE = 87.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
JANUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	76	59	62	63	58	63	67	66	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	233
2	***	***	***	***	***	***	***	***	***	***	***	***	***	86	***	***	***	***	***	***	***	***	***	***	84
3	***	***	***	***	***	89	62	54	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	39
4	***	***	***	***	***	***	***	***	***	***	***	***	***	244	***	87	145	***	119	124	75	***	82	100	150
5	***	76	***	81	75	***	96	91	***	***	91	74	82	81	325	20	67	53	75	88	352	19	319	272	149
6	182	171	145	128	166	175	***	263	207	256	258	***	***	***	***	***	***	***	***	337	347	75	81	57	183
7	80	128	155	198	169	179	164	178	199	174	***	***	***	***	***	***	***	***	110	139	70	102	73	74	24
8	123	130	191	111	159	168	175	190	189	195	254	259	244	***	***	***	***	***	317	303	259	***	116	***	321
9	***	***	337	178	210	187	228	127	99	116	144	28	291	273	300	253	258	***	***	***	***	306	103	105	348
10	76	82	117	85	83	106	88	90	82	91	73	67	100	46	85	186	96	210	***	***	***	303	***	***	324
11	***	328	311	270	270	264	237	12	79	69	***	***	***	***	***	***	346	***	15	***	***	60	77	76	196
12	78	90	96	84	88	74	96	79	78	76	***	***	***	***	***	***	***	***	***	***	***	***	***	77	311
13	***	74	63	66	81	75	125	110	87	80	81	93	***	***	***	199	***	***	58	49	10	293	354	98	92
14	101	116	105	91	97	150	3	119	69	94	76	32	57	288	280	286	***	***	***	***	332	330	112	111	107
15	43	71	98	120	***	115	121	130	197	73	79	9	2	286	306	293	***	***	325	***	152	19	91	89	339
16	48	3	39	82	91	95	90	114	126	79	108	116	219	256	***	278	***	***	***	***	***	***	***	***	270
17	296	298	***	105	95	78	76	78	101	96	100	69	76	336	315	***	***	***	***	***	47	95	82	73	236
18	87	98	122	137	129	99	105	95	86	85	77	71	87	107	58	90	74	357	***	***	92	350	***	86	60
19	101	325	80	66	84	64	74	103	104	107	128	125	270	213	105	285	***	***	***	290	253	168	***	322	243
20	135	341	128	14	112	177	***	114	111	110	127	106	7	283	***	***	***	***	284	117	310	278	297	315	253
21	18	55	59	63	72	***	***	***	119	73	***	***	***	***	***	***	***	***	***	***	66	74	74	67	79
22	78	69	***	***	63	59	76	77	74	***	***	***	***	***	***	***	***	46	***	42	***	67	76	85	288
23	69	68	79	81	77	76	74	72	78	88	87	109	152	96	247	63	266	331	***	39	50	71	76	13	238
24	103	68	91	115	137	6	292	2	132	2	346	311	304	304	***	***	***	***	291	***	306	329	153	135	305
25	102	95	100	119	117	91	100	87	159	102	99	141	223	262	279	***	279	***	***	***	324	49	14	348	332
26	***	***	***	17	***	***	85	62	***	***	***	***	***	***	***	***	***	70	83	***	52	***	***	***	288
27	***	85	87	109	97	63	70	73	78	121	112	47	***	***	***	59	62	***	***	53	74	62	3	79	7
28	80	103	94	102	118	104	71	83	85	80	95	98	108	95	64	***	51	***	31	4	25	***	52	68	227
29	100	107	100	102	128	113	103	88	92	75	83	67	91	159	253	***	***	***	***	***	51	334	60	116	254
30	110	146	126	122	36	63	***	***	109	67	74	320	252	280	344	***	***	***	259	***	266	226	241	179	298
31	163	73	243	89	144	128	138	68	100	106	122	136	297	234	***	***	***	***	***	***	***	***	***	***	173

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 64.7% OPERATIONAL RECOVERY RATE = 64.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.29	0.43	0.44	0.49	0.56	0.72	0.77	0.67	0.73	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.57
2	***	***	***	***	***	***	***	***	***	***	***	0.85	0.93	1.20	1.12	***	***	***	1.05	***	***	***	***	***	1.03
3	***	***	***	0.86	0.68	1.01	0.86	0.94	0.78	0.81	***	***	1.52	***	***	***	1.34	***	***	***	***	***	***	***	0.98
4	***	***	***	***	***	***	***	***	***	***	***	***	***	0.59	***	0.72	0.66	0.50	0.42	0.42	0.65	0.38	0.56	0.43	0.53
5	0.53	0.57	0.70	0.78	0.85	0.68	0.59	0.89	0.50	0.59	0.47	0.59	0.84	0.77	0.59	0.29	0.38	0.45	0.52	0.44	0.35	0.27	0.42	0.41	0.56
6	0.32	0.26	0.22	0.32	0.29	0.29	***	0.35	0.40	0.58	0.60	0.78	0.59	0.77	0.63	0.76	0.68	***	***	0.43	0.20	0.21	0.25	0.45	0.45
7	0.14	0.03	0.40	0.21	0.34	0.31	0.36	0.47	0.69	0.50	0.52	***	***	***	***	***	***	0.25	0.50	0.61	0.53	0.43	0.64	0.54	0.42
8	0.30	0.42	0.28	0.25	0.55	0.37	0.32	0.11	0.26	0.36	0.35	0.37	0.26	***	***	***	0.53	0.65	0.44	0.10	***	***	0.35	0.28	0.34
9	0.11	0.23	0.03	0.15	0.21	0.05	0.02	0.16	0.19	0.19	0.51	0.68	0.78	0.90	0.78	0.79	0.82	***	***	0.41	0.33	0.43	0.22	0.28	0.38
10	0.36	0.19	0.12	0.23	0.21	0.19	0.10	0.24	0.24	0.21	0.13	0.11	0.32	0.74	0.84	0.69	0.62	0.35	***	***	0.24	0.75	0.30	0.25	0.34
11	0.43	0.30	0.27	0.26	0.33	0.15	0.17	0.19	0.36	0.61	0.91	1.00	1.16	0.95	0.92	0.80	0.77	***	0.76	0.50	0.15	0.26	0.35	0.32	0.52
12	0.42	0.29	0.43	0.26	0.30	0.27	0.24	0.18	0.31	0.54	0.99	1.13	1.25	***	1.10	1.06	***	***	0.69	0.73	0.55	0.57	0.40	0.32	0.57
13	0.38	0.55	0.46	0.45	0.43	0.34	0.42	0.52	0.32	0.32	0.22	0.61	0.82	0.64	0.35	0.30	0.32	0.31	0.44	0.62	0.29	0.17	0.12	0.10	0.40
14	0.27	0.34	0.15	0.03	0.08	0.20	0.04	0.07	0.21	0.17	0.43	0.51	0.62	0.58	0.83	0.69	0.66	***	***	***	0.28	0.18	0.28	0.06	0.32
15	0.04	0.26	0.10	0.20	0.15	0.12	0.18	0.13	0.18	0.15	0.38	0.41	0.15	0.28	0.34	0.29	0.59	0.75	0.58	0.59	0.21	0.20	0.38	0.28	0.29
16	0.25	0.22	0.35	0.17	0.26	0.17	0.15	0.24	0.09	0.15	0.46	0.65	0.77	0.51	0.76	0.72	***	***	0.58	0.27	***	***	0.60	0.41	0.39
17	0.19	0.01	0.13	0.29	0.15	0.18	0.14	0.14	0.15	0.23	0.59	0.65	0.86	0.62	0.50	0.62	0.62	***	***	0.46	0.07	0.03	0.32	0.30	0.33
18	0.20	0.23	0.23	0.28	0.24	0.30	0.24	0.21	0.29	0.35	0.21	0.31	0.38	0.56	0.61	0.44	0.54	0.40	0.39	0.29	0.30	0.08	0.15	0.11	0.31
19	0.17	0.12	0.06	0.15	0.03	0.12	0.05	0.33	0.29	0.04	0.13	0.56	0.86	0.79	0.75	0.69	0.79	***	0.48	0.38	0.05	0.27	0.31	0.32	0.34
20	0.48	0.64	0.03	0.01	0.03	0.09	0.16	0.15	0.23	0.23	0.32	0.65	0.62	0.81	0.78	0.90	0.78	0.95	0.33	0.47	0.38	0.30	0.24	0.17	0.41
21	0.25	0.33	0.21	0.38	0.81	0.77	0.74	0.80	0.33	0.78	0.88	1.03	1.35	1.21	0.87	0.88	***	0.77	0.94	0.77	0.64	0.63	0.81	0.72	0.73
22	0.46	0.51	0.66	0.56	0.50	0.66	0.66	0.67	0.69	***	***	***	0.88	***	1.13	0.93	0.72	0.67	0.80	0.94	0.87	0.96	0.59	0.45	0.72
23	0.49	0.64	0.60	0.43	0.33	0.33	0.27	0.39	0.47	0.44	0.41	0.49	0.62	0.66	0.45	0.62	0.48	0.49	0.28	0.19	0.26	0.22	0.16	0.18	0.41
24	0.17	0.10	0.08	0.22	0.21	0.32	0.25	0.28	0.24	0.14	0.21	0.43	0.97	1.01	0.91	0.89	0.91	0.96	0.53	0.36	0.27	0.37	0.29	0.37	0.44
25	0.13	0.26	0.31	0.06	0.29	0.07	0.15	0.12	0.03	0.22	0.49	0.52	0.77	0.72	0.95	0.89	0.96	0.59	0.53	0.01	0.41	0.86	0.81	1.03	0.47
26	1.08	0.85	0.91	0.90	***	0.77	0.66	1.05	0.97	0.79	***	1.07	1.16	1.13	1.09	1.17	0.99	0.65	0.55	0.68	0.70	0.84	0.88	0.83	0.90
27	0.93	0.77	0.52	0.36	0.51	0.59	0.53	0.53	0.57	0.56	0.42	1.06	1.15	***	1.23	1.03	1.02	0.70	0.38	0.42	0.54	0.60	0.45	0.38	0.66
28	0.30	0.25	0.35	0.23	0.26	0.27	0.37	0.28	0.40	0.44	0.42	0.46	0.67	1.04	0.90	0.55	0.97	0.54	0.49	0.59	0.35	0.25	0.26	0.34	0.46
29	0.36	0.26	0.14	0.22	0.30	0.21	0.45	0.37	0.50	0.28	0.42	0.52	0.65	0.68	0.70	0.61	0.80	0.79	***	0.31	0.23	0.21	0.18	0.35	0.41
30	0.23	0.20	0.13	0.23	0.20	0.07	0.26	0.10	0.14	0.08	0.45	0.30	0.78	0.97	0.74	0.90	***	***	0.26	0.41	0.26	0.20	0.38	0.56	0.36
31	0.67	0.70	0.63	0.62	0.49	0.50	0.25	0.24	0.22	0.28	0.32	0.56	0.82	0.92	0.95	0.72	0.58	***	***	***	***	***	***	***	0.56
HRAVE	0.36	0.36	0.32	0.33	0.34	0.35	0.34	0.37	0.37	0.37	0.45	0.63	0.81	0.79	0.80	0.73	0.73	0.60	0.54	0.46	0.36	0.39	0.40	0.38	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.57	1.03	0.98	0.53	0.56	0.45	0.42	0.34	0.38	0.34	0.52	0.57	0.40	0.32	0.29	0.39	0.33	0.31	0.34	0.41	0.73	0.72	0.41	0.44	0.47
MAX	0.77	1.20	1.52	0.72	0.89	0.78	0.69	0.65	0.90	0.84	1.16	1.25	0.82	0.83	0.75	0.77	0.86	0.61	0.86	0.95	1.35	1.13	0.66	1.01	1.03
MIN	0.29	0.85	0.68	0.38	0.27	0.20	0.03	0.10	0.02	0.10	0.15	0.18	0.10	0.03	0.04	0.09	0.01	0.08	0.03	0.01	0.21	0.45	0.16	0.08	0.01

DAY	26	27	28	29	30	31
AVE	0.90	0.66	0.46	0.41	0.36	0.56
MAX	1.17	1.23	1.04	0.80	0.97	0.95
MIN	0.55	0.36	0.23	0.14	0.07	0.22

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 84.8% OPERATIONAL RECOVERY RATE = 84.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.49	0.52	0.36	0.46	0.64	0.69	0.85	0.63	0.61	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.58
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.75	***	***	***	***	***	0.75
3	***	***	***	0.62	0.62	0.86	0.69	0.82	0.88	0.74	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.75
4	***	***	***	***	***	***	***	***	***	***	***	***	***	0.51	***	0.74	0.78	0.41	0.35	0.40	0.62	0.33	0.63	0.36	0.51
5	0.55	0.40	***	0.54	0.80	0.70	***	0.53	0.42	0.45	0.40	0.50	0.72	0.58	0.52	0.26	0.45	0.49	0.30	0.36	0.16	0.43	0.31	0.50	0.47
6	0.39	0.33	0.18	0.21	0.30	0.32	***	0.40	0.23	0.40	0.50	0.66	0.57	0.82	***	***	0.67	***	***	0.23	0.14	0.27	0.06	0.20	0.36
7	0.10	0.03	0.17	0.16	0.31	0.43	0.21	0.60	0.67	0.43	0.50	***	***	***	***	***	***	0.40	0.39	0.54	0.39	0.32	0.51	0.49	0.37
8	0.25	0.47	0.38	0.32	0.49	0.30	0.34	0.27	0.20	0.29	0.28	0.33	0.31	***	***	***	0.52	***	***	0.11	***	***	0.23	0.08	0.30
9	0.04	0.44	0.18	0.14	0.24	0.19	0.05	0.25	0.38	0.14	0.31	0.39	0.73	1.05	0.88	0.67	0.78	***	***	***	0.20	0.36	0.24	0.14	0.37
10	0.49	0.27	0.44	0.19	0.24	0.40	0.29	0.60	0.42	0.18	0.28	0.15	0.19	0.54	0.83	0.76	0.73	0.42	***	***	***	0.60	***	0.22	0.41
11	0.19	0.26	0.24	0.36	0.56	0.24	0.26	0.30	0.54	0.67	***	0.75	1.32	0.75	1.01	0.75	0.95	***	0.70	0.47	0.13	0.27	0.32	0.40	0.52
12	0.41	0.25	0.57	0.28	0.41	0.31	0.16	0.18	0.91	0.51	0.91	***	***	***	***	***	***	***	0.59	0.57	0.56	0.48	0.42	0.32	0.46
13	0.43	0.44	0.44	0.47	0.44	0.27	0.34	0.37	0.47	0.38	0.63	0.58	0.85	0.59	0.47	0.22	0.23	0.17	0.38	0.70	0.31	0.31	0.22	0.01	0.41
14	0.14	0.40	0.14	0.01	0.05	0.20	0.27	0.19	0.38	0.34	0.24	0.21	0.42	0.55	0.69	0.73	0.59	***	***	***	0.15	0.27	0.33	0.31	0.31
15	0.15	0.20	0.29	0.65	0.02	0.09	0.46	0.43	0.41	0.08	0.37	0.42	0.15	0.23	0.24	0.29	***	0.52	0.47	0.53	0.19	0.10	0.25	0.45	0.30
16	0.08	0.53	0.45	0.32	0.32	0.25	0.38	0.27	0.37	0.11	0.30	0.47	0.34	0.45	0.82	0.73	***	***	0.20	0.14	***	***	0.38	0.20	0.36
17	0.18	0.01	0.03	0.27	0.30	0.60	0.28	0.53	0.23	0.25	0.18	0.48	0.54	0.25	0.39	0.63	***	***	***	***	0.06	0.03	0.24	0.07	0.28
18	0.10	0.35	0.39	0.04	0.14	0.48	0.91	0.51	0.43	0.51	0.29	0.20	0.35	0.40	0.42	0.63	0.55	0.30	***	0.33	0.11	0.16	0.08	0.08	0.34
19	0.07	0.19	0.01	0.35	0.01	0.06	0.26	0.23	0.32	0.28	0.12	0.33	0.68	0.83	0.81	0.69	0.81	***	***	0.27	0.17	0.21	0.21	0.26	0.33
20	0.57	0.54	0.23	0.01	0.18	0.38	0.18	0.48	0.05	0.30	0.19	0.51	0.38	0.88	0.81	0.80	0.74	***	0.46	0.66	0.30	0.33	0.20	0.05	0.40
21	0.20	0.64	0.41	0.74	1.02	0.91	0.85	1.00	0.38	0.79	***	***	***	***	1.18	1.26	***	***	0.93	0.84	0.67	0.80	0.74	0.78	0.79
22	0.53	0.41	0.95	0.66	0.93	0.58	0.59	0.81	0.64	***	***	***	***	***	***	***	0.63	0.51	0.78	1.02	0.71	0.98	0.47	0.52	0.69
23	0.40	0.63	0.76	0.70	0.76	0.40	0.35	0.53	0.65	1.05	0.78	0.45	0.54	0.69	0.51	0.62	0.59	0.33	0.14	0.24	0.19	0.13	0.36	0.36	0.51
24	0.06	0.38	0.10	0.21	0.28	0.43	0.44	0.30	0.30	0.09	0.46	0.54	0.88	0.91	0.79	0.82	0.93	***	0.52	0.60	0.32	0.92	0.50	0.21	0.48
25	0.38	0.33	0.15	0.07	0.45	0.33	0.31	0.15	0.16	0.74	0.44	0.37	0.70	0.85	0.98	0.83	0.99	0.62	***	***	0.61	0.73	0.61	0.77	0.53
26	***	***	***	0.85	***	0.78	0.77	1.11	***	0.78	***	***	1.03	1.05	1.05	1.14	0.93	0.61	0.44	0.51	0.80	0.69	1.04	0.80	0.85
27	0.87	0.79	0.71	0.47	0.48	0.51	0.40	0.50	0.71	0.89	0.54	1.12	1.32	***	***	1.03	1.05	0.73	0.34	0.33	0.52	0.58	0.39	0.58	0.68
28	0.30	0.52	0.40	0.26	0.31	0.17	0.27	0.28	0.42	0.63	0.42	0.33	0.56	1.07	0.95	0.57	0.88	0.54	0.49	0.60	0.41	0.33	0.23	0.33	0.47
29	0.30	0.20	0.29	0.14	0.47	0.29	0.49	0.52	0.66	0.48	0.49	0.43	0.56	0.75	0.68	0.63	***	0.74	***	0.33	0.23	0.24	0.23	0.33	0.43
30	0.20	0.41	0.35	0.40	0.65	0.06	0.13	0.06	0.47	0.64	0.65	0.24	0.54	0.92	0.70	0.86	***	***	0.20	0.46	0.49	0.41	0.37	0.51	0.44
31	0.67	0.82	0.86	0.62	0.51	0.55	0.28	0.41	0.27	0.21	0.28	0.52	0.86	0.79	***	***	***	***	***	***	***	***	***	***	0.55
HRAVE	0.32	0.40	0.36	0.36	0.43	0.41	0.40	0.46	0.45	0.46	0.42	0.45	0.63	0.70	0.74	0.71	0.73	0.48	0.47	0.47	0.35	0.41	0.37	0.35	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.58	0.75	0.75	0.51	0.47	0.36	0.37	0.30	0.37	0.41	0.52	0.46	0.41	0.31	0.30	0.36	0.28	0.34	0.33	0.40	0.79	0.69	0.51	0.48	0.53
MAX	0.85	0.75	0.88	0.78	0.80	0.82	0.67	0.52	1.05	0.83	1.32	0.91	0.85	0.73	0.65	0.82	0.63	0.91	0.83	0.88	1.26	1.02	1.05	0.93	0.99
MIN	0.36	0.75	0.62	0.33	0.16	0.06	0.03	0.08	0.04	0.15	0.13	0.16	0.01	0.01	0.02	0.08	0.01	0.04	0.01	0.01	0.20	0.41	0.13	0.06	0.07

DAY	26	27	28	29	30	31
AVE	0.85	0.68	0.47	0.43	0.44	0.55
MAX	1.14	1.32	1.07	0.75	0.92	0.86
MIN	0.44	0.33	0.17	0.14	0.06	0.21

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 78.5% OPERATIONAL RECOVERY RATE = 78.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
JANUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.56	0.50	0.30	0.51	0.60	***	0.97	0.84	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.61
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	0.66	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.66
4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
5	***	***	***	***	***	***	***	***	***	***	0.43	0.50	0.83	0.45	0.50	0.27	0.48	0.51	0.28	0.37	0.17	0.44	0.27	0.46	0.43
6	0.36	0.32	0.25	***	***	0.29	***	***	0.23	0.38	0.49	***	***	***	***	***	***	***	***	***	***	***	0.08	***	0.30
7	***	0.04	0.17	0.17	0.37	0.51	***	0.79	0.63	0.39	***	***	***	***	***	***	***	***	0.34	***	0.36	0.34	0.46	0.44	0.39
8	0.22	***	0.38	0.28	0.59	0.25	0.36	***	***	0.26	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.33
9	***	***	***	***	0.22	0.23	***	***	0.34	0.12	0.27	0.40	0.74	1.03	***	***	***	***	***	***	***	***	***	***	0.42
10	0.59	0.34	0.53	0.16	0.27	0.46	0.32	0.59	0.52	0.19	0.28	0.13	0.18	0.47	0.81	0.83	0.70	0.44	***	***	***	***	***	***	0.43
11	***	***	***	0.40	0.51	0.22	0.26	0.31	0.61	0.51	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.40
12	0.27	0.26	0.61	0.28	0.44	0.34	0.17	0.20	0.81	0.44	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.38
13	***	***	***	***	0.42	0.28	0.33	0.26	0.45	0.36	0.59	0.56	***	***	***	***	***	***	***	***	0.50	***	***	0.01	0.38
14	***	0.47	0.11	0.01	0.09	0.27	0.28	0.20	0.34	0.32	0.22	0.40	0.39	***	***	***	***	***	***	***	***	***	***	***	0.26
15	***	***	0.38	0.66	***	0.09	0.49	0.40	0.38	0.07	0.08	***	0.15	0.26	0.25	0.24	***	***	***	***	***	***	***	***	0.29
16	0.05	0.47	0.48	0.30	0.32	0.27	0.40	0.26	0.31	0.09	0.27	0.49	0.36	0.41	***	***	***	***	***	***	***	***	***	***	0.32
17	0.14	***	***	***	***	0.50	***	0.24	0.25	0.27	0.19	0.69	0.55	0.30	0.31	***	***	***	***	***	0.06	***	***	0.01	0.29
18	0.04	0.44	***	0.03	0.13	0.50	0.82	0.48	0.41	0.46	0.28	0.23	0.34	0.33	0.38	0.67	0.58	0.34	***	***	***	***	***	***	0.38
19	***	***	***	***	***	0.03	***	0.25	0.33	0.23	0.10	0.26	0.67	0.97	***	***	***	***	***	***	0.33	0.18	***	***	0.34
20	***	0.49	0.32	***	0.24	0.37	***	0.49	0.25	0.29	0.18	0.49	0.38	0.93	***	***	***	***	***	0.81	***	0.36	0.34	0.07	0.40
21	***	0.62	0.47	0.81	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.63
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.35	0.51	0.43
23	***	***	***	0.78	0.76	0.44	0.37	0.55	0.61	0.97	0.76	0.50	***	***	***	***	***	***	***	0.26	***	0.12	0.40	***	0.54
24	***	***	***	***	***	***	0.43	0.32	0.26	0.09	0.46	***	***	***	***	***	***	***	***	***	***	0.84	0.67	***	0.44
25	***	***	***	***	***	0.37	***	0.14	0.25	0.68	0.43	0.38	0.70	***	0.89	***	***	***	***	***	0.84	***	***	***	0.52
26	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
27	***	***	0.75	***	***	***	0.34	0.51	0.72	0.88	0.60	***	***	***	***	***	***	***	***	***	***	0.53	***	***	0.62
28	***	***	0.30	0.18	***	0.19	0.26	0.27	0.43	0.58	0.55	0.33	0.53	***	***	***	***	***	***	0.60	***	***	***	***	0.38
29	***	***	0.24	***	***	0.19	0.50	0.49	0.66	0.54	0.54	0.39	0.55	0.68	0.58	***	***	***	***	***	0.24	0.25	***	***	0.45
30	***	***	***	***	0.58	***	***	***	0.46	0.56	0.62	0.23	0.57	0.93	0.70	***	***	***	***	***	***	0.40	0.42	0.55	0.55
31	0.68	0.75	***	***	***	***	***	0.46	0.31	0.24	0.27	0.52	0.83	***	***	***	***	***	***	***	***	***	***	***	0.51
HRAVE	0.32	0.43	0.38	0.35	0.40	0.31	0.44	0.40	0.43	0.39	0.38	0.41	0.52	0.61	0.55	0.50	0.59	0.43	0.31	0.51	0.36	0.38	0.37	0.29	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.61	***	0.66	***	0.43	0.30	0.39	0.33	0.42	0.43	0.40	0.38	0.38	0.26	0.29	0.32	0.29	0.38	0.34	0.40	0.63	0.43	0.54	0.44	0.52
MAX	0.97	***	0.66	***	0.83	0.49	0.79	0.59	1.03	0.83	0.61	0.81	0.59	0.47	0.66	0.49	0.69	0.82	0.97	0.93	0.81	0.51	0.97	0.84	0.89
MIN	0.30	***	0.66	***	0.17	0.08	0.04	0.22	0.12	0.13	0.22	0.17	0.01	0.01	0.07	0.05	0.01	0.03	0.03	0.07	0.47	0.35	0.12	0.09	0.14

DAY	26	27	28	29	30	31
AVE	***	0.62	0.38	0.45	0.55	0.51
MAX	***	0.88	0.60	0.68	0.93	0.83
MIN	***	0.34	0.18	0.19	0.23	0.24

MONTHLY AVERAGE = 0.4 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 37.4% OPERATIONAL RECOVERY RATE = 37.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	7.9	6.6	7.3	6.7	8.8	***	***	***	***	***	***	***	5.0	5.1	4.2	3.4	4.8	5.2	4.8	4.6	5.9	5.7
2	6.1	4.6	4.6	5.1	2.6	3.6	4.2	4.7	4.7	4.5	4.1	4.6	6.2	7.8	7.5	6.7	6.5	6.1	4.1	2.8	1.9	1.7	2.1	3.3	4.6
3	3.3	2.8	3.0	2.6	3.2	3.2	2.9	3.2	3.5	3.5	3.2	3.9	5.6	5.9	4.8	4.2	4.1	3.4	***	5.3	3.1	3.0	4.4	5.0	3.8
4	5.0	5.3	4.7	4.0	4.7	6.5	6.8	7.5	6.9	***	***	8.4	***	***	***	***	***	5.7	6.0	4.8	5.1	3.9	4.1	3.4	5.5
5	3.1	3.3	3.7	3.3	5.1	5.6	4.8	5.3	4.4	4.1	4.6	7.0	6.6	5.8	5.7	6.9	6.0	5.1	5.1	6.9	5.9	4.9	6.3	8.9	5.3
6	7.4	7.0	7.6	***	9.7	8.7	8.8	8.9	8.4	***	***	***	8.6	9.8	***	***	***	***	8.1	8.5	8.1	8.8	8.1	7.3	8.4
7	7.2	7.5	6.9	7.3	6.5	5.4	5.5	4.9	5.8	4.7	4.4	5.4	6.2	***	***	6.2	5.3	4.7	3.7	4.8	7.1	6.5	5.7	5.8	5.8
8	7.3	8.1	***	***	7.1	6.9	6.5	7.1	8.6	***	***	***	***	***	***	***	***	4.9	4.2	5.0	4.7	4.5	5.2	8.2	6.3
9	8.8	6.9	6.3	6.8	6.8	7.4	7.4	8.2	7.8	7.4	***	***	7.9	8.9	***	***	7.2	7.0	7.1	7.5	6.2	6.2	6.7	6.2	7.2
10	5.3	6.1	5.5	4.6	4.9	4.4	6.2	7.1	5.3	4.8	5.4	5.1	5.0	4.4	5.0	5.8	5.3	***	4.5	2.7	2.6	2.2	4.3	4.3	4.8
11	4.3	4.9	4.8	4.7	4.9	5.0	4.2	3.8	4.1	4.1	3.6	3.3	3.3	3.2	2.5	3.2	3.4	3.3	***	5.9	3.2	2.3	3.1	3.9	3.9
12	4.4	5.1	5.0	4.7	5.2	4.9	4.8	5.3	5.3	5.0	3.9	3.5	3.7	4.1	3.3	3.0	4.2	4.9	6.3	6.1	4.1	***	5.7	4.7	4.7
13	4.3	4.3	4.6	4.4	4.5	4.6	4.8	5.0	5.3	4.8	4.5	4.5	3.9	3.1	3.7	3.9	5.8	***	6.6	6.1	5.0	2.6	1.5	2.6	4.4
14	3.2	3.3	3.7	4.2	4.3	4.4	3.9	2.8	3.2	3.1	2.2	2.0	2.5	3.1	4.4	7.5	7.7	***	***	5.8	4.4	2.2	3.0	3.2	3.8
15	3.4	3.0	3.2	4.3	4.6	3.4	3.9	4.3	6.7	***	5.8	***	***	***	5.9	4.4	3.8	3.1	***	7.7	6.2	***	2.8	2.7	4.4
16	2.8	3.0	2.5	2.5	2.8	3.3	3.5	4.6	7.2	5.8	3.3	2.7	5.0	5.8	4.5	3.6	4.3	***	***	6.0	5.5	4.8	5.1	5.0	4.3
17	5.5	4.3	4.5	5.0	4.9	5.2	4.7	4.5	4.5	4.1	3.6	3.2	4.0	3.7	3.8	4.2	4.1	4.0	***	4.9	2.2	2.4	2.7	3.1	4.0
18	2.8	3.6	3.6	3.2	3.5	3.6	3.1	2.6	2.8	2.6	2.3	3.2	3.8	3.8	3.6	4.0	5.8	***	6.3	5.3	3.2	2.7	2.2	2.5	3.5
19	2.4	2.5	3.2	3.4	2.9	3.1	3.1	3.7	3.3	2.5	2.3	2.1	2.7	3.3	2.4	3.5	3.9	3.4	4.4	3.4	4.1	2.7	2.3	2.9	3.1
20	3.6	4.0	4.1	3.6	3.0	2.9	3.1	4.1	4.3	3.2	2.9	2.5	3.1	3.8	4.0	4.2	4.8	5.8	6.1	7.3	5.7	***	2.3	2.4	3.9
21	2.7	2.8	3.6	3.6	3.1	3.5	3.1	3.2	3.8	2.9	2.1	2.3	4.5	5.8	5.3	5.2	7.0	7.0	6.8	4.5	4.4	2.2	2.3	3.1	3.9
22	3.3	4.1	4.5	4.8	2.8	2.9	3.7	3.9	2.5	1.3	2.1	3.2	6.3	8.5	9.8	***	***	***	7.3	7.5	7.4	9.2	9.1	8.1	5.3
23	4.3	3.8	2.7	2.6	3.0	2.8	2.7	2.4	2.8	5.4	5.7	6.4	4.9	3.8	3.8	4.1	***	4.3	4.1	4.4	***	6.3	7.2	***	4.2
24	6.9	5.3	5.0	6.4	8.3	8.4	8.7	9.0	***	9.6	***	***	***	***	8.6	6.7	6.6	6.5	7.4	6.9	6.8	6.9	7.0	6.7	7.2
25	7.4	7.0	6.2	4.6	4.9	5.3	4.9	4.7	4.8	6.1	7.0	6.3	5.9	6.1	6.1	5.2	5.1	6.1	6.6	7.8	8.1	7.5	7.5	7.4	6.2
26	7.5	7.7	7.5	8.6	8.5	8.2	8.6	8.1	8.6	7.1	7.2	7.8	7.3	5.9	5.1	5.2	5.4	5.1	5.7	6.3	6.0	5.8	4.2	4.6	6.8
27	4.3	4.0	4.0	4.1	4.2	4.7	5.2	4.7	3.9	4.0	3.5	4.2	3.7	3.7	4.2	5.5	5.9	7.3	5.7	4.1	3.1	2.3	2.2	3.2	4.2
28	3.8	4.6	4.7	4.7	4.2	4.1	4.2	4.3	2.9	2.8	2.2	2.3	3.3	4.1	4.6	5.8	6.1	5.8	6.8	5.6	3.8	2.1	2.8	3.8	4.1
29	3.9	3.5	3.3	4.2	4.6	4.2	3.9	3.9	3.5	2.1	1.7	2.1	2.5	4.2	5.7	5.2	6.4	6.6	5.5	4.3	4.0	2.8	2.4	3.1	3.9
HRAVE	4.8	4.7	4.6	4.6	4.9	4.9	5.0	5.2	5.0	4.4	3.8	4.2	4.8	5.2	5.0	5.0	5.4	5.2	5.7	5.6	4.9	4.3	4.4	4.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.7	4.6	3.8	5.5	5.3	8.4	5.8	6.3	7.2	4.8	3.9	4.7	4.4	3.8	4.4	4.3	4.0	3.5	3.1	3.9	3.9	5.3	4.2	7.2	6.2
MAX	8.8	7.8	5.9	8.4	8.9	9.8	7.5	8.6	8.9	7.1	5.9	6.3	6.6	7.7	7.7	7.2	5.5	6.3	4.4	7.3	7.0	9.8	7.2	9.6	8.1
MIN	3.4	1.7	2.6	3.4	3.1	7.0	3.7	4.2	6.2	2.2	2.3	3.0	1.5	2.0	2.7	2.5	2.2	2.2	2.1	2.3	2.1	1.3	2.4	5.0	4.6

DAY	26	27	28	29	30	31
AVE	6.8	4.2	4.1	3.9	***	***
MAX	8.6	7.3	6.8	6.6	***	***
MIN	4.2	2.2	2.1	1.7	***	***

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 9.8 MONTHLY MINIMUM = 1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 89.9% OPERATIONAL RECOVERY RATE = 89.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	7.8	6.3	8.8	7.3	11.0	***	***	***	***	***	***	***	4.3	4.6	5.5	4.4	6.2	6.2	5.5	5.1	4.7	6.3
2	6.4	5.5	4.9	4.4	2.0	4.7	4.1	4.7	5.4	4.0	3.4	4.6	6.8	7.3	8.6	6.9	6.4	7.3	4.6	2.9	2.7	2.0	2.7	3.0	4.8
3	2.8	2.9	3.4	2.5	3.3	3.2	2.9	3.4	3.5	3.6	3.2	4.6	6.1	9.2	6.0	3.9	3.1	4.4	***	6.5	3.1	3.3	4.7	5.3	4.1
4	4.3	6.6	4.8	4.3	4.9	7.6	6.7	7.0	7.5	***	***	9.9	***	***	***	***	***	5.2	5.4	4.3	4.2	3.5	4.1	3.6	5.5
5	2.9	3.3	3.5	3.8	5.2	5.8	5.7	6.4	5.2	4.8	7.1	8.2	7.9	4.8	4.7	6.3	5.9	5.2	5.3	5.8	6.5	5.8	6.6	11.2	5.7
6	8.0	7.1	7.6	***	10.4	9.5	10.1	8.0	7.9	***	***	***	9.4	8.5	***	***	***	***	10.4	8.8	9.6	9.4	8.9	8.4	8.9
7	7.6	7.1	6.3	7.2	6.6	6.1	5.7	5.0	5.1	5.4	5.6	5.2	4.5	***	***	5.8	4.9	4.8	4.0	5.5	7.3	7.3	5.9	6.1	5.9
8	6.5	8.0	***	***	9.6	8.2	5.8	8.2	9.3	***	***	***	***	***	***	5.0	5.6	6.6	5.2	4.8	4.8	5.3	4.9	8.9	6.7
9	12.5	7.3	6.8	6.8	7.1	8.1	8.4	9.3	8.4	8.0	***	***	8.4	10.5	***	***	6.9	6.6	6.9	8.7	6.0	6.3	5.9	5.7	7.7
10	5.4	5.8	6.0	4.9	4.6	4.9	7.3	7.0	7.0	6.2	5.5	5.5	4.8	6.4	6.1	6.6	4.5	***	3.6	4.2	2.5	2.2	4.9	5.5	5.3
11	3.8	4.4	3.8	3.4	4.8	3.8	3.6	3.3	3.8	3.8	3.6	4.4	3.0	2.2	3.6	2.8	3.4	3.3	***	5.7	3.2	2.3	2.8	4.0	3.6
12	4.1	4.6	5.3	4.1	4.2	4.8	3.7	3.1	5.4	4.8	4.7	4.5	4.0	4.2	4.0	2.9	4.3	5.0	6.3	6.6	6.3	9.5	5.4	4.5	4.8
13	4.4	3.8	3.5	4.6	4.3	4.7	4.4	4.3	6.1	4.9	4.3	5.1	5.3	4.2	3.5	3.1	5.6	***	7.8	6.9	5.7	2.4	1.1	1.8	4.4
14	2.3	2.2	2.8	2.7	3.7	3.5	2.9	2.0	2.8	2.5	2.1	2.0	1.7	2.4	4.7	8.4	8.2	***	***	5.8	4.3	1.7	2.3	2.9	3.4
15	2.9	2.5	2.7	3.7	4.6	3.9	4.0	4.8	8.0	***	4.8	***	***	***	6.1	5.0	4.2	3.2	***	8.4	7.2	***	1.6	1.3	4.4
16	2.4	3.6	2.7	2.2	3.2	2.7	2.8	4.2	6.9	6.6	3.5	3.1	5.8	6.2	4.6	2.9	3.7	***	***	6.0	6.9	4.8	5.2	4.6	4.3
17	4.6	4.3	4.6	5.2	5.3	4.8	4.9	6.2	5.8	3.9	3.8	3.0	5.4	5.1	5.5	4.7	4.0	3.5	***	5.2	2.5	2.4	2.0	2.6	4.3
18	2.8	3.0	3.3	3.0	3.3	3.2	3.0	2.3	2.4	2.6	2.4	3.3	3.3	3.5	4.3	4.1	5.2	***	6.5	4.1	2.9	2.4	2.8	1.9	3.3
19	2.4	3.4	3.4	3.7	3.5	2.7	3.1	2.7	2.7	2.7	2.3	2.7	3.9	3.8	3.2	3.5	3.8	1.5	4.5	3.8	4.4	3.6	2.5	2.4	3.2
20	3.3	4.5	4.1	3.3	2.3	2.3	3.0	3.0	3.3	3.0	2.8	2.3	1.7	3.2	3.7	4.4	5.6	6.2	3.0	6.7	6.0	***	2.6	1.7	3.6
21	2.3	3.1	3.4	3.4	3.1	2.7	2.2	2.6	3.5	2.8	1.7	1.5	5.5	5.9	4.8	4.9	6.3	6.8	7.7	5.1	4.8	3.0	1.3	2.0	3.8
22	2.7	3.4	4.6	4.1	4.0	3.6	4.9	3.8	2.5	1.5	1.8	3.5	5.5	8.1	9.5	***	***	***	7.7	7.8	9.4	9.4	9.9	7.9	5.5
23	5.1	5.4	3.0	4.4	4.0	4.7	3.4	3.0	4.3	8.1	4.9	6.6	6.3	5.8	4.6	3.6	***	3.1	4.0	4.8	***	5.1	9.4	***	4.9
24	7.0	7.1	5.5	6.8	8.0	9.3	10.2	11.1	***	11.4	***	***	***	***	8.4	6.2	6.3	7.7	9.2	7.7	7.1	7.6	5.9	6.5	7.8
25	7.0	7.2	7.4	5.8	6.3	6.2	6.2	5.4	5.8	4.8	6.8	6.8	7.0	4.8	5.8	5.9	5.1	6.0	7.3	8.2	8.7	7.6	6.1	7.7	6.5
26	7.7	7.8	8.1	8.3	9.9	10.2	8.7	8.0	10.2	7.8	7.8	8.1	7.8	5.7	6.4	6.7	6.8	4.6	6.0	7.2	6.7	5.8	5.4	5.0	7.4
27	4.1	3.7	4.2	3.7	4.0	4.5	4.6	3.8	4.0	4.8	3.9	4.7	2.7	4.6	4.8	5.8	5.8	7.5	6.3	4.2	2.9	2.8	3.3	3.0	4.3
28	4.2	4.4	4.0	4.3	3.5	3.2	4.0	3.3	2.3	2.9	1.6	2.3	3.3	4.9	4.8	5.5	5.8	5.2	6.0	5.4	4.0	3.5	2.5	3.7	3.9
29	3.6	3.6	3.1	5.3	3.8	3.3	2.4	2.4	3.4	2.8	2.2	2.0	2.3	3.6	7.9	6.6	6.9	6.7	6.9	3.6	4.0	2.2	2.4	2.3	3.9
HRAVE	4.8	4.8	4.5	4.6	5.0	5.2	5.0	5.1	5.3	4.7	3.9	4.5	5.1	5.4	5.5	5.0	5.3	5.3	6.1	5.9	5.4	4.7	4.4	4.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.3	4.8	4.1	5.5	5.7	8.9	5.9	6.7	7.7	5.3	3.6	4.8	4.4	3.4	4.4	4.3	4.3	3.3	3.2	3.6	3.8	5.5	4.9	7.8	6.5
MAX	11.0	8.6	9.2	9.9	11.2	10.4	7.6	9.6	12.5	7.3	5.7	9.5	7.8	8.4	8.4	6.9	6.2	6.5	4.5	6.7	7.7	9.9	9.4	11.4	8.7
MIN	4.3	2.0	2.5	3.5	2.9	7.1	4.0	4.8	5.7	2.2	2.2	2.9	1.1	1.7	1.3	2.2	2.0	1.9	1.5	1.7	1.3	1.5	3.0	5.5	4.8

DAY	26	27	28	29	30	31
AVE	7.4	4.3	3.9	3.9	***	***
MAX	10.2	7.5	6.0	7.9	***	***
MIN	4.6	2.7	1.6	2.0	***	***

MONTHLY AVERAGE = 5.0 MONTHLY MAXIMUM = 12.5 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 90.4% OPERATIONAL RECOVERY RATE = 90.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
FEBRUARY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	***	***	***	6.3	9.4	***	***	***	***	***	***	***	***	***	***	***	6.1	4.3	7.0	5.5	5.5	4.9	6.3	6.1
2	6.0	5.9	5.0	4.2	2.1	***	***	***	***	4.2	4.2	4.2	6.7	7.3	9.5	***	***	***	***	1.5	2.3	2.7	3.0	3.6	4.5
3	***	3.0	4.0	2.3	3.1	4.3	3.6	5.1	3.1	5.2	3.7	7.2	5.7	7.7	5.9	***	***	8.4	***	***	3.0	2.9	6.3	***	4.7
4	***	7.0	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	5.0	***	***	***	3.1	***	***	5.0
5	***	3.0	3.2	4.3	4.5	6.3	6.2	6.5	4.4	5.9	***	***	4.7	***	***	***	***	***	***	***	6.2	***	***	***	5.0
6	***	6.9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9.2	8.2	8.1
7	***	6.7	***	***	***	6.1	6.1	5.3	7.9	7.1	5.6	***	***	***	***	***	5.2	***	***	***	***	***	***	***	6.3
8	***	***	***	***	8.5	9.9	6.6	9.3	***	***	***	***	***	***	***	***	***	7.0	***	***	5.2	5.1	***	***	7.4
9	***	***	***	***	***	***	***	***	10.3	***	***	***	***	***	***	***	***	4.7	***	***	***	***	***	***	7.5
10	***	5.2	7.0	4.6	5.3	5.0	7.8	7.7	7.0	9.8	9.0	***	***	7.2	***	***	***	***	***	6.3	2.3	***	5.2	5.9	6.4
11	3.8	***	4.0	3.5	5.2	4.3	3.1	3.3	3.4	4.1	3.8	4.5	3.4	***	6.1	***	***	***	***	***	***	***	2.7	3.8	3.9
12	4.2	***	5.7	4.2	4.2	5.7	3.6	2.9	5.7	4.8	4.3	5.7	6.1	***	***	***	***	***	***	***	***	***	6.0	4.8	4.8
13	5.1	3.3	4.1	4.6	4.1	4.1	4.3	4.3	5.4	5.3	3.7	3.7	***	4.5	2.8	3.3	***	***	***	7.7	***	***	***	2.2	4.3
14	2.1	2.1	2.8	***	3.6	3.8	2.6	2.0	2.9	3.5	2.9	2.5	1.8	***	***	***	***	***	***	***	***	***	***	***	2.7
15	***	2.5	2.8	3.8	4.7	4.4	4.6	5.3	10.9	***	***	***	***	***	***	***	***	***	***	***	***	***	1.5	1.4	4.2
16	2.3	3.6	2.3	2.4	3.6	2.6	2.8	4.2	7.3	6.2	3.8	3.1	7.5	***	4.6	***	***	***	***	***	6.7	***	***	4.3	4.2
17	5.3	4.2	5.0	5.0	5.5	4.6	4.6	5.2	5.0	3.9	4.2	3.4	4.7	5.1	***	***	***	***	***	***	2.5	***	2.2	2.5	4.3
18	2.8	***	***	***	***	***	***	2.7	3.2	2.5	2.2	***	3.8	***	***	***	***	***	***	***	***	***	2.9	1.9	2.7
19	4.6	4.7	4.4	6.8	5.1	2.9	3.1	3.1	2.6	3.9	2.7	2.3	***	***	2.3	***	***	***	***	***	3.9	***	3.3	3.0	3.7
20	4.7	7.2	5.9	5.1	2.2	3.3	3.8	3.3	2.9	2.8	2.5	2.6	2.2	3.2	4.1	4.7	5.9	***	***	***	***	***	***	2.0	3.8
21	***	4.1	4.6	3.3	3.1	2.6	***	3.6	4.5	3.9	2.8	1.5	6.2	7.0	4.1	***	6.4	***	***	5.6	5.0	3.2	1.6	1.5	3.9
22	3.5	4.6	5.1	3.8	3.8	3.9	4.8	3.5	2.5	2.0	3.3	4.1	6.0	***	12.8	***	***	***	***	***	***	***	***	***	4.6
23	***	***	3.6	6.3	6.3	***	***	2.8	4.2	8.5	4.2	6.6	7.7	5.1	4.7	7.0	***	***	***	***	***	***	***	***	5.6
24	***	***	8.8	7.8	***	***	***	***	***	***	***	***	***	***	***	***	6.6	***	***	***	***	8.2	5.8	5.7	7.1
25	***	***	6.2	6.8	7.1	6.8	6.9	6.8	7.8	6.2	***	7.1	7.5	***	6.6	5.8	***	***	***	***	***	***	***	8.4	6.9
26	***	***	9.4	8.0	9.2	11.5	8.8	9.0	5.8	6.8	***	9.4	***	***	5.6	7.1	7.3	***	***	***	5.6	6.0	5.7	6.2	7.6
27	3.7	4.8	5.3	6.0	***	5.0	5.2	4.5	5.1	5.3	5.2	7.9	4.2	4.7	5.5	7.5	***	***	***	***	***	3.2	***	4.5	5.2
28	5.8	5.9	4.4	5.7	2.4	***	3.9	3.5	2.3	3.0	2.6	5.0	5.9	6.8	4.1	3.3	***	***	***	***	***	4.1	5.1	4.1	4.3
29	4.4	3.5	***	4.2	7.8	4.6	2.5	3.9	2.8	2.7	3.3	3.5	2.2	3.2	***	***	***	***	***	***	4.2	***	4.0	2.9	3.7
HRAVE	4.2	4.6	4.9	4.9	4.9	5.3	4.7	4.7	5.1	4.9	3.9	4.7	5.1	5.6	5.6	5.5	6.3	6.2	4.3	5.6	4.4	4.4	4.3	4.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.1	4.5	4.7	5.0	5.0	8.1	6.3	7.4	7.5	6.4	3.9	4.8	4.3	2.7	4.2	4.2	4.3	2.7	3.7	3.8	3.9	4.6	5.6	7.1	6.9
MAX	9.4	9.5	8.4	7.0	6.5	9.2	7.9	9.9	10.3	9.8	6.1	6.1	7.7	3.8	10.9	7.5	5.5	3.8	6.8	7.2	7.0	12.8	8.5	8.8	8.4
MIN	4.3	1.5	2.3	3.1	3.0	6.9	5.2	5.1	4.7	2.3	2.7	2.9	2.2	1.8	1.4	2.3	2.2	1.9	2.3	2.0	1.5	2.0	2.8	5.7	5.8

DAY	26	27	28	29	30	31
AVE	7.6	5.2	4.3	3.7	***	***
MAX	11.5	7.9	6.8	7.8	***	***
MIN	5.6	3.2	2.3	2.2	***	***

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 12.8 MONTHLY MINIMUM = 1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 52.6% OPERATIONAL RECOVERY RATE = 52.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
FEBRUARY - 2016

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	***	***	273	271	265	255	246	***	***	***	***	***	***	***	273	275	278	264	281	271	267	274	284	288
2	278	277	273	274	316	286	275	280	293	280	278	275	278	276	279	279	282	278	278	252	236	176	133	103	310
3	100	83	90	93	87	97	96	104	105	99	90	87	25	75	80	80	293	267	***	293	313	41	79	119	76
4	93	82	97	81	74	73	67	66	71	***	***	71	***	***	***	***	***	36	22	26	64	69	70	76	206
5	87	106	118	88	75	84	102	91	97	101	80	78	33	69	83	64	30	42	69	60	67	81	73	66	107
6	66	67	65	***	67	71	69	70	67	***	***	***	20	33	***	***	***	***	45	57	65	61	67	72	315
7	72	73	71	69	73	84	82	99	115	104	94	89	71	***	***	77	87	92	84	64	61	67	88	79	343
8	70	79	***	***	74	80	80	75	71	***	***	***	***	***	***	***	***	81	82	80	79	82	77	61	116
9	61	72	73	72	70	64	64	66	68	68	***	***	59	65	***	***	43	38	52	39	49	59	67	63	311
10	66	67	77	99	104	87	73	71	85	91	87	73	76	79	69	73	47	***	3	5	358	47	75	89	39
11	106	118	131	140	152	152	152	140	146	121	94	101	92	138	138	261	269	266	***	292	295	71	96	100	222
12	111	128	135	143	153	144	141	144	137	106	91	87	77	69	80	82	76	41	35	18	7	***	71	100	117
13	116	120	107	104	107	117	121	109	87	88	98	95	91	89	98	274	278	***	286	291	300	277	158	97	298
14	100	94	104	107	140	131	144	115	127	155	39	119	336	264	274	287	285	***	***	286	282	263	114	102	183
15	85	79	93	111	116	108	109	92	75	***	78	***	***	***	79	86	90	56	***	296	302	***	30	99	48
16	117	94	95	97	109	132	118	153	151	153	145	127	82	57	76	81	11	***	***	23	43	45	35	90	212
17	119	97	100	111	113	113	101	92	98	99	86	98	88	89	43	272	307	280	***	288	17	92	104	150	100
18	132	115	108	101	101	125	98	93	95	97	68	94	85	46	83	229	253	***	289	287	302	149	88	76	208
19	77	83	95	89	84	92	88	102	100	83	93	134	106	300	308	275	286	303	291	291	278	342	78	97	272
20	105	105	110	109	97	100	108	125	141	98	86	214	277	269	269	264	276	279	292	294	295	***	6	86	104
21	90	90	100	101	102	108	105	100	139	116	106	251	283	280	272	261	283	283	282	281	284	291	112	108	212
22	103	106	111	109	130	97	100	117	105	39	2	295	286	286	276	***	***	***	271	280	287	289	290	294	57
23	303	289	319	83	75	51	24	3	37	58	33	79	88	87	304	275	***	276	7	3	***	1	34	***	207
24	48	69	75	87	80	72	79	82	***	77	***	***	***	***	71	74	17	13	20	49	62	64	66	65	133
25	66	76	76	82	92	100	88	88	94	69	74	76	70	43	14	10	17	27	50	47	54	64	66	65	190
26	64	67	69	67	63	64	65	67	66	73	76	76	71	16	33	49	34	26	17	23	18	28	38	79	355
27	99	98	102	134	108	107	113	125	122	82	92	84	94	93	313	286	280	282	279	285	272	290	27	100	248
28	105	111	110	117	133	112	111	136	107	81	144	162	224	277	279	278	285	278	285	284	289	40	97	104	13
29	106	102	106	115	136	140	142	147	147	115	341	85	205	274	284	279	279	276	280	281	285	299	118	104	354

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 89.9% OPERATIONAL RECOVERY RATE = 89.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	261	261	269	247	251	***	***	***	***	***	***	***	273	274	270	257	273	274	266	270	290	23
2	277	272	274	290	322	286	259	278	302	272	298	315	261	277	259	268	283	284	281	264	256	165	135	99	265
3	99	94	97	97	96	90	88	88	89	86	80	76	74	79	76	77	248	260	***	303	308	52	69	112	235
4	91	80	92	79	77	72	66	70	66	***	***	55	***	***	***	***	***	46	32	34	59	67	68	71	354
5	82	94	114	76	74	84	87	84	104	116	66	64	43	69	87	63	26	42	67	60	57	69	89	62	174
6	65	65	61	***	71	73	72	74	69	***	***	***	22	27	***	***	***	***	61	59	67	57	69	70	339
7	76	75	71	69	75	79	75	93	129	83	79	73	89	***	***	88	91	93	74	63	55	60	73	75	119
8	71	68	***	***	66	71	80	80	73	***	***	***	***	***	***	26	52	80	77	83	78	69	78	60	333
9	56	68	77	71	71	60	61	60	69	66	***	***	63	52	***	***	69	48	54	32	47	61	66	63	23
10	67	71	69	85	90	88	69	72	69	74	73	71	76	64	68	69	54	***	7	1	3	34	65	80	256
11	100	110	113	122	147	158	105	113	81	83	80	78	96	99	101	273	280	268	***	298	290	59	99	86	10
12	113	111	131	139	161	143	108	133	85	85	78	90	86	62	80	76	63	51	48	20	40	29	62	95	141
13	118	105	93	83	91	98	92	81	66	77	85	90	85	73	75	299	281	***	297	295	296	286	204	106	39
14	127	98	91	100	156	159	164	119	108	105	61	160	246	260	271	291	286	***	***	284	283	237	107	105	243
15	93	77	84	115	122	89	86	84	74	***	96	***	***	***	71	87	88	71	***	295	309	***	16	87	273
16	119	71	91	78	89	130	134	158	155	151	129	101	98	71	50	68	1	***	***	28	40	43	64	92	290
17	116	93	91	93	87	98	85	69	76	87	76	81	90	83	38	274	328	289	***	287	36	102	120	152	172
18	150	119	108	101	99	125	106	93	103	101	47	87	68	28	81	217	266	***	286	283	291	162	95	59	148
19	85	43	94	88	83	84	108	136	89	94	97	78	81	300	279	283	305	290	292	292	278	337	26	90	288
20	94	94	116	123	118	127	130	150	130	90	83	323	342	288	298	279	292	275	157	265	285	***	17	71	353
21	84	81	94	106	108	114	93	91	164	166	149	186	307	283	266	271	284	279	282	291	283	284	142	123	229
22	99	101	112	130	149	121	107	142	109	16	14	294	315	295	264	***	***	***	272	278	281	290	293	290	186
23	314	292	324	99	53	4	33	22	30	66	34	61	79	89	20	22	***	263	37	5	***	348	23	***	30
24	53	77	75	88	75	86	77	87	***	81	***	***	***	***	79	69	25	19	23	61	61	66	71	65	131
25	65	78	73	83	82	93	91	81	78	61	71	50	78	39	5	46	32	44	44	45	57	64	69	63	227
26	61	67	73	67	63	64	71	75	61	74	88	66	81	9	71	80	66	28	23	23	20	53	44	69	62
27	101	95	101	128	92	101	111	119	83	70	80	70	122	136	29	275	274	283	289	279	306	324	19	84	180
28	128	106	117	126	145	116	133	157	94	80	163	217	273	296	283	266	281	284	283	285	345	131	99	93	169
29	117	175	109	136	145	127	128	132	123	66	23	338	254	286	289	285	284	284	268	265	254	99	97	96	335

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 90.4% OPERATIONAL RECOVERY RATE = 90.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	***	266	267	***	***	***	***	***	***	***	***	***	***	***	268	264	274	268	267	271	275	35
2	280	270	273	271	323	***	***	***	***	265	267	310	265	270	256	***	***	***	***	201	208	250	146	87	241
3	***	91	98	93	92	80	113	101	105	59	73	46	43	86	77	***	***	247	***	***	309	34	52	***	12
4	***	82	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	51	***	***	***	71	***	***	206
5	***	90	119	71	74	72	81	86	114	87	***	***	46	***	***	***	***	***	***	***	49	***	***	***	128
6	***	73	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	69	69	164
7	***	76	***	***	***	79	72	95	125	94	106	***	***	***	***	***	88	***	***	***	***	***	***	***	141
8	***	***	***	***	71	67	77	80	***	***	***	***	***	***	***	***	***	85	***	***	71	69	***	***	323
9	***	***	***	***	***	***	***	***	70	***	***	***	***	***	***	***	***	52	***	***	***	***	***	***	255
10	***	76	76	75	89	90	68	68	73	94	80	***	***	58	***	***	***	***	***	358	359	***	77	79	179
11	92	***	112	122	143	140	113	118	106	99	81	79	75	***	107	***	***	***	***	***	***	***	102	91	112
12	113	***	136	144	164	147	114	138	88	88	77	90	57	***	***	***	***	***	***	***	***	***	63	102	211
13	120	133	96	85	92	112	96	84	69	84	93	117	***	84	80	309	***	***	***	297	***	***	***	116	265
14	128	101	90	***	158	167	164	152	117	105	51	139	72	***	***	***	***	***	***	***	***	***	***	***	246
15	***	65	77	111	125	95	89	83	75	***	***	***	***	***	***	***	***	***	***	***	***	***	36	84	208
16	119	69	138	74	80	141	135	146	155	148	121	103	103	***	50	***	***	***	***	***	51	***	***	89	342
17	96	93	94	89	86	96	85	70	79	86	77	91	98	88	***	***	***	***	***	***	57	***	112	150	158
18	166	***	***	***	***	***	***	85	107	101	49	***	52	***	***	***	***	***	***	***	***	***	108	61	208
19	67	36	99	88	72	85	123	135	88	106	105	82	***	***	327	***	***	***	***	***	285	***	335	88	81
20	94	91	106	128	134	97	157	152	109	90	72	322	344	296	276	303	291	***	***	***	***	***	***	64	265
21	***	68	93	105	109	117	***	3	190	127	190	188	310	298	289	***	283	***	***	278	289	296	145	108	227
22	92	98	103	125	128	129	98	134	101	59	312	289	315	***	266	***	***	***	***	***	***	***	***	***	348
23	***	***	325	93	62	***	***	339	301	84	66	72	80	69	49	148	***	***	***	***	***	***	***	***	72
24	***	***	66	90	***	***	***	***	***	***	***	***	***	***	***	***	27	***	***	***	***	48	70	53	312
25	***	***	77	80	87	90	102	75	76	48	***	33	60	***	10	69	***	***	***	***	***	***	***	61	187
26	***	***	57	66	80	71	89	76	30	45	***	63	***	***	62	76	65	***	***	***	23	49	60	85	181
27	97	99	102	152	***	110	111	120	98	80	80	75	121	109	80	253	***	***	***	***	***	284	***	78	319
28	122	106	97	124	168	***	123	144	98	89	140	172	267	259	301	281	***	***	***	***	***	40	109	99	357
29	135	148	***	120	120	120	107	115	97	23	25	22	273	286	***	***	***	***	***	***	242	***	82	120	301

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 52.6% OPERATIONAL RECOVERY RATE = 52.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	0.52	0.66	0.49	0.68	0.55	***	***	***	***	***	***	***	0.50	0.51	0.35	0.42	0.48	0.34	0.46	0.56	0.52	0.50
2	0.46	0.42	0.46	0.46	0.49	0.16	0.21	0.43	0.42	0.61	0.74	1.07	1.08	1.09	0.95	0.85	1.02	1.02	0.58	0.47	0.42	0.32	0.23	0.16	0.59
3	0.47	0.20	0.36	0.24	0.26	0.12	0.01	0.11	0.18	0.27	0.47	0.95	1.18	1.06	1.02	0.92	0.80	0.65	***	0.47	0.43	0.45	0.84	1.01	0.54
4	0.61	0.69	0.44	0.68	0.60	0.68	0.73	0.79	0.89	***	***	***	***	***	***	***	***	***	0.86	0.72	0.65	0.49	0.59	0.55	0.66
5	0.33	0.27	0.51	0.49	0.80	0.64	0.53	0.63	0.69	0.72	1.01	1.25	1.28	1.13	0.97	1.33	1.23	1.03	0.79	0.87	0.97	0.64	0.68	***	0.82
6	0.64	0.53	0.71	***	0.97	0.67	0.55	0.60	0.79	***	***	***	1.02	1.09	***	***	***	***	***	0.76	0.73	0.68	0.56	0.53	0.72
7	0.45	0.46	0.57	0.83	0.70	0.44	0.47	0.35	0.52	0.38	0.66	0.79	0.97	***	***	0.84	0.84	0.56	0.49	0.68	0.86	0.98	0.80	0.64	0.65
8	0.66	1.00	***	***	0.77	0.55	0.57	0.60	0.78	***	***	***	***	***	***	***	***	0.83	0.55	0.44	0.57	0.75	0.99	0.96	0.72
9	1.21	0.99	0.81	0.48	0.49	0.55	0.66	0.64	0.60	1.11	***	***	***	1.25	***	***	1.41	0.99	0.90	0.87	0.64	0.54	0.56	0.56	0.80
10	0.44	0.36	0.49	0.36	0.29	0.24	0.40	0.42	0.45	0.53	0.64	1.02	0.86	1.03	0.98	0.84	0.74	***	0.49	0.41	0.33	0.32	0.56	0.55	0.55
11	0.29	0.44	0.32	0.30	0.27	0.31	0.37	0.26	0.38	0.29	0.47	0.62	0.54	0.69	0.89	0.98	1.01	1.04	***	0.36	0.44	0.32	0.17	0.29	0.48
12	0.21	0.31	0.33	0.46	0.44	0.35	0.39	0.41	0.33	0.35	0.44	0.48	0.77	0.85	0.83	0.92	0.73	0.61	0.72	0.59	0.55	***	0.69	0.38	0.53
13	0.27	0.26	0.49	0.38	0.29	0.33	0.35	0.26	0.37	0.34	0.36	0.69	0.95	0.98	1.01	0.83	0.75	***	0.46	0.42	0.62	0.50	0.15	0.42	0.50
14	0.33	0.12	0.10	0.32	0.34	0.27	0.17	0.09	0.14	0.19	0.62	0.72	0.83	0.59	0.83	1.00	1.10	***	***	0.50	0.21	0.28	0.18	0.28	0.42
15	0.44	0.24	0.29	0.30	0.22	0.11	0.29	0.34	0.62	***	0.83	***	***	***	1.03	1.01	0.83	0.81	***	0.76	0.45	***	0.74	0.23	0.53
16	0.11	0.10	0.14	0.32	0.26	0.23	0.13	0.34	0.39	0.41	0.41	0.69	1.01	1.12	1.03	0.99	0.87	***	***	0.89	0.73	0.59	0.74	0.66	0.55
17	0.48	0.32	0.32	0.39	0.54	0.32	0.42	0.33	0.23	0.33	0.55	0.60	0.71	1.07	1.06	1.05	1.07	0.85	***	0.71	0.31	0.24	0.30	0.21	0.54
18	0.16	0.35	0.20	0.68	0.30	0.41	0.26	0.19	0.14	0.26	0.39	0.74	0.86	0.73	0.75	0.73	0.76	***	0.44	0.34	0.37	0.32	0.29	0.34	0.44
19	0.19	0.20	0.18	0.26	0.19	0.31	0.26	0.43	0.38	0.26	0.43	0.51	0.72	0.64	0.49	0.44	0.69	0.49	0.42	0.33	0.47	0.50	0.39	0.13	0.39
20	0.22	0.17	0.25	0.31	0.14	0.25	0.13	0.19	0.28	0.21	0.39	0.80	0.61	0.79	0.84	0.68	0.76	0.85	0.53	0.54	0.42	***	0.53	0.29	0.44
21	0.34	0.41	0.21	0.31	0.15	0.06	0.03	0.22	0.39	0.43	0.69	0.60	0.74	0.93	0.78	0.84	0.94	0.83	0.64	0.54	0.33	0.26	0.25	0.10	0.46
22	0.14	0.18	0.15	0.30	0.16	0.05	0.20	0.29	0.22	0.32	0.32	0.49	0.93	0.85	1.21	***	***	***	0.87	0.68	0.64	0.86	0.66	0.69	0.49
23	0.66	0.36	0.45	0.47	0.37	0.28	0.21	0.26	0.45	1.01	1.18	1.13	1.32	1.25	1.19	1.17	***	0.92	0.80	0.85	***	1.30	***	***	0.78
24	0.61	0.78	0.71	0.52	0.63	0.57	0.67	0.67	***	0.77	***	***	***	***	0.97	1.02	1.27	1.01	0.85	0.76	0.76	0.72	0.68	0.76	0.78
25	0.73	0.61	0.62	0.35	0.40	0.41	0.34	0.35	0.56	0.82	1.42	1.27	1.27	1.01	0.95	1.00	1.03	0.75	0.69	0.68	0.60	0.74	0.69	0.72	0.75
26	0.75	0.77	0.51	0.48	0.65	0.69	0.64	0.62	0.75	0.82	0.98	1.07	1.22	1.24	0.99	1.10	0.90	0.83	0.50	0.64	0.80	0.50	0.66	0.52	0.78
27	0.60	0.45	0.32	0.31	0.31	0.39	0.33	0.24	0.29	0.47	0.46	0.76	0.87	0.82	1.12	1.01	0.65	0.71	0.69	0.26	0.39	0.45	0.36	0.26	0.52
28	0.19	0.19	0.24	0.44	0.33	0.23	0.16	0.36	0.26	0.29	0.74	0.82	0.97	0.93	1.14	1.22	0.95	0.87	0.56	0.25	0.53	0.55	0.35	0.41	0.54
29	0.33	0.48	0.25	0.27	0.21	0.21	0.14	0.23	0.12	0.39	0.59	0.76	0.87	0.82	1.12	0.99	0.81	0.84	0.46	0.60	0.58	0.43	0.36	0.28	0.51
HRAVE	0.44	0.42	0.39	0.42	0.42	0.36	0.36	0.39	0.43	0.48	0.64	0.81	0.94	0.95	0.96	0.93	0.90	0.80	0.62	0.58	0.54	0.55	0.52	0.46	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.50	0.59	0.54	0.66	0.82	0.72	0.65	0.72	0.80	0.55	0.48	0.53	0.50	0.42	0.53	0.55	0.54	0.44	0.39	0.44	0.46	0.49	0.78	0.78	0.75
MAX	0.68	1.09	1.18	0.89	1.33	1.09	0.98	1.00	1.41	1.03	1.04	0.92	1.01	1.10	1.03	1.12	1.07	0.86	0.72	0.85	0.94	1.21	1.32	1.27	1.42
MIN	0.34	0.16	0.01	0.44	0.27	0.53	0.35	0.44	0.48	0.24	0.17	0.21	0.15	0.09	0.11	0.10	0.21	0.14	0.13	0.13	0.03	0.05	0.21	0.52	0.34

DAY	26	27	28	29	30	31
AVE	0.78	0.52	0.54	0.51	***	***
MAX	1.24	1.12	1.22	1.12	***	***
MIN	0.48	0.24	0.16	0.12	***	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 89.1% OPERATIONAL RECOVERY RATE = 89.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	***	0.81	***	0.60	***	***	***	***	***	***	***	***	0.66	0.66	0.33	0.47	0.41	0.40	0.50	0.52	0.63	0.54
2	0.57	0.54	0.49	0.44	0.42	0.17	0.13	0.31	***	0.56	0.72	1.07	1.06	1.22	1.06	0.80	0.86	1.14	***	***	0.25	0.09	0.15	0.02	0.57
3	0.31	0.15	0.14	0.06	0.06	0.04	0.01	0.19	0.37	0.31	0.48	1.09	1.09	1.06	1.00	0.83	0.72	0.80	***	***	0.46	0.64	0.90	0.94	0.53
4	0.67	0.81	0.46	0.64	0.53	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.62	***	0.43	0.46	0.67	0.59
5	0.45	0.52	0.65	0.44	0.63	0.65	0.56	0.74	0.73	0.55	***	***	1.21	1.06	***	1.17	1.27	***	0.69	***	0.86	0.73	0.75	***	0.76
6	0.88	0.75	0.64	***	***	0.59	0.72	0.63	0.77	***	***	***	0.92	***	***	***	***	***	***	0.92	***	0.51	0.42	0.44	0.68
7	0.50	0.46	0.61	0.84	0.68	0.45	0.63	0.41	0.47	0.55	0.77	0.78	***	***	***	***	***	0.69	0.94	0.72	0.77	0.86	0.79	0.59	0.66
8	0.73	***	***	***	0.81	0.64	0.63	0.50	0.60	***	***	***	***	***	***	***	***	0.76	0.51	0.56	0.60	0.77	0.94	***	0.67
9	***	***	0.77	0.46	0.54	0.64	0.67	0.73	0.65	1.00	***	***	***	***	***	***	***	***	***	***	0.63	0.63	0.54	0.48	0.65
10	0.58	0.51	0.89	0.39	0.40	0.35	0.36	0.49	0.63	0.74	0.68	***	0.85	1.10	0.98	***	0.66	***	0.74	0.73	0.40	0.32	0.64	0.44	0.61
11	0.22	0.32	0.19	0.31	0.31	0.44	0.59	0.26	0.39	0.49	0.37	0.36	0.47	0.76	0.78	0.99	1.14	0.87	***	***	0.52	0.40	0.11	0.17	0.48
12	0.26	0.34	0.30	0.60	0.49	0.57	0.35	0.50	0.43	0.46	0.52	0.47	0.76	0.77	0.94	1.00	0.66	0.53	0.73	0.60	0.59	0.74	0.85	0.38	0.58
13	0.28	0.43	0.67	0.48	0.39	0.41	0.36	0.37	0.68	0.45	0.37	0.66	0.91	0.97	***	0.91	0.67	***	***	0.30	***	0.45	0.15	0.24	0.51
14	0.28	0.27	0.19	0.43	0.42	0.20	0.18	0.03	0.17	0.45	0.48	0.56	0.65	0.57	0.86	***	***	***	***	***	***	0.32	0.39	0.28	0.37
15	0.40	0.24	0.35	0.36	0.19	0.42	0.30	0.38	0.67	***	0.64	***	***	***	***	***	***	***	***	***	***	***	0.61	0.25	0.40
16	0.25	0.21	0.29	0.40	0.48	0.44	0.47	0.41	0.37	0.39	0.34	0.62	1.00	***	0.98	0.97	1.04	***	***	***	0.77	0.50	0.58	0.54	0.55
17	0.32	0.24	0.33	0.38	0.69	0.28	0.49	0.58	0.50	0.27	0.55	0.70	0.74	1.14	0.95	0.86	1.01	0.96	***	***	0.38	0.28	0.29	0.27	0.56
18	0.15	0.37	0.20	0.47	0.53	0.53	0.53	0.43	0.17	0.30	0.55	0.67	0.85	0.82	0.70	0.62	***	***	0.60	0.41	0.44	0.37	0.28	0.41	0.47
19	0.16	0.15	0.13	0.19	0.12	0.26	0.25	0.47	0.23	0.27	0.32	0.34	0.94	0.72	0.34	0.59	0.64	0.53	0.44	***	***	0.57	0.30	0.04	0.36
20	0.13	0.18	0.26	0.40	0.06	0.28	0.18	0.29	0.27	0.43	0.55	0.68	0.34	0.88	0.95	0.81	0.84	0.90	***	***	0.68	***	0.50	0.18	0.47
21	0.28	0.29	0.09	0.25	0.10	0.36	0.07	0.33	0.71	0.50	0.61	0.42	0.63	0.89	0.85	1.03	1.10	1.02	0.71	0.57	0.26	0.16	0.45	0.26	0.50
22	0.15	0.31	0.28	0.51	0.51	0.06	0.08	0.30	0.57	0.37	0.36	0.39	0.94	0.79	***	***	***	***	0.77	0.64	0.65	0.86	0.54	***	0.48
23	***	0.47	0.52	0.55	0.63	0.54	0.60	0.47	0.85	0.88	1.07	1.26	1.24	1.16	1.09	1.09	***	0.87	0.82	0.77	***	***	***	***	0.83
24	0.74	0.70	0.80	0.68	***	***	0.55	***	***	***	***	***	***	***	***	***	1.06	0.89	***	0.67	0.81	0.76	0.69	0.83	0.76
25	0.73	0.72	0.67	0.34	0.43	0.43	0.41	0.43	0.68	0.84	1.55	1.44	1.22	0.97	0.91	0.94	1.10	***	***	0.68	0.51	0.82	0.80	0.80	0.79
26	0.76	0.80	0.51	0.46	0.59	0.65	0.68	0.62	0.73	1.11	0.87	***	1.17	1.09	0.92	1.19	0.82	1.12	0.53	0.63	0.70	0.61	0.62	0.61	0.77
27	0.53	0.28	0.39	0.46	0.49	0.41	0.41	0.35	0.54	0.98	0.45	0.98	0.76	0.78	1.05	1.03	***	0.55	0.60	***	0.54	0.63	0.49	0.26	0.59
28	0.26	0.16	0.41	0.54	0.33	0.28	0.17	0.24	0.63	0.59	0.41	0.79	0.86	1.09	1.02	0.81	0.94	1.00	***	***	***	0.60	0.46	0.45	0.57
29	0.41	0.44	0.45	0.20	0.12	0.69	0.62	0.65	0.32	0.45	0.40	0.58	0.92	0.88	1.04	0.85	0.74	0.81	***	***	0.49	0.50	0.48	0.41	0.57
HRAVE	0.42	0.41	0.43	0.43	0.44	0.41	0.41	0.43	0.53	0.56	0.59	0.73	0.89	0.94	0.91	0.90	0.88	0.81	0.66	0.62	0.56	0.54	0.52	0.42	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.54	0.57	0.53	0.59	0.76	0.68	0.66	0.67	0.65	0.61	0.48	0.58	0.51	0.37	0.40	0.55	0.56	0.47	0.36	0.47	0.50	0.48	0.83	0.76	0.79
MAX	0.81	1.22	1.09	0.81	1.27	0.92	0.94	0.94	1.00	1.10	1.14	1.00	0.97	0.86	0.67	1.04	1.14	0.85	0.94	0.95	1.10	0.94	1.26	1.06	1.55
MIN	0.33	0.02	0.01	0.43	0.44	0.42	0.41	0.50	0.46	0.32	0.11	0.26	0.15	0.03	0.19	0.21	0.24	0.15	0.04	0.06	0.07	0.06	0.47	0.55	0.34

DAY	26	27	28	29	30	31
AVE	0.77	0.59	0.57	0.57	***	***
MAX	1.19	1.05	1.09	1.04	***	***
MIN	0.46	0.26	0.16	0.12	***	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 78.0% OPERATIONAL RECOVERY RATE = 78.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
FEBRUARY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.46	***	***	0.53	***	***	0.50
2	***	***	0.51	***	0.47	***	***	***	***	***	0.72	1.08	***	***	***	***	***	***	***	***	***	***	0.06	0.01	0.48
3	***	0.19	0.11	0.05	0.05	0.03	0.01	0.18	0.57	0.31	0.49	***	***	0.83	***	***	***	***	***	***	***	***	***	***	0.26
4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
5	***	***	0.68	0.42	***	***	0.66	0.80	0.71	0.51	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.63
6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
7	***	***	***	***	***	***	***	0.47	0.44	0.64	0.77	***	***	***	***	***	***	***	***	***	***	***	***	***	0.58
8	***	***	***	***	***	***	0.69	0.46	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.57
9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
10	***	***	***	***	***	***	***	***	0.61	0.71	0.86	***	***	***	***	***	***	***	***	***	0.55	***	***	***	0.40	0.63
11	0.20	***	0.18	0.37	***	***	0.65	0.35	0.53	0.43	0.37	0.37	0.39	***	***	***	***	***	***	***	***	***	***	0.17	0.36
12	***	***	***	***	***	***	***	0.54	0.40	0.44	0.47	0.50	***	***	***	***	***	***	***	***	***	***	0.87	0.56	0.54
13	***	0.45	0.60	0.43	***	***	***	0.44	0.68	0.45	0.40	0.57	***	***	***	***	***	***	***	***	***	***	***	***	0.50
14	0.28	0.40	***	***	***	***	***	***	0.20	0.42	0.43	0.60	0.59	***	***	***	***	***	***	***	***	***	***	***	0.42
15	***	0.23	***	***	***	0.41	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.34	0.27	0.31
16	***	0.33	0.36	***	0.46	***	***	0.40	0.37	0.41	0.35	0.64	***	***	***	***	***	***	***	***	***	***	***	0.50	0.42
17	***	***	***	***	0.62	***	***	0.79	0.50	0.27	0.54	***	***	***	***	***	***	***	***	***	***	***	0.30	0.30	0.47
18	***	***	***	***	***	***	***	0.31	0.24	0.27	0.53	***	***	***	***	***	***	***	***	***	***	***	***	0.44	0.36
19	***	***	0.11	***	0.08	0.27	0.34	0.44	0.19	0.27	0.32	0.19	***	***	0.32	***	***	***	***	***	***	***	***	0.03	0.23
20	0.12	0.19	***	0.55	***	***	***	***	0.32	0.37	0.49	0.68	0.36	***	***	***	1.03	***	***	***	***	***	***	0.09	0.42
21	***	0.38	0.08	***	***	***	***	***	0.66	0.45	0.60	0.44	0.47	0.88	0.75	***	***	***	***	***	***	0.08	0.51	0.29	0.47
22	0.04	0.33	***	***	***	0.06	***	0.38	0.53	0.34	0.36	0.38	***	***	***	***	***	***	***	***	***	***	***	***	0.30
23	***	***	***	0.56	***	***	***	0.48	1.00	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.68
24	***	***	0.90	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.90
25	***	***	***	0.27	0.45	0.41	0.51	0.43	0.61	0.98	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.52
26	***	***	***	***	***	***	***	***	***	1.45	***	***	***	***	***	***	***	***	***	***	***	***	0.61	0.66	0.91
27	***	***	0.37	0.50	***	***	***	0.40	0.52	0.90	0.42	1.10	***	***	***	***	***	***	***	***	***	0.73	***	0.31	0.58
28	***	***	0.60	***	***	***	***	0.26	0.58	0.53	0.37	0.79	0.82	***	***	***	***	***	***	***	***	***	***	0.45	0.55
29	0.45	0.52	***	0.14	0.12	0.72	0.57	0.60	0.31	0.51	0.41	0.56	***	***	***	***	***	***	***	***	***	***	0.54	0.44	0.45
HRAVE	0.22	0.34	0.41	0.37	0.32	0.32	0.49	0.45	0.50	0.53	0.49	0.61	0.53	0.86	0.53	***	1.03	***	0.46	***	0.55	0.45	0.46	0.33	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.50	0.48	0.26	***	0.63	***	0.58	0.57	***	0.63	0.36	0.54	0.50	0.42	0.31	0.42	0.47	0.36	0.23	0.42	0.47	0.30	0.68	0.90	0.52
MAX	0.53	1.08	0.83	***	0.80	***	0.77	0.69	***	0.86	0.65	0.87	0.68	0.60	0.41	0.64	0.79	0.53	0.44	1.03	0.88	0.53	1.00	0.90	0.98
MIN	0.46	0.01	0.01	***	0.42	***	0.44	0.46	***	0.40	0.17	0.40	0.40	0.20	0.23	0.33	0.27	0.24	0.03	0.09	0.08	0.04	0.48	0.90	0.27

DAY	26	27	28	29	30	31
AVE	0.91	0.58	0.55	0.45	***	***
MAX	1.45	1.10	0.82	0.72	***	***
MIN	0.61	0.31	0.26	0.12	***	***

MONTHLY AVERAGE = 0.5 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 25.7% OPERATIONAL RECOVERY RATE = 25.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

SODAR AND 10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

MARCH THROUGH JUNE 2016

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

August 2016

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. The smelter air emissions are released to the atmosphere through a 1,000-foot (approximately 300 meter) tall stack. To help refine future AERMOD air dispersion modeling at the facility, ASARCO has been performing site-specific meteorological monitoring at Hayden. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

ASARCO supplemented the 10 meter meteorological tower with a Remtech PA-0 phased-array acoustic Sodar in late May 2014 that measures winds at elevations ranging from approximately 50 to 400 meters above ground level. Sodar (SOnic Detection And Ranging) systems are used to remotely measure the vertical turbulence structure and the wind profile of the lower layer of the atmosphere. Sodar systems are like radar systems except that sound waves rather than radio waves are used. A profile of the atmosphere as a function of height can be obtained by analyzing the return signal at a series of times following the transmission of each pulse. Three antenna beams oriented along the U, V, and W directions allow the calculation of horizontal and vertical wind speeds and directions. Phased-array Sodar systems use a single array of speaker drivers and horns (transducers), and the three antenna beams are electronically generated and steered by phasing the transducers appropriately.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the sodar and 10-meter tower data validation report for the period March through June 2016. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

The tower and sodar data was remotely collected and reviewed on a daily basis. The sodar data was also regularly compared to the tower wind data to ensure proper sodar operation. No significant operational events occurred during the period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A calibration of the ST-10 meteorological equipment was performed on May 26, 2016, and the calibration results are presented in Appendix A. The calibrations demonstrate that the meteorological systems were operating within the acceptable DQO ranges, as listed in the project's QAPP Table B-1. The QAPP does not list calibration DQOs for the parameters collected at ST-10 that are not used in AERMOD dispersion modeling, those parameters being pressure, precipitation, and relative humidity. The DQOs that were used to validate these three additional parameters are listed in Tables 0-7 and 0-8 in EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems - Volume IV: Meteorological Measurements Version 2.0* (March 2008), which list PSD measurement DQOs.

A quality assurance performance audit was also conducted on the ST-10 meteorological tower and sodar equipment on May 26, 2016, before any tower calibrations or adjustments were made. This audit was performed by independent personnel, using independent certified audit standards. The results from this audit are also presented in Appendix A, and indicate that the meteorological systems were operating within the acceptable DQO ranges.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.

- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). Additional data screening is also performed on the sodar data. The internal sodar diagnostic data, including signal to noise ratios (SNRs), the FEMAX ground clutter number, the JAM internal electronic test diagnostic value, and the number of spurious signals (SPU) are screened against manufacturer recommended values. Time series data from the Sodar are screened against rates of change and persistence criteria, and the vertical profiles of the Sodar are screened against expected rate of change with altitude criteria. If the comparisons fall outside of typical ranges, the record is flagged for further inspection. The 15-minute Sodar data are averaged into hourly data using unit vector wind direction averages and scalar wind speed averages, in accordance with Section 6.2 of EPA's Met Monitoring Guidance.

Table 1 summarizes the data screening and validation criteria used for both the 10 meter meteorological tower parameters and the sodar.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were 0.0, -1.8, and -4.1 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%
Sodar Internal Diagnostic Data	JAM > 0, FEMAX > 600, SNR % total bandwidth > 5, SPU > 7.
Sodar Time Series Rate of Change	Same range and persistence checks as listed above for wind speed and direction.
Sodar Rate of Change for Altitude Gates	WS difference more than 4.5 m/s between altitude gates, and WD difference more than 120 degrees between altitude gates.
Sodar Comparison to 10-meter Wind Data	When Wind Speed is > 2 m/s and time is between 10am and 5 pm, then: Wind Speed Average Bias < 1 m/s, WD Standard Deviation Variability < 2 m/s, Wind Direction Average Bias < 10 degrees, WD Standard Deviation Variability < 30 degrees

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, including any necessary data edits. The data review resulted in the manual invalidation of 20 hours of sodar data.

Quality control comparisons of the hourly average 100 meter sodar wind speed and direction data to the hourly average 10 meter meteorological measurements are also performed for the quarter. These tests are performed only when the atmosphere is well mixed and the 10 meter surface winds should be coupled to the Sodar height winds, which occurs during daytime periods (between 10 am and 5 pm) with moderate wind speeds (greater than 2 m/s). The average difference and standard deviation of differences for wind speed and wind direction were computed and compared to the same DQOs EPA recommends for sodar audits against nearby meteorological towers (even though for an audit, the sodar and tower measurement heights are at

the same height, and therefore should agree better than 10 meter tower and 100 meter sodar data). Table 2 presents the results of this quality control comparison for the quarter, and demonstrates that the sodar agrees with the 10-meter tower within the EPA recommended DQO criteria.

Table 2 – Sodar QC Comparisons to 10m Tower Wind Data

Parameter	EPA DQOs	March to June 2016 Performance
Wind Speed Average Difference (m/s)	$< \pm 1$	0.7
Wind Speed Std Dev Difference (m/s)	< 2	1.1
Wind Direction Average Difference (degrees)	$< \pm 10$	-3.5
Wind Direction Std Dev Difference (degrees)	< 30	24.2

Note: The 100m level of hourly averaged sodar wind data was compared to 10m tower wind data.

3.3 Data Capture Statistics

Based on the review of data from calibrations, audits, and the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 3 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis, and the quarterly data capture rates are well above 90% for each month for all parameters except the 400 m level sodar winds and the sigma W data. This is not unexpected, as sodars have difficulty collecting data at altitudes greater than approximately 300 meters, especially in hot and dry locations such as the ST-10 site. EPA also notes in Section 9.8 of the Met Monitoring Guidance that "data capture for wind direction and wind speed from a sodar is defined somewhat differently than for more conventional instruments", and "an averaging period (e.g., hourly) is considered valid if there are at least three valid levels of data for the period (independent of height)". The data capture rates for all sodar levels equal to and below 300 meters in height all meet the data completeness DQO, and therefore the sodar data capture rates meet EPA requirements.

In summary, all meteorological data collected during the quarter meets the DQO completeness goal for all parameters.

Table 3 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip	100m WS/WD	300m WS/WD	400m WS/WD	100m SW	300m SW	400m SW
Jun-15	99.2	99.2	99.2	99.2	99.2	99.2	99.2	96.5	96.5	82.1	94.9	85.4	54.4
Jul-15	100.0	100.0	100.0	100.0	98.1	98.1	98.1	97.3	97.3	85.5	96.1	87.8	64.9
Aug-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.1	98.3	90.9	96.8	92.3	71.9
Sep-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.8	96.8	88.3	94.7	91.2	79.0
Oct-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	95.7	81.7	93.7	88.3	67.9
Nov-15	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.7	94.7	71.5	92.8	82.5	46.8
Dec-15	99.3	99.3	99.3	99.3	99.3	99.3	99.3	96.2	96.5	74.7	95.0	88.3	45.2
Jan-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0	86.7	87.0	64.7	84.8	78.5	37.4
Feb-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0	89.9	90.4	52.6	89.1	78.0	25.7
Mar-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.2	94.4	63.0	92.9	85.9	34.9
Apr-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0	93.9	93.9	68.6	93.1	85.8	42.1
May-16	99.3	99.3	99.3	99.3	99.3	99.3	99.3	94.0	94.0	70.6	93.1	83.7	48.4
Jun-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.4	95.4	76.2	93.5	83.6	45.0
Quarter 1	99.7	99.7	99.7	99.7	99.1	99.1	99.1	97.3	97.4	86.2	95.9	88.5	63.8
Quarter 2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	95.7	80.5	93.7	87.3	64.6
Quarter 3	99.8	99.8	99.8	99.8	99.8	99.8	99.8	91.0	91.3	64.4	89.7	81.7	36.4
Quarter 4	99.8	99.8	99.8	99.8	99.8	99.8	99.8	94.0	94.1	67.4	93.0	85.1	41.8
Total	99.8	99.8	99.8	99.8	99.7	99.7	99.7	94.6	94.7	74.8	93.1	85.5	51.2

Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix B presents plots of various monthly data summaries and data tables for the reporting period (these tables include sodar data for the 100, 300, and 400 meter levels). Also submitted with this report are 15-minute and hourly data files in a format designed for AERMET data processing (all sodar altitude levels are included in these data files).

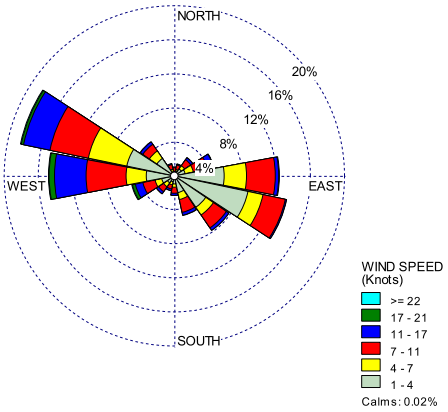
Figure 1 presents plots of the quarterly wind speed and wind direction data at selected heights of 10, 100, and 300 meters above ground, in a format called a "wind rose" plot. These wind roses indicated that there are two predominate wind directions at the site; one from the east (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours). As expected, the wind speeds at 100 and 300 meter levels are higher than the 10 meter winds, with fewer hourly observations in the lower wind speed ranges (gray and yellow bars in the wind roses).

The review of the wind data indicates that there is a diurnal flow pattern at the site, with winds frequently from the east and southeast directions in the morning and evening hours with light to moderate speeds, followed by afternoons with moderate to strong winds. This pattern is evident in the wind roses, and can also be seen in an example of the daily wind data profiles shown in Figure 2 with light easterly and southeasterly flows in the morning followed by stronger westerly wind flows during the afternoon hours. This pattern repeats itself for the majority of the days, and results in the observed bi-modal wind rose distributions.

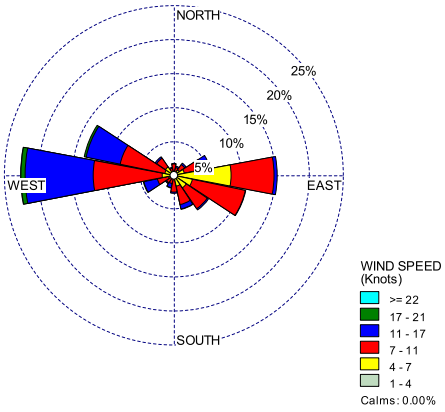
The three-month digital data base in an ASCII format suitable for AERMET processing is included with this data report. It is recommended that Sodar data only up to 400m be used for AERMET processing, for the following reasons. First, this altitude extends 100m taller than the main stack height, which will allow AERMOD to properly simulate stack tip downwash, plume rise, and plume transport. Second, the data capture rates at altitudes above 400m are lower than at altitudes below 400m, and there is an increased number of data screening flags (which indicates that data from higher elevations may not be as reliable as data from 400m and lower altitudes). Therefore, it is not likely that data from these higher Sodar altitudes would add to the accuracy of the AERMET data profile. The included AERMET Stage 1 input file for the onsite data is setup to only process Sodar data up to 400m altitude.

Figure 1 –Wind Rose Plots

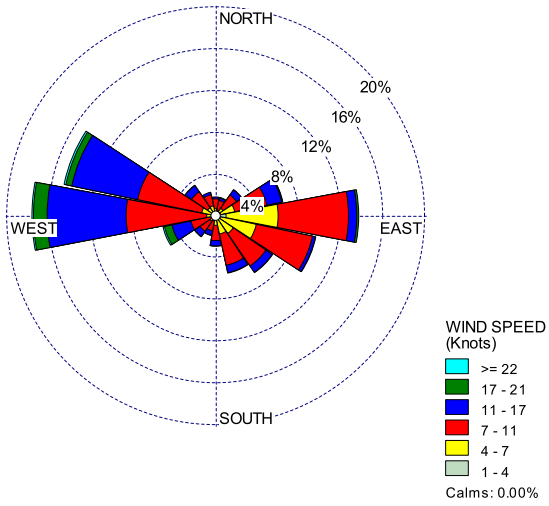
10-Meter Wind Rose



100-Meter Wind Rose

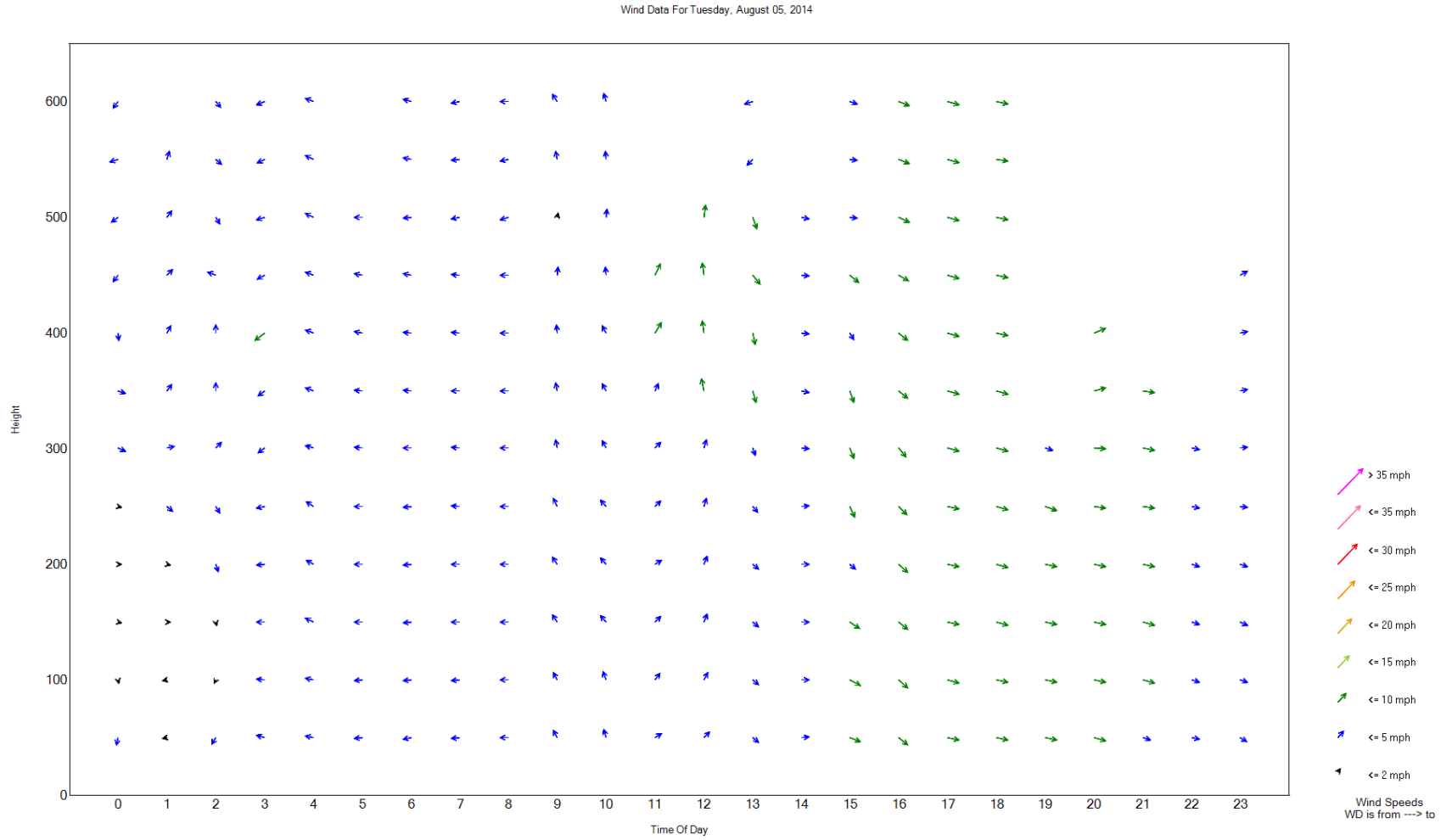


300-Meter Wind Rose



Wind directions are the direction the wind is blowing FROM.

Figure 2 – Example of Typical Diurnal Wind Flow Patterns



Note: Arrows are wind flow vectors and point to the direction the wind is blowing to.

APPENDIX A

Data Screening and Validation Results

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 5/26/2016 By: Samantha Taylor

RM Young Wind Monitor AQ Sensor SN :	126168
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Met One 083 SN N3538
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN 4015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Oakton SN M100608
Relative Humidity Standard	Extech RH390 SN 130327978

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater
Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.6 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	1	0
45	41	40	-1
90	86	86	0
135	131	132	1
180	176	177	1
225	221	221	0
270	266	267	1
315	311	311	-1

Note: Readings adjusted for data logger offset

Magnetic Deviation (east is positive) =	10.3
Vane alignment rod (magnetic) =	349
Alignment (true) =	359
Data Logger Offset =	-4

Acceptable Tolerance is 3 degrees linearity, 5 degrees total
Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 10 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	0.1	0.0	0.1	0.0	-0.01
22.2	22.2	0.0	22.3	0.1	0.09
53.0	52.9	-0.1	52.9	-0.1	0.03

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.09	0.10	0.01	0.5%

Solar Radiation Standard is LiCor 200 SN 68334
Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
17.8	16.5	-1.3

For RH the DQO limit is ± 7%

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.20	0.20	0.00

Note: Input 100 ml for a target of 0.20 inches (20 tips).
The water must be input over at least 5 minutes.

Comments:
Calibration starts 16:45, is over 19:10
The barometric pressure standard was unavailable.

QUALITY ASSURANCE PERFORMANCE AUDIT REPORT

ST-10 SODAR AND 10-METER METEOROLOGICAL TOWER MONITORING STATION

May 26, 2016

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

ASARCO ST-10 SODAR AND 10-M METEOROLOGICAL MONITORING AUDIT REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. The smelter air emissions are released to the atmosphere through a 1,000-foot (approximately 300 meter) tall stack.

To help refine future AERMOD air dispersion modeling at the facility, ASARCO has been performing site-specific meteorological monitoring at Hayden. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters (10 meter wind speed, direction, and sigma theta, 2 and 10 meter temperature and delta temperature, and solar radiation).

ASARCO supplemented the 10 meter meteorological tower by installing an Remtech PA-0 phased-array acoustic Sodar in June 2014 that measures winds at elevations ranging from approximately 50 to 400 meters above ground level. Sodar (SOnic Detection And Ranging) systems are used to remotely measure the vertical turbulence structure and the wind profile of the lower layer of the atmosphere. Sodar systems are like radar systems except that sound waves rather than radio waves are used. Sodar systems operate by issuing an acoustic pulse and then receiving the return signal for a short period of time. Both the intensity and the Doppler (frequency) shift of the return signal are analyzed to determine the wind speed, wind direction and turbulence of the atmosphere. A profile of the atmosphere as a function of height can be obtained by analyzing the return signal at a series of times following the transmission of each pulse. Three antenna beams oriented along the U, V, and W directions allow the calculation of horizontal and vertical wind speeds and directions. Phased-array Sodar systems use a single array of speaker drivers and horns (transducers), and the three antenna beams are electronically generated and steered by phasing the transducers appropriately.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as EPA's Met Monitoring Guidance). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, Data Quality Objectives (DQOs), and auditing procedures.

In May, 2016, an independent quality assurance performance audit was performed on the meteorological monitoring system. This document is the audit report. Section 2 of this report describes the performance audit procedures. Section 3 presents the audit results and compares them to the Data Quality Objectives (DQOs) listed in EPA's Met Monitoring Guidance and the Project QAPP. Appendix A presents the standard certification data sheets.

2.0 AUDIT PROCEDURES

2.1 10-Meter Meteorological Tower Audit Procedures

The 10-meter meteorological tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor. The sensors are connected to a Campbell Scientific CR-1000 data logger that scans the sensors once per second and computes and store 15-minute and hourly averages.

Quality assurance performance audits evaluate the accuracy of these tower-based meteorological sensors using equipment and personnel that are independent from those used for normal operations. Audit equipment is traceable to National Institute of Standards and Technology (NIST) and manufacturer's standards, as appropriate. The accuracy DQOs used to define an acceptable audit are listed in Table 1.

Table 1 – 10-m Meteorological Tower QA Audit DQOs

Parameter	Specifications	QAPP DQO Requirements
Wind Speed (10 meters above ground level)	Starting Torque Threshold (corresponding to sensor starting threshold of 0.5 m/s)	≤ 1 gr/cm
	Sensor Accuracy	0.2 m/s
Wind Direction (10 meters above ground level)	Starting Torque Threshold (corresponding to sensor starting threshold of 0.5 m/s)	≤ 11 gr/cm
	Sensor Accuracy	5 degrees
Temperature (at 2 and 10 meters above ground level)	Sensor Accuracy	0.5 C
Temperature Difference	Sensor Accuracy	0.1 C
Solar Radiation	Sensor Accuracy	5%

Audit procedures for meteorological sensors are presented in the Project QAPP, and are summarized below.

Wind Direction Audit Procedure

The wind sensor orientation is determined using a professional magnetic compass and the RM Young siting fixture. True north is distinguished from magnetic north by reading a magnetic compass and applying a correction factor for the magnetic declination. The declination has been determined from the USGS declination calculation program, and is 10 degrees easterly. The wind direction linearity is checked against various target directions using the RM Young Vane Angle Fixture. The sensor starting threshold is tested using a RM Young model 18331 torque gauge, and must be equal to or less than 11 gr/cm (equivalent to a wind speed threshold of 0.5 m/sec).

Wind Speed Audit Procedure

The horizontal wind speed calibration check is performed using a RM Young digital tachometer. Sensor readings are compared to the calibration values provided in the sensor manufacturer's specifications. The sensor starting threshold is tested using a RM Young model 18130 torque wheel, and must be equal to or less than 1.0 gr/cm (equivalent to a wind speed threshold of 0.5 m/sec).

Temperature and Delta Temperature Audit Procedure

The 2-meter and 10-meter temperature sensor calibration is verified by direct comparison of sensor outputs to a collocated standard thermometer at three different temperatures, encompassing the measurement range expected at this site. Sensors at the 2 and 10 meter levels are checked simultaneously in the same medium so that the delta temperature function can be verified.

Solar Radiation Audit Procedure

The solar radiation pyranometer output is audited using a collocated independent standard.

2.2 Sodar Audit Procedures

The Sodar performance audit compares Sodar measurements with an independent measurement technique, as recommended in Section 9.6 of EPA's Met Monitoring Guidelines. Sodar monitoring systems provide a remote, "indirect" measurement of wind and turbulence parameters. This presents a unique challenge to the quality assurance of these systems, since there is no direct counterpart to the bench top audit methodology of a wind vane. Therefore, a comparison between the Sodar and another measurement system is performed to establish the reasonableness of the Sodar data. One of EPA's recommended approaches to auditing a Sodar is a tethersonde intercomparison. A tethersonde system uses a tethered balloon to lift a

measurement package or "sonde" to an altitude corresponding with the Sodar measurements. This method then collects data over a minimum of five Sodar 15-minute averaging periods. The sonde readings are processed into U and V components that correspond to the Sodar beam directions, and are time averaged to correspond to the Sodar averaging period. The comparison of tethersonde versus Sodar data provides an overall evaluation of the Sodar performance.

A tethersonde system was used as the independent auditing standard for the ASARCO audit. The helium-filled, blimp-shaped, tethered kite/balloon system is capable of measuring wind speed, wind direction, and barometric pressure (which is used to determine height above ground). The nominal accuracy for wind speed is 5% (the sonde package uses the Renewable NRG Systems #40C Anemometer, with a stated accuracy of less than 2% uncertainty), and for wind direction is 2 degrees. The meteorological data measured by the tethersonde are scanned and stored on an SD card once every 10 seconds. The 10-second tethersonde values were then processed into 15-minute averages and compared with the 15-minute averages for the same time periods reported by the Sodar system.

The systematic difference (bias) and comparability (root-mean-square error) between the Sodar and tethersonde U and V components will be calculated using equations 9-1 and 9-2 from page 9-16 of EPA's MMGRMA guidance. Table 9-4 in the MMGRMA guidelines suggests Sodar DQO audit goals for the systematic difference and comparability, as listed below. EPA recommends that the DQO for the wind speed and wind direction comparisons should be applied when winds are greater than approximately 2 m/s (this is because when the winds are light there will be more variability in the observed speeds and directions and potentially larger differences between the Sodar and the tethersonde).

Table 2 – Sodar Performance Audit DQOs

Systematic Difference (Bias)	Comparability (RMS Error)
U and V component $< \pm 1$ m/s	U and V component $< \pm 2$ m/s
Wind Speed $< \pm 1$ m/s	Wind Speed $< \pm 2$ m/s
Wind Direction $< \pm 10$ Degrees	Wind Direction $< \pm 30$ Degrees

EPA notes that comparison results in excess of the audit goals do not necessarily mean that the data are invalid. Other reasons that can contribute to comparison results in excess of the audit goals may include unusual meteorological conditions (such as very turbulent conditions) or differences due to the locations of the two instruments. Both the reasons for and the magnitude of the measured differences should be considered in determining whether the Sodar data is valid.

In addition to the tethersonde audit, the orientation of the Sodar antenna relative to true north is measured by a compass, adjusted to compensate for the local magnetic declination. The antenna alignment is compared to the Sodar AZIMUT setting. A bubble level is used to check the antenna's level.

3.0 AUDIT RESULTS AND ANALYSIS

3.1 10-Meter Meteorological Tower Audit Results

The independent quality assurance performance audit was conducted on the meteorological tower on May 26, 2016. Table 3 presents the results for the audit, and all test results are within the Project DQOs and result in an acceptable audit.

3.2 Sodar Audit Results

The independent quality assurance performance audit of the Sodar system was conducted on May 26, 2016. EPA's Met Monitoring Guidelines recommends that data from a minimum of five Sodar averaging intervals be collected and compared, and the ASARCO audit consisted of five Sodar averaging intervals.

The tethersonde base station was located approximately 350 meters to the southeast of the Sodar antenna. The tethersonde was flown to an approximate altitude of 65 meters above ground level, during a time with elevated afternoon wind speeds and turbulence. The tethersonde clock was synchronized to the Sodar clock, and data was collected and averaged over 15 minute periods. The tethersonde altitudes were determined using the sonde measurements of barometric pressure.

Table 4 presents the results for the Sodar tethersonde audit. All test results are within the Project DQOs and result in an acceptable audit.

The orientation of the Sodar antenna, relative to true north, was measured by a compass and determined to be 120 degrees magnetic, equal to 130 degrees true. This was compared to the Sodar AZIMUT setting of 133 degrees, and the audit readings were within 3 degrees of the Sodar orientation. A bubble level was also used to confirm the antenna was level.

Table 3 – 10-meter Met Tower Audit Results

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 5/26/2016 Auditor: John Podrez

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 126168
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN 81470
Wind Speed Audit Standard:	RM Young 18820 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton 4 Thermistor SN 86818

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.5	0.5	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater
Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.7 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	0	-1
45	41	41	0
90	86	87	1
135	131	133	2
180	176	178	2
225	221	222	1
270	266	266	0
315	311	309	-2

Magnetic Deviation (east is positive) = 10.3
Vane alignment rod (magnetic) = 348
Alignment (true) = 358
Note - Data Logger program has offset of -4 degrees
Acceptable Tolerance is 3 degrees linearity, 5 degrees total
Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 10 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	0.1	0.0	0.1	0.0	-0.01
22.2	22.2	0.1	22.3	0.1	0.09
52.9	52.9	0.0	52.9	0.0	0.03

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.09	0.10	0.01	0.4%

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %
(Note - sensor mV readings are converted to kw/m2 by multiplying 0.1025)

Comments:
Audit starts 16:45, is over 19:10

Table 4 – Sodar Audit Results

ASARCO Hayden Sodar QA Audit Form

Auditor: Mark Podrez Sodar ID: Remtech PA0 Sonde ID: Arduino-NRC40C-1

Audit	Starting	Tethersonde System					Sodar System					Differences			
Date	time	Alt	WS	WD	U	V	Level	WS	WD	U	V	WS	WD	U	V
5/26/2016	17:15	62	6.0	275	-5.9	0.8	50	6.7	258	-6.60	-1.16	0.7	-17	0.7	1.9
5/26/2016	17:30	64	6.1	275	-5.4	0.7	50	6.9	260	-6.83	-0.96	0.8	-15	1.4	1.7
5/26/2016	17:45	60	6.5	278	-6.1	1.1	50	6.5	267	-6.50	-0.11	0.0	-11	0.4	1.2
5/26/2016	18:00	61	5.6	277	-5.4	0.9	50	7.1	279	-6.97	1.35	1.5	2	1.6	-0.5
5/26/2016	18:15	63	6.3	272	-5.9	1.1	50	6.7	281	-6.53	1.51	0.4	9	0.6	-0.4
											Average Difference	0.7	-6	1.0	0.8
											Std Dev of Differences	0.6	11	0.5	1.2
											Audit DQO for Average Difference	1.0	10	1.0	1.0
											Audit DQO Std Dev of Differences	2.0	30	2.0	2.0

APPENDIX A

Audit Standard Certification Sheets

Certificate of Accuracy

Transfer Standard Type: Electronic Thermometer Certificate No: T **022216. 02**

Transfer standard, model/type: Oakton Temp 4 Acorn Series Thermistor Thermometer
Serial number: 86818 Probe S/N: 01J0299
submitted by/owner: RTP Environmental
2027 Broadway, Suite B
Boulder, CO 80304

Was compared to:
NIST Traceable Hg-in-glass thermometers, serial numbers 2J3106, 2Y6027, 3L9452 and ice point. Miller & Weber Hg-in-glass thermometer sn 2J3106 and 2Y6027 are traceable to NIST Test No. 209621, Test Method ASTM E-77. 2J3106 is traceable through Standard No. 1S1262. 2Y6027 is traceable through Standard No. 9C8072. Miller & Weber Hg-in-glass thermometer sn 3L9452 is traceable to NIST Thermometer 40350, through Transfer Standards 3C4465 & 1Y9716.

Date: 02/22/16 Lab temperature: 23.2 °C
Barometric Pressure: 660.1 mmHG

Reference Standard (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Transfer Standard Correction* (°C)
0.0	0.0	0.0	0.0
9.5	9.5	0.0	0.0
21.6	21.6	0.0	0.0
39.4	39.4	0.0	0.0

Note:
If no sign is given on the correction, the true temperature is higher than the indicated temperature. If the sign is negative, the true temperature is lower than the indicated temperature.

Transfer Standard adjustments made? YES ☐ **NO** ■
Pre-calibration measurements:

Reference Thermistor (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Transfer Standard Correction* (°C)

Certified By: R Sanders Date: February 22, 2016

Roger L. Sanders

Chinook Engineering
a division of Inter-Mountain Laboratories, Inc.
555 Absaraka Street
Sheridan, Wyoming 82801 USA
(307) 674-7506
chinook@imlinc.com

CERTIFICATE OF CALIBRATION AND TESTING

MODEL: **18801** (Comprised of Models 18820 Control Unit & 18830 Motor Assembly)
SERIAL NUMBER: 12071

R. M. Young Company certifies that the above equipment was inspected and calibrated prior to shipment in accordance with established manufacturing and testing procedures. Standards established by R.M. Young Company for calibrating the measuring and test equipment used in controlling product quality are traceable to the National Institute of Standards and Technology.

Nominal Motor Rpm	Output Frequency Hz (1)	Calculated Rpm (2)	Indicated Rpm (3)
600	320	600	600
1200	640	1200	1200
2400	1280	2400	2400
4200	2240	4200	4200
~~6,000~~	~~3200~~	~~6000~~	~~6000~~
8,100	4320	8100	8100
9,900	5280	9900	9900
☒ Clockwise and Counterclockwise rotation verified			

(1) Measured at the optical encoder output.
(2) Frequency output produces 32 pulses per revolution of motor shaft.
(3) Indicated on the Control Unit LCD display.

* Indicates out of tolerance

☒ No Calibration Adjustments Required ☐ As Found ☐ As Left

Traceable frequency meter used in calibration Model: 34405A SN: 53020093

Date of inspection 11-5-15
Inspection Interval One Year

Tested By RP

RTP - Solar Radiation Transfer Standard Certification

Date: 21-Nov-15

Primary Standard: Kipp and Zonen CMP 21 SN 110803

Transfer Standard: Licor LI-200 SN 15682

Year	Jul Day	Time	CMP 21	Licor	% Difference
2015	325	815	464.9	454.9	-2%
2015	325	830	466.2	468	0%
2015	325	845	547.8	564.5	3%
2015	325	900	564.9	568.3	1%
2015	325	930	116.5	118.1	1%
2015	325	945	100.8	103.2	2%
			Average % Difference		0.9%

Certification performed by: Mark Podrez

KIPP & ZONEN
SINCE 1830

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER	201510110803
PYRANOMETER MODEL	CMP 21
SERIAL NUMBER	110803
SENSITIVITY	8.29 µV/W/m² at normal incidence on horizontal pyranometer
IMPEDANCE	29 Ω
TEMPERATURE	22 ± 2 °C
REFERENCE PYRANOMETER	Kipp & Zonen CMP 21 sn 100418 active from 01 January 2015
CALIBRATION DATE	26 October 2015
CLASSIFICATION	ISO 9060, Secondary Standard

Calibration procedure

The indoor calibration procedure is based on a side-by-side comparison with a reference pyranometer under an artificial sun fed by an AC voltage stabiliser. It embodies a 150 W Metal-Halide high-pressure gas discharge lamp. Behind the lamp is a reflector with a diameter of 16.2 cm. The reflector is above the pyranometers producing a vertical beam. The reference and test pyrano-meters are mounted horizontally on a table, which can rotate. The irradiance at the pyranometers is approximately 500 W/m². During the calibration procedure the reference and test pyranometer are interchanged to correct for any non-homogeneity of the beam. This procedure is in accordance with ISO 9847, Type IIc.

Hierarchy of traceability

The reference pyranometer was compared with the sun and sky radiation as source under mainly clear sky conditions using the "continuous sun-and-shade method". The measurements were performed in Davos (latitude: 46.8143°, longitude: -9.8458°, altitude: 1588 m above sea level). The readings are referred to the World Radiometric Reference (WRR) as stated in the WMO Technical Regulations. The originally estimated uncertainty of the WRR relative to SI is ±0.3%.

The inclination of the receiver surface versus the true horizontal plane was set to 0.0 degrees, the instrument signal wire to the north. During the comparisons, the instrument received global radiation intensities from 665 to 1082 with a mean of 897 W/m². The angle between the solar beam and the normal of the receiver surface varied from 25.3 to 50.0 with a mean of 33.7 degrees. The ambient temperature ranged from +15.3 to +25.3 with a mean of +20.7 °C. The sensitivity calculation and the single measurements deviation (σ) are based on 626 individual measurements. The obtained sensitivity value and its expanded uncertainty (95% level of confidence) are valid for similar conditions and are: 9.80 ± 0.12 µV/W/m² (but is corrected for its directional response by Kipp & Zonen to 9.80 µV/W/m²).
Dates of measurements: 15-19, 25 July 2014

Global radiation data were calculated from the direct solar radiation as measured with the absolute cavity pyrheliometer PMO2 (member of the WSG, WRR-Factor: 0.998623, based on the last International Pyrheliometer Comparison IPC-2010) and from the diffuse radiation as measured with a continuous disk shaded pyranometer Kipp & Zonen CM22 SN 020059 with sensitivity 8.88 (ventilated with heated air, instrument wire to the north).

Justification of total instrument calibration uncertainty

The combined uncertainty of the result of the calibration is the positive "root sum square" of two uncertainties.
1. The expanded uncertainty due to random effects and instrumental errors during the calibration of the reference CMP 21 as given by the World Radiation Center in Davos is ±0.12/9.80 = ±1.22%. (See traceability text).
2. Also based on experience the expanded uncertainty of the transfer procedure (calibration by comparison) is estimated to be ±0.5%.
The estimated combined expanded uncertainty is the positive "root sum square" of these two uncertainties: $\sqrt{(1.22^2 + 0.5^2)} = \pm 1.32\%$.

Notice

The calibration certificate supplied with the instrument is at the date of first use. Even though the calibration certificate is dated relative to manufacture, or recalibration, the instrument does not undergo any sensitivity changes when kept in the original packing. From the moment the instrument is taken from its packaging and exposed to irradiance the sensitivity may deviate with time. See the 'non-stability' value (% change in sensitivity per year) given in the radiometer specifications.

Delft, The Netherlands, 26 October 2015

J. Mes
(in charge of calibration facility)

Victor Cassella
(in charge of test)

Arduino-NRC40C-1 Sonde Calibration Certification

Cert Date: 05/19/16

Cal by: Mark Podrez

Sonde WD Calibration

Compass	Sonde	Error
0	4	4
45	46	1
90	91	1
135	137	2
180	183	3
225	230	5
270	275	5
315	320	5
0	5	5
AVE		3.4

Sonde WS Calibration - against RM Young 18802 SN 12071

RPM	Target m/s	Sonde m/s	Error
0	0.4	0.4	0.0
100	2.9	2.8	-0.1
200	5.5	5.5	0.0
300	8.0	7.9	-0.1

Altitude Calibration Check

Topo Map Height Diff m	Sonde Diff Reading m
80	78

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Dec 2015 ti Feb 2016 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
3	WS	16041115	WINDSPD TOO CONSTANT 12 HR	1.1	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16030202	WIND SPD TOO CONSTANT 3 HR	0.2	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16030304	WIND SPD TOO CONSTANT 3 HR	0.18	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16030305	WIND SPD TOO CONSTANT 3 HR	0.16	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16030723	WIND SPD TOO CONSTANT 3 HR	0.04	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16031117	WIND SPD TOO CONSTANT 3 HR	0.04	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16031810	WIND SPD TOO CONSTANT 3 HR	0.11	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16031811	WIND SPD TOO CONSTANT 3 HR	0.11	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16031917	WIND SPD TOO CONSTANT 3 HR	0.16	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16032407	WIND SPD TOO CONSTANT 3 HR	0.16	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16032509	WIND SPD TOO CONSTANT 3 HR	0.16	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16040408	WIND SPD TOO CONSTANT 3 HR	0.04	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16041112	WIND SPD TOO CONSTANT 3 HR	0.2	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16041113	WIND SPD TOO CONSTANT 3 HR	0.2	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16050216	WIND SPD TOO CONSTANT 3 HR	0.02	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16050809	WIND SPD TOO CONSTANT 3 HR	0.2	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16051403	WIND SPD TOO CONSTANT 3 HR	0.11	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16052306	WIND SPD TOO CONSTANT 3 HR	0.09	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16053109	WIND SPD TOO CONSTANT 3 HR	0.13	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16060403	WIND SPD TOO CONSTANT 3 HR	0.09	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16060504	WIND SPD TOO CONSTANT 3 HR	0.2	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16060505	WIND SPD TOO CONSTANT 3 HR	0.2	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16060518	WIND SPD TOO CONSTANT 3 HR	0.2	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16061710	WIND SPD TOO CONSTANT 3 HR	0.18	WS does vary around event, WD and Sigma vary - WS is valid
7	WD	16033101	WIND DIR TOO CONSTANT 3 HR	0.8	WS does vary around event, WD and Sigma vary - WS is valid
7	WD	16040105	WIND DIR TOO CONSTANT 3 HR	0.4	WS does vary around event, WD and Sigma vary - WS is valid
7	WD	16050701	WIND DIR TOO CONSTANT 3 HR	0.4	WS does vary around event, WD and Sigma vary - WS is valid
7	WD	16051300	WIND DIR TOO CONSTANT 3 HR	0.9	WS does vary around event, WD and Sigma vary - WS is valid
7	WD	16060820	WIND DIR TOO CONSTANT 3 HR	0.6	WS does vary around event, WD and Sigma vary - WS is valid
7	WD	16060821	WIND DIR TOO CONSTANT 3 HR	0.8	WS does vary around event, WD and Sigma vary - WS is valid
7	WD	16061504	WIND DIR TOO CONSTANT 3 HR	0.5	WS does vary around event, WD and Sigma vary - WS is valid
10	TP	16061913	OUT OF C LIMITS	45.38	Just above QC threshold, extreme high temperatures also at nearby stations, data is valid
10	TP	16061914	OUT OF C LIMITS	46.27	Just above QC threshold, extreme high temperatures also at nearby stations, data is valid
10	TP	16061915	OUT OF C LIMITS	46.59	Just above QC threshold, extreme high temperatures also at nearby stations, data is valid
10	TP	16061915	OUT OF C LIMITS	45.31	Just above QC threshold, extreme high temperatures also at nearby stations, data is valid
10	TP	16061916	OUT OF C LIMITS	45.93	Just above QC threshold, extreme high temperatures also at nearby stations, data is valid
10	TP	16061917	OUT OF C LIMITS	45.36	Just above QC threshold, extreme high temperatures also at nearby stations, data is valid
11	TP	16040609	HIGH RATE OF C CHANGE	7.08	During morning or evening transition - Data is Valid
11	TP	16040609	HIGH RATE OF C CHANGE	6.33	During morning or evening transition - Data is Valid
11	TP	16041012	HIGH RATE OF C CHANGE	5.31	During wind shift - Data is Valid
11	TP	16050407	HIGH RATE OF C CHANGE	5.01	During morning or evening transition - Data is Valid
11	TP	16061115	HIGH RATE OF C CHANGE	6.27	During wind shift - Data is Valid
11	TP	16061115	HIGH RATE OF C CHANGE	5.96	During wind shift - Data is Valid
11	TP	16062719	HIGH RATE OF C CHANGE	5.86	During morning or evening transition - Data is Valid
11	TP	16062719	HIGH RATE OF C CHANGE	5.71	During morning or evening transition - Data is Valid
11	TP	16062821	HIGH RATE OF C CHANGE	5.01	During morning or evening transition - Data is Valid
11	TP	16062822	HIGH RATE OF C CHANGE	5.7	During morning or evening transition - Data is Valid
11	TP	16062822	HIGH RATE OF C CHANGE	5.58	During morning or evening transition - Data is Valid
11	TP	16062918	HIGH RATE OF C CHANGE	9.67	During morning or evening transition - Data is Valid
11	TP	16062918	HIGH RATE OF C CHANGE	9.19	During morning or evening transition - Data is Valid
15	D1	16050210	DT LARGE READING	-2.02	Late morning, no precip and clear sky - DT is valid
15	D1	16050211	DT LARGE READING	-2.46	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16050412	DT LARGE READING	-2.08	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16050413	DT LARGE READING	-2.36	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16050611	DT LARGE READING	-2.07	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16051509	DT LARGE READING	-2.17	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16052010	DT LARGE READING	-2.03	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16052011	DT LARGE READING	-2.12	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16052110	DT LARGE READING	-2.14	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16052111	DT LARGE READING	-2.12	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16052112	DT LARGE READING	-2.48	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16052113	DT LARGE READING	-2.16	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16052813	DT LARGE READING	-2.01	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16053010	DT LARGE READING	-2.02	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16053011	DT LARGE READING	-2.6	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16053012	DT LARGE READING	-2.22	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16060710	DT LARGE READING	-2.01	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16062010	DT LARGE READING	-2.03	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16062809	DT LARGE READING	-2.03	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16062812	DT LARGE READING	-2.16	Late morning/early afternoon, no precip and clear sky - DT is valid
15	D1	16062909	DT LARGE READING	-2.17	Late morning/early afternoon, no precip and clear sky - DT is valid
16	D1	16051812	DT + During Daytime	0.12	Just outside of Screening Limit - Data is valid
17	D1	16030801	DT - During Nighttime	-0.14	Just outside of Screening Limit - Data is valid
17	D1	16050622	DT - During Nighttime	-0.19	Just outside of Screening Limit - Data is valid
17	D1	16050623	DT - During Nighttime	-0.17	Just outside of Screening Limit - Data is valid
17	D1	16050700	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid
17	D1	16050701	DT - During Nighttime	-0.17	Just outside of Screening Limit - Data is valid
17	D1	16050704	DT - During Nighttime	-0.17	Just outside of Screening Limit - Data is valid
17	D1	16062522	DT - During Nighttime	-0.14	Just outside of Screening Limit - Data is valid
17	D1	16062722	DT - During Nighttime	-0.12	Just outside of Screening Limit - Data is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Dec 2015 ti Feb 2016 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
17	D1	16062823	DT - During Nighttime	-0.17	Just outside of Screening Limit - Data is valid
17	D1	16062922	DT - During Nighttime	-0.14	Just outside of Screening Limit - Data is valid
17	D1	16062923	DT - During Nighttime	-0.19	Just outside of Screening Limit - Data is valid
17	D1	16063000	DT - During Nighttime	-0.26	Just outside of Screening Limit - Data is valid
18	RH	16030416	OUT OF LIMITS	3.92	Low RH with very hot temperatures - data is valid
18	RH	16040316	OUT OF LIMITS	3.89	Low RH with very hot temperatures - data is valid
18	RH	16040317	OUT OF LIMITS	3.22	Low RH with very hot temperatures - data is valid
18	RH	16040416	OUT OF LIMITS	3.87	Low RH with very hot temperatures - data is valid
18	RH	16040611	OUT OF LIMITS	2.69	Low RH with very hot temperatures - data is valid
18	RH	16040612	OUT OF LIMITS	0.98	Low RH with very hot temperatures - data is valid
18	RH	16040613	OUT OF LIMITS	0.32	Low RH with very hot temperatures - data is valid
18	RH	16040614	OUT OF LIMITS	0.14	Low RH with very hot temperatures - data is valid
18	RH	16040615	OUT OF LIMITS	0.27	Low RH with very hot temperatures - data is valid
18	RH	16040616	OUT OF LIMITS	0.58	Low RH with very hot temperatures - data is valid
18	RH	16040617	OUT OF LIMITS	1.85	Low RH with very hot temperatures - data is valid
18	RH	16040618	OUT OF LIMITS	2.64	Low RH with very hot temperatures - data is valid
18	RH	16042113	OUT OF LIMITS	0.65	Low RH with very hot temperatures - data is valid
18	RH	16042114	OUT OF LIMITS	1.34	Low RH with very hot temperatures - data is valid
18	RH	16042115	OUT OF LIMITS	1.72	Low RH with very hot temperatures - data is valid
18	RH	16042116	OUT OF LIMITS	1.51	Low RH with very hot temperatures - data is valid
18	RH	16042117	OUT OF LIMITS	1.89	Low RH with very hot temperatures - data is valid
18	RH	16042118	OUT OF LIMITS	3.61	Low RH with very hot temperatures - data is valid
18	RH	16050413	OUT OF LIMITS	2.97	Low RH with very hot temperatures - data is valid
18	RH	16050414	OUT OF LIMITS	3.69	Low RH with very hot temperatures - data is valid
18	RH	16050416	OUT OF LIMITS	3.78	Low RH with very hot temperatures - data is valid
18	RH	16050514	OUT OF LIMITS	2.92	Low RH with very hot temperatures - data is valid
18	RH	16050515	OUT OF LIMITS	1.59	Low RH with very hot temperatures - data is valid
18	RH	16050516	OUT OF LIMITS	1.81	Low RH with very hot temperatures - data is valid
18	RH	16050517	OUT OF LIMITS	2.35	Low RH with very hot temperatures - data is valid
18	RH	16050518	OUT OF LIMITS	3.32	Low RH with very hot temperatures - data is valid
18	RH	16051312	OUT OF LIMITS	3.97	Low RH with very hot temperatures - data is valid
18	RH	16051313	OUT OF LIMITS	3.2	Low RH with very hot temperatures - data is valid
18	RH	16051512	OUT OF LIMITS	3.99	Low RH with very hot temperatures - data is valid
18	RH	16051513	OUT OF LIMITS	3.65	Low RH with very hot temperatures - data is valid
18	RH	16051514	OUT OF LIMITS	1.94	Low RH with very hot temperatures - data is valid
18	RH	16051515	OUT OF LIMITS	0.75	Low RH with very hot temperatures - data is valid
18	RH	16051516	OUT OF LIMITS	2.77	Low RH with very hot temperatures - data is valid
18	RH	16052813	OUT OF LIMITS	1.96	Low RH with very hot temperatures - data is valid
18	RH	16052814	OUT OF LIMITS	0.82	Low RH with very hot temperatures - data is valid
18	RH	16052815	OUT OF LIMITS	1.31	Low RH with very hot temperatures - data is valid
18	RH	16052816	OUT OF LIMITS	2.03	Low RH with very hot temperatures - data is valid
18	RH	16052817	OUT OF LIMITS	1.35	Low RH with very hot temperatures - data is valid
18	RH	16052818	OUT OF LIMITS	3.52	Low RH with very hot temperatures - data is valid
18	RH	16052911	OUT OF LIMITS	3.77	Low RH with very hot temperatures - data is valid
18	RH	16052912	OUT OF LIMITS	2.8	Low RH with very hot temperatures - data is valid
18	RH	16052913	OUT OF LIMITS	2.05	Low RH with very hot temperatures - data is valid
18	RH	16052914	OUT OF LIMITS	1.86	Low RH with very hot temperatures - data is valid
18	RH	16052915	OUT OF LIMITS	2.08	Low RH with very hot temperatures - data is valid
18	RH	16052916	OUT OF LIMITS	1.84	Low RH with very hot temperatures - data is valid
18	RH	16052917	OUT OF LIMITS	1.49	Low RH with very hot temperatures - data is valid
18	RH	16052918	OUT OF LIMITS	2.41	Low RH with very hot temperatures - data is valid
18	RH	16053112	OUT OF LIMITS	3.51	Low RH with very hot temperatures - data is valid
18	RH	16053114	OUT OF LIMITS	3.47	Low RH with very hot temperatures - data is valid

ASARCO March-June 2016 Sodar QC Screening Report - 15-Minute Data

Date/time beginning	QCCODE	SNR1	SNR2	SNR3	*Comment*
4/8/2016 2:15	NOISE > 8750	8504	8604	8902	Noise flag - sodar automatically invalidated data
4/8/2016 2:30	NOISE > 8750	8804	8804	9202	Noise flag - sodar automatically invalidated data
4/8/2016 19:15	NOISE > 8750	8504	8604	8802	Noise flag - sodar automatically invalidated data
4/10/2016 15:15	NOISE > 8750	8904	8604	8902	Noise flag - data is consistent with adjacent periods - data is valid
4/15/2016 16:30	NOISE > 8750	8104	8304	8902	Noise flag - sodar automatically invalidated data
4/15/2016 18:00	NOISE > 8750	8004	8204	8902	Noise flag - sodar automatically invalidated data
4/15/2016 18:45	NOISE > 8750	8204	8404	8902	Noise flag - sodar automatically invalidated data
4/25/2016 16:30	NOISE > 8750	8804	8803	8802	Noise flag - sodar automatically invalidated data
5/18/2016 11:45	NOISE > 8750	8404	8604	8802	Noise flag - data is consistent with adjacent periods - data is valid
6/10/2016 19:45	NOISE > 8750	9203	9203	9402	Noise flag - data is consistent with adjacent periods - data is valid
6/28/2016 22:15	NOISE > 8750	8504	8604	9002	Noise flag - sodar automatically invalidated data
6/28/2016 22:30	NOISE > 8750	8803	8404	8902	Noise flag - sodar automatically invalidated data
6/29/2016 18:00	NOISE > 8750	8204	8404	8802	Noise flag - sodar automatically invalidated data

Date/Time	QCCODE	Value	*Comment*
4/8/2016 2:15	FEMAX > 600	1486	Sodar data internally invalidated
4/8/2016 2:30	FEMAX > 600	1486	Sodar data internally invalidated
4/10/2016 2:00	FEMAX > 600	1486	Elevated ground clutter but data is valid and reasonable
4/10/2016 2:15	FEMAX > 600	1486	Elevated ground clutter but data is valid and reasonable
4/11/2016 2:00	FEMAX > 600	1486	Elevated ground clutter but data is valid and reasonable
4/11/2016 2:15	FEMAX > 600	1486	Elevated ground clutter but data is valid and reasonable
4/12/2016 2:15	FEMAX > 600	1486	Elevated ground clutter but data is valid and reasonable
4/12/2016 2:30	FEMAX > 600	1486	Elevated ground clutter but data is valid and reasonable
4/13/2016 2:15	FEMAX > 600	1486	Elevated ground clutter but data is valid and reasonable
4/13/2016 2:30	FEMAX > 600	1486	Elevated ground clutter but data is valid and reasonable
5/6/2016 23:15	FEMAX > 600	3880	Sodar data internally invalidated
5/6/2016 23:30	FEMAX > 600	3880	Sodar data internally invalidated
5/6/2016 23:45	FEMAX > 600	3880	Sodar data internally invalidated
5/7/2016 0:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/7/2016 0:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/7/2016 0:30	FEMAX > 600	3880	Sodar data internally invalidated
5/7/2016 23:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/7/2016 23:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/8/2016 0:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/8/2016 0:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/8/2016 0:30	FEMAX > 600	3880	Sodar data internally invalidated
5/8/2016 0:45	FEMAX > 600	3880	Sodar data internally invalidated
5/8/2016 23:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/8/2016 23:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/9/2016 0:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/9/2016 0:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/9/2016 0:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/9/2016 0:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/9/2016 23:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/9/2016 23:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/9/2016 23:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/9/2016 23:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/10/2016 0:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/10/2016 0:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/10/2016 0:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/10/2016 0:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/10/2016 23:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/10/2016 23:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/10/2016 23:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/11/2016 0:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/11/2016 0:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/11/2016 0:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/11/2016 0:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/11/2016 1:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/11/2016 23:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/11/2016 23:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/11/2016 23:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/12/2016 0:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/12/2016 0:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/12/2016 0:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/12/2016 0:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable

ASARCO March-June 2016 Sodar QC Screening Report - 15-Minute Data

5/12/2016 1:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/12/2016 23:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/12/2016 23:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/12/2016 23:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/13/2016 0:00	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/13/2016 0:15	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/13/2016 0:30	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/13/2016 0:45	FEMAX > 600	3880	Elevated ground clutter but data is valid and reasonable
5/17/2016 22:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/17/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/17/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/17/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/18/2016 1:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/18/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/18/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/18/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/18/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/18/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/18/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/18/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/18/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/18/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/18/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/18/2016 23:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/19/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/19/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/19/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/19/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/19/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/19/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/19/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/19/2016 3:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/19/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/19/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/19/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/19/2016 23:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/20/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/20/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/20/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/20/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/20/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/20/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/20/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/20/2016 3:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/20/2016 22:30	FEMAX > 600	662	Sodar data internally invalidated
5/20/2016 22:45	FEMAX > 600	662	Sodar data internally invalidated
5/20/2016 23:00	FEMAX > 600	662	Sodar data internally invalidated
5/20/2016 23:15	FEMAX > 600	662	Sodar data internally invalidated
5/20/2016 23:30	FEMAX > 600	662	Sodar data internally invalidated
5/20/2016 23:45	FEMAX > 600	662	Sodar data internally invalidated
5/21/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/21/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/21/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/21/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/21/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/21/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/21/2016 22:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/21/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/21/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/21/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/22/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/22/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/22/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/22/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/22/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/22/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/22/2016 22:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable

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5/22/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/22/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/22/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/23/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/23/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/23/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/23/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/23/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/23/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/23/2016 22:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/23/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/23/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/23/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/24/2016 1:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/24/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/24/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/24/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/24/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/24/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/24/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/24/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/24/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/24/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/24/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/24/2016 23:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/25/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/25/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/25/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/25/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/25/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/25/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/25/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/25/2016 3:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/25/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/25/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/25/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/25/2016 23:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/26/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/26/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/26/2016 2:00	FEMAX > 600	616	Sodar data internally invalidated
5/26/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/26/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/26/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/26/2016 22:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/26/2016 22:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/26/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/26/2016 23:15	FEMAX > 600	662	Sodar data internally invalidated
5/27/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/27/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/27/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/27/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/27/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/27/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/27/2016 22:45	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/27/2016 23:00	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/27/2016 23:15	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/27/2016 23:30	FEMAX > 600	662	Elevated ground clutter but data is valid and reasonable
5/28/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/28/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/28/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/28/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/28/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/28/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/29/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/29/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/29/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/29/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable

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5/29/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/29/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/30/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/30/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/30/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/30/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/30/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/30/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/30/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/30/2016 3:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/31/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/31/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/31/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/31/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/31/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/31/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/31/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
5/31/2016 3:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/1/2016 1:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/1/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/1/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/1/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/1/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/1/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/2/2016 1:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/2/2016 2:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/2/2016 2:15	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/2/2016 2:30	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/2/2016 2:45	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/2/2016 3:00	FEMAX > 600	616	Elevated ground clutter but data is valid and reasonable
6/7/2016 21:15	FEMAX > 600	1442	Elevated ground clutter but data is valid and reasonable
6/7/2016 21:30	FEMAX > 600	1442	Elevated ground clutter but data is valid and reasonable
6/7/2016 21:45	FEMAX > 600	1442	Elevated ground clutter but data is valid and reasonable
6/7/2016 22:00	FEMAX > 600	1442	Elevated ground clutter but data is valid and reasonable
6/7/2016 22:15	FEMAX > 600	1442	Elevated ground clutter but data is valid and reasonable
6/7/2016 22:30	FEMAX > 600	1442	Elevated ground clutter but data is valid and reasonable
6/8/2016 21:15	FEMAX > 600	911	Elevated ground clutter but data is valid and reasonable
6/8/2016 21:30	FEMAX > 600	911	Elevated ground clutter but data is valid and reasonable
6/8/2016 21:45	FEMAX > 600	911	Elevated ground clutter but data is valid and reasonable
6/8/2016 22:00	FEMAX > 600	911	Elevated ground clutter but data is valid and reasonable
6/12/2016 1:00	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/12/2016 1:15	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/12/2016 1:30	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/12/2016 1:45	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/12/2016 2:00	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/12/2016 2:15	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/12/2016 21:30	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/12/2016 21:45	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/13/2016 1:00	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/13/2016 1:15	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/13/2016 1:30	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/13/2016 1:45	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/13/2016 2:00	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/13/2016 2:15	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/13/2016 21:15	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/13/2016 21:30	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/13/2016 21:45	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/13/2016 22:00	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/14/2016 0:45	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/14/2016 1:00	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/14/2016 1:15	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/14/2016 1:30	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/14/2016 1:45	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/14/2016 2:00	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/14/2016 21:15	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/14/2016 21:30	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/15/2016 0:45	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable

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6/15/2016 1:00	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/15/2016 1:15	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/15/2016 1:30	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/15/2016 1:45	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/15/2016 2:00	FEMAX > 600	695	Elevated ground clutter but data is valid and reasonable
6/15/2016 21:15	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/15/2016 21:30	FEMAX > 600	870	Elevated ground clutter but data is valid and reasonable
6/30/2016 6:00	FEMAX > 600	2303	Elevated ground clutter but data is valid and reasonable
6/30/2016 6:15	FEMAX > 600	2303	Elevated ground clutter but data is valid and reasonable
6/30/2016 6:30	FEMAX > 600	2303	Elevated ground clutter but data is valid and reasonable
6/30/2016 6:45	FEMAX > 600	2303	Elevated ground clutter but data is valid and reasonable
6/30/2016 7:00	FEMAX > 600	2303	Elevated ground clutter but data is valid and reasonable
6/30/2016 7:15	FEMAX > 600	2303	Elevated ground clutter but data is valid and reasonable
6/30/2016 7:30	FEMAX > 600	2303	Elevated ground clutter but data is valid and reasonable
6/30/2016 7:45	FEMAX > 600	2303	Elevated ground clutter but data is valid and reasonable
6/30/2016 10:00	FEMAX > 600	712	Elevated ground clutter but data is valid and reasonable
6/30/2016 10:15	FEMAX > 600	712	Elevated ground clutter but data is valid and reasonable
6/30/2016 10:30	FEMAX > 600	712	Elevated ground clutter but data is valid and reasonable
6/30/2016 10:45	FEMAX > 600	712	Elevated ground clutter but data is valid and reasonable
6/30/2016 11:00	FEMAX > 600	712	Elevated ground clutter but data is valid and reasonable
6/30/2016 11:15	FEMAX > 600	712	Elevated ground clutter but data is valid and reasonable
6/30/2016 11:30	FEMAX > 600	764	Elevated ground clutter but data is valid and reasonable
6/30/2016 11:45	FEMAX > 600	764	Elevated ground clutter but data is valid and reasonable

Date/Time	QCCODE	Value	*Comment*
3/6/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
3/7/2016 5:45	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
3/13/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
3/20/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
3/25/2016 22:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
3/27/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
3/28/2016 3:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
3/29/2016 7:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
4/3/2016 0:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
4/10/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
4/17/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
4/22/2016 17:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
4/24/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
4/30/2016 20:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
5/2/2016 21:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
5/8/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
5/9/2016 1:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
5/12/2016 12:00	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
5/14/2016 13:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
5/22/2016 2:30	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable
5/22/2016 4:15	JAM <> 0	91	Analog Filter/amp diagnostic flag, but data is valid and reasonable

ASARCO March-June 2016 Sodar QC Screening Report - Hourly Data

Date/time beginning	QCCODE	Test Condition	at Gate Ht		Comment
3/18/2016 11:00	Hour to Hour WS	> 9.0 m/s at gate	400		Data is reasonable and valid
3/18/2016 17:00	Hour to Hour WS	> 9.0 m/s at gate	350		Unreasonable WS in later hour, do not see jump in 10m WS, hour is invalidated
3/24/2016 15:00	Hour to Hour WS	> 9.0 m/s at gate	350		Data is reasonable and valid
3/25/2016 11:00	Hour to Hour WS	> 9.0 m/s at gate	400		Data is reasonable and valid
3/25/2016 12:00	Hour to Hour WS	> 9.0 m/s at gate	350		Data is reasonable and valid
3/25/2016 17:00	Hour to Hour WS	> 9.0 m/s at gate	150		Data is reasonable and valid
3/25/2016 17:00	Hour to Hour WS	> 9.0 m/s at gate	200		Data is reasonable and valid
3/25/2016 17:00	Hour to Hour WS	> 9.0 m/s at gate	250		Data is reasonable and valid
3/25/2016 17:00	Hour to Hour WS	> 9.0 m/s at gate	300		Data is reasonable and valid
3/25/2016 18:00	Hour to Hour WS	> 9.0 m/s at gate	350		Data is reasonable and valid
3/25/2016 18:00	Hour to Hour WS	> 9.0 m/s at gate	400		Data is reasonable and valid
4/24/2016 16:00	Hour to Hour WS	> 9.0 m/s at gate	400		Data is reasonable and valid
5/4/2016 17:00	Hour to Hour WS	> 9.0 m/s at gate	350		Data is reasonable and valid
3/2/2016 19:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250		Data is reasonable and valid
3/4/2016 6:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50		Data is reasonable and valid
3/8/2016 15:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	250		Data is reasonable and valid
3/10/2016 9:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50		Data is reasonable and valid
3/31/2016 7:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250		Data is reasonable and valid
4/2/2016 16:00	Hourly WS difference	< 0.5 for >= 12 hours at gate	100		Data is reasonable and valid
4/4/2016 21:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	150		Data is reasonable and valid
4/9/2016 5:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	250		Data is reasonable and valid
4/10/2016 20:00	Hourly WS difference	< 0.5 for >= 12 hours at gate	250		Data is reasonable and valid
4/11/2016 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	50		Data is reasonable and valid
4/12/2016 15:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	100		Data is reasonable and valid
4/21/2016 4:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200		Data is reasonable and valid
4/27/2016 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	100		Data is reasonable and valid
4/29/2016 4:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	350		Data is reasonable and valid
5/17/2016 5:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	300		Data is reasonable and valid
5/27/2016 23:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	150		Data is reasonable and valid
6/8/2016 17:00	Hourly WD difference	< 1.0 for >= 3 hours at gate	50		Data is reasonable and valid
6/15/2016 1:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	150		Data is reasonable and valid
6/15/2016 2:00	Hourly WS difference	< 0.1 for >= 3 hours at gate	200		Data is reasonable and valid
3/1/2016 13:00	WD ROC > 90	109	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
3/1/2016 22:00	WD ROC > 90	95	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
3/2/2016 11:00	WD ROC > 90	98	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
3/3/2016 13:00	WD ROC > 90	102	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
3/5/2016 19:00	WD ROC > 90	96	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
3/5/2016 20:00	WD ROC > 90	125	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
3/9/2016 22:00	WD ROC > 90	133	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
3/13/2016 20:00	WD ROC > 90	178	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
3/15/2016 10:00	WD ROC > 90	162	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
3/15/2016 14:00	WD ROC > 90	178	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
3/18/2016 21:00	WD ROC > 90	134	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
3/19/2016 21:00	WD ROC > 90	91	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
3/24/2016 16:00	WS ROC > 4.5	6.2	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
3/24/2016 22:00	WD ROC > 90	116	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
3/25/2016 22:00	WD ROC > 90	100	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
3/26/2016 22:00	WD ROC > 90	119	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
3/27/2016 10:00	WD ROC > 90	94	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
3/30/2016 13:00	WD ROC > 90	165	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
3/31/2016 0:00	WD ROC > 90	111	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
3/31/2016 1:00	WD ROC > 90	156	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
3/31/2016 10:00	WD ROC > 90	120	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
3/31/2016 22:00	WD ROC > 90	95	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
4/1/2016 21:00	WD ROC > 90	119	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
4/3/2016 16:00	WD ROC > 90	97	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
4/3/2016 17:00	WD ROC > 90	148	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
4/3/2016 20:00	WD ROC > 90	154	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
4/12/2016 1:00	WD ROC > 90	165	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
4/13/2016 22:00	WD ROC > 90	123	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
4/19/2016 22:00	WD ROC > 90	180	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
4/22/2016 0:00	WD ROC > 90	126	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
4/22/2016 13:00	WD ROC > 90	160	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
4/24/2016 3:00	WD ROC > 90	140	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
4/28/2016 3:00	WD ROC > 90	105	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
4/29/2016 21:00	WD ROC > 90	108	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
5/1/2016 10:00	WD ROC > 90	154	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/2/2016 16:00	WD ROC > 90	103	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
5/2/2016 17:00	WD ROC > 90	96	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
5/2/2016 22:00	WD ROC > 90	98	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/2/2016 23:00	WD ROC > 90	141	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
5/3/2016 0:00	WD ROC > 90	169	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
5/3/2016 13:00	WD ROC > 90	175	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
5/3/2016 22:00	WD ROC > 90	119	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/3/2016 23:00	WD ROC > 90	94	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
5/5/2016 9:00	WD ROC > 90	179	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
5/6/2016 8:00	WD ROC > 90	165	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
5/8/2016 23:00	WD ROC > 90	93	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/9/2016 2:00	WD ROC > 90	118	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
5/9/2016 22:00	WD ROC > 90	114	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
5/10/2016 21:00	WD ROC > 90	122	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/10/2016 23:00	WD ROC > 90	125	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/11/2016 1:00	WD ROC > 90	175	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
5/12/2016 2:00	WD ROC > 90	102	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
5/12/2016 13:00	WD ROC > 90	117	at gate	200	Data is valid, occurs during transitional period and/or lower speeds

ASARCO March-June 2016 Sodar QC Screening Report - Hourly Data

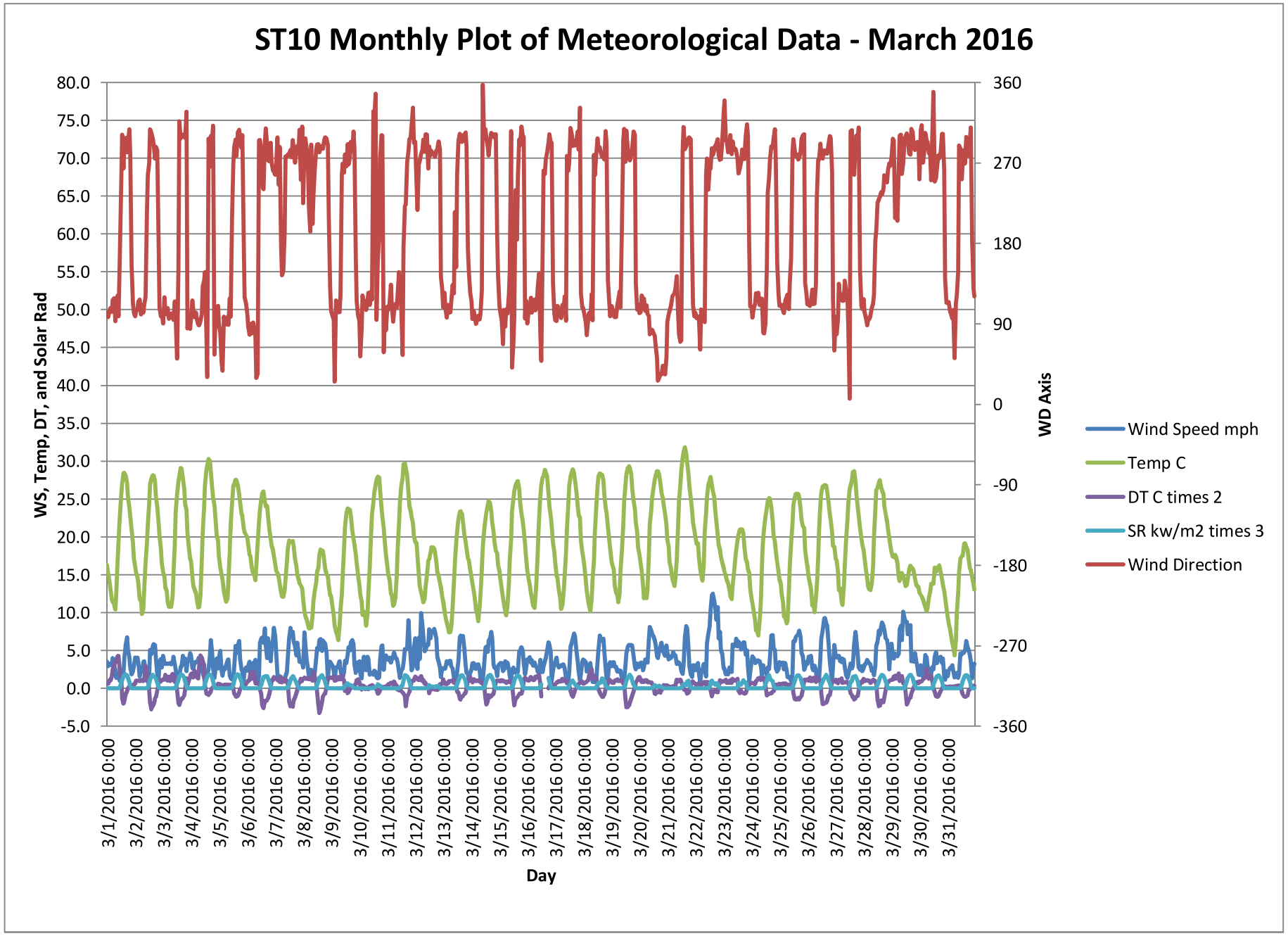
Date/time beginning	QCCODE	Test Condition	at Gate Ht		Comment
5/13/2016 0:00	WD ROC > 90	116	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/14/2016 3:00	WD ROC > 90	114	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/16/2016 11:00	WD ROC > 90	177	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
5/17/2016 3:00	WD ROC > 90	160	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
5/18/2016 2:00	WD ROC > 90	117	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
5/18/2016 20:00	WD ROC > 90	145	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
5/18/2016 22:00	WD ROC > 90	167	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
5/22/2016 3:00	WD ROC > 90	110	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
5/23/2016 8:00	WD ROC > 90	178	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
5/24/2016 6:00	WD ROC > 90	90	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
5/26/2016 6:00	WD ROC > 90	179	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
5/29/2016 8:00	WD ROC > 90	118	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
5/30/2016 0:00	WD ROC > 90	144	at gate	200	Data is valid, occurs during transitional period and/or lower speeds
5/30/2016 3:00	WD ROC > 90	125	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
5/30/2016 23:00	WD ROC > 90	124	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/1/2016 22:00	WD ROC > 90	144	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
6/2/2016 1:00	WD ROC > 90	163	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/2/2016 10:00	WD ROC > 90	97	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/4/2016 10:00	WD ROC > 90	175	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/7/2016 2:00	WD ROC > 90	128	at gate	250	Data is valid, occurs during transitional period and/or lower speeds
6/12/2016 3:00	WD ROC > 90	131	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/13/2016 2:00	WD ROC > 90	178	at gate	300	Data is valid, occurs during transitional period and/or lower speeds
6/13/2016 4:00	WD ROC > 90	129	at gate	150	Data is valid, occurs during transitional period and/or lower speeds
6/14/2016 3:00	WD ROC > 90	103	at gate	350	Data is valid, occurs during transitional period and/or lower speeds
6/17/2016 0:00	WD ROC > 90	132	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/25/2016 13:00	WD ROC > 90	166	at gate	100	Data is valid, occurs during transitional period and/or lower speeds
6/25/2016 17:00	WD ROC > 90	93	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/28/2016 0:00	WD ROC > 90	136	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/28/2016 17:00	WD ROC > 90	133	at gate	400	Data is valid, occurs during transitional period and/or lower speeds
6/30/2016 5:00	WD ROC > 90	116	at gate	400	Data is valid, occurs during transitional period and/or lower speeds

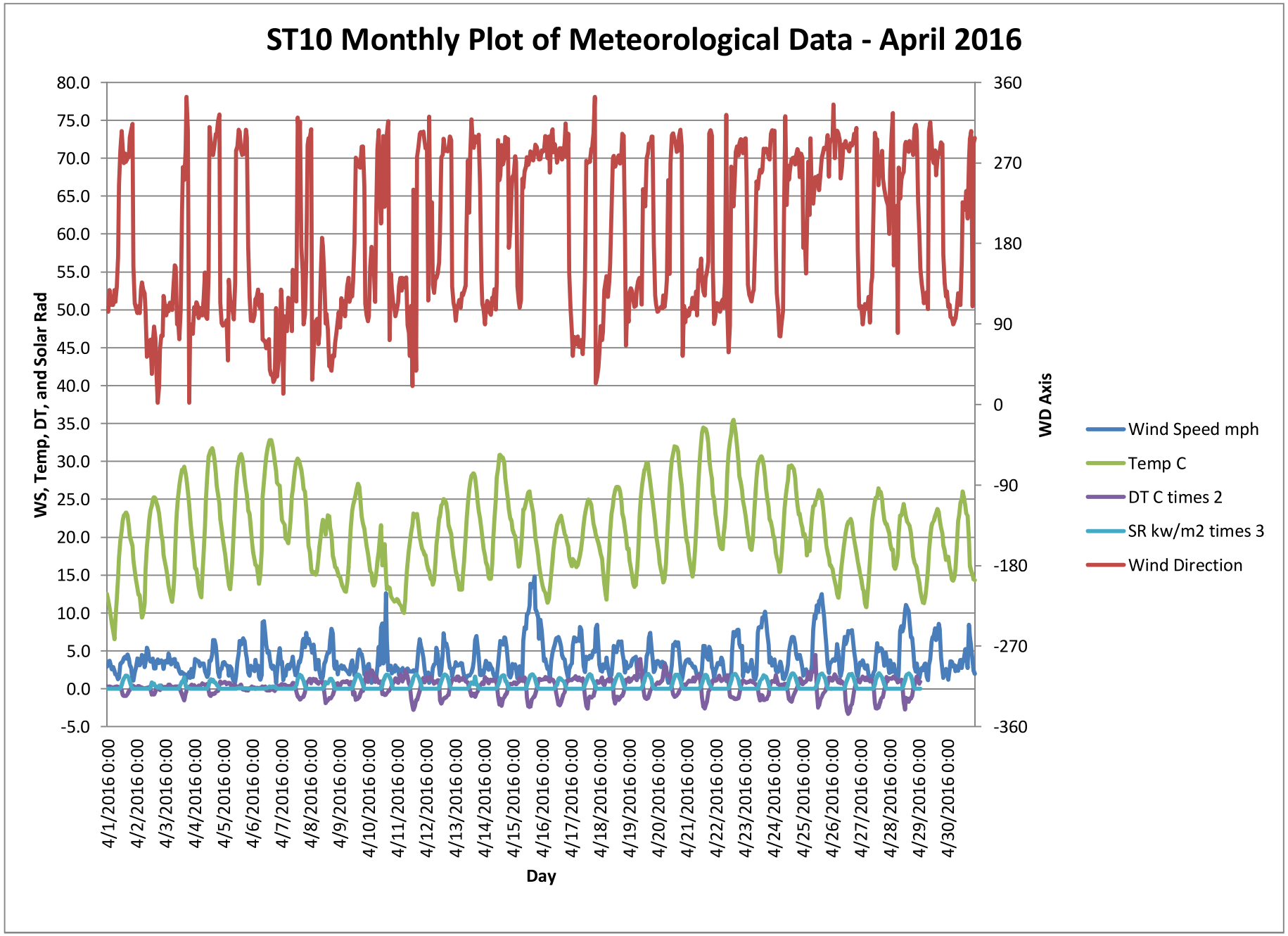
AZMET and ST10 Reported Precipitation Totals
(inches/month)

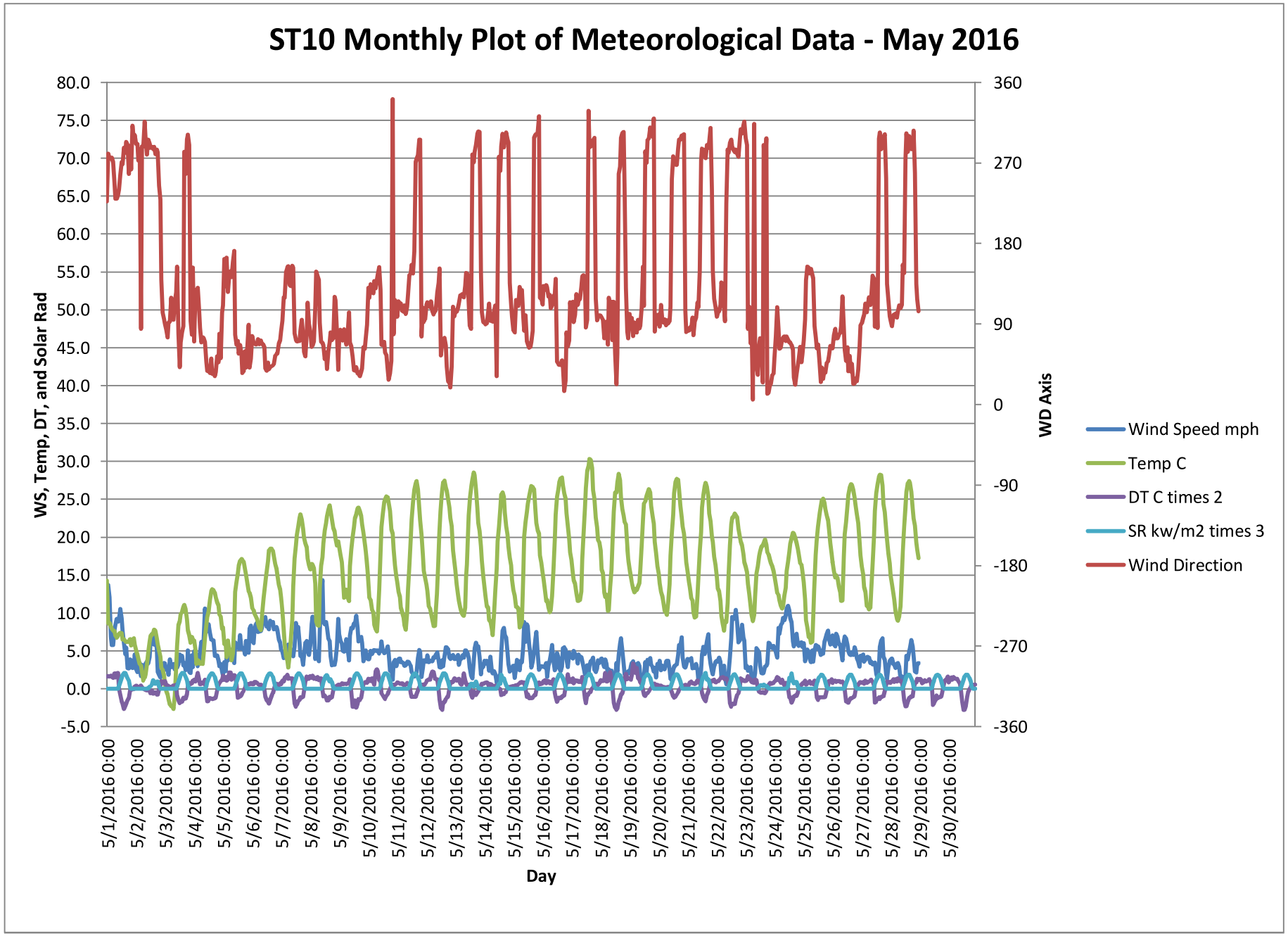
Month	Coolidge	Safford	ST-10
Jun-15	0.22	1.12	0.30
Jul-15	0.52	0.84	0.92
Aug-15	1.44	4.44	2.34
Sep-15	2.52	3.10	1.27
Oct-15	0.96	0.77	1.74
Nov-15	0.34	0.19	0.69
Dec-15	0.13	0.46	0.94
Jan-16	1.57	1.17	1.29
Feb-16	0.01	0.17	0.09
Mar-16	0.00	0.00	0.01
Apr-16	0.38	0.60	0.43
May-16	0.11	0.19	0.10
Jun-16	0.00	1.17	0.54
Totals	**6.13**	**10.92**	**8.20**

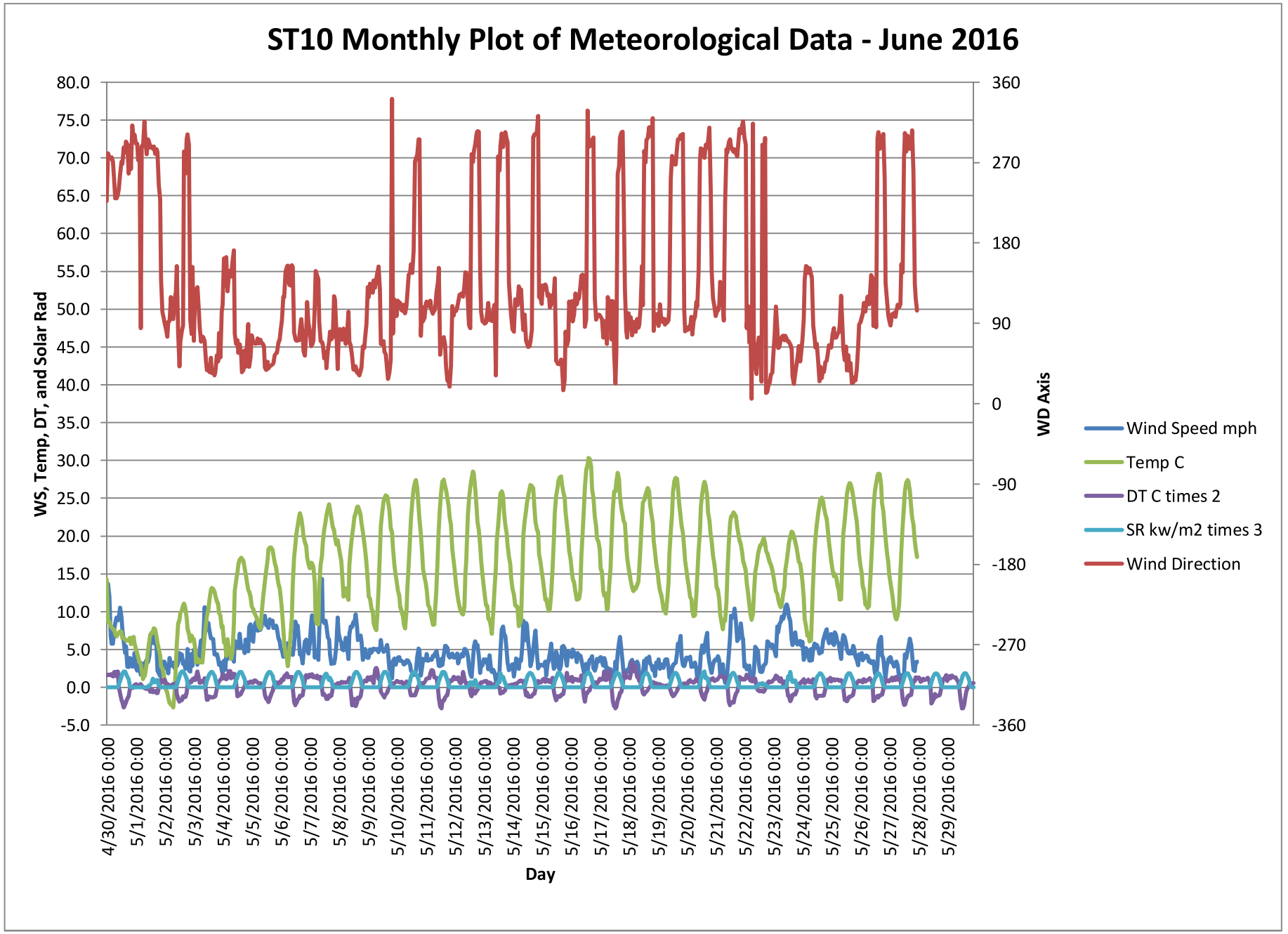
APPENDIX B

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - March 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
3/1/2016 0:00
3/2/2016 0:00
3/3/2016 0:00
3/4/2016 0:00
3/5/2016 0:00
3/6/2016 0:00
3/7/2016 0:00
3/8/2016 0:00
3/9/2016 0:00
3/10/2016 0:00
3/11/2016 0:00
3/12/2016 0:00
3/13/2016 0:00
3/14/2016 0:00
3/15/2016 0:00
3/16/2016 0:00
3/17/2016 0:00
3/18/2016 0:00
3/19/2016 0:00
3/20/2016 0:00
3/21/2016 0:00
3/22/2016 0:00
3/23/2016 0:00
3/24/2016 0:00
3/25/2016 0:00
3/26/2016 0:00
3/27/2016 0:00
3/28/2016 0:00
3/29/2016 0:00
3/30/2016 0:00
3/31/2016 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - April 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
4/1/2016 0:00
4/2/2016 0:00
4/3/2016 0:00
4/4/2016 0:00
4/5/2016 0:00
4/6/2016 0:00
4/7/2016 0:00
4/8/2016 0:00
4/9/2016 0:00
4/10/2016 0:00
4/11/2016 0:00
4/12/2016 0:00
4/13/2016 0:00
4/14/2016 0:00
4/15/2016 0:00
4/16/2016 0:00
4/17/2016 0:00
4/18/2016 0:00
4/19/2016 0:00
4/20/2016 0:00
4/21/2016 0:00
4/22/2016 0:00
4/23/2016 0:00
4/24/2016 0:00
4/25/2016 0:00
4/26/2016 0:00
4/27/2016 0:00
4/28/2016 0:00
4/29/2016 0:00
4/30/2016 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - May 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
5/1/2016 0:00
5/2/2016 0:00
5/3/2016 0:00
5/4/2016 0:00
5/5/2016 0:00
5/6/2016 0:00
5/7/2016 0:00
5/8/2016 0:00
5/9/2016 0:00
5/10/2016 0:00
5/11/2016 0:00
5/12/2016 0:00
5/13/2016 0:00
5/14/2016 0:00
5/15/2016 0:00
5/16/2016 0:00
5/17/2016 0:00
5/18/2016 0:00
5/19/2016 0:00
5/20/2016 0:00
5/21/2016 0:00
5/22/2016 0:00
5/23/2016 0:00
5/24/2016 0:00
5/25/2016 0:00
5/26/2016 0:00
5/27/2016 0:00
5/28/2016 0:00
5/29/2016 0:00
5/30/2016 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - June 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
4/30/2016 0:00
5/1/2016 0:00
5/2/2016 0:00
5/3/2016 0:00
5/4/2016 0:00
5/5/2016 0:00
5/6/2016 0:00
5/7/2016 0:00
5/8/2016 0:00
5/9/2016 0:00
5/10/2016 0:00
5/11/2016 0:00
5/12/2016 0:00
5/13/2016 0:00
5/14/2016 0:00
5/15/2016 0:00
5/16/2016 0:00
5/17/2016 0:00
5/18/2016 0:00
5/19/2016 0:00
5/20/2016 0:00
5/21/2016 0:00
5/22/2016 0:00
5/23/2016 0:00
5/24/2016 0:00
5/25/2016 0:00
5/26/2016 0:00
5/27/2016 0:00
5/28/2016 0:00
5/29/2016 0:00
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
MARCH - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.5	2.9	3.3	3.1	3.0	4.0	3.2	2.4	1.4	2.0	1.5	1.0	1.2	1.2	2.1	4.1	5.8	6.8	5.1	4.1	2.8	1.9	2.3	2.9	3.0
2	4.1	4.0	4.1	3.4	1.5	2.4	2.2	3.3	3.6	2.2	1.0	1.4	1.5	5.1	4.6	5.5	5.8	5.7	4.0	1.8	1.2	3.5	3.9	2.8	3.3
3	4.3	3.3	3.2	3.3	3.2	3.3	3.3	3.2	3.4	4.2	3.1	2.5	1.1	1.4	1.7	2.8	3.0	4.3	3.2	3.9	2.3	3.5	3.7	4.6	3.2
4	4.3	2.7	2.5	3.4	3.4	3.6	3.8	4.1	3.6	2.8	2.0	1.4	0.9	1.6	2.0	2.6	4.4	6.4	4.6	2.6	1.4	2.9	3.9	2.7	3.1
5	4.1	5.0	2.3	1.7	2.7	2.5	3.0	3.6	3.8	1.7	1.4	1.2	1.1	2.9	5.6	4.7	5.6	6.3	3.9	2.6	2.2	1.1	2.3	2.8	3.1
6	2.3	2.9	3.5	1.9	1.6	3.3	3.0	3.8	1.3	0.7	1.6	5.9	6.6	6.7	6.1	7.9	5.7	4.0	6.6	5.4	3.6	5.3	6.4	8.0	4.3
7	6.9	4.9	1.9	1.3	1.6	1.4	1.3	1.3	0.9	1.6	2.2	4.1	6.7	8.0	7.1	7.4	6.3	5.6	4.4	6.0	4.7	3.5	3.5	3.5	4.0
8	2.8	7.4	5.8	3.7	3.0	1.5	1.6	2.5	1.0	1.2	2.2	4.0	5.3	5.1	6.3	6.5	5.0	6.3	6.1	5.9	4.7	1.1	2.8	3.5	4.0
9	3.3	3.1	2.3	1.1	2.8	2.8	3.0	3.5	2.5	1.4	1.4	2.1	3.6	3.4	4.5	5.4	5.0	6.1	6.4	5.8	3.2	2.0	2.3	3.4	3.4
10	3.6	2.0	1.3	2.9	4.2	2.7	2.4	4.2	3.8	1.8	1.9	2.1	1.8	2.3	2.2	1.5	1.3	1.5	3.8	5.6	5.7	2.5	4.1	4.3	2.9
11	3.8	3.8	4.1	3.4	3.8	4.2	4.7	4.1	3.9	3.4	2.2	1.4	2.3	2.5	3.3	5.2	5.2	5.2	9.0	6.6	3.9	2.4	3.0	5.2	4.0
12	6.6	3.9	2.6	6.7	3.9	9.9	8.4	6.9	4.9	5.0	5.8	5.7	7.8	6.6	7.5	7.6	7.8	7.4	6.5	4.2	3.5	2.7	1.5	2.6	5.7
13	2.7	2.6	2.7	3.6	3.3	3.6	3.6	2.9	2.7	1.4	1.4	1.2	2.2	3.7	6.7	7.0	6.6	6.9	5.3	3.0	2.0	1.9	1.0	2.1	3.3
14	2.5	3.3	3.4	2.8	2.6	3.1	3.1	2.5	1.2	0.9	1.0	3.0	5.4	5.5	4.8	6.2	6.6	7.5	6.6	3.2	2.8	2.8	1.6	2.8	3.5
15	3.2	3.3	3.3	2.3	2.4	3.6	2.8	3.4	2.5	1.6	1.1	2.5	2.8	2.1	2.4	1.9	2.3	4.9	5.1	5.4	4.9	3.3	1.9	2.5	3.0
16	3.8	3.8	4.1	3.4	3.7	3.0	3.4	3.0	2.8	2.2	2.2	3.8	2.2	2.2	2.9	3.6	4.0	5.0	6.1	5.7	4.8	0.9	2.3	3.3	3.4
17	3.4	4.0	3.2	2.8	2.9	3.0	3.0	3.2	2.6	1.2	0.7	1.0	2.1	5.5	6.1	6.6	7.2	6.8	5.0	3.5	2.2	1.0	1.9	3.4	3.4
18	3.8	3.7	3.5	2.2	2.8	3.1	3.3	1.7	0.9	0.9	0.9	0.9	3.5	5.1	7.0	6.4	6.4	6.5	4.9	2.6	1.3	1.5	3.2	3.5	3.3
19	2.9	3.4	3.5	2.9	2.9	2.2	2.5	2.1	2.4	1.2	0.7	1.0	3.0	4.6	5.4	5.7	5.7	5.7	5.6	4.3	2.9	2.5	3.3	2.8	3.3
20	2.8	3.4	3.4	2.4	2.9	3.8	3.8	3.4	6.5	8.1	7.6	7.2	6.9	6.4	5.8	4.3	4.0	5.0	5.6	6.1	5.0	4.7	4.3	5.6	5.0
21	4.8	3.8	4.2	4.0	4.2	4.8	4.4	4.3	3.2	3.5	3.4	3.0	2.3	1.9	3.0	6.7	8.2	8.0	5.3	2.9	1.9	1.5	3.0	3.1	4.0
22	2.4	2.8	3.4	2.0	0.8	1.9	2.4	3.2	2.9	1.6	5.9	7.2	8.2	10.3	12.3	12.5	11.6	10.8	9.0	10.7	6.6	7.4	5.1	4.6	6.1
23	2.7	2.6	1.9	2.0	1.8	2.8	2.3	2.2	5.8	5.5	5.7	6.5	5.5	6.2	6.0	5.1	5.3	6.1	6.1	4.5	5.0	2.9	0.9	2.1	4.1
24	3.5	4.2	4.0	3.3	3.4	3.6	3.7	3.6	3.0	1.7	3.1	2.3	2.2	1.8	2.8	2.6	4.2	7.0	7.0	5.4	5.1	2.7	2.2	2.5	3.5
25	3.5	3.1	3.3	3.4	2.5	3.4	2.4	1.5	1.5	1.5	0.9	1.9	6.2	6.2	6.6	7.0	7.2	7.6	6.8	4.7	4.2	2.5	2.8	3.5	3.9
26	3.2	4.2	4.1	4.3	2.7	2.4	3.0	2.3	1.1	1.6	1.0	4.2	6.6	7.6	9.1	9.3	8.6	8.4	6.0	3.5	2.4	1.0	3.0	5.7	4.4
27	4.4	4.1	4.1	4.3	3.6	3.4	4.0	3.8	2.9	1.8	1.4	1.9	2.7	3.3	2.6	3.0	5.9	7.4	6.3	4.4	2.7	2.5	2.9	2.3	3.6
28	2.7	3.1	3.3	3.8	3.6	3.3	3.1	2.3	2.5	1.8	3.0	5.6	6.2	7.6	7.1	8.2	8.7	8.2	7.7	6.6	6.3	5.7	2.5	4.3	4.9
29	5.9	4.4	3.9	4.6	4.4	4.3	4.6	7.8	8.3	6.4	10.1	9.2	8.8	8.7	7.2	7.3	8.3	3.6	4.2	3.5	4.7	3.6	3.0	1.8	5.8
30	1.8	3.1	2.5	1.5	2.8	4.4	4.1	3.0	2.5	1.5	2.0	2.8	2.5	4.2	4.8	3.3	4.0	4.1	4.2	3.3	4.0	1.5	1.2	2.3	3.0
31	1.6	2.4	2.7	2.6	3.1	2.3	1.4	1.6	2.0	1.4	1.9	4.6	4.4	4.7	4.6	4.9	6.3	5.4	5.2	4.4	3.6	1.3	2.7	3.3	3.3
HRAVE	3.6	3.6	3.3	3.0	2.9	3.3	3.3	3.2	2.9	2.4	2.6	3.3	4.0	4.7	5.2	5.6	5.9	6.1	5.7	4.6	3.6	2.7	2.8	3.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.0	3.3	3.2	3.1	3.1	4.3	4.0	4.0	3.4	2.9	4.0	5.7	3.3	3.5	3.0	3.4	3.4	3.3	3.3	5.0	4.0	6.1	4.1	3.5	3.9
MAX	6.8	5.8	4.6	6.4	6.3	8.0	8.0	7.4	6.4	5.7	9.0	9.9	7.0	7.5	5.4	6.1	7.2	7.0	5.7	8.1	8.2	12.5	6.5	7.0	7.6
MIN	1.0	1.0	1.1	0.9	1.1	0.7	0.9	1.0	1.1	1.3	1.4	1.5	1.0	0.9	1.1	0.9	0.7	0.9	0.7	2.4	1.5	0.8	0.9	1.7	0.9

DAY	26	27	28	29	30	31
AVE	4.4	3.6	4.9	5.8	3.0	3.3
MAX	9.3	7.4	8.7	10.1	4.8	6.3
MIN	1.0	1.4	1.8	1.8	1.2	1.3

MONTHLY AVERAGE = 3.8 MONTHLY MAXIMUM = 12.5 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	103	97	104	108	104	117	119	93	108	122	99	170	247	302	264	293	298	282	293	308	281	155	113	103	52
2	98	105	106	115	117	101	111	102	111	120	211	256	269	307	303	297	291	275	288	284	182	108	99	102	102
3	91	120	104	101	108	95	98	102	101	95	115	95	51	151	317	298	300	300	302	298	327	85	96	85	250
4	96	116	106	97	103	95	90	89	93	101	132	138	148	82	31	297	266	300	298	312	56	109	88	110	248
5	90	80	46	37	98	90	89	98	89	118	98	206	270	288	296	278	304	307	296	287	301	188	120	113	156
6	102	87	78	90	79	91	86	77	29	35	295	295	284	246	241	293	308	291	273	272	293	270	262	261	322
7	257	267	299	246	288	178	144	149	192	277	277	279	280	284	276	295	286	270	281	289	286	307	251	311	143
8	225	288	297	285	283	219	193	290	202	234	264	285	290	291	282	287	289	286	295	299	297	290	211	130	224
9	105	100	95	25	116	114	103	103	123	257	269	259	279	266	291	268	276	293	284	305	286	165	115	99	328
10	93	54	84	122	108	116	106	116	125	111	126	117	328	318	347	95	163	189	273	301	301	58	103	83	283
11	109	105	113	134	110	93	104	112	108	124	148	130	108	55	176	221	223	270	284	296	299	312	332	292	86
12	293	246	218	269	272	280	284	296	282	302	302	264	288	278	284	280	281	277	284	286	294	285	144	128	191
13	108	125	108	97	111	103	103	114	133	124	215	154	257	295	303	299	294	296	302	304	288	174	150	125	220
14	115	95	104	99	90	96	99	95	102	128	357	298	308	297	289	279	295	304	301	302	298	302	190	144	252
15	111	102	95	67	106	87	106	102	122	149	305	41	67	97	240	184	254	296	290	310	300	299	96	116	357
16	90	105	107	119	103	112	117	105	113	130	147	78	49	170	261	258	274	282	293	302	293	293	136	101	80
17	94	93	110	105	103	97	111	102	121	93	278	261	270	309	301	289	294	289	295	305	285	332	124	108	160
18	108	100	91	77	93	102	96	123	94	279	256	279	297	286	287	282	277	276	274	306	291	139	114	99	300
19	110	107	100	98	98	112	116	126	109	196	294	308	271	306	287	277	273	280	286	305	301	135	106	112	52
20	102	104	122	118	118	104	111	101	99	78	80	84	80	77	66	52	26	30	34	33	43	43	34	51	350
21	93	100	104	110	120	122	124	130	143	100	78	70	71	284	310	285	289	292	298	298	296	176	111	99	33
22	102	96	96	98	61	106	104	94	92	256	275	240	264	264	286	279	284	289	291	296	279	273	274	294	339
23	325	340	295	294	282	295	301	280	294	285	286	283	274	258	264	271	285	283	275	300	313	300	171	109	128
24	109	97	108	113	124	119	125	111	118	118	81	79	91	153	236	254	274	288	287	297	307	270	158	123	78
25	110	111	111	105	102	115	120	123	107	136	164	282	296	284	278	280	274	276	282	296	300	302	136	124	118
26	112	112	110	115	128	112	113	134	230	273	274	291	277	275	284	281	284	281	291	300	297	260	118	60	2
27	98	78	94	135	118	123	116	116	139	128	123	85	6	305	307	260	257	288	300	293	309	150	111	106	50
28	117	103	97	89	95	96	99	108	113	123	183	194	226	230	232	237	235	240	256	251	248	262	270	267	103
29	276	297	294	208	218	205	265	300	301	258	270	296	299	303	298	281	279	308	305	289	285	292	293	291	227
30	252	306	312	270	284	304	295	293	281	278	251	310	349	249	254	265	278	275	281	302	303	261	140	114	241
31	113	114	104	101	96	106	52	113	122	148	289	286	252	271	284	269	299	297	278	294	310	184	130	121	247

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MARCH - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	8	12	9	7	10	7	9	9	16	17	28	53	51	50	35	27	11	8	6	6	32	11	8	9	18
2	7	10	8	9	14	9	9	6	8	22	57	32	39	18	19	17	13	8	6	21	22	12	8	12	16
3	7	7	6	8	8	6	7	7	7	7	12	27	36	51	38	32	27	7	8	7	34	10	9	6	16
4	9	9	8	7	7	6	6	5	8	15	22	45	76	38	36	22	23	9	7	21	35	16	7	12	19
5	8	6	34	32	10	8	8	7	6	33	30	49	71	37	24	16	12	9	7	41	13	40	10	12	22
6	14	9	9	41	47	11	9	9	50	67	27	11	17	17	20	11	17	16	10	7	17	13	12	11	20
7	11	12	30	22	26	35	16	10	35	20	38	25	17	13	15	15	14	18	17	9	11	21	18	33	20
8	15	20	10	7	14	19	18	11	54	48	31	18	14	18	13	15	15	11	8	7	8	62	27	11	20
9	9	8	10	46	13	10	9	8	13	31	28	18	20	39	33	19	18	16	7	7	14	17	11	9	17
10	8	34	33	13	9	12	14	9	11	26	26	32	63	28	37	38	55	27	13	7	5	41	11	8	23
11	13	8	9	9	7	8	6	6	8	16	21	35	22	31	39	23	15	11	8	9	36	58	35	13	19
12	8	22	16	14	15	8	7	10	14	18	19	20	14	19	17	16	15	10	7	4	4	43	37	10	15
13	11	12	8	7	9	7	8	9	12	35	35	43	41	31	16	15	14	11	9	7	27	10	33	8	17
14	8	6	8	7	12	7	8	10	24	33	61	22	19	20	18	16	15	11	9	8	10	15	32	7	16
15	8	10	8	9	9	8	10	8	14	35	43	42	36	41	46	47	47	20	8	7	6	7	21	11	21
16	8	8	7	6	7	8	7	9	11	23	21	32	42	30	44	23	21	14	7	6	6	30	14	10	16
17	7	8	8	9	8	8	9	7	11	37	63	51	34	21	23	12	16	11	8	5	15	23	27	8	18
18	8	10	9	11	8	8	10	14	34	44	68	63	25	20	18	16	15	13	7	8	40	21	7	7	20
19	9	13	8	10	10	10	11	11	14	28	63	55	27	18	17	18	18	14	6	6	26	11	7	16	18
20	11	6	6	13	10	8	8	15	25	13	15	17	18	16	14	31	23	17	13	11	12	14	15	10	14
21	12	11	7	7	9	9	4	5	10	22	15	22	33	53	39	16	14	11	7	7	10	22	7	12	15
22	9	7	7	23	60	15	10	9	10	45	19	20	17	16	12	11	11	11	10	9	10	8	10	11	15
23	30	15	13	20	17	6	6	19	12	14	17	19	23	19	19	21	15	13	8	6	7	30	31	31	17
24	24	26	30	25	24	9	9	8	14	30	17	36	51	63	36	55	25	11	7	6	6	22	19	7	23
25	8	11	9	9	14	7	12	21	25	29	65	35	18	16	23	17	14	12	8	9	10	25	15	12	18
26	11	8	11	8	13	12	11	12	38	16	38	20	20	19	13	15	12	9	9	6	8	39	8	15	15
27	13	7	12	6	7	9	9	8	12	26	40	29	41	37	52	58	20	9	10	10	12	18	8	11	19
28	11	9	9	9	10	9	8	12	16	28	55	26	26	16	20	17	12	17	12	12	13	10	14	11	16
29	11	8	12	17	12	11	13	9	10	14	13	13	12	13	14	15	13	16	12	10	6	8	6	13	12
30	15	9	12	44	16	14	11	16	20	56	35	42	53	22	26	31	21	14	9	8	5	40	30	12	23
31	14	10	10	9	8	14	20	11	15	29	50	28	18	23	29	26	14	14	8	7	10	25	10	10	17
HRAVE	11	11	12	15	14	10	10	10	18	28	35	32	32	27	26	23	19	13	9	9	15	23	16	12	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	18	16	16	19	22	20	20	20	17	23	19	15	17	16	21	16	18	20	18	14	15	15	17	23	18
MAX	53	57	51	76	71	67	38	62	46	63	58	43	43	61	47	44	63	68	63	31	53	60	31	63	65
MIN	6	6	6	5	6	7	9	7	7	5	6	4	7	6	6	6	5	7	6	6	4	7	6	6	7

DAY	26	27	28	29	30	31
AVE	15	19	16	12	23	17
MAX	39	58	55	17	56	50
MIN	6	6	8	6	5	7

MONTHLY AVERAGE = 18.0 MONTHLY MAXIMUM = 76.5 MONTHLY MINIMUM = 4.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	16.3	15.1	14.1	13.1	11.8	11.4	11.2	10.4	12.5	16.5	20.0	22.7	25.4	27.1	28.4	28.4	28.1	27.1	25.2	23.9	22.7	21.0	19.3	17.1	19.5
2	16.1	15.2	14.7	13.9	11.8	11.6	9.8	10.6	13.0	16.5	19.1	21.5	24.4	26.9	27.6	28.1	28.1	27.3	25.3	24.0	21.9	20.1	18.5	16.5	19.3
3	15.4	14.7	13.4	12.9	11.5	10.8	10.8	10.8	12.0	15.1	19.1	23.3	25.6	27.3	28.0	29.1	29.0	27.7	26.3	24.3	23.5	20.5	18.7	17.1	19.5
4	16.8	14.7	13.6	13.1	12.6	11.7	10.6	10.7	12.3	17.1	20.6	23.9	26.8	28.7	29.4	30.3	30.0	28.5	26.5	25.2	24.2	21.9	20.2	19.5	20.4
5	17.4	16.0	15.0	14.4	12.8	12.2	11.4	11.9	14.4	17.9	21.5	24.3	26.8	26.9	27.5	27.5	26.8	25.6	24.6	23.1	22.7	21.2	20.6	20.3	20.1
6	19.9	19.0	17.7	17.4	16.0	15.1	15.2	14.3	16.1	19.1	22.0	23.5	24.9	25.6	26.0	24.7	24.0	24.1	22.8	21.0	19.7	18.9	18.2	17.5	20.1
7	16.4	15.6	15.2	14.6	13.8	12.7	12.1	12.1	12.9	14.4	16.7	18.4	19.5	19.3	19.3	19.5	18.7	17.1	16.2	15.0	14.4	13.8	13.6	13.1	15.6
8	11.8	10.2	9.5	9.1	8.6	7.9	7.9	8.0	9.6	11.6	12.9	13.9	15.4	16.0	17.5	18.4	18.2	18.1	16.8	15.8	15.1	14.8	13.6	12.3	13.0
9	12.2	10.9	9.7	8.3	7.5	7.2	6.4	8.3	10.4	12.4	15.1	18.6	21.3	23.0	23.7	23.7	23.6	22.8	21.0	19.7	19.0	17.7	16.5	15.0	15.6
10	13.7	12.4	11.5	9.7	10.1	9.5	8.3	9.8	12.8	16.0	20.4	23.0	24.4	25.8	26.9	27.5	27.9	27.8	26.1	24.0	22.7	21.2	19.0	17.6	18.7
11	16.1	15.1	14.3	12.5	12.2	10.9	11.1	12.0	14.9	18.4	21.7	24.6	26.7	27.8	29.6	29.8	29.1	28.2	25.8	24.1	23.4	22.6	21.8	20.1	20.5
12	19.3	19.2	17.4	15.1	13.5	12.7	12.0	11.4	11.9	13.4	14.9	16.8	17.0	17.9	18.6	18.6	18.5	17.9	16.6	15.4	14.8	13.9	13.4	12.1	15.5
13	11.6	10.4	9.4	8.7	8.1	7.4	7.4	8.1	10.9	13.6	16.7	19.2	20.7	22.4	23.3	23.4	23.0	22.0	20.4	19.3	18.5	17.2	17.0	15.7	15.6
14	14.7	13.8	12.9	12.0	10.4	9.8	8.9	10.8	12.6	15.6	18.6	20.7	22.4	23.3	24.1	24.7	24.5	23.3	21.9	20.7	19.3	18.2	17.9	16.2	17.4
15	15.5	14.4	13.2	12.1	11.0	10.2	9.6	10.9	13.8	16.9	19.6	23.4	24.9	26.1	26.8	27.1	27.4	26.4	24.5	23.1	22.0	20.9	19.1	17.5	19.0
16	15.5	14.4	13.8	12.6	12.0	10.9	10.6	12.0	14.8	18.4	21.8	25.7	26.8	27.9	28.0	28.9	28.5	28.0	25.8	24.0	22.7	21.5	19.2	18.0	20.1
17	16.6	14.9	14.6	13.0	11.9	10.4	11.1	12.0	15.0	17.8	21.2	24.1	26.7	28.0	28.6	28.9	28.3	27.4	25.9	24.0	22.9	22.5	19.5	18.0	20.1
18	17.4	16.0	14.2	12.9	11.6	10.9	10.2	11.8	14.5	16.9	20.6	23.8	26.7	28.0	28.4	28.3	28.2	27.4	25.6	23.9	23.2	21.3	19.6	18.5	20.0
19	16.9	16.2	15.7	13.7	12.6	12.3	11.4	12.5	15.6	18.1	21.4	24.6	26.9	28.3	29.1	29.4	29.0	28.2	26.4	24.7	23.7	21.9	20.7	18.6	20.7
20	17.7	16.4	15.6	13.7	11.9	13.0	11.9	13.1	17.7	21.6	23.4	25.1	26.3	27.5	28.0	28.7	28.6	28.1	26.9	25.8	25.0	24.1	23.0	21.6	21.4
21	19.6	18.7	16.6	15.8	14.5	14.2	13.5	14.6	17.0	21.7	24.8	26.9	28.8	30.5	31.2	31.8	31.0	29.8	28.2	26.6	25.1	23.5	21.9	20.9	22.8
22	20.1	19.1	19.2	17.4	15.8	15.0	14.2	16.4	20.7	23.0	25.2	26.8	27.4	27.9	26.8	26.0	25.3	23.8	22.0	20.2	19.0	18.3	17.4	16.6	21.0
23	16.0	15.4	14.8	14.3	13.9	13.0	12.2	11.8	13.5	15.2	17.1	18.5	19.5	20.3	21.0	21.0	21.0	20.4	18.8	17.1	16.6	15.7	15.3	13.2	16.5
24	11.9	11.2	10.1	9.0	7.6	7.5	6.9	8.9	12.4	15.5	19.5	21.4	22.8	23.8	24.7	25.1	25.0	23.9	22.1	20.1	19.3	18.1	16.6	15.5	16.6
25	14.4	13.8	12.5	11.3	9.5	9.3	8.6	8.9	12.9	16.2	19.2	21.8	24.2	25.1	25.7	25.7	25.6	25.2	23.7	22.2	21.4	21.2	18.3	16.9	18.1
26	16.1	14.7	13.8	13.2	11.0	11.4	10.1	12.0	13.6	17.0	21.0	24.1	25.8	26.6	26.6	26.8	26.8	26.0	24.6	23.0	22.1	20.6	18.8	18.7	19.3
27	17.1	16.9	15.4	13.0	13.1	11.6	11.0	13.4	16.0	19.6	22.1	24.5	26.3	26.7	27.5	28.6	28.7	27.3	25.7	23.8	22.9	21.2	19.8	19.0	20.5
28	18.2	17.2	15.7	14.4	13.4	13.0	13.0	13.8	16.0	20.0	23.5	26.2	26.5	27.1	27.5	26.5	26.1	25.6	24.0	23.0	22.1	21.0	19.9	19.0	20.5
29	18.0	17.4	17.3	17.6	17.3	16.6	14.6	14.2	14.5	15.2	14.9	14.1	13.5	13.7	14.4	15.6	16.2	15.9	15.8	15.5	14.5	13.6	13.5	13.4	15.3
30	12.6	12.4	12.1	11.7	11.1	10.8	10.2	10.7	11.9	12.8	13.8	13.8	13.8	16.0	15.4	15.9	16.1	16.2	15.4	14.4	13.7	12.9	12.1	10.6	13.2
31	9.3	8.6	7.8	7.1	5.9	5.5	4.3	6.3	9.9	12.6	15.4	17.1	17.5	17.5	19.0	19.1	18.7	18.2	17.2	15.8	15.7	14.7	13.7	13.0	12.9
HRAVE	15.8	14.8	13.9	12.8	11.8	11.2	10.5	11.4	13.8	16.7	19.5	21.8	23.4	24.5	25.1	25.4	25.2	24.4	22.8	21.4	20.4	19.2	17.9	16.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19.5	19.3	19.5	20.4	20.1	20.1	15.6	13.0	15.6	18.7	20.5	15.5	15.6	17.4	19.0	20.1	20.1	20.0	20.7	21.4	22.8	21.0	16.5	16.6	18.1
MAX	28.4	28.1	29.1	30.3	27.5	26.0	19.5	18.4	23.7	27.9	29.8	19.3	23.4	24.7	27.4	28.9	28.9	28.4	29.4	28.7	31.8	27.9	21.0	25.1	25.7
MIN	10.4	9.8	10.8	10.6	11.4	14.3	12.1	7.9	6.4	8.3	10.9	11.4	7.4	8.9	9.6	10.6	10.4	10.2	11.4	11.9	13.5	14.2	11.8	6.9	8.6

DAY	26	27	28	29	30	31
AVE	19.3	20.5	20.5	15.3	13.2	12.9
MAX	26.8	28.7	27.5	18.0	16.2	19.1
MIN	10.1	11.0	13.0	13.4	10.2	4.3

MONTHLY AVERAGE = 18.4 MONTHLY MAXIMUM = 31.8 MONTHLY MINIMUM = 4.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.7	0.6	0.6	0.6	0.6	0.4	0.4	-0.3	-0.7	-1.3	-1.1	-0.8	-0.9	-0.8	-0.9	-0.8	-0.5	-0.2	0.4	0.6	0.6	0.6	0.6	0.8	0.0
2	0.8	0.6	0.5	0.4	0.6	0.5	0.6	0.3	-1.1	-1.2	-0.7	-0.8	-0.8	-0.9	-0.9	-0.8	-0.6	-0.3	0.5	0.7	0.5	0.8	0.8	0.6	0.0
3	0.8	0.6	0.7	0.8	0.4	0.7	0.6	0.4	-0.5	-1.5	-1.7	-1.5	-0.9	-1.0	-0.7	-0.8	-0.5	0.1	0.6	0.6	0.6	0.9	0.9	0.8	0.0
4	0.8	0.6	0.8	0.8	0.6	0.8	0.8	0.6	-1.0	-1.6	-1.3	-1.0	-0.9	-1.2	-0.9	-1.0	-0.4	0.1	0.4	0.5	0.6	0.8	1.0	0.6	0.0
5	0.8	0.8	0.8	0.6	0.7	0.6	0.6	0.3	-0.9	-1.0	-0.9	-0.9	-0.8	-0.8	-1.0	-0.8	-0.4	-0.1	0.2	0.5	0.5	0.4	0.4	0.3	0.0
6	0.3	0.7	0.5	0.6	0.4	0.5	0.6	-0.1	-0.5	-0.5	-0.9	-1.0	-1.0	-1.1	-1.0	-0.7	-0.6	-0.5	0.1	0.2	0.4	0.3	0.1	0.1	-0.1
7	0.1	0.2	0.2	0.2	0.3	0.3	0.2	-0.1	-0.4	-0.6	-0.8	-1.1	-1.2	-1.1	-1.0	-1.1	-0.6	-0.2	0.0	-0.1	0.0	0.1	0.1	0.1	-0.3
8	0.3	-0.1	-0.1	0.1	0.2	0.2	0.0	0.2	-0.4	-0.8	-0.9	-0.9	-0.9	-0.7	-1.1	-1.3	-0.8	-0.5	0.1	0.3	0.4	0.3	0.4	0.3	-0.2
9	0.5	0.6	0.6	0.6	0.7	0.4	0.6	-0.5	-1.2	-0.8	-0.7	-0.9	-1.2	-1.1	-1.2	-1.1	-0.8	-0.4	0.1	0.3	0.5	0.5	0.6	0.7	-0.1
10	0.7	0.4	0.6	0.8	0.4	0.7	0.6	-0.7	-1.3	-1.1	-1.4	-1.3	-1.1	-1.1	-0.9	-0.8	-0.5	-0.3	0.2	0.6	0.5	0.7	0.8	0.8	-0.1
11	1.2	0.6	0.4	0.7	0.7	0.7	0.6	-0.5	-1.4	-1.4	-1.2	-1.0	-1.3	-0.8	-1.0	-0.8	-0.5	-0.2	0.1	0.2	0.2	0.3	0.5	0.5	-0.1
12	0.4	0.4	0.6	0.2	0.2	0.1	0.0	0.0	-0.3	-0.8	-1.0	-1.2	-1.3	-1.3	-1.3	-1.2	-0.9	-0.5	0.0	0.3	0.5	0.6	0.3	0.4	-0.2
13	0.4	0.4	0.6	0.5	0.5	0.4	0.4	-0.8	-1.4	-0.8	-0.9	-0.9	-1.1	-1.2	-1.2	-1.1	-0.9	-0.4	0.1	0.4	0.5	0.4	0.4	0.5	-0.2
14	0.4	0.6	0.5	0.6	0.5	0.6	0.3	-0.5	-0.6	-0.6	-0.7	-1.0	-1.2	-1.2	-1.3	-1.2	-0.9	-0.4	0.1	0.4	0.5	0.5	0.4	0.4	-0.2
15	0.5	0.5	0.5	0.4	0.6	0.7	0.4	-0.5	-1.3	-0.9	-0.7	-1.3	-1.3	-1.4	-1.1	-1.0	-0.6	-0.3	0.1	0.4	0.5	0.8	0.7	0.5	-0.2
16	0.8	0.6	0.8	0.7	0.6	0.6	0.4	-0.8	-1.6	-1.4	-1.4	-1.6	-1.3	-1.2	-1.1	-1.1	-0.8	-0.5	0.1	0.5	0.6	0.6	0.9	0.7	-0.2
17	0.9	0.7	0.7	0.6	0.8	0.6	0.4	-0.8	-1.4	-0.8	-0.7	-0.8	-1.1	-1.1	-1.2	-1.1	-0.8	-0.4	0.2	0.8	0.7	0.5	0.8	0.7	-0.1
18	0.6	0.6	0.6	0.5	0.7	0.8	0.5	-0.4	-0.5	-0.6	-0.6	-0.8	-1.2	-1.2	-1.3	-1.1	-0.9	-0.5	0.1	0.7	0.5	0.6	0.6	0.7	-0.1
19	0.6	0.4	0.7	0.6	0.6	0.5	0.5	-0.4	-1.3	-0.9	-0.6	-0.9	-1.1	-1.2	-1.3	-1.1	-0.8	-0.5	0.1	0.6	0.7	0.5	0.6	0.9	-0.1
20	0.7	0.8	0.5	1.1	0.7	0.5	0.4	-0.3	-0.8	-1.3	-1.5	-1.6	-1.6	-1.5	-1.0	-0.8	-0.4	0.0	0.2	0.3	0.3	0.3	0.4	0.3	-0.2
21	0.4	0.4	0.9	0.8	0.9	0.8	0.5	-0.4	-1.0	-1.2	-1.6	-1.6	-1.4	-1.2	-1.2	-1.1	-0.8	-0.4	0.2	0.6	0.6	0.6	0.6	0.5	-0.2
22	0.7	1.0	1.0	0.8	0.6	0.7	0.6	-0.2	-1.6	-0.8	-0.9	-1.4	-1.1	-1.1	-1.1	-0.9	-0.8	-0.4	-0.1	0.0	0.1	0.2	0.2	0.3	-0.2
23	0.3	0.4	0.4	0.3	0.3	0.4	0.6	0.0	-0.4	-0.8	-1.1	-1.2	-1.4	-1.4	-1.4	-1.2	-1.1	-0.7	-0.1	0.3	0.3	0.5	0.4	0.6	-0.2
24	0.6	0.6	0.7	0.7	0.6	0.5	0.3	-1.1	-1.6	-1.2	-1.8	-1.5	-1.5	-1.1	-1.4	-1.1	-0.9	-0.6	-0.1	0.3	0.4	0.5	0.4	0.4	-0.3
25	0.4	0.4	0.5	0.6	0.6	0.6	0.2	-0.3	-0.9	-1.0	-0.8	-1.1	-1.4	-1.4	-1.4	-1.2	-0.9	-0.6	0.0	0.3	0.5	0.7	0.7	0.3	-0.2
26	0.4	0.4	0.3	0.4	0.9	0.5	0.4	-0.7	-0.5	-0.7	-0.7	-1.2	-1.2	-1.3	-1.3	-1.1	-0.9	-0.6	0.0	0.5	0.6	0.6	0.7	0.5	-0.2
27	0.8	0.7	0.9	0.9	0.6	1.3	0.9	-0.7	-1.3	-1.1	-1.0	-1.3	-1.3	-1.2	-1.2	-1.0	-1.0	-0.6	0.0	0.4	0.4	0.6	0.5	0.5	-0.1
28	0.5	0.6	0.7	0.7	0.6	0.6	0.3	-0.6	-1.0	-1.1	-1.2	-2.0	-1.6	-1.6	-1.6	-0.7	-0.6	-0.4	0.0	0.1	0.2	0.2	0.2	0.2	-0.3
29	0.1	0.2	0.2	0.3	0.3	0.3	0.3	-0.2	-0.5	-0.5	-0.6	-1.0	-1.0	-1.3	-1.1	-0.8	-0.7	-0.4	-0.3	-0.1	0.1	0.2	0.1	0.2	-0.3
30	0.3	0.2	0.1	0.1	0.1	0.0	0.1	-0.3	-0.8	-0.7	-1.0	-0.7	-0.9	-1.1	-0.8	-1.0	-0.7	-0.6	-0.1	0.3	0.4	0.4	0.5	0.6	-0.2
31	0.7	0.6	0.5	0.6	0.5	0.6	0.5	-0.5	-1.2	-0.9	-1.0	-1.3	-1.1	-0.9	-1.3	-1.3	-1.0	-0.7	-0.2	0.2	0.3	0.4	0.2	0.1	-0.3
HRAVE	0.6	0.5	0.6	0.6	0.5	0.5	0.4	-0.3	-1.0	-1.0	-1.0	-1.2	-1.2	-1.2	-1.1	-1.0	-0.7	-0.4	0.1	0.4	0.4	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2
MAX	0.8	0.8	0.9	1.0	0.8	0.7	0.3	0.4	0.7	0.8	1.2	0.6	0.6	0.6	0.8	0.9	0.9	0.8	0.9	1.1	0.9	1.0	0.6	0.7	0.7
MIN	-1.3	-1.2	-1.7	-1.6	-1.0	-1.1	-1.2	-1.3	-1.2	-1.4	-1.4	-1.3	-1.4	-1.3	-1.4	-1.6	-1.4	-1.3	-1.3	-1.6	-1.6	-1.6	-1.4	-1.8	-1.4

DAY	26	27	28	29	30	31
AVE	-0.2	-0.1	-0.3	-0.3	-0.2	-0.3
MAX	0.9	1.3	0.7	0.3	0.6	0.7
MIN	-1.3	-1.3	-2.0	-1.3	-1.1	-1.3

MONTHLY AVERAGE = -0.2 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	704	704	704	704	704	704	705	705	706	706	706	706	705	704	703	703	703	703	703	704	704	704	704	704	704
2	704	704	704	703	703	704	704	705	705	705	705	704	703	703	702	702	702	702	702	703	703	703	704	704	703
3	704	704	704	704	704	704	704	705	705	705	705	704	704	703	702	702	702	702	702	702	702	702	702	702	703
4	702	703	703	703	702	703	703	703	704	704	703	702	702	701	700	700	700	700	700	700	701	701	701	702	702
5	701	701	701	701	702	702	702	703	703	703	703	703	702	701	701	700	700	700	700	701	701	702	702	702	702
6	702	702	702	702	702	701	701	701	702	702	701	700	700	699	698	698	697	697	697	697	698	698	698	699	700
7	699	699	699	699	698	699	699	699	699	698	698	697	697	696	695	695	694	694	694	695	695	695	695	695	697
8	695	695	696	695	695	696	696	697	697	697	697	697	697	697	696	696	696	696	697	697	698	699	699	699	697
9	699	699	699	699	699	700	700	701	702	702	702	701	701	700	700	700	699	700	700	701	702	702	702	703	700
10	703	703	702	702	702	702	703	703	704	704	704	704	703	703	702	702	701	701	701	702	702	703	703	703	703
11	703	703	703	703	703	703	703	704	704	704	703	703	702	701	700	699	699	699	699	699	700	700	700	700	701
12	701	701	701	700	701	701	702	703	703	703	703	703	703	703	702	702	702	703	703	703	704	704	704	704	702
13	704	704	704	704	704	704	704	705	705	705	705	704	704	703	702	701	701	702	702	702	703	703	703	703	703
14	703	703	703	702	703	703	703	703	704	704	703	703	702	702	701	700	700	700	701	701	702	702	702	703	702
15	702	702	703	703	703	703	703	704	704	704	704	703	703	702	701	701	701	700	701	701	701	701	701	702	702
16	702	702	702	702	702	702	702	703	703	703	703	702	701	700	700	699	699	699	699	700	700	700	700	700	701
17	700	700	700	700	701	701	701	701	702	701	701	701	700	699	698	698	698	698	698	698	699	699	699	699	700
18	699	699	699	700	700	700	700	701	701	701	701	701	700	699	699	699	699	699	699	700	700	700	701	701	700
19	701	701	701	701	701	702	702	703	703	703	703	702	702	701	701	700	700	700	700	701	701	702	702	702	702
20	702	703	703	703	703	703	704	705	705	705	705	705	704	704	703	702	702	702	702	702	703	704	704	704	703
21	704	704	704	704	704	704	704	705	705	705	705	704	703	702	701	700	700	700	700	700	700	701	701	701	703
22	701	701	700	700	700	700	701	700	700	700	700	700	699	699	698	697	697	697	697	698	699	699	700	700	699
23	700	700	700	700	701	701	701	702	703	703	704	703	703	703	703	702	703	703	703	704	704	705	705	705	702
24	705	704	704	704	704	704	705	705	705	705	705	704	703	702	701	700	700	700	700	700	700	700	700	700	702
25	700	700	700	700	699	700	700	700	701	700	700	699	699	698	697	697	696	696	696	697	697	697	697	697	698
26	697	697	697	697	698	698	698	699	699	699	699	699	698	698	698	698	698	698	699	699	700	700	701	701	699
27	702	702	703	703	703	703	704	704	704	704	704	704	703	702	702	701	701	700	700	701	701	701	701	701	702
28	701	701	701	701	700	700	701	701	700	700	700	699	698	698	697	696	696	696	696	696	697	697	697	697	698
29	697	697	697	696	696	696	697	697	698	698	698	698	699	698	698	698	698	698	697	697	698	698	698	699	698
30	699	699	699	699	699	700	700	701	701	701	701	701	701	700	700	700	699	699	699	699	700	700	700	700	700
31	700	700	700	699	699	700	700	701	701	701	700	700	700	700	699	699	699	699	699	700	701	701	702	702	700
HRAVE	701	701	701	701	701	701	702	702	702	702	702	702	701	700	700	700	699	699	700	700	700	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	704	703	703	702	702	700	697	697	700	703	701	702	703	702	702	701	700	700	702	703	703	699	702	702	698
MAX	706	705	705	704	703	702	699	699	703	704	704	704	705	704	704	703	702	701	703	705	705	701	705	705	701
MIN	703	702	702	700	700	697	694	695	699	701	699	700	701	700	700	699	698	699	700	702	700	697	700	700	696

DAY	26	27	28	29	30	31
AVE	699	702	698	698	700	700
MAX	701	704	701	699	701	702
MIN	697	700	696	696	699	699

MONTHLY AVERAGE = 700.9 MONTHLY MAXIMUM = 706.3 MONTHLY MINIMUM = 694.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	31	33	36	38	41	42	42	45	37	27	22	18	15	11	10	11	11	13	15	18	20	21	26	30	26
2	31	32	34	35	40	43	47	45	36	26	22	19	16	14	13	12	11	13	16	18	22	24	27	31	26
3	33	34	37	37	40	43	41	42	37	30	23	17	14	11	6	5	6	7	8	12	16	18	22	24	23
4	25	29	32	32	33	35	39	40	35	23	18	14	10	5	5	5	4	6	8	11	12	14	17	18	20
5	21	23	26	27	30	31	33	33	28	20	14	11	8	9	9	8	10	12	13	16	17	18	20	20	19
6	20	22	25	26	30	31	31	33	30	22	16	14	12	13	14	19	22	21	22	24	26	30	37	34	24
7	37	41	44	44	46	49	50	49	44	40	34	28	24	21	19	18	20	26	28	30	32	34	36	41	35
8	45	56	61	63	66	68	67	69	60	52	48	47	40	38	33	30	31	29	30	31	33	34	35	39	46
9	41	44	48	53	56	59	61	55	45	39	32	23	19	13	13	13	13	13	15	17	19	20	24	26	32
10	29	32	34	37	37	39	43	40	31	24	17	13	11	11	9	6	6	6	10	13	15	18	21	22	22
11	25	27	28	31	32	35	34	31	25	19	14	11	8	8	4	4	6	7	12	14	14	15	16	19	18
12	21	23	27	40	54	56	56	53	42	35	33	26	25	24	23	23	24	26	29	32	33	36	38	40	34
13	42	44	48	50	52	54	54	50	40	33	27	21	19	17	16	16	16	18	19	21	22	24	26	28	32
14	30	32	34	36	40	43	45	39	34	26	22	22	21	20	20	20	20	22	25	27	31	34	36	39	30
15	42	44	47	50	55	57	59	54	42	34	30	19	12	10	10	10	8	10	15	16	17	18	23	25	30
16	27	29	31	33	34	36	37	32	27	20	15	8	6	5	6	6	7	8	10	11	12	14	17	20	19
17	22	25	26	29	31	34	33	30	24	18	14	11	8	7	6	6	6	8	8	10	11	14	16	19	17
18	20	21	24	27	30	31	33	29	24	20	15	12	10	8	5	5	6	7	9	13	15	16	19	20	17
19	22	23	24	27	30	31	34	30	24	20	17	15	12	7	6	6	7	8	9	10	11	14	16	18	18
20	20	23	24	27	30	30	32	29	24	20	19	16	14	11	10	10	10	11	13	15	17	18	19	20	19
21	24	26	28	30	31	32	33	30	26	20	17	14	12	8	8	6	7	7	8	9	13	14	18	19	18
22	20	22	22	25	30	30	31	26	17	15	14	11	11	9	12	13	14	15	17	20	21	21	23	26	19
23	30	34	34	34	34	35	36	36	24	18	13	11	9	6	6	6	6	6	9	12	14	15	15	19	19
24	19	20	21	24	25	27	27	24	18	14	12	10	8	7	6	5	6	8	9	11	14	15	17	19	15
25	21	21	23	25	30	29	30	28	21	15	12	11	10	9	9	8	8	8	10	12	13	14	17	18	17
26	19	22	22	22	26	27	29	24	21	18	13	11	9	8	8	8	8	9	10	13	15	17	18	18	16
27	18	17	20	26	27	30	29	26	21	15	13	12	12	11	11	9	8	11	13	16	18	19	22	22	18
28	24	27	30	31	33	33	33	32	29	23	22	20	19	18	18	15	14	14	19	20	19	22	29	31	24
29	32	35	36	37	38	40	45	55	56	56	47	46	47	44	42	39	38	39	40	41	36	32	27	27	41
30	28	28	30	32	35	47	53	51	46	41	38	38	46	31	32	31	30	28	28	29	28	31	33	36	35
31	40	42	44	47	49	51	55	44	34	28	23	18	19	19	16	15	18	20	23	26	28	28	30	31	31
HRAVE	28	30	32	35	38	40	41	39	32	26	22	18	16	14	13	12	13	14	16	18	20	21	24	26	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	26	26	23	20	19	24	35	46	32	22	18	34	32	30	30	19	17	17	18	19	18	19	19	15	17
MAX	45	47	43	40	33	37	50	69	61	43	35	56	54	45	59	37	34	33	34	32	33	31	36	27	30
MIN	10	11	5	4	8	12	18	29	13	6	4	21	16	20	8	5	6	5	6	10	6	9	6	5	8

DAY	26	27	28	29	30	31
AVE	16	18	24	41	35	31
MAX	29	30	33	56	53	55
MIN	8	8	14	27	28	15

MONTHLY AVERAGE = 24.5 MONTHLY MAXIMUM = 69.2 MONTHLY MINIMUM = 3.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.51	0.65	0.68	0.83	0.77	0.68	0.43	0.28	0.11	0.01	0.00	0.00	0.00	0.00	0.00	5.36
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.29	0.48	0.62	0.77	0.83	0.76	0.60	0.48	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	5.40
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.19	0.44	0.56	0.82	0.71	0.76	0.62	0.58	0.33	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.14
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.29	0.53	0.69	0.82	0.87	0.84	0.74	0.55	0.27	0.10	0.01	0.00	0.00	0.00	0.00	0.00	5.75
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.30	0.54	0.61	0.79	0.85	0.57	0.63	0.43	0.22	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.07
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.26	0.47	0.60	0.60	0.69	0.67	0.49	0.36	0.32	0.18	0.01	0.00	0.00	0.00	0.00	0.00	4.74
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.27	0.44	0.64	0.77	0.81	0.60	0.58	0.53	0.25	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.05
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.32	0.52	0.55	0.47	0.47	0.38	0.65	0.58	0.33	0.15	0.01	0.00	0.00	0.00	0.00	0.00	4.50
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.55	0.71	0.82	0.87	0.84	0.74	0.58	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.13
10	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.35	0.56	0.72	0.84	0.88	0.85	0.76	0.60	0.40	0.17	0.01	0.00	0.00	0.00	0.00	0.00	6.31
11	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.56	0.65	0.64	0.66	0.53	0.53	0.43	0.22	0.14	0.01	0.00	0.00	0.00	0.00	0.00	4.88
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.34	0.56	0.72	0.83	0.87	0.84	0.74	0.59	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	6.12
13	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.57	0.73	0.84	0.89	0.85	0.76	0.60	0.40	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.34
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.54	0.71	0.82	0.86	0.81	0.73	0.58	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.10
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.57	0.74	0.85	0.86	0.85	0.74	0.58	0.38	0.14	0.01	0.00	0.00	0.00	0.00	0.00	6.25
16	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.58	0.74	0.86	0.91	0.88	0.78	0.62	0.41	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.53
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.39	0.59	0.75	0.87	0.91	0.87	0.78	0.62	0.41	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.56
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.39	0.60	0.76	0.87	0.91	0.88	0.78	0.62	0.42	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.61
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.39	0.59	0.75	0.87	0.92	0.88	0.79	0.62	0.41	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.58
20	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.38	0.59	0.75	0.83	0.88	0.85	0.79	0.63	0.42	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.50
21	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.38	0.56	0.73	0.88	0.93	0.91	0.78	0.59	0.38	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.51
22	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.41	0.61	0.76	0.87	0.91	0.88	0.77	0.60	0.40	0.16	0.02	0.00	0.00	0.00	0.00	0.00	6.59
23	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.43	0.64	0.80	0.90	0.93	0.91	0.81	0.65	0.44	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.93
24	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.43	0.63	0.79	0.90	0.94	0.91	0.81	0.64	0.44	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.93
25	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.42	0.62	0.79	0.89	0.93	0.90	0.80	0.64	0.43	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.86
26	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.21	0.42	0.62	0.79	0.89	0.93	0.90	0.80	0.64	0.43	0.18	0.03	0.00	0.00	0.00	0.00	0.00	6.86
27	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.43	0.63	0.79	0.90	0.93	0.89	0.80	0.63	0.43	0.18	0.03	0.00	0.00	0.00	0.00	0.00	6.89
28	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.32	0.62	0.78	0.87	0.78	0.79	0.68	0.28	0.28	0.14	0.02	0.00	0.00	0.00	0.00	0.00	5.75
29	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.19	0.17	0.26	0.54	0.45	0.68	0.47	0.32	0.29	0.07	0.02	0.00	0.00	0.00	0.00	0.00	3.68
30	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.45	0.44	0.42	0.28	0.70	0.50	0.32	0.57	0.20	0.17	0.03	0.00	0.00	0.00	0.00	0.00	4.26
31	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.45	0.65	0.82	0.88	0.59	0.51	0.75	0.68	0.35	0.18	0.04	0.00	0.00	0.00	0.00	0.00	6.18
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.55	0.69	0.79	0.82	0.78	0.70	0.56	0.36	0.15	0.02	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.36	5.40	5.14	5.75	5.07	4.74	5.05	4.50	6.13	6.31	4.88	6.12	6.34	6.10	6.25	6.53	6.56	6.61	6.58	6.50	6.51	6.59	6.93	6.93	6.86
MAX	0.83	0.83	0.82	0.87	0.85	0.69	0.81	0.65	0.87	0.88	0.66	0.87	0.89	0.86	0.86	0.91	0.91	0.91	0.92	0.88	0.93	0.91	0.93	0.94	0.93
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.86	6.89	5.75	3.68	4.26	6.18
MAX	0.93	0.93	0.87	0.68	0.70	0.88
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MARCH - 2016

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.01	0.00
MAX	0.00	0.00	0.00	0.00	0.01	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.01 MONTHLY MAXIMUM = 0.01 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	2.9	3.3	3.7	3.0	2.5	2.9	2.3	1.9	1.8	1.3	1.4	3.3	3.5	3.6	4.1	4.2	4.0	4.5	4.0	3.2	2.7	1.1	1.1	2.1	2.9
2	2.8	4.0	3.9	3.1	3.6	4.5	4.3	2.9	3.5	5.4	4.8	4.0	3.6	3.7	4.0	2.7	2.7	3.7	3.8	3.4	3.6	3.7	3.3	2.6	3.7
3	3.6	3.7	3.4	4.7	3.9	3.2	3.5	3.8	3.9	2.9	3.3	2.7	2.3	1.9	2.2	2.0	2.0	0.9	1.5	1.9	2.2	1.5	2.6	1.5	2.7
4	2.8	3.9	3.8	3.7	3.6	3.0	3.3	3.3	3.3	2.3	2.0	1.5	2.0	3.7	3.7	4.5	6.4	6.4	5.7	4.4	2.2	1.5	2.6	2.7	3.4
5	3.5	3.5	3.2	3.1	2.9	1.7	3.0	2.7	1.5	1.0	0.9	1.6	3.6	4.7	6.3	5.8	6.3	6.7	6.3	4.7	4.0	2.1	1.8	3.0	3.5
6	2.8	2.7	2.3	3.8	2.8	3.1	1.6	1.2	1.9	8.8	8.9	7.2	5.8	4.8	4.9	3.9	2.8	2.6	3.0	2.7	0.8	2.2	4.2	5.3	3.8
7	3.3	3.6	1.1	2.1	1.8	3.0	3.1	2.6	3.2	3.6	4.2	2.7	1.8	1.7	2.6	3.6	3.5	4.3	6.2	6.6	5.5	7.4	6.0	6.6	3.8
8	6.0	5.6	4.7	5.8	4.3	2.5	2.8	3.8	2.3	1.5	1.3	1.7	3.3	3.7	4.3	4.8	4.8	6.4	7.9	7.3	3.0	2.7	3.6	1.9	4.0
9	2.7	2.8	3.1	2.6	3.0	2.6	2.5	2.3	2.0	1.9	3.1	3.8	2.9	1.8	2.5	2.8	4.6	5.2	4.7	4.6	3.7	1.9	2.0	2.9	3.0
10	3.0	3.3	1.8	0.8	1.5	2.0	1.6	1.2	2.9	5.6	3.2	8.1	8.6	3.3	3.7	12.6	6.3	2.5	3.0	3.0	2.0	2.5	2.3	3.1	3.7
11	2.8	2.6	1.8	2.0	2.6	2.7	2.4	2.3	2.3	2.7	2.2	2.3	2.3	2.2	2.5	2.3	2.0	2.9	5.2	6.6	5.6	5.1	4.2	2.5	3.0
12	1.8	1.8	2.1	0.8	1.2	1.5	2.7	3.2	3.3	5.4	4.6	2.7	1.8	2.5	4.5	7.3	5.8	5.9	5.2	3.8	2.8	2.7	1.6	2.5	3.2
13	2.9	3.5	3.2	3.0	3.1	3.4	3.3	2.5	1.6	1.4	1.4	1.8	1.7	1.9	2.2	2.8	3.6	6.4	6.9	5.3	4.2	1.9	1.8	2.4	3.0
14	2.1	3.1	3.7	3.2	2.5	3.4	2.9	2.7	2.1	1.6	1.8	1.5	3.2	5.1	6.3	6.2	5.8	6.8	6.7	5.5	3.5	1.8	1.5	2.0	3.5
15	3.3	2.8	3.2	2.6	1.4	2.3	3.0	1.6	1.7	6.4	8.1	7.9	9.8	10.0	10.9	13.9	13.4	13.5	14.8	10.6	10.1	9.5	6.6	9.1	7.3
16	7.7	6.2	3.7	4.0	3.3	2.7	2.6	1.3	3.7	4.8	5.3	5.8	6.6	6.8	6.9	6.3	5.5	4.4	4.0	3.9	2.9	2.0	1.4	2.6	4.3
17	3.1	3.3	5.7	6.8	6.6	6.3	6.6	6.3	8.1	7.8	5.0	3.0	2.2	4.2	4.1	3.9	4.3	4.1	4.4	5.0	4.9	7.9	8.4	5.4	5.3
18	3.2	2.4	2.2	3.2	2.7	3.1	4.1	2.8	1.9	1.4	1.9	3.7	5.6	5.2	4.8	5.8	6.3	6.0	6.2	4.8	3.8	2.2	3.6	2.7	3.7
19	2.8	2.9	3.1	3.8	4.0	4.1	4.2	3.0	1.4	1.9	1.8	1.6	1.9	2.4	2.0	4.3	4.8	6.7	7.3	5.3	4.2	2.2	2.6	3.6	3.4
20	3.7	3.5	3.2	2.9	3.6	3.2	3.4	2.8	1.5	0.8	1.1	1.8	3.2	5.8	5.8	6.2	5.6	6.1	5.0	3.1	1.1	1.6	2.8	3.4	3.4
21	3.7	3.9	3.9	3.4	3.4	3.0	2.8	2.9	2.2	1.6	1.9	2.0	1.7	2.7	5.7	5.6	4.6	4.1	3.8	5.6	5.0	2.9	2.5	1.5	3.3
22	2.4	2.8	3.4	3.4	3.2	4.1	3.6	2.5	1.3	1.0	1.1	1.7	1.8	2.1	5.1	7.5	6.9	7.5	7.7	7.8	6.0	5.4	5.7	1.6	4.0
23	2.9	3.3	2.4	2.3	2.7	2.9	3.8	2.7	1.5	1.2	1.9	7.4	8.1	8.2	8.1	9.4	9.4	10.2	9.2	7.3	5.8	3.5	4.1	3.0	5.1
24	3.1	3.9	2.5	2.2	2.2	3.0	3.6	2.9	1.3	1.2	1.6	2.2	3.2	4.8	5.9	6.7	6.9	6.8	5.8	4.6	3.9	4.4	4.4	3.7	3.8
25	2.7	1.8	2.1	2.6	2.1	2.0	1.6	1.8	3.1	7.8	9.7	9.3	11.0	10.1	11.6	11.8	12.5	11.2	9.6	7.3	5.9	3.2	2.1	3.3	6.1
26	3.5	3.8	3.9	3.7	4.3	5.9	4.6	2.2	1.6	2.5	5.3	6.8	5.9	6.4	7.6	7.6	7.4	7.7	6.6	4.9	3.6	2.2	1.6	2.9	4.7
27	3.4	3.2	3.8	3.3	2.7	2.6	3.1	1.8	0.9	1.7	1.5	2.0	2.4	4.0	6.0	4.9	5.1	5.4	5.2	4.4	3.1	4.8	4.1	3.3	3.5
28	2.1	3.7	2.2	2.3	3.3	2.4	1.4	0.9	2.3	7.6	8.3	7.6	8.2	10.3	11.1	10.6	10.2	8.9	6.8	6.7	5.3	2.9	2.2	3.4	5.4
29	2.1	1.4	2.1	2.7	2.4	3.0	3.3	1.7	1.1	3.1	3.9	6.2	6.8	7.1	8.0	6.4	7.3	8.6	7.9	4.1	2.5	1.4	2.2	2.6	4.1
30	2.0	1.2	2.5	3.6	3.6	2.9	3.1	2.3	3.0	2.4	3.1	3.8	2.7	3.5	4.1	5.2	4.1	2.7	8.5	7.0	5.5	3.7	2.4	2.0	3.5
HRAVE	3.2	3.3	3.1	3.2	3.0	3.1	3.1	2.5	2.4	3.3	3.5	3.9	4.3	4.6	5.4	6.1	5.8	6.0	6.1	5.2	4.0	3.3	3.2	3.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.9	3.7	2.7	3.4	3.5	3.8	3.8	4.0	3.0	3.7	3.0	3.2	3.0	3.5	7.3	4.3	5.3	3.7	3.4	3.4	3.3	4.0	5.1	3.8	6.1
MAX	4.5	5.4	4.7	6.4	6.7	8.9	7.4	7.9	5.2	12.6	6.6	7.3	6.9	6.8	14.8	7.7	8.4	6.3	7.3	6.2	5.7	7.8	10.2	6.9	12.5
MIN	1.1	2.6	0.9	1.5	0.9	0.8	1.1	1.3	1.8	0.8	1.8	0.8	1.4	1.5	1.4	1.3	2.2	1.4	1.4	0.8	1.5	1.0	1.2	1.2	1.6

DAY	26	27	28	29	30	31
AVE	4.7	3.5	5.4	4.1	3.5	***
MAX	7.7	6.0	11.1	8.6	8.5	***
MIN	1.6	0.9	0.9	1.1	1.2	***

MONTHLY AVERAGE = 3.9 MONTHLY MAXIMUM = 14.8 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	107	104	128	111	112	111	128	115	131	165	245	284	306	288	270	281	271	274	277	299	307	314	154	114	119
2	108	102	110	102	129	137	128	124	105	53	62	55	72	34	69	87	73	38	2	20	62	77	77	121	357
3	111	100	110	104	114	112	106	132	156	153	90	89	73	105	215	265	251	284	344	306	2	81	90	79	42
4	109	101	114	110	97	108	106	100	118	147	99	96	143	310	291	291	279	290	302	301	317	324	114	91	281
5	88	91	89	94	49	140	117	106	106	95	135	283	288	307	305	285	279	279	288	307	299	176	122	94	162
6	96	93	100	118	120	129	112	107	123	73	72	70	63	71	73	39	33	33	25	29	108	31	45	61	226
7	128	112	12	99	84	82	119	97	107	82	151	132	121	115	321	297	316	177	149	90	100	160	290	298	237
8	298	308	28	54	88	93	96	68	78	143	187	177	141	91	101	83	43	43	38	55	54	68	80	94	99
9	103	86	119	101	115	99	113	133	142	115	121	121	138	180	276	269	272	266	265	288	288	243	113	100	170
10	93	99	153	176	149	152	115	205	286	307	239	202	248	300	221	291	303	317	72	147	130	113	107	99	290
11	106	114	132	141	127	142	131	135	142	88	80	54	110	21	240	135	38	276	288	302	305	303	305	294	57
12	287	289	116	322	160	226	134	125	143	141	147	159	192	275	278	297	284	284	283	287	299	295	132	114	247
13	106	94	109	112	117	108	125	122	127	133	198	273	214	276	319	291	287	299	293	296	302	246	142	112	130
14	106	90	108	116	112	103	100	119	115	129	106	136	296	251	256	290	268	276	299	297	297	175	194	238	159
15	255	257	277	271	133	115	108	117	252	242	261	266	276	268	274	283	279	273	283	290	288	278	274	274	299
16	284	282	284	300	294	275	300	259	300	308	282	291	281	270	279	287	287	274	279	293	314	277	303	147	115
17	108	81	55	75	67	71	76	64	64	72	57	75	143	272	270	271	272	285	287	303	344	24	30	42	184
18	58	88	72	82	128	137	144	120	137	158	216	274	278	266	272	274	279	269	280	302	300	186	66	108	283
19	93	126	130	126	117	109	110	129	137	142	141	112	241	234	222	275	281	292	289	299	299	178	122	112	27
20	104	105	107	109	108	122	110	124	140	251	146	270	300	303	295	293	282	284	300	307	288	54	110	92	93
21	105	99	100	108	107	119	108	107	126	100	150	145	163	138	127	122	142	148	160	303	307	300	152	90	187
22	99	114	113	110	104	114	118	108	136	324	108	59	88	266	242	221	256	282	288	279	291	297	295	281	277
23	295	298	252	134	123	120	115	125	129	178	249	241	252	262	259	262	286	282	286	284	275	274	302	306	307
24	296	306	175	125	108	77	76	92	105	207	322	223	267	251	265	274	275	276	268	278	286	280	254	281	45
25	275	175	196	147	192	271	212	298	231	225	244	254	245	256	240	257	276	280	287	285	286	301	255	292	50
26	296	298	335	275	302	306	303	296	253	266	290	291	294	287	286	283	292	289	292	303	299	309	172	110	278
27	108	110	89	99	112	107	108	120	92	134	143	220	304	297	297	245	269	267	283	252	241	232	228	223	252
28	191	262	300	326	156	167	222	80	265	230	252	256	260	290	294	288	283	295	288	287	279	309	313	306	96
29	227	188	153	136	124	113	123	125	107	306	316	293	276	270	284	256	275	281	283	293	291	168	136	121	122
30	126	109	111	98	97	90	94	96	108	124	120	111	159	226	218	225	239	208	273	296	305	110	292	298	319

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	12	8	7	10	10	7	10	16	25	38	47	25	26	35	35	26	23	18	13	7	15	32	46	17	21
2	12	13	11	10	14	6	5	23	27	17	18	27	49	40	34	47	36	26	12	10	11	11	11	19	20
3	10	7	9	7	7	14	9	8	8	22	27	32	45	60	58	40	40	48	34	19	19	38	13	12	24
4	10	9	8	7	7	7	8	9	11	22	26	46	44	43	39	32	14	12	9	7	18	38	9	10	19
5	7	7	7	9	36	40	10	9	22	37	49	32	29	26	25	21	14	9	7	7	6	30	13	8	19
6	13	13	14	6	9	8	61	42	57	12	10	15	19	18	18	26	36	22	12	17	34	42	26	15	23
7	11	15	49	26	23	25	16	18	14	20	12	36	30	29	26	14	20	51	32	17	15	31	14	9	23
8	16	10	45	14	16	11	15	7	21	31	47	46	31	34	28	26	17	13	14	17	36	38	18	31	24
9	12	9	14	11	9	9	14	11	16	24	21	18	38	49	39	34	19	14	12	6	4	56	38	13	20
10	8	10	33	39	32	20	19	59	25	14	49	17	16	27	30	21	15	40	18	9	15	16	15	9	23
11	12	15	23	15	15	8	6	10	22	24	38	38	44	46	42	41	51	20	9	8	6	6	5	16	22
12	16	33	25	38	46	46	16	9	13	15	17	30	51	61	27	14	18	10	8	5	5	18	24	11	23
13	8	12	12	11	9	9	7	15	22	34	37	43	59	73	54	35	26	14	9	7	6	18	7	8	22
14	16	10	7	7	12	7	7	10	16	30	32	58	34	25	23	19	20	15	9	7	13	38	34	35	20
15	15	19	14	19	38	10	9	30	50	19	16	22	15	15	13	10	10	11	7	10	10	8	10	8	16
16	8	8	9	9	9	23	9	38	20	19	19	21	20	18	17	18	21	14	13	8	7	11	39	8	16
17	12	15	19	12	14	15	18	22	19	11	23	32	42	39	33	36	30	14	12	7	17	13	15	17	20
18	18	24	35	28	15	12	6	13	20	60	60	27	18	26	31	18	20	13	11	8	7	17	18	12	22
19	19	17	10	6	6	8	8	14	21	23	40	53	40	46	55	29	27	13	9	7	4	26	8	7	21
20	8	8	8	7	8	7	8	9	31	59	58	33	28	23	28	17	17	15	11	8	24	33	14	16	20
21	9	8	7	7	9	7	8	9	22	30	32	37	49	35	23	17	26	20	17	8	7	38	19	57	21
22	13	7	12	9	9	11	8	9	42	44	56	38	61	49	31	18	20	11	10	6	5	7	10	22	21
23	9	22	22	11	11	10	9	13	26	45	59	23	19	22	22	19	13	10	9	8	6	9	8	7	17
24	12	22	9	8	11	7	8	12	45	44	38	53	43	28	19	15	15	11	11	9	4	7	13	9	19
25	12	35	34	30	22	19	29	24	57	16	14	20	16	17	15	18	12	11	9	6	6	18	33	10	20
26	13	34	26	15	9	9	11	22	31	34	23	20	19	18	15	15	13	10	12	10	7	15	24	10	17
27	11	12	8	10	12	9	10	26	46	38	67	56	50	29	16	22	19	19	14	10	10	10	12	23	22
28	41	15	31	43	9	22	21	46	40	18	16	18	24	13	14	12	13	11	13	8	6	10	32	11	20
29	23	22	9	11	9	12	11	17	41	19	27	18	18	19	14	20	13	13	10	8	5	20	5	10	16
30	41	41	16	8	6	16	8	17	15	35	32	30	62	34	28	30	30	20	12	10	11	57	35	13	25
HRAVE	14	16	18	15	15	14	13	19	27	28	34	32	35	33	28	24	22	18	13	9	11	24	19	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	21	20	24	19	19	23	23	24	20	23	22	23	22	20	16	16	20	22	21	20	21	21	17	19	20
MAX	47	49	60	46	49	61	51	47	56	59	51	61	73	58	50	39	42	60	55	59	57	61	59	53	57
MIN	7	5	7	7	6	6	9	7	4	8	5	5	6	7	7	7	7	6	4	7	7	5	6	4	6

DAY	26	27	28	29	30	31
AVE	17	22	20	16	25	***
MAX	34	67	46	41	62	***
MIN	7	8	6	5	6	***

MONTHLY AVERAGE = 20.6 MONTHLY MAXIMUM = 72.8 MONTHLY MINIMUM = 3.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
APRIL - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	12.5	11.7	10.7	9.5	8.6	7.6	6.5	9.1	11.7	14.8	17.3	19.6	20.9	22.1	22.9	23.1	23.3	22.8	21.5	20.1	19.5	18.9	17.0	15.6	16.1
2	14.3	13.3	12.5	12.3	10.6	9.4	10.0	11.2	15.7	18.8	20.5	22.2	23.5	24.2	24.9	25.3	25.1	24.5	24.0	23.1	22.0	20.5	19.4	17.7	18.5
3	16.7	15.8	14.7	13.6	12.7	11.9	11.5	13.0	16.4	20.6	23.8	25.5	26.9	28.0	28.9	28.7	29.3	28.4	27.6	26.0	24.3	22.6	20.6	19.1	21.1
4	17.3	15.9	15.8	14.4	13.4	12.5	12.1	14.8	17.9	21.4	24.9	28.0	30.6	31.0	31.5	31.8	31.4	30.3	28.5	26.8	25.6	24.5	22.4	21.2	22.7
5	19.6	18.4	17.7	16.0	14.7	13.7	13.1	15.3	17.1	21.0	24.5	26.8	29.1	30.1	30.7	31.0	30.4	29.5	27.7	26.3	25.6	23.5	23.1	21.0	22.7
6	19.8	18.0	17.1	16.4	16.2	14.9	13.8	15.1	18.2	25.3	27.4	29.4	30.6	31.8	32.5	32.8	32.8	32.0	31.3	30.0	28.7	27.2	27.0	26.8	24.8
7	23.8	22.3	22.0	21.6	19.8	19.6	19.2	20.2	22.2	25.4	26.2	28.0	29.4	29.9	30.4	30.1	29.5	28.9	27.6	26.4	26.1	23.8	20.9	18.8	24.7
8	18.0	15.8	15.3	15.4	15.3	15.1	15.6	17.1	18.7	20.0	21.6	22.3	21.8	20.3	21.5	22.9	22.8	21.3	20.3	17.5	16.8	16.1	15.9	15.3	18.4
9	14.9	14.7	14.0	13.6	13.3	12.8	12.8	13.9	16.1	18.4	21.4	23.5	24.2	24.9	25.7	26.4	27.1	26.6	25.1	22.7	21.8	21.1	20.2	18.9	19.7
10	17.8	16.9	15.5	15.2	14.1	13.6	14.1	14.9	16.8	18.2	19.6	21.6	16.3	17.1	19.1	15.1	13.1	13.4	13.3	12.3	12.0	11.7	11.5	11.5	15.2
11	11.8	11.7	11.3	11.1	10.8	10.3	10.0	11.8	14.4	16.6	18.2	19.4	20.8	21.7	23.1	23.0	22.6	23.0	21.7	20.0	19.2	18.5	18.2	17.7	16.9
12	17.6	16.4	15.7	15.6	14.6	14.4	13.8	14.4	16.8	19.0	20.5	22.4	22.8	24.2	24.5	25.0	24.9	24.5	23.2	21.6	21.0	20.4	18.9	17.5	19.6
13	16.5	15.5	14.8	14.0	13.1	13.1	13.1	15.1	17.2	19.9	22.3	24.5	26.1	27.2	28.1	28.4	28.4	27.9	26.3	24.5	23.5	22.4	21.0	20.0	21.0
14	18.4	17.6	16.7	16.2	14.7	14.5	14.5	16.5	19.5	22.4	25.0	27.9	29.0	30.8	30.9	30.6	30.4	29.7	27.8	26.3	24.9	23.7	22.5	22.1	23.0
15	21.0	20.5	20.1	19.2	17.6	16.1	16.5	18.4	21.1	23.6	23.8	24.6	25.1	25.8	26.0	25.0	24.2	23.2	21.3	19.9	18.8	17.6	16.4	15.2	20.9
16	14.2	13.5	13.0	12.6	12.1	11.4	11.9	13.1	15.2	16.8	18.5	19.9	20.8	21.6	22.1	22.4	22.9	22.2	21.3	20.4	20.2	19.4	18.7	17.4	17.6
17	16.6	16.2	17.1	16.9	16.5	16.1	16.3	17.1	17.6	18.9	20.2	21.6	23.1	23.9	24.6	24.9	24.7	24.3	23.3	21.8	21.0	20.3	19.8	19.2	20.1
18	18.6	17.8	17.2	15.7	13.9	12.4	11.8	15.1	18.1	20.7	23.1	24.1	25.3	26.2	26.6	26.6	26.6	26.0	24.8	23.1	22.4	21.0	20.3	18.4	20.7
19	18.5	16.9	15.9	14.9	14.0	13.4	13.7	15.2	18.0	21.8	24.4	26.4	27.7	28.9	29.0	29.8	29.7	28.6	27.3	25.8	24.9	23.4	21.8	20.2	22.1
20	19.1	17.9	16.5	15.6	14.8	14.1	14.6	16.6	19.3	22.7	26.4	28.3	30.2	31.1	32.0	31.9	31.8	31.2	29.8	28.1	26.8	24.8	22.8	21.1	23.7
21	19.8	19.1	17.5	16.7	15.7	14.8	15.6	17.9	20.5	23.8	27.0	30.1	32.4	33.8	34.5	34.2	34.3	33.7	32.4	30.3	28.9	27.8	25.7	24.9	25.5
22	23.0	22.3	20.8	19.8	18.9	18.5	18.4	20.3	22.1	24.6	28.3	31.1	32.6	33.7	35.0	35.5	34.5	33.6	31.9	29.9	28.0	27.2	26.1	24.8	26.7
23	23.9	22.8	21.8	20.4	19.6	18.6	18.3	19.7	22.4	25.0	27.9	29.6	29.9	30.3	30.7	30.4	29.5	28.1	26.5	25.1	23.9	22.4	22.0	21.2	24.6
24	20.3	19.8	18.0	17.4	16.8	15.4	15.5	17.6	20.4	22.8	24.6	26.5	27.5	29.4	29.1	29.5	29.3	29.0	27.8	26.1	24.3	23.0	23.1	21.9	23.1
25	21.2	20.3	20.4	19.5	17.6	18.9	18.2	20.2	22.5	24.1	24.2	24.6	25.0	25.7	26.2	25.9	25.3	24.3	22.5	20.5	18.9	18.0	17.2	16.3	21.6
26	16.2	15.8	15.0	14.1	13.4	12.6	12.0	13.2	14.9	16.8	18.4	19.5	20.6	21.5	22.0	22.1	22.4	21.9	20.8	19.6	18.7	18.0	16.7	15.9	17.6
27	15.1	14.4	13.2	13.0	11.3	10.8	12.0	14.2	16.9	20.1	22.2	23.5	24.7	25.2	25.3	26.5	26.0	26.0	25.0	23.7	22.3	21.8	21.8	21.1	19.8
28	20.5	19.2	18.4	18.4	16.2	15.8	16.5	17.6	20.6	22.8	22.9	23.5	24.4	23.4	22.7	22.0	21.8	21.5	20.6	18.6	17.4	16.7	16.3	16.0	19.7
29	14.8	14.0	12.9	12.0	11.4	11.3	12.1	13.7	15.8	18.1	20.0	21.5	21.9	22.1	22.8	23.1	23.7	23.2	22.3	21.2	20.4	19.0	18.2	17.0	18.0
30	17.4	17.4	16.1	15.5	14.5	14.3	14.8	15.8	18.8	22.2	22.8	24.5	25.0	26.0	25.2	24.1	23.1	22.8	19.6	16.2	15.5	15.0	14.4	14.3	19.0
HRAVE	18.0	17.1	16.3	15.6	14.5	13.9	13.9	15.6	18.1	20.9	22.9	24.7	25.6	26.4	27.0	26.9	26.7	26.1	24.8	23.1	22.1	21.0	20.0	18.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16.1	18.5	21.1	22.7	22.7	24.8	24.7	18.4	19.7	15.2	16.9	19.6	21.0	23.0	20.9	17.6	20.1	20.7	22.1	23.7	25.5	26.7	24.6	23.1	21.6
MAX	23.3	25.3	29.3	31.8	31.0	32.8	30.4	22.9	27.1	21.6	23.1	25.0	28.4	30.9	26.0	22.9	24.9	26.6	29.8	32.0	34.5	35.5	30.7	29.5	26.2
MIN	6.5	9.4	11.5	12.1	13.1	13.8	18.8	15.1	12.8	11.5	10.0	13.8	13.1	14.5	15.2	11.4	16.1	11.8	13.4	14.1	14.8	18.4	18.3	15.4	16.3

DAY	26	27	28	29	30	31
AVE	17.6	19.8	19.7	18.0	19.0	***
MAX	22.4	26.5	24.4	23.7	26.0	***
MIN	12.0	10.8	15.8	11.3	14.3	***

MONTHLY AVERAGE = 20.8 MONTHLY MAXIMUM = 35.5 MONTHLY MINIMUM = 6.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
APRIL - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.3	0.4	0.4	0.6	0.5	1.0	0.8	-0.8	-1.0	-0.9	-1.0	-1.4	-1.4	-1.5	-1.5	-1.3	-1.1	-0.9	-0.2	0.4	0.4	0.3	0.7	0.6	-0.3
2	0.6	0.9	0.8	0.9	1.2	0.8	0.3	-0.3	-1.0	-1.3	-1.5	-1.6	-1.6	-1.1	-1.3	-1.1	-0.7	-0.2	0.1	0.3	0.4	0.5	0.6	0.8	-0.1
3	0.7	0.7	0.6	0.9	0.6	0.7	0.5	-1.0	-1.6	-1.7	-2.0	-1.6	-1.5	-1.3	-1.2	-1.0	-0.8	-0.3	0.1	0.6	0.7	0.6	0.6	0.6	-0.3
4	0.7	0.8	0.6	0.6	0.7	0.6	0.2	-1.2	-1.8	-1.5	-1.5	-1.3	-1.5	-1.3	-1.2	-1.1	-0.9	-0.5	0.1	0.5	0.5	0.6	0.6	0.7	-0.3
5	0.6	0.6	0.8	0.7	0.7	0.8	0.3	-0.3	-0.6	-0.8	-0.8	-0.9	-1.2	-1.3	-1.3	-1.4	-0.9	-0.6	0.0	0.4	0.6	0.6	0.5	0.9	-0.1
6	0.6	0.6	0.7	0.5	0.7	0.7	0.8	-0.3	-0.3	-1.1	-1.3	-1.5	-1.4	-1.5	-1.3	-0.8	-0.4	0.1	0.5	0.7	0.5	0.6	0.6	0.5	-0.1
7	1.2	0.5	0.5	0.6	0.5	0.6	0.3	-0.1	-0.3	-0.6	-1.1	-1.1	-0.9	-0.9	-0.8	-0.6	-0.2	-0.1	0.0	0.0	0.1	0.1	0.3	-0.1	-0.1
8	0.0	0.1	0.2	0.1	0.2	0.3	-0.1	-0.6	-0.8	-0.8	-0.8	-0.8	-0.7	-0.6	-1.2	-1.1	-0.3	-0.1	-0.1	0.4	0.2	0.3	0.3	0.4	-0.2
9	0.4	0.4	0.3	0.3	0.3	0.3	-0.1	-0.7	-0.9	-1.1	-1.8	-1.9	-1.5	-1.1	-1.1	-1.0	-1.0	-0.6	-0.1	0.4	0.6	0.6	0.5	0.5	-0.3
10	0.6	0.6	0.6	0.4	0.5	0.5	0.2	-0.3	-0.6	-0.7	-0.6	-1.2	-0.4	-0.8	-1.1	-0.6	-0.4	-0.2	-0.2	-0.1	-0.1	0.1	0.2	0.1	-0.1
11	0.0	0.0	0.2	0.2	0.4	0.4	0.2	-0.8	-1.1	-1.3	-1.3	-1.4	-1.4	-1.2	-1.4	-1.2	-0.6	-0.7	-0.3	0.0	0.1	0.1	0.2	0.4	-0.4
12	0.4	0.5	0.3	0.3	0.5	0.4	0.3	0.1	-1.0	-1.3	-1.6	-1.7	-1.3	-1.3	-1.3	-1.4	-1.1	-0.9	-0.3	0.3	0.4	0.5	0.5	0.4	-0.3
13	0.6	0.6	0.6	0.5	0.6	0.3	-0.3	-1.2	-0.9	-1.0	-1.0	-1.2	-1.2	-1.2	-1.2	-1.1	-0.9	-0.9	-0.3	0.2	0.3	0.4	0.4	0.5	-0.3
14	0.4	0.5	0.4	0.3	0.6	0.5	-0.4	-1.3	-1.3	-1.1	-1.2	-1.2	-1.3	-1.5	-1.5	-1.3	-1.0	-0.6	-0.1	0.2	0.2	0.3	0.4	0.4	-0.4
15	0.3	0.4	0.6	0.6	0.5	0.4	-0.2	-0.6	-0.7	-1.0	-0.9	-1.2	-1.3	-1.2	-1.2	-1.1	-0.9	-0.5	-0.2	0.0	0.1	0.1	0.1	0.1	-0.3
16	0.1	0.1	0.2	0.2	0.3	0.4	0.2	-0.6	-0.7	-1.1	-1.3	-1.4	-1.5	-1.6	-1.5	-1.4	-1.4	-0.8	-0.3	0.0	0.2	0.4	0.4	0.4	-0.4
17	0.5	0.5	0.1	0.1	0.0	0.1	0.0	-0.5	-0.8	-1.5	-1.5	-1.7	-1.7	-1.5	-1.5	-1.3	-1.1	-0.9	-0.4	0.1	0.2	0.1	0.1	0.1	-0.5
18	0.2	0.4	0.5	0.7	1.0	1.4	0.0	-1.1	-1.2	-1.0	-1.2	-1.4	-1.5	-1.4	-1.5	-1.3	-1.2	-0.8	-0.4	0.2	0.4	0.6	0.5	0.8	-0.3
19	0.9	1.1	0.5	0.5	0.3	0.2	-0.4	-1.0	-0.8	-1.3	-1.3	-1.3	-1.3	-1.5	-1.1	-1.3	-1.0	-0.5	-0.2	0.3	0.6	0.5	0.4	0.6	-0.3
20	0.5	0.6	0.6	0.5	0.4	0.4	-0.4	-1.3	-0.9	-0.7	-1.0	-1.2	-1.3	-1.5	-1.4	-1.4	-1.1	-0.8	-0.2	0.5	0.5	0.8	0.8	0.8	-0.3
21	0.6	0.6	0.7	0.6	0.6	0.5	-0.3	-1.4	-1.4	-1.3	-1.3	-1.5	-1.4	-1.7	-1.8	-1.3	-0.9	-0.4	0.3	0.3	0.4	0.6	0.5	0.6	-0.3
22	0.8	0.6	0.7	0.6	0.5	0.5	-0.2	-1.1	-0.9	-0.8	-0.9	-1.3	-1.4	-1.3	-1.7	-1.6	-1.2	-0.9	-0.2	0.2	0.4	0.4	0.3	0.4	-0.3
23	0.6	0.7	0.5	0.4	0.4	0.4	0.1	-0.8	-0.9	-0.9	-1.2	-1.6	-1.4	-1.5	-1.5	-1.2	-1.2	-0.8	-0.4	0.0	0.2	0.4	0.4	0.5	-0.4
24	0.6	0.4	0.5	0.4	0.5	0.8	-0.4	-1.1	-0.9	-0.9	-1.0	-1.4	-1.4	-1.7	-1.6	-1.4	-1.1	-0.9	-0.3	0.3	0.7	0.5	0.2	0.4	-0.4
25	0.4	0.3	0.4	0.3	0.4	0.4	0.2	-0.5	-0.9	-1.3	-1.2	-1.3	-1.4	-1.2	-1.3	-1.0	-0.8	-0.6	-0.3	0.1	0.2	0.3	0.4	0.6	-0.3
26	0.3	0.2	0.1	0.1	0.1	0.1	-0.1	-0.6	-0.9	-1.1	-1.5	-1.6	-1.6	-1.8	-1.6	-1.4	-1.3	-0.9	-0.4	0.0	0.3	0.3	0.3	0.5	-0.5
27	0.3	0.3	0.4	0.4	0.6	0.4	-0.7	-1.0	-0.7	-1.3	-1.2	-1.3	-1.3	-1.2	-1.0	-1.1	-0.8	-0.8	-0.4	0.1	0.3	0.2	0.1	0.2	-0.4
28	0.2	0.2	0.2	0.3	0.6	0.8	0.2	-0.5	-0.8	-1.3	-1.2	-1.4	-1.6	-1.7	-1.3	-0.8	-0.9	-0.7	-0.5	-0.1	0.1	0.2	0.2	0.3	-0.4
29	0.4	0.4	0.5	0.2	0.2	0.1	-0.5	-0.6	-0.6	-1.1	-1.3	-1.6	-1.2	-0.9	-0.9	-0.9	-0.9	-0.6	-0.3	0.2	0.5	0.6	0.3	0.2	-0.3
30	0.2	0.4	0.6	0.4	0.5	0.4	-0.4	-0.8	-1.4	-1.7	-1.6	-1.9	-1.3	-1.4	-0.8	-0.6	-0.6	-0.5	0.0	0.0	0.0	0.1	0.2	0.4	-0.4
HRAVE	0.5	0.5	0.5	0.4	0.5	0.5	0.0	-0.7	-0.9	-1.1	-1.2	-1.4	-1.3	-1.3	-1.3	-1.1	-0.9	-0.6	-0.2	0.2	0.3	0.4	0.4	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.3	-0.1	-0.3	-0.3	-0.1	-0.1	-0.1	-0.2	-0.3	-0.1	-0.4	-0.3	-0.3	-0.4	-0.3	-0.4	-0.5	-0.3	-0.3	-0.3	-0.3	-0.3	-0.4	-0.4	-0.3
MAX	1.0	1.2	0.9	0.8	0.9	0.8	1.2	0.4	0.6	0.6	0.4	0.5	0.6	0.6	0.6	0.4	0.5	1.4	1.1	0.8	0.7	0.8	0.7	0.8	0.6
MIN	-1.5	-1.6	-2.0	-1.8	-1.4	-1.5	-1.1	-1.2	-1.9	-1.2	-1.4	-1.7	-1.2	-1.5	-1.3	-1.6	-1.7	-1.5	-1.5	-1.5	-1.8	-1.7	-1.6	-1.7	-1.4

DAY	26	27	28	29	30	31
AVE	-0.5	-0.4	-0.4	-0.3	-0.4	***
MAX	0.5	0.6	0.8	0.6	0.6	***
MIN	-1.8	-1.3	-1.7	-1.6	-1.9	***

MONTHLY AVERAGE = -0.3 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	702	702	702	702	702	702	703	704	704	704	704	704	703	703	702	702	702	703	703	704	704	705	705	705	703
2	705	706	706	706	706	707	707	708	708	708	708	707	707	706	705	705	704	704	704	704	704	705	705	705	706
3	705	705	705	705	705	705	706	706	706	706	706	705	704	703	703	702	702	701	701	702	702	703	703	704	704
4	704	704	704	704	704	705	705	706	706	706	706	705	704	704	703	703	702	702	703	703	703	703	704	704	704
5	704	704	704	704	704	704	705	706	706	706	705	705	704	703	703	702	702	702	702	703	703	704	705	705	704
6	706	705	705	705	706	706	706	707	707	706	706	706	705	704	703	703	702	702	701	702	702	702	702	702	704
7	703	703	703	702	702	702	701	701	701	701	701	700	700	700	699	699	698	699	699	699	700	700	701	701	701
8	702	703	702	701	701	702	702	702	703	703	702	702	701	702	701	700	700	700	700	701	701	702	702	702	702
9	702	702	702	702	702	703	703	703	703	703	703	702	701	701	700	699	699	699	698	699	699	699	699	699	701
10	699	699	699	699	699	700	700	700	700	700	701	700	701	701	700	700	701	702	702	702	703	703	704	704	701
11	704	704	704	704	704	704	705	705	705	705	705	704	704	703	703	702	702	702	702	702	703	703	703	703	703
12	703	703	703	703	703	703	704	704	705	705	705	705	704	704	704	703	703	703	704	704	704	705	705	705	704
13	705	705	705	705	705	705	706	706	706	705	705	704	704	703	702	701	701	701	701	701	701	701	701	701	703
14	701	701	701	701	701	701	701	702	701	701	701	700	699	698	697	696	696	696	696	696	696	696	696	696	699
15	696	696	696	696	696	696	696	696	696	696	695	695	694	694	693	693	693	693	694	695	696	696	697	697	695
16	697	697	698	698	698	699	699	700	700	700	700	700	699	699	699	699	699	700	700	701	701	702	702	702	699
17	702	702	702	702	702	702	703	703	703	703	703	703	702	702	701	701	701	701	701	702	703	703	704	704	702
18	704	704	704	704	704	704	705	705	705	705	705	704	704	703	703	703	703	702	703	703	703	704	704	704	704
19	704	704	703	703	704	704	704	704	704	704	704	703	703	702	701	701	701	701	701	701	701	702	702	702	703
20	702	702	701	702	702	702	702	703	703	703	703	702	701	701	700	700	700	700	700	700	701	701	701	701	701
21	701	701	701	701	701	701	702	702	702	702	702	701	700	700	699	698	698	698	698	698	699	699	700	700	700
22	700	700	700	700	701	701	702	702	702	702	702	701	701	700	699	699	698	698	698	699	699	700	700	701	700
23	701	701	701	701	701	701	702	702	702	701	701	700	700	699	699	698	698	698	698	698	699	699	700	700	700
24	700	700	700	700	700	700	701	701	701	701	701	700	700	699	699	698	698	698	697	697	698	698	698	698	699
25	699	698	698	698	698	698	698	698	698	698	697	697	697	696	695	695	695	695	696	696	697	697	697	697	697
26	697	697	698	698	698	698	699	700	700	700	700	700	700	700	700	700	699	700	700	700	700	701	701	701	699
27	701	700	700	700	700	700	700	700	700	700	699	699	698	697	696	696	695	695	695	695	695	696	696	696	698
28	695	696	696	696	695	695	696	696	696	696	696	696	695	695	695	695	695	695	696	697	697	698	698	698	696
29	699	699	699	699	699	700	700	701	701	701	701	700	700	700	699	699	698	698	698	699	699	699	699	699	699
30	699	698	698	698	698	698	698	699	698	698	697	696	695	695	694	694	694	694	694	696	697	697	697	697	697
HRAVE	701	701	701	701	701	702	702	702	702	702	702	702	701	700	700	699	699	699	699	700	700	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	703	706	704	704	704	704	701	702	701	701	703	704	703	699	695	699	702	704	703	701	700	700	700	699	697
MAX	705	708	706	706	706	707	703	703	703	704	705	705	706	702	697	702	704	705	704	703	702	702	702	701	699
MIN	702	704	701	702	702	701	698	700	698	699	702	703	701	696	693	697	701	702	701	700	698	698	698	697	695

DAY	26	27	28	29	30	31
AVE	699	698	696	699	697	***
MAX	701	701	698	701	699	***
MIN	697	695	695	698	694	***

MONTHLY AVERAGE = 700.9 MONTHLY MAXIMUM = 708.2 MONTHLY MINIMUM = 693.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	33	35	35	39	41	42	43	36	29	24	21	19	17	16	15	15	15	16	19	22	24	27	28	31	27
2	34	35	36	39	38	41	40	36	31	29	26	23	19	17	14	12	11	12	13	15	16	17	18	19	25
3	22	24	24	26	28	30	31	26	21	15	10	9	8	7	6	5	4	3	6	8	10	13	16	19	15
4	20	22	22	24	26	28	28	22	17	13	10	7	4	5	5	4	4	5	6	8	11	13	14	15	14
5	16	18	19	22	24	26	27	23	20	14	10	8	7	6	5	5	5	6	8	10	10	13	14	17	14
6	19	20	22	22	23	24	27	23	19	8	5	3	1	0	0	0	1	2	3	4	5	6	5	5	10
7	6	8	11	11	13	13	13	14	12	8	9	7	5	5	6	7	10	13	18	23	24	35	51	60	16
8	67	85	92	88	85	90	85	77	68	63	51	49	49	57	46	38	42	50	54	73	76	83	84	88	68
9	90	90	92	94	93	93	93	82	70	57	45	34	30	30	28	23	21	20	22	30	35	37	40	45	54
10	50	50	56	56	60	61	60	58	50	45	40	31	64	63	53	65	74	71	76	89	92	93	91	91	64
11	86	86	88	90	92	93	96	84	69	54	44	39	33	31	27	25	28	27	33	40	43	45	46	49	56
12	50	56	62	65	68	69	74	72	61	47	40	32	28	26	27	23	22	20	25	31	32	35	40	45	44
13	50	53	59	62	69	67	67	55	46	35	30	26	20	15	15	16	18	19	21	24	27	28	30	36	37
14	41	45	49	51	57	59	56	48	38	29	24	17	16	11	11	13	13	13	17	20	24	27	31	31	31
15	33	33	30	30	37	43	40	32	28	29	28	28	24	22	19	18	15	12	10	10	13	17	21	30	25
16	35	37	39	41	44	47	46	41	36	32	26	22	19	17	17	16	16	17	18	21	23	23	26	27	29
17	30	34	30	30	31	32	31	28	26	24	21	17	15	15	13	13	13	14	15	18	21	24	25	26	23
18	28	30	31	34	38	43	45	35	28	24	17	14	12	12	11	11	11	12	13	16	17	18	21	24	23
19	23	25	27	30	33	35	34	29	24	17	13	9	7	7	7	7	7	8	9	11	12	13	17	19	18
20	21	24	26	29	31	32	31	25	20	16	11	8	7	6	5	5	4	5	5	8	10	14	14	16	16
21	19	19	22	25	26	28	27	21	17	12	10	8	5	1	1	2	2	2	4	6	8	9	11	13	12
22	16	17	18	20	21	23	22	19	16	14	8	6	5	5	6	5	5	5	6	7	9	11	14	18	12
23	20	22	25	29	31	33	32	28	23	22	19	15	14	13	13	13	19	24	26	25	20	22	21	21	22
24	21	20	23	26	26	28	27	23	19	15	13	10	8	6	7	6	5	6	7	9	10	13	19	21	15
25	24	26	27	29	31	32	35	34	31	29	28	25	21	21	18	15	8	7	5	6	9	12	14	16	21
26	17	17	23	26	28	34	39	36	32	28	25	21	19	16	16	15	15	17	20	22	24	27	28	30	24
27	32	33	35	36	40	42	38	31	26	20	17	16	14	14	13	10	12	12	13	15	17	17	16	17	22
28	20	19	21	22	24	25	24	24	19	16	17	20	21	27	26	22	19	16	17	21	23	26	29	29	22
29	31	33	36	38	43	46	42	37	33	33	31	28	27	27	24	24	23	24	25	27	30	32	33	36	32
30	35	37	39	42	44	45	40	37	31	24	22	19	18	16	17	20	23	24	40	61	66	70	73	71	38
HRAVE	33	35	37	39	41	43	43	38	32	27	22	19	18	17	16	15	15	16	18	23	25	27	30	32	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	27	25	15	14	14	10	16	68	54	64	56	44	37	31	25	29	23	23	18	16	12	12	22	15	21
MAX	43	41	31	28	27	27	60	92	94	93	96	74	69	59	43	47	34	45	35	32	28	23	33	28	35
MIN	15	11	3	4	5	0	5	38	20	31	25	20	15	11	10	16	13	11	7	4	1	5	13	5	5

DAY	26	27	28	29	30	31
AVE	24	22	22	32	38	***
MAX	39	42	29	46	73	***
MIN	15	10	16	23	16	***

MONTHLY AVERAGE = 27.6 MONTHLY MAXIMUM = 96.0 MONTHLY MINIMUM = 0.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.45	0.65	0.81	0.90	0.94	0.91	0.83	0.68	0.47	0.21	0.04	0.00	0.00	0.00	0.00	0.00	7.18
2	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.46	0.65	0.81	0.91	0.95	0.91	0.82	0.65	0.44	0.19	0.04	0.00	0.00	0.00	0.00	0.00	7.13
3	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.47	0.67	0.83	0.93	0.97	0.93	0.84	0.68	0.45	0.21	0.05	0.00	0.00	0.00	0.00	0.00	7.33
4	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.47	0.67	0.83	0.93	0.97	0.93	0.81	0.65	0.39	0.18	0.02	0.00	0.00	0.00	0.00	0.00	7.15
5	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.17	0.36	0.63	0.73	0.76	0.89	0.86	0.80	0.65	0.34	0.19	0.02	0.00	0.00	0.00	0.00	0.00	6.45
6	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.26	0.40	0.63	0.83	0.95	0.92	0.95	0.85	0.69	0.38	0.11	0.02	0.00	0.00	0.00	0.00	0.00	7.04
7	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.29	0.33	0.32	0.53	0.36	0.35	0.36	0.21	0.09	0.03	0.01	0.00	0.00	0.00	0.00	0.00	3.04
8	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.41	0.49	0.65	0.42	0.38	0.58	0.69	0.66	0.19	0.05	0.01	0.00	0.00	0.00	0.00	0.00	4.87
9	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.47	0.68	0.84	0.95	0.86	0.91	0.84	0.67	0.39	0.24	0.04	0.00	0.00	0.00	0.00	0.00	7.21
10	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.24	0.42	0.34	0.40	0.54	0.17	0.58	0.59	0.15	0.10	0.07	0.07	0.00	0.00	0.00	0.00	0.00	3.74
11	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.28	0.49	0.67	0.84	0.96	0.92	0.95	0.81	0.62	0.31	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.12
12	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.45	0.38	0.68	0.92	0.97	0.94	0.73	0.68	0.38	0.25	0.05	0.00	0.00	0.00	0.00	0.00	6.50
13	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.50	0.70	0.85	0.94	0.99	0.95	0.85	0.68	0.39	0.26	0.06	0.00	0.00	0.00	0.00	0.00	7.54
14	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.29	0.51	0.70	0.86	0.94	0.98	0.94	0.84	0.67	0.36	0.19	0.05	0.00	0.00	0.00	0.00	0.00	7.42
15	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.50	0.69	0.72	0.85	0.96	0.92	0.82	0.64	0.38	0.22	0.04	0.00	0.00	0.00	0.00	0.00	7.11
16	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.52	0.71	0.86	0.95	0.99	0.95	0.85	0.67	0.44	0.22	0.04	0.00	0.00	0.00	0.00	0.00	7.59
17	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.25	0.38	0.71	0.86	0.96	0.99	0.99	0.90	0.71	0.34	0.27	0.06	0.00	0.00	0.00	0.00	0.00	7.46
18	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.54	0.74	0.89	0.97	1.00	0.96	0.86	0.70	0.37	0.27	0.07	0.00	0.00	0.00	0.00	0.00	7.79
19	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.54	0.74	0.89	0.98	1.01	0.97	0.86	0.70	0.34	0.16	0.06	0.00	0.00	0.00	0.00	0.00	7.67
20	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.54	0.74	0.89	0.98	1.01	0.97	0.87	0.71	0.40	0.28	0.07	0.00	0.00	0.00	0.00	0.00	7.88
21	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.33	0.52	0.75	0.83	0.96	0.96	0.89	0.89	0.71	0.39	0.28	0.06	0.00	0.00	0.00	0.00	0.00	7.67
22	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.25	0.49	0.71	0.84	0.96	0.97	0.96	0.85	0.67	0.36	0.28	0.06	0.00	0.00	0.00	0.00	0.00	7.48
23	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.54	0.73	0.86	0.97	1.00	0.95	0.85	0.66	0.37	0.26	0.06	0.00	0.00	0.00	0.00	0.00	7.57
24	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.56	0.75	0.89	0.98	1.01	0.97	0.87	0.67	0.39	0.28	0.07	0.00	0.00	0.00	0.00	0.00	7.90
25	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.53	0.56	0.75	0.97	0.99	0.88	0.78	0.52	0.39	0.27	0.07	0.00	0.00	0.00	0.00	0.00	7.14
26	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.53	0.72	0.87	0.95	0.99	0.95	0.85	0.65	0.39	0.26	0.07	0.00	0.00	0.00	0.00	0.00	7.63
27	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.55	0.76	0.88	0.99	0.85	0.56	0.42	0.55	0.30	0.29	0.09	0.00	0.00	0.00	0.00	0.00	6.70
28	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.56	0.75	0.89	0.97	0.99	0.95	0.59	0.29	0.38	0.26	0.10	0.00	0.00	0.00	0.00	0.00	7.20
29	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.17	0.39	0.59	0.84	0.83	0.53	0.45	0.45	0.36	0.31	0.22	0.08	0.00	0.00	0.00	0.00	0.00	5.34
30	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.19	0.48	0.74	0.57	0.82	0.57	0.51	0.22	0.13	0.15	0.10	0.01	0.00	0.00	0.00	0.00	0.00	4.63
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.48	0.65	0.79	0.89	0.87	0.85	0.75	0.59	0.35	0.21	0.05	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	7.18	7.13	7.33	7.15	6.45	7.04	3.04	4.87	7.21	3.74	7.12	6.50	7.54	7.42	7.11	7.59	7.46	7.79	7.67	7.88	7.67	7.48	7.57	7.90	7.14
MAX	0.94	0.95	0.97	0.97	0.89	0.95	0.53	0.69	0.95	0.59	0.96	0.97	0.99	0.98	0.96	0.99	0.99	1.00	1.01	1.01	0.96	0.97	1.00	1.01	0.99
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	7.63	6.70	7.20	5.34	4.63	***
MAX	0.99	0.99	0.99	0.84	0.82	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
APRIL - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.12	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.02	0.00	0.00	0.40
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.03
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.43 MONTHLY MAXIMUM = 0.15 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
MAY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	1.8	2.7	3.5	3.1	3.1	3.3	3.0	1.1	2.2	1.3	2.5	3.9	3.3	2.4	3.8	3.9	2.7	1.8	3.1	3.5	3.4	1.0	0.9	1.8	2.6
2	2.0	3.3	3.5	2.8	4.2	6.0	9.4	10.3	9.3	8.0	8.2	6.5	4.9	5.1	2.6	2.6	2.6	2.3	2.2	4.3	4.3	2.8	2.5	0.9	4.6
3	3.4	4.9	3.8	5.2	5.4	4.1	5.0	6.2	6.6	5.7	4.6	2.6	2.7	2.3	2.7	3.0	2.3	1.6	1.5	2.7	5.3	5.0	2.2	2.8	3.8
4	3.0	4.4	3.9	3.8	4.4	4.5	3.7	5.7	9.2	9.0	8.1	3.9	5.1	5.7	3.8	4.4	4.5	5.1	6.0	7.1	4.9	4.8	6.9	3.3	5.2
5	2.2	1.8	1.9	0.7	2.3	3.2	3.1	2.5	1.3	1.4	1.3	3.1	3.9	3.7	5.8	6.9	6.0	5.7	6.2	5.2	6.0	11.0	7.2	5.2	4.1
6	4.2	3.9	2.3	2.6	7.5	7.1	5.2	3.0	1.1	2.9	7.0	6.7	8.4	7.4	8.2	8.5	7.3	8.4	8.4	10.8	11.6	4.7	8.2	6.8	6.3
7	4.0	3.2	1.3	2.0	6.8	5.0	1.7	1.3	1.0	2.0	1.6	2.7	2.0	2.8	3.7	4.0	5.0	5.6	7.3	5.6	3.7	3.3	2.8	6.9	3.6
8	7.6	5.1	3.5	1.5	2.5	3.1	2.2	2.3	2.2	2.3	2.1	3.6	6.1	5.1	4.7	4.7	6.5	7.2	6.5	4.4	3.8	2.9	1.6	1.4	3.9
9	2.8	3.1	3.3	3.1	2.8	2.5	2.2	1.7	1.5	2.1	2.6	3.8	5.2	5.8	6.8	7.1	7.2	7.0	6.3	5.1	2.7	1.6	1.2	2.3	3.7
10	2.8	3.2	2.9	3.8	1.5	1.9	2.3	2.2	1.6	1.3	1.2	2.0	2.4	4.6	7.8	6.9	6.9	6.8	5.5	5.0	4.0	2.2	2.4	0.9	3.4
11	2.1	3.2	3.8	3.4	1.9	2.5	2.1	2.5	1.0	1.2	1.3	1.6	2.1	2.6	2.8	5.0	5.9	5.9	6.5	5.0	5.5	4.2	1.7	1.9	3.2
12	3.1	2.2	2.7	3.9	3.3	3.5	2.9	2.8	2.0	1.6	1.4	1.5	1.6	2.2	3.9	3.1	2.5	3.9	5.0	5.1	4.2	1.2	2.2	3.1	2.9
13	2.2	3.1	3.4	2.9	1.7	3.5	3.8	2.3	3.2	2.8	2.0	1.6	2.4	4.8	8.3	7.6	8.3	6.9	7.3	5.5	3.2	1.2	2.9	4.1	4.0
14	3.1	1.8	1.7	1.7	2.1	2.6	2.2	2.7	1.9	0.9	1.4	2.1	2.1	3.0	5.5	5.6	7.6	5.5	5.0	3.1	2.9	3.1	2.7	4.8	3.1
15	1.7	1.8	2.4	3.5	3.4	3.0	2.7	2.5	4.3	5.9	3.2	6.2	8.0	8.0	7.7	8.3	8.4	7.9	7.8	7.5	7.9	6.7	5.9	5.0	5.4
16	2.4	2.5	3.1	2.9	1.3	2.0	2.2	1.7	1.5	1.4	2.0	1.9	1.9	3.7	6.3	7.4	7.0	7.4	8.4	7.2	7.2	7.3	7.4	4.9	4.2
17	4.2	3.9	2.0	2.8	2.8	3.0	3.8	2.8	1.3	2.4	2.7	4.4	6.6	5.8	7.5	6.5	6.4	8.4	7.1	5.7	2.7	1.3	5.0	6.9	4.4
18	4.9	4.4	1.6	1.4	0.6	0.7	1.4	1.1	1.7	2.5	2.5	5.9	8.7	11.6	9.6	7.9	6.9	6.9	5.8	5.1	4.0	4.0	3.6	2.4	4.4
19	3.3	3.4	2.5	4.4	3.4	4.0	3.0	3.0	2.7	3.5	2.0	1.9	2.6	2.2	2.2	1.6	3.0	5.6	5.9	6.0	4.6	2.5	2.1	2.7	3.2
20	3.8	3.9	4.5	2.7	3.0	2.8	2.9	2.1	2.3	2.3	3.2	4.0	2.8	4.1	5.9	6.5	5.7	8.2	7.9	6.5	6.7	6.2	5.4	5.3	4.5
21	4.6	4.3	2.9	2.7	1.3	1.7	2.5	2.1	3.5	6.6	5.4	4.7	5.7	6.8	7.4	6.0	6.9	8.1	10.5	10.8	8.4	4.5	2.5	1.2	5.0
22	1.4	2.3	1.7	2.2	1.9	2.8	3.3	2.8	1.1	1.7	2.4	5.9	6.5	7.6	8.1	7.2	8.8	8.7	7.6	6.5	5.2	3.3	3.9	4.6	4.5
23	3.6	2.0	2.3	1.5	1.0	0.9	0.9	2.0	1.1	1.2	1.5	2.6	3.8	5.4	6.8	6.5	7.1	5.7	6.6	5.7	6.3	7.7	4.8	1.5	3.7
24	1.5	3.7	2.6	1.4	1.7	1.3	1.6	0.9	1.4	1.8	1.5	4.3	5.9	6.7	6.8	6.3	7.2	7.5	7.0	6.1	3.9	1.8	1.6	1.7	3.6
25	1.9	1.5	1.7	2.0	2.1	2.5	2.5	2.0	1.4	1.4	2.5	2.9	6.0	6.2	6.9	7.4	7.9	8.6	8.5	7.5	5.6	4.2	6.2	6.2	4.4
26	3.2	2.5	4.1	1.5	1.7	1.7	1.2	0.9	1.0	1.8	1.8	3.3	4.5	6.6	5.8	6.3	***	***	***	***	***	1.8	1.9	2.0	2.8
27	3.0	3.1	3.4	3.2	3.8	3.4	2.7	2.1	1.5	1.1	3.6	4.1	3.7	4.0	4.1	5.3	4.8	5.7	5.8	5.0	3.4	2.5	1.3	2.1	3.4
28	2.8	2.9	2.7	3.3	3.8	3.6	2.5	2.1	1.6	2.0	1.6	2.9	3.1	4.4	3.7	4.1	4.3	4.7	6.5	5.9	5.2	2.4	3.6	5.7	3.6
29	4.8	2.4	1.8	1.9	2.6	3.7	4.3	2.3	1.5	1.4	1.9	3.1	2.9	3.8	5.8	5.4	5.1	4.8	5.3	5.4	4.8	4.5	5.0	4.0	3.7
30	2.0	1.9	2.2	1.0	1.1	2.3	2.8	2.7	1.2	1.9	3.0	5.1	3.8	3.9	4.0	8.2	8.0	7.5	7.6	6.6	3.8	3.7	2.0	1.3	3.7
31	2.0	2.7	3.8	2.9	3.6	3.4	2.2	1.5	1.6	1.5	1.1	2.0	3.0	4.0	3.4	3.6	5.9	5.1	7.0	6.4	4.6	4.6	4.4	2.2	3.4
HRAVE	3.1	3.1	2.8	2.6	2.9	3.1	2.9	2.6	2.4	2.7	2.8	3.6	4.2	4.9	5.5	5.7	6.0	6.1	6.4	5.9	5.0	3.8	3.6	3.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.6	4.6	3.8	5.2	4.1	6.3	3.6	3.9	3.7	3.4	3.2	2.9	4.0	3.1	5.4	4.2	4.4	4.4	3.2	4.5	5.0	4.5	3.7	3.6	4.4
MAX	3.9	10.3	6.6	9.2	11.0	11.6	7.3	7.6	7.2	7.8	6.5	5.1	8.3	7.6	8.4	8.4	8.4	11.6	6.0	8.2	10.8	8.8	7.7	7.5	8.6
MIN	0.9	0.9	1.5	3.0	0.7	1.1	1.0	1.4	1.2	0.9	1.0	1.2	1.2	0.9	1.7	1.3	1.3	0.6	1.6	2.1	1.2	1.1	0.9	0.9	1.4

DAY	26	27	28	29	30	31
AVE	2.8	3.4	3.6	3.7	3.7	3.4
MAX	6.6	5.8	6.5	5.8	8.2	7.0
MIN	0.9	1.1	1.6	1.4	1.0	1.1

MONTHLY AVERAGE = 4.0 MONTHLY MAXIMUM = 11.6 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MAY - 2016

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	123	131	107	106	101	100	296	237	280	258	334	283	186	334	287	267	235	273	274	301	300	257	42	104	100
2	104	127	112	108	99	74	66	70	79	87	94	102	67	38	9	45	243	111	24	25	20	14	308	1	189
3	25	25	37	46	63	83	74	74	72	39	30	31	357	3	295	277	265	216	328	288	307	303	16	93	175
4	103	91	115	100	126	143	124	96	83	70	78	148	124	153	147	113	137	96	91	98	187	259	288	313	323
5	275	315	112	227	137	116	118	125	97	279	255	161	219	243	231	228	225	223	215	221	283	302	303	298	93
6	301	299	269	291	315	308	305	303	109	182	209	199	217	233	259	277	245	248	257	278	283	317	286	281	248
7	281	281	275	277	313	302	263	268	113	130	301	351	245	266	324	309	306	292	292	294	303	298	299	301	90
8	299	309	302	263	277	288	255	262	309	308	256	292	303	272	282	257	281	279	288	286	293	305	225	150	109
9	118	117	114	112	119	110	104	121	142	263	301	298	302	295	294	286	296	290	298	304	304	298	158	116	332
10	106	100	99	86	317	133	109	108	110	117	17	275	232	307	290	291	292	291	303	303	292	315	301	333	163
11	107	87	86	89	84	97	104	107	135	153	167	235	148	261	263	318	317	292	287	299	301	304	331	125	18
12	91	82	100	87	114	102	95	135	142	112	64	106	81	208	298	276	281	287	283	301	304	316	88	89	182
13	88	105	109	93	53	95	92	135	140	157	149	104	99	271	280	288	286	285	290	302	299	230	122	106	20
14	107	87	20	79	123	101	90	87	107	159	284	271	238	251	240	242	258	282	234	167	128	140	196	291	228
15	268	270	137	121	105	113	119	118	127	133	176	225	246	242	245	235	249	257	271	277	269	260	260	277	181
16	245	281	305	297	274	110	102	135	127	154	119	235	274	212	256	270	278	274	281	267	260	264	292	313	23
17	324	297	201	135	131	101	127	112	294	280	284	292	307	308	254	255	264	292	292	300	303	145	324	296	35
18	297	318	193	123	238	177	292	250	210	157	160	208	55	55	37	44	45	37	36	45	45	53	31	55	139
19	40	58	77	72	123	97	113	111	100	62	97	117	213	141	162	217	316	305	283	289	301	253	139	104	17
20	95	99	82	64	101	95	110	104	126	92	123	184	143	197	221	217	221	240	232	241	258	292	314	300	246
21	303	294	304	294	150	119	101	83	200	205	187	196	184	211	249	235	237	258	284	286	291	309	299	288	78
22	256	230	157	134	122	121	106	123	138	266	287	266	264	283	281	273	284	280	275	271	267	224	219	211	30
23	207	136	240	174	113	108	51	75	295	310	176	298	276	265	251	272	276	272	281	292	283	264	280	161	205
24	289	288	247	144	100	106	108	134	299	309	334	232	262	246	258	268	275	284	281	274	284	295	305	307	155
25	260	160	132	122	107	105	98	109	120	274	298	279	248	245	247	264	255	248	260	272	292	319	284	260	327
26	106	271	226	179	102	86	115	191	247	285	264	267	293	301	278	290	***	***	***	***	***	292	151	124	266
27	113	114	109	117	113	124	101	131	147	237	278	272	272	283	273	271	285	277	298	287	308	292	133	114	257
28	101	98	116	114	110	109	131	132	142	141	137	152	138	163	154	148	292	261	277	290	288	288	292	307	81
29	305	273	266	161	133	117	110	119	110	149	172	147	158	158	237	214	235	258	266	295	298	299	292	310	340
30	286	41	121	170	114	133	110	123	126	119	127	117	148	254	267	294	292	299	299	295	308	298	305	296	330
31	131	113	101	120	101	106	123	115	112	143	193	266	120	304	286	300	280	290	281	295	308	307	290	148	129

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MAY - 2016

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	17	13	12	11	11	36	8	33	15	49	48	20	32	42	27	22	42	54	20	8	7	56	44	45	28
2	37	11	7	8	11	11	8	9	12	18	14	18	18	25	53	51	43	46	46	14	13	37	11	53	24
3	27	16	21	17	13	13	10	8	13	20	23	57	54	65	40	31	40	39	41	12	6	5	29	13	26
4	13	12	6	10	16	7	20	18	12	11	24	32	32	25	37	37	26	15	18	11	16	23	10	17	19
5	33	32	21	50	19	10	10	14	29	32	51	37	41	35	28	19	23	25	15	13	26	11	12	12	25
6	14	14	30	36	10	9	11	17	63	61	27	24	26	20	19	18	24	16	11	9	9	21	11	8	21
7	8	8	17	11	10	8	38	23	66	40	70	52	59	52	41	34	24	16	10	8	9	7	8	8	26
8	10	10	14	23	11	20	15	30	30	30	49	31	18	22	29	27	19	14	12	9	5	5	27	15	20
9	8	10	11	14	12	10	10	21	29	40	40	35	25	30	19	15	15	14	13	8	8	30	36	8	19
10	9	7	10	8	58	10	13	17	28	43	60	46	54	39	16	19	16	14	13	8	4	23	9	61	24
11	8	8	7	7	27	9	11	13	47	37	53	56	49	53	43	23	17	18	10	7	5	33	26	15	24
12	8	11	10	7	11	6	8	8	16	19	49	54	46	37	22	34	49	19	9	7	12	55	29	11	22
13	17	11	9	8	35	8	7	15	14	19	32	55	50	34	14	16	11	13	10	7	8	24	6	10	18
14	11	28	35	30	10	9	10	11	20	64	42	44	53	50	20	20	15	11	26	16	11	16	55	8	26
15	47	24	10	6	8	7	11	13	14	16	34	19	19	25	19	15	19	16	12	8	8	9	10	11	16
16	52	21	12	11	49	15	15	16	30	50	62	50	55	38	22	18	20	19	9	10	9	9	9	9	25
17	11	6	18	11	15	15	9	11	40	26	34	22	14	22	19	21	19	12	13	9	7	41	22	8	18
18	8	12	30	19	45	38	26	39	39	41	37	47	14	14	14	16	14	12	14	17	18	17	18	33	24
19	21	23	21	15	16	15	16	22	29	19	37	52	42	43	42	67	34	14	9	7	6	23	8	11	25
20	9	11	9	61	20	13	15	18	17	32	31	47	44	38	23	19	19	15	12	11	10	15	13	11	21
21	9	7	8	8	32	12	9	20	43	19	21	30	21	21	19	27	16	12	8	7	7	12	13	57	18
22	47	12	14	7	7	7	10	16	55	59	35	25	21	19	18	18	12	11	10	8	7	9	8	7	19
23	28	49	30	37	19	36	35	15	53	45	52	43	41	22	21	21	16	17	16	9	6	10	16	31	28
24	46	13	17	9	14	59	11	40	46	30	62	55	21	22	18	24	15	16	13	8	4	30	45	44	28
25	22	13	8	7	7	8	8	16	45	53	47	42	25	30	19	20	13	15	13	11	12	17	17	13	20
26	32	49	20	46	14	29	44	38	52	44	58	39	29	21	23	22	***	***	***	***	***	23	18	7	32
27	6	10	9	8	10	10	9	13	24	43	21	22	31	53	28	24	20	16	12	6	6	32	18	10	18
28	7	9	13	9	7	8	9	11	24	22	49	45	53	40	37	38	26	26	12	8	5	20	10	8	21
29	9	15	26	17	5	6	9	25	32	49	40	55	44	46	27	26	26	27	17	8	8	7	9	9	23
30	18	30	17	57	48	11	7	14	43	33	29	26	32	40	31	22	15	14	10	8	10	25	19	40	25
31	22	12	10	12	6	10	17	22	25	40	71	53	42	33	44	36	22	19	11	8	7	7	5	25	23
HRAVE	20	16	16	19	19	15	14	19	32	36	42	40	36	34	27	26	22	19	15	9	9	21	18	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	28	24	26	19	25	21	26	20	19	24	24	22	18	26	16	25	18	24	25	21	18	19	28	28	20
MAX	56	53	65	37	51	63	70	49	40	61	56	55	55	64	47	62	41	47	67	61	57	59	53	62	53
MIN	7	7	5	6	10	8	7	5	8	4	5	6	6	8	6	9	6	8	6	9	7	7	6	4	7

DAY	26	27	28	29	30	31
AVE	32	18	21	23	25	23
MAX	58	53	53	55	57	71
MIN	7	6	5	5	7	5

MONTHLY AVERAGE = 22.7 MONTHLY MAXIMUM = 70.7 MONTHLY MINIMUM = 3.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MAY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	13.3	12.6	12.6	12.5	12.7	12.3	11.8	13.5	15.0	17.7	19.6	20.3	20.4	21.8	22.0	22.6	23.2	23.3	22.8	21.7	20.5	19.7	19.1	17.5	17.9
2	16.2	14.9	14.5	13.7	13.2	14.6	16.6	18.0	19.7	21.8	23.5	25.4	25.9	26.9	27.6	27.9	28.6	28.0	27.4	26.1	25.3	24.8	23.5	22.7	22.0
3	22.0	21.4	20.8	20.5	20.0	18.9	19.9	21.8	24.2	25.6	27.1	28.8	30.0	31.2	32.2	32.2	32.1	32.0	31.0	29.5	27.9	27.1	25.5	23.8	26.1
4	22.3	21.6	20.6	19.7	18.1	17.8	19.1	24.1	28.3	29.7	31.6	34.0	35.1	36.2	36.1	35.9	36.2	35.1	34.3	33.5	32.6	31.7	29.1	27.2	28.7
5	26.3	25.0	23.3	22.2	20.2	19.3	20.2	22.9	25.1	27.6	30.1	32.8	34.5	35.4	36.1	35.8	35.2	34.3	32.8	30.8	28.7	25.8	23.8	22.8	28.0
6	21.9	21.9	20.9	19.6	19.7	18.2	18.5	20.0	21.0	23.2	25.0	27.3	27.6	27.6	26.6	26.0	26.9	25.7	24.3	22.1	20.5	19.5	18.0	16.9	22.5
7	16.2	15.8	15.3	14.8	13.0	12.3	13.0	13.8	16.4	18.9	20.4	21.4	22.2	23.7	24.4	24.5	24.7	24.5	23.3	22.0	20.9	20.2	19.5	18.3	19.2
8	17.5	17.2	16.8	16.3	15.6	15.0	14.9	15.5	16.6	18.5	20.1	21.3	21.6	23.5	23.5	24.3	23.9	23.3	22.5	21.1	20.2	19.7	18.8	17.7	19.4
9	17.0	16.2	15.5	14.6	13.6	12.5	14.5	16.4	19.1	21.0	23.0	24.7	26.3	26.9	27.4	27.6	27.5	27.0	26.1	24.7	23.8	22.9	21.4	20.3	21.3
10	19.3	18.2	17.2	16.7	15.1	13.9	15.6	18.7	21.5	24.0	26.4	27.3	29.4	30.4	31.1	31.3	30.8	30.4	29.3	27.9	26.5	26.0	25.2	24.2	24.0
11	22.6	20.7	19.3	18.4	17.9	17.0	17.2	20.6	23.1	25.5	28.4	29.8	31.2	32.4	33.0	33.1	33.0	32.8	31.7	29.8	28.4	27.3	26.5	24.7	26.0
12	23.1	21.7	20.6	19.7	18.9	18.7	19.1	20.9	22.9	25.4	29.7	32.7	34.0	35.3	35.7	36.0	35.9	36.2	35.4	33.2	31.4	31.1	28.8	26.6	28.1
13	25.2	23.5	22.9	22.3	19.9	19.5	21.2	23.2	27.4	30.7	33.2	35.1	37.3	38.4	37.6	37.2	37.1	36.8	35.0	33.5	31.7	30.8	28.7	27.9	29.8
14	27.4	26.3	24.5	24.2	23.0	22.5	22.5	24.6	27.8	30.5	32.9	34.5	35.7	35.2	36.5	36.4	35.1	34.1	33.0	30.2	29.1	28.5	27.5	27.6	29.6
15	26.4	25.4	23.5	22.5	22.2	21.1	22.0	24.0	27.7	30.2	31.5	33.6	34.1	34.5	34.7	34.5	33.6	32.6	31.1	29.3	28.1	26.6	25.0	23.5	28.2
16	23.2	22.4	21.5	20.3	19.5	18.5	19.0	20.9	24.2	26.2	27.6	28.7	29.9	31.9	32.6	32.1	31.9	31.6	30.4	28.6	27.4	26.5	25.5	24.3	26.0
17	23.8	23.4	21.7	20.4	19.7	19.2	18.9	21.4	22.9	25.2	26.9	28.6	28.2	28.9	31.1	31.1	30.9	30.1	28.8	27.2	26.2	25.4	24.2	22.4	25.3
18	21.5	21.0	20.2	19.5	18.9	19.0	18.8	21.0	23.0	25.6	26.9	24.1	21.5	19.0	20.5	22.0	22.6	21.9	21.8	21.8	21.4	21.0	20.5	19.6	21.4
19	19.5	18.6	17.9	17.3	15.9	16.4	16.5	19.4	22.0	24.1	25.9	27.2	29.0	30.5	30.1	30.8	31.3	31.3	30.4	28.5	27.2	26.4	25.1	23.8	24.4
20	22.7	22.4	22.1	20.6	19.9	19.7	20.6	23.5	26.3	28.8	31.4	33.0	33.5	34.3	35.3	35.5	35.1	34.0	32.7	30.9	29.2	27.3	26.3	25.4	27.9
21	24.5	23.4	22.5	21.4	20.0	19.5	20.8	23.7	26.0	27.7	29.2	30.6	31.7	32.4	32.3	32.8	31.9	30.0	27.9	26.4	25.0	24.2	23.6	23.0	26.3
22	22.4	20.9	19.8	18.9	18.0	17.1	18.9	20.8	23.2	25.7	26.6	28.6	29.5	30.0	30.2	31.0	30.6	29.9	28.8	27.0	25.8	24.4	23.5	22.9	24.8
23	22.0	21.4	21.1	19.6	18.7	17.7	18.6	21.3	22.9	24.9	27.4	28.2	29.9	30.9	31.5	31.9	31.5	31.1	30.2	28.3	26.8	26.3	25.2	24.3	25.5
24	23.7	22.2	20.3	20.0	19.2	18.2	17.9	20.5	23.2	25.7	27.4	29.6	30.1	31.2	31.2	31.5	31.3	30.5	29.5	27.7	26.2	24.6	23.7	23.3	25.4
25	22.4	21.0	20.5	19.5	18.5	17.4	18.8	20.7	23.4	25.2	27.2	29.1	30.7	31.2	31.5	31.8	31.4	30.5	28.9	26.7	25.0	23.9	22.7	21.1	25.0
26	19.8	19.2	19.0	18.0	17.0	16.8	17.4	18.8	20.4	22.0	23.3	25.0	25.8	26.3	26.9	27.0	***	***	***	***	***	22.4	20.9	20.2	21.4
27	19.2	18.4	17.6	17.0	16.0	15.6	17.0	18.9	21.3	23.7	26.3	28.3	29.5	29.9	30.8	30.9	30.9	30.5	29.5	27.7	26.5	25.7	24.3	22.9	24.1
28	21.6	20.7	19.5	18.4	17.9	17.8	17.5	20.5	23.6	27.1	29.6	32.0	33.7	34.8	35.1	35.4	35.4	34.9	33.6	31.4	29.8	28.5	27.5	26.7	27.2
29	25.5	24.4	23.2	21.3	20.2	19.3	20.7	22.5	25.5	28.3	30.5	32.8	34.3	35.2	36.0	36.1	35.5	35.0	34.1	31.7	30.0	28.9	26.9	26.0	28.5
30	25.3	23.9	22.8	21.6	20.7	19.2	21.3	23.8	26.2	29.2	31.5	33.0	34.0	34.2	34.5	33.9	33.4	32.6	31.6	30.0	28.5	27.6	26.5	25.2	27.9
31	23.4	22.0	20.8	19.9	19.5	18.6	19.1	21.5	24.9	27.9	30.0	32.6	34.6	34.4	35.2	35.2	35.4	34.3	32.7	31.4	30.3	29.5	29.1	27.7	27.9
HRAVE	21.8	20.9	20.0	19.1	18.2	17.5	18.3	20.5	23.1	25.4	27.4	29.0	30.0	30.8	31.3	31.4	31.4	30.8	29.7	28.0	26.7	25.6	24.4	23.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	17.9	22.0	26.1	28.7	28.0	22.5	19.2	19.4	21.3	24.0	26.0	28.1	29.8	29.6	28.2	26.0	25.3	21.4	24.4	27.9	26.3	24.8	25.5	25.4	25.0
MAX	23.3	28.6	32.2	36.2	36.1	27.6	24.7	24.3	27.6	31.3	33.1	36.2	38.4	36.5	34.7	32.6	31.1	26.9	31.3	35.5	32.8	31.0	31.9	31.5	31.8
MIN	11.8	13.2	18.9	17.8	19.3	16.9	12.3	14.9	12.5	13.9	17.0	18.7	19.5	22.5	21.1	18.5	18.9	18.8	15.9	19.7	19.5	17.1	17.7	17.9	17.4

DAY	26	27	28	29	30	31
AVE	21.4	24.1	27.2	28.5	27.9	27.9
MAX	27.0	30.9	35.4	36.1	34.5	35.4
MIN	16.8	15.6	17.5	19.3	19.2	18.6

MONTHLY AVERAGE = 25.2 MONTHLY MAXIMUM = 38.4 MONTHLY MINIMUM = 11.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MAY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.4	0.3	0.2	0.1	0.2	0.1	-0.1	-0.4	-0.7	-1.0	-1.3	-1.5	-1.2	-1.2	-1.2	-1.1	-1.1	-0.7	-0.5	0.0	0.3	0.3	0.4	0.6	-0.4
2	0.7	0.7	0.3	0.4	1.0	0.4	-0.3	-0.8	-1.3	-1.7	-2.0	-2.5	-1.9	-1.5	-1.2	-1.2	-1.0	-0.6	-0.1	0.2	0.2	0.3	0.3	0.3	-0.5
3	0.3	0.2	0.2	0.1	0.2	0.3	-0.4	-1.0	-1.4	-1.2	-1.4	-1.4	-1.4	-1.5	-1.4	-1.2	-1.0	-0.6	-0.2	0.3	0.4	0.5	0.6	0.6	-0.4
4	0.5	0.6	0.6	1.2	1.3	1.0	0.8	-0.6	-1.3	-1.4	-1.6	-2.0	-2.1	-2.4	-1.8	-1.3	-1.0	-0.2	0.1	0.2	0.2	0.3	0.2	0.4	-0.3
5	0.5	0.6	0.6	0.4	0.6	0.4	-0.3	-1.2	-0.9	-0.8	-1.0	-2.0	-1.9	-1.6	-1.7	-1.5	-1.1	-0.7	-0.2	0.2	0.1	0.0	0.0	0.1	-0.5
6	0.2	0.3	0.5	0.4	0.1	0.1	-0.3	-0.7	-0.6	-1.2	-1.4	-2.1	-1.9	-1.9	-1.5	-1.2	-1.2	-0.8	-0.4	-0.1	-0.1	-0.1	-0.2	-0.2	-0.6
7	-0.1	-0.2	0.0	0.1	-0.2	-0.1	-0.4	-0.4	-0.6	-1.4	-1.1	-1.6	-1.1	-1.3	-1.6	-1.4	-1.3	-1.1	-0.6	-0.1	0.1	0.2	0.3	0.1	-0.6
8	0.0	0.0	0.1	0.2	0.2	0.1	-0.3	-0.2	-0.4	-0.8	-1.3	-1.3	-1.1	-1.5	-1.2	-1.4	-1.0	-0.8	-0.6	0.0	0.2	0.3	0.4	0.7	-0.4
9	0.3	0.3	0.2	0.2	0.3	0.6	-0.8	-0.9	-1.0	-1.0	-1.3	-1.5	-1.8	-1.6	-1.6	-1.6	-1.4	-1.0	-0.5	0.0	0.3	0.3	0.5	0.4	-0.5
10	0.5	0.4	0.5	0.4	0.8	0.3	-0.7	-1.2	-1.0	-1.0	-1.1	-1.2	-1.6	-1.6	-1.7	-1.5	-1.3	-1.0	-0.5	0.1	0.4	0.2	0.4	0.5	-0.5
11	0.5	0.4	0.4	0.5	0.6	0.5	-0.4	-1.3	-0.6	-1.0	-1.1	-1.2	-1.5	-1.5	-1.3	-1.3	-1.2	-1.0	-0.6	0.1	0.3	0.4	0.5	0.6	-0.4
12	0.6	0.6	0.6	0.5	0.6	0.5	-0.2	-1.1	-1.0	-1.0	-1.1	-1.2	-1.1	-1.4	-1.4	-1.0	-0.7	-0.8	-0.5	0.2	0.5	0.4	0.8	0.7	-0.3
13	0.7	0.8	0.6	0.7	0.6	0.6	-0.7	-1.3	-1.7	-1.9	-1.5	-1.2	-1.7	-1.7	-1.5	-1.3	-1.3	-1.0	-0.3	0.1	0.6	0.7	0.5	0.3	-0.5
14	0.4	0.5	0.6	0.7	0.6	0.4	-0.2	-1.2	-1.2	-0.8	-1.0	-1.1	-1.3	-0.8	-1.2	-1.1	-0.7	-0.6	-0.4	-0.1	0.1	0.1	0.2	0.3	-0.3
15	0.4	0.5	0.2	0.2	0.3	0.4	-0.5	-1.0	-1.9	-2.2	-1.5	-1.9	-1.6	-1.7	-1.5	-1.4	-1.0	-0.7	-0.5	0.0	0.1	0.1	0.2	0.2	-0.6
16	0.3	0.3	0.4	0.4	0.5	0.2	-0.5	-0.8	-1.0	-1.2	-1.5	-1.3	-1.3	-1.6	-1.6	-1.4	-1.3	-0.9	-0.6	-0.1	0.1	0.1	0.1	0.2	-0.5
17	0.2	0.3	0.3	0.3	0.5	0.6	-0.2	-0.8	-0.6	-0.9	-1.2	-1.7	-1.3	-1.0	-1.4	-1.3	-1.1	-1.0	-0.5	0.0	0.3	0.3	0.0	-0.1	-0.4
18	0.0	0.0	0.2	0.5	0.2	0.2	0.0	-0.5	-0.8	-1.5	-1.7	-0.7	0.1	-0.2	-0.7	-0.8	-0.6	-0.2	-0.1	0.0	0.1	0.1	0.3	0.2	-0.2
19	0.2	0.2	0.3	0.2	0.6	0.2	-0.2	-1.1	-1.5	-1.7	-1.5	-1.4	-1.6	-1.8	-1.3	-0.9	-1.1	-1.0	-0.7	-0.1	0.2	0.4	0.5	0.5	-0.5
20	0.6	0.4	0.6	0.6	0.3	0.3	-0.7	-1.2	-1.4	-1.6	-2.0	-2.1	-2.0	-2.0	-1.9	-1.8	-1.5	-0.9	-0.4	0.0	0.1	0.1	0.1	0.2	-0.7
21	0.2	0.3	0.4	0.7	0.4	0.3	-0.8	-1.2	-1.1	-1.7	-2.1	-2.1	-2.5	-2.2	-1.5	-1.5	-1.1	-0.6	-0.3	-0.1	0.0	0.1	0.2	0.2	-0.7
22	0.3	0.4	0.5	0.4	0.3	0.2	-1.0	-1.3	-0.8	-1.1	-1.2	-1.4	-1.6	-1.8	-1.7	-1.4	-1.3	-1.0	-0.6	-0.1	0.1	0.3	0.3	0.4	-0.5
23	0.2	0.2	0.4	0.5	0.3	0.4	-0.3	-1.1	-0.6	-0.9	-1.2	-1.3	-1.5	-1.6	-1.6	-1.5	-1.3	-1.0	-0.7	-0.1	0.2	0.1	0.2	0.3	-0.5
24	0.3	0.8	0.6	0.3	0.6	0.6	-0.3	-0.5	-0.6	-1.1	-1.0	-1.7	-1.6	-1.8	-1.6	-1.5	-1.3	-1.0	-0.6	0.0	0.4	0.5	0.3	0.3	-0.4
25	0.4	0.4	0.4	0.3	0.4	0.3	-1.0	-1.1	-1.0	-0.9	-1.3	-1.3	-1.7	-1.6	-1.6	-1.4	-1.0	-0.8	-0.4	-0.1	0.1	0.1	0.1	0.1	-0.5
26	0.3	0.3	0.2	0.3	0.4	0.3	-0.6	-0.6	-0.8	-1.0	-1.1	-1.5	-1.6	-1.8	-1.6	-1.6	***	***	***	***	***		0.5	0.4	0.3	-0.5
27	0.3	0.3	0.2	0.4	0.3	0.2	-0.9	-1.1	-1.0	-0.9	-1.3	-1.6	-1.4	-1.5	-1.5	-1.5	-1.4	-1.0	-0.7	-0.1	0.3	0.5	0.6	0.5	-0.5
28	0.7	0.5	0.6	0.6	0.3	0.2	-0.6	-1.1	-1.1	-1.5	-1.3	-1.7	-2.0	-2.0	-1.8	-1.6	-1.2	-0.9	-0.6	-0.1	0.3	0.4	0.5	0.3	-0.5
29	0.3	0.4	0.4	0.5	0.6	0.2	-0.8	-0.9	-1.1	-1.1	-1.3	-1.7	-1.8	-2.0	-1.7	-1.7	-1.2	-0.9	-0.6	0.0	0.2	0.4	0.3	0.3	-0.6
30	0.5	0.6	0.7	0.5	0.6	0.5	-0.8	-1.5	-0.9	-1.5	-2.0	-2.6	-2.2	-1.6	-1.6	-1.5	-1.3	-1.0	-0.6	0.0	0.2	0.4	0.5	0.6	-0.6
31	0.5	0.8	0.6	0.6	0.4	0.2	-0.6	-0.9	-1.1	-1.2	-1.0	-1.3	-1.8	-1.6	-1.5	-1.4	-1.4	-0.9	-0.3	0.0	0.2	0.3	0.5	0.4	-0.4
HRAVE	0.4	0.4	0.4	0.4	0.5	0.3	-0.5	-0.9	-1.0	-1.2	-1.4	-1.6	-1.6	-1.6	-1.5	-1.4	-1.2	-0.8	-0.4	0.0	0.2	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.4	-0.5	-0.4	-0.3	-0.5	-0.6	-0.6	-0.4	-0.5	-0.5	-0.4	-0.3	-0.5	-0.3	-0.6	-0.5	-0.4	-0.2	-0.5	-0.7	-0.7	-0.5	-0.5	-0.4	-0.5
MAX	0.6	1.0	0.6	1.3	0.6	0.5	0.3	0.7	0.6	0.8	0.6	0.8	0.8	0.7	0.5	0.5	0.6	0.5	0.6	0.6	0.7	0.5	0.5	0.8	0.4
MIN	-1.5	-2.5	-1.5	-2.4	-2.0	-2.1	-1.6	-1.5	-1.8	-1.7	-1.5	-1.4	-1.9	-1.3	-2.2	-1.6	-1.7	-1.7	-1.8	-2.1	-2.5	-1.8	-1.6	-1.8	-1.7

DAY	26	27	28	29	30	31
AVE	-0.5	-0.5	-0.5	-0.6	-0.6	-0.4
MAX	0.5	0.6	0.7	0.6	0.7	0.8
MIN	-1.8	-1.6	-2.0	-2.0	-2.6	-1.8

MONTHLY AVERAGE = -0.5 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = -2.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	698	697	698	698	698	698	699	700	701	701	701	700	700	700	700	700	700	700	700	701	702	702	702	703	700
2	703	702	702	703	703	703	704	704	704	704	704	704	703	702	702	701	701	701	700	701	701	701	702	702	702
3	702	701	701	701	702	702	702	703	703	703	702	702	701	701	701	700	700	700	700	700	701	701	701	702	701
4	702	702	702	702	702	702	703	703	703	703	702	702	701	701	700	699	698	698	698	698	698	699	700	701	701
5	701	701	700	700	700	700	701	701	701	701	701	700	699	698	697	697	696	696	696	696	697	697	698	699	699
6	699	698	698	698	699	699	700	700	700	700	699	699	699	698	698	697	697	697	697	697	698	700	700	701	699
7	701	701	701	701	701	702	702	702	703	703	702	702	701	701	700	699	699	698	698	698	699	699	699	699	700
8	699	699	699	699	699	699	700	700	701	700	700	700	700	699	699	698	698	698	699	699	700	700	701	701	700
9	701	701	701	701	701	701	701	702	702	702	702	701	701	700	700	699	699	699	699	699	700	700	700	701	700
10	701	701	701	701	702	702	702	703	703	702	702	702	701	701	700	700	700	700	700	700	700	701	702	702	701
11	702	702	702	702	703	703	704	704	704	704	704	703	703	702	702	701	701	701	701	702	702	703	703	703	702
12	703	703	703	703	704	704	705	705	705	705	705	704	704	703	703	702	702	701	701	702	702	702	703	703	703
13	703	703	703	703	703	704	704	704	704	704	704	703	702	702	701	701	701	701	701	701	701	701	701	702	702
14	701	701	701	702	702	702	702	702	702	702	702	701	700	700	699	698	698	698	698	698	698	699	699	699	700
15	699	699	699	699	699	699	699	699	699	699	698	698	697	697	697	696	696	696	696	697	697	698	698	698	698
16	698	699	699	699	699	700	700	700	700	700	700	699	698	697	697	697	697	696	697	697	698	698	699	699	698
17	699	699	699	699	699	699	700	700	700	700	700	699	699	698	698	698	698	698	698	698	699	699	700	700	699
18	700	700	700	700	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	702	702	702	701
19	702	702	702	701	701	702	702	702	702	701	701	701	700	700	699	698	698	697	698	698	698	698	698	699	700
20	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	697	698	699	700	700	699
21	700	701	700	701	701	701	702	702	702	702	702	701	701	700	700	700	699	700	700	700	700	701	702	702	701
22	702	702	702	702	702	702	702	702	702	702	702	701	701	700	700	699	699	699	699	699	699	700	700	700	701
23	700	700	700	700	700	700	701	701	701	700	700	700	699	699	698	697	697	697	697	697	698	698	699	699	699
24	699	699	699	700	700	700	701	701	701	701	701	701	701	701	700	700	700	700	700	700	701	701	702	702	700
25	702	702	702	702	702	703	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	702	702	702
26	702	702	702	702	702	702	702	703	703	702	702	702	701	701	700	700	***	***	***	***	***	701	701	701	702
27	701	701	701	701	701	701	702	702	702	701	701	700	700	699	699	698	698	698	698	698	699	699	699	699	700
28	700	700	700	700	700	700	701	701	701	701	700	700	699	699	698	698	698	697	698	699	699	700	701	701	699
29	701	702	702	702	702	703	703	704	703	703	703	702	701	701	700	700	699	699	699	700	700	701	701	702	701
30	702	702	702	702	702	702	702	703	702	702	701	701	700	700	699	698	698	698	698	698	699	699	699	699	700
31	699	699	699	699	699	700	700	700	700	700	700	699	698	698	697	697	696	696	697	697	698	698	699	699	698
HRAVE	701	701	701	701	701	701	702	702	702	702	701	701	700	700	699	699	699	699	699	699	699	700	700	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	702	701	701	699	699	700	700	700	701	702	703	702	700	698	698	699	701	700	699	701	701	699	700	702
MAX	703	704	703	703	701	701	703	701	702	703	704	705	704	702	699	700	700	702	702	700	702	702	701	702	703
MIN	697	700	700	698	696	697	698	698	699	700	701	701	701	698	696	696	698	700	697	697	699	699	697	699	700

DAY	26	27	28	29	30	31
AVE	702	700	699	701	700	698
MAX	703	702	701	704	703	700
MIN	700	698	697	699	698	696

MONTHLY AVERAGE = 700.3 MONTHLY MAXIMUM = 705.0 MONTHLY MINIMUM = 695.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	79	82	80	78	76	80	79	71	65	51	37	36	35	28	30	30	27	26	27	30	33	36	38	42	50
2	46	50	54	55	57	52	41	35	31	27	23	20	20	18	16	16	14	14	16	20	21	22	23	27	30
3	27	30	34	35	36	38	35	30	25	22	20	16	12	11	10	9	8	8	10	12	15	16	19	21	21
4	24	24	27	28	30	30	28	21	16	15	13	9	7	3	4	4	4	7	8	9	10	8	11	15	15
5	15	18	20	24	24	27	25	21	17	12	9	8	7	6	3	2	2	2	3	5	14	28	30	31	15
6	31	30	32	35	32	37	39	35	31	26	21	15	12	13	16	17	11	11	15	23	31	37	45	52	27
7	53	53	55	56	68	72	70	66	51	37	32	28	26	23	23	24	23	22	23	24	27	28	29	38	39
8	45	47	49	51	53	58	58	60	54	43	35	34	33	23	22	20	22	23	26	30	33	35	37	39	39
9	41	43	45	47	50	53	45	39	33	32	27	24	20	18	17	17	17	17	18	21	24	25	28	30	31
10	32	33	34	35	41	44	37	29	24	21	18	19	16	15	13	12	13	14	16	18	20	22	22	27	24
11	27	29	31	33	35	37	34	27	22	19	15	12	10	10	9	8	8	8	9	10	13	15	18	20	19
12	20	23	26	25	28	27	26	23	21	17	13	9	6	5	5	5	5	4	5	7	9	11	13	14	15
13	17	19	20	19	25	24	19	18	13	10	8	7	4	3	5	5	5	5	6	7	10	12	15	15	12
14	16	17	20	21	23	23	21	19	17	15	15	14	12	15	12	13	16	17	19	27	31	32	33	23	20
15	24	27	37	40	40	46	41	34	21	15	11	5	4	4	2	1	3	6	8	10	11	12	13	15	18
16	15	17	21	26	28	26	23	21	18	14	12	10	9	7	6	7	8	9	9	10	13	20	22	24	16
17	25	23	25	27	29	31	30	25	23	27	29	28	28	25	14	11	12	13	15	19	21	23	28	35	24
18	37	39	40	42	44	44	44	39	35	29	26	36	48	58	50	44	41	43	41	39	40	44	43	49	41
19	51	53	56	59	65	62	59	50	40	35	28	23	19	16	14	15	15	17	18	21	23	25	27	31	34
20	33	33	33	38	41	41	37	31	25	21	16	15	14	10	7	6	8	6	6	8	14	23	24	24	21
21	25	27	29	31	35	37	32	28	24	18	17	15	13	11	9	9	10	12	15	16	18	22	25	28	21
22	28	29	31	34	37	39	34	29	25	22	20	17	16	17	16	14	13	12	14	15	18	21	21	21	23
23	21	22	22	26	28	30	28	22	18	16	13	13	11	11	10	10	11	11	11	12	9	10	16	17	17
24	18	18	21	22	25	26	25	20	16	13	11	9	9	7	7	6	6	8	10	12	13	17	21	22	15
25	23	26	27	30	32	32	27	25	21	19	17	13	9	10	9	7	7	6	8	10	14	17	16	14	17
26	17	18	22	25	27	29	25	24	24	22	21	19	17	16	14	13	***	***	***	***	***	21	23	25	21
27	27	28	29	30	32	32	28	24	20	18	17	14	11	10	10	9	9	10	10	13	16	17	19	21	19
28	23	24	25	27	28	27	25	20	16	12	10	8	6	2	1	1	2	1	4	7	9	12	13	17	13
29	19	21	22	24	27	29	23	15	14	12	8	4	3	2	2	2	2	1	2	5	7	9	11	13	12
30	13	16	16	17	21	21	18	14	11	8	9	9	7	6	7	7	6	6	5	6	8	9	11	13	11
31	14	16	17	18	19	20	16	14	11	8	6	5	4	4	3	3	3	5	7	8	10	11	10	12	10
HRAVE	29	30	32	34	37	38	35	30	25	21	18	16	14	13	12	11	11	12	13	15	18	21	23	25	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	50	30	21	15	15	27	39	39	31	24	19	15	12	20	18	16	24	41	34	21	21	23	17	15	17
MAX	82	57	38	30	31	52	72	60	53	44	37	28	25	33	46	28	35	58	65	41	37	39	30	26	32
MIN	26	14	8	3	2	11	22	20	17	12	8	4	3	12	1	6	11	26	14	6	9	12	9	6	6

DAY	26	27	28	29	30	31
AVE	21	19	13	12	11	10
MAX	29	32	28	29	21	20
MIN	13	9	1	1	5	3

MONTHLY AVERAGE = 22.2 MONTHLY MAXIMUM = 81.9 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.20	0.35	0.71	0.85	0.69	0.45	0.77	0.58	0.45	0.46	0.28	0.08	0.00	0.00	0.00	0.00	0.00	5.96
2	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.33	0.54	0.73	0.88	0.96	1.00	0.96	0.86	0.62	0.45	0.30	0.10	0.00	0.00	0.00	0.00	0.00	7.87
3	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.34	0.55	0.74	0.88	0.97	1.00	0.96	0.86	0.60	0.46	0.29	0.09	0.00	0.00	0.00	0.00	0.00	7.88
4	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.56	0.74	0.89	0.98	0.99	0.98	0.87	0.60	0.46	0.19	0.05	0.00	0.00	0.00	0.00	0.00	7.80
5	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.56	0.76	0.90	0.99	0.98	0.95	0.87	0.62	0.47	0.28	0.10	0.00	0.00	0.00	0.00	0.00	7.97
6	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.29	0.41	0.57	0.74	0.99	1.03	0.98	0.76	0.48	0.50	0.30	0.10	0.00	0.00	0.00	0.00	0.00	7.33
7	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.16	0.44	0.77	0.83	0.70	0.91	0.99	0.84	0.60	0.51	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.27
8	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.27	0.58	0.84	0.68	0.41	0.84	0.43	0.50	0.39	0.25	0.10	0.00	0.00	0.00	0.00	0.00	5.47
9	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.36	0.57	0.75	0.89	0.97	1.00	0.96	0.86	0.58	0.51	0.30	0.10	0.00	0.00	0.00	0.00	0.00	8.02
10	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.58	0.77	0.90	0.98	1.00	0.96	0.87	0.60	0.52	0.30	0.10	0.00	0.00	0.00	0.00	0.00	8.12
11	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.34	0.54	0.67	0.87	0.99	1.01	0.98	0.85	0.58	0.51	0.32	0.11	0.00	0.00	0.00	0.00	0.00	7.93
12	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.27	0.34	0.53	0.77	0.84	0.75	0.74	0.71	0.51	0.43	0.27	0.11	0.00	0.00	0.00	0.00	0.00	6.39
13	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.59	0.77	0.91	1.00	1.03	1.00	0.71	0.55	0.53	0.34	0.07	0.00	0.00	0.00	0.00	0.00	8.06
14	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.34	0.43	0.72	0.89	0.91	0.78	0.53	0.61	0.44	0.28	0.20	0.09	0.00	0.00	0.00	0.00	0.00	6.35
15	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.59	0.77	0.83	1.02	1.03	0.99	0.89	0.59	0.54	0.32	0.12	0.00	0.00	0.00	0.00	0.00	8.24
16	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.60	0.78	0.92	1.00	1.03	0.99	0.89	0.58	0.53	0.32	0.12	0.00	0.00	0.00	0.00	0.00	8.32
17	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.15	0.36	0.56	0.90	0.94	0.48	0.52	0.89	0.56	0.53	0.31	0.09	0.00	0.00	0.00	0.00	0.00	6.41
18	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.30	0.48	0.64	0.92	0.27	0.16	0.31	0.75	0.59	0.48	0.07	0.06	0.00	0.00	0.00	0.00	0.00	5.12
19	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.37	0.58	0.76	0.90	0.98	1.01	0.98	0.88	0.57	0.54	0.32	0.12	0.01	0.00	0.00	0.00	0.00	8.20
20	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.58	0.76	0.93	0.99	0.98	0.98	0.89	0.59	0.53	0.33	0.13	0.01	0.00	0.00	0.00	0.00	8.26
21	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.39	0.60	0.79	0.92	1.00	1.02	0.99	0.93	0.61	0.45	0.16	0.07	0.01	0.00	0.00	0.00	0.00	8.12
22	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.39	0.60	0.77	0.91	0.99	1.02	0.97	0.88	0.61	0.54	0.33	0.13	0.01	0.00	0.00	0.00	0.00	8.33
23	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.40	0.60	0.78	0.92	1.00	1.03	0.99	0.89	0.63	0.55	0.33	0.13	0.01	0.00	0.00	0.00	0.00	8.44
24	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.40	0.61	0.79	0.93	1.01	1.04	0.99	0.90	0.64	0.55	0.34	0.13	0.01	0.00	0.00	0.00	0.00	8.53
25	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.39	0.60	0.78	0.91	1.00	1.03	0.98	0.89	0.63	0.54	0.33	0.13	0.01	0.00	0.00	0.00	0.00	8.40
26	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.59	0.77	0.91	0.98	1.01	0.98	0.88	0.62	***	***	***	***	***	0.00	0.00	0.00	7.30
27	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.59	0.77	0.91	1.00	1.04	0.98	0.89	0.62	0.55	0.34	0.13	0.01	0.00	0.00	0.00	0.00	8.38
28	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.39	0.60	0.78	0.92	1.00	1.04	1.00	0.91	0.63	0.55	0.34	0.14	0.01	0.00	0.00	0.00	0.00	8.48
29	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.40	0.61	0.80	0.94	1.02	1.06	1.00	0.91	0.63	0.56	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.61
30	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.40	0.60	0.78	0.92	1.00	1.04	0.99	0.90	0.62	0.56	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.50
31	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.40	0.61	0.79	0.93	1.00	1.04	0.99	0.89	0.63	0.62	0.24	0.05	0.00	0.00	0.00	0.00	0.00	8.37
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.34	0.53	0.73	0.89	0.93	0.92	0.91	0.83	0.58	0.50	0.29	0.10	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.96	7.87	7.88	7.80	7.97	7.33	7.27	5.47	8.02	8.12	7.93	6.39	8.06	6.35	8.24	8.32	6.41	5.12	8.20	8.26	8.12	8.33	8.44	8.53	8.40
MAX	0.85	1.00	1.00	0.99	0.99	1.03	0.99	0.84	1.00	1.00	1.01	0.84	1.03	0.91	1.03	1.03	0.94	0.92	1.01	0.99	1.02	1.02	1.03	1.04	1.03
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	7.30	8.38	8.48	8.61	8.50	8.37
MAX	1.01	1.04	1.04	1.06	1.04	1.04
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.10 MONTHLY MAXIMUM = 0.07 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 99.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
JUNE - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	3.1	3.0	2.8	3.1	1.2	2.2	1.3	0.6	0.9	1.2	1.7	2.3	3.4	5.0	5.4	6.1	5.9	6.4	6.9	5.1	3.7	3.1	2.4	1.5	3.3
2	2.5	2.3	4.2	4.2	2.8	3.2	2.1	1.7	1.5	1.2	1.8	3.2	3.5	3.7	4.1	6.1	7.7	9.1	7.8	5.3	2.9	2.5	1.4	2.4	3.6
3	2.6	2.5	2.6	2.6	2.9	2.2	1.7	1.1	0.6	1.2	2.8	5.2	5.3	5.8	5.6	7.8	8.7	9.1	7.7	3.8	5.4	5.1	2.8	0.9	4.0
4	1.6	2.6	2.5	2.5	3.0	1.7	2.5	1.3	0.8	1.1	1.0	3.1	4.0	3.3	3.6	3.9	5.6	7.6	8.9	6.5	5.3	4.3	1.6	2.7	3.4
5	2.5	2.3	4.3	4.2	4.3	4.2	4.0	3.3	2.8	1.8	1.5	1.7	1.7	2.0	3.9	6.5	7.2	7.3	7.3	5.6	4.0	1.9	1.7	3.1	3.7
6	3.5	3.2	2.8	3.2	4.2	3.4	3.2	2.9	2.7	2.2	2.1	1.5	3.6	4.0	6.7	8.6	7.3	8.8	9.1	7.6	6.0	2.8	2.4	4.2	4.4
7	5.9	4.5	2.1	2.7	2.8	2.2	3.2	2.0	1.4	1.0	2.7	2.5	2.9	4.6	5.6	5.9	6.4	7.3	7.3	6.1	4.2	3.4	3.7	3.2	3.9
8	1.0	3.7	2.1	0.9	1.0	0.8	0.9	1.7	1.1	1.7	2.5	2.0	3.2	4.2	6.0	6.8	7.0	7.8	7.2	5.8	3.8	3.2	2.8	4.6	3.4
9	7.7	5.8	4.3	4.7	4.1	4.5	3.2	3.8	4.8	4.9	5.3	5.8	6.6	7.2	7.7	8.6	8.3	8.0	8.2	7.4	4.1	3.2	2.5	3.5	5.6
10	4.3	5.1	3.1	2.8	2.8	2.3	3.3	1.6	1.9	4.8	5.0	5.5	7.1	8.0	9.7	9.8	7.1	6.4	4.1	7.1	7.5	5.1	3.8	3.6	5.1
11	3.4	3.2	1.8	2.6	2.7	3.0	2.9	2.8	3.0	1.6	1.8	1.4	2.1	2.3	5.4	8.6	4.0	5.3	3.4	2.4	2.3	1.7	3.7	6.6	3.2
12	4.5	3.2	3.9	2.1	1.5	3.0	3.0	2.7	2.2	1.9	2.7	1.9	2.2	2.3	2.0	5.8	6.3	7.9	7.9	7.0	4.4	4.1	3.4	5.5	3.8
13	3.3	1.7	1.6	1.4	2.0	3.2	1.9	2.0	1.8	1.1	1.2	3.3	7.2	6.0	7.0	7.6	7.9	8.2	8.6	7.5	5.7	5.5	6.4	5.9	4.5
14	4.7	1.6	2.0	2.4	2.8	3.4	2.4	0.6	0.9	1.1	1.6	2.7	3.0	2.7	2.8	3.8	6.5	8.1	7.8	5.9	3.0	1.4	2.6	3.6	3.2
15	3.1	3.1	3.0	2.7	4.1	3.1	3.5	2.2	1.5	1.6	1.8	2.5	4.2	5.5	6.5	7.8	8.0	9.0	8.1	7.7	5.7	4.7	5.4	5.2	4.6
16	3.6	2.3	2.0	3.1	3.0	2.2	1.6	1.5	1.2	1.2	1.8	2.3	2.9	4.4	5.0	6.9	7.5	6.8	6.2	5.7	3.0	1.8	1.3	1.4	3.3
17	2.1	3.2	3.0	2.5	2.7	2.7	1.4	1.8	1.3	1.4	1.3	1.8	3.1	4.1	5.6	7.0	6.0	5.8	4.8	4.2	4.2	3.2	0.8	2.2	3.2
18	2.8	3.0	2.1	1.4	2.7	4.0	3.7	2.2	1.6	1.7	1.6	1.6	2.9	4.3	4.7	6.1	6.6	7.4	8.2	6.8	4.7	5.0	2.3	1.9	3.7
19	2.8	3.9	3.5	4.3	3.1	3.0	0.7	1.0	1.3	0.8	2.0	2.8	2.6	2.8	3.6	5.3	7.6	8.3	8.7	7.2	6.2	3.9	1.8	2.3	3.7
20	3.3	3.2	3.2	2.7	3.5	3.5	4.6	3.2	2.4	1.5	3.7	3.6	2.9	3.2	2.2	2.1	5.0	8.0	8.0	6.0	11.5	6.8	3.8	2.9	4.2
21	3.2	4.3	2.3	1.6	1.4	0.9	1.8	0.9	0.9	1.2	2.1	3.8	5.3	6.5	6.8	7.1	7.3	7.4	7.2	6.1	4.3	3.7	4.4	4.2	3.9
22	3.3	2.5	2.3	1.9	2.3	1.7	1.1	0.7	1.9	2.6	3.8	6.2	6.4	7.3	7.6	7.2	7.0	7.1	6.9	5.6	3.3	2.5	2.8	5.0	4.1
23	3.2	2.3	1.9	1.5	1.3	1.9	1.5	0.7	1.2	2.7	1.4	4.4	4.7	4.9	5.9	6.4	3.7	2.7	1.7	1.8	3.0	2.0	1.1	1.6	2.7
24	2.6	0.9	0.7	0.6	1.0	1.6	2.6	2.5	2.3	1.7	2.2	1.6	1.8	2.7	5.4	5.9	7.6	7.6	6.7	4.3	2.7	5.4	6.6	3.9	3.4
25	3.7	2.6	2.5	2.5	2.2	1.9	0.9	0.5	1.7	1.6	1.1	1.4	2.3	2.3	1.7	3.3	2.5	3.5	3.4	5.6	5.4	8.8	8.2	4.7	3.1
26	2.5	2.2	3.4	3.8	3.2	2.4	3.0	2.9	3.1	2.0	4.2	4.4	6.2	2.0	2.7	3.6	3.3	4.2	4.5	7.1	1.8	2.7	4.5	5.4	3.5
27	3.7	2.6	2.1	3.2	2.4	2.2	3.3	3.0	3.5	1.9	1.5	2.0	1.9	2.3	3.1	2.3	2.8	1.9	7.5	5.4	2.9	3.7	1.8	1.1	2.8
28	3.0	3.3	3.8	3.8	2.8	4.2	3.5	6.2	5.6	3.5	3.8	4.1	3.9	2.7	2.9	3.2	3.1	2.6	7.1	3.7	4.3	8.9	13.3	5.4	4.5
29	7.1	7.3	7.2	4.7	2.5	3.4	4.1	2.9	2.6	4.2	2.8	3.0	3.2	3.0	2.2	2.8	2.7	5.4	7.1	3.6	2.2	3.1	5.9	5.5	4.1
30	5.9	5.5	3.7	4.4	4.9	4.2	5.0	4.0	2.8	3.9	3.0	3.0	4.2	3.2	2.0	2.4	1.5	2.0	1.8	3.3	2.4	2.6	2.2	1.5	3.3
HRAVE	3.6	3.2	2.9	2.8	2.7	2.7	2.6	2.2	2.0	2.0	2.4	3.0	3.8	4.1	4.8	5.8	5.9	6.6	6.7	5.6	4.3	3.9	3.6	3.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.3	3.6	4.0	3.4	3.7	4.4	3.9	3.4	5.6	5.1	3.2	3.8	4.5	3.2	4.6	3.3	3.2	3.7	3.7	4.2	3.9	4.1	2.7	3.4	3.1
MAX	6.9	9.1	9.1	8.9	7.3	9.1	7.3	7.8	8.6	9.8	8.6	7.9	8.6	8.1	9.0	7.5	7.0	8.2	8.7	11.5	7.4	7.6	6.4	7.6	8.8
MIN	0.6	1.2	0.6	0.8	1.5	1.5	1.0	0.8	2.5	1.6	1.4	1.5	1.1	0.6	1.5	1.2	0.8	1.4	0.7	1.5	0.9	0.7	0.7	0.6	0.5

DAY	26	27	28	29	30	31
AVE	3.5	2.8	4.5	4.1	3.3	***
MAX	7.1	7.5	13.3	7.3	5.9	***
MIN	1.8	1.1	2.6	2.2	1.5	***

MONTHLY AVERAGE = 3.8 MONTHLY MAXIMUM = 13.3 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JUNE - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	57	98	46	101	254	315	301	327	238	224	283	279	317	300	288	282	287	284	295	293	303	303	314	295	177
2	247	126	116	107	129	114	102	132	142	144	283	273	271	271	256	287	286	284	286	283	297	305	266	133	275
3	125	130	118	130	108	97	86	62	311	260	292	289	289	290	276	282	284	288	286	295	311	314	281	197	83
4	159	139	114	104	118	72	122	129	96	205	277	55	45	66	228	261	295	290	286	298	306	288	164	109	307
5	106	97	100	102	97	103	104	110	143	151	132	146	174	267	278	297	293	284	295	301	297	252	132	100	234
6	101	95	107	93	98	109	118	126	81	97	215	124	281	274	243	259	258	277	277	278	279	315	280	312	167
7	297	296	150	125	81	90	87	114	135	99	113	108	356	247	264	259	286	296	307	299	300	298	304	304	248
8	141	295	172	251	265	131	126	134	163	261	265	266	300	303	292	296	295	294	293	294	294	294	299	305	116
9	304	295	287	311	305	298	289	296	299	299	300	291	292	288	278	284	282	287	292	295	292	288	267	304	35
10	308	312	258	183	130	141	168	152	254	289	281	281	276	287	274	284	274	263	220	85	344	312	95	77	92
11	125	126	124	94	124	107	131	105	91	88	95	257	285	292	285	78	91	65	72	69	85	129	315	313	94
12	304	285	302	266	136	113	114	114	118	127	92	37	312	110	102	234	270	273	284	287	292	307	312	311	327
13	286	251	136	117	106	94	104	105	144	95	324	280	244	261	249	285	266	278	283	285	288	313	305	317	39
14	313	152	139	100	106	101	124	54	101	131	164	165	307	308	296	255	269	289	299	309	314	289	100	99	163
15	90	90	87	86	86	99	91	98	98	125	89	343	243	251	263	274	280	285	284	282	289	299	302	307	72
16	307	196	118	106	107	78	82	98	101	88	303	278	300	270	255	286	295	300	307	308	312	301	340	59	160
17	90	94	95	80	110	116	118	107	162	223	243	348	285	303	317	307	295	287	282	293	311	306	128	83	9
18	113	81	82	15	136	115	122	108	132	123	92	107	271	255	273	281	276	276	281	286	300	300	302	180	118
19	118	88	92	90	83	82	33	137	131	155	283	285	261	254	264	293	299	290	291	297	306	298	161	132	327
20	107	114	135	101	100	88	83	143	147	129	122	142	207	181	184	166	270	292	299	299	44	48	107	88	136
21	331	300	142	101	82	66	99	116	105	255	285	309	294	305	282	285	290	283	288	278	289	294	294	299	69
22	302	285	227	239	299	98	145	301	296	297	300	298	292	288	294	287	282	279	288	289	291	295	282	304	172
23	282	343	292	295	76	109	92	111	264	285	195	155	151	198	238	231	199	141	161	164	110	116	125	128	34
24	142	96	223	206	145	151	120	103	105	112	104	28	302	262	299	300	198	150	148	137	161	140	146	129	25
25	123	120	97	103	154	107	135	125	123	155	122	248	285	73	24	261	272	299	269	276	156	152	154	138	23
26	101	112	114	125	118	140	131	119	150	139	163	153	160	143	308	288	318	293	294	132	189	128	103	118	145
27	94	111	115	89	143	110	83	135	137	134	136	191	178	134	87	40	82	127	101	141	67	295	317	152	304
28	143	121	126	104	118	79	83	71	95	160	114	51	103	3	70	62	83	245	163	194	199	348	82	120	237
29	127	134	137	114	130	78	133	115	133	166	149	144	152	32	229	257	217	196	118	110	137	85	36	73	332
30	90	83	106	94	111	74	46	72	124	121	110	106	134	121	112	98	125	137	123	87	136	117	142	145	59

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JUNE - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	45	17	28	52	57	52	52	58	35	66	40	49	43	36	24	17	15	13	14	8	5	7	42	35	34
2	21	8	10	9	13	9	10	13	27	54	40	37	29	30	25	20	13	10	10	6	9	9	29	12	19
3	15	15	11	10	14	11	10	38	52	31	22	19	21	18	19	16	10	9	8	8	7	10	33	34	18
4	18	12	12	12	10	16	10	20	38	52	73	52	40	45	42	25	20	14	8	9	6	9	33	9	24
5	11	9	11	12	8	9	9	7	12	28	43	64	71	54	26	21	19	11	11	9	5	36	20	9	21
6	8	12	9	6	11	11	8	8	16	33	36	61	43	29	22	16	18	11	9	8	10	16	42	11	19
7	6	17	33	16	13	19	8	16	34	64	37	61	50	26	31	24	17	15	12	8	7	8	6	13	23
8	37	15	14	34	36	31	18	17	58	36	34	47	53	29	20	22	15	13	10	8	5	7	9	10	24
9	9	9	11	8	11	8	7	15	16	16	20	27	21	19	16	15	14	16	12	10	10	6	16	13	14
10	8	8	20	33	13	18	22	27	26	16	17	19	15	13	10	9	11	14	19	36	26	27	17	13	18
11	14	8	12	10	12	14	8	16	14	36	52	45	49	45	28	67	17	10	11	10	14	52	14	10	24
12	10	7	6	24	18	9	9	12	22	29	30	46	43	48	33	21	23	14	9	9	8	11	12	10	19
13	23	31	24	18	10	7	19	19	24	55	66	49	26	23	20	17	24	13	10	8	8	12	11	10	22
14	12	23	13	11	8	8	10	42	51	43	61	49	41	43	53	34	18	11	10	9	11	42	25	9	27
15	8	10	13	12	7	7	10	12	29	32	52	44	35	29	22	15	15	12	10	7	5	9	10	10	17
16	9	18	9	8	16	39	18	18	27	50	33	55	40	26	30	17	16	14	14	9	10	14	25	38	23
17	8	8	17	16	12	9	14	16	26	34	40	57	48	49	26	16	22	12	11	8	8	31	54	30	24
18	12	10	25	71	23	8	7	11	22	25	51	59	40	33	20	27	13	10	7	6	7	6	11	20	22
19	10	8	8	7	9	11	33	37	28	61	26	19	37	30	24	28	12	12	9	8	7	18	16	10	19
20	10	8	9	49	12	10	18	13	20	36	31	35	38	44	36	51	29	12	11	8	23	50	10	14	24
21	39	19	26	14	44	40	13	26	52	47	40	28	22	20	15	14	12	10	11	7	5	5	5	11	22
22	13	26	47	31	14	35	18	61	30	36	24	19	19	21	14	14	15	15	11	8	5	8	26	12	22
23	13	48	40	15	36	12	18	48	37	18	43	15	13	22	16	12	25	13	14	10	8	13	34	21	23
24	15	37	34	33	21	15	7	9	11	19	27	62	70	48	29	21	21	11	12	10	13	8	8	10	23
25	9	12	9	15	12	15	19	26	15	20	41	49	35	44	59	23	40	23	10	10	22	10	9	12	22
26	13	18	13	13	12	12	10	13	17	35	11	15	12	43	39	19	21	17	29	17	38	26	15	7	19
27	9	13	13	13	18	15	18	19	12	25	54	58	39	38	58	55	41	66	29	18	50	11	18	31	30
28	7	6	7	10	13	17	15	10	20	22	39	32	34	42	64	48	65	38	27	19	27	19	12	19	26
29	10	11	10	13	27	21	16	13	19	12	18	30	26	36	50	49	35	22	16	16	29	24	26	21	23
30	20	21	18	18	12	39	15	10	12	8	14	12	12	16	17	15	21	9	20	23	12	12	11	32	17
HRAVE	15	15	17	20	17	18	15	22	27	35	37	41	35	33	30	25	21	16	13	11	13	17	20	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	34	19	18	24	21	19	23	24	14	18	24	19	22	27	17	23	24	22	19	24	22	22	23	23	22
MAX	66	54	52	73	71	61	64	58	27	36	67	48	66	61	52	55	57	71	61	51	52	61	48	70	59
MIN	5	6	7	6	5	6	6	5	6	8	8	6	7	8	5	8	8	6	7	8	5	5	8	7	9

DAY	26	27	28	29	30	31
AVE	19	30	26	23	17	***
MAX	43	66	65	50	39	***
MIN	7	9	6	10	8	***

MONTHLY AVERAGE = 22.1 MONTHLY MAXIMUM = 72.9 MONTHLY MINIMUM = 4.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JUNE - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	27.6	27.3	27.6	26.5	25.9	26.2	25.8	26.7	28.7	30.6	32.2	34.0	34.8	35.4	36.0	36.1	35.9	35.7	34.6	33.2	31.9	30.8	30.4	28.8	30.9
2	27.1	26.4	25.1	24.6	23.0	22.8	23.8	25.3	28.1	31.1	32.8	34.9	36.2	37.6	38.5	39.0	38.7	38.1	36.9	35.0	34.1	33.4	32.2	30.3	31.5
3	28.5	27.2	26.0	24.7	23.4	21.7	23.3	25.8	28.5	32.4	35.8	38.0	40.0	41.1	41.6	41.7	41.3	40.7	39.4	37.7	36.1	35.2	33.8	32.8	33.2
4	30.9	28.6	27.9	26.6	26.0	24.5	24.8	26.5	31.0	35.0	38.9	41.7	42.4	42.8	44.1	43.9	43.5	42.4	41.1	39.4	37.6	36.7	35.0	33.3	35.2
5	31.7	30.8	28.8	28.4	27.5	26.0	26.7	29.5	32.2	35.4	38.3	40.2	41.9	42.4	43.5	43.9	43.6	42.8	41.6	39.7	37.9	36.2	34.9	32.5	35.7
6	31.1	30.0	28.3	27.1	27.0	25.0	27.0	28.8	33.5	36.9	38.1	40.6	41.9	42.8	43.8	43.0	42.8	41.8	40.8	38.6	37.0	35.4	34.4	32.8	35.4
7	31.1	29.6	28.3	26.8	25.7	24.7	25.9	28.7	30.8	33.3	36.1	37.6	38.7	40.4	40.7	40.4	40.0	39.5	38.1	36.7	35.1	33.9	32.6	31.6	33.6
8	30.3	29.7	26.8	28.0	27.4	26.5	26.8	28.4	30.8	32.3	34.1	35.5	37.2	38.5	39.6	39.6	39.5	39.0	38.0	36.4	34.8	33.9	32.9	32.3	33.3
9	31.9	31.2	30.3	29.4	28.2	27.3	27.6	29.3	30.5	31.8	33.0	34.2	35.5	36.0	36.7	37.2	37.3	37.0	36.2	34.9	34.0	33.1	32.1	31.0	32.7
10	30.2	29.8	28.7	27.8	27.1	26.9	26.9	28.4	29.8	31.8	33.1	34.6	35.8	36.0	33.8	32.7	32.7	31.9	31.2	26.4	22.4	23.1	22.6	22.5	29.4
11	22.0	21.6	21.4	21.2	20.5	20.8	20.5	23.5	26.7	28.7	31.4	32.4	33.8	35.0	34.4	28.1	29.6	31.0	32.0	31.5	30.4	29.4	30.5	29.9	27.8
12	28.5	27.1	26.4	25.4	23.9	23.0	24.2	26.4	28.5	30.8	33.3	35.1	36.1	36.1	36.6	38.1	37.7	37.1	35.7	33.8	32.3	31.1	30.5	29.9	31.2
13	28.9	27.9	26.5	25.4	23.7	22.5	23.9	25.9	28.3	30.2	32.5	33.5	34.8	35.4	35.6	35.6	35.6	34.9	33.9	32.0	30.4	29.6	29.1	28.2	30.2
14	27.5	25.4	23.8	22.4	20.9	21.2	21.6	23.6	26.6	29.2	32.1	33.8	34.6	35.2	36.1	37.0	37.1	35.9	34.8	33.0	31.6	30.7	28.2	26.3	29.5
15	24.8	23.7	22.5	21.2	19.8	19.6	21.7	24.1	27.6	30.8	33.3	34.9	37.1	37.6	37.6	37.7	37.4	36.7	35.8	33.8	31.9	30.6	29.4	28.7	29.9
16	27.9	26.3	25.2	24.3	23.3	22.0	22.8	24.9	28.3	30.6	32.4	34.0	35.8	37.0	38.0	37.8	37.4	36.9	35.9	34.3	32.7	31.4	30.7	29.2	30.8
17	26.9	25.3	24.1	23.4	22.1	22.1	22.4	25.4	28.3	30.8	33.5	35.5	36.8	38.2	38.6	38.7	38.6	38.5	37.7	35.7	33.9	32.5	32.7	29.8	31.3
18	27.5	26.1	24.9	24.0	22.4	22.5	24.4	26.7	29.7	33.5	37.4	39.5	40.5	40.8	42.1	42.3	42.0	41.3	40.1	38.1	36.6	35.5	34.5	33.0	33.6
19	31.3	29.8	28.5	27.2	26.3	25.6	25.6	27.6	30.7	34.9	38.8	41.8	43.9	45.4	46.3	46.6	45.9	45.4	44.0	42.3	40.4	39.0	37.8	36.1	36.7
20	34.6	32.9	32.2	30.6	29.4	29.0	30.7	31.8	35.9	38.2	40.9	42.7	43.3	44.0	44.4	44.6	44.8	43.3	42.1	40.8	37.8	36.3	34.9	34.3	37.5
21	33.4	33.1	30.9	30.8	30.6	29.0	30.1	31.9	34.6	36.4	37.7	39.2	40.3	40.5	40.5	40.8	40.7	40.5	39.9	38.4	37.1	36.3	35.3	34.7	35.9
22	34.1	33.6	32.9	31.9	31.8	30.3	31.1	32.8	34.8	36.6	38.3	39.9	40.8	41.3	41.8	41.9	42.0	41.5	40.6	39.1	37.7	36.6	35.5	35.3	36.8
23	34.2	33.6	32.2	31.2	30.3	29.3	29.7	31.2	33.5	34.7	35.6	37.5	37.1	38.4	38.3	36.9	36.6	36.4	36.3	35.5	34.2	34.1	33.6	32.9	34.3
24	32.3	32.4	31.7	31.5	30.8	30.0	29.6	30.3	31.6	33.4	35.7	36.8	37.8	38.9	39.9	40.1	38.2	35.5	35.4	35.2	33.8	33.3	32.9	32.0	34.1
25	31.1	30.3	30.1	29.6	28.5	28.5	28.4	29.1	30.0	31.4	32.9	34.8	36.0	37.0	37.8	38.9	39.7	39.1	38.5	37.3	34.2	32.8	31.3	30.7	33.3
26	30.3	30.0	29.9	29.3	29.3	28.5	28.7	29.4	30.6	33.3	34.9	36.0	36.0	35.2	36.5	37.3	37.7	38.1	37.1	32.9	32.2	31.8	31.4	30.7	32.8
27	30.5	30.0	29.3	29.2	27.9	28.0	28.7	30.3	32.1	33.5	35.6	37.8	38.4	39.5	39.9	40.3	40.2	40.3	38.7	32.9	32.0	30.2	30.8	30.2	33.6
28	29.7	29.4	29.1	28.7	28.0	28.9	30.8	33.3	35.8	37.4	38.3	38.9	40.1	40.1	40.9	41.5	41.5	42.2	39.9	38.5	37.3	32.3	26.6	25.3	34.8
29	24.6	24.3	25.2	24.7	24.5	24.9	24.5	26.0	29.6	31.6	33.0	35.2	36.6	37.1	38.8	38.7	38.8	38.2	28.5	30.0	28.7	29.3	29.6	27.6	30.4
30	26.6	25.1	22.7	21.6	21.8	22.4	23.0	23.5	23.9	23.8	23.6	24.0	24.9	24.6	25.3	26.1	26.4	26.4	26.5	27.2	26.0	25.9	25.5	25.3	24.7
HRAVE	29.6	28.6	27.6	26.8	25.9	25.3	26.0	27.8	30.4	32.7	34.8	36.5	37.6	38.3	38.9	38.9	38.8	38.3	37.0	35.3	33.7	32.7	31.7	30.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	30.9	31.5	33.2	35.2	35.7	35.4	33.6	33.3	32.7	29.4	27.8	31.2	30.2	29.5	29.9	30.8	31.3	33.6	36.7	37.5	35.9	36.8	34.3	34.1	33.3
MAX	36.1	39.0	41.7	44.1	43.9	43.8	40.7	39.6	37.3	36.0	35.0	38.1	35.6	37.1	37.7	38.0	38.7	42.3	46.6	44.8	40.8	42.0	38.4	40.1	39.7
MIN	25.8	22.8	21.7	24.5	26.0	25.0	24.7	26.5	27.3	22.4	20.5	23.0	22.5	20.9	19.6	22.0	22.1	22.4	25.6	29.0	29.0	30.3	29.3	29.6	28.4

DAY	26	27	28	29	30	31
AVE	32.8	33.6	34.8	30.4	24.7	***
MAX	38.1	40.3	42.2	38.8	27.2	***
MIN	28.5	27.9	25.3	24.3	21.6	***

MONTHLY AVERAGE = 32.7 MONTHLY MAXIMUM = 46.6 MONTHLY MINIMUM = 19.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JUNE - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.4	0.2	0.2	0.4	0.2	0.4	0.3	-0.2	-0.5	-0.8	-1.2	-1.4	-1.5	-1.5	-1.7	-1.5	-1.5	-1.0	-0.5	0.0	0.4	0.6	0.6	0.6	-0.4
2	0.6	0.4	0.3	0.3	0.6	0.3	-0.8	-0.9	-0.9	-1.0	-1.1	-1.6	-1.5	-1.5	-1.5	-1.5	-1.3	-0.9	-0.4	0.2	0.5	0.6	0.5	0.6	-0.4
3	0.8	0.7	0.6	0.6	0.5	0.7	-0.6	-0.8	-0.5	-0.9	-1.1	-1.5	-1.7	-1.6	-1.5	-1.5	-1.3	-0.9	-0.4	0.2	0.5	0.4	0.6	0.5	-0.3
4	0.7	0.7	0.8	0.6	0.6	0.6	-0.2	-0.6	-0.6	-0.9	-0.9	-1.5	-1.6	-1.6	-1.6	-1.3	-1.2	-0.8	-0.4	0.2	0.4	0.7	0.6	0.9	-0.3
5	0.8	0.9	0.7	0.7	1.0	0.8	0.0	-1.1	-1.4	-1.2	-1.2	-1.1	-1.3	-1.1	-1.5	-1.5	-1.2	-1.0	-0.5	0.1	0.6	0.6	0.6	0.8	-0.3
6	0.8	1.0	0.9	0.7	0.5	0.7	-0.4	-1.0	-1.7	-1.8	-1.3	-1.4	-1.6	-1.7	-1.6	-1.2	-1.1	-0.9	-0.5	0.0	0.2	0.4	0.5	0.6	-0.4
7	0.5	0.7	0.7	0.6	0.8	0.4	-1.0	-1.2	-1.0	-0.8	-2.0	-1.8	-1.5	-1.9	-1.7	-1.4	-1.2	-1.1	-0.5	-0.1	0.2	0.5	0.5	0.7	-0.5
8	0.6	0.6	0.6	0.3	0.4	0.4	-0.3	-0.9	-0.7	-0.9	-1.2	-1.2	-1.5	-1.6	-1.7	-1.5	-1.5	-1.2	-0.7	-0.1	0.3	0.4	0.3	0.2	-0.5
9	0.1	0.0	0.0	0.1	0.1	0.1	-0.3	-0.8	-1.1	-1.3	-1.5	-1.6	-1.9	-1.8	-1.7	-1.6	-1.3	-1.0	-0.7	-0.2	0.1	0.2	0.2	0.1	-0.6
10	0.2	0.1	0.2	0.1	0.0	0.0	-0.3	-0.8	-0.8	-1.3	-1.5	-1.6	-1.6	-1.5	-0.5	-0.2	-0.3	-0.2	-0.2	0.2	0.2	0.2	0.2	0.2	-0.4
11	0.2	0.3	0.3	0.4	0.4	0.2	0.1	-0.9	-1.4	-1.1	-1.3	-1.0	-1.2	-1.3	-0.8	-0.5	-1.0	-0.5	-0.1	0.3	0.4	0.4	0.4	0.2	-0.3
12	0.2	0.5	0.5	0.5	0.3	0.2	-0.7	-1.4	-1.5	-1.4	-1.7	-1.4	-1.2	-0.9	-1.0	-1.2	-1.0	-0.9	-0.5	-0.1	0.3	0.3	0.3	0.2	-0.5
13	0.3	0.3	0.4	0.4	0.5	0.4	-0.6	-1.1	-1.2	-0.8	-1.0	-1.3	-1.5	-1.5	-1.5	-1.6	-1.2	-0.9	-0.6	-0.1	0.2	0.2	0.3	0.2	-0.5
14	0.3	0.5	0.5	0.4	0.5	0.3	-0.7	-0.4	-0.6	-1.0	-1.3	-1.8	-1.4	-1.3	-1.3	-1.3	-1.3	-1.0	-0.6	0.0	0.4	0.4	0.7	0.6	-0.4
15	0.7	0.8	0.6	0.6	0.5	0.3	-0.9	-1.2	-1.1	-1.3	-1.4	-1.4	-1.6	-1.7	-1.5	-1.4	-1.3	-1.0	-0.6	-0.1	0.3	0.4	0.3	0.3	-0.5
16	0.4	0.7	0.4	0.5	0.5	0.6	-0.6	-0.7	-0.8	-1.0	-1.0	-1.2	-1.3	-1.4	-1.5	-1.6	-1.4	-1.0	-0.6	0.0	0.4	0.5	0.4	0.6	-0.4
17	0.7	0.7	0.6	0.7	0.6	0.2	-0.5	-0.9	-0.9	-0.9	-1.0	-1.1	-1.3	-1.6	-1.5	-1.5	-1.2	-1.2	-0.8	-0.1	0.4	0.8	0.3	0.7	-0.4
18	0.8	0.7	0.6	0.9	0.7	0.2	-0.6	-1.1	-1.1	-1.3	-1.4	-1.4	-1.4	-1.3	-1.5	-1.4	-1.3	-1.0	-0.7	-0.1	0.4	0.5	0.7	0.7	-0.4
19	0.8	0.8	0.9	0.6	0.7	0.6	-0.1	-0.6	-0.9	-0.6	-0.9	-1.2	-1.4	-1.2	-1.3	-1.3	-1.2	-0.9	-0.4	0.1	0.4	0.6	0.5	0.8	-0.2
20	0.9	0.9	0.7	0.7	1.0	0.7	0.0	-0.8	-1.3	-1.0	-2.0	-2.0	-1.7	-1.7	-1.4	-1.1	-1.2	-0.8	-0.4	-0.1	0.0	0.1	0.4	0.4	-0.4
21	0.4	0.3	0.4	0.3	0.6	0.2	-0.5	-0.6	-0.8	-0.8	-1.2	-1.5	-1.7	-1.6	-1.3	-1.2	-1.1	-1.0	-0.6	-0.1	0.3	0.5	0.3	0.3	-0.4
22	0.2	0.2	0.3	0.5	0.7	0.4	-0.4	-0.4	-0.8	-1.2	-1.3	-1.7	-1.7	-1.7	-1.8	-1.7	-1.4	-1.0	-0.7	-0.1	0.3	0.4	0.3	0.2	-0.5
23	0.3	0.4	0.6	0.4	0.4	0.4	0.0	-0.3	-0.6	-0.7	-0.8	-1.6	-1.1	-1.2	-1.0	-0.6	-0.5	-0.5	-0.3	0.1	0.2	0.3	0.3	0.3	-0.2
24	0.2	0.3	0.3	0.4	0.4	0.4	0.0	-0.1	-0.8	-0.9	-1.3	-1.1	-1.1	-1.4	-1.6	-1.5	-1.1	-0.8	-0.4	0.0	0.1	0.1	0.1	0.2	-0.4
25	0.2	0.1	0.2	0.2	0.2	0.2	-0.1	-0.2	-0.7	-0.9	-0.9	-0.9	-1.1	-1.2	-1.1	-1.0	-1.0	-0.9	-0.5	-0.2	-0.2	-0.1	-0.1	-0.1	-0.4
26	0.0	0.0	0.0	0.1	0.1	0.3	-0.1	-0.5	-0.8	-1.2	-1.9	-1.7	-1.4	-0.8	-1.0	-0.9	-0.9	-1.0	-0.5	-0.2	0.0	0.0	0.0	0.0	-0.5
27	0.1	0.3	0.2	0.2	0.4	0.2	-0.1	-0.9	-1.2	-1.0	-1.0	-1.4	-1.3	-1.7	-1.6	-1.3	-1.0	-0.8	-0.5	-0.3	-0.2	-0.3	-0.1	0.1	-0.5
28	0.2	0.1	0.1	0.2	0.5	0.3	-0.5	-1.1	-1.7	-2.0	-2.0	-1.9	-2.2	-1.4	-1.5	-1.4	-1.1	-1.0	-0.7	-0.4	-0.2	-0.2	-0.1	-0.2	-0.8
29	0.0	0.0	0.0	-0.1	0.1	0.0	-0.3	-0.9	-1.5	-2.2	-1.8	-1.8	-2.0	-1.5	-1.5	-1.2	-1.1	-1.1	-0.6	-0.4	-0.3	-0.1	-0.1	-0.2	-0.8
30	-0.3	-0.1	0.2	0.2	0.2	0.2	0.1	-0.1	-0.3	-0.3	-0.2	-0.3	-0.5	-0.6	-0.6	-0.5	-0.4	-0.3	-0.2	0.1	0.1	0.1	0.1	0.1	-0.1
HRAVE	0.4	0.4	0.4	0.4	0.5	0.4	-0.3	-0.8	-1.0	-1.1	-1.3	-1.4	-1.5	-1.4	-1.4	-1.2	-1.1	-0.9	-0.5	0.0	0.2	0.3	0.3	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.4	-0.4	-0.3	-0.3	-0.3	-0.4	-0.5	-0.5	-0.6	-0.4	-0.3	-0.5	-0.5	-0.4	-0.5	-0.4	-0.4	-0.4	-0.2	-0.4	-0.4	-0.5	-0.2	-0.4	-0.4
MAX	0.6	0.6	0.8	0.9	1.0	1.0	0.8	0.6	0.2	0.2	0.4	0.5	0.5	0.7	0.8	0.7	0.8	0.9	0.9	1.0	0.6	0.7	0.6	0.4	0.2
MIN	-1.7	-1.6	-1.7	-1.6	-1.5	-1.8	-2.0	-1.7	-1.9	-1.6	-1.4	-1.7	-1.6	-1.8	-1.7	-1.6	-1.6	-1.5	-1.4	-2.0	-1.7	-1.8	-1.6	-1.6	-1.2

DAY	26	27	28	29	30	31
AVE	-0.5	-0.5	-0.8	-0.8	-0.1	***
MAX	0.3	0.4	0.5	0.1	0.2	***
MIN	-1.9	-1.7	-2.2	-2.2	-0.6	***

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = -2.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JUNE - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	699	699	699	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	699	699	700	700	701	701	700
2	701	701	701	702	702	702	703	703	704	703	703	703	702	701	701	700	700	700	700	700	701	702	702	702	702
3	702	702	702	702	702	703	703	704	704	704	703	703	702	701	701	700	700	700	700	700	700	701	701	701	702
4	701	701	700	700	701	701	702	702	702	702	701	701	701	700	699	699	698	698	698	699	699	699	699	699	700
5	699	699	699	699	700	700	700	701	701	701	700	700	699	699	698	697	697	696	696	697	697	697	697	697	699
6	698	698	698	698	698	698	699	699	699	699	698	698	697	697	696	696	695	695	695	696	696	698	698	698	697
7	699	699	699	700	700	701	701	701	701	701	700	700	699	699	698	698	697	697	697	697	698	698	699	699	699
8	699	700	700	701	701	701	701	702	702	701	701	701	700	699	698	698	697	697	698	698	698	699	699	700	700
9	700	700	701	701	702	702	702	703	703	703	702	702	702	701	700	700	699	699	699	699	700	700	701	701	701
10	702	702	702	703	703	703	703	703	703	703	703	702	701	701	700	700	701	700	701	702	702	702	703	703	702
11	702	702	702	702	702	703	703	703	703	703	703	703	702	701	701	701	701	700	700	701	701	702	702	702	702
12	703	703	703	703	703	704	704	704	704	704	704	704	703	703	702	702	702	701	702	702	702	703	703	703	703
13	704	704	704	704	704	704	704	705	704	704	704	703	703	702	702	701	701	701	701	701	701	701	701	702	703
14	701	702	701	701	702	702	702	703	703	702	702	701	701	700	699	699	698	698	698	699	699	700	700	700	701
15	700	700	700	700	701	701	702	702	702	702	702	701	701	701	700	700	699	699	699	700	700	700	701	701	701
16	701	702	702	702	702	703	703	704	704	704	703	703	703	702	702	701	701	701	701	701	701	702	702	703	702
17	703	703	703	703	704	704	705	705	705	705	705	705	704	704	703	703	702	702	703	703	703	703	703	704	704
18	704	704	704	703	704	704	704	705	705	705	704	704	703	703	702	702	702	701	701	702	702	702	703	703	703
19	703	703	703	702	702	703	703	703	703	702	702	701	701	700	699	699	698	698	698	698	699	699	700	700	701
20	700	700	700	700	701	701	702	702	703	703	702	702	701	701	700	700	699	699	699	700	701	701	702	702	701
21	703	703	703	703	703	704	704	705	705	704	704	703	703	702	701	701	700	700	700	700	700	701	701	701	702
22	701	701	701	701	702	702	702	702	702	702	702	702	701	701	700	700	699	699	699	700	700	701	701	701	701
23	702	702	702	702	702	702	703	703	703	703	703	703	703	703	702	702	701	701	701	701	701	702	702	702	702
24	702	702	702	702	702	702	703	703	703	703	703	702	702	701	700	699	699	699	699	699	699	700	701	701	701
25	701	701	701	701	702	702	702	702	702	702	702	702	701	701	700	699	699	699	699	699	700	700	701	701	701
26	702	702	702	702	702	702	703	703	704	704	704	703	703	703	702	701	701	701	701	702	703	703	703	704	702
27	704	703	703	703	703	704	704	704	705	704	704	704	703	702	701	701	700	700	700	702	702	702	703	703	703
28	703	702	703	703	703	703	704	704	704	704	703	703	702	701	701	700	699	699	699	700	700	702	703	703	702
29	704	704	703	703	703	703	704	704	704	704	704	703	702	702	701	700	700	699	701	701	701	702	702	703	702
30	704	704	704	703	704	703	704	704	704	704	704	704	704	704	703	702	702	701	701	701	702	702	703	703	703
HRAVE	701	701	702	702	702	702	703	703	703	703	703	702	702	701	700	700	700	699	699	700	700	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	702	702	700	699	697	699	700	701	702	702	703	703	701	701	702	704	703	701	701	702	701	702	701	701
MAX	701	704	704	702	701	699	701	702	703	703	703	704	705	703	702	704	705	705	703	703	705	702	703	703	702
MIN	698	700	700	698	696	695	697	697	699	700	700	701	701	698	699	701	702	701	698	699	700	699	701	699	699

DAY	26	27	28	29	30	31
AVE	702	703	702	702	703	***
MAX	704	705	704	704	704	***
MIN	701	700	699	699	701	***

MONTHLY AVERAGE = 701.3 MONTHLY MAXIMUM = 705.2 MONTHLY MINIMUM = 695.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JUNE - 2016

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	13	14	15	16	16	20	20	19	18	15	14	10	10	9	8	9	9	9	10	12	13	15	17	18	14
2	19	21	22	23	25	26	24	22	17	13	11	10	8	7	5	5	4	3	4	6	5	6	7	9	13
3	11	13	14	15	17	21	16	14	14	9	6	4	3	1	0	0	0	0	1	2	4	6	6	7	8
4	8	10	11	13	15	17	15	13	9	6	3	1	0	0	0	0	0	0	0	1	3	3	5	7	6
5	10	10	11	11	13	13	14	11	8	9	7	4	2	0	0	0	0	0	0	2	3	5	6	9	6
6	10	11	14	13	13	17	13	11	9	8	6	4	3	1	0	0	0	0	0	1	2	4	4	4	6
7	5	6	8	10	11	12	9	8	7	5	3	2	2	1	1	3	4	4	6	7	9	10	11	12	6
8	15	14	17	19	20	23	23	25	25	27	25	21	19	15	13	12	11	10	8	11	15	18	19	19	18
9	23	24	25	28	32	36	36	34	32	30	29	26	22	22	20	19	19	20	21	22	24	26	28	28	26
10	30	31	33	37	44	44	43	38	33	31	29	27	26	25	27	31	32	36	36	63	76	72	75	78	41
11	79	82	82	85	87	86	84	70	52	43	35	34	31	26	28	45	40	39	33	35	42	47	35	37	52
12	41	46	48	50	60	66	56	46	36	29	24	18	14	12	11	8	8	8	9	12	14	16	19	19	28
13	21	23	26	29	36	39	33	27	22	17	14	14	14	12	12	11	9	7	7	9	11	11	10	12	18
14	12	15	20	24	27	25	23	22	16	10	9	8	9	8	6	3	3	3	2	3	4	6	10	12	12
15	13	15	17	20	21	22	18	15	11	7	6	7	6	7	7	5	3	2	2	3	5	7	11	14	10
16	15	16	20	22	23	25	23	20	14	11	10	8	6	3	2	2	3	4	5	6	9	11	12	15	12
17	16	18	19	21	24	23	20	17	12	11	9	7	6	4	3	2	1	0	1	4	7	8	8	11	10
18	14	14	17	19	17	18	14	13	10	6	3	1	1	1	0	0	0	1	2	4	5	6	9	9	8
19	12	12	15	15	17	17	19	17	12	8	4	1	0	0	0	0	0	0	0	1	3	4	6	8	7
20	10	12	11	14	16	16	14	13	9	9	7	6	5	4	3	3	4	6	7	9	17	19	23	23	11
21	25	24	28	30	31	34	29	24	20	17	16	14	12	12	11	11	10	10	11	13	15	16	17	18	19
22	19	20	22	23	23	26	22	20	17	14	12	10	10	10	9	9	8	8	9	11	13	15	17	18	15
23	19	21	23	24	26	28	27	24	19	18	15	13	14	13	13	16	16	16	16	18	21	20	20	21	19
24	21	24	24	25	26	29	30	27	25	21	19	19	17	16	15	13	16	20	19	20	23	25	25	28	22
25	31	33	34	36	37	39	39	36	34	30	26	23	21	17	13	13	11	12	13	19	26	30	36	37	27
26	38	39	38	39	38	40	39	38	35	28	25	22	21	22	21	17	17	17	20	30	33	33	35	38	30
27	38	39	40	39	44	46	39	36	30	26	22	19	16	13	13	13	14	12	17	33	37	46	43	44	30
28	45	46	45	46	47	42	33	29	26	22	20	19	15	15	12	9	8	9	15	20	24	38	60	65	30
29	72	76	66	68	70	70	73	66	47	44	39	32	28	24	21	20	21	21	51	45	50	50	43	51	48
30	55	65	83	92	92	85	82	77	76	81	81	77	72	77	71	64	62	65	68	65	71	73	75	73	74
HRAVE	25	26	28	30	32	33	31	28	23	20	18	15	14	13	12	11	11	11	13	16	19	22	23	25	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	14	13	8	6	6	6	6	18	26	41	52	28	18	12	10	12	10	8	7	11	19	15	19	22	27
MAX	20	26	21	17	14	17	12	27	36	78	87	66	39	27	22	25	24	19	19	23	34	26	28	30	39
MIN	8	3	0	0	0	0	1	8	19	25	26	8	7	2	2	2	0	0	0	3	10	8	13	13	11

DAY	26	27	28	29	30	31
AVE	30	30	30	48	74	***
MAX	40	46	65	76	92	***
MIN	17	12	8	20	55	***

MONTHLY AVERAGE = 20.9 MONTHLY MAXIMUM = 92.2 MONTHLY MINIMUM = 0.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JUNE - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.21	0.40	0.74	0.88	0.98	1.01	0.96	0.87	0.62	0.54	0.32	0.11	0.01	0.00	0.00	0.00	0.00	7.77
2	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.57	0.74	0.89	0.98	1.01	0.98	0.86	0.63	0.52	0.34	0.12	0.01	0.00	0.00	0.00	0.00	8.20
3	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.38	0.59	0.77	0.90	0.99	1.04	0.98	0.88	0.65	0.55	0.34	0.12	0.01	0.00	0.00	0.00	0.00	8.36
4	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.78	0.92	0.98	1.01	0.98	0.87	0.66	0.52	0.29	0.12	0.01	0.00	0.00	0.00	0.00	8.29
5	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.51	0.70	0.86	0.96	1.01	0.96	0.85	0.65	0.54	0.34	0.14	0.01	0.00	0.00	0.00	0.00	8.02
6	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.57	0.78	0.86	0.98	1.04	0.99	0.86	0.67	0.55	0.35	0.16	0.01	0.00	0.00	0.00	0.00	8.37
7	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.41	0.62	0.80	0.93	1.02	1.06	1.01	0.87	0.67	0.56	0.35	0.15	0.01	0.00	0.00	0.00	0.00	8.63
8	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.37	0.57	0.75	0.88	0.97	1.01	0.96	0.82	0.65	0.54	0.34	0.15	0.01	0.00	0.00	0.00	0.00	8.17
9	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.55	0.71	0.85	0.94	0.98	0.93	0.80	0.64	0.52	0.33	0.14	0.01	0.00	0.00	0.00	0.00	7.89
10	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.25	0.48	0.71	0.81	0.91	0.93	0.62	0.09	0.05	0.06	0.04	0.03	0.00	0.00	0.00	0.00	0.00	5.09
11	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.35	0.55	0.73	0.86	0.95	1.02	1.00	0.31	0.08	0.52	0.34	0.14	0.01	0.00	0.00	0.00	0.00	6.98
12	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.37	0.57	0.75	0.88	0.97	0.89	0.33	0.40	0.63	0.50	0.37	0.15	0.01	0.00	0.00	0.00	0.00	6.97
13	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.59	0.73	0.89	0.91	1.00	0.99	0.85	0.73	0.57	0.36	0.16	0.02	0.00	0.00	0.00	0.00	8.33
14	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.40	0.61	0.79	0.93	1.01	1.05	1.00	0.85	0.71	0.58	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.66
15	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.40	0.61	0.79	0.93	1.01	1.05	1.00	0.85	0.71	0.58	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.66
16	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.40	0.61	0.79	0.92	1.02	1.06	1.01	0.87	0.72	0.59	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.72
17	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.40	0.61	0.79	0.92	1.01	1.06	1.01	0.86	0.73	0.60	0.39	0.18	0.02	0.00	0.00	0.00	0.00	8.74
18	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.40	0.61	0.79	0.92	1.02	0.97	0.67	0.86	0.71	0.57	0.37	0.17	0.02	0.00	0.00	0.00	0.00	8.23
19	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.59	0.76	0.90	1.00	1.04	0.97	0.83	0.69	0.55	0.34	0.15	0.02	0.00	0.00	0.00	0.00	8.37
20	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.56	0.74	0.87	0.97	1.01	0.97	0.83	0.58	0.47	0.20	0.13	0.02	0.00	0.00	0.00	0.00	7.84
21	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.55	0.72	0.86	0.95	0.99	0.81	0.56	0.50	0.39	0.30	0.15	0.02	0.00	0.00	0.00	0.00	7.29
22	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.32	0.56	0.74	0.87	0.97	1.01	0.96	0.82	0.68	0.55	0.36	0.16	0.02	0.00	0.00	0.00	0.00	8.21
23	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.17	0.55	0.24	0.45	0.50	0.25	0.50	0.40	0.15	0.15	0.14	0.06	0.00	0.00	0.00	0.00	0.00	3.65
24	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.08	0.28	0.30	0.58	0.60	0.83	1.00	0.73	0.63	0.26	0.29	0.18	0.02	0.00	0.00	0.00	0.00	5.83
25	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.12	0.20	0.31	0.44	0.68	0.65	0.52	0.83	0.43	0.53	0.23	0.11	0.03	0.00	0.00	0.00	0.00	5.13
26	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.14	0.27	0.52	0.51	0.52	0.33	0.25	0.43	0.46	0.34	0.34	0.10	0.01	0.00	0.00	0.00	0.00	4.29
27	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.31	0.34	0.44	0.76	0.89	0.65	0.99	0.84	0.67	0.48	0.36	0.13	0.00	0.00	0.00	0.00	0.00	6.94
28	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.55	0.72	0.86	0.97	0.97	0.98	0.87	0.69	0.59	0.42	0.19	0.02	0.00	0.00	0.00	0.00	8.31
29	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.25	0.54	0.57	0.65	0.84	0.97	0.85	0.86	0.56	0.33	0.20	0.04	0.01	0.00	0.00	0.00	0.00	6.75
30	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.13	0.12	0.11	0.16	0.24	0.23	0.18	0.15	0.13	0.07	0.04	0.00	0.00	0.00	0.00	0.00	1.68
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.32	0.51	0.66	0.80	0.89	0.90	0.85	0.73	0.57	0.47	0.31	0.13	0.01	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	7.77	8.20	8.36	8.29	8.02	8.37	8.63	8.17	7.89	5.09	6.98	6.97	8.33	8.66	8.66	8.72	8.74	8.23	8.37	7.84	7.29	8.21	3.65	5.83	5.13
MAX	1.01	1.01	1.04	1.01	1.01	1.04	1.06	1.01	0.98	0.93	1.02	0.97	1.00	1.05	1.05	1.06	1.06	1.02	1.04	1.01	0.99	1.01	0.55	1.00	0.83
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.29	6.94	8.31	6.75	1.68	***
MAX	0.52	0.99	0.98	0.97	0.24	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JUNE - 2016

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.04	0.00	0.00	0.40
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
30	0.00	0.00	0.04	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.01	0.13	***
MAX	0.00	0.00	0.00	0.01	0.05	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.54 MONTHLY MAXIMUM = 0.36 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	4.0	4.2	3.9	4.2	4.2	5.2	4.8	3.3	2.4	2.3	2.8	2.7	3.0	2.7	3.6	4.4	5.7	6.9	6.7	5.5	4.5	1.4	1.6	2.9	3.9
2	3.6	4.4	4.2	5.8	4.5	2.9	3.2	3.1	4.1	3.5	2.8	1.8	2.3	4.3	5.4	5.6	6.7	6.5	5.5	3.1	1.8	2.2	4.0	3.2	3.9
3	3.8	3.8	3.4	3.7	3.8	3.1	3.8	3.9	3.5	3.1	3.4	3.3	4.1	4.6	4.1	4.3	4.7	4.9	***	4.8	3.5	2.4	2.8	4.1	3.8
4	4.6	4.3	3.2	3.3	3.7	3.9	3.8	3.6	4.1	3.9	3.3	2.9	3.3	4.5	3.8	4.4	4.5	***	***	4.0	2.0	2.4	3.6	3.3	3.7
5	3.7	4.1	3.1	3.1	2.9	3.1	2.8	3.5	3.4	2.9	2.9	2.9	4.1	4.2	5.8	5.0	5.4	***	***	4.1	4.3	3.2	1.9	2.4	3.6
6	3.3	2.4	3.3	3.2	2.4	3.2	3.3	3.3	2.7	2.4	3.3	***	6.2	6.9	7.7	7.6	7.2	4.4	6.3	7.0	5.8	5.6	8.5	***	4.8
7	9.6	7.5	3.7	2.4	2.7	2.5	1.5	1.3	1.8	2.1	3.2	5.1	6.5	7.9	7.7	6.5	6.9	4.2	4.2	***	6.4	5.1	3.5	4.4	4.6
8	2.2	6.3	***	4.3	3.8	3.0	2.1	2.8	2.7	2.8	3.5	4.1	5.2	5.9	6.5	6.8	5.5	5.6	7.5	6.9	7.1	3.6	3.3	4.2	4.6
9	3.1	3.6	2.9	2.4	2.7	3.6	4.1	4.1	3.5	2.0	2.4	3.3	4.4	4.3	5.2	6.0	5.1	6.8	7.8	7.4	6.0	2.6	2.3	3.0	4.1
10	3.2	2.6	1.8	2.6	4.5	4.6	4.3	5.6	6.1	3.8	3.1	3.6	3.5	4.0	4.2	3.7	4.0	3.6	***	5.8	6.1	4.8	3.6	3.8	4.0
11	4.9	4.1	5.3	3.8	3.8	4.3	4.9	5.4	4.7	4.1	3.2	3.1	3.7	4.1	3.9	***	5.9	6.4	***	8.9	6.2	3.8	3.8	4.9	4.7
12	7.9	4.9	3.2	5.5	6.4	8.9	***	7.1	5.3	5.5	5.8	6.8	7.8	8.4	7.4	7.4	6.4	6.5	***	5.9	4.7	4.1	2.4	2.0	5.9
13	2.9	3.6	3.5	3.9	4.6	4.6	4.4	3.8	3.3	2.8	2.3	3.5	3.2	4.7	6.2	7.5	7.0	6.3	***	***	3.5	3.3	3.7	1.8	4.1
14	2.5	2.9	3.6	3.4	2.7	3.1	3.7	3.3	2.7	2.2	2.6	3.8	5.1	6.5	6.0	5.8	6.1	7.2	***	5.1	4.2	4.6	3.8	1.9	4.0
15	2.6	3.2	3.5	2.8	3.0	3.3	3.2	3.7	3.8	3.1	2.2	3.0	4.2	3.6	4.7	4.0	4.9	5.3	6.1	6.1	6.0	4.3	3.5	2.3	3.9
16	3.0	4.0	4.5	3.4	3.7	4.0	4.0	4.1	3.9	3.0	3.1	4.4	5.0	4.9	4.3	5.4	5.7	5.2	6.5	***	5.6	5.6	2.3	3.0	4.3
17	3.5	4.1	4.2	3.7	3.6	3.8	4.6	3.8	3.5	2.8	2.3	3.4	4.0	5.3	8.6	7.2	7.6	***	***	***	3.8	2.9	2.6	3.0	4.2
18	3.9	4.7	4.3	3.1	3.7	4.2	4.3	3.8	3.0	1.4	2.0	3.3	4.3	5.9	6.1	6.5	6.9	***	***	4.2	2.5	2.3	3.2	3.4	4.0
19	4.0	3.9	4.3	4.1	3.9	3.5	4.4	3.5	2.9	2.2	1.6	2.9	3.9	5.7	6.1	6.6	7.8	6.4	***	***	4.7	2.5	2.9	3.2	4.1
20	3.3	4.2	3.9	3.1	3.5	4.3	4.4	4.3	6.2	8.6	7.5	8.1	8.2	5.8	5.7	5.6	4.6	5.0	5.4	7.0	6.2	5.4	6.2	6.7	5.5
21	6.4	4.7	4.2	4.3	5.8	5.6	5.3	4.8	4.4	4.6	4.1	3.8	3.8	3.8	4.0	5.8	7.2	7.0	***	4.2	3.8	3.3	2.4	3.7	4.7
22	3.0	2.9	3.6	2.5	2.0	2.6	3.4	3.3	2.5	2.5	5.1	8.2	8.5	***	***	***	***	***	***	***	8.2	8.0	7.3	6.4	4.7
23	5.9	2.8	2.8	3.7	3.2	3.4	3.6	3.4	5.8	6.3	6.6	7.2	6.8	6.7	7.0	6.4	5.0	5.7	6.7	5.6	5.4	5.1	3.3	2.4	5.0
24	3.0	4.0	3.9	3.5	3.7	4.1	4.1	4.3	4.0	3.1	3.8	4.1	4.4	5.0	5.1	4.4	5.5	6.9	***	7.2	6.5	4.5	2.8	2.3	4.4
25	3.1	3.9	4.3	4.6	4.5	4.7	4.4	3.1	2.2	2.6	4.3	4.3	5.0	5.7	7.0	***	8.1	7.4	***	***	6.2	4.0	2.5	3.5	4.5
26	4.2	4.5	4.3	5.6	5.2	4.0	4.7	3.6	1.9	1.5	2.5	4.3	6.2	6.4	10.2	***	***	***	***	5.3	4.2	2.8	1.7	4.3	4.4
27	5.8	5.5	5.5	4.8	4.6	3.8	4.9	4.6	3.5	3.2	3.3	4.1	3.5	4.9	4.3	4.4	6.3	7.1	6.7	5.6	4.3	2.4	2.7	3.1	4.5
28	4.1	4.2	3.3	3.5	4.3	4.0	3.6	3.3	3.2	3.0	3.6	7.0	7.3	8.3	6.9	8.1	***	***	8.7	8.7	7.1	8.2	4.8	4.8	5.5
29	6.8	5.7	4.2	6.4	7.3	6.1	5.5	7.0	7.5	7.0	7.0	9.7	9.2	10.0	7.0	7.3	9.1	5.5	3.8	4.7	5.9	6.1	5.1	3.7	6.6
30	2.6	3.5	3.4	2.4	3.8	4.6	5.0	4.3	3.3	3.0	4.2	4.1	4.6	4.5	5.9	5.9	4.5	4.9	5.2	4.5	4.7	3.1	1.3	2.2	4.0
31	2.3	2.6	3.3	3.1	3.8	3.8	3.1	3.0	2.6	2.5	2.8	4.4	5.7	5.4	6.0	6.2	5.8	5.4	5.6	6.7	5.0	3.2	2.0	3.2	4.1
HRAVE	4.1	4.1	3.8	3.7	3.9	4.1	4.0	3.9	3.7	3.4	3.6	4.4	5.1	5.5	5.9	5.9	6.1	5.9	6.2	5.8	5.0	4.0	3.4	3.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.9	3.9	3.8	3.7	3.6	4.8	4.6	4.6	4.1	4.0	4.7	5.9	4.1	4.0	3.9	4.3	4.2	4.0	4.1	5.5	4.7	4.7	5.0	4.4	4.5
MAX	6.9	6.7	4.9	4.6	5.8	8.5	9.6	7.5	7.8	6.1	8.9	8.9	7.5	7.2	6.1	6.5	8.6	6.9	7.8	8.6	7.2	8.5	7.2	7.2	8.1
MIN	1.4	1.8	2.4	2.0	1.9	2.4	1.3	2.1	2.0	1.8	3.1	2.0	1.8	1.9	2.2	2.3	2.3	1.4	1.6	3.1	2.4	2.0	2.4	2.3	2.2

DAY	26	27	28	29	30	31
AVE	4.4	4.5	5.5	6.6	4.0	4.1
MAX	10.2	7.1	8.7	10.0	5.9	6.7
MIN	1.5	2.4	3.0	3.7	1.3	2.0

MONTHLY AVERAGE = 4.5 MONTHLY MAXIMUM = 10.2 MONTHLY MINIMUM = 1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.2% OPERATIONAL RECOVERY RATE = 94.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
MARCH - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	6.3	3.6	2.7	2.9	3.1	3.7	3.2	2.4	2.2	2.5	2.4	2.7	1.5	3.2	5.2	5.7	5.6	9.9	7.1	5.1	4.3	3.5	2.0	3.6	3.9
2	3.1	4.1	3.4	5.2	4.1	2.4	2.3	1.7	3.5	2.7	2.7	1.4	2.5	5.3	3.7	5.1	6.5	6.7	5.8	3.6	4.0	3.7	4.3	3.2	3.8
3	3.0	3.4	3.3	3.3	3.5	2.7	3.4	2.7	3.4	3.1	3.8	3.1	5.2	4.3	3.8	4.1	4.9	5.9	***	4.3	2.8	2.5	2.6	5.0	3.6
4	4.9	3.7	3.0	3.3	3.9	3.3	4.1	2.8	3.7	4.7	2.8	2.3	3.5	6.5	5.4	5.2	4.5	***	***	4.2	5.0	3.4	3.6	2.6	3.9
5	4.1	5.5	3.3	3.5	4.4	3.2	3.2	3.1	3.0	2.8	2.7	3.3	3.7	4.8	6.3	5.4	6.7	***	***	4.7	3.0	3.7	3.3	4.0	4.0
6	3.9	2.9	3.3	3.2	1.9	3.7	3.1	3.3	3.7	2.2	2.7	***	8.7	8.6	9.1	10.5	7.3	5.1	6.5	6.4	5.6	5.9	8.3	***	5.3
7	9.9	8.2	4.6	3.8	3.6	3.7	4.9	2.2	3.0	2.2	3.4	4.6	6.4	7.2	8.1	5.8	7.5	3.4	3.9	***	5.0	3.5	3.2	3.7	4.9
8	3.1	8.7	***	4.3	4.1	3.2	2.5	3.9	3.4	3.7	3.2	4.4	4.5	5.0	5.2	7.8	5.3	6.0	7.5	6.5	7.4	3.5	3.3	2.7	4.7
9	2.6	3.3	2.5	1.7	1.5	2.9	3.1	2.9	2.8	2.7	2.6	3.8	4.5	6.1	5.7	6.3	5.9	6.7	8.5	7.2	5.8	2.9	2.3	3.5	4.1
10	3.8	3.2	2.0	3.1	5.1	4.2	3.9	4.6	6.0	5.7	3.1	3.2	5.8	4.6	6.4	3.7	3.6	2.4	***	5.1	7.0	5.2	3.8	3.9	4.3
11	5.1	5.5	6.2	4.2	3.6	4.2	4.2	4.9	4.1	3.8	3.4	3.0	3.2	3.2	3.7	6.0	6.6	6.7	***	10.9	6.8	4.6	3.8	5.2	4.9
12	8.1	5.2	4.1	7.1	6.8	11.3	***	9.5	7.4	4.5	6.3	7.8	8.1	12.6	10.0	7.2	6.5	6.9	***	4.9	4.6	3.0	4.5	3.8	6.8
13	2.7	3.4	3.2	3.4	4.1	4.4	3.5	3.1	3.0	2.9	1.4	4.1	5.7	6.6	6.0	7.7	6.2	7.3	***	***	3.2	2.6	3.1	1.4	4.1
14	2.6	3.2	3.3	3.6	3.6	3.3	3.7	3.7	3.0	2.0	2.6	3.2	4.1	6.1	5.0	5.9	7.0	6.1	***	5.0	3.8	4.8	3.8	4.3	4.1
15	3.6	2.8	2.7	2.4	2.9	3.5	3.1	3.3	4.0	3.6	2.8	3.5	4.3	4.3	3.9	3.8	5.2	5.4	5.0	6.0	5.5	4.1	3.8	2.2	3.8
16	3.0	3.5	3.9	3.1	2.9	2.9	3.8	4.3	3.9	3.0	3.6	4.5	7.2	4.9	5.4	5.9	4.4	7.2	6.2	***	6.6	5.4	3.4	2.5	4.4
17	3.2	7.0	5.4	5.4	3.8	2.7	4.0	2.8	2.9	2.5	3.4	3.3	3.6	4.9	8.1	7.2	8.1	***	***	***	5.9	3.3	3.1	3.3	4.5
18	4.2	4.7	5.1	2.8	3.5	3.5	4.2	3.8	3.9	2.1	2.3	3.1	4.4	6.5	7.0	6.3	7.4	***	***	4.0	5.1	2.1	3.3	3.1	4.2
19	3.4	3.4	3.6	3.5	3.8	3.3	4.0	2.8	2.4	1.7	1.2	2.7	2.8	5.2	7.4	5.8	7.8	6.6	***	***	6.2	3.5	2.7	2.8	3.9
20	3.3	5.0	3.7	6.0	3.2	3.9	3.9	4.7	7.7	9.1	8.2	6.6	6.8	7.5	7.6	6.3	4.8	4.6	8.2	7.0	7.0	6.1	5.2	6.0	5.9
21	6.6	4.6	4.1	4.6	6.8	5.8	5.3	5.6	5.6	5.2	2.9	3.8	5.9	5.3	6.2	4.8	7.8	6.3	***	3.7	3.5	2.9	3.4	3.4	5.0
22	2.8	2.3	2.4	2.0	1.3	2.1	3.2	2.6	2.0	3.8	6.2	8.9	9.6	***	***	***	***	***	***	***	8.7	8.5	7.5	6.9	4.8
23	5.7	4.4	3.7	4.8	4.5	4.5	4.0	3.5	5.8	6.0	6.4	7.0	7.2	5.6	6.5	6.0	7.2	5.9	5.8	6.4	6.2	4.7	3.5	3.4	5.4
24	3.1	4.8	4.4	3.3	4.0	5.1	4.0	3.5	4.0	4.1	5.0	3.0	3.7	5.8	5.6	3.5	10.1	10.9	***	7.4	9.2	4.4	2.4	2.3	4.9
25	2.4	3.4	4.2	4.7	3.9	4.3	4.2	2.3	3.7	2.4	4.0	4.1	5.3	5.8	8.3	***	7.9	5.2	***	***	5.7	4.3	4.3	4.7	4.5
26	4.3	4.1	4.4	5.4	4.9	4.0	5.3	3.5	2.8	1.8	3.1	5.0	7.8	9.0	11.8	***	***	***	***	6.4	4.6	3.2	2.0	4.5	4.9
27	6.8	4.7	6.0	5.4	5.5	3.8	6.6	4.6	3.0	3.9	3.1	2.5	4.0	2.9	4.5	5.6	5.5	8.8	6.6	6.6	5.4	3.8	2.8	2.3	4.8
28	3.5	3.5	2.8	2.8	4.3	4.0	3.7	3.0	3.1	3.9	3.3	10.4	8.9	7.2	7.3	8.8	***	***	10.3	9.3	8.5	7.8	4.6	4.8	5.7
29	6.2	6.1	4.7	7.0	7.9	7.2	6.8	7.0	8.5	7.5	6.9	9.0	7.8	8.6	8.1	7.6	8.8	6.2	2.8	5.7	6.3	6.0	5.5	4.3	6.8
30	2.7	4.3	3.5	2.7	3.9	5.5	5.2	3.9	3.5	3.7	3.8	3.8	5.3	4.8	7.3	6.0	4.3	5.1	5.5	4.8	4.5	3.4	1.6	2.7	4.2
31	2.0	2.1	3.3	2.9	3.4	3.2	2.5	2.1	2.0	2.0	2.3	5.5	7.2	6.1	3.9	5.2	6.7	5.2	6.4	6.4	5.0	4.5	0.9	2.5	3.9
HRAVE	4.2	4.3	3.8	3.9	4.0	4.0	4.0	3.7	3.9	3.6	3.6	4.5	5.5	5.9	6.4	6.1	6.4	6.3	6.4	5.9	5.5	4.2	3.6	3.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.9	3.8	3.6	3.9	4.0	5.3	4.9	4.7	4.1	4.3	4.9	6.8	4.1	4.1	3.8	4.4	4.5	4.2	3.9	5.9	5.0	4.8	5.4	4.9	4.5
MAX	9.9	6.7	5.9	6.5	6.7	10.5	9.9	8.7	8.5	7.0	10.9	12.6	7.7	7.0	6.0	7.2	8.1	7.4	7.8	9.1	7.8	9.6	7.2	10.9	8.3
MIN	1.5	1.4	2.5	2.3	2.7	1.9	2.2	2.5	1.5	2.0	3.0	3.0	1.4	2.0	2.2	2.5	2.5	2.1	1.2	3.2	2.9	1.3	3.4	2.3	2.3

DAY	26	27	28	29	30	31
AVE	4.9	4.8	5.7	6.8	4.2	3.9
MAX	11.8	8.8	10.4	9.0	7.3	7.2
MIN	1.8	2.3	2.8	2.8	1.6	0.9

MONTHLY AVERAGE = 4.6 MONTHLY MAXIMUM = 12.6 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.4% OPERATIONAL RECOVERY RATE = 94.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
MARCH - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	6.7	3.7	5.4	3.9	3.8	2.5	4.3	2.5	2.4	2.5	3.0	3.7	3.2	4.0	***	6.2	6.9	***	***	4.7	***	4.7	2.4	5.4	4.1
2	3.4	5.1	***	6.4	3.2	3.3	3.2	2.3	5.2	3.4	3.6	4.6	3.1	4.9	***	***	***	***	***	***	3.8	4.1	4.4	3.3	4.0
3	3.1	4.7	4.7	3.5	3.4	2.6	7.3	3.2	7.1	3.2	3.8	3.6	6.5	5.2	***	***	***	***	***	***	***	***	2.8	6.3	4.4
4	8.8	5.2	4.4	4.5	4.1	3.2	4.4	***	***	4.9	3.0	4.4	3.9	6.0	5.3	6.5	***	***	***	***	***	6.2	***	***	5.0
5	***	7.9	2.8	3.1	4.1	3.6	4.3	4.1	3.3	3.0	3.4	***	***	5.3	***	5.2	***	***	***	4.9	***	4.0	3.2	3.8	4.1
6	3.5	***	***	4.1	***	3.6	4.1	***	4.7	2.2	***	***	9.6	***	8.4	11.0	***	4.9	***	7.2	5.1	5.8	10.0	***	6.0
7	***	8.1	***	3.8	3.8	4.3	7.4	2.0	3.0	2.2	3.2	4.2	4.7	***	***	***	***	***	***	***	***	***	3.4	3.6	4.1
8	3.1	***	***	***	***	***	1.8	***	4.1	2.6	3.1	4.2	***	5.2	4.0	7.3	4.6	5.2	***	***	***	3.3	3.4	3.7	4.0
9	3.2	3.8	2.2	1.3	1.4	7.3	4.4	3.2	3.2	3.5	2.8	5.2	4.3	9.2	7.2	***	***	7.2	***	***	***	3.0	2.1	3.5	4.1
10	4.9	4.9	4.1	2.9	6.1	4.7	4.1	5.0	7.6	6.4	3.2	3.6	7.9	***	7.8	***	***	***	***	***	***	6.2	4.6	3.3	5.1
11	5.8	8.5	6.7	6.2	4.2	4.8	4.7	5.6	4.0	3.7	3.6	***	***	3.5	***	***	***	***	***	10.5	***	***	3.5	6.1	5.4
12	***	***	***	7.2	***	***	***	***	10.2	3.4	7.5	8.6	***	12.0	***	***	***	***	***	***	***	***	5.0	4.4	7.3
13	3.3	3.6	***	***	4.4	5.5	4.0	3.2	2.7	2.7	4.3	4.5	6.1	11.1	7.3	***	***	***	***	***	***	***	***	1.8	4.6
14	3.3	5.1	3.4	4.6	3.2	3.6	3.6	4.9	3.4	2.6	3.5	5.0	5.3	8.2	4.3	7.3	***	***	***	***	***	***	5.5	4.0	4.5
15	3.5	2.2	2.3	3.9	4.1	3.7	3.2	3.8	4.5	4.4	2.1	3.8	***	4.8	4.2	3.1	***	***	***	6.9	***	***	4.3	***	3.8
16	4.6	4.2	3.4	4.2	3.3	3.7	5.6	4.5	4.4	3.8	5.0	5.3	***	6.6	9.8	***	***	***	***	***	***	***	***	***	4.9
17	***	9.5	6.0	6.6	4.5	4.6	4.9	2.4	3.6	3.0	3.7	3.3	3.6	4.1	***	9.0	9.9	***	***	***	8.1	3.0	***	3.8	5.2
18	***	5.1	6.4	3.4	3.6	4.0	4.0	5.3	5.3	3.9	4.1	3.4	***	***	***	***	***	***	***	***	7.4	***	2.6	4.2	4.5
19	3.3	5.3	3.5	3.5	4.0	4.2	5.6	3.7	5.1	2.6	3.7	3.2	***	***	8.0	***	***	***	***	***	***	***	***	***	4.3
20	3.7	***	***	8.5	3.2	3.4	5.0	5.1	8.4	***	8.3	***	***	7.3	***	***	***	***	11.3	***	***	***	***	6.2	6.4
21	7.9	4.4	***	4.4	7.3	9.7	6.4	6.6	6.0	5.4	3.1	3.9	5.7	4.3	5.6	5.4	***	***	***	***	***	4.4	3.5	2.5	5.4
22	2.3	2.6	1.9	2.7	1.5	4.0	5.5	2.8	3.0	4.0	8.8	***	***	***	***	***	***	***	***	***	***	8.3	***	6.6	4.2
23	6.2	4.3	3.9	4.7	6.8	7.5	***	***	***	6.5	***	***	***	***	***	***	9.3	***	***	***	***	***	4.9	3.2	5.7
24	2.9	4.8	4.2	3.3	5.5	***	***	***	5.4	5.6	4.3	***	4.9	7.0	6.1	5.1	***	***	***	***	***	4.8	3.4	4.2	4.8
25	2.4	***	3.6	***	***	4.8	4.1	2.6	4.1	3.6	5.6	3.7	***	***	***	***	***	***	***	***	***	4.2	4.6	5.6	4.1
26	5.9	5.6	5.2	8.0	5.7	4.3	5.0	1.5	3.9	1.4	4.6	***	***	***	***	***	***	***	***	8.9	4.8	3.8	1.8	***	4.7
27	***	***	8.1	8.1	6.8	2.6	6.8	5.6	5.8	4.1	3.5	2.2	5.7	4.7	5.2	***	***	***	***	***	***	3.5	2.5	3.2	4.9
28	4.5	3.3	3.1	3.3	6.0	4.2	2.4	3.5	3.2	4.1	3.2	10.9	8.4	***	***	8.7	***	***	***	***	***	***	4.6	4.2	4.9
29	4.9	6.4	4.9	5.8	8.5	7.4	5.8	7.5	9.6	***	***	8.8	8.1	10.4	***	7.6	6.6	6.4	3.5	***	***	***	5.8	4.3	6.8
30	***	***	***	3.2	***	5.6	***	***	4.6	3.3	4.8	3.7	4.4	5.2	10.4	5.7	4.7	***	***	***	***	5.8	***	3.1	5.0
31	1.6	2.4	5.8	5.6	3.8	2.9	1.9	2.2	3.2	3.5	2.8	***	9.8	6.0	4.3	7.7	***	5.3	***	***	5.3	4.9	1.8	3.7	4.2
HRAVE	4.3	5.0	4.4	4.7	4.5	4.5	4.6	3.9	4.9	3.6	4.1	4.7	5.9	6.4	6.5	6.8	7.0	5.8	7.4	7.2	5.7	4.7	3.9	4.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.1	4.0	4.4	5.0	4.1	6.0	4.1	4.0	4.1	5.1	5.4	7.3	4.6	4.5	3.8	4.9	5.2	4.5	4.3	6.4	5.4	4.2	5.7	4.8	4.1
MAX	6.9	6.4	7.3	8.8	7.9	11.0	8.1	7.3	9.2	7.9	10.5	12.0	11.1	8.2	6.9	9.8	9.9	7.4	8.0	11.3	9.7	8.8	9.3	7.0	5.6
MIN	2.4	2.3	2.6	3.0	2.8	2.2	2.0	1.8	1.3	2.9	3.5	3.4	1.8	2.6	2.1	3.3	2.4	2.6	2.6	3.2	2.5	1.5	3.2	2.9	2.4

DAY	26	27	28	29	30	31
AVE	4.7	4.9	4.9	6.8	5.0	4.2
MAX	8.9	8.1	10.9	10.4	10.4	9.8
MIN	1.4	2.2	2.4	3.5	3.1	1.6

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 12.0 MONTHLY MINIMUM = 1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 63.0% OPERATIONAL RECOVERY RATE = 63.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
MARCH - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	107	111	113	140	121	138	151	142	92	98	104	131	256	156	283	281	290	289	280	285	287	269	156	105	98
2	100	107	112	129	133	130	113	126	121	111	122	258	295	316	284	279	278	277	273	280	302	85	107	96	236
3	105	105	102	120	134	123	144	146	121	96	89	84	89	3	292	345	293	282	***	286	288	61	83	97	314
4	106	113	95	108	113	136	121	113	107	123	92	94	133	97	44	315	269	***	***	283	315	75	96	102	202
5	102	101	91	79	89	75	80	96	110	87	85	121	221	265	281	272	284	***	***	267	209	292	327	125	270
6	141	121	86	93	82	91	102	92	84	81	273	***	286	264	248	263	281	295	272	272	269	268	255	***	29
7	261	254	291	307	290	310	253	339	354	316	300	271	270	278	274	283	282	265	263	***	276	279	267	296	247
8	162	255	***	279	302	273	291	285	263	257	267	274	278	282	275	282	280	279	283	289	289	282	314	157	139
9	114	97	95	79	89	105	108	113	114	182	298	271	269	269	277	270	268	279	275	287	289	273	130	102	190
10	96	47	16	91	125	121	122	141	151	155	159	111	199	272	353	62	129	165	***	299	290	9	86	93	343
11	78	103	139	113	92	104	110	118	109	90	94	111	103	84	88	***	249	255	***	281	288	288	319	275	39
12	278	260	207	259	271	265	***	279	276	284	298	273	277	273	280	276	277	277	***	279	279	288	312	49	274
13	107	112	106	107	122	141	127	123	99	84	205	163	245	275	284	277	284	286	***	***	180	17	70	98	72
14	107	108	106	108	95	96	107	103	95	92	101	323	283	281	279	273	282	289	***	291	287	281	287	239	212
15	135	108	104	86	80	95	87	90	99	93	245	39	68	90	172	196	224	282	283	289	289	287	285	54	100
16	103	105	113	97	131	141	149	150	127	119	91	80	19	85	258	270	264	272	285	***	292	8	324	96	339
17	101	106	108	115	114	122	150	131	102	88	105	202	270	291	292	282	282	***	***	***	279	290	338	108	218
18	128	122	119	97	106	108	115	141	121	25	107	237	277	281	280	275	279	***	***	267	270	332	98	106	242
19	109	127	136	111	104	100	140	136	145	138	321	298	265	277	281	270	273	273	***	***	284	226	110	93	259
20	99	109	110	106	103	116	112	96	85	88	86	89	88	85	72	71	10	30	24	44	26	51	58	65	337
21	74	87	97	99	75	75	87	94	83	78	79	83	84	105	286	291	283	283	***	287	282	277	132	152	170
22	153	167	116	93	90	150	161	157	123	179	274	254	263	***	***	***	***	***	***	***	280	276	274	280	33
23	279	330	280	304	315	281	276	285	285	283	276	276	273	264	262	273	275	279	272	272	286	285	340	358	303
24	83	91	97	84	82	101	117	129	135	143	84	89	17	153	220	270	274	275	***	284	287	293	261	132	326
25	111	119	114	106	107	114	149	129	130	163	198	265	274	271	274	***	277	281	***	***	281	303	88	162	133
26	151	148	139	155	131	140	135	115	97	39	309	272	282	269	280	***	***	***	***	288	78	280	19	83	309
27	68	72	73	75	102	85	80	119	123	87	90	88	32	296	305	301	258	276	287	294	286	204	170	155	115
28	161	151	101	98	109	109	107	91	90	100	139	193	201	242	243	251	***	***	257	254	258	253	260	255	298
29	262	269	271	199	201	201	230	288	289	272	264	296	295	292	293	278	279	286	296	280	281	277	275	275	119
30	268	278	324	315	287	279	283	284	287	264	199	312	356	281	253	259	272	275	273	286	291	302	329	89	320
31	79	84	92	98	104	110	112	105	93	99	184	277	262	273	261	268	279	280	275	278	281	285	225	153	29

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.2% OPERATIONAL RECOVERY RATE = 94.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
MARCH - 2016

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	83	121	109	115	129	136	109	114	94	84	90	121	217	78	332	268	265	287	286	293	308	284	326	89	292
2	86	107	111	134	134	122	144	158	167	112	132	220	209	298	285	265	274	275	271	262	98	66	104	86	14
3	90	103	107	144	150	131	149	163	98	84	76	85	88	14	297	345	270	285	***	282	269	57	84	98	188
4	121	120	86	135	133	164	107	100	105	102	85	110	95	103	53	312	258	***	***	273	258	42	96	106	285
5	120	95	85	79	68	79	95	108	121	92	88	107	189	264	286	273	279	***	***	132	113	282	56	80	207
6	175	121	89	110	95	107	112	89	90	80	263	***	294	254	244	251	289	297	273	256	267	262	250	***	161
7	257	259	273	269	320	285	271	341	339	312	297	274	266	270	278	299	287	277	267	***	290	279	252	325	284
8	148	252	***	279	301	1	326	306	266	272	268	265	278	269	263	280	273	281	282	285	285	286	303	207	292
9	123	94	98	65	66	100	116	111	113	219	283	270	315	280	282	278	267	281	283	285	291	288	141	101	125
10	79	45	356	87	122	123	130	135	155	156	137	118	207	273	356	65	105	119	***	316	307	8	95	100	54
11	67	98	155	143	96	98	100	90	93	85	95	111	113	139	72	235	248	248	***	289	289	300	336	266	37
12	276	259	196	228	284	265	***	279	290	274	289	281	276	248	258	290	284	264	***	275	276	259	328	293	225
13	153	144	112	107	140	133	102	88	81	89	282	156	253	285	309	282	288	298	***	***	26	326	68	57	200
14	105	84	106	133	121	107	123	116	100	111	124	316	333	290	281	270	283	283	***	292	287	234	279	273	205
15	132	124	119	95	81	89	86	90	85	84	60	30	52	88	173	203	229	287	286	281	285	281	304	351	35
16	130	103	112	98	119	150	152	106	86	78	73	83	18	80	266	260	272	258	284	***	294	352	248	98	67
17	92	94	110	98	99	143	151	150	91	102	100	199	246	276	293	284	274	***	***	***	280	314	333	110	90
18	123	111	91	99	110	108	126	147	120	12	184	292	284	282	285	294	278	***	***	268	267	55	88	107	327
19	109	142	130	110	102	107	135	120	124	131	88	191	301	321	283	274	264	270	***	***	302	312	133	95	154
20	98	112	123	124	101	111	106	79	72	81	90	87	87	87	72	67	28	22	59	52	38	58	82	64	62
21	74	87	94	91	75	77	75	76	69	75	89	73	71	128	297	258	283	281	***	257	289	272	150	149	183
22	168	191	125	110	97	149	166	172	171	187	264	254	264	***	***	***	***	***	***	***	280	262	271	276	355
23	283	328	281	293	299	286	286	289	290	286	289	268	275	264	272	270	271	270	270	269	278	281	350	33	135
24	92	90	90	81	94	98	116	121	149	153	74	113	38	107	215	268	259	270	***	298	274	313	172	140	294
25	123	121	134	107	106	150	152	154	75	132	165	262	298	279	282	***	275	274	***	***	281	290	224	152	177
26	155	139	150	159	146	124	151	145	97	355	323	286	282	273	297	***	***	***	***	300	100	317	306	91	28
27	71	72	70	73	99	92	72	106	98	99	180	50	45	341	332	351	263	267	289	298	277	166	168	134	40
28	158	167	117	114	115	112	139	92	102	111	154	196	194	236	232	228	***	***	262	259	246	254	275	282	283
29	242	263	265	203	207	200	202	256	282	266	251	287	292	287	309	280	276	269	329	273	278	281	281	279	35
30	263	269	303	280	280	271	283	301	317	260	200	289	11	123	254	241	278	283	273	289	300	300	25	34	47
31	56	81	94	90	103	116	117	93	84	150	227	276	268	279	263	263	289	283	275	282	278	288	226	160	137

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.4% OPERATIONAL RECOVERY RATE = 94.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
MARCH - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	52	105	119	120	125	152	170	115	71	88	101	135	183	116	***	262	281	***	***	276	***	310	341	73	243
2	87	110	***	120	132	45	184	254	201	116	100	178	221	309	***	***	***	***	***	***	94	78	105	83	253
3	84	107	109	104	140	123	140	159	120	90	75	89	104	141	***	***	***	***	***	***	***	***	89	102	291
4	110	104	73	131	134	152	104	***	***	102	40	103	164	96	65	334	***	***	***	***	***	30	***	***	311
5	***	104	77	100	54	83	107	114	121	101	113	***	***	266	***	277	***	***	***	114	***	293	65	29	223
6	170	***	***	96	***	109	116	***	93	68	***	***	295	***	258	255	***	290	***	259	279	260	245	***	256
7	***	254	***	269	325	287	279	338	333	0	344	273	298	***	***	***	***	***	***	***	***	***	261	301	55
8	148	***	***	***	***	***	333	***	259	229	264	269	***	275	263	270	274	288	***	***	***	289	303	179	160
9	103	104	84	84	142	121	100	114	104	172	283	263	313	279	288	***	***	309	***	***	***	299	125	102	312
10	74	22	9	74	122	124	129	126	137	152	120	111	221	***	5	***	***	***	***	***	***	350	99	100	95
11	63	114	154	134	113	99	123	82	94	72	165	***	***	138	***	***	***	***	***	285	***	***	36	298	295
12	***	***	***	222	***	***	***	***	292	249	290	279	***	247	***	***	***	***	***	***	***	***	314	257	297
13	151	178	***	***	132	136	57	86	81	72	270	180	218	271	311	***	***	***	***	***	***	***	***	53	149
14	107	80	104	165	113	109	122	126	106	85	115	329	320	291	279	270	***	***	***	***	***	***	274	251	294
15	122	92	129	81	79	87	87	90	83	91	35	35	***	91	101	216	***	***	***	279	***	***	324	***	12
16	184	122	95	75	123	142	160	102	92	105	79	93	***	92	290	***	***	***	***	***	***	***	***	***	16
17	***	110	103	101	99	134	154	148	89	121	100	161	221	279	***	298	276	***	***	***	264	324	***	118	322
18	***	99	86	103	121	115	125	150	109	70	182	302	***	***	***	***	***	***	***	***	349	***	117	112	127
19	99	125	124	150	104	104	117	115	94	133	73	160	***	***	284	***	***	***	***	***	***	***	***	***	63
20	102	***	***	117	97	106	99	72	73	***	100	***	***	98	***	***	***	***	95	***	***	***	***	69	78
21	66	87	***	90	75	68	75	83	75	75	94	78	77	148	295	270	***	***	***	***	***	273	146	165	180
22	157	188	118	96	86	151	171	175	155	186	282	***	***	***	***	***	***	***	***	***	***	259	***	280	121
23	282	314	292	322	306	290	***	***	***	284	***	***	***	***	***	***	266	***	***	***	***	***	35	73	261
24	93	93	96	80	106	***	***	***	143	133	81	***	46	84	147	260	***	***	***	***	***	323	197	118	5
25	129	***	138	***	***	182	151	143	73	131	174	264	***	***	***	***	***	***	***	***	***	299	215	145	129
26	138	132	148	152	148	125	153	90	76	57	329	***	***	***	***	***	***	***	***	286	50	320	300	***	226
27	***	***	65	69	86	148	72	108	116	103	302	129	47	294	318	***	***	***	***	***	***	149	191	130	9
28	150	167	125	114	95	123	118	85	86	103	160	190	201	***	***	205	***	***	***	***	***	***	271	284	8
29	234	258	270	211	198	206	197	257	287	***	***	288	294	306	***	277	283	267	348	***	***	***	272	282	69
30	***	***	***	272	***	271	***	***	314	246	193	289	4	117	272	199	264	***	***	***	***	257	***	52	187
31	133	294	89	70	107	110	87	92	44	157	222	***	273	283	241	270	***	299	***	***	276	286	229	127	217

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 63.0% OPERATIONAL RECOVERY RATE = 63.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.33	0.43	0.32	0.25	0.26	0.31	0.16	0.12	0.19	0.27	0.70	0.90	0.84	1.00	1.02	1.17	0.77	0.52	***	0.44	0.47	0.48	0.40	0.34	0.51
2	0.26	0.43	0.46	0.32	0.31	0.12	0.08	0.07	0.26	0.33	0.81	0.67	0.82	0.90	0.97	0.99	0.92	0.88	0.37	0.60	0.65	0.32	0.41	0.45	0.52
3	0.47	0.15	0.28	0.22	0.23	0.20	0.28	0.26	0.22	0.20	0.41	0.61	0.88	0.92	1.26	1.21	1.13	1.03	***	0.56	0.65	0.52	0.40	0.57	0.55
4	0.48	0.47	0.23	0.12	0.13	0.46	0.49	0.56	0.35	0.35	0.54	0.85	1.03	1.17	0.88	1.13	1.07	***	***	0.54	0.39	0.47	0.49	0.44	0.57
5	0.44	0.73	0.52	0.38	0.35	0.25	0.16	0.38	0.16	0.24	0.74	0.75	0.92	0.98	0.87	0.78	0.85	***	***	0.63	0.50	0.36	0.45	0.54	0.54
6	0.54	0.50	0.54	0.54	0.37	0.41	0.41	0.52	0.40	0.55	0.74	***	1.10	0.92	0.91	0.68	1.00	0.82	0.78	0.64	0.67	0.67	0.78	***	0.66
7	***	0.68	0.65	0.54	0.41	0.49	0.27	0.19	0.32	0.28	0.84	0.93	1.12	0.87	1.07	0.92	0.92	0.70	0.63	***	0.71	0.37	0.56	0.56	0.64
8	0.68	0.82	***	***	0.34	0.69	0.21	0.31	0.49	0.92	0.80	0.91	0.92	0.78	0.83	1.08	0.81	0.76	***	0.84	0.43	0.48	0.53	0.42	0.67
9	0.43	0.28	0.24	0.31	0.29	0.08	0.07	0.14	0.37	0.50	0.42	0.56	0.93	1.10	1.20	1.02	0.83	0.98	0.90	0.71	0.56	0.51	0.45	0.36	0.55
10	0.40	0.40	0.29	0.36	0.31	0.30	0.31	0.35	0.45	0.58	0.80	0.81	1.26	1.22	1.14	1.18	0.99	0.89	***	0.70	0.99	0.58	0.48	0.43	0.66
11	0.47	0.40	0.30	0.39	0.38	0.27	0.49	0.43	0.24	0.65	0.62	0.84	0.86	0.92	1.00	***	1.06	***	***	0.84	0.82	1.03	0.96	0.72	0.65
12	0.50	0.72	0.72	0.87	0.59	0.52	***	0.67	0.67	0.89	1.00	1.18	1.13	0.88	0.92	0.92	1.05	0.67	***	0.44	0.20	0.51	0.40	0.32	0.72
13	0.22	0.15	0.41	0.17	0.14	0.21	0.36	0.26	0.27	0.52	0.80	1.02	0.91	0.98	0.95	0.82	0.86	0.76	***	***	***	0.42	0.75	0.72	0.56
14	0.24	0.46	0.30	0.19	0.18	0.30	0.27	0.07	0.26	0.48	0.79	0.97	1.11	0.94	0.99	0.90	0.86	0.85	***	0.40	0.53	0.79	0.30	0.43	0.55
15	0.31	0.29	0.22	0.31	0.20	0.33	0.23	0.23	0.21	0.39	0.55	0.94	0.94	1.02	1.14	0.94	1.07	0.91	0.62	0.20	0.60	***	0.78	0.46	0.56
16	0.28	0.26	0.43	0.25	0.31	0.37	0.37	0.32	0.33	0.68	0.56	0.90	0.92	1.30	1.18	1.08	1.06	1.02	0.97	***	0.55	***	0.67	0.36	0.64
17	0.29	0.36	0.30	0.39	0.30	0.24	0.33	0.23	0.28	0.64	0.83	1.01	0.86	0.91	0.93	1.09	1.13	***	***	***	0.71	0.66	0.62	0.35	0.59
18	0.44	0.47	0.56	0.52	0.21	0.23	0.28	0.28	0.33	0.48	0.80	1.03	0.94	1.03	1.06	1.06	0.87	***	***	0.53	0.37	0.47	0.39	0.31	0.58
19	0.35	0.35	0.29	0.20	0.41	0.21	0.22	0.20	0.10	0.32	0.48	0.93	1.09	1.21	1.01	0.99	1.00	0.74	***	***	0.68	0.67	0.36	0.46	0.56
20	0.46	0.34	0.09	0.30	0.22	0.26	0.31	0.37	0.86	1.07	1.12	1.04	1.11	0.91	1.29	1.12	1.12	1.02	0.79	0.63	0.54	0.67	0.76	0.59	0.71
21	0.51	0.37	0.31	0.35	0.40	0.37	0.36	0.26	0.32	0.64	0.74	1.00	1.06	0.82	0.94	1.27	1.10	1.07	***	0.48	0.32	0.46	0.46	0.46	0.61
22	0.38	0.40	0.31	0.30	0.32	0.33	0.22	0.24	0.32	0.51	0.93	0.89	1.07	***	***	***	***	***	***	***	0.79	0.63	0.53	0.70	0.52
23	0.49	0.48	0.17	0.26	0.35	0.21	0.33	0.66	0.50	0.78	0.88	1.04	1.16	0.93	0.77	1.19	1.06	0.81	1.14	0.70	0.51	1.00	0.66	0.34	0.68
24	0.48	0.64	0.57	0.52	0.51	0.43	0.24	0.23	0.45	0.71	0.86	1.09	1.12	1.18	1.13	1.30	1.17	1.13	***	0.64	0.54	0.51	0.44	0.38	0.71
25	0.33	0.47	0.46	0.39	0.23	0.30	0.31	0.18	0.49	0.71	0.89	1.13	1.11	1.21	1.09	***	0.86	0.92	***	***	0.76	0.83	0.58	0.48	0.65
26	0.51	0.45	0.55	0.47	0.42	0.30	0.31	0.41	0.25	0.40	0.60	0.82	0.98	0.84	0.88	***	***	***	***	0.49	0.57	0.52	0.42	0.70	0.54
27	0.71	0.81	0.67	0.67	0.31	0.35	0.44	0.47	0.38	0.61	0.94	0.91	1.04	1.24	1.35	1.20	1.23	0.71	0.88	0.44	0.58	0.76	0.65	0.39	0.74
28	0.42	0.35	0.29	0.48	0.37	0.29	0.22	0.25	0.46	0.56	0.79	1.05	0.75	0.84	0.81	1.08	***	***	0.69	0.80	0.87	0.77	0.50	0.56	0.60
29	0.77	0.48	0.41	0.80	0.78	0.49	0.48	0.60	0.93	0.78	0.92	***	1.09	1.16	0.88	0.92	0.85	0.91	0.63	0.66	0.56	0.50	0.39	0.30	0.71
30	0.50	0.37	0.47	0.50	0.47	0.66	0.54	0.54	0.73	0.94	1.03	0.99	1.01	0.99	0.94	0.98	1.02	0.81	0.77	***	0.47	0.58	0.33	0.07	0.68
31	0.22	0.14	0.30	0.23	0.33	0.24	0.12	0.02	0.31	0.51	1.02	1.15	0.93	0.74	1.14	1.04	1.21	1.09	0.62	0.63	0.29	0.50	0.42	0.40	0.57
HRAVE	0.43	0.44	0.39	0.39	0.34	0.33	0.30	0.32	0.38	0.56	0.77	0.93	1.00	1.00	1.02	1.04	1.00	0.87	0.75	0.59	0.58	0.59	0.53	0.45	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.51	0.52	0.55	0.57	0.54	0.66	0.64	0.67	0.55	0.66	0.65	0.72	0.56	0.55	0.56	0.64	0.59	0.58	0.56	0.71	0.61	0.52	0.68	0.71	0.65
MAX	1.17	0.99	1.26	1.17	0.98	1.10	1.12	1.08	1.20	1.26	1.06	1.18	1.02	1.11	1.14	1.30	1.13	1.06	1.21	1.29	1.27	1.07	1.19	1.30	1.21
MIN	0.12	0.07	0.15	0.12	0.16	0.37	0.19	0.21	0.07	0.29	0.24	0.20	0.14	0.07	0.20	0.25	0.23	0.21	0.10	0.09	0.26	0.22	0.17	0.23	0.18

DAY	26	27	28	29	30	31
AVE	0.54	0.74	0.60	0.71	0.68	0.57
MAX	0.98	1.35	1.08	1.16	1.03	1.21
MIN	0.25	0.31	0.22	0.30	0.07	0.02

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 92.9% OPERATIONAL RECOVERY RATE = 92.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.36	0.49	0.22	0.16	0.33	0.30	0.16	0.21	0.46	0.19	0.30	0.72	0.88	1.04	1.10	1.14	0.68	***	***	0.43	0.51	0.48	0.46	0.43	0.50
2	0.39	0.41	0.35	0.38	0.70	0.20	0.18	0.12	0.32	0.48	0.58	0.55	0.69	1.10	1.04	0.84	0.97	***	***	0.81	0.75	0.31	0.41	0.43	0.55
3	0.45	0.22	0.37	0.32	0.58	0.62	0.30	0.24	0.49	0.36	0.39	0.47	0.82	0.87	1.24	1.12	0.77	0.99	***	0.55	0.72	0.56	0.39	0.70	0.59
4	0.43	0.47	0.48	0.15	0.36	0.46	0.54	0.52	0.51	0.44	0.55	0.80	0.99	***	0.84	1.03	***	***	***	***	0.39	0.45	0.53	0.45	0.55
5	0.44	0.76	0.59	0.61	0.63	0.35	0.21	0.33	0.31	0.29	0.81	0.86	0.98	0.93	1.06	0.73	0.58	***	***	0.69	0.72	0.66	0.61	0.70	0.63
6	0.55	0.58	0.62	0.41	0.50	0.41	0.43	0.45	0.39	0.46	0.82	***	0.93	0.90	1.06	0.79	0.85	0.75	***	***	0.83	0.72	0.69	***	0.66
7	***	0.54	0.67	0.51	0.48	0.50	0.29	0.21	0.39	0.40	0.86	0.97	1.09	0.68	0.87	0.90	0.92	***	0.60	***	***	0.37	0.50	0.59	0.62
8	0.61	0.75	***	***	***	0.81	0.28	0.36	0.81	0.90	0.76	0.68	1.05	0.81	0.92	1.07	0.79	0.75	***	***	0.43	0.52	0.65	0.75	0.72
9	0.39	0.48	0.45	0.39	0.18	0.28	0.05	0.04	0.59	0.46	0.31	0.66	0.79	0.84	1.12	1.00	0.88	0.91	***	0.51	0.65	0.51	0.56	0.36	0.54
10	0.56	0.74	0.65	0.52	0.22	0.32	0.50	0.29	0.55	0.32	0.50	0.79	1.27	1.23	1.11	1.14	***	***	***	***	1.05	0.58	0.59	0.38	0.67
11	0.58	0.41	0.42	0.37	0.44	0.36	0.72	0.76	0.22	0.55	0.61	0.66	0.98	***	***	***	0.68	***	***	***	0.83	1.08	1.06	0.84	0.64
12	0.44	0.47	0.86	0.59	0.58	0.51	***	***	0.87	0.88	1.10	1.13	1.31	0.93	0.99	0.94	1.02	***	***	***	0.32	0.54	0.47	0.54	0.76
13	0.34	0.46	0.48	0.11	0.13	0.11	0.21	0.34	0.46	0.46	0.66	0.96	0.83	0.85	0.79	0.83	0.81	0.71	***	***	0.29	0.47	0.67	0.59	0.53
14	0.38	0.38	0.29	0.31	0.26	0.17	0.11	0.43	0.55	0.25	0.72	1.08	0.97	0.96	0.94	0.88	0.87	***	***	***	0.79	0.73	0.54	0.62	0.58
15	0.71	0.46	0.40	0.41	0.47	0.38	0.53	0.68	0.37	0.34	0.51	0.97	1.13	1.06	1.09	1.00	1.16	1.21	***	***	***	***	0.60	0.55	0.70
16	0.29	0.23	0.43	0.40	0.31	0.41	0.40	0.56	0.54	0.46	0.41	0.92	0.88	***	1.36	1.09	1.05	1.45	***	***	***	***	0.40	0.37	0.63
17	0.40	0.25	0.38	0.81	0.58	0.60	0.29	0.27	0.61	0.66	0.72	1.14	0.82	0.76	***	***	1.04	***	***	***	***	0.72	0.57	0.32	0.61
18	0.45	0.61	0.76	0.62	0.41	0.63	0.47	0.27	0.31	0.41	0.76	1.02	0.85	0.98	1.30	0.81	1.13	***	***	0.68	0.53	0.49	0.44	0.25	0.64
19	0.32	0.44	0.19	0.32	0.49	0.27	0.37	0.73	0.51	0.35	0.60	0.78	0.99	1.12	0.95	0.86	0.96	0.90	***	***	***	0.75	0.43	0.53	0.61
20	0.27	0.28	0.15	0.84	0.62	0.61	0.49	0.85	0.76	***	1.03	0.92	1.08	0.87	1.14	1.15	0.99	1.06	0.77	0.59	0.59	0.66	0.80	0.60	0.74
21	0.36	0.30	0.25	0.23	0.42	0.50	0.59	0.41	0.42	0.82	0.76	1.11	1.04	0.86	0.88	1.14	1.07	***	***	***	0.38	0.52	0.45	0.36	0.61
22	0.29	0.31	0.33	0.35	0.30	0.43	0.53	0.24	0.17	0.57	0.87	***	1.08	***	***	***	***	***	***	***	***	0.54	0.59	0.61	0.48
23	0.49	0.45	0.14	0.32	0.32	0.31	0.36	***	0.53	0.67	0.95	1.06	0.98	0.89	0.87	1.25	0.92	0.84	1.19	0.95	0.29	0.58	0.87	0.52	0.68
24	0.92	0.74	0.49	0.59	0.50	0.52	0.34	0.30	0.60	0.83	0.84	0.98	1.20	1.39	1.23	1.23	0.96	1.24	***	***	0.60	***	0.53	0.38	0.78
25	0.45	0.44	0.65	0.63	0.07	0.13	0.19	0.34	0.68	0.50	0.80	1.30	1.01	1.07	***	***	0.61	***	***	***	0.82	0.80	0.57	0.55	0.61
26	0.43	0.51	0.47	0.51	0.51	0.40	0.46	0.50	0.32	0.49	0.66	0.90	1.22	***	0.92	***	***	***	***	0.93	0.53	0.61	0.37	0.63	0.60
27	0.62	0.74	0.79	0.87	0.54	0.53	0.64	0.62	0.31	0.65	1.00	0.80	0.90	1.27	1.34	1.19	1.39	0.78	***	***	0.65	0.72	0.59	0.48	0.79
28	0.47	0.41	0.43	0.49	0.62	0.24	0.49	0.76	0.45	0.41	0.82	1.00	0.88	0.86	0.78	***	***	***	***	***	0.99	0.69	0.67	0.68	0.64
29	0.70	0.43	0.44	0.69	0.64	0.55	0.49	0.41	0.77	0.82	***	***	1.02	1.29	0.97	1.19	0.91	1.05	0.58	0.62	***	0.37	0.36	0.34	0.70
30	0.44	0.47	0.37	0.41	0.41	0.76	0.98	0.75	0.88	1.00	1.05	0.88	0.99	0.94	1.16	0.97	0.99	0.79	0.73	***	***	0.61	0.71	0.59	0.77
31	0.69	0.05	0.11	0.13	0.55	0.40	0.14	0.25	0.53	0.62	0.92	1.18	0.90	0.67	1.09	0.89	1.33	1.07	0.59	0.62	0.31	0.53	0.54	0.44	0.61
HRAVE	0.47	0.46	0.44	0.45	0.44	0.42	0.39	0.42	0.51	0.53	0.72	0.90	0.99	0.97	1.04	1.01	0.94	0.97	0.74	0.67	0.61	0.59	0.57	0.52	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.50	0.55	0.59	0.55	0.63	0.66	0.62	0.72	0.54	0.67	0.64	0.76	0.53	0.58	0.70	0.63	0.61	0.64	0.61	0.74	0.61	0.48	0.68	0.78	0.61
MAX	1.14	1.10	1.24	1.03	1.06	1.06	1.09	1.07	1.12	1.27	1.08	1.31	0.96	1.08	1.21	1.45	1.14	1.30	1.12	1.15	1.14	1.08	1.25	1.39	1.30
MIN	0.16	0.12	0.22	0.15	0.21	0.39	0.21	0.28	0.04	0.22	0.22	0.32	0.11	0.11	0.34	0.23	0.25	0.25	0.19	0.15	0.23	0.17	0.14	0.30	0.07

DAY	26	27	28	29	30	31
AVE	0.60	0.79	0.64	0.70	0.77	0.61
MAX	1.22	1.39	1.00	1.29	1.16	1.33
MIN	0.32	0.31	0.24	0.34	0.37	0.05

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 85.9% OPERATIONAL RECOVERY RATE = 85.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
MARCH - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.32	0.54	0.22	0.14	0.32	***	0.14	0.26	0.49	0.16	0.30	0.68	0.95	***	***	0.76	***	***	***	***	***	0.42	0.50	0.49	0.42
2	0.37	***	***	0.41	0.70	***	***	***	0.50	0.45	0.55	0.54	0.70	0.98	***	***	***	***	***	***	0.80	0.30	0.41	0.46	0.55
3	***	0.25	0.40	0.34	0.61	***	***	***	0.57	0.35	0.40	0.46	***	***	***	***	***	***	***	***	***	***	0.46	0.89	0.47
4	***	0.94	0.51	***	0.43	***	***	***	***	0.45	0.51	0.93	***	***	***	***	***	***	***	***	***	***	***	***	0.63
5	***	***	***	0.68	0.60	0.37	***	***	***	0.32	0.81	***	***	***	***	***	***	***	***	***	***	0.69	0.53	0.82	0.60
6	***	***	***	0.36	***	***	***	***	0.41	0.43	***	***	***	***	***	***	***	***	***	***	***	0.77	***	***	0.49
7	***	0.45	***	***	0.53	0.49	0.35	0.23	0.40	0.38	0.71	1.00	***	***	***	***	***	***	***	***	***	***	0.56	***	0.51
8	***	***	***	***	***	***	***	***	1.11	0.95	0.80	0.65	***	0.75	0.69	***	***	***	***	***	***	0.55	0.60	***	0.76
9	0.32	***	***	0.61	0.18	***	***	0.03	0.53	0.40	0.31	0.78	0.80	***	***	***	***	***	***	***	***	***	0.81	***	0.48
10	***	***	0.73	***	***	***	***	0.25	0.56	0.31	0.50	0.93	***	***	***	***	***	***	***	***	***	***	0.58	0.34	0.52
11	***	0.44	0.41	0.44	0.48	***	***	0.71	0.22	0.51	0.66	***	***	***	***	***	***	***	***	***	***	***	***	***	0.48
12	***	***	***	***	***	***	***	***	***	***	***	1.09	***	***	***	***	***	***	***	***	***	***	0.50	0.50	0.70
13	***	***	***	***	***	***	0.20	0.33	0.51	0.48	0.65	0.93	***	0.96	***	***	***	***	***	***	***	***	***	***	0.58
14	0.37	0.36	0.26	0.38	***	***	***	***	0.61	0.25	0.70	1.15	***	***	1.11	***	***	***	***	***	***	***	0.56	0.52	0.57
15	***	0.47	0.37	0.48	0.47	***	0.51	0.61	0.35	0.34	0.47	0.84	***	***	***	***	***	***	***	***	***	***	0.60	***	0.50
16	0.28	0.23	0.39	0.42	0.41	***	***	0.55	0.60	0.42	0.41	***	***	***	***	***	***	***	***	***	***	***	***	***	0.41
17	***	0.28	***	1.04	0.97	***	***	0.27	0.54	0.63	0.74	1.14	0.87	***	***	***	***	***	***	***	***	***	***	***	0.72
18	***	***	0.75	0.68	0.45	***	***	0.27	0.31	0.41	0.69	1.07	***	***	***	***	***	***	***	***	***	***	0.43	0.24	0.53
19	0.35	***	***	0.30	0.48	0.27	***	0.77	0.51	0.34	0.62	0.73	***	***	***	***	***	***	***	***	***	***	***	***	0.49
20	***	***	***	0.87	0.70	0.74	0.60	0.86	0.72	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.75
21	0.21	0.25	***	***	0.45	0.51	0.56	0.60	0.38	0.78	***	***	1.09	***	***	***	***	***	***	***	***	***	0.47	0.33	0.51
22	0.29	0.28	***	0.40	0.32	***	0.58	0.24	0.15	0.67	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.37
23	***	***	***	0.33	0.34	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.57	0.41
24	***	***	***	***	***	***	***	***	0.67	0.87	0.88	***	***	***	***	***	***	***	***	***	***	***	***	***	0.81
25	0.65	***	0.83	***	***	***	***	0.35	0.72	0.48	0.88	1.36	***	***	***	***	***	***	***	***	***	***	0.35	0.58	0.69
26	***	0.50	0.49	***	***	***	***	0.52	0.34	0.54	0.69	***	***	***	***	***	***	***	***	***	***	***	***	***	0.51
27	***	***	***	***	0.59	***	***	0.62	0.32	0.68	***	***	0.73	1.21	***	***	***	***	***	***	***	0.69	0.64	***	0.69
28	0.50	0.39	0.49	0.50	0.72	0.25	0.54	0.70	0.41	0.39	0.86	***	***	***	***	***	***	***	***	***	***	***	0.69	0.69	0.55
29	***	0.40	0.44	0.70	***	***	0.44	0.44	***	***	***	***	***	***	***	1.14	***	1.10	0.68	***	***	***	***	***	0.67
30	***	***	***	***	***	***	***	***	1.00	1.01	1.08	0.86	1.04	0.98	1.26	1.07	1.06	***	***	***	***	***	***	***	1.04
31	***	0.01	***	***	***	***	***	0.23	0.52	0.55	0.91	***	***	***	***	***	***	***	***	***	***	***	***	0.46	0.45
HRAVE	0.37	0.39	0.48	0.50	0.51	0.44	0.44	0.44	0.52	0.50	0.66	0.89	0.88	0.98	1.02	0.99	1.06	1.10	0.68	***	0.80	0.57	0.54	0.53	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.42	0.55	0.47	0.63	0.60	0.49	0.51	0.76	0.48	0.52	0.48	0.70	0.58	0.57	0.50	0.41	0.72	0.53	0.49	0.75	0.51	0.37	0.41	0.81	0.69
MAX	0.95	0.98	0.89	0.94	0.82	0.77	1.00	1.11	0.81	0.93	0.71	1.09	0.96	1.15	0.84	0.60	1.14	1.07	0.77	0.87	1.09	0.67	0.57	0.88	1.36
MIN	0.14	0.30	0.25	0.43	0.32	0.36	0.23	0.55	0.03	0.25	0.22	0.50	0.20	0.25	0.34	0.23	0.27	0.24	0.27	0.60	0.21	0.15	0.33	0.67	0.35

DAY	26	27	28	29	30	31
AVE	0.51	0.69	0.55	0.67	1.04	0.45
MAX	0.69	1.21	0.86	1.14	1.26	0.91
MIN	0.34	0.32	0.25	0.40	0.86	0.01

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 34.9% OPERATIONAL RECOVERY RATE = 34.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
APRIL - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.8	3.7	3.5	3.9	3.3	3.8	4.1	3.7	3.5	2.5	2.2	3.8	4.6	4.8	5.2	5.1	5.9	5.3	4.5	***	3.7	2.3	2.0	2.8	3.8
2	3.3	5.2	5.5	4.2	5.1	4.5	4.6	5.3	6.3	5.5	6.2	4.9	4.7	4.2	4.6	5.0	4.3	4.2	4.4	4.1	4.3	4.5	3.8	4.1	4.7
3	4.1	3.9	4.5	4.6	4.2	4.7	4.8	4.4	4.4	3.4	4.3	4.7	4.4	5.0	5.0	5.6	5.1	3.8	2.7	2.8	1.8	1.9	2.9	3.0	4.0
4	3.0	4.1	4.9	4.7	4.0	3.8	4.1	4.3	3.8	3.2	3.0	2.5	4.8	4.7	5.7	4.9	6.6	6.8	***	***	4.6	2.9	2.6	2.8	4.2
5	2.8	3.7	3.4	3.9	4.3	2.3	3.3	3.8	3.0	2.3	2.5	3.7	4.2	5.3	6.5	6.1	6.2	6.2	7.8	6.6	5.3	3.6	1.9	2.7	4.2
6	2.9	3.0	3.3	4.0	4.3	3.8	3.1	3.2	4.1	6.9	***	7.2	7.0	6.5	6.1	4.9	4.4	3.3	3.6	3.9	2.6	4.1	3.8	7.0	4.5
7	4.5	3.8	3.6	3.1	2.7	3.6	3.9	3.6	4.8	5.3	4.2	3.5	3.2	3.3	4.0	4.4	4.3	4.0	5.4	6.6	5.7	5.2	4.4	8.1	4.4
8	5.2	***	***	5.8	4.8	2.9	3.1	3.8	3.1	2.5	3.7	3.8	3.0	3.5	4.5	4.1	5.4	6.0	7.9	6.3	4.3	4.1	4.2	3.4	4.3
9	3.0	3.0	3.2	3.2	3.2	3.3	2.9	2.8	2.8	3.0	3.9	5.1	5.3	3.8	4.4	4.3	5.7	5.4	5.9	5.7	4.2	2.8	2.7	2.9	3.9
10	3.5	3.2	3.2	1.3	2.1	2.6	1.7	2.3	3.4	5.9	4.9	7.5	8.6	4.6	3.9	5.2	5.3	3.6	2.9	3.0	3.2	3.3	3.3	3.1	3.8
11	3.7	3.1	2.9	3.1	3.0	2.8	2.8	2.7	3.0	3.4	4.1	4.3	4.4	3.8	4.2	3.7	3.4	3.8	4.4	7.2	***	6.4	***	***	3.8
12	2.9	3.0	1.9	2.5	1.7	1.9	2.9	3.3	3.7	6.0	5.6	4.6	4.2	4.3	4.4	6.6	6.5	6.2	6.2	5.3	4.4	3.0	2.2	2.6	4.0
13	2.8	3.3	3.2	3.6	4.1	3.8	3.9	3.8	2.4	2.7	2.7	4.0	3.6	4.0	5.2	3.8	4.3	6.1	7.0	6.9	5.5	4.6	2.3	2.0	4.0
14	2.8	3.0	3.9	4.0	3.3	3.5	3.4	3.9	2.7	2.5	3.2	3.7	3.8	5.4	6.4	5.9	5.7	6.4	***	7.0	6.6	4.4	2.7	3.3	4.2
15	4.8	4.7	4.4	4.7	3.6	1.5	2.2	2.5	3.4	6.4	8.9	8.5	9.5	9.3	***	***	***	***	***	***	***	***	7.9	8.3	5.6
16	9.9	8.6	6.0	5.4	5.3	3.8	3.4	3.3	4.1	5.5	5.6	6.0	7.4	6.5	7.6	6.6	6.2	5.3	5.1	5.5	4.0	3.5	2.6	2.1	5.4
17	3.2	5.0	6.5	***	7.0	6.4	5.6	7.8	7.6	6.9	6.3	4.0	3.4	5.2	5.5	5.6	5.0	4.7	5.0	***	5.0	5.5	***	4.7	5.5
18	3.8	3.8	3.5	3.5	4.5	4.0	3.7	3.4	2.4	3.1	4.0	4.4	6.8	5.2	5.9	6.5	5.7	6.8	7.0	6.8	5.1	3.2	3.2	4.7	4.6
19	4.2	3.8	3.5	3.9	4.5	4.9	6.0	4.8	2.5	2.5	3.3	3.5	4.0	4.5	3.8	4.8	5.5	6.9	7.2	6.9	6.2	2.7	2.0	3.4	4.4
20	4.6	5.1	3.4	***	3.9	4.8	4.1	3.4	2.7	2.3	3.2	3.8	4.7	6.1	6.9	6.2	6.8	6.2	***	***	2.5	***	2.4	3.2	4.3
21	3.8	4.4	5.2	4.7	4.0	3.8	3.5	3.5	2.9	2.4	2.8	3.6	4.2	4.7	5.7	6.1	5.5	6.3	***	6.4	6.6	5.5	***	3.4	4.5
22	2.1	2.3	3.9	4.2	4.7	6.3	4.2	3.4	2.7	2.0	3.3	4.2	4.8	3.8	4.7	8.8	***	7.3	***	9.4	9.6	8.1	8.1	4.1	5.1
23	2.8	4.0	4.4	3.0	2.5	2.8	3.9	3.5	3.4	2.6	3.4	5.6	9.3	8.0	9.6	***	9.2	10.0	***	***	7.3	6.4	5.4	4.8	5.3
24	3.7	4.8	3.1	2.3	2.2	2.7	3.1	4.1	2.9	3.5	4.4	4.5	5.6	5.1	6.1	7.5	7.3	6.9	***	6.4	4.8	6.8	7.6	5.6	4.8
25	3.9	3.1	4.2	2.6	3.4	4.1	4.0	3.1	2.8	7.1	10.2	11.4	8.5	***	***	***	***	***	***	9.2	8.3	6.8	3.8	4.9	5.6
26	4.5	5.9	4.1	4.0	4.6	6.6	6.7	3.5	3.0	3.8	5.1	6.5	7.9	7.7	7.7	7.7	7.1	8.3	7.5	5.5	5.3	3.9	2.5	2.2	5.5
27	3.9	3.9	3.6	3.6	3.6	3.7	3.9	2.8	2.4	2.7	3.9	4.2	4.3	4.8	5.7	6.1	6.0	5.7	6.1	5.8	5.2	7.0	7.1	4.6	4.6
28	3.6	4.9	4.7	3.0	4.3	4.3	3.0	1.9	2.8	7.5	9.2	8.2	7.9	11.0	9.9	***	***	***	7.0	7.4	7.5	5.4	2.8	4.4	5.7
29	4.1	2.8	2.0	2.7	2.0	3.6	4.7	4.5	2.7	3.2	5.0	6.2	7.7	7.8	7.1	7.2	6.9	8.5	***	5.7	4.4	2.5	1.9	2.7	4.6
30	3.8	2.7	2.0	2.7	3.1	3.6	3.1	3.7	3.8	3.6	3.2	5.4	3.7	4.7	5.3	6.4	5.0	3.8	***	7.4	7.2	4.3	3.0	1.9	4.1
HRAVE	3.8	4.0	3.8	3.6	3.8	3.8	3.8	3.7	3.4	4.0	4.6	5.1	5.5	5.4	5.8	5.7	5.7	5.8	5.7	6.2	5.2	4.5	3.7	3.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.8	4.7	4.0	4.2	4.2	4.5	4.4	4.3	3.9	3.8	3.8	4.0	4.0	4.2	5.6	5.4	5.5	4.6	4.4	4.3	4.5	5.1	5.3	4.8	5.6
MAX	5.9	6.3	5.6	6.8	7.8	7.2	8.1	7.9	5.9	8.6	7.2	6.6	7.0	7.0	9.5	9.9	7.8	7.0	7.2	6.9	6.6	9.6	10.0	7.6	11.4
MIN	2.0	3.3	1.8	2.5	1.9	2.6	2.7	2.5	2.7	1.3	2.7	1.7	2.0	2.5	1.5	2.1	3.2	2.4	2.0	2.3	2.4	2.0	2.5	2.2	2.6

DAY	26	27	28	29	30	31
AVE	5.5	4.6	5.7	4.6	4.1	***
MAX	8.3	7.1	11.0	8.5	7.4	***
MIN	2.2	2.4	1.9	1.9	1.9	***

MONTHLY AVERAGE = 4.6 MONTHLY MAXIMUM = 11.4 MONTHLY MINIMUM = 1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 93.9% OPERATIONAL RECOVERY RATE = 93.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
APRIL - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.4	3.2	3.5	3.9	3.2	3.7	4.7	4.4	3.8	1.6	1.9	4.2	5.4	5.0	4.5	7.1	6.4	4.9	4.3	***	4.0	3.1	3.6	3.7	4.1
2	3.5	5.6	5.7	4.8	5.7	5.0	4.9	6.1	7.3	5.9	7.4	5.5	6.1	4.7	5.7	2.8	4.8	4.3	4.0	4.9	5.8	4.3	4.0	4.2	5.1
3	5.1	4.3	5.0	4.8	4.0	3.5	5.0	5.1	4.3	4.4	4.7	4.5	4.1	5.4	4.9	6.9	4.2	5.1	3.7	3.7	2.9	1.1	3.3	5.5	4.4
4	3.2	3.5	4.7	4.2	3.1	3.1	3.3	4.3	3.7	3.8	3.3	2.6	2.6	5.5	6.4	6.3	6.4	6.2	***	***	2.5	3.3	3.6	4.1	4.1
5	3.1	3.2	3.6	3.8	4.1	3.6	3.3	3.4	3.5	1.6	2.6	3.2	4.3	5.3	6.8	6.3	4.5	6.0	9.4	6.6	5.2	3.2	1.4	1.9	4.2
6	2.8	3.1	2.7	3.8	3.9	3.6	3.6	3.4	6.4	7.7	***	6.8	7.3	6.4	5.7	6.2	5.4	4.2	4.4	3.8	3.6	4.2	3.3	7.0	4.8
7	4.7	4.8	4.8	3.9	2.5	3.1	4.0	3.6	5.1	5.6	4.4	3.0	3.7	4.1	3.5	3.9	4.2	3.7	5.8	8.1	5.8	5.5	5.1	6.7	4.6
8	6.2	***	***	6.8	4.9	2.8	2.8	3.6	3.4	2.7	3.6	2.5	3.5	3.3	6.8	5.3	5.0	5.4	7.4	6.7	3.8	3.9	4.0	4.0	4.5
9	3.4	2.9	2.9	3.1	2.9	2.4	2.6	2.4	2.5	2.7	3.4	4.3	6.5	3.2	4.4	5.2	5.2	4.5	3.8	6.9	2.9	3.1	4.4	5.8	3.8
10	4.5	3.7	3.5	2.6	2.7	3.6	2.7	2.6	4.5	5.2	3.8	7.0	10.3	4.2	3.5	5.1	7.4	3.4	2.7	2.7	5.3	3.1	2.6	3.7	4.2
11	3.8	3.6	3.2	3.4	3.1	2.9	3.1	2.6	3.2	3.0	4.9	5.1	4.6	4.8	6.4	4.2	3.5	4.7	4.0	8.0	***	3.2	***	***	4.1
12	4.5	4.8	2.6	3.7	1.8	2.9	4.0	4.1	4.5	6.5	5.9	5.6	4.8	5.2	6.2	7.1	8.1	7.5	8.2	5.4	5.0	3.6	3.3	2.6	4.9
13	1.9	3.0	3.4	4.4	3.7	2.7	2.2	2.3	2.0	2.3	2.0	3.7	2.8	4.8	5.3	4.0	5.4	5.2	6.6	7.6	5.8	3.9	4.6	3.1	3.9
14	1.8	2.8	4.1	4.7	2.7	2.7	2.8	2.8	2.4	2.5	3.2	3.4	6.4	7.2	6.8	5.7	5.1	5.8	***	9.8	7.4	4.5	4.5	3.1	4.4
15	4.6	5.5	5.1	5.1	3.7	1.7	2.2	2.9	3.8	6.5	9.6	9.6	11.7	12.3	***	***	***	***	***	***	***	***	6.9	8.2	6.2
16	9.6	9.4	6.2	5.8	6.1	4.1	4.0	3.0	3.6	5.1	5.0	6.6	5.1	5.7	6.1	6.3	7.8	3.9	6.2	7.8	4.0	4.5	2.8	4.6	5.5
17	4.3	5.0	7.2	***	8.4	6.0	6.4	11.4	9.0	6.9	7.6	4.7	4.1	4.9	6.2	7.8	7.7	5.9	4.3	***	4.5	4.8	***	6.5	6.4
18	3.9	4.4	4.1	5.4	4.4	3.8	4.1	3.4	2.9	3.1	2.3	3.8	5.5	4.9	5.8	6.3	5.6	8.2	7.3	6.9	5.8	4.8	2.7	5.6	4.8
19	5.0	4.2	3.1	3.5	4.2	4.6	5.2	4.4	2.2	3.4	3.2	3.9	3.4	7.0	7.2	5.0	5.4	7.9	8.2	7.4	5.8	1.8	1.4	3.4	4.6
20	4.2	5.2	2.9	***	3.6	4.1	3.7	2.7	1.6	1.0	1.9	3.4	2.9	5.7	9.1	7.1	6.0	5.3	***	***	3.6	***	2.2	2.3	3.9
21	2.8	5.2	5.8	3.7	3.2	3.3	3.7	3.3	3.2	3.0	2.8	3.6	5.8	3.1	6.2	7.1	6.8	5.3	***	6.4	6.8	5.4	***	5.6	4.6
22	3.9	3.5	3.3	3.4	4.3	6.8	3.8	3.1	2.6	2.1	3.9	6.1	5.2	2.3	5.4	9.2	***	6.8	***	11.9	10.0	7.9	8.4	5.7	5.4
23	3.1	4.9	4.9	3.6	2.6	2.2	3.3	2.9	2.8	2.8	3.4	6.8	9.5	8.7	10.7	***	10.1	10.1	***	***	9.5	6.9	5.8	4.9	5.7
24	4.0	5.0	3.7	2.0	4.8	2.9	3.8	4.8	3.5	5.1	3.1	5.9	8.2	7.1	5.3	7.8	11.7	10.0	***	7.5	3.6	6.0	7.7	6.4	5.6
25	5.4	3.5	5.0	2.8	3.5	5.6	4.4	4.3	3.8	8.0	11.4	12.8	10.2	***	***	***	***	***	***	10.1	8.7	5.9	4.8	6.8	6.5
26	4.2	4.3	4.1	5.0	3.7	6.2	6.9	3.9	3.1	3.4	6.5	6.8	8.1	8.9	10.4	9.1	8.8	8.3	6.5	6.8	6.9	5.8	3.3	2.3	6.0
27	3.0	3.6	3.8	3.2	2.9	3.3	2.9	1.3	2.4	3.3	4.0	4.9	5.0	4.1	4.7	6.0	4.7	5.1	7.2	6.1	3.8	8.0	8.6	6.7	4.5
28	4.1	4.9	4.8	3.2	4.5	5.1	3.4	2.9	3.2	5.5	11.7	6.7	7.5	10.6	10.3	***	***	***	6.6	6.7	9.1	6.5	3.2	4.3	5.9
29	5.2	3.8	2.7	2.7	3.3	3.2	3.9	4.1	2.7	3.8	4.4	8.5	8.5	6.2	8.6	7.0	5.6	6.6	***	9.1	5.4	4.1	3.6	3.4	5.1
30	2.5	3.7	2.9	2.7	3.2	3.0	3.6	5.2	5.0	5.0	5.2	6.2	4.9	5.5	5.7	6.0	4.5	4.4	***	8.3	6.8	4.7	2.7	3.6	4.6
HRAVE	4.1	4.3	4.1	3.9	3.8	3.7	3.8	3.8	3.7	4.1	4.7	5.4	5.9	5.7	6.4	6.2	6.2	5.9	5.8	7.0	5.5	4.5	4.2	4.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.1	5.1	4.4	4.1	4.2	4.8	4.6	4.5	3.8	4.2	4.1	4.9	3.9	4.4	6.2	5.5	6.4	4.8	4.6	3.9	4.6	5.4	5.7	5.6	6.5
MAX	7.1	7.4	6.9	6.4	9.4	7.7	8.1	7.4	6.9	10.3	8.0	8.2	7.6	9.8	12.3	9.6	11.4	8.2	8.2	9.1	7.1	11.9	10.7	11.7	12.8
MIN	1.6	2.8	1.1	2.5	1.4	2.7	2.5	2.5	2.4	2.6	2.6	1.8	1.9	1.8	1.7	2.8	4.1	2.3	1.4	1.0	2.8	2.1	2.2	2.0	2.8

DAY	26	27	28	29	30	31
AVE	6.0	4.5	5.9	5.1	4.6	***
MAX	10.4	8.6	11.7	9.1	8.3	***
MIN	2.3	1.3	2.9	2.7	2.5	***

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 12.8 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 93.9% OPERATIONAL RECOVERY RATE = 93.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
APRIL - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.8	4.4	4.2	4.1	3.0	4.0	5.2	4.7	4.6	0.9	2.0	4.7	6.4	4.2	***	***	10.0	5.9	***	***	***	2.6	***	4.2	4.4
2	5.8	8.6	7.0	5.8	5.6	5.3	8.6	9.2	8.7	8.3	7.8	7.0	6.1	5.8	5.6	2.6	6.5	4.1	***	4.8	6.2	***	***	5.6	6.4
3	6.2	5.3	8.0	6.0	4.1	4.6	6.3	7.2	3.2	4.4	***	4.6	4.0	***	5.9	***	5.7	5.2	4.2	***	***	***	6.2	4.8	5.3
4	4.3	3.7	5.2	5.5	4.4	3.0	2.8	5.6	4.3	4.3	6.1	***	***	***	7.9	5.2	***	***	***	***	***	***	***	***	4.8
5	***	3.1	4.3	5.8	5.0	2.8	2.9	3.9	3.9	***	2.8	***	5.4	***	***	***	5.3	***	***	***	***	3.1	1.0	***	3.8
6	***	2.2	2.9	4.2	5.1	***	7.4	5.3	7.6	9.3	***	***	***	5.2	5.6	6.7	6.5	***	***	***	1.8	***	***	***	5.4
7	4.1	***	***	***	***	4.3	3.5	***	4.4	***	4.8	2.9	***	4.1	3.4	***	***	***	***	***	4.6	4.1	6.1	6.9	4.4
8	4.8	***	***	6.1	5.0	2.1	2.9	3.8	3.6	4.4	4.9	2.8	3.2	3.6	7.3	6.1	5.7	5.2	9.1	6.5	3.7	4.4	4.0	4.7	4.7
9	4.1	2.2	3.5	2.3	3.4	2.9	3.1	2.4	2.2	2.8	3.6	4.2	6.3	3.8	3.0	4.5	6.9	4.7	***	7.3	1.5	3.6	4.6	7.1	3.9
10	4.7	3.8	2.9	3.5	3.7	5.7	2.8	2.7	5.7	5.1	3.4	7.2	***	3.0	3.2	7.5	***	2.8	2.4	3.0	6.7	3.1	5.3	3.7	4.2
11	5.1	3.5	3.2	3.6	3.2	3.6	2.7	3.3	4.1	3.2	5.4	6.5	4.8	6.0	5.2	5.1	4.0	4.6	3.3	***	***	***	***	***	4.2
12	4.1	7.2	4.1	5.4	3.7	4.4	3.5	4.6	5.1	6.0	6.4	6.2	3.9	3.5	4.8	7.3	***	7.2	***	***	4.8	4.1	3.1	4.1	4.9
13	1.5	3.7	5.3	4.9	3.8	2.6	2.4	2.6	1.7	2.7	2.9	3.9	2.9	5.0	6.4	3.4	5.2	4.2	***	***	***	***	2.3	2.7	3.5
14	1.8	2.9	5.6	5.2	1.9	3.0	2.8	2.9	2.9	4.3	4.5	6.1	5.7	8.0	***	6.0	6.1	6.8	***	***	4.7	4.2	3.6	3.2	4.4
15	6.2	5.8	5.1	7.2	3.9	2.0	2.1	3.8	3.6	8.2	9.4	8.8	***	***	***	***	***	***	***	***	***	***	***	8.6	5.8
16	***	9.1	5.9	***	6.4	***	4.1	***	3.7	8.3	4.7	6.0	5.6	5.6	***	8.7	7.2	3.6	***	***	***	***	***	5.9	6.1
17	5.0	5.4	***	***	***	***	***	***	***	***	7.9	5.5	3.1	***	***	9.1	6.6	***	6.6	***	***	***	***	***	6.2
18	5.6	5.6	5.5	5.1	4.1	3.8	4.1	4.4	3.9	3.2	1.8	5.7	9.9	4.9	6.3	7.7	5.5	***	***	7.6	***	***	2.5	9.5	5.3
19	5.3	4.8	3.6	4.0	***	4.7	4.7	4.2	4.1	4.0	***	***	4.4	8.6	7.3	***	***	9.3	***	***	***	***	2.0	3.6	5.0
20	4.0	5.8	***	***	4.0	5.2	3.5	3.4	1.7	2.2	1.5	2.9	***	***	***	8.0	***	***	***	***	5.0	***	***	2.8	3.9
21	***	7.9	***	6.1	4.2	3.5	3.6	5.1	3.6	4.4	3.5	5.2	5.8	***	***	8.1	***	***	***	***	***	***	***	***	5.1
22	***	***	2.9	3.6	6.2	***	4.6	2.9	3.1	3.2	6.3	8.1	6.6	***	***	***	***	***	***	13.6	***	8.8	9.6	8.1	6.3
23	3.5	4.8	4.7	3.9	3.8	2.7	4.1	3.0	2.7	2.9	3.2	5.4	***	7.3	8.6	***	***	6.3	***	***	***	***	***	***	4.5
24	***	5.3	2.8	3.2	5.6	5.5	6.1	5.1	4.9	4.6	4.6	6.4	8.0	7.8	***	11.0	11.8	***	***	***	2.6	***	8.5	***	6.1
25	5.4	2.9	5.1	2.9	3.6	3.6	4.3	4.3	4.3	10.2	11.4	***	***	***	***	***	***	***	***	***	***	5.9	***	***	5.3
26	***	3.7	4.3	6.6	4.2	***	5.2	4.0	3.0	3.9	6.4	***	10.6	10.9	***	8.8	9.5	***	5.0	***	8.0	***	2.9	2.4	5.8
27	6.7	3.5	3.8	3.2	***	3.5	3.3	1.5	3.9	4.9	5.7	5.5	5.3	5.0	***	***	***	***	***	7.2	3.8	8.6	***	***	4.7
28	***	4.6	3.8	4.6	4.5	6.2	3.6	3.5	3.8	***	***	6.6	9.1	***	***	***	***	***	***	***	***	6.6	3.3	5.3	5.0
29	5.9	3.5	2.9	2.8	3.5	3.0	5.2	3.4	2.0	2.5	6.3	9.0	7.7	***	***	6.3	6.3	5.4	***	***	***	4.4	3.4	2.6	4.5
30	1.9	4.4	2.5	2.9	2.6	3.5	3.1	4.6	5.4	4.9	5.4	7.5	6.3	5.6	4.7	***	***	4.0	***	***	6.2	4.9	3.3	5.0	4.4
HRAVE	4.5	4.7	4.4	4.6	4.2	3.8	4.1	4.1	4.0	4.7	5.1	5.8	6.0	5.7	5.7	6.8	6.8	5.3	5.1	7.1	4.6	4.9	4.2	5.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.4	6.4	5.3	4.8	3.8	5.4	4.4	4.7	3.9	4.2	4.2	4.9	3.5	4.4	5.8	6.1	6.2	5.3	5.0	3.9	5.1	6.3	4.5	6.1	5.3
MAX	10.0	9.2	8.0	7.9	5.8	9.3	6.9	9.1	7.3	7.5	6.5	7.3	6.4	8.0	9.4	9.1	9.1	9.9	9.3	8.0	8.1	13.6	8.6	11.8	11.4
MIN	0.9	2.6	3.2	2.8	1.0	1.8	2.9	2.1	1.5	2.4	2.7	3.1	1.5	1.8	2.0	3.6	3.1	1.8	2.0	1.5	3.5	2.9	2.7	2.6	2.9

DAY	26	27	28	29	30	31
AVE	5.8	4.7	5.0	4.5	4.4	***
MAX	10.9	8.6	9.1	9.0	7.5	***
MIN	2.4	1.5	3.3	2.0	1.9	***

MONTHLY AVERAGE = 4.9 MONTHLY MAXIMUM = 13.6 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 68.6% OPERATIONAL RECOVERY RATE = 68.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	153	151	111	104	105	114	127	123	119	158	219	273	274	270	276	275	275	269	270	***	314	313	317	65	136
2	78	66	78	93	70	77	83	79	71	77	75	86	81	41	67	96	86	9	5	8	65	75	85	73	338
3	80	85	75	87	101	83	94	102	98	98	89	91	89	81	193	280	276	315	77	355	317	0	66	72	68
4	87	95	117	129	143	151	126	133	103	86	89	65	176	222	269	275	273	272	***	***	333	306	42	87	130
5	91	102	100	104	110	118	90	96	100	94	131	251	267	310	309	280	281	278	284	287	287	287	74	91	12
6	86	82	80	105	115	135	118	102	84	71	***	30	72	78	79	47	6	53	15	8	46	310	34	55	340
7	72	97	103	99	80	88	76	83	69	74	109	102	103	122	38	279	304	3	177	128	96	115	234	285	277
8	276	***	***	65	77	88	77	69	81	139	176	179	173	96	97	91	72	25	33	44	55	75	79	76	253
9	78	85	82	86	117	146	111	85	84	95	112	102	166	173	272	274	265	268	261	284	291	283	310	92	331
10	102	114	116	230	294	280	265	299	301	289	264	206	208	270	192	277	289	289	30	111	154	132	154	147	154
11	114	99	81	75	79	81	84	88	96	100	85	82	77	84	304	139	56	289	274	287	***	325	***	***	142
12	317	230	20	10	55	56	88	85	122	153	160	171	114	267	262	279	279	279	280	282	296	318	342	84	335
13	85	92	107	111	112	132	127	151	101	98	158	289	223	200	83	273	277	289	288	290	286	357	14	65	163
14	86	88	103	119	113	125	138	150	100	95	100	152	259	270	256	279	270	266	***	290	283	279	251	270	181
15	252	253	259	266	282	193	157	203	256	257	258	265	281	277	***	***	***	***	***	***	***	***	277	272	208
16	279	277	282	283	284	281	283	294	283	288	282	274	282	275	269	278	277	267	273	278	291	53	296	38	194
17	93	69	70	***	76	71	87	78	71	71	43	88	163	279	268	275	270	274	277	***	329	11	***	24	141
18	45	74	59	65	78	74	83	110	112	91	170	265	273	263	269	271	268	273	270	282	289	279	59	27	290
19	51	70	91	106	118	138	153	146	86	138	153	187	178	255	173	272	270	271	271	292	290	279	49	103	277
20	109	114	106	***	116	133	123	108	91	162	166	269	276	290	286	275	273	273	***	***	310	***	78	85	317
21	100	107	117	142	134	145	122	132	142	140	144	160	136	166	105	104	134	165	***	281	287	282	***	221	22
22	323	97	119	117	115	120	115	138	138	47	90	95	91	276	243	242	***	281	***	268	270	272	279	271	291
23	270	276	288	221	136	106	116	127	121	167	280	207	249	257	266	***	274	280	***	***	278	262	269	276	85
24	277	290	253	169	114	88	80	86	101	186	313	204	271	270	262	272	270	271	***	262	272	259	254	257	184
25	265	210	210	175	208	255	264	267	273	195	228	259	257	***	***	***	***	***	***	287	283	281	269	263	76
26	272	271	354	266	276	290	288	283	268	271	277	280	281	278	276	277	280	279	280	283	287	281	292	61	284
27	108	111	104	93	107	114	137	138	78	130	175	264	336	277	285	262	261	266	272	263	253	249	247	241	213
28	185	239	262	320	161	173	196	214	223	242	246	257	256	280	277	***	***	***	279	280	276	276	293	307	107
29	283	298	246	171	238	158	157	156	131	347	309	278	275	266	277	266	260	278	***	282	0	319	61	168	205
30	167	273	111	109	103	103	99	98	103	135	124	100	103	199	247	230	256	194	***	292	286	339	71	336	7

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 93.9% OPERATIONAL RECOVERY RATE = 93.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
APRIL - 2016

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	166	154	139	113	115	119	131	139	144	160	245	273	276	278	219	273	274	270	273	***	299	112	289	59	97
2	103	69	80	95	71	70	80	69	79	68	82	67	73	91	71	96	74	0	29	46	98	73	61	62	72
3	72	80	81	82	96	83	98	84	82	79	85	98	67	69	184	250	196	170	80	5	105	36	74	37	90
4	99	96	152	119	136	152	142	156	99	91	122	125	212	276	278	283	270	292	***	***	357	271	36	81	104
5	95	96	102	97	115	119	91	91	86	86	155	275	330	315	303	290	262	281	268	301	275	319	73	66	34
6	73	69	76	98	118	124	93	86	64	70	***	28	58	57	70	46	10	61	22	11	28	312	56	59	39
7	69	98	118	128	81	128	77	74	80	71	124	102	98	123	69	269	296	1	181	133	79	127	248	293	64
8	304	***	***	62	73	129	94	76	90	155	176	219	244	105	107	87	67	45	34	46	36	79	88	81	107
9	80	83	84	79	121	152	133	87	84	131	150	117	128	159	298	261	259	265	272	284	198	222	302	68	280
10	95	135	128	210	282	283	280	226	292	296	295	211	222	254	215	274	271	310	32	117	225	151	146	138	267
11	116	118	92	82	84	76	69	80	82	92	83	60	52	108	303	143	93	318	291	291	***	32	***	***	260
12	261	73	269	3	30	57	68	71	130	160	157	178	112	256	265	278	277	296	285	284	292	13	21	86	3
13	81	73	110	133	120	103	89	91	75	91	110	306	221	90	75	249	275	279	282	275	296	20	317	337	47
14	65	89	107	150	112	93	85	84	81	109	129	115	322	282	271	273	276	261	***	294	286	272	258	276	257
15	262	235	236	268	300	270	180	215	251	247	254	258	277	291	***	***	***	***	***	***	***	***	270	265	293
16	284	279	280	282	282	287	293	310	308	318	296	278	293	295	263	265	271	269	273	263	283	41	297	338	131
17	85	65	64	***	68	30	92	65	48	70	59	85	140	267	276	287	267	271	297	***	300	15	***	38	329
18	42	64	65	55	70	66	72	89	87	66	275	280	297	275	252	285	280	277	273	270	285	306	33	50	349
19	56	76	69	119	131	151	154	141	92	92	125	182	211	242	178	264	276	280	272	297	291	312	233	125	149
20	116	119	95	***	135	151	112	93	39	33	48	267	287	296	260	276	277	283	***	***	302	***	70	84	220
21	94	121	119	138	119	126	131	158	138	107	131	147	129	171	96	106	128	162	***	281	294	280	***	177	165
22	83	95	118	116	140	129	125	149	110	54	79	89	81	156	253	240	***	279	***	282	275	264	278	282	137
23	268	284	289	262	183	101	115	134	139	144	344	179	250	252	256	***	306	289	***	***	268	261	269	273	132
24	287	288	290	354	119	76	55	88	102	157	64	159	261	249	259	281	284	271	***	258	302	245	253	247	209
25	257	222	214	196	217	246	264	256	292	198	238	263	248	***	***	***	***	***	***	293	285	277	276	250	121
26	268	260	346	267	255	287	288	279	261	294	288	288	272	270	276	291	277	285	282	289	290	292	289	121	66
27	107	125	105	82	102	105	129	58	70	152	158	249	13	260	295	264	244	262	270	246	182	274	241	234	218
28	151	228	217	335	178	186	189	210	248	241	245	272	251	275	280	***	***	***	284	307	284	266	305	303	286
29	284	293	294	277	288	223	160	157	149	359	295	284	283	270	283	265	248	278	***	265	357	100	99	120	197
30	195	291	86	132	158	114	110	121	146	116	111	88	101	212	201	226	246	209	***	305	281	14	61	47	250

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 93.9% OPERATIONAL RECOVERY RATE = 93.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
APRIL - 2016

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	147	138	107	114	112	118	127	136	128	100	157	271	282	277	***	***	254	254	***	***	***	170	***	108	213
2	85	64	97	96	81	55	76	61	92	60	83	64	67	98	58	355	60	56	***	13	96	***	***	67	18
3	68	76	89	95	79	68	85	84	111	70	***	102	66	***	150	***	76	167	65	***	***	***	59	91	261
4	76	12	150	103	126	154	122	165	111	69	120	***	***	***	286	272	***	***	***	***	***	***	***	***	257
5	***	96	106	75	98	345	67	85	93	***	134	***	296	***	***	***	275	***	***	***	***	348	107	***	105
6	***	70	76	81	110	***	104	91	29	54	***	***	***	58	60	86	15	***	***	***	85	***	***	***	15
7	74	***	***	***	***	134	96	***	98	***	154	130	***	125	67	***	***	***	***	***	80	150	265	293	54
8	294	***	***	72	96	86	99	70	100	132	194	199	251	136	128	95	65	52	30	41	326	77	96	68	119
9	100	134	88	117	165	147	136	102	113	135	142	116	115	127	317	227	233	269	***	284	120	241	335	63	277
10	103	130	108	216	306	290	279	256	295	305	305	175	***	277	229	318	***	311	15	124	229	137	114	95	345
11	106	118	92	85	87	82	68	87	98	95	78	61	9	110	264	138	109	302	292	***	***	***	***	***	92
12	295	79	192	8	337	41	74	83	115	137	164	157	106	248	261	283	***	319	***	***	308	44	256	78	97
13	52	70	113	159	142	114	97	103	39	77	71	292	216	43	60	301	271	258	***	***	***	***	110	332	269
14	69	87	112	128	106	97	76	81	85	103	137	116	302	267	***	271	265	252	***	***	273	257	229	261	314
15	236	235	247	259	301	226	172	216	250	244	254	241	***	***	***	***	***	***	***	***	***	***	***	265	292
16	***	274	282	***	285	***	293	***	310	312	315	279	279	298	***	258	275	266	***	***	***	***	***	324	332
17	96	69	***	***	***	***	***	***	***	***	51	72	111	***	***	263	289	***	337	***	***	***	***	***	128
18	76	59	80	50	77	68	74	82	98	70	7	283	276	265	262	288	277	***	***	273	***	***	99	60	170
19	59	70	80	108	***	122	138	139	100	81	***	***	209	263	180	***	***	294	***	***	***	***	236	136	136
20	110	119	***	***	125	144	104	84	41	49	88	260	***	***	***	272	***	***	***	***	288	***	***	68	73
21	***	139	***	116	125	123	129	155	129	117	117	129	79	***	***	104	***	***	***	***	***	***	***	***	23
22	***	***	121	118	160	***	122	148	155	49	132	83	85	***	***	***	***	***	***	293	***	256	290	289	26
23	271	284	289	274	192	106	102	126	116	106	336	238	***	252	257	***	***	282	***	***	***	***	***	***	174
24	***	297	1	46	126	71	59	80	114	166	61	151	255	244	***	314	281	***	***	***	319	***	250	***	222
25	254	197	207	202	215	235	245	252	324	201	231	***	***	***	***	***	***	***	***	***	***	280	***	***	251
26	***	289	354	265	257	***	277	266	234	264	280	***	270	270	***	295	271	***	273	***	294	***	280	97	204
27	86	120	105	82	***	116	102	54	91	158	168	261	351	263	***	***	***	***	***	216	189	279	***	***	28
28	***	223	189	24	235	193	185	216	304	***	***	290	249	***	***	***	***	***	***	***	***	263	306	319	49
29	324	275	289	267	286	199	145	142	168	5	301	283	267	***	***	267	237	262	***	***	***	105	110	128	53
30	236	292	73	129	122	116	106	123	146	112	144	91	125	188	220	***	***	202	***	***	276	26	51	101	144

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 68.6% OPERATIONAL RECOVERY RATE = 68.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.39	0.34	0.26	0.24	0.29	0.31	0.29	0.31	0.39	0.49	0.84	1.03	1.07	1.17	1.22	1.01	0.94	1.03	0.77	***	0.58	0.64	0.66	0.47	0.64
2	0.33	0.36	0.50	0.35	0.45	0.36	0.30	0.39	0.61	1.04	1.33	1.15	1.22	1.19	1.28	1.05	1.10	0.88	0.63	0.42	0.38	0.51	0.65	0.51	0.71
3	0.53	0.43	0.44	0.42	0.37	0.53	0.34	0.29	0.35	0.66	0.99	0.99	1.03	1.28	1.23	1.26	1.06	1.07	***	0.63	0.64	0.55	0.47	0.50	0.70
4	0.43	0.34	0.47	0.64	0.30	0.28	0.21	0.30	0.42	0.59	0.79	0.89	1.12	***	1.34	1.22	0.83	0.85	***	***	0.63	0.67	0.42	0.51	0.63
5	0.60	0.50	0.45	0.29	0.36	0.30	0.42	0.21	0.22	0.57	0.78	0.92	0.76	1.02	1.00	1.14	1.02	0.62	0.60	0.34	0.64	0.68	0.63	0.33	0.60
6	0.42	0.51	0.35	0.32	0.34	0.25	0.25	0.32	0.59	1.00	***	0.99	1.32	1.24	1.05	1.20	1.07	0.92	0.65	0.74	0.69	0.63	0.67	0.85	0.71
7	0.42	0.50	0.57	0.70	0.61	0.55	0.62	0.44	0.54	0.95	0.67	0.56	0.95	0.91	1.03	0.75	0.75	0.63	0.80	***	0.91	0.80	0.79	0.63	0.70
8	0.92	***	***	0.95	0.62	0.49	0.49	0.47	0.52	0.77	0.92	0.84	0.82	0.75	1.04	0.86	1.11	0.73	0.62	0.63	0.82	0.60	0.47	0.64	0.73
9	0.50	0.31	0.42	0.31	0.17	0.39	0.03	0.15	0.24	0.54	0.96	1.15	1.10	1.10	0.98	1.14	1.05	0.93	0.62	0.49	0.69	0.79	0.58	0.47	0.63
10	0.51	0.39	0.45	0.29	0.36	0.35	0.35	0.43	0.32	0.82	0.83	1.06	0.68	0.60	0.66	0.71	0.93	0.75	0.66	0.35	0.51	0.45	0.44	0.32	0.55
11	0.26	0.38	0.39	0.41	0.36	0.28	0.08	0.11	0.52	0.70	0.96	1.34	1.10	0.92	1.10	1.02	1.10	0.97	0.63	0.54	***	0.64	***	***	0.66
12	0.57	0.78	0.54	0.56	0.30	0.29	0.20	0.17	0.38	0.80	0.76	0.84	1.01	0.97	1.10	1.05	0.69	0.87	0.77	0.45	0.36	0.46	0.55	0.46	0.62
13	0.36	0.37	0.46	0.51	0.36	0.18	0.17	0.22	0.25	0.67	0.83	1.29	1.24	1.30	1.34	1.01	1.03	1.12	0.72	0.61	0.68	0.77	0.54	0.27	0.68
14	0.52	0.33	0.22	0.25	0.32	0.22	0.15	0.21	0.26	0.64	0.82	1.28	1.11	1.16	1.00	0.92	1.21	0.72	***	0.70	0.50	0.46	0.44	0.59	0.61
15	0.49	0.62	0.64	0.70	0.37	0.18	0.30	0.32	0.42	0.88	1.03	1.15	1.17	0.80	***	***	***	***	***	***	***	***	0.88	0.63	0.66
16	0.57	0.59	0.37	0.39	0.34	0.33	0.61	0.41	0.88	0.97	1.08	0.97	0.85	1.08	1.17	1.05	1.21	0.70	0.95	0.84	0.58	0.58	0.47	0.45	0.73
17	0.35	0.51	0.84	***	0.98	0.88	1.04	***	0.93	0.90	0.94	0.92	1.07	1.07	1.06	1.20	1.01	1.02	0.86	***	0.55	0.89	***	1.04	0.90
18	0.79	0.62	0.50	0.39	0.54	0.28	0.25	0.16	0.55	0.73	1.13	0.95	1.04	0.85	1.01	1.07	1.17	1.00	0.82	0.50	0.48	0.69	0.52	0.40	0.68
19	0.42	0.57	0.39	0.26	0.32	0.23	0.42	0.35	0.26	0.57	0.70	1.00	1.15	1.23	1.27	1.35	0.98	0.90	0.73	0.63	0.45	0.50	0.34	0.39	0.64
20	0.50	0.34	0.36	***	0.35	0.31	0.31	0.23	0.34	0.93	1.07	0.91	1.03	1.24	1.03	1.14	0.84	0.84	***	***	0.61	***	0.34	0.34	0.65
21	0.47	0.53	0.52	0.46	0.28	0.29	0.28	0.24	0.37	0.45	0.69	0.83	0.96	1.09	1.30	1.30	***	1.17	***	0.65	0.72	0.55	***	0.50	0.65
22	0.61	0.24	0.30	0.38	0.48	0.40	0.37	0.60	0.42	0.80	0.84	1.24	1.14	1.16	1.13	0.88	***	0.97	***	0.80	0.84	0.52	0.68	0.34	0.69
23	0.35	0.36	0.39	0.31	0.30	0.16	0.29	0.30	0.30	0.62	0.98	1.19	1.08	1.02	1.07	***	1.15	1.24	***	***	0.58	0.45	0.43	0.44	0.62
24	0.54	0.48	0.41	0.10	0.17	0.26	0.35	0.67	0.64	1.03	1.22	1.28	1.39	0.99	1.09	1.08	0.79	0.53	***	0.61	0.62	0.51	0.53	0.55	0.69
25	0.68	0.50	0.74	0.64	0.33	0.37	0.48	0.40	0.81	0.85	1.09	1.00	***	***	***	***	***	***	***	1.02	0.74	0.67	0.52	0.46	0.66
26	0.58	0.65	0.85	0.63	0.35	0.52	0.58	0.61	0.60	0.86	0.94	1.10	1.07	1.04	1.00	0.89	1.25	0.84	0.85	0.86	0.54	0.48	0.51	0.34	0.75
27	0.44	0.32	0.37	0.38	0.26	0.13	0.24	0.11	0.74	0.98	1.41	1.33	1.14	1.00	0.86	1.00	0.94	1.05	0.97	0.33	0.64	0.73	0.63	0.93	0.71
28	0.73	0.62	0.73	0.92	0.53	0.49	0.31	0.29	0.58	1.07	1.12	1.15	1.17	1.05	1.05	***	***	***	0.78	0.57	0.68	0.48	0.56	0.60	0.74
29	0.49	0.30	0.36	0.29	0.24	0.46	0.61	0.55	0.29	0.78	0.93	1.02	0.82	0.99	1.06	0.92	0.91	0.91	***	0.62	0.73	0.81	0.53	0.36	0.65
30	0.56	0.65	0.47	0.28	0.28	0.33	0.40	0.32	0.40	0.94	1.09	1.14	1.15	0.81	1.05	0.97	0.83	0.68	***	0.69	0.51	0.72	0.62	0.72	0.68
HRAVE	0.51	0.46	0.47	0.44	0.38	0.35	0.36	0.33	0.47	0.79	0.96	1.05	1.06	1.04	1.09	1.05	1.00	0.89	0.75	0.61	0.62	0.62	0.55	0.52	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.64	0.71	0.70	0.63	0.60	0.71	0.70	0.73	0.63	0.55	0.66	0.62	0.68	0.61	0.66	0.73	0.90	0.68	0.64	0.65	0.65	0.69	0.62	0.69	0.66
MAX	1.22	1.33	1.28	1.34	1.14	1.32	1.03	1.11	1.15	1.06	1.34	1.10	1.34	1.28	1.17	1.21	1.20	1.17	1.35	1.24	1.30	1.24	1.24	1.39	1.09
MIN	0.24	0.30	0.29	0.21	0.21	0.25	0.42	0.47	0.03	0.29	0.08	0.17	0.17	0.15	0.18	0.33	0.35	0.16	0.23	0.23	0.24	0.24	0.16	0.10	0.33

DAY	26	27	28	29	30	31
AVE	0.75	0.71	0.74	0.65	0.68	***
MAX	1.25	1.41	1.17	1.06	1.15	***
MIN	0.34	0.11	0.29	0.24	0.28	***

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 93.1% OPERATIONAL RECOVERY RATE = 93.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.31	0.55	0.41	0.51	0.29	0.27	0.25	0.48	0.48	0.56	0.86	1.04	0.92	1.23	1.38	1.06	1.04	0.87	0.83	***	0.58	0.64	0.71	0.50	0.69
2	0.46	0.60	0.49	0.42	0.51	0.60	0.58	0.71	0.73	1.13	1.24	1.23	1.26	1.25	1.43	0.97	1.18	0.84	0.62	0.46	0.45	0.44	0.68	0.55	0.78
3	0.69	0.46	0.35	0.62	0.53	0.60	0.46	0.41	0.92	0.63	0.93	1.14	1.08	1.49	1.31	1.30	1.10	1.24	***	0.61	0.71	0.74	0.56	0.62	0.80
4	0.55	0.41	0.43	0.64	0.35	0.56	0.40	0.33	0.36	0.74	0.84	0.93	***	1.32	1.23	1.26	***	***	***	***	0.84	0.67	0.46	0.48	0.67
5	0.60	0.50	0.53	0.24	0.50	0.56	0.67	0.28	0.38	0.68	0.88	1.01	0.87	1.06	0.99	1.19	0.92	***	***	***	***	0.72	0.61	0.35	0.68
6	0.31	0.48	0.41	0.26	0.29	0.40	0.40	0.37	0.59	0.95	***	***	***	1.21	1.00	1.22	1.11	1.06	***	***	0.67	0.58	0.78	0.88	0.68
7	0.49	0.64	0.64	0.73	0.64	0.48	0.60	0.45	0.72	1.03	0.72	0.49	0.85	0.76	1.08	0.90	0.65	***	***	***	0.93	0.76	0.55	0.71	0.71
8	1.05	***	***	0.67	0.46	0.41	0.32	0.22	0.50	0.76	0.90	0.78	0.68	0.93	1.11	0.84	0.95	0.65	0.55	***	0.74	0.82	0.73	0.75	0.71
9	0.51	0.47	0.68	0.51	0.50	0.27	0.02	0.01	0.09	0.40	1.01	1.03	1.08	1.29	1.02	0.99	1.12	0.83	0.47	0.66	0.60	0.72	0.60	0.70	0.65
10	0.84	0.63	0.50	0.52	0.70	0.59	0.46	0.41	0.13	0.74	0.78	0.99	0.76	0.62	0.61	0.72	***	0.77	0.37	0.34	0.56	0.49	0.46	0.44	0.58
11	0.18	0.33	0.26	0.31	0.45	0.55	0.50	0.28	0.46	0.56	1.03	1.11	1.09	0.91	1.07	0.83	0.93	0.89	0.55	***	***	***	***	***	0.65
12	0.91	0.79	0.82	0.80	0.49	0.39	0.30	0.17	0.48	0.78	0.90	1.16	1.20	0.97	1.03	0.95	0.72	0.77	0.74	0.50	0.39	0.69	0.70	0.66	0.72
13	0.72	0.50	0.42	0.55	0.47	0.13	0.03	0.07	0.06	0.29	0.58	1.30	1.15	1.42	1.20	1.15	0.99	0.90	0.67	***	0.76	0.59	0.41	0.42	0.64
14	0.62	0.55	0.50	0.39	0.51	0.24	0.23	0.22	0.18	0.45	0.61	1.31	1.33	1.34	1.11	1.03	1.03	0.77	***	0.86	0.46	0.55	0.87	0.39	0.68
15	0.44	0.47	0.58	0.78	0.41	0.24	0.32	0.32	0.46	1.02	0.78	1.18	1.23	***	***	***	***	***	***	***	***	***	***	***	0.63
16	***	0.68	0.33	0.33	0.36	0.76	1.02	0.68	0.82	1.06	1.03	0.88	0.73	1.02	1.03	1.01	1.18	0.71	0.89	***	0.54	0.51	0.50	0.54	0.76
17	0.53	0.37	0.70	***	***	1.01	1.15	***	***	***	1.10	0.81	1.07	1.10	1.24	1.07	0.96	1.01	0.87	***	1.06	***	***	1.01	0.94
18	0.70	0.74	0.57	0.40	0.54	0.40	0.56	0.50	0.37	0.87	1.21	0.96	1.00	0.84	0.84	1.04	1.09	1.01	0.89	0.78	0.68	0.72	0.66	0.58	0.75
19	0.48	0.88	0.49	0.16	0.38	0.37	0.36	0.39	0.26	0.53	0.71	1.07	1.37	1.09	1.18	1.16	0.98	0.84	***	0.72	0.62	0.54	0.40	0.39	0.67
20	0.48	0.42	0.62	***	0.32	0.26	0.48	0.16	0.27	0.71	0.99	0.84	1.12	1.41	0.88	***	1.03	0.82	***	***	***	***	0.49	0.40	0.65
21	0.38	0.50	0.48	0.45	0.22	0.15	0.36	0.14	0.35	0.41	0.65	0.91	1.08	0.88	***	***	***	***	***	0.48	0.76	***	***	0.44	0.51
22	0.63	0.60	0.25	0.34	0.50	0.40	0.25	0.34	0.31	0.71	0.94	1.41	1.17	1.15	1.06	***	***	***	***	***	***	0.55	0.59	0.40	0.64
23	0.47	0.34	0.40	0.41	0.43	0.27	0.16	0.15	0.18	0.42	0.83	1.08	***	***	0.90	***	1.08	***	***	***	0.55	0.45	0.33	0.43	0.49
24	0.59	0.45	0.55	0.56	0.27	0.28	0.37	0.47	0.49	1.01	1.28	1.18	1.11	1.18	0.96	1.05	***	***	***	***	***	0.58	0.55	0.44	0.70
25	0.62	0.63	0.73	0.68	0.50	0.27	0.54	0.47	0.90	0.63	1.02	1.00	***	***	***	***	***	***	***	***	0.79	0.71	0.58	0.38	0.65
26	0.54	***	0.80	0.79	0.39	0.27	0.77	0.64	0.49	0.80	0.83	1.07	1.05	1.11	0.95	0.81	1.25	0.57	0.80	***	0.58	0.40	0.64	0.48	0.73
27	0.44	0.41	0.42	0.71	0.63	0.49	0.55	0.28	0.42	0.81	1.16	1.25	1.09	1.14	0.92	1.14	0.97	1.02	***	0.38	0.59	0.81	0.77	0.92	0.75
28	1.01	0.74	0.62	0.79	0.60	0.46	0.24	0.42	0.85	0.85	0.96	1.00	0.92	1.09	***	***	***	***	***	***	0.72	0.62	0.62	0.61	0.73
29	0.50	0.35	0.55	0.39	0.31	0.51	0.67	0.69	0.39	0.82	0.99	0.90	0.88	0.98	1.11	0.82	0.87	0.84	***	***	0.75	0.60	0.53	0.50	0.68
30	0.80	0.72	0.52	0.31	0.41	0.24	0.26	0.29	0.33	1.00	1.14	0.94	1.03	0.94	1.09	0.91	0.94	0.66	***	0.59	0.48	0.67	0.69	0.62	0.68
HRAVE	0.58	0.54	0.52	0.51	0.45	0.41	0.44	0.36	0.45	0.74	0.93	1.03	1.04	1.10	1.07	1.02	1.00	0.85	0.69	0.58	0.66	0.62	0.59	0.56	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.69	0.78	0.80	0.67	0.68	0.68	0.71	0.71	0.65	0.58	0.65	0.72	0.64	0.68	0.63	0.76	0.94	0.75	0.67	0.65	0.51	0.64	0.49	0.70	0.65
MAX	1.38	1.43	1.49	1.32	1.19	1.22	1.08	1.11	1.29	0.99	1.11	1.20	1.42	1.34	1.23	1.18	1.24	1.21	1.37	1.41	1.08	1.41	1.08	1.28	1.02
MIN	0.25	0.42	0.35	0.33	0.24	0.26	0.45	0.22	0.01	0.13	0.18	0.17	0.03	0.18	0.24	0.33	0.37	0.37	0.16	0.16	0.14	0.25	0.15	0.27	0.27

DAY	26	27	28	29	30	31
AVE	0.73	0.75	0.73	0.68	0.68	***
MAX	1.25	1.25	1.09	1.11	1.14	***
MIN	0.27	0.28	0.24	0.31	0.24	***

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 85.8% OPERATIONAL RECOVERY RATE = 85.8%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
APRIL - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.33	***	***	0.53	***	***	***	0.52	0.51	0.59	0.87	1.02	***	1.31	***	***	***	***	***	***	***	0.67	***	***	0.71
2	0.49	0.58	0.58	0.41	***	0.56	0.54	0.71	0.89	1.16	1.21	1.28	1.34	1.14	***	***	***	***	***	***	0.44	***	***	***	0.81
3	0.66	***	0.36	0.67	0.54	0.62	***	0.55	0.83	0.69	***	***	***	***	***	***	***	***	***	***	***	***	***	0.71	0.63
4	0.60	0.62	***	***	***	***	***	0.33	0.38	0.72	0.88	***	***	***	***	***	***	***	***	***	***	***	***	***	0.59
5	***	***	0.56	***	***	***	0.67	***	***	***	0.97	***	***	***	***	***	***	***	***	***	***	***	0.61	***	0.70
6	***	***	0.40	0.30	***	***	0.43	0.38	0.44	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.39
7	***	***	***	***	***	***	***	***	0.70	***	***	***	***	***	***	***	***	***	***	***	***	***	0.63	***	0.66
8	1.04	***	***	0.73	0.39	0.36	0.22	0.20	0.53	0.84	0.93	0.74	0.67	1.01	1.10	0.90	***	0.54	***	***	0.72	0.87	0.72	0.78	0.70
9	0.63	0.73	0.67	0.55	0.55	0.23	0.02	0.03	0.09	0.40	1.10	1.01	1.19	1.36	1.21	1.05	1.40	***	***	***	0.65	0.75	0.65	0.66	0.71
10	0.89	0.63	0.50	0.55	0.64	0.61	0.53	0.33	0.16	0.77	0.74	***	***	0.56	0.65	***	***	0.59	0.36	0.23	***	***	***	***	0.55
11	***	0.30	0.30	0.32	0.38	0.62	0.63	0.34	0.49	0.56	1.03	1.27	1.25	0.91	1.07	0.85	0.81	0.93	0.66	***	***	***	***	***	0.71
12	0.92	0.79	0.79	0.82	0.64	0.41	0.28	0.18	0.38	0.74	0.94	1.19	1.29	0.99	0.99	0.85	***	0.77	***	***	***	0.69	0.68	0.59	0.75
13	0.65	0.52	0.45	0.56	0.46	0.13	0.06	0.06	0.08	0.37	0.68	1.20	0.96	***	***	0.89	0.98	0.74	***	***	***	***	0.35	0.43	0.53
14	0.62	0.57	0.46	0.47	0.47	0.21	0.22	0.33	0.30	0.48	0.67	1.30	1.55	***	***	***	***	***	***	***	***	0.52	0.83	0.39	0.59
15	0.47	0.49	0.64	0.80	0.42	0.24	0.31	0.34	0.49	0.97	0.67	***	***	***	***	***	***	***	***	***	***	***	***	***	0.53
16	***	***	***	***	***	***	***	***	0.88	0.97	0.98	***	0.82	***	***	***	1.13	***	***	***	***	***	***	0.42	0.87
17	0.53	0.32	***	***	***	***	***	***	***	***	***	0.78	***	***	***	***	***	***	***	***	***	***	***	***	0.54
18	***	0.62	***	***	***	0.42	0.59	0.47	0.35	0.87	1.18	0.99	***	***	***	***	***	***	***	***	***	***	***	***	0.69
19	***	***	***	0.16	***	0.48	0.37	0.39	0.27	0.54	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.37
20	0.43	0.45	***	***	***	***	0.47	0.15	0.28	0.78	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.43
21	***	***	***	0.39	0.24	0.10	0.42	***	0.35	0.38	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.31
22	***	***	***	***	0.53	***	0.27	0.31	0.37	0.71	***	***	***	***	***	***	***	***	***	***	***	***	***	0.42	0.43
23	0.43	0.37	0.43	0.41	0.49	0.25	0.12	0.11	0.16	0.41	0.84	***	***	***	***	***	***	***	***	***	***	***	***	***	0.37
24	***	***	0.68	***	***	***	***	***	0.48	0.90	1.31	***	***	***	***	***	***	***	***	***	***	***	***	***	0.84
25	***	0.59	0.70	0.73	0.48	0.30	0.57	0.44	0.92	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.59
26	***	***	***	0.95	***	***	***	0.58	0.48	0.80	0.91	***	***	***	***	***	***	***	***	***	***	***	0.61	0.58	0.70
27	0.40	0.40	0.43	0.76	***	***	0.63	0.26	0.43	0.77	1.21	1.16	1.24	***	***	***	***	***	***	***	***	***	***	***	0.70
28	***	***	***	***	***	***	0.30	0.46	0.95	***	***	***	***	***	***	***	***	***	***	***	***	***	0.64	***	0.59
29	***	0.32	0.51	0.38	0.33	0.53	0.70	0.64	0.36	0.86	0.96	0.99	***	***	***	***	***	***	***	***	***	0.63	0.55	0.52	0.59
30	0.80	0.74	***	0.29	0.39	0.23	0.26	0.28	0.31	1.02	1.21	***	***	0.99	***	***	***	0.59	***	***	***	0.63	0.65	0.66	0.60
HRAVE	0.62	0.53	0.53	0.54	0.46	0.37	0.39	0.35	0.46	0.72	0.96	1.08	1.15	1.03	1.00	0.91	1.08	0.69	0.51	0.23	0.60	0.68	0.63	0.56	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.71	0.81	0.63	0.59	0.70	0.39	0.66	0.70	0.71	0.55	0.71	0.75	0.53	0.59	0.53	0.87	0.54	0.69	0.37	0.43	0.31	0.43	0.37	0.84	0.59
MAX	1.31	1.34	0.83	0.88	0.97	0.44	0.70	1.10	1.40	0.89	1.27	1.29	1.20	1.55	0.97	1.13	0.78	1.18	0.54	0.78	0.42	0.71	0.84	1.31	0.92
MIN	0.33	0.41	0.36	0.33	0.56	0.30	0.63	0.20	0.02	0.16	0.30	0.18	0.06	0.21	0.24	0.42	0.32	0.35	0.16	0.15	0.10	0.27	0.11	0.48	0.30

DAY	26	27	28	29	30	31
AVE	0.70	0.70	0.59	0.59	0.60	***
MAX	0.95	1.24	0.95	0.99	1.21	***
MIN	0.48	0.26	0.30	0.32	0.23	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 42.1% OPERATIONAL RECOVERY RATE = 42.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
MAY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	2.3	2.8	4.0	4.0	4.4	3.9	2.8	2.1	2.4	2.7	3.8	4.7	4.6	3.7	4.9	4.6	4.9	4.4	4.0	4.2	3.7	2.9	1.5	2.6	3.6
2	2.3	3.3	4.0	3.8	4.5	6.7	***	***	8.6	8.4	7.6	7.1	6.2	6.3	5.4	5.2	4.1	4.3	2.9	4.0	4.9	4.4	2.9	2.7	5.0
3	3.2	5.6	5.3	6.3	6.8	6.0	6.3	6.5	6.3	6.9	5.5	4.0	4.1	5.1	5.3	4.7	3.5	4.1	3.0	3.6	5.1	4.5	4.2	3.5	5.0
4	3.6	4.4	4.2	3.9	5.9	6.1	6.3	7.8	***	8.0	8.8	5.7	4.7	7.5	6.2	5.3	5.7	5.3	6.3	***	5.2	6.5	6.8	***	5.9
5	5.3	5.3	2.7	2.2	2.9	2.6	3.5	3.8	3.1	2.1	3.7	5.1	5.2	5.3	6.5	8.9	***	6.4	8.3	***	5.6	***	***	5.8	4.7
6	5.4	5.3	3.6	3.8	6.1	8.1	7.7	3.7	2.2	3.6	4.9	10.0	8.1	7.8	7.8	7.9	8.8	***	***	***	***	4.9	7.2	***	6.2
7	5.7	4.8	3.2	2.3	4.4	5.4	3.1	1.8	2.8	4.1	4.5	4.6	4.8	4.6	5.0	5.1	4.6	5.7	7.1	6.5	5.5	***	4.2	4.6	4.5
8	8.9	7.5	5.2	2.8	2.8	3.2	2.5	3.5	3.0	3.2	3.6	4.0	6.1	6.7	5.6	5.3	6.5	8.2	7.4	5.8	4.8	3.5	4.2	2.2	4.9
9	2.1	2.7	3.5	3.6	3.1	3.3	3.3	3.3	2.4	3.3	4.3	5.1	5.8	5.4	6.5	6.6	6.6	6.7	6.0	6.2	4.6	4.4	3.6	2.4	4.4
10	2.9	3.6	3.7	4.1	3.2	3.3	3.6	3.9	2.8	3.0	4.4	4.7	4.2	6.3	7.5	8.0	6.6	6.6	6.7	***	5.2	4.1	3.9	3.3	4.6
11	3.6	4.7	3.2	3.5	2.8	2.8	3.5	3.6	2.6	2.4	3.5	3.8	3.6	4.8	4.7	5.0	5.6	6.4	6.7	5.9	6.1	5.8	2.8	3.1	4.2
12	2.9	3.1	3.3	3.9	4.0	4.7	4.2	3.3	2.6	2.4	2.5	3.2	3.0	2.9	4.7	5.0	3.3	4.7	4.7	6.3	5.7	3.6	2.2	2.9	3.7
13	2.5	3.2	4.8	4.0	3.2	3.5	3.8	3.0	3.4	3.0	3.2	4.2	4.9	5.7	8.3	8.7	7.4	6.6	8.3	6.8	5.2	3.7	3.0	4.1	4.8
14	4.4	3.6	2.6	3.4	2.6	3.0	2.9	3.1	3.2	2.5	3.2	4.0	4.0	3.8	6.1	5.7	7.5	5.9	5.6	5.2	5.3	4.7	5.7	5.2	4.3
15	4.1	4.3	4.3	2.7	3.3	3.7	3.7	4.0	4.1	5.4	4.9	7.1	8.0	***	***	7.3	***	***	***	8.9	8.9	***	8.8	8.4	5.7
16	4.2	3.4	3.1	4.0	3.3	2.0	2.6	2.7	2.7	3.4	4.7	6.7	4.0	3.9	6.3	7.3	7.6	7.3	***	***	***	9.0	8.9	6.0	4.9
17	4.9	3.7	3.0	2.1	3.0	2.9	3.6	3.7	3.2	3.0	4.1	4.6	5.5	6.2	7.3	7.6	6.7	6.7	6.5	***	5.1	5.6	5.4	7.6	4.9
18	6.1	5.5	3.6	2.3	2.3	1.7	2.1	1.5	1.9	3.4	4.2	4.1	5.0	***	8.6	8.0	6.1	6.1	5.8	5.8	5.1	4.2	4.2	3.4	4.4
19	3.8	5.7	4.0	5.3	5.2	5.4	5.3	4.5	3.8	3.8	3.9	4.3	4.9	4.7	4.5	4.3	4.5	4.5	6.1	7.2	6.2	4.0	***	2.9	4.7
20	3.0	4.2	4.6	3.3	3.0	3.1	3.3	3.0	2.9	3.4	4.2	5.2	5.6	5.5	5.5	9.2	6.8	***	***	***	8.0	7.2	5.2	***	4.8
21	***	4.9	4.7	4.2	2.3	1.7	1.7	2.7	4.0	8.4	7.5	6.2	7.4	6.8	7.2	8.4	7.2	8.1	***	***	***	8.1	4.3	3.0	5.5
22	2.8	2.5	2.2	0.9	1.5	2.6	3.6	3.6	2.8	3.5	4.2	6.8	7.4	8.0	8.1	8.1	8.5	8.3	7.2	7.7	7.4	5.2	4.7	5.5	5.1
23	6.7	4.5	3.4	3.1	1.7	1.8	2.5	1.9	3.0	2.7	3.8	5.4	4.5	6.7	6.5	7.3	6.9	7.0	6.1	7.0	7.5	8.1	7.6	3.5	5.0
24	2.0	3.8	4.1	2.5	2.3	2.2	1.9	1.4	2.6	3.7	4.5	5.7	7.2	7.5	7.1	7.5	7.6	7.0	6.7	7.9	5.5	4.6	3.4	2.7	4.6
25	5.3	2.4	1.8	1.7	2.4	2.6	2.8	2.9	2.9	3.1	4.2	4.5	5.5	6.4	6.2	8.0	***	***	***	***	6.6	5.3	5.1	7.5	4.4
26	5.7	4.0	5.1	3.5	1.7	2.1	2.2	1.6	2.9	4.7	***	4.5	4.7	5.9	6.7	6.9	6.1	7.4	7.0	6.6	5.1	5.1	3.9	5.0	4.7
27	3.2	2.9	3.9	3.6	4.4	4.4	4.6	3.4	2.3	2.4	3.8	5.1	4.7	4.6	6.1	5.2	5.1	6.1	6.9	6.2	5.1	4.3	2.9	3.1	4.4
28	3.2	3.1	3.2	3.8	4.9	3.6	3.5	2.8	2.8	2.9	3.1	4.2	6.1	5.5	5.3	5.2	4.9	5.3	6.6	***	6.3	5.7	4.6	6.0	4.5
29	6.5	4.3	3.9	4.0	2.6	3.6	4.7	4.0	2.8	2.7	3.5	4.6	5.5	5.8	5.6	6.9	6.1	***	6.1	6.1	6.5	6.0	7.1	5.6	5.0
30	4.0	4.2	3.5	3.0	1.9	1.9	3.0	3.5	2.9	3.5	4.1	4.9	5.1	6.7	4.3	5.7	9.4	9.5	8.2	***	6.1	4.4	4.1	4.4	4.7
31	3.2	3.9	3.6	3.5	3.9	5.1	5.2	3.5	2.8	3.0	4.1	4.8	5.1	4.2	5.5	5.8	6.6	6.5	7.1	***	6.4	5.7	5.5	2.6	4.7
HRAVE	4.1	4.1	3.7	3.4	3.4	3.6	3.7	3.3	3.2	3.8	4.4	5.1	5.3	5.7	6.2	6.6	6.3	6.3	6.3	6.2	5.8	5.2	4.8	4.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.6	5.0	5.0	5.9	4.7	6.2	4.5	4.9	4.4	4.6	4.2	3.7	4.8	4.3	5.7	4.9	4.9	4.4	4.7	4.8	5.5	5.1	5.0	4.6	4.4
MAX	4.9	8.6	6.9	8.8	8.9	10.0	7.1	8.9	6.7	8.0	6.7	6.3	8.7	7.5	8.9	9.0	7.6	8.6	7.2	9.2	8.4	8.5	8.1	7.9	8.0
MIN	1.5	2.3	3.0	3.6	2.1	2.2	1.8	2.2	2.1	2.8	2.4	2.2	2.5	2.5	2.7	2.0	2.1	1.5	2.9	2.9	1.7	0.9	1.7	1.4	1.7

DAY	26	27	28	29	30	31
AVE	4.7	4.4	4.5	5.0	4.7	4.7
MAX	7.4	6.9	6.6	7.1	9.5	7.1
MIN	1.6	2.3	2.8	2.6	1.9	2.6

MONTHLY AVERAGE = 4.7 MONTHLY MAXIMUM = 10.0 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.0% OPERATIONAL RECOVERY RATE = 94.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
MAY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.2	2.7	3.8	5.2	4.1	4.0	2.3	1.9	1.7	2.3	5.4	5.4	3.3	3.6	3.6	4.3	4.9	4.2	3.8	4.7	4.4	4.1	3.4	6.6	3.9
2	4.2	3.3	4.4	4.1	5.2	6.7	***	***	10.1	9.1	9.0	10.2	7.3	7.3	5.6	4.8	3.3	3.0	4.1	4.2	5.9	4.2	3.7	3.5	5.6
3	4.6	5.9	6.1	6.9	7.5	7.8	6.3	7.3	6.9	8.4	7.0	5.0	4.9	***	3.1	6.7	4.5	3.6	3.3	4.3	6.5	5.5	3.8	4.8	5.7
4	3.7	2.8	4.0	4.0	7.2	6.9	7.7	9.7	***	11.0	10.9	7.5	6.0	5.3	5.9	4.9	6.1	5.8	8.1	***	4.8	6.7	5.7	***	6.4
5	5.3	7.7	2.9	2.2	4.4	2.6	3.4	3.9	3.3	2.5	4.0	6.2	6.0	5.2	7.7	9.7	***	6.5	6.6	***	5.7	***	***	5.2	5.1
6	4.8	5.5	3.8	3.5	7.5	7.8	7.3	4.2	1.9	4.6	4.6	9.9	8.3	5.6	6.7	6.3	11.0	***	***	***	***	5.4	6.7	***	6.1
7	6.0	4.9	4.0	4.2	5.3	4.8	2.6	2.2	2.4	4.2	5.2	5.8	5.6	5.5	4.3	3.9	7.9	5.8	6.6	8.0	6.8	***	4.1	2.4	4.9
8	10.4	6.3	3.7	2.9	4.5	4.0	3.1	4.6	2.4	3.2	2.8	4.9	7.3	7.3	7.0	7.0	5.9	9.1	9.3	6.4	5.2	2.9	4.2	4.3	5.4
9	2.2	2.0	2.6	3.0	2.4	2.8	2.6	2.9	2.2	2.4	3.9	6.0	4.4	5.8	7.3	7.6	8.8	7.1	6.0	5.2	3.8	4.2	4.3	5.0	4.4
10	4.1	5.1	3.8	4.6	4.1	3.8	3.7	4.2	3.0	3.5	3.5	4.8	4.8	5.5	9.1	8.8	5.2	5.1	6.0	***	6.1	3.1	5.6	2.9	4.8
11	3.0	4.8	4.1	2.8	2.7	2.4	2.6	3.3	2.8	3.2	4.2	3.5	2.4	4.3	5.2	6.5	6.4	5.4	7.1	6.0	6.5	5.7	2.6	3.9	4.2
12	2.4	3.6	4.2	3.2	3.7	3.3	2.9	2.7	2.8	2.9	2.6	3.0	3.2	4.3	3.9	5.2	6.7	6.5	8.4	6.0	6.3	5.1	3.4	5.1	4.2
13	4.1	3.8	4.4	3.9	5.5	4.3	3.4	2.9	3.1	3.1	3.4	3.1	3.5	6.8	7.5	7.8	8.0	7.9	9.9	6.7	5.7	4.1	4.2	3.6	5.0
14	4.1	3.7	3.8	3.7	4.6	2.7	2.7	3.6	3.2	1.9	3.5	4.3	4.2	5.3	5.4	5.3	7.2	7.5	5.5	5.3	6.2	6.6	5.9	4.9	4.6
15	4.6	3.9	5.6	4.3	3.8	3.5	4.0	5.4	4.6	6.8	3.8	7.0	8.2	***	***	6.7	***	***	***	9.1	8.3	***	8.4	9.5	6.0
16	6.2	5.4	3.8	4.9	3.6	2.2	2.0	2.4	4.4	4.9	4.4	6.4	4.9	6.6	8.4	10.1	8.9	8.4	***	***	***	8.7	9.4	5.5	5.8
17	3.4	3.6	2.4	3.2	4.0	3.0	3.1	3.0	3.0	3.3	5.0	4.7	5.7	6.3	5.6	10.7	5.8	6.7	8.6	***	6.4	5.2	3.7	7.0	4.9
18	5.3	4.9	4.0	4.1	4.6	2.1	2.4	3.0	2.6	4.3	5.1	4.3	6.4	***	5.1	9.4	7.2	6.4	6.4	6.7	6.0	4.1	4.2	4.4	4.9
19	4.8	6.3	5.0	5.2	6.1	5.1	4.9	5.1	5.2	4.7	5.0	3.7	4.7	5.1	6.2	5.8	4.8	5.8	7.9	6.8	5.4	5.2	***	3.7	5.3
20	4.0	3.1	3.0	3.5	3.1	3.7	3.8	2.5	4.2	3.7	4.8	4.4	5.8	5.3	7.7	8.1	4.9	***	***	***	8.5	9.8	3.9	***	4.9
21	***	5.6	5.0	5.0	2.8	3.1	1.8	2.4	4.6	7.8	7.3	4.7	6.6	6.7	7.7	5.9	7.1	10.0	***	***	***	8.4	3.7	3.6	5.5
22	3.7	2.4	2.5	2.0	3.0	2.1	2.8	3.3	2.2	2.5	3.6	4.7	10.4	10.0	9.0	7.0	10.1	7.9	8.5	7.6	7.5	7.2	4.9	5.7	5.4
23	6.6	4.8	4.6	3.4	3.0	2.5	3.1	1.6	3.3	5.1	4.4	5.6	5.5	7.6	8.0	5.2	6.4	6.5	6.8	6.9	8.8	9.4	7.6	5.5	5.5
24	4.5	3.9	3.7	3.9	2.5	1.4	2.5	1.8	2.6	3.2	3.8	5.2	8.1	7.5	9.6	7.5	7.1	6.7	7.4	6.8	5.9	4.0	4.2	2.8	4.9
25	4.7	2.9	2.9	5.1	3.2	2.0	2.1	2.3	3.0	2.7	2.9	2.8	4.5	6.9	6.0	10.6	***	***	***	***	6.8	6.4	4.1	10.1	4.6
26	5.7	2.5	5.0	3.1	2.3	2.2	2.3	2.0	3.3	5.2	***	5.4	6.4	6.6	6.4	4.5	4.6	7.8	7.4	5.5	5.3	4.2	4.2	3.3	4.6
27	5.1	3.1	3.6	4.5	5.3	4.7	4.9	2.8	2.8	2.3	3.6	5.7	4.8	5.5	6.0	5.1	6.1	6.6	8.2	6.4	6.4	4.6	4.1	4.6	4.9
28	4.6	2.3	3.5	4.4	4.7	3.6	2.6	2.5	3.3	2.5	5.0	4.8	5.6	5.6	6.5	4.4	4.9	6.0	5.6	***	7.4	4.2	4.3	5.7	4.5
29	5.6	3.4	3.7	4.7	3.8	2.9	4.1	4.2	1.8	2.8	3.2	5.2	6.7	7.2	6.2	6.6	5.9	4.8	5.5	5.9	6.9	5.7	10.7	6.4	5.2
30	4.9	3.2	3.0	3.4	3.3	3.5	3.5	3.2	3.1	3.5	3.0	6.6	5.7	7.5	7.9	6.7	8.0	8.1	8.1	***	6.0	5.2	4.2	2.9	5.0
31	2.7	4.3	3.2	3.0	3.4	4.1	4.9	4.3	2.9	5.3	2.0	5.7	7.2	7.9	4.7	7.2	7.1	7.0	6.4	***	6.4	5.7	6.1	3.8	5.0
HRAVE	4.7	4.1	3.9	3.9	4.2	3.7	3.5	3.5	3.4	4.3	4.6	5.4	5.8	6.2	6.4	6.8	6.6	6.5	6.9	6.2	6.3	5.6	5.0	4.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.9	5.6	5.7	6.4	5.1	6.1	4.9	5.4	4.4	4.8	4.2	4.2	5.0	4.6	6.0	5.8	4.9	4.9	5.3	4.9	5.5	5.4	5.5	4.9	4.6
MAX	6.6	10.2	8.4	11.0	9.7	11.0	8.0	10.4	8.8	9.1	7.1	8.4	9.9	7.5	9.5	10.1	10.7	9.4	7.9	9.8	10.0	10.4	9.4	9.6	10.6
MIN	1.7	3.0	3.1	2.8	2.2	1.9	2.2	2.4	2.0	2.9	2.4	2.4	2.9	1.9	3.5	2.0	2.4	2.1	3.7	2.5	1.8	2.0	1.6	1.4	2.0

DAY	26	27	28	29	30	31
AVE	4.6	4.9	4.5	5.2	5.0	5.0
MAX	7.8	8.2	7.4	10.7	8.1	7.9
MIN	2.0	2.3	2.3	1.8	2.9	2.0

MONTHLY AVERAGE = 5.0 MONTHLY MAXIMUM = 11.0 MONTHLY MINIMUM = 1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.0% OPERATIONAL RECOVERY RATE = 94.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	5.3	3.8	3.6	4.2	4.8	3.8	1.8	2.1	2.0	3.4	4.9	5.7	3.4	3.0	4.0	4.1	3.8	3.2	4.6	***	6.4	3.7	3.3	4.9	3.9
2	2.8	4.5	5.1	4.8	5.1	8.4	***	***	***	***	***	10.2	6.3	7.4	5.6	4.8	4.0	2.9	3.5	***	6.6	***	2.0	4.8	5.2
3	4.8	6.7	6.0	***	***	7.8	7.2	7.4	***	8.0	6.1	4.6	3.3	***	4.1	6.2	5.7	3.5	2.5	***	8.2	6.0	3.5	6.2	5.7
4	5.0	3.3	3.7	3.5	8.4	8.5	7.7	10.3	***	***	***	9.5	5.9	6.1	3.6	***	7.3	***	***	***	***	***	***	***	6.4
5	8.5	7.3	3.3	2.1	4.9	2.2	3.3	5.2	4.2	3.8	***	8.2	6.5	6.0	8.5	***	***	***	***	***	***	***	***	5.0	5.3
6	3.6	5.0	4.2	4.1	7.1	***	***	4.3	2.3	4.0	***	9.4	8.8	6.1	***	6.6	9.4	***	***	***	***	***	5.6	***	5.8
7	***	6.3	2.8	4.6	5.6	4.9	2.4	2.0	4.1	7.1	4.6	5.5	5.8	5.2	2.7	4.0	8.7	5.7	***	***	***	***	4.7	2.7	4.7
8	***	***	3.1	3.8	4.7	4.6	3.7	4.9	1.6	3.3	2.7	4.3	7.0	6.4	6.4	7.6	6.0	10.2	***	***	4.3	4.1	4.9	3.1	4.8
9	3.4	3.6	3.0	3.5	4.4	2.2	2.2	2.3	6.1	2.3	4.1	5.8	4.9	***	8.5	7.1	6.0	***	***	***	4.6	4.0	5.6	5.5	4.4
10	4.6	5.6	3.1	4.7	3.0	3.2	3.5	4.1	2.9	3.2	2.5	2.9	4.7	***	10.2	10.6	6.3	5.5	6.9	***	***	1.8	6.7	4.3	4.8
11	4.8	4.3	3.9	3.5	3.0	2.7	4.6	3.0	4.0	3.2	4.4	2.3	2.6	2.5	4.8	6.7	***	***	***	***	***	***	4.9	4.8	3.9
12	2.7	3.7	2.2	3.1	4.2	3.8	3.3	2.8	3.3	3.1	3.0	3.0	***	4.9	3.9	4.5	6.4	7.9	***	***	***	3.6	***	4.5	3.9
13	7.0	4.6	4.7	***	5.1	6.2	3.6	2.7	3.5	5.4	3.8	3.7	2.7	8.8	6.5	***	***	8.3	***	***	***	***	2.9	***	5.0
14	4.0	4.0	3.9	3.5	3.9	2.8	3.0	6.3	3.1	2.0	3.5	3.7	4.7	4.6	7.0	4.8	6.2	***	***	5.6	5.9	6.7	5.7	4.8	4.5
15	4.2	4.5	4.3	3.2	4.3	3.7	4.4	6.2	4.8	6.6	5.5	5.9	5.7	***	***	***	***	***	***	***	9.1	***	7.9	***	5.4
16	7.1	5.9	3.3	5.0	2.7	3.5	2.2	4.2	4.4	***	5.2	***	***	***	***	***	6.1	***	***	***	***	***	11.9	***	5.1
17	4.0	***	2.1	2.9	3.6	2.3	3.8	2.7	3.1	3.7	4.5	4.7	6.7	6.4	7.3	***	4.9	***	***	***	***	5.4	3.6	***	4.2
18	5.5	***	3.2	3.2	5.9	2.2	2.5	3.4	4.0	4.5	5.2	4.8	***	***	***	***	6.3	***	5.9	6.5	6.6	2.8	1.6	5.9	4.5
19	5.5	5.8	6.2	5.1	6.6	6.9	4.5	5.3	5.6	6.3	5.7	3.8	4.5	4.8	6.0	5.4	4.7	5.5	7.3	***	6.0	2.9	***	4.7	5.4
20	4.5	3.6	3.0	4.3	3.2	3.9	3.9	3.9	6.2	5.2	5.5	3.0	6.2	5.9	9.7	7.5	6.2	***	***	***	***	***	***	***	5.0
21	***	***	***	***	2.8	3.2	2.2	2.5	4.3	9.3	7.6	7.4	8.6	7.0	***	8.2	***	***	***	***	***	***	3.0	4.0	5.4
22	3.6	2.3	3.3	2.0	2.8	2.8	3.7	3.2	2.3	4.4	3.0	5.2	10.6	***	***	6.9	11.7	***	***	***	8.1	5.1	4.3	4.7
23	***	4.8	4.2	4.9	3.8	***	***	1.5	4.0	5.5	4.8	5.2	5.1	8.2	***	***	6.1	7.8	7.9	***	***	***	***	6.3	5.3
24	4.3	***	***	***	***	***	2.3	1.2	3.0	3.8	2.7	4.8	***	***	9.6	***	***	***	***	***	***	2.8	4.9	3.8	3.9
25	5.6	2.0	1.8	4.8	3.1	5.2	4.9	3.7	4.3	1.8	3.7	2.9	6.3	***	***	11.6	***	***	***	***	***	***	***	***	4.4
26	6.4	***	5.9	***	3.2	1.7	4.2	1.9	2.8	4.4	***	5.7	6.4	6.9	4.6	4.8	5.4	8.0	5.8	***	***	***	3.6	***	4.8
27	5.6	3.2	4.1	5.4	8.5	4.5	7.1	***	4.6	2.1	3.9	5.5	3.9	4.9	6.2	6.6	***	***	***	***	6.7	6.7	4.2	5.9	5.2
28	4.2	2.8	4.1	3.9	4.2	3.5	2.9	2.7	4.9	2.6	6.7	4.5	5.3	5.2	5.0	6.5	***	7.5	***	***	7.4	***	***	6.5	4.8
29	6.7	3.1	***	5.6	4.6	2.8	4.1	4.7	1.9	3.4	6.4	5.5	5.2	***	***	***	***	***	***	***	***	***	11.2	8.1	5.2
30	***	2.1	5.3	3.5	***	***	2.8	5.4	5.7	4.1	3.3	7.1	6.8	7.4	5.3	7.2	***	***	***	***	***	***	***	4.2	5.0
31	1.9	5.0	***	***	4.0	3.9	4.8	5.5	2.2	4.1	3.8	6.6	8.0	7.5	5.6	6.4	***	***	***	***	***	***	***	***	4.9
HRAVE	4.8	4.3	3.8	4.0	4.5	4.1	3.8	4.0	3.8	4.3	4.5	5.4	5.8	6.0	6.1	6.6	6.4	6.3	5.5	6.1	6.5	4.5	5.1	5.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.9	5.2	5.7	6.4	5.3	5.8	4.7	4.8	4.4	4.8	3.9	3.9	5.0	4.5	5.4	5.1	4.2	4.5	5.4	5.0	5.4	4.7	5.3	3.9	4.4
MAX	6.4	10.2	8.2	10.3	8.5	9.4	8.7	10.2	8.5	10.6	6.7	7.9	8.8	7.0	9.1	11.9	7.3	6.6	7.3	9.7	9.3	11.7	8.2	9.6	11.6
MIN	1.8	2.0	2.5	3.3	2.1	2.3	2.0	1.6	2.2	1.8	2.3	2.2	2.7	2.0	3.2	2.2	2.1	1.6	2.9	3.0	2.2	2.0	1.5	1.2	1.8

DAY	26	27	28	29	30	31
AVE	4.8	5.2	4.8	5.2	5.0	4.9
MAX	8.0	8.5	7.5	11.2	7.4	8.0
MIN	1.7	2.1	2.6	1.9	2.1	1.9

MONTHLY AVERAGE = 4.9 MONTHLY MAXIMUM = 11.9 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 70.6% OPERATIONAL RECOVERY RATE = 70.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	70	79	107	127	132	94	0	318	276	267	150	284	224	68	273	270	272	269	269	284	199	323	312	80	119
2	68	79	95	101	76	67	***	***	93	88	84	91	80	75	342	37	277	175	47	3	11	12	348	315	106
3	7	17	39	63	62	66	66	71	73	74	69	36	39	355	276	269	272	222	73	322	283	288	241	105	197
4	75	87	105	105	72	73	70	72	***	78	67	148	115	166	170	146	106	100	88	***	193	241	272	***	353
5	80	78	56	19	47	92	111	107	156	216	276	128	190	264	260	231	***	247	194	***	252	***	***	282	158
6	289	281	273	279	285	311	295	311	233	171	247	194	196	231	243	268	249	***	***	***	***	279	275	***	13
7	279	277	272	264	283	302	350	75	57	252	352	324	284	266	174	288	312	282	278	289	289	***	179	256	179
8	287	285	285	276	298	271	267	283	303	318	260	266	282	274	277	265	277	275	282	281	258	169	94	321	191
9	84	101	113	136	124	111	97	105	128	246	277	292	274	270	280	275	283	286	286	292	295	125	24	63	91
10	94	105	104	108	133	107	103	106	93	98	78	268	202	275	286	277	282	283	283	***	292	287	281	266	127
11	325	5	84	86	91	93	102	119	143	164	176	132	53	251	274	324	331	316	281	290	287	292	152	28	87
12	92	86	90	98	115	113	114	105	93	87	64	91	131	42	284	326	296	278	275	290	287	279	328	85	111
13	80	85	116	107	98	95	104	98	105	134	166	130	136	220	278	279	281	271	288	294	289	175	54	135	52
14	122	131	40	89	106	100	98	93	100	140	249	285	231	199	263	244	263	273	248	166	165	162	167	282	74
15	276	150	98	148	145	132	113	98	127	139	167	196	241	***	***	249	***	***	***	271	273	***	253	251	214
16	267	240	302	293	303	25	77	73	88	140	103	3	190	244	245	271	269	278	***	***	***	263	267	292	256
17	319	353	224	197	98	87	101	137	216	280	273	273	296	338	260	252	264	276	282	***	287	64	2	290	263
18	286	291	288	13	29	346	350	325	135	176	182	181	44	***	42	18	15	34	35	41	312	87	100	20	107
19	30	48	71	66	67	68	66	73	85	78	87	86	241	148	158	173	269	295	280	276	278	296	***	100	47
20	91	108	127	115	89	99	86	80	115	117	91	176	136	187	253	209	205	***	***	***	251	273	300	***	16
21	***	285	320	328	290	343	126	91	138	201	192	189	190	186	209	249	254	246	***	***	***	286	282	269	255
22	278	263	264	108	83	100	115	104	125	285	251	272	268	268	282	270	278	283	270	268	269	254	217	236	183
23	226	236	259	294	203	296	287	12	350	303	189	273	272	275	258	259	275	271	272	282	278	265	271	195	215
24	322	334	285	256	59	0	36	69	258	288	332	232	265	255	250	260	266	273	275	273	277	269	287	325	165
25	16	269	261	116	104	96	96	92	94	248	270	277	264	256	251	252	***	***	***	***	274	323	294	257	115
26	272	280	259	249	56	85	15	3	308	259	***	258	267	308	269	288	283	271	281	284	282	108	81	352	189
27	162	101	128	126	120	135	122	126	152	176	267	270	258	280	266	264	276	276	279	276	279	1	54	72	224
28	85	89	86	106	140	129	126	86	88	111	179	174	166	166	175	176	299	269	263	***	282	294	262	290	79
29	293	288	289	7	81	107	112	124	111	150	178	138	173	168	259	212	239	***	252	285	286	286	277	287	158
30	233	110	85	78	338	80	104	127	152	168	170	113	153	270	259	283	295	292	292	***	283	278	290	65	275
31	177	78	76	100	116	128	155	155	91	148	180	248	140	287	272	283	278	284	277	***	289	290	284	253	293

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.0% OPERATIONAL RECOVERY RATE = 94.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	41	110	94	153	141	112	19	356	333	250	35	297	252	29	267	257	253	346	265	270	245	323	343	143	133
2	16	82	88	79	65	72	***	***	102	97	86	101	72	60	30	37	72	115	45	14	11	28	90	112	299
3	180	16	26	52	51	73	68	65	69	77	39	47	3	***	225	257	287	122	89	324	290	276	161	143	330
4	78	67	89	97	78	74	70	74	***	81	75	143	112	177	170	153	108	107	105	***	179	242	271	***	165
5	100	98	80	52	71	91	117	115	135	242	281	160	193	261	261	257	***	242	190	***	245	***	***	282	6
6	278	297	247	265	287	314	295	284	100	114	235	180	199	234	241	250	255	***	***	***	***	268	273	***	328
7	300	257	314	249	264	290	348	11	81	176	299	318	270	261	146	284	314	317	278	283	344	***	201	251	156
8	279	293	228	235	280	272	277	282	303	308	309	273	278	282	286	255	272	274	291	275	256	162	111	93	345
9	90	42	92	95	98	129	109	123	108	226	263	330	280	264	265	266	289	287	284	290	74	108	160	42	356
10	90	101	94	127	89	112	106	117	123	153	34	290	198	280	271	288	277	303	291	***	309	101	294	86	241
11	68	27	355	75	91	93	108	139	153	105	122	112	87	259	290	328	338	326	290	291	282	300	117	52	202
12	134	77	161	99	116	104	101	89	79	86	86	109	78	100	239	296	281	279	273	305	283	306	317	49	341
13	314	82	120	107	85	88	121	86	86	83	124	172	144	220	277	271	273	285	291	297	290	141	137	145	222
14	98	124	109	256	188	110	103	97	116	181	275	283	204	170	266	252	276	280	255	168	169	162	191	315	33
15	289	199	110	195	180	152	134	119	137	122	96	194	240	***	***	252	***	***	***	274	266	***	253	245	255
16	235	230	323	285	271	350	62	47	102	153	160	170	168	222	243	270	297	288	***	***	***	256	257	291	301
17	354	325	195	356	137	87	95	149	223	312	273	296	299	322	262	247	273	273	290	***	293	63	300	286	26
18	339	261	307	287	251	348	41	70	87	148	158	184	35	***	41	14	43	40	38	34	129	114	97	6	298
19	44	49	67	74	67	69	67	69	79	71	82	100	226	118	128	170	278	282	273	277	280	25	***	129	139
20	96	130	154	136	91	126	141	104	111	122	91	177	185	182	234	214	222	***	***	***	264	282	336	***	342
21	***	288	333	358	299	283	181	99	134	191	191	203	176	169	208	258	262	258	***	***	***	287	279	271	181
22	302	302	270	301	347	85	117	116	94	134	185	299	275	283	279	282	276	285	262	249	268	268	236	237	30
23	230	243	257	319	195	295	297	339	271	1	187	265	271	269	249	261	278	273	279	281	292	276	274	238	111
24	105	45	289	285	323	2	21	55	7	311	337	251	270	274	245	257	279	271	284	283	275	264	260	339	214
25	32	269	345	34	256	80	87	96	88	17	296	207	261	272	283	237	***	***	***	***	258	332	298	246	165
26	267	307	237	244	50	51	9	342	298	251	***	222	279	306	272	294	276	287	278	289	286	154	80	50	55
27	220	120	120	111	126	149	123	123	146	184	290	275	276	275	252	274	307	274	272	278	284	51	93	76	174
28	24	134	137	101	139	145	101	76	98	109	150	156	174	158	178	115	311	273	279	***	280	305	265	283	271
29	301	238	345	17	63	108	141	145	165	156	183	150	135	169	247	218	229	208	251	313	280	274	294	302	156
30	39	177	355	194	342	53	116	158	163	146	137	116	152	262	243	281	296	285	282	***	289	285	186	228	328
31	161	102	30	86	110	130	155	162	194	128	116	224	133	292	284	296	267	290	285	***	294	296	291	206	9

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 94.0% OPERATIONAL RECOVERY RATE = 94.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
MAY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	333	177	173	136	142	112	22	40	45	199	335	296	251	20	278	257	246	290	252	***	270	336	311	167	257
2	37	91	85	68	60	76	***	***	***	***	***	101	75	55	59	66	83	141	17	***	19	***	64	244	91
3	178	26	24	***	***	74	67	64	***	94	33	53	4	***	193	243	304	121	140	***	287	234	197	250	332
4	78	64	95	95	91	84	76	74	***	***	***	110	103	171	139	***	133	***	***	***	***	***	***	***	271
5	102	127	89	52	55	97	141	103	129	120	***	155	188	264	267	***	***	***	***	***	***	***	***	276	259
6	271	291	264	246	293	***	***	322	112	134	***	170	191	224	***	238	252	***	***	***	***	***	279	***	250
7	***	249	350	268	257	291	353	30	96	129	233	4	260	257	198	288	308	331	***	***	***	***	201	314	77
8	***	***	208	238	281	275	279	277	297	321	338	268	274	288	280	264	267	277	***	***	236	172	109	64	179
9	119	270	294	126	80	121	103	129	91	169	277	334	280	***	264	269	269	***	***	***	87	105	149	1	138
10	69	114	107	111	99	109	121	129	119	149	101	320	207	***	282	282	283	300	273	***	***	156	290	243	148
11	72	21	16	77	96	95	104	138	161	128	132	49	40	290	290	335	***	***	***	***	***	***	128	23	293
12	138	100	50	72	112	129	103	87	82	84	81	119	***	107	221	293	289	262	***	***	***	305	***	59	155
13	336	124	126	***	112	78	103	84	95	97	133	147	144	263	271	***	***	284	***	***	***	***	152	***	260
14	107	118	97	259	201	111	101	82	114	162	287	268	191	177	265	251	287	***	***	166	169	159	258	326	168
15	278	204	124	166	173	155	123	125	140	138	135	197	276	***	***	***	***	***	***	***	268	***	244	***	22
16	233	266	334	301	321	317	72	342	93	***	165	***	***	***	***	***	***	301	***	***	***	***	***	266	***	240
17	348	***	192	69	89	119	72	122	223	330	265	294	290	332	256	***	286	***	***	***	***	66	307	***	331
18	340	***	80	261	221	336	39	76	107	148	165	189	***	***	***	***	51	***	38	41	121	141	68	31	236
19	39	45	79	73	70	66	73	89	80	52	93	117	223	83	127	174	298	286	276	***	269	102	***	167	348
20	99	122	153	117	93	103	135	93	116	125	101	156	190	180	223	219	232	***	***	***	***	***	***	***	43
21	***	***	***	***	305	281	137	61	127	179	208	189	176	178	***	250	***	***	***	***	***	***	272	257	188
22	308	314	272	317	30	88	117	125	95	73	97	251	267	***	***	281	263	***	***	***	***	277	235	232	167
23	***	237	261	327	258	***	***	340	266	359	166	259	266	278	***	***	294	282	278	***	***	***	***	226	229
24	73	***	***	***	***	***	104	94	19	277	69	256	***	***	234	***	***	***	***	***	***	239	257	1	161
25	352	272	4	55	292	86	75	92	60	4	296	182	241	***	***	245	***	***	***	***	***	***	***	***	96
26	278	***	229	***	111	66	21	331	315	253	***	213	283	304	288	307	247	292	263	***	***	***	85	***	336
27	224	117	116	103	105	140	113	***	141	194	274	273	265	246	261	261	***	***	***	***	280	22	171	65	352
28	65	136	106	99	113	142	100	77	91	82	140	173	145	145	144	120	***	308	***	***	281	***	***	289	158
29	278	239	***	1	71	113	129	135	40	162	153	165	127	***	***	***	***	***	***	***	***	***	295	270	238
30	***	157	356	160	***	***	117	148	161	152	140	118	151	274	251	285	***	***	***	***	***	***	***	255	346
31	127	97	***	***	128	133	155	148	156	147	157	251	155	292	273	306	***	***	***	***	***	***	***	***	342

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 70.6% OPERATIONAL RECOVERY RATE = 70.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.52	0.42	0.39	0.41	0.27	0.50	0.27	0.27	0.38	0.61	1.21	1.07	0.86	1.11	1.08	0.90	1.15	1.09	0.88	0.51	0.67	0.72	0.74	0.66	0.70
2	0.52	0.42	0.20	0.24	0.47	0.75	***	***	1.10	1.19	1.03	1.27	1.17	1.23	1.25	1.23	1.26	1.29	0.87	0.65	0.75	0.53	0.70	0.66	0.85
3	0.62	0.98	0.96	0.73	0.86	0.69	0.51	0.64	0.82	1.19	1.22	1.18	1.11	1.12	1.09	1.17	1.02	1.04	0.60	***	0.95	0.80	0.70	0.67	0.90
4	0.45	0.51	0.56	0.42	0.49	0.53	0.69	1.05	***	0.85	1.03	1.03	1.02	0.82	1.18	1.25	1.02	0.86	***	***	1.05	0.88	0.73	***	0.82
5	0.67	0.73	0.52	0.51	0.51	0.18	0.29	0.20	0.36	0.66	1.03	1.05	0.90	1.04	1.02	0.90	***	0.87	***	***	0.89	***	***	0.72	0.69
6	0.66	0.85	0.68	0.45	0.63	0.61	0.58	0.54	0.84	1.03	1.07	1.10	0.93	0.96	0.93	1.03	1.07	***	***	***	***	0.79	1.03	***	0.83
7	***	0.69	0.56	0.46	0.69	0.34	0.22	0.30	0.66	1.02	1.18	1.17	1.15	1.19	1.16	1.07	0.99	0.87	0.76	0.57	0.55	***	0.78	0.84	0.78
8	0.75	0.70	0.38	0.55	0.69	0.40	0.22	0.36	0.84	1.02	1.11	1.04	1.18	1.01	1.06	0.92	1.19	0.81	0.69	0.61	0.62	0.82	0.77	0.54	0.76
9	0.43	0.26	0.34	0.43	0.28	0.26	0.10	0.16	0.51	0.85	1.05	1.06	1.08	1.14	1.07	0.95	0.97	0.67	0.74	0.59	0.67	0.89	0.79	0.64	0.66
10	0.53	0.47	0.56	0.47	0.66	0.39	0.14	0.25	0.48	0.68	1.04	1.22	1.12	1.12	1.00	0.97	0.92	0.94	0.99	***	0.58	0.54	0.46	0.52	0.70
11	0.69	0.56	0.57	0.48	0.42	0.18	0.09	0.23	0.49	0.63	0.76	1.00	1.10	1.12	1.34	1.41	1.08	0.97	0.80	0.67	0.52	0.50	0.81	0.77	0.72
12	0.46	0.48	0.46	0.50	0.33	0.34	0.30	0.16	0.15	0.26	0.59	0.97	0.99	1.01	1.11	1.11	1.16	0.79	0.65	0.87	0.81	0.68	0.50	0.51	0.63
13	0.58	0.52	0.43	0.36	0.31	0.31	0.49	0.43	0.30	0.49	0.85	0.85	0.97	1.15	1.07	0.95	0.97	0.92	1.09	0.48	0.51	0.74	0.59	0.47	0.66
14	0.53	0.52	0.76	0.56	0.60	0.21	0.19	0.19	0.19	0.70	1.07	1.14	1.18	1.16	1.06	0.78	0.88	0.75	0.66	0.50	0.36	0.54	0.51	0.66	0.65
15	0.54	0.68	0.71	0.57	0.33	0.23	0.15	0.35	0.57	0.96	1.15	1.00	1.25	***	***	***	***	***	***	0.60	0.93	***	0.66	0.70	0.67
16	0.95	0.98	0.64	0.58	0.55	0.21	0.19	0.11	0.56	0.99	1.14	1.41	1.40	1.27	1.12	0.90	0.88	0.99	***	***	***	0.49	0.57	0.85	0.80
17	0.84	0.67	0.58	0.48	0.49	0.31	0.25	0.27	0.57	0.63	0.88	0.87	1.07	0.86	1.08	1.01	1.17	0.99	0.93	***	0.56	0.72	0.77	0.55	0.72
18	0.55	0.52	0.60	0.54	0.75	0.34	0.21	0.38	0.68	0.94	1.09	1.03	0.62	***	1.01	1.18	1.08	0.75	0.72	0.64	0.66	0.86	0.79	0.75	0.73
19	0.62	0.63	0.61	0.68	0.59	0.48	0.38	0.44	0.67	0.81	0.97	1.17	1.22	1.02	1.27	1.31	1.14	0.93	0.71	0.63	0.55	0.52	***	0.51	0.78
20	0.59	0.60	0.42	0.61	0.43	0.27	0.29	0.27	0.51	0.88	1.13	1.01	1.11	1.09	1.09	1.22	1.12	***	***	***	0.80	0.69	0.77	***	0.75
21	***	0.59	0.51	0.41	0.42	0.37	0.18	0.45	0.75	0.82	0.81	0.95	1.02	1.11	1.18	1.00	1.01	0.93	***	***	***	0.66	0.51	0.59	0.71
22	0.67	0.47	0.33	0.32	0.18	0.06	0.15	0.22	0.56	0.95	0.94	0.91	1.05	1.16	1.02	1.14	1.14	0.85	1.07	0.72	0.60	0.21	0.36	0.42	0.65
23	0.40	0.70	0.69	0.55	0.27	0.14	0.32	0.44	0.96	0.85	0.93	1.19	1.22	1.19	1.28	0.96	0.97	1.15	0.89	0.60	0.77	0.67	0.63	0.67	0.77
24	0.59	0.62	0.55	0.41	0.45	0.41	0.26	0.29	0.89	0.84	1.06	1.04	0.92	1.01	0.63	1.07	1.23	1.02	0.98	0.78	0.62	0.35	0.50	0.59	0.71
25	0.80	0.67	0.58	0.39	0.51	0.17	0.06	0.42	0.60	1.03	1.06	1.11	1.15	1.31	1.29	0.94	***	***	***	***	0.84	0.75	0.93	0.91	0.78
26	0.74	0.81	1.07	0.86	0.64	0.53	0.38	0.44	0.86	1.23	***	1.09	1.27	1.21	1.18	1.12	1.17	1.16	0.85	0.63	0.74	0.83	0.74	0.85	0.89
27	0.54	0.53	0.50	0.38	0.39	0.27	0.23	0.14	0.22	0.72	0.85	1.05	1.08	1.08	1.17	1.15	1.15	1.06	0.89	0.66	0.51	0.71	0.66	0.65	0.69
28	0.52	0.69	0.56	0.37	0.33	0.25	0.28	0.16	0.23	0.58	0.80	1.02	1.22	1.09	1.16	1.07	1.09	0.92	0.80	***	0.70	0.65	0.68	0.65	0.69
29	0.59	0.80	0.66	0.59	0.56	0.08	0.33	0.52	0.62	0.85	0.84	1.13	1.11	1.07	1.05	0.87	1.12	***	0.98	0.73	0.61	0.54	0.77	0.70	0.74
30	0.62	0.66	0.77	0.68	0.46	0.11	0.03	0.31	0.54	0.96	1.15	1.01	1.07	1.44	1.11	1.02	0.90	0.97	1.09	***	0.73	0.63	0.72	0.66	0.77
31	0.43	0.50	0.75	0.63	0.45	0.45	0.52	0.37	0.57	0.79	1.18	1.14	1.07	***	1.24	1.03	1.04	0.81	0.82	***	0.50	0.53	0.69	0.74	0.74
HRAVE	0.60	0.62	0.58	0.50	0.48	0.33	0.28	0.35	0.58	0.84	1.01	1.07	1.08	1.11	1.11	1.05	1.07	0.94	0.85	0.64	0.68	0.65	0.68	0.66	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.70	0.85	0.90	0.82	0.69	0.83	0.78	0.76	0.66	0.70	0.72	0.63	0.66	0.65	0.67	0.80	0.72	0.73	0.78	0.75	0.71	0.65	0.77	0.71	0.78
MAX	1.21	1.29	1.22	1.25	1.05	1.10	1.19	1.19	1.14	1.22	1.41	1.16	1.15	1.18	1.25	1.41	1.17	1.18	1.31	1.22	1.18	1.16	1.28	1.23	1.31
MIN	0.27	0.20	0.51	0.42	0.18	0.45	0.22	0.22	0.10	0.14	0.09	0.15	0.30	0.19	0.15	0.11	0.25	0.21	0.38	0.27	0.18	0.06	0.14	0.26	0.06

DAY	26	27	28	29	30	31
AVE	0.89	0.69	0.69	0.74	0.77	0.74
MAX	1.27	1.17	1.22	1.13	1.44	1.24
MIN	0.38	0.14	0.16	0.08	0.03	0.37

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 93.1% OPERATIONAL RECOVERY RATE = 93.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
MAY - 2016

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.70	0.75	0.71	0.56	0.37	0.36	0.26	0.17	0.33	0.56	1.27	1.01	0.82	1.24	1.37	0.90	0.98	0.91	0.65	0.38	1.00	0.87	0.75	0.67	0.73
2	0.55	0.58	0.41	0.30	0.51	0.64	***	***	***	1.14	***	1.19	0.99	1.36	1.15	1.09	0.99	1.22	1.07	0.71	0.74	0.68	0.74	0.74	0.84
3	0.69	0.72	0.78	0.82	0.80	0.73	0.52	0.56	1.03	1.27	1.00	1.16	1.16	***	1.14	1.19	1.09	1.04	***	***	0.77	***	0.81	0.77	0.90
4	0.46	0.63	0.63	0.70	0.60	0.68	0.74	1.02	***	***	***	1.12	1.24	1.07	1.30	1.18	***	1.01	***	***	1.19	1.02	0.67	***	0.90
5	0.58	0.69	0.66	0.53	0.63	0.28	0.34	0.15	0.50	0.74	0.99	1.04	0.93	0.98	0.87	0.84	***	0.92	***	***	0.78	***	***	1.09	0.71
6	0.86	0.97	0.73	0.66	0.71	***	0.53	0.51	0.72	1.18	1.19	1.15	0.97	***	1.06	1.10	1.01	***	***	***	***	1.43	1.27	***	0.94
7	***	***	0.61	0.79	0.79	0.34	0.35	0.33	0.67	0.94	1.38	1.07	1.44	1.13	1.21	1.09	0.84	0.80	0.74	***	0.61	***	0.53	0.80	0.82
8	0.75	0.73	0.66	0.81	0.71	0.31	0.38	0.31	0.66	0.89	1.11	0.86	0.99	0.92	1.07	0.91	1.10	0.75	***	***	0.74	0.63	0.62	0.51	0.75
9	0.51	0.50	0.43	0.41	0.62	0.64	0.48	0.21	0.74	0.78	1.29	1.07	0.99	1.05	1.09	1.10	1.11	0.84	1.05	***	0.83	0.74	0.75	0.77	0.78
10	0.58	0.45	0.41	0.48	0.77	0.52	0.39	0.14	0.24	0.75	0.88	1.20	1.02	1.19	1.02	1.06	0.99	0.88	0.98	***	***	0.70	0.63	0.55	0.72
11	0.67	0.49	0.56	0.56	0.45	0.11	0.41	0.09	0.38	0.46	0.99	1.07	1.19	1.13	1.21	1.29	1.03	1.06	***	0.60	0.47	***	0.63	0.69	0.71
12	0.62	0.50	0.50	0.27	0.34	0.22	0.04	0.26	0.30	0.26	0.60	0.97	1.10	0.90	0.94	***	1.21	0.84	***	1.03	1.27	0.67	0.57	0.62	0.64
13	0.61	0.56	0.40	0.45	0.37	0.33	0.38	0.50	0.60	0.46	0.63	0.85	0.90	1.04	***	0.61	***	0.77	***	***	0.61	0.66	0.60	0.52	0.59
14	0.40	0.54	0.59	0.57	0.64	0.07	0.02	0.23	0.11	0.69	0.85	1.09	1.29	1.32	1.18	1.15	0.82	0.58	0.66	0.60	0.56	0.60	0.49	0.68	0.66
15	0.69	0.63	0.61	0.58	0.46	0.32	0.32	0.50	0.46	0.93	1.05	***	***	***	***	***	***	***	***	***	***	***	0.64	0.83	0.62
16	0.99	1.02	0.59	0.75	0.55	0.17	0.35	0.09	0.62	0.97	1.20	1.42	1.58	1.50	1.21	0.86	0.77	***	***	***	***	***	***	***	0.86
17	0.89	0.91	0.62	0.44	0.57	0.24	0.17	0.23	0.75	0.68	0.88	1.07	1.06	***	0.94	1.21	1.04	0.85	***	***	0.65	0.68	0.65	0.68	0.72
18	0.71	0.61	0.86	0.61	0.71	0.55	0.19	0.33	0.48	0.88	1.06	1.01	0.70	***	1.18	1.16	1.19	0.70	0.50	0.50	0.96	0.91	0.78	0.89	0.76
19	0.93	0.79	0.62	0.62	0.55	0.34	0.35	0.42	0.70	0.78	0.89	1.09	1.18	0.99	1.52	1.39	1.15	1.00	0.88	***	***	0.84	***	0.63	0.84
20	0.70	0.51	0.47	0.59	0.49	0.57	0.37	0.20	0.54	0.82	1.11	1.13	1.06	1.14	1.24	1.34	0.85	***	***	***	0.57	***	***	***	0.76
21	***	0.78	0.76	0.70	0.35	0.32	0.22	0.51	0.84	1.00	0.96	0.85	1.18	1.07	***	0.77	0.93	***	***	***	***	0.58	0.60	0.65	0.73
22	0.84	0.41	0.33	0.31	0.29	0.03	0.13	0.30	0.62	0.96	0.85	0.77	1.07	1.19	1.06	1.24	***	***	***	***	0.54	0.40	0.57	0.40	0.62
23	0.42	0.73	0.77	0.64	0.26	0.10	0.21	0.37	0.93	0.78	0.86	1.08	1.08	1.23	1.59	0.88	1.11	1.21	0.93	***	0.61	0.61	***	0.66	0.78
24	0.75	0.69	0.55	0.54	0.42	0.45	0.32	0.28	0.78	0.80	1.02	1.00	0.84	0.87	0.72	0.96	***	***	***	***	***	0.29	0.50	0.59	0.65
25	0.69	0.70	0.70	0.55	0.66	0.07	0.21	0.15	0.50	0.87	1.10	1.00	1.05	1.05	1.32	***	***	***	***	***	0.39	***	1.00	***	0.71
26	0.86	0.91	1.14	0.70	0.59	0.48	0.37	0.49	1.01	1.09	***	1.14	1.09	***	1.16	1.25	1.05	1.12	0.91	***	1.08	0.97	0.71	0.61	0.89
27	0.54	0.57	0.47	0.48	0.32	0.25	0.10	0.15	0.51	0.78	1.17	1.12	1.10	1.09	1.13	1.27	1.36	1.07	1.06	***	0.38	0.70	0.68	0.64	0.74
28	0.49	0.74	0.57	0.49	0.30	0.30	0.24	0.07	0.75	0.57	0.81	1.03	1.20	1.16	1.26	1.02	***	1.13	***	***	***	0.54	0.60	0.70	0.70
29	0.61	0.76	0.59	0.42	0.64	0.21	0.29	0.43	0.61	0.73	0.93	1.04	***	***	***	***	0.62	***	***	***	0.60	0.67	0.76	0.78	0.63
30	0.65	0.69	0.66	0.60	0.65	0.25	0.11	0.38	0.55	0.90	1.02	1.01	1.26	1.64	0.98	1.27	***	0.74	0.72	***	0.63	0.66	0.62	0.69	0.76
31	0.71	0.54	0.61	0.58	0.38	0.41	0.35	0.29	0.69	0.74	1.07	1.05	1.03	***	1.09	1.02	1.12	***	***	***	0.47	***	0.69	0.56	0.71
HRAVE	0.67	0.67	0.61	0.56	0.53	0.34	0.30	0.32	0.61	0.81	1.01	1.06	1.09	1.14	1.15	1.08	1.02	0.93	0.85	0.64	0.72	0.72	0.69	0.68	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.73	0.84	0.90	0.90	0.71	0.94	0.82	0.75	0.78	0.72	0.71	0.64	0.59	0.66	0.62	0.86	0.72	0.76	0.84	0.76	0.73	0.62	0.78	0.65	0.71
MAX	1.37	1.36	1.27	1.30	1.09	1.43	1.44	1.11	1.29	1.20	1.29	1.27	1.04	1.32	1.05	1.58	1.21	1.19	1.52	1.34	1.18	1.24	1.59	1.02	1.32
MIN	0.17	0.30	0.52	0.46	0.15	0.51	0.33	0.31	0.21	0.14	0.09	0.04	0.33	0.02	0.32	0.09	0.17	0.19	0.34	0.20	0.22	0.03	0.10	0.28	0.07

DAY	26	27	28	29	30	31
AVE	0.89	0.74	0.70	0.63	0.76	0.71
MAX	1.25	1.36	1.26	1.04	1.64	1.12
MIN	0.37	0.10	0.07	0.21	0.11	0.29

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 83.7% OPERATIONAL RECOVERY RATE = 83.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
MAY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.70	0.71	0.80	0.58	0.39	0.38	0.26	0.22	0.38	0.54	1.35	1.01	0.88	1.07	1.30	1.01	0.88	***	0.63	***	1.17	0.92	0.77	0.67	0.76
2	0.57	0.61	0.44	0.32	0.46	0.46	***	***	***	***	***	***	***	***	***	***	0.80	***	0.99	***	***	***	0.83	0.60	0.61
3	0.69	***	0.73	***	***	0.71	0.51	0.48	***	***	0.82	1.25	***	***	***	1.15	***	***	***	***	***	***	0.62	0.77	0.77
4	0.47	0.63	0.71	0.76	0.65	0.72	0.76	0.99	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.71
5	0.61	0.68	0.70	0.57	0.62	0.27	0.32	0.14	0.49	0.87	***	***	***	***	***	***	***	***	***	***	***	***	***	1.32	0.60
6	***	1.09	0.77	0.68	0.59	***	***	0.64	0.76	1.23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.82
7	***	***	***	0.86	0.56	***	0.31	0.33	0.68	0.89	1.24	1.16	1.57	1.12	***	1.04	0.79	0.78	***	***	***	***	0.50	0.78	0.84
8	***	***	0.80	0.81	0.64	0.30	0.40	***	0.66	0.86	1.16	0.87	0.99	***	0.87	0.94	1.14	***	***	***	***	0.65	0.64	0.47	0.76
9	0.57	0.53	0.44	0.45	0.55	0.59	0.40	0.18	0.66	0.75	1.31	1.08	0.76	***	***	***	***	***	***	***	0.79	0.73	0.71	0.76	0.66
10	0.55	0.47	0.38	0.46	0.82	0.52	0.37	0.15	0.26	0.72	0.75	1.27	1.09	***	***	***	***	***	***	***	***	0.68	0.66	0.57	0.61
11	0.71	0.50	0.54	0.60	0.43	0.11	0.39	0.10	0.42	0.47	1.09	***	***	***	***	1.09	***	***	***	***	***	***	0.73	0.62	0.56
12	0.68	0.57	0.54	0.26	***	0.22	0.03	0.24	0.30	0.30	0.60	***	***	***	***	***	***	***	***	***	***	***	***	0.70	0.40
13	***	***	***	***	0.43	0.38	0.39	0.51	0.56	0.48	0.55	***	***	***	***	***	***	***	***	***	***	***	0.57	***	0.48
14	0.39	0.58	0.62	0.60	0.66	0.08	0.02	0.22	0.10	0.64	0.83	1.23	1.28	***	***	1.51	***	***	***	0.70	0.65	0.63	0.51	0.63	0.63
15	0.70	0.61	0.58	0.58	0.49	0.26	0.35	0.53	0.46	***	0.71	***	***	***	***	***	***	***	***	***	***	***	***	***	0.53
16	***	1.18	***	0.86	***	0.16	0.37	0.08	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.53
17	1.00	***	0.58	0.37	0.66	0.23	0.15	0.22	0.75	0.68	0.74	0.99	***	***	0.72	***	***	***	***	***	***	0.69	0.61	***	0.60
18	0.65	***	0.91	0.71	0.73	0.53	0.18	0.34	0.49	0.96	0.99	***	***	***	***	***	***	***	0.47	0.44	0.92	0.90	0.80	0.93	0.68
19	0.96	0.80	0.57	0.57	***	***	0.33	0.44	0.75	0.71	0.96	1.13	1.12	1.02	1.78	1.32	1.21	1.17	***	***	***	***	***	0.79	0.92
20	0.73	0.56	0.53	0.60	0.50	0.61	0.40	0.19	0.58	0.85	1.17	1.25	1.03	1.11	***	***	***	***	***	***	***	***	***	***	0.72
21	***	***	***	***	***	0.33	0.22	0.49	0.71	0.91	1.01	0.88	1.17	***	***	***	***	***	***	***	***	***	0.64	0.67	0.70
22	0.87	0.44	0.34	0.32	0.33	0.03	0.13	0.28	0.59	0.97	***	***	***	***	***	***	***	***	***	***	***	***	0.64	0.36	0.44
23	***	0.73	0.81	0.61	0.27	***	***	0.35	1.01	***	0.95	1.09	0.95	***	***	***	***	***	***	***	***	***	***	0.73	0.75
24	***	***	***	***	***	***	***	0.30	0.68	***	0.97	1.03	***	***	***	***	***	***	***	***	***	***	0.49	0.51	0.66
25	0.69	0.67	0.71	0.69	***	0.07	0.17	0.16	0.48	0.86	1.00	***	***	***	***	***	***	***	***	***	***	***	***	***	0.55
26	***	***	***	***	0.61	***	0.40	0.47	1.01	1.04	***	1.20	***	***	***	***	***	***	***	***	***	***	0.74	***	0.78
27	0.57	0.56	0.45	***	***	***	0.12	***	0.47	0.83	1.27	1.11	1.13	***	1.34	***	***	***	***	***	***	0.77	0.71	0.64	0.77
28	0.50	0.72	***	0.48	0.28	***	0.25	0.07	0.71	0.59	0.90	1.14	***	***	***	***	***	***	***	***	***	***	***	***	0.56
29	***	0.85	***	0.42	0.72	0.31	0.25	0.48	0.58	0.72	0.94	***	***	***	***	***	***	***	***	***	***	***	***	***	0.59
30	***	***	0.69	0.50	***	***	0.01	0.19	***	0.97	***	***	1.44	***	1.08	***	***	***	***	***	***	***	***	0.76	0.71
31	0.62	0.55	***	***	***	***	0.28	***	0.62	***	***	1.02	***	***	***	***	***	***	***	***	***	***	***	***	0.62
HRAVE	0.66	0.67	0.62	0.57	0.54	0.35	0.29	0.33	0.58	0.78	0.97	1.10	1.12	1.08	1.18	1.15	0.96	0.97	0.70	0.57	0.88	0.75	0.66	0.70	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.76	0.61	0.77	0.71	0.60	0.82	0.84	0.76	0.66	0.61	0.56	0.40	0.48	0.63	0.53	0.53	0.60	0.68	0.92	0.72	0.70	0.44	0.75	0.66	0.55
MAX	1.35	0.99	1.25	0.99	1.32	1.23	1.57	1.16	1.31	1.27	1.09	0.70	0.57	1.51	0.71	1.18	1.00	0.99	1.78	1.25	1.17	0.97	1.09	1.03	1.00
MIN	0.22	0.32	0.48	0.47	0.14	0.59	0.31	0.30	0.18	0.15	0.10	0.03	0.38	0.02	0.26	0.08	0.15	0.18	0.33	0.19	0.22	0.03	0.27	0.30	0.07

DAY	26	27	28	29	30	31
AVE	0.78	0.77	0.56	0.59	0.71	0.62
MAX	1.20	1.34	1.14	0.94	1.44	1.02
MIN	0.40	0.12	0.07	0.25	0.01	0.28

MONTHLY AVERAGE = 0.7 MONTHLY MAXIMUM = 1.8 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 48.4% OPERATIONAL RECOVERY RATE = 48.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Speed (m/s)
JUNE - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.8	3.5	3.3	4.0	3.8	2.9	3.0	2.5	2.1	3.4	4.4	4.0	5.2	5.2	5.5	6.8	6.6	6.3	6.9	6.0	4.9	4.1	3.5	4.0	4.4
2	3.4	3.7	4.6	4.8	4.6	3.9	3.3	2.6	2.7	2.7	3.7	4.9	5.2	5.2	5.6	5.7	7.6	8.6	***	7.3	5.4	4.2	3.5	3.3	4.6
3	3.7	3.6	3.5	2.9	3.1	3.3	2.6	2.4	2.2	1.8	3.4	6.1	6.1	6.5	6.2	6.5	6.6	***	8.4	***	5.5	7.3	6.0	4.4	4.6
4	3.0	3.5	5.1	4.2	2.8	2.6	3.0	3.2	1.9	2.4	3.5	4.1	4.4	5.7	3.8	6.0	6.3	6.0	***	***	6.7	5.5	3.5	2.7	4.1
5	3.0	3.1	4.2	4.8	4.2	4.3	4.6	4.0	3.3	3.1	3.1	4.8	4.6	5.1	5.2	6.1	7.6	6.6	***	***	***	3.5	2.9	2.2	4.3
6	3.0	3.9	3.6	3.3	4.6	4.3	3.8	3.3	3.2	3.5	3.1	4.2	4.3	5.8	6.7	8.1	7.2	8.2	***	***	8.4	***	4.9	4.9	4.9
7	6.8	6.2	4.2	2.9	3.3	2.8	3.3	3.5	2.5	3.7	3.2	4.5	4.4	6.5	7.0	8.1	6.9	6.8	7.8	6.6	6.3	5.0	4.2	4.6	5.0
8	3.6	4.5	4.6	2.6	2.5	2.3	1.3	1.8	2.3	3.5	4.5	4.8	4.5	5.5	6.3	7.3	7.7	7.8	7.5	7.3	5.7	4.2	4.1	5.4	4.6
9	8.2	8.1	5.4	5.6	5.5	6.3	4.7	3.8	5.5	5.2	5.4	6.7	6.5	7.5	7.9	8.3	8.1	7.8	8.9	***	5.9	4.6	4.5	4.8	6.3
10	4.9	6.2	4.2	4.9	5.0	4.6	4.5	2.3	2.5	4.7	5.5	5.7	6.7	7.8	9.3	***	***	6.5	5.4	4.7	***	***	4.2	3.7	5.2
11	4.4	3.4	2.8	3.9	2.7	3.4	3.4	3.9	3.4	3.2	3.2	3.5	3.7	4.3	5.3	6.2	2.9	3.5	3.2	2.6	2.0	2.1	3.3	5.0	3.6
12	6.1	4.1	4.3	4.5	2.6	2.2	3.1	3.5	3.3	3.1	3.8	4.2	4.3	4.4	3.6	5.6	7.6	8.3	8.5	9.1	6.6	6.3	4.5	5.6	5.0
13	4.7	3.2	1.6	1.0	0.9	2.6	2.8	2.5	2.5	3.0	4.6	4.2	6.6	7.6	7.4	5.7	7.2	8.1	9.2	***	7.6	6.4	7.1	6.9	4.9
14	6.6	3.3	2.6	2.4	3.1	3.9	3.5	2.3	2.2	2.5	3.8	4.1	4.2	4.6	4.6	4.4	6.6	7.6	7.3	***	***	3.2	3.4	3.3	4.1
15	3.8	3.6	3.4	3.5	3.6	3.6	4.0	3.7	3.3	2.9	3.5	4.1	4.3	7.2	7.9	7.5	6.9	***	***	9.1	7.7	7.0	8.1	7.8	5.3
16	5.8	3.5	2.5	2.4	3.3	2.9	2.5	2.4	2.5	3.1	3.7	4.4	4.4	6.3	5.9	6.8	7.4	7.2	6.2	***	***	3.5	3.4	2.5	4.2
17	1.9	2.5	3.1	2.8	3.4	3.8	2.6	2.7	2.3	2.9	3.2	3.7	4.4	4.9	6.6	8.0	6.8	6.3	5.7	***	5.1	4.6	2.0	1.9	4.0
18	2.5	3.1	2.9	2.5	2.2	4.5	5.0	4.2	3.1	3.0	3.7	4.2	4.8	5.4	6.1	6.3	6.5	8.2	8.8	8.5	6.1	7.0	5.1	3.4	4.9
19	***	3.3	3.2	4.0	3.6	3.3	2.5	1.9	1.1	1.0	2.9	3.8	4.3	4.8	4.6	7.1	8.3	7.6	8.0	***	7.9	6.9	3.3	2.8	4.4
20	4.0	3.7	3.3	3.4	3.5	4.3	6.3	5.4	3.8	3.3	4.6	5.0	5.9	5.0	4.4	3.8	5.4	7.5	9.3	***	***	4.3	3.8	3.8	4.7
21	3.2	4.8	3.3	2.9	1.7	1.9	1.6	1.5	2.3	4.2	4.2	4.7	6.3	5.9	6.8	7.4	7.3	7.5	7.6	7.5	6.4	5.0	5.9	6.1	4.8
22	5.1	4.7	3.4	2.3	***	3.1	1.6	1.6	2.9	3.7	4.7	6.9	7.0	6.9	8.1	7.8	6.5	6.2	6.4	6.7	5.0	4.1	4.1	4.2	4.9
23	4.5	3.3	2.9	2.8	3.1	1.7	1.2	2.2	2.6	3.4	3.2	4.1	4.7	6.2	6.3	7.0	5.6	2.7	2.3	***	2.8	3.2	2.5	2.0	3.5
24	2.8	2.6	2.7	2.2	1.9	1.5	2.3	3.1	3.6	3.0	3.1	4.3	4.1	4.5	4.6	6.5	6.0	7.2	7.2	6.1	5.1	6.9	8.2	6.7	4.4
25	6.2	5.6	3.7	3.1	2.9	3.0	2.2	2.1	2.6	2.4	2.0	3.1	3.9	3.7	3.7	4.5	4.5	4.6	4.0	5.3	6.7	8.2	***	8.6	4.2
26	4.6	3.0	4.3	6.7	5.8	3.8	4.2	4.4	3.5	3.4	4.3	5.0	6.2	4.1	3.0	4.6	4.7	4.5	5.6	4.2	2.7	2.4	4.3	6.2	4.4
27	5.0	3.8	2.9	3.2	3.6	3.1	4.3	4.4	3.8	3.2	3.7	4.1	4.5	3.9	4.6	5.1	5.0	4.4	4.8	6.4	2.9	4.5	2.2	2.2	4.0
28	3.1	3.1	3.6	4.0	3.7	5.2	5.5	5.8	6.9	4.9	5.1	5.2	5.0	5.2	4.5	3.7	5.1	4.3	4.7	5.7	5.3	6.3	6.7	7.7	5.0
29	4.8	10.1	9.6	7.1	4.0	4.2	4.5	4.0	3.4	3.3	2.9	3.4	4.3	5.1	4.5	5.2	4.0	4.3	4.4	3.3	3.2	3.9	5.5	6.8	4.8
30	4.4	3.8	***	***	7.1	5.3	5.3	4.6	3.8	3.5	4.2	3.1	3.5	3.9	2.5	2.9	2.2	2.1	2.7	4.0	3.4	4.0	3.7	3.3	3.8
HRAVE	4.4	4.2	3.8	3.6	3.5	3.5	3.4	3.2	3.0	3.2	3.8	4.5	4.9	5.5	5.6	6.2	6.3	6.3	6.4	6.1	5.4	4.9	4.4	4.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.4	4.6	4.6	4.1	4.3	4.9	5.0	4.6	6.3	5.2	3.6	5.0	4.9	4.1	5.3	4.2	4.0	4.9	4.4	4.7	4.8	4.9	3.5	4.4	4.2
MAX	6.9	8.6	8.4	6.7	7.6	8.4	8.1	7.8	8.9	9.3	6.2	9.1	9.2	7.6	9.1	7.4	8.0	8.8	8.3	9.3	7.6	8.1	7.0	8.2	8.6
MIN	2.1	2.6	1.8	1.9	2.2	3.0	2.5	1.3	3.8	2.3	2.0	2.2	0.9	2.2	2.9	2.4	1.9	2.2	1.0	3.3	1.5	1.6	1.2	1.5	2.0

DAY	26	27	28	29	30	31
AVE	4.4	4.0	5.0	4.8	3.8	***
MAX	6.7	6.4	7.7	10.1	7.1	***
MIN	2.4	2.2	3.1	2.9	2.1	***

MONTHLY AVERAGE = 4.6 MONTHLY MAXIMUM = 10.1 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 95.4% OPERATIONAL RECOVERY RATE = 95.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Speed (m/s)
JUNE - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.6	2.8	4.3	4.8	4.7	3.4	4.2	3.2	4.3	4.3	5.7	4.5	5.9	6.6	5.5	5.7	5.8	6.4	5.4	6.9	5.6	4.5	4.2	5.2	4.9
2	3.3	3.4	3.2	4.6	4.6	3.5	2.5	2.7	2.1	2.9	3.5	4.4	4.3	5.7	7.4	8.1	9.0	10.2	***	8.6	5.9	4.2	3.8	2.8	4.8
3	3.5	4.1	4.9	2.4	2.8	3.6	3.3	2.3	2.5	2.2	3.4	4.7	6.4	5.3	6.7	9.1	5.5	***	8.7	***	7.5	7.6	6.9	3.7	4.9
4	2.7	3.9	4.8	4.1	2.1	2.9	2.7	2.7	1.1	1.5	2.2	4.2	5.8	6.1	5.4	6.6	7.6	4.5	***	***	6.5	6.5	4.5	3.1	4.2
5	3.1	2.9	3.2	4.3	4.4	3.9	4.2	4.7	4.4	3.2	3.2	3.4	4.2	7.3	5.3	6.7	9.1	7.0	***	***	***	4.1	3.2	2.0	4.5
6	2.1	3.6	4.4	4.0	3.9	4.1	3.4	3.5	2.9	3.6	4.0	4.3	5.4	4.2	9.6	9.5	9.3	13.4	***	***	7.6	***	5.2	4.2	5.4
7	7.1	6.0	5.1	2.9	2.7	2.7	2.7	3.1	3.0	4.6	4.7	6.9	6.1	6.5	7.0	9.0	7.5	6.5	7.7	5.2	6.0	5.1	7.6	5.0	5.4
8	3.7	5.3	6.0	2.8	2.9	3.3	2.3	2.1	2.0	4.0	3.8	4.8	5.3	6.1	7.2	7.6	7.9	8.2	8.1	7.7	5.9	4.3	4.5	6.1	5.1
9	8.5	8.3	5.8	6.3	5.0	5.9	4.8	4.4	4.7	4.3	4.3	6.3	7.3	8.1	8.6	8.4	7.3	8.4	8.8	***	8.0	5.1	5.6	6.1	6.5
10	5.2	5.8	5.0	4.2	4.9	5.1	4.2	2.2	2.6	4.3	5.3	5.5	7.9	8.9	9.6	***	***	9.1	4.9	4.0	***	***	3.3	3.8	5.3
11	3.9	3.9	3.5	4.4	2.8	3.1	3.1	3.5	3.6	3.1	3.8	3.8	3.8	4.1	5.2	6.2	2.2	2.8	2.9	2.7	2.3	3.0	4.9	6.4	3.7
12	5.6	4.0	4.5	4.1	2.9	2.1	2.4	2.9	3.0	3.5	4.4	6.3	5.1	5.3	4.9	6.7	8.2	7.8	8.3	8.9	7.3	6.3	5.4	4.7	5.2
13	4.0	3.8	3.1	3.0	3.1	1.9	2.1	1.8	1.6	2.8	4.7	5.8	5.1	5.4	6.5	5.6	7.6	8.9	7.8	***	8.5	7.0	7.8	6.2	5.0
14	6.4	3.2	2.5	1.6	2.7	3.9	2.4	2.0	2.5	2.4	4.2	4.9	3.3	6.6	5.1	6.1	6.7	6.9	9.6	***	***	3.8	2.9	3.5	4.2
15	3.9	3.4	4.0	4.6	5.0	3.3	3.8	3.8	5.1	3.0	3.7	4.6	4.8	7.6	7.1	7.7	8.5	***	***	14.8	7.1	6.6	7.8	8.3	5.8
16	6.2	4.4	2.0	1.9	1.7	2.7	2.2	2.0	2.3	3.8	3.8	4.3	3.2	5.6	6.7	9.4	6.8	8.4	6.5	***	***	5.4	4.4	3.1	4.4
17	3.0	1.9	2.5	4.3	3.5	3.3	1.5	1.9	2.4	2.1	3.5	4.5	4.3	4.3	6.1	7.6	6.7	8.6	7.2	***	4.2	4.5	2.3	1.7	4.0
18	2.8	3.3	2.2	1.9	2.8	3.8	4.7	3.8	4.5	3.9	4.0	4.0	4.2	5.7	6.5	6.5	7.7	9.8	9.4	9.6	6.7	6.7	4.9	3.4	5.1
19	***	3.9	3.3	4.7	4.1	3.0	2.4	1.9	1.6	1.1	2.8	4.8	5.8	5.3	6.6	7.4	8.8	7.6	6.7	***	8.4	6.4	2.9	3.3	4.7
20	3.5	3.1	2.4	3.0	3.7	3.8	6.0	5.6	3.6	3.4	3.6	5.9	6.0	4.7	5.6	4.5	6.4	7.6	6.6	***	***	5.5	3.5	3.8	4.6
21	4.0	4.4	3.5	2.3	2.2	2.3	1.3	2.6	2.1	3.4	4.3	4.7	6.4	8.5	6.5	8.1	6.6	7.0	7.8	6.2	6.7	4.9	6.5	6.7	5.0
22	5.2	5.0	4.5	2.5	***	3.0	1.5	1.8	2.9	2.5	3.9	6.5	6.2	3.2	6.9	7.2	8.4	8.4	11.6	7.1	5.1	7.4	4.6	5.3	5.3
23	4.2	4.2	4.0	2.8	3.3	2.5	1.7	1.9	2.1	3.0	3.3	5.2	5.8	7.5	6.2	7.7	4.1	2.7	2.5	***	3.4	3.1	3.0	2.4	3.8
24	2.8	3.4	2.3	2.4	2.0	1.8	2.0	2.9	3.3	3.3	3.5	4.8	5.5	3.2	4.4	6.9	6.2	8.3	7.9	7.0	5.0	7.4	8.0	7.0	4.6
25	7.0	7.0	4.4	3.3	4.1	4.2	3.5	2.8	2.3	1.8	0.5	3.0	4.1	3.9	4.1	4.0	4.0	4.8	4.4	5.0	5.7	8.6	***	9.9	4.5
26	6.2	4.7	6.1	7.4	6.6	4.1	4.0	5.8	4.4	3.2	4.5	5.2	7.1	5.7	4.3	5.8	4.8	5.0	5.4	6.4	4.2	2.3	5.0	6.6	5.2
27	5.2	3.6	3.2	3.2	4.1	3.2	4.2	4.4	3.7	3.2	4.6	4.5	4.7	4.8	6.7	6.0	6.0	4.5	4.6	6.9	3.5	2.9	2.8	3.3	4.3
28	3.8	3.4	4.1	4.0	4.3	5.6	5.7	6.1	7.6	5.7	6.0	5.8	6.6	6.1	6.3	5.2	6.1	4.6	4.1	6.6	5.3	5.9	9.4	7.6	5.7
29	5.1	11.1	8.9	7.5	4.6	4.4	5.9	4.4	3.8	3.5	2.6	2.7	5.2	4.6	4.4	4.5	4.3	4.3	7.4	4.0	3.3	4.1	5.3	5.7	5.1
30	5.6	3.3	***	***	5.6	5.1	6.0	5.6	3.9	3.8	4.1	3.3	3.7	4.4	2.9	2.5	2.1	2.2	3.9	5.2	3.8	4.1	4.8	4.6	4.1
HRAVE	4.6	4.4	4.1	3.8	3.7	3.5	3.4	3.3	3.2	3.3	3.9	4.8	5.3	5.7	6.2	6.8	6.6	6.9	6.7	6.8	5.7	5.3	5.0	4.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.9	4.8	4.9	4.2	4.5	5.4	5.4	5.1	6.5	5.3	3.7	5.2	5.0	4.2	5.8	4.4	4.0	5.1	4.7	4.6	5.0	5.3	3.8	4.6	4.5
MAX	6.9	10.2	9.1	7.6	9.1	13.4	9.0	8.2	8.8	9.6	6.4	8.9	8.9	9.6	14.8	9.4	8.6	9.8	8.8	7.6	8.5	11.6	7.7	8.3	9.9
MIN	2.8	2.1	2.2	1.1	2.0	2.1	2.7	2.0	4.3	2.2	2.2	2.1	1.6	1.6	3.0	1.7	1.5	1.9	1.1	2.4	1.3	1.5	1.7	1.8	0.5

DAY	26	27	28	29	30	31
AVE	5.2	4.3	5.7	5.1	4.1	***
MAX	7.4	6.9	9.4	11.1	6.0	***
MIN	2.3	2.8	3.4	2.6	2.1	***

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 14.8 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 95.4% OPERATIONAL RECOVERY RATE = 95.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Speed (m/s)
JUNE - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	3.4	4.6	4.2	3.8	5.5	3.6	6.4	3.5	5.4	3.0	5.3	5.5	5.4	6.7	***	***	***	***	***	4.8	4.9	6.0	4.8
2	5.1	3.2	5.6	4.9	4.7	3.6	3.2	2.6	2.2	2.5	2.8	4.3	4.8	7.7	6.5	6.7	8.7	10.9	***	***	***	***	***	3.4	4.9
3	3.2	5.8	8.2	3.3	5.3	3.8	***	6.7	3.0	2.0	3.5	5.6	5.9	5.4	5.8	8.0	7.5	***	***	***	10.7	***	***	***	5.5
4	***	***	5.3	***	***	***	2.8	2.6	1.1	1.1	1.9	3.7	5.1	***	6.8	7.9	9.4	***	***	***	***	***	***	***	4.3
5	***	***	5.1	5.2	5.1	4.3	4.5	5.1	4.0	3.0	2.8	2.6	3.5	7.4	9.8	6.9	7.9	7.2	***	***	***	***	4.5	***	5.2
6	4.3	4.9	5.5	4.5	3.9	4.6	3.6	3.9	2.6	3.5	3.8	4.7	5.9	5.5	10.3	7.1	***	***	***	***	***	***	***	4.4	4.9
7	***	***	6.9	2.6	3.0	2.5	3.0	***	***	4.8	5.7	***	5.8	5.8	7.1	9.1	***	5.9	8.1	***	***	***	***	***	5.4
8	3.6	4.5	6.4	3.1	2.7	3.1	2.6	2.7	2.7	3.5	3.8	5.8	6.4	6.1	7.3	8.0	8.5	7.6	***	***	***	***	4.8	6.1	5.0
9	8.8	5.6	5.7	***	***	***	***	4.1	4.7	5.8	5.3	6.8	7.0	9.1	8.4	7.6	6.9	7.0	***	***	***	***	6.3	5.7	6.6
10	***	***	4.8	6.0	5.3	5.4	4.7	3.3	3.1	4.4	7.4	6.7	6.8	8.1	10.7	***	***	***	3.8	4.2	***	***	3.2	4.2	5.4
11	4.1	3.6	4.2	4.9	2.6	3.0	2.7	3.9	4.1	4.1	4.7	3.5	3.7	3.4	5.4	5.9	1.8	3.6	3.2	2.9	2.1	4.3	6.2	7.9	4.0
12	***	4.2	4.3	3.2	4.4	4.4	3.7	2.6	3.8	4.2	3.9	6.8	4.2	5.2	4.6	6.8	8.3	***	***	***	7.6	6.3	***	***	4.9
13	4.0	3.1	3.2	2.4	3.1	2.6	2.4	1.6	1.6	3.4	5.0	7.0	3.5	6.2	7.4	***	***	***	***	***	12.0	7.6	***	***	4.5
14	***	1.8	3.0	4.4	3.1	3.9	2.0	3.0	4.3	4.0	***	3.5	2.9	7.5	5.2	7.2	6.3	***	11.7	***	***	***	***	***	3.9	4.6
15	4.2	***	***	***	***	3.8	3.7	4.0	6.0	2.7	4.3	4.6	3.9	8.2	7.2	***	***	***	***	***	***	***	***	9.3	5.2
16	5.5	***	2.8	2.1	1.8	3.4	3.6	***	2.6	5.3	3.6	3.9	5.9	6.3	6.1	***	***	***	***	***	***	***	5.7	3.5	4.1
17	1.8	***	2.9	***	3.5	4.1	1.6	3.1	2.1	1.8	5.2	4.9	4.2	4.3	5.7	***	***	9.4	8.2	***	***	***	***	***	4.2
18	4.3	***	***	***	3.9	3.8	5.1	5.0	9.2	4.5	3.7	3.4	3.7	7.6	5.4	9.4	8.1	10.8	***	***	***	***	***	***	5.9
19	***	4.5	4.2	4.7	4.2	3.5	2.6	3.0	***	3.9	5.3	5.4	4.8	4.6	9.0	10.2	11.8	7.6	6.5	***	***	5.4	***	7.4	5.7
20	3.1	***	2.2	3.3	4.0	3.8	6.1	6.3	4.2	4.1	4.8	5.2	5.5	7.3	5.2	4.1	6.4	8.1	***	***	***	***	3.7	5.7	4.9
21	5.7	***	3.5	2.8	2.1	2.1	1.2	2.0	1.5	2.6	3.6	4.4	7.2	7.6	6.8	8.6	5.8	***	***	***	7.2	***	***	7.3	4.6
22	5.4	***	4.4	2.3	***	2.6	1.3	2.2	3.2	3.2	3.7	6.4	6.4	5.0	7.8	7.9	8.6	***	***	***	4.6	***	3.7	***	4.6
23	3.8	4.9	3.4	***	***	1.5	1.6	2.0	1.4	3.1	3.1	5.3	6.7	8.0	6.8	9.1	2.4	***	3.0	***	***	3.1	5.1	2.4	4.0
24	3.2	2.7	2.6	2.9	2.1	1.8	2.3	5.8	3.7	3.1	4.2	3.7	5.2	2.0	5.4	6.1	6.6	***	6.0	***	5.2	8.6	7.5	6.9	4.4
25	7.5	6.3	4.3	2.9	3.2	3.1	2.8	2.9	2.3	1.7	1.1	2.8	4.9	3.7	3.7	4.2	4.5	3.2	6.5	6.4	5.4	5.4	***	10.1	4.3
26	5.5	4.4	7.0	7.2	7.7	3.5	3.7	5.1	6.2	3.9	4.8	5.6	7.2	5.4	4.5	5.3	4.6	5.3	5.4	6.8	3.9	4.0	4.9	7.4	5.4
27	***	3.1	3.5	4.3	3.8	4.1	4.9	3.7	4.0	3.2	6.0	6.5	5.6	4.8	8.7	7.4	6.0	4.7	5.3	6.8	4.4	2.1	4.8	4.8	4.9
28	2.8	3.3	3.4	4.1	3.9	6.1	6.4	6.4	7.4	5.7	6.3	6.3	6.9	3.6	7.0	6.5	7.8	4.1	3.8	8.4	4.4	6.7	9.1	7.0	5.7
29	5.6	10.0	9.8	7.0	4.6	4.8	5.8	4.3	4.1	3.2	2.8	3.9	6.7	5.1	5.2	4.3	4.7	5.2	8.7	5.3	3.3	4.1	5.5	***	5.4
30	5.5	4.1	***	***	***	2.2	4.4	5.3	4.4	3.5	3.8	4.1	3.6	4.6	3.1	2.0	2.2	2.3	4.2	6.1	4.2	4.4	5.5	5.6	4.0
HRAVE	4.6	4.4	4.6	4.0	3.8	3.5	3.5	3.8	3.8	3.5	4.2	4.8	5.3	5.9	6.6	6.9	6.6	6.4	6.0	5.9	5.8	5.1	5.3	6.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.8	4.9	5.5	4.3	5.2	4.9	5.4	5.0	6.6	5.4	4.0	4.9	4.5	4.6	5.2	4.1	4.2	5.9	5.7	4.9	4.6	4.6	4.0	4.4	4.3
MAX	6.7	10.9	10.7	9.4	9.8	10.3	9.1	8.5	9.1	10.7	7.9	8.3	12.0	11.7	9.3	6.3	9.4	10.8	11.8	8.1	8.6	8.6	9.1	8.6	10.1
MIN	3.0	2.2	2.0	1.1	2.6	2.6	2.5	2.6	4.1	3.1	1.8	2.6	1.6	1.8	2.7	1.8	1.6	3.4	2.6	2.2	1.2	1.3	1.4	1.8	1.1

DAY	26	27	28	29	30	31
AVE	5.4	4.9	5.7	5.4	4.0	***
MAX	7.7	8.7	9.1	10.0	6.1	***
MIN	3.5	2.1	2.8	2.8	2.0	***

MONTHLY AVERAGE = 4.9 MONTHLY MAXIMUM = 12.0 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 76.2% OPERATIONAL RECOVERY RATE = 76.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Wind Direction (Degrees true)
JUNE - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	345	89	78	41	178	220	65	74	19	178	276	272	316	294	277	281	274	276	283	285	283	271	5	79	201
2	181	264	154	126	119	128	138	110	90	133	232	265	263	268	268	273	276	279	***	273	280	276	1	101	224
3	120	120	136	98	101	95	91	84	47	303	293	273	276	279	278	260	270	***	284	***	281	294	287	294	17
4	305	225	156	105	93	91	85	77	77	107	186	38	75	83	175	272	280	288	***	***	287	285	278	38	50
5	102	100	112	113	90	92	95	103	95	91	90	133	175	244	271	279	281	283	***	***	***	280	297	61	241
6	98	104	101	107	109	104	91	87	104	85	254	180	226	274	267	260	253	264	***	***	273	***	307	286	350
7	288	281	231	131	92	85	94	100	127	111	35	95	45	201	265	266	273	282	292	295	290	290	281	295	121
8	319	307	290	280	328	300	327	74	83	270	265	266	309	274	277	270	277	287	287	289	290	295	289	286	174
9	292	290	282	292	319	301	282	287	282	284	272	277	275	278	276	284	279	285	290	***	289	286	278	276	182
10	279	291	283	217	156	158	164	176	247	278	275	275	279	273	276	***	***	271	265	138	***	***	81	79	210
11	77	79	78	83	99	90	81	77	85	84	93	248	278	268	273	11	82	86	83	83	74	122	271	320	306
12	287	295	309	284	311	69	109	149	146	126	103	88	336	86	96	237	265	270	272	283	288	280	279	299	269
13	268	285	256	271	106	95	92	94	115	95	143	296	265	261	253	269	269	278	276	***	270	284	284	312	206
14	332	305	163	127	99	110	116	101	131	146	11	121	290	285	287	268	264	278	281	***	***	328	33	86	181
15	93	91	100	96	93	93	106	103	93	107	102	65	211	255	258	277	275	***	***	269	280	275	273	286	74
16	288	282	160	146	109	105	90	82	90	91	254	290	274	265	256	264	279	281	283	***	***	279	279	315	298
17	351	90	95	95	103	142	123	107	135	195	277	279	314	316	330	313	284	277	276	***	316	297	260	349	273
18	85	89	69	10	43	119	127	118	101	92	89	45	263	268	274	275	272	268	265	277	284	287	285	276	117
19	***	111	95	90	80	95	75	358	3	287	273	264	272	274	253	275	278	280	284	***	289	290	284	153	226
20	116	106	91	90	82	74	64	77	96	91	107	144	157	178	189	172	256	286	290	***	***	90	102	106	253
21	126	286	277	166	24	304	49	50	90	271	259	286	277	314	282	279	279	276	279	274	281	288	285	285	253
22	289	293	302	252	***	323	40	235	311	294	272	284	279	276	279	282	273	279	287	284	288	281	282	291	297
23	281	319	303	280	304	350	203	282	311	277	254	169	165	181	250	247	219	158	153	***	165	156	177	266	306
24	182	237	278	288	316	257	151	149	123	109	125	43	181	238	243	285	271	163	156	145	155	159	156	154	111
25	154	157	160	127	98	115	105	154	162	161	141	205	263	156	74	263	264	274	272	265	161	158	***	152	27
26	156	150	138	158	132	134	151	122	139	167	165	162	164	153	358	279	307	308	294	113	99	148	142	136	140
27	116	83	86	86	80	85	73	82	106	96	113	109	181	162	82	83	74	152	101	146	140	298	332	84	297
28	130	99	104	110	91	69	66	73	86	146	149	83	86	22	14	91	115	213	181	189	194	285	348	138	18
29	145	147	148	128	85	75	86	120	96	145	143	158	171	80	320	222	238	201	175	91	90	70	23	37	213
30	77	96	***	***	150	82	60	55	87	122	152	141	149	158	135	100	96	95	86	90	117	154	143	144	360

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 95.4% OPERATIONAL RECOVERY RATE = 95.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Wind Direction (Degrees true)
JUNE - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	340	68	73	356	161	205	97	86	104	163	321	266	317	278	285	280	285	276	299	287	282	267	109	78	6
2	171	40	113	142	129	92	94	79	60	101	324	264	270	287	282	274	287	282	***	267	274	273	345	99	71
3	133	125	132	105	108	86	86	90	70	332	281	269	280	270	286	275	234	***	290	***	285	295	294	233	144
4	291	222	145	115	107	85	88	70	147	120	47	66	55	100	188	276	263	273	***	***	287	273	299	38	241
5	93	89	98	128	95	87	86	100	82	77	88	119	188	189	254	288	268	280	***	***	***	270	303	42	148
6	116	105	77	106	136	115	86	85	82	84	199	165	225	251	273	260	259	259	***	***	277	***	314	327	298
7	293	281	348	121	101	87	111	115	132	105	65	88	37	227	258	269	280	293	286	303	289	301	256	300	129
8	331	297	301	288	321	345	332	348	15	278	255	273	303	320	282	282	285	278	276	287	290	303	289	278	195
9	277	284	274	288	310	293	283	284	329	1	288	273	282	274	275	270	285	295	294	***	291	287	280	277	134
10	274	289	276	226	168	167	166	205	278	282	269	276	277	272	263	***	***	257	255	155	***	***	71	84	132
11	88	73	68	72	85	87	81	83	87	71	96	277	295	290	273	0	29	77	107	91	72	180	265	300	150
12	290	248	277	311	314	27	92	129	157	152	88	92	13	68	88	262	278	277	272	292	290	282	275	292	234
13	269	313	108	3	298	55	85	10	91	59	118	329	249	269	277	262	270	273	273	***	282	281	279	314	41
14	331	50	179	137	96	115	111	116	184	141	26	130	344	2	313	291	263	282	282	***	***	346	64	92	45
15	93	88	94	108	109	74	106	113	118	99	102	350	202	254	261	298	266	***	***	248	284	273	275	286	225
16	289	287	149	158	111	119	103	87	101	82	8	270	289	265	258	280	277	287	288	***	***	289	281	312	147
17	292	59	94	108	130	136	133	104	152	183	212	285	292	327	325	341	277	271	264	***	312	318	293	359	268
18	125	90	60	359	42	116	137	114	94	99	70	86	269	269	269	267	266	262	265	277	280	291	286	272	45
19	***	95	95	80	89	90	78	343	326	219	283	277	264	265	262	277	305	270	293	***	287	285	301	185	183
20	119	107	125	82	84	79	61	80	102	113	99	115	140	173	193	132	247	273	292	***	***	79	99	115	7
21	183	299	285	179	71	298	339	341	6	332	250	305	277	311	300	259	289	281	282	290	280	288	284	284	274
22	285	289	306	261	***	308	337	343	293	341	183	281	272	283	284	279	283	273	296	282	282	264	280	276	172
23	275	309	337	289	309	297	270	305	285	291	238	138	161	164	221	229	219	171	145	***	159	171	208	274	237
24	225	300	291	286	323	276	165	154	139	167	109	31	112	243	1	295	274	162	163	150	158	153	152	155	94
25	161	158	165	116	117	125	142	163	169	160	200	187	273	42	36	277	252	255	261	277	159	160	***	149	49
26	158	166	151	135	137	143	167	154	138	119	157	133	157	134	349	304	297	336	290	86	123	149	136	139	11
27	103	85	95	101	77	77	83	97	94	103	103	134	159	142	80	77	81	109	94	153	207	335	42	351	293
28	65	85	80	88	84	68	72	80	87	141	130	75	96	25	8	42	128	186	181	189	179	264	23	140	23
29	110	144	142	129	80	75	68	99	79	91	105	142	161	57	17	212	223	210	194	163	76	50	5	53	75
30	81	104	***	***	161	97	63	54	85	109	125	96	154	133	158	156	97	88	86	95	108	150	135	139	350

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 95.4% OPERATIONAL RECOVERY RATE = 95.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Wind Direction (Degrees true)
JUNE - 2016

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	***	77	22	135	213	99	72	124	173	326	327	327	282	286	295	***	***	***	***	***	272	103	82	88
2	199	144	118	129	132	53	99	84	63	91	216	254	287	284	277	267	289	284	***	***	***	***	***	98	34
3	123	127	142	111	99	102	***	99	121	348	276	256	285	271	280	273	302	***	***	***	285	***	***	***	9
4	***	***	133	***	***	***	85	71	172	77	105	52	48	***	206	284	265	***	***	***	***	***	***	***	275
5	***	***	104	110	91	86	81	97	82	78	112	113	161	216	254	304	275	281	***	***	***	***	275	***	32
6	186	112	54	65	145	117	85	89	87	74	189	185	220	245	287	273	***	***	***	***	***	***	***	336	62
7	***	***	349	146	145	109	185	***	***	103	98	***	34	236	259	275	***	287	286	***	***	***	***	***	350
8	324	313	279	267	323	344	327	336	101	312	200	268	341	323	282	269	287	275	***	***	***	***	291	283	40
9	279	286	266	***	***	***	***	284	28	349	276	275	276	270	280	276	269	288	***	***	***	***	282	276	124
10	***	***	279	186	168	174	185	185	285	292	275	273	282	278	268	***	***	***	239	156	***	***	69	85	32
11	91	87	86	97	95	85	85	77	82	88	95	305	331	333	272	331	81	81	107	90	57	182	263	312	148
12	***	262	277	50	316	110	125	134	176	145	103	95	78	58	97	283	266	***	***	***	291	278	***	***	266
13	273	329	90	352	319	82	86	42	76	75	119	300	232	273	279	***	***	***	***	***	292	271	***	***	103
14	***	90	182	307	109	108	88	119	167	152	***	130	318	356	326	290	260	***	283	***	***	***	***	85	182
15	93	***	***	***	***	35	97	121	129	159	98	314	214	257	267	***	***	***	***	***	***	***	***	278	304
16	287	***	156	164	115	128	99	***	95	71	354	265	285	279	259	***	***	***	***	***	***	***	268	315	272
17	51	***	93	***	124	129	143	25	118	248	251	281	299	329	315	***	***	266	254	***	***	***	***	***	67
18	189	***	***	***	100	115	144	155	74	77	77	92	277	269	237	278	270	262	***	***	***	***	***	***	137
19	***	111	126	87	107	94	74	345	***	176	279	267	289	270	225	277	299	270	312	***	***	278	***	206	136
20	118	***	110	84	74	73	64	84	109	128	100	121	149	167	221	150	232	283	***	***	***	***	107	116	270
21	154	***	278	168	84	307	70	356	75	322	248	285	275	316	298	264	278	***	***	***	280	***	***	285	306
22	285	***	313	236	***	322	338	326	301	28	216	272	278	289	275	276	269	***	***	***	278	***	267	***	102
23	275	296	302	***	***	304	271	327	286	291	181	146	160	163	235	236	143	***	152	***	***	170	190	273	295
24	196	296	295	269	325	284	144	144	134	170	134	54	129	250	356	298	276	***	132	***	166	150	153	152	199
25	160	161	165	120	105	113	122	155	151	165	101	115	273	14	52	286	254	324	251	261	155	163	***	148	336
26	161	167	149	145	145	144	165	159	145	110	160	125	150	130	356	297	304	336	287	98	108	222	135	151	9
27	***	101	102	101	83	45	91	97	93	98	108	147	151	151	82	78	90	118	108	142	202	326	74	323	262
28	215	82	91	97	92	74	72	82	87	147	142	84	109	84	4	40	131	41	186	174	176	238	24	138	26
29	106	143	141	131	85	73	72	96	75	88	97	146	159	72	59	173	219	196	188	158	61	38	357	***	347
30	67	89	***	***	***	218	71	55	74	113	126	93	138	116	160	143	94	94	96	96	113	149	130	127	130

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 76.2% OPERATIONAL RECOVERY RATE = 76.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

100 meter Sigma W (m/s)
JUNE - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.67	0.66	0.63	0.66	0.42	0.37	0.66	0.34	0.64	0.90	0.97	1.02	1.03	1.08	1.19	1.12	0.90	0.85	0.71	0.65	0.53	0.35	0.47	0.55	0.72
2	0.65	0.72	0.43	0.46	0.30	0.44	0.24	0.30	0.42	0.63	0.87	1.06	1.04	0.99	1.09	1.12	1.03	0.77	***	0.62	0.40	0.34	0.66	0.69	0.66
3	0.42	0.46	0.40	0.38	0.43	0.15	0.14	0.31	0.52	0.56	0.86	1.08	1.05	1.02	1.16	1.04	***	***	***	***	0.53	0.56	0.62	0.51	0.61
4	0.71	0.60	0.52	0.58	0.31	0.11	0.34	0.48	0.51	0.81	0.92	1.12	1.28	1.28	1.08	0.91	0.93	***	***	***	0.80	0.81	0.59	0.62	0.73
5	0.66	0.50	0.39	0.41	0.47	0.48	0.38	0.33	0.37	0.47	0.81	1.17	1.32	1.25	1.14	1.11	***	0.60	***	***	***	***	0.37	0.54	0.67
6	0.63	0.47	0.55	0.59	0.38	0.28	0.33	0.22	0.49	0.70	0.81	0.95	0.94	1.00	0.90	***	0.55	0.76	***	***	1.18	***	0.78	0.75	0.66
7	0.92	0.63	0.53	0.45	0.46	0.47	0.54	0.44	0.59	0.86	1.03	1.04	1.30	1.09	1.16	0.78	0.82	0.98	0.86	***	0.49	0.46	0.32	0.46	0.73
8	0.41	0.46	0.59	0.24	0.16	0.07	0.07	0.13	0.38	0.90	1.05	1.16	1.12	1.08	1.10	1.09	0.94	0.55	1.13	0.53	0.39	0.26	0.63	0.57	0.63
9	0.59	0.68	0.56	0.41	0.35	0.53	0.21	0.51	0.81	0.98	1.16	1.03	0.97	1.09	1.12	0.87	0.85	1.09	0.90	***	0.45	0.34	0.36	0.48	0.71
10	0.45	0.39	0.36	0.28	0.31	0.32	0.78	0.30	0.55	0.76	1.03	0.96	0.92	1.17	0.94	***	***	0.59	0.44	0.48	***	***	0.63	0.62	0.61
11	0.54	0.34	0.37	0.60	0.40	0.25	0.20	0.26	0.53	0.65	0.79	1.14	1.31	1.11	1.04	0.86	0.50	0.33	0.51	0.40	0.32	0.49	0.93	0.70	0.61
12	0.64	0.43	0.36	0.60	0.33	0.05	0.15	0.33	0.47	0.56	0.99	1.00	1.17	***	0.83	1.04	0.86	0.90	0.87	0.47	0.45	0.55	0.76	0.68	0.63
13	0.81	0.54	0.32	0.35	0.26	0.11	0.18	0.21	0.23	0.76	1.20	1.15	1.13	1.12	1.23	1.26	1.15	1.02	0.93	***	0.83	0.59	0.70	0.70	0.73
14	0.98	0.83	0.56	0.28	0.04	0.30	0.22	0.45	0.72	0.73	1.07	1.13	1.33	1.06	1.23	1.08	1.06	0.72	***	***	***	0.64	0.67	0.65	0.75
15	0.63	0.51	0.45	0.52	0.43	0.41	0.22	0.38	0.74	0.76	1.01	1.09	1.16	0.97	1.12	1.03	0.68	***	***	0.43	0.75	0.51	0.71	0.74	0.69
16	0.80	0.58	0.22	0.12	0.33	0.37	0.29	0.21	0.41	0.84	1.01	1.16	1.00	1.18	0.88	0.76	0.96	1.07	0.85	***	***	***	0.48	0.34	0.66
17	0.31	0.20	0.33	0.22	0.19	0.39	0.12	0.23	0.39	0.65	0.94	1.29	1.25	1.10	0.96	1.05	0.98	0.93	0.84	***	***	***	0.45	0.33	0.63
18	0.21	0.62	0.30	0.29	0.11	0.24	0.34	0.23	0.44	0.68	0.95	1.16	0.88	1.16	1.03	1.02	0.92	0.92	0.77	1.05	0.50	0.36	0.37	0.45	0.62
19	***	0.50	0.38	0.52	0.38	0.20	0.06	0.23	0.13	0.65	0.71	0.92	1.04	1.03	1.06	0.90	0.75	1.29	***	***	0.66	0.54	0.45	0.18	0.60
20	0.45	0.55	0.39	0.35	0.33	0.40	0.69	0.62	0.50	0.69	1.05	1.08	1.12	1.05	1.11	0.98	1.08	0.81	0.55	***	***	1.01	0.47	0.49	0.72
21	0.46	0.43	0.45	0.43	0.11	0.01	0.10	0.23	0.60	0.91	1.00	1.16	1.21	1.07	0.99	0.94	0.78	0.63	0.87	0.70	0.37	0.16	0.28	0.40	0.60
22	0.37	0.36	0.46	0.31	***	0.37	0.14	0.58	0.64	0.98	1.09	1.14	1.06	1.08	0.86	0.89	0.83	0.99	1.04	0.51	0.35	***	0.35	0.91	0.70
23	0.58	0.45	0.34	0.26	0.18	0.15	0.19	0.18	0.44	0.64	0.62	0.79	0.78	0.74	0.84	0.80	0.83	0.57	0.26	***	0.11	0.22	0.57	0.53	0.48
24	0.43	0.26	0.10	0.14	0.21	0.02	0.01	0.14	0.19	0.19	0.79	1.00	1.04	1.15	1.06	1.10	1.05	0.67	0.62	0.55	0.37	0.50	0.51	0.43	0.52
25	0.46	0.32	0.18	0.40	0.28	0.17	0.01	0.16	0.10	0.25	0.81	1.04	1.07	0.90	1.11	1.01	0.95	0.86	0.56	0.49	0.78	0.89	***	0.62	0.58
26	0.52	0.48	0.35	0.38	0.44	0.29	0.25	0.36	0.44	0.54	0.73	0.78	0.83	0.75	0.93	0.92	0.90	0.93	0.71	0.79	0.32	0.18	0.27	0.46	0.56
27	0.43	0.46	0.22	0.35	0.28	0.23	0.40	0.45	0.39	0.65	1.05	0.99	1.11	1.23	1.13	1.25	1.16	1.20	0.81	0.57	0.34	0.34	0.24	0.40	0.65
28	0.60	0.23	0.04	0.23	0.38	0.51	0.50	0.57	0.88	0.96	1.10	0.92	1.07	1.08	1.22	1.21	1.23	0.94	0.78	0.63	0.53	0.89	1.06	0.80	0.76
29	0.71	0.73	0.60	0.56	0.56	0.42	0.58	0.39	0.59	0.42	0.62	0.99	1.08	1.26	1.36	1.27	0.89	0.90	0.96	0.43	0.43	0.48	1.10	1.11	0.77
30	0.98	0.72	***	***	0.50	0.89	0.59	0.43	0.42	0.21	0.38	0.21	0.40	0.50	0.33	0.48	0.48	0.26	0.27	0.34	0.40	0.32	0.33	0.55	0.45
HRAVE	0.59	0.50	0.39	0.39	0.32	0.30	0.30	0.33	0.48	0.68	0.91	1.02	1.07	1.05	1.04	1.00	0.89	0.82	0.74	0.57	0.51	0.49	0.56	0.58	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.72	0.66	0.61	0.73	0.67	0.66	0.73	0.63	0.71	0.61	0.61	0.63	0.73	0.75	0.69	0.66	0.63	0.62	0.60	0.72	0.60	0.70	0.48	0.52	0.58
MAX	1.19	1.12	1.16	1.28	1.32	1.18	1.30	1.16	1.16	1.17	1.31	1.17	1.26	1.33	1.16	1.18	1.29	1.16	1.29	1.12	1.21	1.14	0.84	1.15	1.11
MIN	0.34	0.24	0.14	0.11	0.33	0.22	0.32	0.07	0.21	0.28	0.20	0.05	0.11	0.04	0.22	0.12	0.12	0.11	0.06	0.33	0.01	0.14	0.11	0.01	0.01

DAY	26	27	28	29	30	31
AVE	0.56	0.65	0.76	0.77	0.45	***
MAX	0.93	1.25	1.23	1.36	0.98	***
MIN	0.18	0.22	0.04	0.39	0.21	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 93.5% OPERATIONAL RECOVERY RATE = 93.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

300 meter Sigma W (m/s)
JUNE - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.71	0.64	0.64	0.67	0.41	0.40	0.57	0.37	0.80	0.98	1.00	0.91	1.09	0.88	0.98	1.03	0.99	0.88	0.70	***	***	0.75	0.53	0.43	0.74
2	0.48	0.51	0.54	0.46	0.29	0.28	0.15	0.10	0.31	0.58	0.96	1.18	0.95	0.95	0.96	1.22	1.10	***	***	***	0.24	0.31	0.62	0.61	0.61
3	0.51	0.58	0.46	0.39	0.31	0.02	0.10	0.31	0.55	0.45	0.96	1.16	1.22	1.23	0.93	***	***	***	***	***	***	0.48	0.64	0.83	0.62
4	0.91	0.57	0.53	0.55	0.49	0.47	0.63	0.39	0.56	0.75	0.95	1.15	1.36	***	0.93	0.84	***	***	***	***	***	0.84	***	0.69	0.74
5	0.64	0.34	0.40	0.49	0.43	0.44	0.35	0.36	0.43	0.57	0.91	1.02	1.27	1.18	1.24	1.20	***	***	***	***	***	***	0.44	0.55	0.68
6	0.58	0.44	0.55	0.57	0.41	0.29	0.42	0.34	0.47	0.61	0.79	0.95	0.97	1.06	***	***	***	***	***	***	***	***	0.93	0.80	0.64
7	***	0.56	0.50	0.39	0.50	0.46	0.64	0.55	0.65	***	1.02	***	1.49	***	1.16	0.97	0.75	0.81	***	***	***	0.74	0.67	0.55	0.73
8	0.42	0.38	0.60	0.27	0.10	0.21	0.11	0.05	0.47	0.92	1.03	1.33	1.18	1.37	0.97	1.19	1.14	0.72	1.24	***	0.31	0.29	0.60	0.60	0.67
9	0.61	***	0.53	0.46	0.28	***	***	0.47	0.81	0.92	1.11	1.01	1.09	0.97	1.04	0.86	0.94	0.95	***	***	***	0.38	0.35	0.49	0.74
10	0.49	0.33	0.47	0.47	0.40	0.32	0.75	0.23	0.46	0.84	1.17	0.94	0.86	1.00	0.93	***	***	***	0.46	0.58	***	***	0.52	0.64	0.62
11	0.50	0.53	0.57	0.50	0.32	0.20	0.11	0.11	0.19	0.38	0.73	0.89	1.21	1.18	1.00	1.02	0.53	0.38	0.47	0.34	0.35	0.63	0.89	0.87	0.58
12	***	0.49	0.50	0.59	0.23	0.10	0.19	0.17	0.24	0.55	1.07	***	1.26	***	0.94	0.88	0.98	1.10	***	0.42	0.44	0.60	0.75	0.71	0.61
13	0.71	0.58	0.45	0.48	0.24	0.12	0.23	0.20	0.10	0.69	1.43	1.27	1.27	0.99	1.07	0.98	1.25	***	***	***	0.69	0.53	0.54	***	0.69
14	***	0.69	0.35	0.33	0.22	0.49	0.16	0.46	0.93	0.66	0.88	1.14	1.21	1.11	1.03	1.07	1.10	0.41	***	***	***	***	0.61	0.67	0.71
15	0.61	0.43	0.40	0.56	0.37	0.44	0.24	0.37	0.62	0.69	0.94	1.26	0.97	1.23	1.26	***	0.57	***	***	***	0.90	0.57	0.62	0.57	0.68
16	0.67	0.39	0.14	0.11	0.24	0.38	0.12	0.20	0.30	0.91	0.94	1.10	1.01	1.10	0.89	0.82	***	1.16	***	***	***	***	0.46	0.44	0.60
17	0.44	0.22	0.17	0.09	0.13	0.25	0.01	0.24	0.42	0.52	0.89	1.05	1.06	1.12	***	***	***	0.82	***	***	***	***	0.44	0.34	0.48
18	0.38	0.57	0.32	0.31	0.31	0.13	0.29	0.45	0.30	0.63	0.97	1.13	0.79	1.10	1.12	0.77	***	***	***	***	0.42	0.35	***	0.56	0.57
19	***	0.41	0.21	0.48	0.27	0.20	0.16	0.22	0.35	0.56	0.49	0.93	0.88	1.03	***	1.03	***	***	***	***	***	0.55	0.38	0.28	0.50
20	0.50	0.46	0.38	0.36	0.31	0.37	0.67	0.69	0.63	0.69	1.15	1.00	1.15	1.20	1.06	0.98	1.16	***	***	***	***	0.86	0.44	0.61	0.73
21	0.52	0.38	0.41	0.39	0.27	0.11	0.17	0.22	0.55	1.00	1.13	1.25	1.28	1.30	0.92	0.75	0.86	0.78	***	***	***	***	***	0.38	0.67
22	0.36	0.33	0.55	0.36	***	0.22	0.39	0.42	0.67	0.89	1.12	0.98	1.05	1.03	***	***	0.75	0.98	***	***	***	***	0.25	***	0.65
23	0.52	0.40	0.31	0.20	0.18	0.20	0.24	0.43	0.42	0.61	0.65	0.94	0.75	0.72	0.79	0.86	***	0.43	0.27	***	0.08	0.18	0.49	0.51	0.46
24	0.52	0.37	0.18	0.16	0.17	0.05	0.01	0.14	0.31	0.24	0.59	0.91	1.04	1.24	1.11	0.93	0.81	0.75	0.76	***	0.39	0.45	0.66	0.33	0.53
25	0.36	0.28	0.13	0.20	0.19	0.07	0.09	0.22	0.45	0.12	0.77	0.95	1.29	0.98	1.16	0.81	0.94	1.00	0.65	0.47	0.58	0.91	***	0.51	0.57
26	0.46	0.43	0.39	0.44	0.49	0.39	0.26	0.42	0.42	0.64	0.49	0.81	1.03	0.69	0.96	0.96	0.99	0.85	0.60	0.49	0.33	0.24	0.55	0.44	0.57
27	0.44	0.57	0.28	0.29	0.29	0.27	0.28	0.31	0.29	0.43	0.93	0.92	1.20	1.15	1.14	1.28	1.03	1.31	0.86	0.52	0.37	0.50	0.57	0.59	0.66
28	0.51	0.32	0.30	0.23	0.30	0.29	0.62	0.74	0.68	0.93	1.09	0.83	1.20	1.24	1.29	1.14	1.22	1.02	0.82	0.79	0.42	0.84	***	0.83	0.77
29	0.56	0.87	0.41	0.47	0.51	0.36	0.60	0.29	0.33	0.51	0.47	1.03	1.14	1.26	1.25	1.36	0.94	0.88	0.89	0.44	0.34	0.47	0.95	0.91	0.72
30	0.88	0.64	***	***	***	***	0.70	0.34	0.19	0.10	0.14	0.26	0.25	0.30	0.26	0.32	0.14	0.19	0.23	0.34	0.33	0.27	0.39	0.34	0.33
HRAVE	0.55	0.47	0.40	0.39	0.31	0.27	0.32	0.33	0.46	0.63	0.89	1.01	1.08	1.06	1.02	0.97	0.91	0.81	0.66	0.49	0.41	0.53	0.57	0.57	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.74	0.61	0.62	0.74	0.68	0.64	0.73	0.67	0.74	0.62	0.58	0.61	0.69	0.71	0.68	0.60	0.48	0.57	0.50	0.73	0.67	0.65	0.46	0.53	0.57
MAX	1.09	1.22	1.23	1.36	1.27	1.06	1.49	1.37	1.11	1.17	1.21	1.26	1.43	1.21	1.26	1.16	1.12	1.13	1.03	1.20	1.30	1.12	0.94	1.24	1.29
MIN	0.37	0.10	0.02	0.39	0.34	0.29	0.39	0.05	0.28	0.23	0.11	0.10	0.10	0.16	0.24	0.11	0.01	0.13	0.16	0.31	0.11	0.22	0.08	0.01	0.07

DAY	26	27	28	29	30	31
AVE	0.57	0.66	0.77	0.72	0.33	***
MAX	1.03	1.31	1.29	1.36	0.88	***
MIN	0.24	0.27	0.23	0.29	0.10	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 83.6% OPERATIONAL RECOVERY RATE = 83.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Sodar Meteorological Data

400 meter Sigma W (m/s)
JUNE - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	0.70	0.44	0.47	0.54	0.33	0.86	0.98	1.04	0.84	1.07	0.87	***	1.03	***	***	***	***	***	***	***	0.45	0.74
2	0.50	0.50	0.56	0.47	0.31	0.27	0.18	0.09	0.30	0.54	0.99	1.26	0.97	***	***	***	***	***	***	***	***	***	***	0.57	0.54
3	0.55	0.70	0.50	0.49	0.23	0.01	***	***	0.51	0.45	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.43
4	***	***	0.56	***	***	***	0.78	0.43	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.59
5	***	***	***	***	***	***	0.33	0.38	0.42	0.56	0.87	***	1.21	***	***	***	***	***	***	***	***	***	***	***	0.63
6	***	***	***	***	***	0.31	0.45	0.34	0.48	0.54	0.53	***	0.93	***	***	***	***	***	***	***	***	***	***	***	0.51
7	***	***	***	***	***	***	0.83	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.83
8	***	***	0.61	0.27	0.14	0.18	0.25	0.09	0.55	0.96	1.05	1.43	1.27	***	0.89	1.03	***	***	***	***	***	***	***	***	0.67
9	***	***	***	***	***	***	***	***	***	***	1.17	0.98	1.20	0.90	***	***	***	***	***	***	***	***	0.38	0.54	0.86
10	***	***	0.50	0.43	0.39	0.33	0.72	0.25	0.45	0.79	1.18	0.96	***	0.96	***	***	***	***	0.37	0.53	***	***	0.49	0.63	0.60
11	0.52	0.53	0.59	0.57	0.32	0.22	0.14	0.13	0.20	0.34	0.69	0.97	1.24	1.28	1.11	1.15	0.57	0.40	0.45	0.41	0.47	0.57	0.83	***	0.60
12	***	***	***	0.65	0.20	0.09	0.21	0.18	0.24	0.64	1.13	***	***	***	***	***	***	***	***	***	***	***	***	***	0.42
13	***	0.57	0.63	***	***	***	0.20	0.20	0.11	0.65	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.39
14	***	***	***	***	0.39	***	***	***	0.97	0.78	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.71
15	***	***	***	***	***	***	0.28	***	***	0.65	***	***	***	1.30	***	***	***	***	***	***	***	***	***	***	0.74
16	***	***	***	***	0.25	0.36	0.20	***	0.26	***	0.80	***	***	***	***	***	***	***	***	***	***	***	***	***	0.37
17	***	***	***	***	0.16	***	0.01	0.28	0.50	0.57	0.99	1.01	***	1.20	***	***	***	***	***	***	***	***	***	***	0.59
18	***	***	***	***	***	0.12	0.27	***	0.10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.16
19	***	***	0.24	***	0.18	0.20	0.16	0.22	***	0.52	0.45	***	0.74	***	***	***	***	***	***	***	***	***	***	***	0.34
20	***	***	***	0.42	***	0.35	***	0.70	0.69	0.67	***	***	0.99	1.19	***	***	1.03	***	***	***	***	***	0.40	0.62	0.71
21	***	***	0.39	0.41	0.29	0.15	0.19	0.20	0.55	1.12	1.15	1.34	1.30	***	***	***	***	***	***	***	***	***	***	***	0.64
22	***	***	***	***	***	***	0.44	0.44	0.51	0.79	1.13	0.92	***	***	***	***	***	***	***	***	***	***	***	***	0.70
23	***	***	***	***	***	0.25	0.24	0.48	0.37	0.63	0.61	0.94	0.65	***	0.55	***	***	***	***	***	***	***	0.42	0.51	0.51
24	0.54	0.39	0.18	***	0.22	***	***	***	***	0.28	0.56	0.99	***	1.18	1.05	0.95	0.88	***	***	***	***	0.48	***	0.33	0.62
25	0.35	0.23	0.13	0.21	0.21	0.07	0.09	0.23	0.50	***	0.81	0.94	1.28	0.97	0.96	0.86	0.91	0.99	***	***	0.60	0.70	***	0.57	0.58
26	0.49	0.42	0.45	0.47	***	0.41	0.28	0.44	0.43	0.67	0.52	0.86	1.08	0.62	0.89	1.07	1.18	0.81	***	0.37	0.34	0.22	0.54	***	0.60
27	***	0.52	0.27	0.27	0.30	0.31	0.29	0.30	0.28	0.48	0.90	1.01	1.15	1.13	1.11	1.25	1.15	***	0.85	0.54	0.40	0.48	0.61	0.56	0.64
28	0.49	0.33	0.29	0.24	0.30	0.29	0.58	0.66	***	1.06	1.27	0.92	1.19	1.21	1.37	1.07	***	1.04	0.81	***	***	***	***	0.80	0.77
29	0.62	***	0.41	***	0.48	0.33	0.68	0.33	0.40	0.72	0.55	1.05	1.11	1.26	1.29	1.38	0.98	0.92	0.79	0.40	0.32	0.45	***	***	0.72
30	***	0.61	***	***	***	***	0.62	0.35	0.19	0.11	0.16	0.25	0.24	0.31	0.26	0.32	0.09	0.21	0.25	0.30	0.35	0.30	0.38	0.36	0.30
HRAVE	0.51	0.48	0.42	0.43	0.28	0.25	0.36	0.32	0.43	0.65	0.84	0.98	1.04	1.03	0.95	1.01	0.85	0.73	0.59	0.42	0.41	0.46	0.51	0.54	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.74	0.54	0.43	0.59	0.63	0.51	0.83	0.67	0.86	0.60	0.60	0.42	0.39	0.71	0.74	0.37	0.59	0.16	0.34	0.71	0.64	0.70	0.51	0.62	0.58
MAX	1.07	1.26	0.70	0.78	1.21	0.93	0.83	1.43	1.20	1.18	1.28	1.13	0.65	0.97	1.30	0.80	1.20	0.27	0.74	1.19	1.34	1.13	0.94	1.18	1.28
MIN	0.33	0.09	0.01	0.43	0.33	0.31	0.83	0.09	0.38	0.25	0.13	0.09	0.11	0.39	0.28	0.20	0.01	0.10	0.16	0.35	0.15	0.44	0.24	0.18	0.07

DAY	26	27	28	29	30	31
AVE	0.60	0.64	0.77	0.72	0.30	***
MAX	1.18	1.25	1.37	1.38	0.62	***
MIN	0.22	0.27	0.24	0.32	0.09	***

MONTHLY AVERAGE = 0.6 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 45.0% OPERATIONAL RECOVERY RATE = 45.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

JULY THROUGH SEPTEMBER 2016

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

January 2017

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period July through September 2016. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

The tower data was remotely collected and reviewed on a regular basis. The following significant operational events occurred during the period.

An apparent lightning strike occurred at the tower on July 20, 2016, at about 4pm, and the data logger and communication system became inoperative. A site technician inspected the site on July 22 and noted that the main AC power was down. On July 26 the AC power system was repaired and the data logger and communication modem were rebooted and began operation. The status of the sensors at that time included operational wind and precipitation sensors, and an inoperative solar radiation sensor. While the barometric pressure and relative humidity initially appeared to be operating properly, they subsequently exhibited erratic readings. The solar radiation sensor was replaced with a spare on July 29, 2016.

There continued to be periods in early August with erratic readings for the solar radiation, barometric pressure, and relative humidity sensors. It is possible that damage to the data logger, and/or periodic losses of AC power combined with a damaged battery caused these erratic readings as the sensors are directly powered by the 12 volt output on the data logger. To address this, the data logger and battery were replaced on August 30, 2016. In addition, the solar radiation sensor was replaced with a new sensor on September 13, and the relative humidity sensor was replaced on September 19, 2016. All equipment operated properly after these repairs were completed.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

Calibrations and audits were performed the previous quarter in May 2016, and were scheduled for the next quarter in November 2016 (the November calibrations confirmed that the as-found accuracy of all the repaired sensors was within the DQOs).

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were 0.0, -3.7, and -5.3 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, including any necessary data edits.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. The wind speed, direction, temperature, delta temperature, and precipitation parameters met the quarterly data capture goals. The lightning strike and related issues with the solar radiation, barometric pressure, and relative humidity sensors described in Section 2 resulted in the quarterly data capture for those parameters being less than the 90% goal. However, since the equipment repairs have been completed, the data capture rate for these parameters have been greater than 99%.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Jul-16	81.5	81.5	81.5	71.4	80.1	81.5	81.3
Aug-16	99.7	99.7	99.7	41.3	69.6	11.6	99.6
Sep-16	99.9	99.9	99.9	57.9	99.6	38.6	99.9
Oct-16							
Nov-16							
Dec-16							
Jan-17							
Feb-17							
Mar-17							
Apr-17							
May-17							
Jun-17							
Quarter 1	93.8	93.8	93.8	56.7	83.1	43.5	93.7
Quarter 2							
Quarter 3							
Quarter 4							
Total	93.8	93.8	93.8	56.7	83.1	43.5	93.7

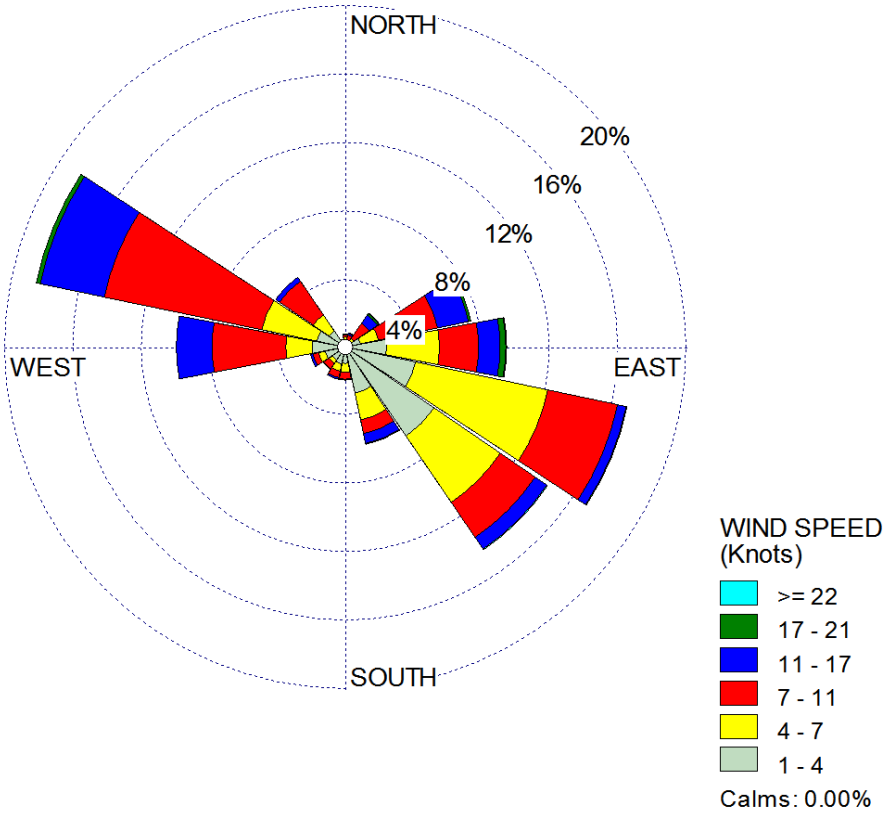
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix B presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours). This is similar to wind patterns previously observed.

Figure 1 – 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for July-Sept 2016 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	16073117	WIND SPD TOO CONSTANT 3 HR	0	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16081518	WIND SPD TOO CONSTANT 3 HR	0	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16091010	WIND SPD TOO CONSTANT 3 HR	0	WS does vary around event, WD and Sigma vary - WS is valid
4	WS	16091705	WIND SPD TOO CONSTANT 3 HR	0.11	WS does vary around event, WD and Sigma vary - WS is valid
7	WD	16091703	WIND DIR TOO CONSTANT 3 HR	0.3	WS does vary around event and Sigma vary - WD is valid
7	WD	16091704	WIND DIR TOO CONSTANT 3 HR	0.6	WS does vary around event and Sigma vary - WD is valid
11	TP	16071916	HIGH RATE OF C CHANGE	8.4	During wind shift - Data is Valid
11	TP	16071916	HIGH RATE OF C CHANGE	6.8	During wind shift - Data is Valid
11	TP	16072016	HIGH RATE OF C CHANGE	8.8	During wind shift and precip event - Data is Valid
11	TP	16072016	HIGH RATE OF C CHANGE	6.9	During wind shift and precip event - Data is Valid
11	TP	16072918	HIGH RATE OF C CHANGE	8.7	During wind shift and precip event - Data is Valid
11	TP	16072918	HIGH RATE OF C CHANGE	8.1	During wind shift and precip event - Data is Valid
11	TP	16072919	HIGH RATE OF C CHANGE	5.8	During morning or evening transition - Data is Valid
11	TP	16073118	HIGH RATE OF C CHANGE	5	During wind shift - Data is Valid
11	TP	16081318	HIGH RATE OF C CHANGE	8.4	During wind shift and precip event - Data is Valid
11	TP	16081318	HIGH RATE OF C CHANGE	7.4	During wind shift and precip event - Data is Valid
11	TP	16083015	HIGH RATE OF C CHANGE	8	During wind shift and precip event - Data is Valid
11	TP	16083015	HIGH RATE OF C CHANGE	6.2	During wind shift and precip event - Data is Valid
11	TP	16090118	HIGH RATE OF C CHANGE	8.2	During wind shift and precip event - Data is Valid
11	TP	16090118	HIGH RATE OF C CHANGE	7.7	During wind shift and precip event - Data is Valid
11	TP	16091910	HIGH RATE OF C CHANGE	7.79	During wind shift at morning transition - Data is Valid
11	TP	16091910	HIGH RATE OF C CHANGE	7.04	During wind shift at morning transition - Data is Valid
11	TP	16092817	HIGH RATE OF C CHANGE	5.65	During wind shift and precip event - Data is Valid
11	TP	16092817	HIGH RATE OF C CHANGE	5.12	During wind shift and precip event - Data is Valid
11	TP	16092919	HIGH RATE OF C CHANGE	5.35	During wind shift and precip event - Data is Valid
11	TP	16093016	HIGH RATE OF C CHANGE	5.51	During morning or evening transition - Data is Valid
11	TP	16093016	HIGH RATE OF C CHANGE	5.25	During morning or evening transition - Data is Valid
15	D1	16080712	DT LARGE READING	-2.4	Mid-day high temperatures and SR - Data is valid
16	D1	16083015	DT + During Daytime	0.5	During a precip event - Data is valid
17	D1	16073122	DT - During Nighttime	-0.2	Just outside of Screening Limit - Occurs after very hot day - Data is valid
17	D1	16073123	DT - During Nighttime	-0.2	Just outside of Screening Limit - Occurs after very hot day - Data is valid
17	D1	16080100	DT - During Nighttime	-0.2	Just outside of Screening Limit - Occurs after very hot day - Data is valid
17	D1	16080101	DT - During Nighttime	-0.3	Just outside of Screening Limit - Occurs after very hot day - Data is valid
17	D1	16080102	DT - During Nighttime	-0.3	Just outside of Screening Limit - Occurs after very hot day - Data is valid
17	D1	16080103	DT - During Nighttime	-0.3	Just outside of Screening Limit - Occurs after very hot day - Data is valid
17	D1	16080104	DT - During Nighttime	-0.2	Just outside of Screening Limit - Occurs after very hot day - Data is valid
19	RH	16070111	OUT OF LIMITS	96.5	Just outside of Screening Limit - Occurs during precip event - Data is valid
19	RH	16070112	OUT OF LIMITS	95.7	Just outside of Screening Limit - Occurs during precip event - Data is valid
21	PR	16070110	OUT OF LIMITS	0.44	Precipitation also observed recently at neaby station - data appears valid
21	PR	16070201	OUT OF LIMITS	0.7	Precipitation also observed recently at neaby station - data appears valid
21	PR	16070204	OUT OF LIMITS	0.3	Precipitation also observed recently at neaby station - data appears valid
21	PR	16072016	OUT OF LIMITS	0.42	**Occurred during Data Logger failure - no precip at nearby stations - invalidated**
21	PR	16081318	OUT OF LIMITS	0.21	**Occurred during Data Logger failure - no precip at nearby stations - invalidated for 18-19 hours**
21	PR	16091217	OUT OF LIMITS	0.23	Precipitation not observed at neaby station, temperature decrease - data appears valid
21	PR	16092816	OUT OF LIMITS	0.24	Precipitation not observed at neaby station, temperature decrease - data appears valid
21	PR	16093017	OUT OF LIMITS	0.22	Precipitation not observed at neaby station, temperature decrease - data appears valid
24	BP	16081907	OUT OF LIMITS	634.1	**Hourly data exceeds limits - data invalidated**
24	BP	16092806	OUT OF LIMITS	642.3	**Hourly data exceeds limits - data invalidated**
		7/20/2016 15:00			**Pressure Data Invalidated based on poor Comparison to ST-23 Sensor**
		7/29/2016 13:00			**Pressure Data Invalidated based on poor Comparison to ST-23 Sensor**
		7/29/2016 15:00			**Pressure Data Invalidated based on poor Comparison to ST-23 Sensor**
		7/29/2016 16:00			**Pressure Data Invalidated based on poor Comparison to ST-23 Sensor**
		7/31/2016 15:00			**Pressure Data Invalidated based on poor Comparison to ST-23 Sensor**
		7/31/2016 16:00			**Pressure Data Invalidated based on poor Comparison to ST-23 Sensor**

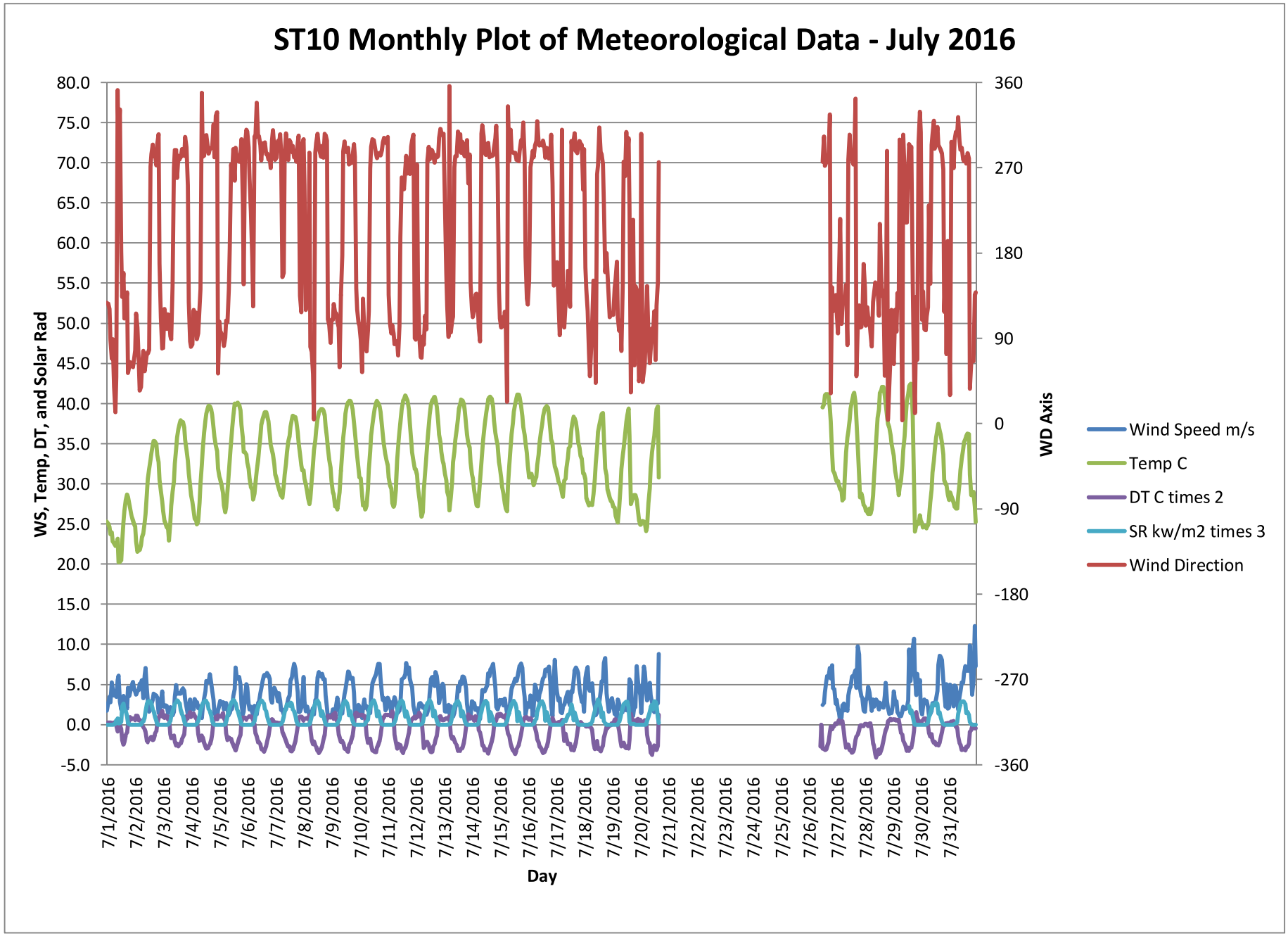
AZMET and ST10 Reported Precipitation Totals

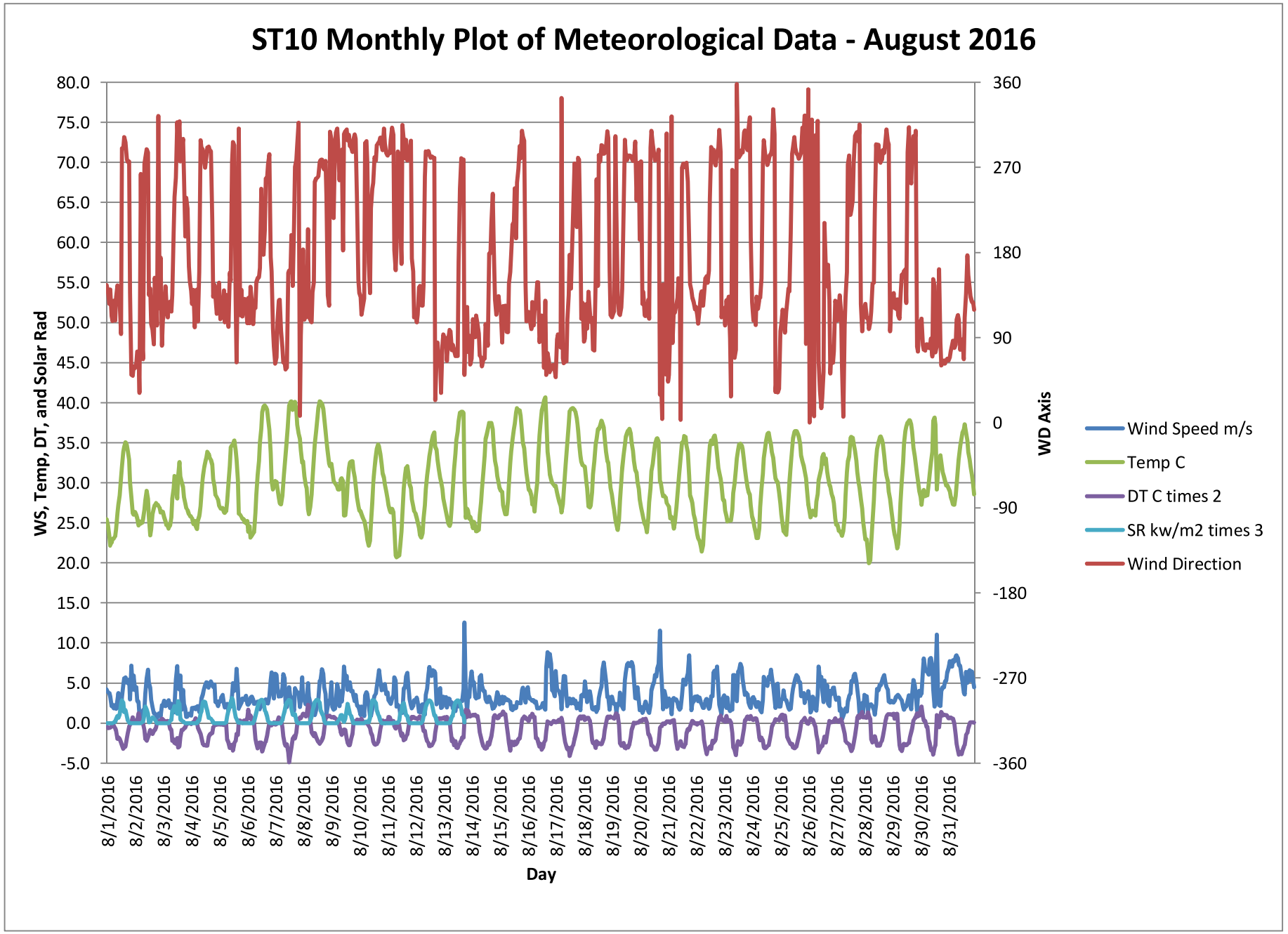
(inches/month)

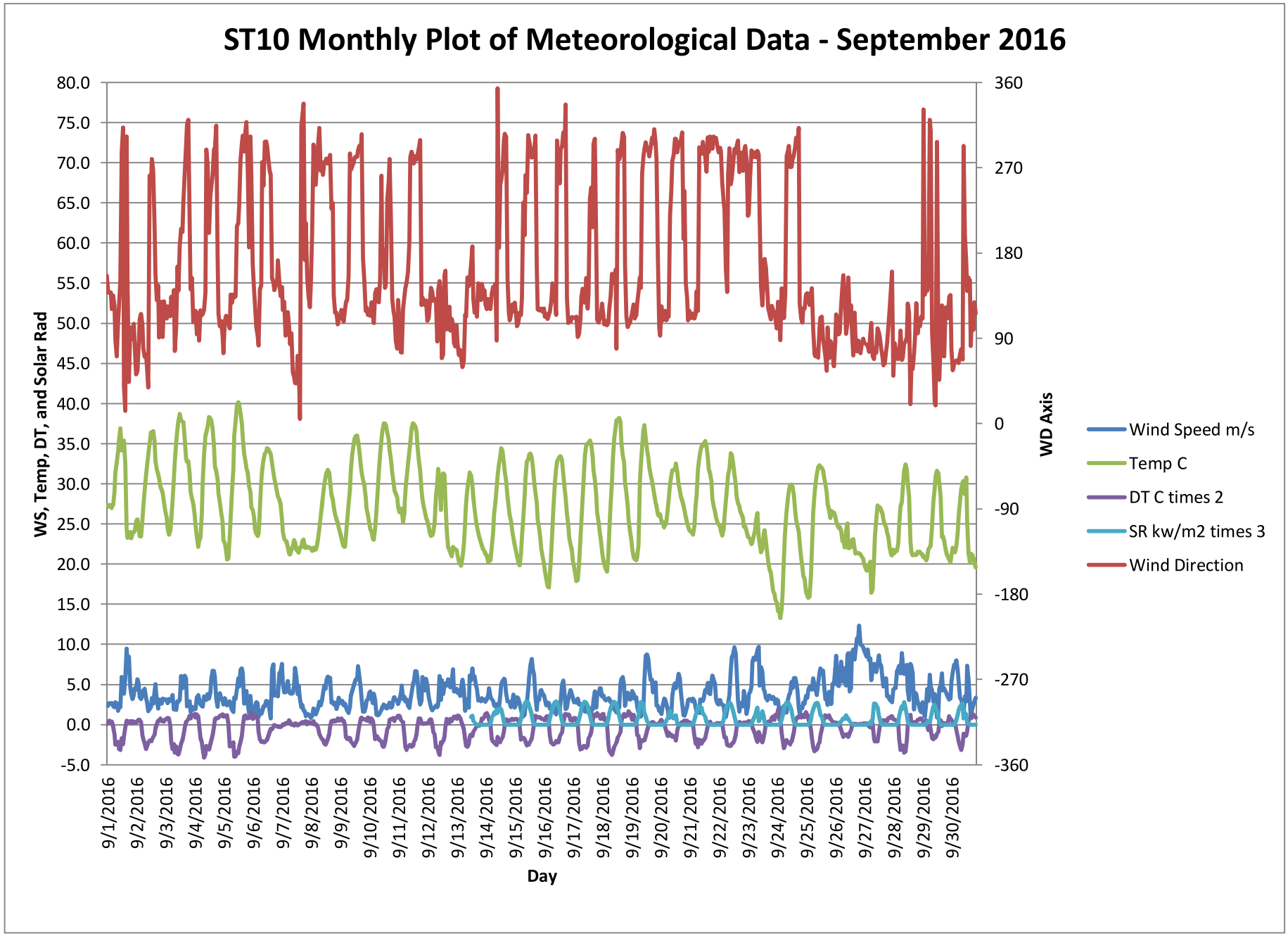
Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Jul-16	0.23	0.79	0.51	2.09
Aug-16	0.42	1.35	0.88	0.90
Sep-16	0.20	3.43	1.81	1.56
Oct-16				
Nov-16				
Dec-16				
Jan-17				
Feb-17				
Mar-17				
Apr-17				
May-17				
Jun-17				
Totals	**0.84**	**5.57**	**3.21**	**4.55**

APPENDIX B

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - July 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
7/1/2016
7/2/2016
7/3/2016
7/4/2016
7/5/2016
7/6/2016
7/7/2016
7/8/2016
7/9/2016
7/10/2016
7/11/2016
7/12/2016
7/13/2016
7/14/2016
7/15/2016
7/16/2016
7/17/2016
7/18/2016
7/19/2016
7/20/2016
7/21/2016
7/22/2016
7/23/2016
7/24/2016
7/25/2016
7/26/2016
7/27/2016
7/28/2016
7/29/2016
7/30/2016
7/31/2016
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - August 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
8/1/2016
8/2/2016
8/3/2016
8/4/2016
8/5/2016
8/6/2016
8/7/2016
8/8/2016
8/9/2016
8/10/2016
8/11/2016
8/12/2016
8/13/2016
8/14/2016
8/15/2016
8/16/2016
8/17/2016
8/18/2016
8/19/2016
8/20/2016
8/21/2016
8/22/2016
8/23/2016
8/24/2016
8/25/2016
8/26/2016
8/27/2016
8/28/2016
8/29/2016
8/30/2016
8/31/2016


ST10 Monthly Plot of Meteorological Data - September 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
9/1/2016
9/2/2016
9/3/2016
9/4/2016
9/5/2016
9/6/2016
9/7/2016
9/8/2016
9/9/2016
9/10/2016
9/11/2016
9/12/2016
9/13/2016
9/14/2016
9/15/2016
9/16/2016
9/17/2016
9/18/2016
9/19/2016
9/20/2016
9/21/2016
9/22/2016
9/23/2016
9/24/2016
9/25/2016
9/26/2016
9/27/2016
9/28/2016
9/29/2016
9/30/2016
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
JULY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	1.7	2.7	3.4	2.8	5.2	4.4	3.6	4.1	3.5	5.6	6.1	2.9	1.9	3.3	3.6	2.6	2.6	2.0	4.6	3.6	4.1	4.7	5.3	4.6	3.7
2	4.2	3.8	4.2	4.3	5.1	5.2	5.6	3.3	6.1	7.1	4.4	3.0	1.6	2.0	2.5	3.1	3.9	3.7	3.6	3.4	1.4	1.4	2.8	4.2	3.7
3	2.4	2.3	2.4	2.3	1.4	1.7	2.2	1.6	1.1	1.6	3.4	4.9	3.8	3.9	3.8	3.8	4.3	4.5	4.3	3.1	2.2	1.2	2.0	3.1	2.8
4	1.8	2.2	1.9	3.2	2.8	2.8	2.1	2.3	1.4	0.8	2.1	3.2	4.1	5.4	5.3	5.3	6.3	5.1	4.2	3.1	1.3	1.2	0.7	1.9	2.9
5	2.5	3.0	2.7	2.8	1.9	2.6	2.7	1.8	1.1	1.4	2.1	1.9	3.6	4.4	7.1	5.7	5.7	5.9	4.9	2.6	1.3	1.7	3.3	5.0	3.2
6	4.6	2.5	1.9	2.2	1.5	1.3	2.3	1.3	1.3	2.6	2.9	3.9	4.5	5.4	6.1	6.2	6.1	6.4	6.2	5.6	3.2	2.7	4.1	4.6	3.7
7	4.3	3.8	2.9	3.9	3.0	1.9	1.8	1.3	1.9	1.9	2.4	3.2	3.6	5.5	5.9	6.7	7.6	6.9	5.7	4.0	1.6	1.6	2.2	3.2	3.6
8	5.9	2.9	1.6	2.2	1.7	1.2	0.8	1.5	2.1	1.3	3.0	3.2	5.8	6.5	6.3	6.0	6.3	5.7	5.7	3.6	2.1	0.8	1.1	1.0	3.3
9	1.0	1.9	1.9	1.6	2.6	3.4	2.4	1.2	1.6	1.4	2.6	3.8	4.4	5.5	6.6	6.5	5.7	5.8	5.8	4.0	1.4	1.0	1.0	2.4	3.1
10	2.2	1.9	0.8	2.2	3.1	2.1	2.3	1.8	1.6	1.4	3.5	5.2	5.6	5.9	6.3	7.0	7.5	7.6	5.8	3.8	3.1	3.3	1.8	2.0	3.7
11	3.3	3.1	2.9	1.2	2.2	2.8	3.4	2.8	2.0	1.5	1.7	2.5	5.7	5.7	5.8	6.2	7.7	6.4	7.1	5.7	5.0	4.7	2.3	1.5	3.9
12	0.9	1.4	1.7	2.6	2.7	2.5	2.1	2.3	1.9	1.2	1.5	2.1	3.8	5.6	5.9	5.4	4.8	6.5	6.0	4.5	2.7	3.5	4.4	5.1	3.4
13	4.8	1.7	1.6	2.0	2.5	1.4	2.3	1.8	1.0	1.5	2.1	2.7	4.8	4.2	5.4	5.0	6.0	5.9	5.5	4.5	2.5	1.3	0.7	1.0	3.0
14	2.9	2.8	2.7	1.8	1.8	2.1	1.3	0.7	2.6	4.3	4.3	4.1	4.5	4.9	6.4	6.0	6.9	7.2	7.5	6.4	4.6	2.2	1.9	2.5	3.9
15	3.1	2.9	3.1	2.4	3.2	2.5	1.4	1.1	1.5	3.6	4.5	5.0	5.2	5.7	5.4	5.9	6.8	7.3	7.6	7.0	4.9	3.4	1.2	2.2	4.0
16	2.7	2.2	3.6	3.1	1.1	2.1	5.0	4.4	3.4	2.9	3.8	4.4	5.3	5.7	6.0	6.9	6.9	6.7	7.2	5.3	2.4	1.1	6.0	8.0	4.4
17	4.9	4.0	3.0	3.2	1.6	1.4	2.1	2.5	3.1	3.5	4.1	2.9	2.4	4.2	4.0	5.5	6.7	7.1	6.7	6.4	4.4	3.8	2.9	2.9	3.9
18	1.6	5.8	6.5	7.1	4.5	4.2	4.6	5.1	3.0	2.2	1.1	1.4	2.5	2.8	4.1	5.4	5.4	7.6	8.3	3.9	2.9	1.6	2.1	3.0	4.0
19	3.3	2.4	1.3	1.5	0.9	3.1	2.6	1.9	1.9	1.6	1.8	2.2	1.8	2.3	3.0	5.7	5.3	1.5	1.1	2.4	2.2	7.3	5.3	4.7	2.8
20	3.6	1.5	4.4	7.2	6.5	4.2	3.0	3.7	5.2	3.6	2.8	2.2	1.5	1.8	2.5	2.7	8.8	***	***	***	***	***	***	***	3.8
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	1.6	***	2.5	2.7	4.0	5.3	6.0	6.0	7.1	5.8	7.4	4.5	4.4	2.6	4.6
27	3.0	1.9	1.6	0.3	0.9	2.4	2.6	1.8	2.2	1.7	3.6	4.6	4.7	5.9	6.1	6.3	6.8	4.6	9.7	8.7	4.5	3.5	3.3	1.8	3.9
28	1.6	3.0	3.4	4.7	4.0	3.1	1.7	3.1	2.2	2.9	3.1	2.9	1.9	2.7	2.3	2.3	2.1	3.6	5.2	2.9	2.0	1.4	1.5	1.5	2.7
29	2.5	4.1	2.8	2.9	1.6	1.3	1.0	1.1	1.7	2.2	2.0	2.0	2.1	3.0	9.4	5.4	6.6	9.5	10.7	6.1	3.7	6.3	4.4	5.6	4.1
30	1.9	1.3	2.3	3.1	2.8	3.0	2.2	1.2	1.4	1.7	2.7	2.6	2.5	3.2	4.2	7.4	8.5	8.5	8.0	5.5	4.0	2.2	5.0	2.0	3.6
31	2.2	5.0	3.5	3.7	2.3	4.8	4.7	3.1	1.9	3.5	4.1	5.3	5.2	6.4	7.3	6.7	6.7	6.7	9.8	6.1	3.7	5.4	12.3	7.3	5.3
HRAVE	2.9	2.8	2.7	3.0	2.7	2.7	2.6	2.3	2.3	2.5	3.0	3.3	3.7	4.4	5.2	5.4	6.1	5.9	6.3	4.7	3.1	2.9	3.3	3.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.7	3.7	2.8	2.9	3.2	3.7	3.6	3.3	3.1	3.7	3.9	3.4	3.0	3.9	4.0	4.4	3.9	4.0	2.8	3.8	***	***	***	***	***
MAX	6.1	7.1	4.9	6.3	7.1	6.4	7.6	6.5	6.6	7.6	7.7	6.5	6.0	7.5	7.6	8.0	7.1	8.3	7.3	8.8	***	***	***	***	***
MIN	1.7	1.4	1.1	0.7	1.1	1.3	1.3	0.8	1.0	0.8	1.2	0.9	0.7	0.7	1.1	1.1	1.4	1.1	0.9	1.5	***	***	***	***	***

DAY	26	27	28	29	30	31
AVE	4.6	3.9	2.7	4.1	3.6	5.3
MAX	7.4	9.7	5.2	10.7	8.5	12.3
MIN	1.6	0.3	1.4	1.0	1.2	1.9

MONTHLY AVERAGE = 3.6 MONTHLY MAXIMUM = 12.3 MONTHLY MINIMUM = 0.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.5% OPERATIONAL RECOVERY RATE = 81.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JULY - 2016

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	128	127	121	88	69	89	39	12	49	352	296	332	181	134	159	111	124	138	53	61	65	61	60	66	201
2	77	116	102	64	35	39	59	77	55	63	74	74	78	271	285	294	283	287	272	295	305	169	112	79	291
3	80	121	115	100	115	112	93	89	146	270	289	288	259	283	279	281	290	286	282	303	291	251	129	87	201
4	81	83	120	97	117	89	95	123	142	349	281	282	303	304	293	285	290	290	292	316	281	324	328	53	321
5	107	98	94	89	82	91	108	107	141	185	273	261	289	257	291	278	283	277	286	300	236	147	295	310	268
6	308	291	259	223	174	124	303	302	338	302	303	294	278	296	294	297	284	285	279	280	270	300	310	290	249
7	278	281	298	294	305	287	154	159	283	306	289	278	299	297	287	293	281	282	276	296	304	135	117	294	46
8	300	252	120	130	128	286	82	76	52	4	286	296	306	291	287	282	293	281	306	304	298	110	104	85	21
9	110	110	126	117	116	108	102	60	135	177	287	298	287	287	291	273	281	275	284	295	281	143	120	106	24
10	104	89	54	132	97	96	76	98	119	269	292	300	299	293	284	280	285	285	283	288	296	302	298	296	311
11	303	135	105	95	104	95	84	87	86	72	103	197	260	258	247	269	283	264	268	264	292	299	305	90	326
12	89	273	151	92	70	70	92	83	114	100	278	292	279	289	288	284	275	284	281	283	301	311	307	305	214
13	306	231	158	124	91	356	96	108	113	271	282	282	308	300	305	286	297	285	282	287	299	254	284	147	39
14	120	113	120	135	137	127	101	87	306	315	303	287	283	292	296	281	283	282	283	291	301	315	268	141	191
15	111	101	112	103	118	109	23	335	277	310	289	286	285	286	278	278	277	288	298	300	318	280	176	132	323
16	125	152	271	277	288	281	293	298	319	297	293	296	293	299	291	281	291	290	280	284	305	253	146	154	326
17	161	170	132	94	115	310	142	101	127	130	161	161	123	298	289	299	306	287	285	292	298	295	294	247	21
18	290	165	142	119	74	50	82	106	151	117	43	263	273	313	285	285	274	233	160	180	160	131	112	116	99
19	115	115	143	152	171	112	98	108	76	148	277	261	308	279	301	225	33	157	215	62	145	141	114	45	234
20	52	306	44	55	64	111	145	92	64	78	100	93	118	67	124	150	276	***	***	***	***	***	***	***	116
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	141	***	277	303	272	276	283	280	326	32	144	119	131	136	176
27	120	95	152	216	105	125	130	127	146	83	278	305	286	280	274	277	343	50	104	125	101	102	108	168	262
28	143	103	123	113	109	97	81	129	137	149	144	143	114	211	159	135	140	50	68	288	4	39	74	120	82
29	73	63	120	97	137	123	299	137	4	305	263	212	212	270	295	289	292	151	50	11	134	67	297	329	91
30	307	109	140	100	98	113	123	230	147	294	305	319	290	298	313	294	291	289	285	268	118	165	73	193	53
31	103	30	297	294	270	299	308	307	323	298	289	291	279	277	281	274	285	279	37	64	66	66	135	139	329

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.5% OPERATIONAL RECOVERY RATE = 81.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JULY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	21	11	10	22	10	28	20	20	44	21	12	40	35	14	19	28	19	26	18	14	9	7	6	9	19
2	29	38	29	35	36	15	13	14	17	14	13	20	31	48	46	26	17	18	11	8	25	16	10	9	22
3	13	34	45	12	16	12	10	15	40	29	21	15	22	28	23	29	18	19	9	8	8	36	9	8	20
4	19	24	44	7	8	9	17	14	26	55	33	21	24	21	20	18	15	18	17	8	30	19	41	16	22
5	14	10	9	8	13	9	10	16	30	34	30	52	28	33	15	19	19	15	10	9	20	21	26	11	19
6	9	35	64	47	37	46	12	42	60	30	37	31	26	21	17	20	19	14	13	7	9	10	9	8	26
7	8	9	9	10	9	18	15	39	37	64	50	34	31	19	20	15	14	13	11	9	14	11	9	49	22
8	7	26	11	9	8	43	51	22	37	69	32	46	19	16	19	17	19	17	12	9	9	34	16	35	24
9	35	36	32	34	9	7	10	41	27	41	29	25	27	19	15	14	18	13	10	9	19	8	17	8	21
10	8	33	46	19	7	13	12	14	21	46	22	18	20	22	21	16	14	11	10	8	5	6	15	13	18
11	25	16	10	29	14	9	10	12	16	26	42	57	32	27	22	22	16	23	15	11	6	6	39	24	21
12	53	50	17	10	12	21	12	12	24	44	54	33	41	18	19	19	20	18	9	8	8	7	7	8	22
13	8	42	27	10	12	46	12	15	48	46	46	39	22	32	20	26	17	13	11	7	6	23	25	28	24
14	6	9	17	25	35	18	29	45	33	19	19	27	25	22	18	19	14	11	8	8	9	48	19	10	21
15	11	9	8	11	11	23	46	25	29	19	20	17	18	20	19	18	13	14	10	9	8	12	18	9	17
16	12	37	35	15	26	39	7	10	20	25	25	31	23	21	20	14	14	13	9	7	10	19	9	8	19
17	13	14	13	10	13	31	22	14	9	12	13	43	36	22	24	19	16	11	9	8	8	7	27	25	17
18	49	18	14	9	16	20	11	13	18	24	52	51	43	32	28	21	16	19	22	30	21	23	13	9	24
19	10	19	28	19	21	9	10	19	26	51	43	48	38	52	33	49	26	41	43	23	28	15	16	15	28
20	23	37	17	11	9	13	10	13	11	15	23	23	49	40	52	40	38	***	***	***	***	***	***	***	25
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	75	***	44	45	38	18	16	13	20	17	22	11	15	17	27
27	10	15	25	24	13	12	12	20	20	35	25	21	21	20	18	17	26	50	11	20	23	21	11	52	22
28	22	15	13	12	13	18	42	15	24	20	21	35	51	31	47	48	52	25	8	44	55	52	38	37	31
29	9	7	19	25	35	44	44	29	30	26	41	37	55	35	4	21	21	22	33	27	43	29	41	18	29
30	52	37	19	7	10	13	18	31	31	34	29	26	36	23	22	16	12	12	9	23	15	48	13	36	24
31	33	17	14	6	21	16	10	14	30	25	21	16	18	16	18	17	15	16	16	10	12	10	14	11	17
HRAVE	20	24	23	17	17	21	19	21	28	33	32	32	31	27	24	23	19	19	14	14	17	20	19	19	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19	22	20	22	19	26	22	24	21	18	21	22	24	21	17	19	17	24	28	25	***	***	***	***	***
MAX	44	48	45	55	52	64	64	69	41	46	57	54	48	48	46	39	43	52	52	52	***	***	***	***	***
MIN	6	8	8	7	8	7	8	7	7	5	6	7	6	6	8	7	7	9	9	9	***	***	***	***	***

DAY	26	27	28	29	30	31
AVE	27	22	31	29	24	17
MAX	75	52	55	55	52	33
MIN	11	10	8	4	7	6

MONTHLY AVERAGE = 22.2 MONTHLY MAXIMUM = 75.0 MONTHLY MINIMUM = 4.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.5% OPERATIONAL RECOVERY RATE = 81.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JULY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	25.3	25.1	24.5	23.7	23.9	22.8	22.6	22.3	22.3	23.2	20.2	20.2	20.5	22.7	25.3	26.7	28.0	28.7	28.3	27.5	26.8	26.0	25.5	25.1	24.5
2	24.7	22.8	21.6	22.0	21.8	22.4	23.3	23.8	25.2	26.2	28.8	30.6	31.9	33.0	33.8	34.8	35.3	35.3	35.0	33.6	32.7	30.5	29.1	27.8	28.6
3	26.6	25.4	25.1	24.6	24.5	22.9	25.2	27.2	29.0	30.3	32.6	34.4	35.8	36.8	37.5	37.9	37.7	37.7	37.0	35.5	34.2	32.9	31.3	29.8	31.3
4	28.6	27.7	26.5	25.7	25.5	24.9	25.4	27.7	30.0	32.4	34.3	36.4	37.9	38.7	39.4	39.7	39.6	39.2	38.6	37.0	35.8	34.8	34.0	31.9	33.0
5	30.9	30.5	29.8	28.9	27.3	26.4	27.1	29.3	31.2	33.2	35.0	36.7	38.5	40.0	39.8	40.0	40.1	39.8	39.1	37.4	35.8	34.0	34.0	33.7	34.1
6	32.7	31.9	30.7	29.6	29.3	28.0	28.8	30.0	31.7	32.9	34.2	35.8	37.3	38.1	38.6	38.9	38.9	38.5	37.8	36.1	34.8	34.1	33.7	32.4	34.0
7	31.2	30.6	29.8	29.4	28.9	28.5	28.3	29.8	31.1	32.5	33.9	35.3	36.0	37.1	38.0	38.5	38.3	38.3	37.7	36.5	35.1	33.8	32.3	31.7	33.4
8	31.7	30.6	29.9	29.0	28.2	27.5	28.2	30.4	32.5	34.2	35.4	36.7	38.1	38.8	39.0	39.3	39.3	39.2	38.5	37.1	35.7	34.4	33.0	32.0	34.1
9	30.3	29.0	28.7	27.2	27.3	26.8	28.1	28.9	31.6	34.0	35.7	37.3	38.8	39.7	40.1	40.3	40.3	40.1	39.3	37.8	36.2	34.7	33.5	31.9	34.1
10	30.8	30.7	28.6	27.3	27.6	26.8	27.3	29.4	31.8	34.0	36.0	37.4	38.6	39.4	40.0	40.3	40.1	39.6	39.0	37.4	35.9	34.7	33.6	33.0	34.1
11	32.3	30.8	29.8	29.4	27.7	27.1	27.5	29.2	33.0	34.6	36.7	37.5	39.3	40.3	40.5	41.0	40.7	40.3	39.2	37.6	35.4	33.9	32.9	31.9	34.5
12	31.8	31.1	29.5	28.3	26.9	25.9	26.5	29.2	31.4	33.6	35.5	37.0	38.6	39.9	40.4	40.5	40.8	40.5	39.6	37.7	36.1	35.2	34.0	32.8	34.3
13	32.5	31.2	30.4	29.1	28.4	26.7	28.3	30.2	32.7	34.0	35.5	36.7	38.1	39.3	39.9	40.5	40.4	39.9	39.1	37.4	36.1	35.0	34.5	32.6	34.5
14	31.2	30.7	29.1	28.2	27.4	27.2	28.3	30.1	32.9	34.5	35.9	37.3	38.4	39.6	40.4	40.8	40.8	40.6	39.6	37.8	36.3	35.7	34.8	32.7	34.6
15	32.0	30.7	29.6	28.8	27.5	27.0	26.6	29.8	32.3	34.6	36.2	37.6	39.0	39.9	40.7	41.1	41.1	40.7	39.8	38.4	37.1	36.1	35.1	33.8	34.8
16	32.3	30.8	31.2	31.3	30.5	29.8	30.5	30.9	32.3	33.6	35.0	36.4	37.4	38.4	39.2	39.5	39.7	39.5	38.6	36.8	35.5	35.0	33.0	32.2	34.6
17	31.7	31.2	30.3	30.0	29.7	28.8	28.4	30.4	30.6	32.0	33.2	34.4	34.7	36.8	37.6	38.4	38.1	37.7	36.4	35.2	34.5	33.6	33.1	31.3	33.3
18	31.3	30.6	28.3	27.8	27.3	27.6	27.5	27.4	28.7	30.6	32.6	34.5	36.5	37.3	38.2	38.6	38.8	35.8	31.9	31.1	29.4	28.7	28.3	27.8	31.5
19	27.8	27.1	27.0	26.1	25.5	25.2	27.0	29.6	31.8	33.6	34.4	36.1	37.7	38.6	39.4	35.9	27.5	28.1	28.5	28.6	28.6	28.0	26.5	25.5	30.2
20	24.9	25.0	25.3	25.3	25.1	24.1	24.6	27.6	29.4	32.0	33.9	34.8	35.9	38.1	39.2	39.6	30.8	***	***	***	***	***	***	***	30.3
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	37.7	***	39.6	40.0	41.0	41.2	41.2	41.0	39.4	37.7	33.8	31.7	31.3	30.7	37.4
27	30.3	30.3	29.8	29.3	29.1	27.9	28.2	30.6	34.0	35.8	36.5	38.0	39.4	40.2	41.1	41.4	40.1	37.9	34.6	31.0	28.3	28.8	28.3	27.4	33.3
28	27.1	26.6	26.5	26.2	26.9	26.2	26.9	28.6	30.7	33.3	35.5	38.2	39.3	41.2	41.6	42.1	42.0	41.0	39.9	38.4	37.5	37.0	36.1	35.0	34.3
29	34.1	33.5	31.6	30.6	30.3	28.6	29.6	30.4	32.3	34.2	35.9	37.8	40.3	41.2	42.1	42.4	42.5	38.6	29.9	24.1	24.9	25.2	25.0	26.1	33.0
30	25.4	25.0	24.5	24.7	24.8	24.4	24.8	25.6	27.7	29.3	31.4	32.9	34.2	35.8	36.8	37.4	36.6	36.1	35.1	33.6	30.4	30.0	29.9	28.7	30.2
31	28.0	28.9	28.4	28.2	27.7	27.2	26.9	26.9	28.5	30.0	31.7	33.1	34.2	35.1	35.6	35.9	36.2	36.2	31.2	28.6	28.6	29.0	27.1	25.3	30.4
HRAVE	29.8	29.1	28.3	27.6	27.2	26.4	27.0	28.6	30.6	32.3	34.0	35.3	36.8	37.9	38.7	39.0	38.3	38.0	36.5	34.8	33.4	32.5	31.6	30.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	24.5	28.6	31.3	33.0	34.1	34.0	33.4	34.1	34.1	34.1	34.5	34.3	34.5	34.6	34.8	34.6	33.3	31.5	30.2	30.3	***	***	***	***	***
MAX	28.7	35.3	37.9	39.7	40.1	38.9	38.5	39.3	40.3	40.3	41.0	40.8	40.5	40.8	41.1	39.7	38.4	38.8	39.4	39.6	***	***	***	***	***
MIN	20.2	21.6	22.9	24.9	26.4	28.0	28.3	27.5	26.8	26.8	27.1	25.9	26.7	27.2	26.6	29.8	28.4	27.3	25.2	24.1	***	***	***	***	***

DAY	26	27	28	29	30	31
AVE	37.4	33.3	34.3	33.0	30.2	30.4
MAX	41.2	41.4	42.1	42.5	37.4	36.2
MIN	30.7	27.4	26.2	24.1	24.4	25.3

MONTHLY AVERAGE = 32.7 MONTHLY MAXIMUM = 42.5 MONTHLY MINIMUM = 20.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.5% OPERATIONAL RECOVERY RATE = 81.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JULY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-0.4	-0.2	0.0	-0.3	-0.9	-1.2	-1.1	-0.7	-0.5	0.0	0.3	0.5	0.3	0.4	0.4	-0.1
2	0.3	0.6	0.6	0.3	0.3	0.2	0.0	-0.2	-0.3	-0.5	-1.0	-1.1	-0.9	-0.8	-0.8	-1.0	-0.9	-0.6	-0.4	0.1	0.4	0.6	0.6	0.8	-0.2
3	0.5	0.4	0.6	0.5	0.3	0.5	-0.6	-0.9	-0.7	-0.7	-1.0	-1.3	-1.2	-1.4	-1.2	-1.2	-0.9	-0.8	-0.6	0.1	0.5	0.4	0.5	0.8	-0.3
4	0.5	0.6	0.7	0.6	0.4	0.4	-0.6	-1.0	-1.0	-0.7	-0.8	-1.1	-1.4	-1.5	-1.5	-1.4	-1.2	-0.9	-0.6	0.2	0.4	0.5	0.3	0.6	-0.4
5	0.5	0.5	0.5	0.7	0.4	0.2	-0.5	-1.0	-0.8	-0.9	-0.9	-1.1	-1.3	-1.5	-1.6	-1.3	-1.1	-0.9	-0.6	0.2	0.4	0.4	0.4	0.3	-0.4
6	0.4	0.5	0.5	0.5	0.4	0.3	0.0	-0.5	-0.7	-1.1	-1.1	-1.2	-1.5	-1.6	-1.7	-1.5	-1.3	-1.1	-0.7	-0.2	0.2	0.3	0.3	0.1	-0.4
7	0.1	0.1	0.1	0.1	0.1	0.1	-0.4	-0.7	-0.8	-1.0	-1.2	-1.4	-1.4	-1.6	-1.7	-1.6	-1.3	-1.0	-0.7	-0.1	0.3	0.5	0.5	0.4	-0.5
8	0.3	0.4	0.4	0.4	0.3	0.6	-0.3	-0.9	-1.2	-1.1	-1.3	-1.4	-1.6	-1.8	-1.7	-1.5	-1.4	-1.0	-0.6	0.0	0.4	0.5	0.5	0.4	-0.5
9	0.5	0.6	0.3	0.8	0.3	0.2	-0.6	-0.8	-1.1	-1.0	-1.1	-1.5	-1.5	-1.6	-1.7	-1.3	-1.2	-1.0	-0.7	0.0	0.6	0.8	0.5	0.6	-0.4
10	0.6	0.6	0.6	0.5	0.6	0.4	-0.6	-1.1	-1.1	-0.9	-1.3	-1.6	-1.6	-1.7	-1.7	-1.4	-1.3	-1.0	-0.7	0.0	0.4	0.5	0.6	0.6	-0.4
11	0.6	0.6	0.5	0.5	0.8	0.6	-0.6	-1.1	-1.5	-1.2	-1.4	-1.3	-1.6	-1.8	-1.5	-1.4	-1.3	-0.9	-0.5	-0.1	0.3	0.3	0.4	0.5	-0.5
12	0.4	0.5	0.5	0.8	0.6	0.4	-0.7	-1.5	-1.3	-1.1	-1.1	-1.2	-1.5	-1.7	-1.7	-1.4	-1.2	-1.0	-0.7	0.0	0.4	0.5	0.4	0.3	-0.5
13	0.3	0.4	0.4	0.4	0.4	0.5	-0.7	-0.9	-0.8	-1.0	-1.1	-1.3	-1.6	-1.6	-1.6	-1.5	-1.4	-1.1	-0.8	-0.2	0.4	0.6	0.4	0.5	-0.5
14	0.5	0.4	0.3	0.5	0.4	0.5	-0.3	-0.5	-0.9	-1.3	-1.4	-1.6	-1.5	-1.6	-1.8	-1.5	-1.3	-1.1	-0.7	-0.1	0.2	0.3	0.6	0.5	-0.5
15	0.7	0.6	0.6	0.5	0.4	0.6	-0.2	-0.5	-0.7	-1.2	-1.4	-1.6	-1.6	-1.8	-1.6	-1.5	-1.3	-1.0	-0.6	-0.1	0.3	0.4	0.4	0.5	-0.4
16	0.4	0.3	0.4	0.3	0.2	0.2	-0.2	-0.5	-0.9	-1.1	-1.4	-1.4	-1.6	-1.8	-1.7	-1.6	-1.4	-1.1	-0.7	-0.1	0.2	0.4	0.2	0.1	-0.5
17	0.1	0.1	0.2	0.1	0.2	0.3	-0.1	-1.0	-0.6	-0.9	-1.2	-1.2	-1.2	-1.6	-1.4	-1.6	-1.4	-1.1	-0.5	-0.1	0.1	0.2	0.1	0.0	-0.5
18	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.4	-1.2	-1.5	-1.1	-1.0	-1.5	-1.5	-1.7	-1.5	-1.3	-0.8	-0.5	-0.1	-0.2	-0.1	-0.1	0.0	-0.6
19	0.1	0.1	0.3	0.3	0.1	0.0	-0.4	-1.1	-1.3	-1.2	-1.1	-1.4	-1.5	-1.4	-1.5	-0.9	0.7	0.3	0.1	0.2	0.3	0.2	0.4	0.2	-0.4
20	0.3	0.2	0.2	0.1	0.3	0.2	-0.6	-1.1	-1.2	-1.7	-1.9	-1.6	-1.3	-1.5	-1.6	-1.3	0.6	***	***	***	***	***	***	***	-0.7
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	-1.3	***	-1.5	-1.5	-1.6	-1.5	-1.3	-1.1	-0.5	-0.1	-0.3	-0.1	-0.1	0.1	-0.8
27	0.0	0.1	0.3	0.1	0.2	0.2	-0.4	-0.9	-1.4	-1.3	-1.2	-1.6	-1.6	-1.7	-1.7	-1.5	-0.9	-0.7	-0.6	-0.3	-0.1	0.0	-0.1	-0.1	-0.6
28	0.1	0.1	0.0	-0.1	0.1	0.1	-0.4	-1.2	-1.3	-1.9	-2.0	-1.9	-1.6	-1.8	-1.6	-1.4	-1.0	-0.6	-0.3	-0.1	0.2	0.3	0.3	0.3	-0.7
29	0.3	0.3	0.3	0.2	0.3	0.3	0.0	-0.5	-0.6	-1.0	-1.2	-1.3	-1.6	-1.4	-1.6	-1.5	-1.4	-1.0	-0.4	0.5	0.8	0.5	0.2	0.2	-0.4
30	0.2	0.2	0.3	0.4	0.4	0.2	-0.1	-0.5	-0.7	-0.6	-1.0	-1.1	-1.1	-1.3	-1.2	-1.3	-1.1	-0.8	-0.5	0.0	-0.1	0.1	0.0	0.1	-0.4
31	0.1	0.1	0.2	0.2	0.2	0.1	-0.1	-0.2	-0.7	-1.1	-1.2	-1.6	-1.5	-1.5	-1.6	-1.4	-1.4	-1.2	-0.5	-0.3	-0.1	-0.1	-0.2	-0.2	-0.6
HRAVE	0.3	0.3	0.4	0.3	0.3	0.3	-0.3	-0.8	-0.9	-1.1	-1.2	-1.3	-1.4	-1.5	-1.5	-1.4	-1.1	-0.9	-0.5	0.0	0.3	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	-0.2	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.4	-0.4	-0.5	-0.5	-0.5	-0.5	-0.4	-0.5	-0.5	-0.6	-0.4	-0.7	***	***	***	***	***
MAX	0.5	0.8	0.8	0.7	0.7	0.5	0.5	0.6	0.8	0.6	0.8	0.8	0.6	0.6	0.7	0.4	0.3	0.0	0.7	0.6	***	***	***	***	***
MIN	-1.2	-1.1	-1.4	-1.5	-1.6	-1.7	-1.7	-1.8	-1.7	-1.7	-1.8	-1.7	-1.6	-1.8	-1.8	-1.8	-1.6	-1.7	-1.5	-1.9	***	***	***	***	***

DAY	26	27	28	29	30	31
AVE	-0.8	-0.6	-0.7	-0.4	-0.4	-0.6
MAX	0.1	0.3	0.3	0.8	0.4	0.2
MIN	-1.6	-1.7	-2.0	-1.6	-1.3	-1.6

MONTHLY AVERAGE = -0.5 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.5% OPERATIONAL RECOVERY RATE = 81.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JULY - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	702	702	702	702	703	703	704	704	704	704	704	705	704	704	703	703	702	702	702	703	703	703	703	703
2	703	703	703	703	704	704	705	705	706	705	705	705	704	704	703	703	702	702	702	702	703	703	703	703	704
3	703	703	704	704	704	705	705	705	705	705	705	705	704	703	703	702	702	702	702	702	702	703	703	703	703
4	703	703	703	703	703	703	704	704	704	704	704	704	703	703	702	701	701	701	701	701	701	702	702	702	702
5	702	702	702	702	702	703	703	703	704	703	703	703	702	702	701	701	700	700	700	700	700	701	701	702	702
6	702	702	703	703	703	703	704	704	704	704	703	703	703	702	702	701	701	700	700	700	700	701	701	701	702
7	702	702	702	702	703	703	703	704	704	704	703	703	703	702	701	701	701	700	700	700	701	701	702	702	702
8	702	702	703	703	703	703	704	704	704	704	704	704	703	702	702	702	701	701	701	701	701	702	702	702	702
9	702	703	703	703	704	704	704	705	705	705	705	704	704	703	703	702	701	701	701	701	701	702	702	702	703
10	702	702	702	702	702	702	702	703	703	702	702	701	701	700	700	699	699	698	698	698	698	698	698	699	700
11	699	699	699	700	700	700	701	701	701	701	701	700	700	699	699	698	698	698	698	698	698	699	699	700	699
12	700	700	700	700	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	699	700	700	701	702	701
13	702	702	702	702	703	703	704	705	705	704	704	704	704	703	702	702	701	701	701	701	702	702	702	702	703
14	703	703	703	703	704	704	704	705	705	705	705	704	704	703	702	701	701	700	700	700	701	701	701	701	703
15	702	702	702	702	702	703	703	703	703	703	703	703	702	701	701	700	700	699	699	699	699	700	700	700	701
16	700	701	701	702	702	703	703	703	703	703	703	702	702	701	700	700	699	699	699	699	700	701	701	702	701
17	702	702	702	702	702	702	703	703	704	704	704	704	704	703	702	701	701	701	701	702	702	703	703	704	702
18	704	704	705	705	705	705	705	705	706	706	706	705	704	704	703	702	702	702	703	703	704	705	705	705	704
19	705	705	705	705	705	705	706	706	706	705	705	705	704	703	702	702	703	703	703	703	704	705	706	707	704
20	706	705	705	705	704	705	705	705	705	705	705	705	704	703	702	***	***	***	***	***	***	***	***	***	705
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	700	***	699	698	698	697	696	696	696	697	698	699	699	699	698
27	699	699	699	699	700	700	701	701	701	701	701	700	699	698	698	697	697	696	697	699	699	700	700	700	699
28	700	700	700	701	701	701	701	701	701	701	701	700	699	699	698	697	697	697	697	697	697	698	698	698	699
29	698	698	698	699	699	699	700	700	700	700	700	699	698	***	***	***	***	***	699	700	700	700	700	700	699
30	700	700	699	699	699	700	701	701	701	701	701	700	700	699	698	697	697	697	697	698	699	700	700	699	699
31	699	700	699	699	700	700	701	701	701	701	701	701	700	699	698	***	***	***	698	698	699	699	700	701	700
HRAVE	702	702	702	702	702	703	703	703	703	703	703	703	702	702	701	700	700	700	700	700	700	701	701	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	703	704	703	702	702	702	702	702	703	700	699	701	703	703	701	701	702	704	704	705	***	***	***	***	***
MAX	705	706	705	704	704	704	704	704	705	703	701	702	705	705	703	703	704	706	707	706	***	***	***	***	***
MIN	702	702	702	701	700	700	700	701	701	698	698	699	701	700	699	699	701	702	702	702	***	***	***	***	***

DAY	26	27	28	29	30	31
AVE	698	699	699	699	699	700
MAX	700	701	701	700	701	701
MIN	696	696	697	698	697	698

MONTHLY AVERAGE = 701.7 MONTHLY MAXIMUM = 706.6 MONTHLY MINIMUM = 696.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 80.1% OPERATIONAL RECOVERY RATE = 80.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JULY - 2016

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	72	73	76	79	74	83	86	86	86	82	95	97	96	81	65	56	47	45	51	49	50	53	55	58	71
2	61	80	84	84	87	82	74	73	69	60	44	37	33	33	33	31	30	28	27	32	35	42	50	55	53
3	62	67	68	71	71	79	67	54	47	44	36	30	27	23	20	19	19	17	19	23	27	30	36	42	42
4	48	51	55	58	57	61	57	46	37	31	27	24	18	17	16	15	15	14	15	19	22	26	27	33	33
5	34	33	33	37	45	48	42	36	30	25	22	18	14	11	11	9	8	8	9	12	15	19	18	17	23
6	19	21	24	26	28	32	33	31	30	29	26	22	19	17	17	16	17	17	17	20	24	26	28	31	24
7	35	38	43	45	46	47	49	43	40	37	35	33	30	28	25	22	21	15	16	18	22	26	30	29	32
8	28	29	31	32	35	37	36	31	25	19	18	16	17	19	18	15	14	13	13	15	19	22	26	28	23
9	31	33	33	38	37	38	35	34	26	21	19	17	15	13	12	12	11	11	12	13	17	18	22	25	23
10	27	28	32	35	34	35	34	30	26	21	18	15	13	12	11	11	11	11	12	14	16	16	17	17	21
11	15	18	22	26	29	29	27	25	19	15	12	10	8	8	8	8	8	8	7	9	13	16	18	20	16
12	22	21	23	26	29	31	29	24	21	18	15	13	9	7	6	7	7	7	8	10	12	13	13	15	16
13	16	18	20	23	24	29	25	23	20	20	18	16	13	12	10	10	10	12	14	16	19	20	22	27	18
14	28	28	30	33	35	35	33	31	29	28	24	21	19	17	15	14	13	11	12	14	16	17	17	21	22
15	23	24	28	28	31	32	33	29	26	24	20	17	15	13	12	12	12	12	13	15	17	18	20	22	21
16	26	27	29	32	35	37	37	37	33	29	25	21	18	17	16	15	14	13	15	16	19	20	25	30	24
17	31	32	35	36	37	39	39	34	35	32	30	25	26	21	19	19	19	20	22	24	25	27	28	38	29
18	40	42	51	49	51	49	49	49	44	36	30	25	22	21	20	20	19	27	35	41	47	52	54	56	39
19	55	58	58	62	65	66	56	43	35	29	28	24	21	19	19	26	64	62	61	63	62	59	65	68	49
20	72	70	64	61	61	68	70	54	44	36	30	28	24	20	17	16	42	***	***	***	***	***	***	***	46
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	22	***	19	18	17	16	16	17	19	23	31	37	39	43	24
27	45	45	45	48	51	52	52	43	33	26	27	24	22	20	19	18	19	22	30	40	54	47	49	54	37
28	56	60	60	64	59	62	60	51	41	35	30	24	18	16	13	11	9	14	16	20	23	23	24	25	34
29	27	27	31	38	40	49	44	38	37	33	29	24	16	15	15	15	12	18	45	81	79	75	76	64	39
30	68	72	76	76	74	76	73	71	58	51	44	38	35	30	28	27	28	27	31	33	41	43	41	47	49
31	52	45	49	52	53	56	57	59	53	48	44	40	37	35	34	32	26	29	40	53	55	54	54	59	47
HRAVE	40	42	44	46	48	50	48	43	38	33	30	26	23	21	19	18	20	19	22	27	30	32	34	37	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	71	53	42	33	23	24	32	23	23	21	16	16	18	22	21	24	29	39	49	46	***	***	***	***	***
MAX	97	87	79	61	48	33	49	37	38	35	29	31	29	35	33	37	39	56	68	72	***	***	***	***	***
MIN	45	27	17	14	8	16	15	13	11	11	7	6	10	11	12	13	19	19	19	16	***	***	***	***	***

DAY	26	27	28	29	30	31
AVE	24	37	34	39	49	47
MAX	43	54	64	81	76	59
MIN	16	18	9	12	27	26

MONTHLY AVERAGE = 32.8 MONTHLY MAXIMUM = 96.5 MONTHLY MINIMUM = 6.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.5% OPERATIONAL RECOVERY RATE = 81.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JULY - 2016

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.18	0.26	0.04	0.08	0.12	0.74	0.87	0.63	0.55	0.34	0.07	0.01	0.00	0.00	0.00	0.00	3.94
2	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.13	0.30	0.56	0.85	0.94	0.99	0.95	0.86	0.63	0.55	0.32	0.17	0.02	0.00	0.00	0.00	0.00	7.36
3	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.55	0.72	0.86	0.95	1.00	0.95	0.87	0.61	0.45	0.36	0.16	0.02	0.00	0.00	0.00	0.00	7.98
4	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.56	0.74	0.87	0.96	1.01	0.96	0.88	0.64	0.56	0.36	0.16	0.02	0.00	0.00	0.00	0.00	8.22
5	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.55	0.72	0.87	0.95	1.02	0.97	0.88	0.65	0.57	0.37	0.17	0.02	0.00	0.00	0.00	0.00	8.22
6	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.55	0.73	0.86	0.95	1.00	0.95	0.87	0.64	0.56	0.35	0.16	0.02	0.00	0.00	0.00	0.00	8.12
7	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.33	0.52	0.68	0.84	0.81	0.78	0.91	0.86	0.63	0.55	0.36	0.16	0.02	0.00	0.00	0.00	0.00	7.58
8	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.55	0.73	0.87	0.96	1.00	0.92	0.71	0.38	0.56	0.37	0.17	0.02	0.00	0.00	0.00	0.00	7.72
9	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.21	0.55	0.73	0.87	0.96	0.99	0.91	0.71	0.39	0.56	0.36	0.16	0.02	0.00	0.00	0.00	0.00	7.55
10	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.20	0.55	0.73	0.87	0.95	1.00	0.91	0.71	0.35	0.56	0.36	0.16	0.02	0.00	0.00	0.00	0.00	7.50
11	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.23	0.56	0.74	0.88	0.97	1.01	0.92	0.66	0.34	0.56	0.36	0.16	0.02	0.00	0.00	0.00	0.00	7.53
12	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.29	0.57	0.75	0.89	0.98	1.02	0.92	0.69	0.35	0.56	0.37	0.16	0.02	0.00	0.00	0.00	0.00	7.66
13	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.31	0.55	0.72	0.86	0.95	0.99	0.91	0.75	0.35	0.56	0.36	0.16	0.01	0.00	0.00	0.00	0.00	7.55
14	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.33	0.53	0.71	0.85	0.94	0.98	0.90	0.68	0.15	0.52	0.35	0.16	0.01	0.00	0.00	0.00	0.00	7.19
15	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.34	0.55	0.72	0.86	0.94	0.99	0.89	0.67	0.15	0.51	0.35	0.15	0.01	0.00	0.00	0.00	0.00	7.26
16	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.24	0.54	0.72	0.85	0.91	0.96	0.88	0.67	0.16	0.51	0.34	0.14	0.01	0.00	0.00	0.00	0.00	7.10
17	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.20	0.14	0.23	0.39	0.43	0.45	0.84	0.66	0.18	0.50	0.31	0.09	0.01	0.00	0.00	0.00	0.00	4.53
18	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.38	0.56	0.75	0.85	1.03	0.91	0.69	0.31	0.49	0.14	0.05	0.00	0.00	0.00	0.00	0.00	6.28
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.49	0.70	0.83	0.89	0.95	0.95	0.71	0.11	0.02	0.04	0.04	0.00	0.00	0.00	0.00	6.14
20	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.33	0.52	0.70	0.82	0.62	0.97	0.94	0.81	0.29	0.07	***	***	***	***	***	***	***	6.24
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
27	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
28	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
29	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.79	0.48	0.59	0.37	0.08	0.00	0.00	0.00	0.00	2.31
30	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.47	0.64	0.84	0.79	0.80	0.92	0.85	0.47	0.49	0.31	0.12	0.01	0.00	0.00	0.00	0.00	7.11
31	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.11	0.44	0.70	0.84	0.94	0.97	0.94	0.85	0.47	0.52	0.39	0.10	0.01	0.00	0.00	0.00	0.00	7.33
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.26	0.48	0.66	0.79	0.85	0.91	0.91	0.77	0.41	0.49	0.33	0.13	0.01	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.94	7.36	7.98	8.22	8.22	8.12	7.58	7.72	7.55	7.50	7.53	7.66	7.55	7.19	7.26	7.10	4.53	6.28	6.14	6.24	***	***	***	***	***
MAX	0.87	0.99	1.00	1.01	1.02	1.00	0.91	1.00	0.99	1.00	1.01	1.02	0.99	0.98	0.99	0.96	0.84	1.03	0.95	0.97	***	***	***	***	***
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***

DAY	26	27	28	29	30	31
TOT	***	***	***	2.31	7.11	7.33
MAX	***	***	***	0.79	0.92	0.97
MIN	***	***	***	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 71.4% OPERATIONAL RECOVERY RATE = 71.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JULY - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.01	0.00	0.00	0.02	0.05	0.01	0.03	0.01	0.44	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60
2	0.00	0.70	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.16
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	***	***	0.00
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	0.00	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.14	0.06	0.00	0.00	0.33
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.60	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	***	***	***	***	***
MAX	0.44	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	***	***	***	***	***
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.33	0.00	0.00
MAX	0.00	0.00	0.00	0.14	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 2.09 MONTHLY MAXIMUM = 0.70 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 81.3% OPERATIONAL RECOVERY RATE = 81.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
AUGUST - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.2	3.9	3.7	3.3	2.1	2.3	1.8	2.2	1.8	2.9	3.7	1.9	1.5	3.2	4.8	5.6	5.7	5.1	5.0	5.4	2.9	7.2	4.2	5.9	3.8
2	4.2	4.5	2.8	2.6	0.9	0.7	1.5	1.6	1.7	3.7	5.6	6.7	5.0	4.3	2.9	2.0	1.2	1.2	1.0	0.7	1.2	1.2	0.8	2.2	2.5
3	2.2	2.8	2.1	2.6	2.3	2.8	1.9	2.4	1.7	1.3	2.3	5.4	7.1	4.3	4.2	5.9	1.7	4.2	2.4	1.7	0.8	0.8	1.2	1.1	2.7
4	0.9	1.9	1.8	1.9	1.7	2.0	2.1	1.4	2.1	3.1	3.6	4.1	4.7	5.1	5.0	4.4	4.6	5.2	4.8	4.5	4.8	2.6	2.7	2.1	3.2
5	2.7	2.7	3.3	3.5	2.4	1.9	2.1	2.4	1.5	2.4	2.0	3.5	4.9	4.0	4.6	6.8	4.3	1.8	2.1	2.6	3.1	3.0	2.9	3.4	3.1
6	2.4	2.3	2.5	3.1	3.3	2.9	2.4	2.4	2.5	2.7	2.2	1.7	2.1	2.8	2.5	2.5	2.9	2.5	2.4	3.4	5.4	6.3	4.3	3.1	2.9
7	6.2	6.0	4.4	3.3	3.4	3.4	4.4	6.1	5.5	2.5	2.0	3.4	4.5	3.1	3.3	2.0	1.5	4.3	4.0	3.8	3.8	2.0	2.8	5.7	3.8
8	3.2	2.9	2.4	3.0	5.0	3.2	2.5	1.9	1.4	1.2	1.0	1.6	2.4	2.9	5.2	5.4	6.7	6.1	4.5	3.6	1.2	2.1	2.8	2.8	3.1
9	5.1	2.0	1.6	1.8	2.9	4.9	4.3	2.1	3.9	2.7	4.2	7.1	5.5	5.9	4.2	4.4	5.1	3.9	4.0	3.4	2.7	3.5	2.2	2.0	3.7
10	1.7	1.0	2.0	1.8	0.9	3.4	3.9	3.6	2.3	0.8	0.9	1.7	2.7	3.4	3.7	4.5	5.7	6.6	5.2	4.1	4.2	4.7	4.8	3.7	3.2
11	3.8	2.9	2.6	2.4	3.1	3.5	5.7	5.2	2.1	2.3	2.0	1.2	1.7	1.3	4.3	4.5	5.8	6.3	4.8	2.9	2.2	1.8	2.1	2.8	3.2
12	2.7	3.2	2.6	1.4	1.3	2.2	2.3	1.1	1.1	3.5	4.3	6.1	7.0	6.1	5.9	6.6	6.5	6.2	2.4	2.7	3.9	4.4	1.9	2.1	3.6
13	3.3	2.8	3.2	1.9	3.0	3.0	2.3	2.5	1.8	2.1	1.5	2.7	2.1	2.2	2.7	2.8	2.7	4.3	12.5	3.6	1.4	3.2	3.2	5.2	3.2
14	6.4	4.8	5.1	3.3	3.1	3.2	3.2	5.8	6.0	4.6	4.0	4.0	3.0	2.6	2.6	3.3	2.7	2.6	1.8	1.9	2.1	3.2	3.9	3.3	3.6
15	2.3	2.7	3.3	2.5	3.2	2.8	3.0	2.9	2.8	2.7	1.7	1.6	2.1	1.8	1.9	2.6	2.5	2.5	2.5	4.0	4.4	3.7	2.6	3.8	2.7
16	4.5	3.4	3.0	2.9	2.8	2.8	2.6	2.7	1.9	1.9	1.8	1.9	2.2	2.5	2.0	1.6	6.9	8.9	7.1	8.6	7.4	4.1	4.0	3.3	3.8
17	6.5	4.3	4.2	3.9	3.4	1.7	4.5	5.9	5.8	3.4	2.1	2.4	3.1	2.4	2.5	3.0	2.4	2.8	1.9	1.9	2.4	1.6	3.5	3.6	3.3
18	3.4	5.2	3.7	2.6	3.9	4.0	3.3	1.8	1.7	1.6	2.0	1.4	1.7	3.1	4.0	4.6	6.7	7.5	6.7	5.2	3.3	3.3	1.7	2.6	3.5
19	3.3	2.6	2.4	2.4	1.3	2.4	2.3	3.8	2.5	2.0	1.7	5.4	6.3	7.3	7.5	7.2	7.1	7.6	7.0	5.5	3.1	3.1	4.5	2.8	4.2
20	1.6	2.0	1.3	1.6	2.3	2.7	2.0	1.5	1.3	2.2	4.1	4.7	5.1	6.0	5.8	6.7	7.3	11.5	7.1	4.0	1.7	4.0	3.2	2.0	3.8
21	2.9	3.0	2.8	1.1	2.8	3.1	2.9	3.0	2.6	2.0	1.7	1.8	3.4	5.4	5.0	4.8	5.6	6.2	8.5	5.8	1.6	2.5	2.7	3.3	3.5
22	3.0	3.4	2.7	3.2	2.6	2.3	1.9	1.9	2.7	3.0	2.5	1.8	2.1	3.3	3.3	6.2	6.5	5.7	7.1	4.1	2.3	1.5	1.1	3.1	3.2
23	3.5	3.2	1.9	3.2	2.0	1.5	1.8	1.7	6.0	6.0	3.7	2.7	***	6.4	6.6	7.4	6.9	5.5	4.3	3.5	3.8	3.5	2.6	2.1	3.9
24	1.9	3.1	3.3	3.0	2.2	2.0	2.6	2.4	1.6	1.3	2.9	5.8	5.1	5.1	4.6	5.8	5.5	6.7	5.8	4.6	3.0	1.9	4.7	4.9	3.7
25	2.1	2.1	2.9	3.0	4.1	3.0	2.8	2.5	1.9	1.7	1.8	3.5	4.3	5.0	5.5	6.0	5.7	5.2	5.0	3.4	3.4	3.7	2.5	3.4	3.5
26	3.1	4.0	2.8	1.3	1.7	3.3	2.9	1.9	1.6	3.6	7.0	5.4	5.8	4.1	2.6	5.3	3.5	4.7	2.4	2.1	4.0	3.6	4.4	4.4	3.6
27	3.3	2.9	3.1	3.2	1.6	1.8	0.5	0.9	1.5	1.8	1.4	2.6	3.3	3.7	5.3	5.2	5.8	6.2	5.2	4.3	2.8	1.1	1.8	2.5	3.0
28	1.3	3.5	3.3	3.4	1.5	2.2	2.2	2.3	2.1	1.6	1.0	2.3	4.2	4.1	4.7	4.7	5.2	5.6	6.0	4.9	4.5	4.2	2.7	2.6	3.3
29	2.8	2.6	2.6	2.7	3.2	3.4	3.5	3.3	3.1	2.9	2.0	1.7	2.2	2.0	2.7	3.5	2.7	1.7	3.5	5.4	4.6	3.6	1.6	3.3	2.9
30	4.0	3.4	3.6	6.5	8.0	6.8	6.4	6.0	8.0	8.1	7.1	***	4.2	2.0	5.4	11.0	2.8	2.2	2.1	4.0	4.4	4.5	5.2	5.3	5.3
31	6.2	6.8	7.8	7.0	7.0	7.8	7.7	8.2	8.4	8.1	7.3	7.1	5.9	5.2	3.8	3.6	6.4	5.0	6.3	6.6	5.3	6.4	5.2	4.5	6.4
HRAVE	3.4	3.3	3.1	2.9	2.9	3.0	3.0	3.0	2.9	2.9	2.9	3.4	3.8	3.9	4.2	4.8	4.7	5.0	4.7	3.9	3.3	3.3	3.0	3.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.8	2.5	2.7	3.2	3.1	2.9	3.8	3.1	3.7	3.2	3.2	3.6	3.2	3.6	2.7	3.8	3.3	3.5	4.2	3.8	3.5	3.2	3.9	3.7	3.5
MAX	7.2	6.7	7.1	5.2	6.8	6.3	6.2	6.7	7.1	6.6	6.3	7.0	12.5	6.4	4.4	8.9	6.5	7.5	7.6	11.5	8.5	7.1	7.4	6.7	6.0
MIN	1.5	0.7	0.8	0.9	1.5	1.7	1.5	1.0	1.6	0.8	1.2	1.1	1.4	1.8	1.6	1.6	1.6	1.4	1.3	1.3	1.1	1.1	1.5	1.3	1.7

DAY	26	27	28	29	30	31
AVE	3.6	3.0	3.3	2.9	5.3	6.4
MAX	7.0	6.2	6.0	5.4	11.0	8.4
MIN	1.3	0.5	1.0	1.6	2.0	3.6

MONTHLY AVERAGE = 3.5 MONTHLY MAXIMUM = 12.5 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.7% OPERATIONAL RECOVERY RATE = 99.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
AUGUST - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	146	138	125	141	113	108	129	108	133	145	130	127	94	290	290	302	296	279	276	277	138	51	50	59	218
2	58	63	75	75	32	263	86	67	273	280	289	286	135	142	104	98	83	153	133	103	324	121	175	81	20
3	108	118	144	127	111	124	128	118	135	200	239	259	318	296	319	276	288	300	261	197	238	226	165	150	127
4	139	126	140	101	138	141	107	159	299	290	289	280	269	282	291	292	288	287	213	133	146	133	115	130	222
5	148	110	113	119	140	106	135	133	101	158	150	276	297	293	129	64	168	311	114	140	112	125	131	122	191
6	105	132	105	144	129	104	122	122	148	153	154	163	247	178	178	204	258	259	273	284	175	160	100	81	336
7	62	69	107	129	130	97	80	64	64	56	58	158	161	159	198	145	211	270	278	294	317	7	92	141	265
8	183	109	124	112	204	112	109	106	138	148	254	258	259	261	275	278	278	270	268	277	239	135	124	308	181
9	300	282	216	293	306	311	294	256	286	289	182	305	308	310	298	304	293	292	286	299	305	300	234	151	35
10	138	133	114	123	131	296	298	274	170	137	227	247	253	281	277	293	296	296	302	292	288	311	295	286	211
11	282	285	285	299	312	304	183	161	186	287	200	216	168	315	298	280	299	277	280	285	298	174	160	111	14
12	116	106	114	143	145	124	124	145	260	287	286	287	283	280	282	280	280	24	67	85	69	67	31	82	87
13	93	88	90	65	88	98	97	77	82	77	70	70	71	170	247	279	276	278	51	112	122	75	92	61	248
14	68	110	97	91	113	105	94	71	69	60	67	67	104	94	81	178	180	212	242	191	130	114	126	134	45
15	123	117	85	123	115	124	96	96	147	159	178	209	212	248	195	254	268	292	280	309	303	298	145	107	326
16	108	117	107	99	128	103	118	127	149	148	85	95	113	101	58	129	50	73	65	54	56	61	61	55	62
17	48	88	93	91	79	343	68	63	68	65	109	135	177	142	193	225	274	209	207	280	278	198	110	127	27
18	86	90	125	99	139	118	107	110	77	76	153	257	145	283	276	293	292	284	285	292	308	301	161	114	200
19	112	115	118	303	224	134	115	114	122	141	220	299	283	278	283	282	282	280	277	277	297	235	274	275	257
20	194	277	126	138	114	113	118	130	110	291	308	295	284	277	281	280	289	29	54	4	146	69	51	306	162
21	43	51	103	324	85	121	116	123	132	153	147	3	269	274	270	272	275	255	192	146	140	132	128	120	329
22	122	114	105	119	136	139	124	135	153	155	148	161	236	292	285	289	275	272	285	291	310	286	111	121	354
23	121	103	129	118	133	89	28	267	71	69	77	358	***	281	281	283	288	286	306	309	293	288	311	323	351
24	196	128	108	123	104	133	120	130	132	153	275	298	285	280	273	278	283	284	288	331	305	33	53	32	302
25	36	97	104	119	111	95	118	127	142	139	200	284	291	302	291	284	283	279	283	286	312	308	325	83	237
26	151	352	0	190	320	29	7	304	277	319	65	34	16	26	54	211	164	144	167	129	52	79	63	76	243
27	129	126	108	124	135	117	59	6	103	133	159	273	282	220	225	236	274	303	306	307	297	315	126	97	309
28	115	120	126	111	111	99	106	118	147	148	222	294	278	294	277	275	278	288	285	299	310	297	294	97	37
29	132	126	137	121	120	131	114	110	131	156	156	160	162	127	286	312	269	253	283	303	297	309	81	75	178
30	107	105	110	82	77	76	83	79	79	89	70	***	152	145	74	81	103	162	84	60	65	66	62	66	287
31	68	66	70	76	83	87	79	83	109	114	108	77	87	88	67	111	136	177	156	143	133	128	127	120	227

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.7% OPERATIONAL RECOVERY RATE = 99.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
AUGUST - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	14	20	13	10	16	16	12	16	20	22	16	21	45	34	23	18	17	16	12	17	12	17	44	9	19
2	14	11	15	12	47	49	18	17	36	13	12	12	31	12	14	18	31	22	31	36	29	23	20	10	22
3	13	13	10	6	11	9	11	11	27	38	36	15	12	17	22	19	42	13	23	22	20	16	14	14	18
4	18	9	8	12	11	7	12	17	23	19	25	20	16	18	18	15	14	9	29	10	11	13	17	14	15
5	9	11	12	9	13	15	14	12	37	27	35	58	19	23	28	11	31	63	15	22	10	10	10	7	21
6	9	12	9	10	6	9	12	13	14	17	32	42	54	38	46	42	39	39	16	8	30	14	11	14	22
7	13	13	13	11	14	12	11	12	9	23	52	27	22	51	32	48	54	21	18	8	8	32	12	46	23
8	51	13	25	16	33	17	9	14	20	32	36	23	31	29	27	19	16	15	10	6	28	7	13	40	22
9	8	23	45	12	9	8	8	19	11	21	26	23	10	16	22	19	14	18	13	7	9	10	15	8	16
10	10	17	12	8	44	12	14	29	28	47	31	34	24	18	17	20	18	12	12	7	8	14	16	10	19
11	6	4	10	8	9	9	17	16	28	23	37	41	24	34	15	14	14	8	7	7	12	16	13	9	16
12	11	9	9	34	37	8	6	18	25	17	22	17	13	17	17	15	13	25	37	11	11	9	52	48	20
13	10	9	11	24	9	16	16	10	14	22	47	31	50	57	40	40	46	22	28	45	45	8	12	10	26
14	7	16	11	23	21	14	14	10	9	11	15	20	37	46	66	25	33	28	16	9	6	8	8	7	19
15	15	11	10	21	12	8	9	18	14	15	54	48	48	57	49	39	42	23	21	7	6	17	11	8	23
16	8	11	15	19	15	13	11	9	14	25	30	53	54	52	77	57	44	11	20	16	15	21	17	22	26
17	11	15	14	13	30	40	10	9	8	18	30	42	27	36	42	27	43	27	20	11	5	26	8	16	22
18	16	17	24	30	12	12	16	25	21	35	40	53	69	27	25	26	14	9	9	7	6	4	50	11	23
19	18	8	41	35	49	12	14	11	19	30	60	17	17	13	14	18	13	10	8	10	25	25	13	20	21
20	37	34	19	11	9	9	12	18	40	33	24	19	21	20	17	13	19	15	16	32	42	19	13	24	22
21	26	19	7	38	15	16	11	15	19	33	45	37	51	18	20	23	15	12	15	12	28	24	11	11	22
22	12	14	12	7	9	5	9	14	20	18	23	43	55	46	30	16	16	17	8	6	6	23	46	8	19
23	6	51	28	9	44	41	30	33	12	12	23	53	***	15	19	15	15	14	15	8	6	6	11	24	21
24	23	5	8	10	28	11	8	11	25	42	27	19	20	20	23	22	13	11	11	16	20	27	12	12	18
25	40	34	13	19	9	13	8	12	17	27	31	26	25	24	19	19	15	18	9	8	7	8	15	21	18
26	27	36	39	52	39	15	28	40	47	54	15	23	19	38	47	20	43	13	11	15	14	27	10	20	29
27	9	12	7	10	14	20	47	64	41	23	53	42	47	47	27	33	21	16	13	8	9	33	15	14	26
28	38	6	10	8	26	13	9	9	15	29	49	41	27	27	26	24	18	16	8	7	6	4	8	39	19
29	10	5	8	9	5	6	8	9	16	16	39	55	63	52	46	31	31	43	16	7	8	8	24	23	22
30	12	12	15	13	8	10	11	12	13	13	17	***	21	58	33	10	33	14	23	8	23	18	9	8	17
31	10	9	8	8	10	8	8	9	9	10	15	16	25	27	33	37	18	15	10	8	10	8	10	9	14
HRAVE	16	15	16	16	20	15	14	17	21	25	32	32	33	32	30	24	26	19	16	13	15	16	17	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19	22	18	15	21	22	23	22	16	19	16	20	26	19	23	26	22	23	21	22	22	19	21	18	18
MAX	45	49	42	29	63	54	54	51	45	47	41	52	57	66	57	77	43	69	60	42	51	55	53	42	40
MIN	9	10	6	7	7	6	8	6	7	7	4	6	8	6	6	8	5	4	8	9	7	5	6	5	7

DAY	26	27	28	29	30	31
AVE	29	26	19	22	17	14
MAX	54	64	49	63	58	37
MIN	10	7	4	5	8	8

MONTHLY AVERAGE = 20.7 MONTHLY MAXIMUM = 77.0 MONTHLY MINIMUM = 4.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.7% OPERATIONAL RECOVERY RATE = 99.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
AUGUST - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	25.5	24.7	23.3	22.2	22.5	23.0	23.0	23.3	24.2	26.2	27.3	28.4	30.6	32.0	33.9	34.5	35.1	34.7	34.0	32.8	30.1	28.2	26.2	26.0	28.0
2	26.4	25.9	25.6	24.7	25.2	24.9	25.0	25.5	26.6	27.8	29.0	28.0	25.6	23.5	24.1	26.1	26.8	27.2	27.5	27.3	27.1	26.8	26.3	26.4	26.2
3	26.3	25.7	25.2	24.7	24.6	24.3	24.6	25.7	28.1	29.3	30.9	30.6	28.0	30.8	32.6	30.7	30.1	29.5	28.2	27.4	26.9	26.6	26.1	25.9	27.6
4	25.7	25.6	24.8	25.3	24.6	24.2	25.3	25.9	27.1	29.0	30.6	31.6	32.5	33.1	33.9	33.6	33.2	32.8	32.2	30.4	29.6	28.5	28.2	27.9	29.0
5	27.2	26.9	26.8	26.9	26.4	26.2	26.5	27.6	30.0	32.1	34.3	34.7	34.7	35.3	34.1	32.9	30.3	26.1	26.0	25.7	25.5	25.5	25.0	25.0	28.8
6	25.2	23.9	24.6	23.2	23.4	23.6	23.8	26.2	28.5	31.0	32.7	35.0	36.7	38.8	39.5	39.6	39.5	39.1	38.1	36.6	33.7	30.3	29.1	29.7	31.3
7	30.2	30.1	29.3	28.2	27.5	27.3	28.4	30.2	31.8	33.6	35.4	38.2	39.6	40.0	40.1	39.1	39.4	40.1	39.0	37.3	36.2	35.5	34.1	32.5	34.3
8	32.6	30.8	29.7	29.3	26.7	26.1	27.0	28.6	30.5	33.1	34.8	36.4	38.1	39.4	40.2	40.1	39.9	39.2	38.2	36.4	35.2	33.8	32.4	32.1	33.8
9	32.3	31.6	30.2	30.0	29.8	29.5	29.2	29.2	30.3	30.6	30.2	25.9	26.0	27.6	29.7	31.8	32.5	32.7	32.7	31.6	30.7	29.7	28.1	27.1	30.0
10	26.6	26.4	26.1	25.6	25.3	24.8	23.8	22.9	22.2	22.8	24.9	27.5	30.0	31.9	33.3	34.2	34.8	34.5	33.6	32.2	31.2	30.6	29.8	29.0	28.5
11	28.0	27.2	26.6	26.3	26.8	26.3	24.5	21.0	20.7	20.8	20.9	22.0	23.9	26.1	29.3	31.0	31.8	32.1	31.2	29.8	29.3	27.9	27.1	26.5	26.5
12	26.2	25.6	25.0	24.4	23.5	23.2	23.8	25.5	27.2	29.1	30.9	32.2	33.3	34.3	35.1	35.9	36.3	34.5	34.1	32.9	31.7	30.6	30.1	29.2	29.8
13	28.0	27.2	26.4	25.8	25.0	24.6	24.9	27.3	29.1	31.7	33.6	35.3	36.4	37.7	38.8	38.9	38.9	38.7	30.3	25.6	26.8	26.5	25.5	25.8	30.4
14	25.1	24.4	25.1	24.5	23.9	24.0	24.1	25.9	27.6	29.2	31.2	33.4	35.5	36.1	36.6	37.5	37.5	37.4	36.7	34.7	32.8	31.9	30.9	30.0	30.7
15	29.4	29.0	28.9	27.2	26.5	26.1	26.1	27.8	30.0	32.6	33.9	35.4	36.7	37.4	38.8	39.3	39.0	39.0	38.3	36.4	35.0	34.3	32.3	31.2	32.9
16	30.0	29.1	29.0	28.4	27.3	27.4	26.4	28.5	30.0	32.9	35.9	37.3	39.0	39.6	40.2	40.7	38.3	33.9	32.4	31.1	30.4	30.0	29.8	29.5	32.4
17	29.6	28.8	28.3	27.6	27.1	26.3	27.3	29.0	31.3	33.4	35.3	37.2	38.9	39.2	39.3	39.3	39.1	38.9	38.0	36.6	35.0	33.4	32.7	32.2	33.5
18	32.1	32.0	30.2	29.3	27.0	26.9	27.2	28.8	31.1	32.7	34.8	35.4	36.7	36.7	37.1	37.7	37.4	36.8	35.6	33.9	32.8	32.5	30.7	29.4	32.7
19	28.6	27.3	26.6	25.4	24.8	24.1	25.5	27.8	30.0	31.9	33.4	34.7	35.7	36.2	36.5	36.7	36.1	35.0	34.0	32.8	31.6	31.2	30.1	29.2	31.1
20	27.9	26.9	26.1	25.6	24.9	24.7	23.8	25.6	27.6	29.4	31.5	32.3	33.9	34.8	35.3	35.5	35.1	30.2	29.9	28.8	28.3	28.4	28.2	27.5	29.3
21	27.2	27.1	25.6	25.8	25.3	24.3	25.0	26.6	28.4	30.0	31.7	33.1	35.0	35.1	35.8	35.7	34.7	33.8	30.8	28.4	27.9	27.5	26.1	25.4	29.4
22	24.6	23.6	23.1	22.8	22.0	21.4	22.2	24.4	26.6	28.9	31.0	33.2	34.6	35.3	34.8	35.6	35.9	35.3	33.6	31.8	31.3	30.5	29.7	27.9	29.2
23	27.7	26.5	25.8	25.2	25.3	25.3	25.3	26.5	28.7	29.9	31.7	33.0	***	34.2	34.8	34.9	34.7	34.1	32.7	31.7	30.4	29.4	28.9	28.5	29.8
24	27.1	25.8	25.2	24.5	23.8	23.1	23.1	24.3	27.0	29.3	31.1	33.1	34.3	35.2	36.0	36.3	35.6	34.8	33.8	33.1	31.5	30.6	30.2	30.0	29.9
25	28.8	27.4	26.1	24.8	23.9	23.7	23.5	25.1	27.7	30.1	32.2	34.1	35.5	36.2	36.5	36.5	36.1	35.7	34.8	33.4	32.7	32.1	31.5	30.5	30.8
26	29.2	27.3	26.4	25.7	26.2	26.5	26.0	25.9	27.7	28.6	30.3	31.0	31.8	33.2	33.6	32.4	33.0	31.4	30.7	29.8	29.5	28.6	28.1	27.4	29.2
27	25.6	24.8	24.7	24.0	23.9	23.8	23.4	24.1	25.7	28.5	31.3	32.6	33.3	35.5	35.8	35.6	34.9	34.0	32.8	31.4	30.0	29.4	28.0	26.8	29.2
28	25.2	23.8	22.9	23.0	21.3	20.0	20.3	22.5	25.2	27.9	30.5	33.0	34.2	35.0	35.5	35.8	35.4	34.8	33.4	31.6	30.9	30.2	28.9	28.0	28.7
29	26.5	25.7	24.2	23.5	23.0	21.8	22.3	24.7	27.4	30.2	32.5	34.9	36.5	37.0	37.5	37.8	37.8	37.2	36.4	34.4	33.3	32.4	31.1	30.3	30.8
30	28.9	28.3	27.3	28.8	29.1	28.3	28.4	29.9	31.0	32.6	33.9	***	37.7	38.1	37.2	29.2	31.6	32.3	33.4	32.6	31.3	30.7	30.3	29.6	31.3
31	29.7	29.3	28.9	28.3	27.7	27.3	27.2	28.4	29.8	31.8	33.4	34.4	35.6	36.2	36.6	37.3	36.3	35.3	33.8	32.9	32.0	31.0	29.6	28.5	31.7
HRAVE	27.9	27.1	26.4	25.8	25.3	24.9	25.1	26.3	28.0	29.9	31.6	32.8	34.0	34.9	35.6	35.6	35.4	34.6	33.4	32.0	31.0	30.1	29.2	28.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	28.0	26.2	27.6	29.0	28.8	31.3	34.3	33.8	30.0	28.5	26.5	29.8	30.4	30.7	32.9	32.4	33.5	32.7	31.1	29.3	29.4	29.2	29.8	29.9	30.8
MAX	35.1	29.0	32.6	33.9	35.3	39.6	40.1	40.2	32.7	34.8	32.1	36.3	38.9	37.5	39.3	40.7	39.3	37.7	36.7	35.5	35.8	35.9	34.9	36.3	36.5
MIN	22.2	23.5	24.3	24.2	25.0	23.2	27.3	26.1	25.9	22.2	20.7	23.2	24.6	23.9	26.1	26.4	26.3	26.9	24.1	23.8	24.3	21.4	25.2	23.1	23.5

DAY	26	27	28	29	30	31
AVE	29.2	29.2	28.7	30.8	31.3	31.7
MAX	33.6	35.8	35.8	37.8	38.1	37.3
MIN	25.7	23.4	20.0	21.8	27.3	27.2

MONTHLY AVERAGE = 30.2 MONTHLY MAXIMUM = 40.7 MONTHLY MINIMUM = 20.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.7% OPERATIONAL RECOVERY RATE = 99.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
AUGUST - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	-0.2	-0.3	-0.3	-0.3	-0.2	-0.1	-0.1	-0.3	-0.5	-1.0	-0.9	-1.0	-1.2	-1.4	-1.6	-1.5	-1.4	-0.9	-0.6	-0.3	-0.1	0.0	0.4	0.1	-0.6
2	0.1	0.1	0.2	0.6	0.3	0.2	0.1	0.0	-0.4	-1.0	-1.1	-0.9	-0.7	-0.4	-0.5	-0.7	-0.5	-0.5	-0.3	0.0	0.1	0.2	0.1	0.3	-0.2
3	0.2	0.1	0.1	0.1	0.1	0.1	-0.4	-0.4	-1.1	-1.0	-1.2	-1.3	-0.9	-1.5	-1.4	-0.9	-0.4	-0.4	-0.3	-0.3	-0.1	0.0	0.0	0.0	-0.5
4	-0.1	0.0	0.1	0.1	0.3	0.0	-0.3	-0.5	-0.7	-0.9	-1.3	-1.4	-1.4	-1.4	-1.4	-0.9	-0.7	-0.7	-0.6	-0.3	-0.1	-0.1	-0.1	-0.1	-0.5
5	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-1.0	-1.2	-1.6	-1.6	-1.3	-1.7	-1.3	-1.1	-0.7	-0.7	0.1	0.2	0.1	0.0	0.1	0.2	0.1	-0.5
6	0.3	0.8	0.3	0.5	0.2	0.3	0.0	-1.0	-1.3	-1.6	-1.3	-1.2	-1.2	-1.8	-1.5	-1.3	-1.2	-0.8	-0.4	0.0	0.0	-0.2	0.0	0.1	-0.5
7	-0.1	-0.1	0.1	0.4	0.2	0.2	-0.3	-0.8	-1.3	-1.4	-1.3	-1.8	-2.4	-1.9	-1.6	-1.0	-0.8	-1.0	-0.6	-0.1	0.2	0.4	0.3	0.5	-0.6
8	0.6	0.5	0.4	0.6	1.1	1.0	0.1	-0.6	-0.7	-0.8	-0.6	-0.9	-1.1	-1.2	-1.3	-1.2	-1.1	-0.8	-0.4	0.3	0.4	0.4	0.5	0.4	-0.2
9	0.4	0.4	0.4	0.3	0.3	0.2	0.1	-0.2	-0.6	-0.7	-0.6	-0.4	-0.4	-1.0	-1.2	-1.4	-1.4	-1.0	-0.6	-0.1	0.1	0.1	0.2	0.2	-0.3
10	0.1	0.2	0.3	0.1	0.0	0.0	0.0	0.0	-0.2	-0.3	-0.6	-0.8	-1.1	-1.3	-1.4	-1.3	-1.2	-0.9	-0.4	0.0	0.2	0.1	0.0	0.1	-0.3
11	0.1	0.4	0.4	0.1	0.1	0.1	-0.2	-0.3	-0.1	0.1	-0.2	-0.5	-0.8	-0.7	-1.1	-1.0	-0.8	-0.7	-0.4	0.2	0.3	0.4	0.4	0.3	-0.2
12	0.3	0.3	0.3	0.3	0.4	0.3	-0.2	-0.5	-0.5	-0.8	-1.1	-1.2	-1.4	-1.4	-1.4	-1.3	-1.1	-0.6	-0.1	0.2	0.3	0.2	0.3	0.3	-0.4
13	0.3	0.3	0.2	0.4	0.1	0.2	-0.4	-1.1	-1.0	-1.4	-1.1	-1.5	-1.5	-1.4	-1.3	-1.1	-0.9	-0.9	0.1	0.8	0.4	0.8	0.5	0.4	-0.4
14	0.5	0.5	0.5	0.5	0.4	0.4	0.0	-0.6	-0.9	-1.2	-1.5	-1.6	-1.6	-1.5	-1.2	-1.4	-1.0	-0.8	-0.3	0.3	0.5	0.4	0.3	0.3	-0.4
15	0.5	0.5	0.6	0.7	0.5	0.6	-0.1	-0.8	-1.3	-1.7	-1.2	-1.2	-1.4	-1.2	-1.3	-1.3	-1.0	-1.0	-0.6	0.2	0.3	0.4	0.4	0.2	-0.4
16	0.2	0.1	0.4	0.4	0.6	0.4	0.4	-0.9	-1.0	-1.2	-1.5	-1.3	-1.7	-1.5	-1.3	-1.1	-0.5	0.1	0.1	0.0	-0.1	0.0	0.1	0.1	-0.4
17	0.0	0.1	0.1	0.2	0.1	0.3	-0.1	-0.7	-1.2	-1.5	-1.6	-1.6	-2.0	-1.8	-1.5	-1.4	-1.0	-0.8	-0.4	0.2	0.3	0.4	0.3	0.4	-0.6
18	0.4	0.2	0.2	0.3	0.3	0.2	-0.2	-1.1	-1.2	-1.2	-1.5	-1.1	-1.3	-1.2	-1.3	-1.3	-1.2	-0.9	-0.5	0.0	0.4	0.4	0.3	0.4	-0.5
19	0.3	0.3	0.3	0.5	0.6	0.5	-0.1	-1.3	-1.4	-1.4	-1.2	-1.5	-1.6	-1.5	-1.5	-1.3	-0.9	-0.4	-0.2	0.0	0.0	0.0	0.0	0.0	-0.5
20	0.1	0.2	0.1	0.2	0.2	0.3	0.0	-0.7	-0.7	-1.0	-1.4	-1.5	-1.5	-1.7	-1.7	-1.5	-1.2	-0.4	-0.2	-0.1	0.0	-0.1	0.0	0.1	-0.5
21	0.1	0.1	0.0	0.1	0.1	0.2	-0.3	-1.2	-1.6	-1.3	-1.3	-1.1	-1.4	-1.5	-1.5	-1.3	-0.7	-0.4	-0.4	-0.2	0.0	0.1	0.0	0.0	-0.6
22	0.0	-0.1	0.0	0.0	0.0	0.1	-0.3	-1.1	-1.5	-1.9	-1.7	-1.6	-1.5	-1.6	-1.1	-1.2	-1.1	-1.0	-0.3	0.1	0.3	0.5	0.2	0.2	-0.6
23	0.2	0.1	0.4	0.1	0.2	0.1	0.0	-0.6	-1.5	-1.7	-2.0	-1.5	***	-1.1	-1.3	-1.4	-1.2	-0.9	-0.4	0.1	0.2	0.4	0.3	0.2	-0.5
24	0.4	0.3	0.2	0.3	0.3	0.2	-0.2	-0.9	-1.1	-0.9	-1.1	-1.5	-1.6	-1.5	-1.4	-1.4	-1.1	-0.6	-0.2	0.0	0.1	0.2	0.2	0.2	-0.5
25	0.2	0.4	0.5	0.5	0.2	0.5	-0.1	-0.9	-1.0	-1.2	-1.3	-1.3	-1.5	-1.6	-1.5	-1.4	-1.1	-0.8	-0.4	0.0	0.1	0.3	0.3	0.2	-0.5
26	0.0	0.0	0.1	0.3	0.2	0.2	0.0	-0.2	-0.7	-1.1	-1.8	-1.7	-1.5	-1.4	-1.1	-0.9	-1.2	-0.7	-0.3	0.1	0.0	0.1	0.1	0.1	-0.5
27	0.3	0.1	0.2	0.1	0.2	0.2	0.0	-0.3	-0.7	-1.1	-1.2	-1.3	-1.3	-1.6	-1.7	-1.5	-1.3	-0.8	-0.2	0.3	0.5	0.3	0.6	0.7	-0.4
28	0.4	0.4	0.4	0.3	0.7	0.4	0.2	-1.0	-1.2	-1.1	-0.8	-1.2	-1.4	-1.4	-1.4	-1.3	-1.1	-0.8	-0.4	0.2	0.3	0.5	0.5	0.5	-0.3
29	0.5	0.5	0.6	0.3	0.5	0.6	-0.3	-1.4	-1.6	-1.8	-1.4	-1.3	-1.4	-1.4	-1.3	-1.3	-0.9	-0.6	-0.4	0.2	0.3	0.3	0.6	0.4	-0.4
30	0.5	0.8	1.0	0.4	0.2	0.1	-0.2	-1.0	-1.3	-1.7	-1.7	***	-2.0	-1.6	-1.4	0.5	0.2	-0.3	0.5	0.7	0.5	0.5	0.5	0.5	-0.2
31	0.5	0.3	0.3	0.4	0.3	0.3	0.0	-0.7	-1.3	-1.7	-2.0	-1.8	-1.9	-1.7	-1.5	-1.4	-0.8	-0.6	-0.3	-0.1	0.0	0.1	0.0	0.0	-0.6
HRAVE	0.2	0.2	0.3	0.3	0.3	0.3	-0.1	-0.7	-1.0	-1.2	-1.3	-1.3	-1.4	-1.4	-1.4	-1.3	-1.2	-0.9	-0.7	-0.3	0.1	0.2	0.2	0.2	0.2

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.6	-0.2	-0.5	-0.5	-0.5	-0.5	-0.6	-0.2	-0.3	-0.3	-0.2	-0.4	-0.4	-0.4	-0.4	-0.4	-0.6	-0.5	-0.5	-0.5	-0.6	-0.6	-0.5	-0.5	-0.5
MAX	0.4	0.6	0.2	0.3	0.2	0.8	0.5	1.1	0.4	0.3	0.4	0.4	0.8	0.5	0.7	0.6	0.4	0.4	0.6	0.3	0.2	0.5	0.4	0.4	0.5
MIN	-1.6	-1.1	-1.5	-1.4	-1.7	-1.8	-2.4	-1.3	-1.4	-1.4	-1.1	-1.4	-1.5	-1.6	-1.7	-1.7	-2.0	-1.5	-1.6	-1.7	-1.6	-1.9	-2.0	-1.6	-1.6

DAY	26	27	28	29	30	31
AVE	-0.5	-0.4	-0.3	-0.4	-0.2	-0.6
MAX	0.3	0.7	0.7	0.6	1.0	0.5
MIN	-1.8	-1.7	-1.4	-1.8	-2.0	-2.0

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = -2.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.7% OPERATIONAL RECOVERY RATE = 99.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
AUGUST - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	701	701	701	701	701	701	702	702	702	702	703	702	702	701	700	699	699	699	700	700	701	702	702	702	701
2	702	702	702	702	702	702	703	703	704	703	703	703	703	703	703	702	702	702	702	702	702	703	703	703	703
3	703	703	702	702	702	703	703	703	703	703	703	702	702	701	701	700	700	701	701	701	701	701	701	701	702
4	701	700	700	700	700	701	701	701	701	701	701	700	700	699	***	***	***	***	***	***	***	***	***	***	700
5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
12	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
13	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	699	700	700	700	700	700
14	700	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	698	698	698	698	699	700	700	700	700
15	701	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	698	698	698	698	699	699	699	700	700
16	700	700	700	700	700	701	701	701	701	701	701	701	700	699	698	698	698	699	700	701	701	701	701	701	700
17	701	701	701	700	700	701	701	702	702	702	702	701	700	700	699	698	698	698	698	698	699	699	699	699	700
18	699	699	699	699	700	700	701	701	701	701	701	701	700	699	698	698	697	697	697	698	698	699	699	699	699
19	699	699	699	699	699	***	***	***	700	700	700	700	699	699	698	697	697	697	697	698	698	699	700	700	699
20	700	700	700	700	700	700	701	701	701	701	701	700	700	699	698	698	698	698	698	699	699	699	700	700	700
21	700	700	700	700	700	700	701	701	701	701	701	700	700	699	698	698	698	698	699	700	700	700	700	700	700
22	700	700	700	700	701	701	701	701	701	701	701	701	700	699	699	699	698	698	698	699	699	700	700	700	700
23	700	701	701	701	701	702	702	703	704	704	703	703	***	701	701	701	701	701	701	701	701	702	702	702	702
24	702	702	702	702	702	703	703	703	703	703	703	702	702	701	700	700	700	700	700	700	701	701	701	701	702
25	701	701	701	701	701	702	702	702	702	702	702	701	701	700	699	699	698	698	698	699	699	699	700	700	700
26	700	700	700	701	701	701	702	702	702	702	702	702	701	700	699	699	699	700	700	700	700	700	700	700	701
27	700	700	700	700	701	701	701	702	702	702	702	701	701	700	700	699	699	699	699	699	700	700	701	701	700
28	701	701	701	701	702	702	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	701	701	701
29	701	701	701	701	701	701	702	702	702	702	702	701	700	700	699	699	698	698	698	699	699	699	700	700	700
30	700	700	701	701	701	701	701	702	702	702	702	***	697	698	699	699	699	699	698	699	699	700	700	700	700
31	700	700	700	700	701	701	701	701	702	702	701	701	700	700	699	698	698	698	698	699	700	700	701	701	700
HRAVE	701	701	701	701	701	701	702	702	702	702	702	701	700	700	699	699	699	699	699	699	700	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	703	702	700	***	***	***	***	***	***	***	***	700	700	700	700	700	699	699	700	700	700	702	702	700
MAX	703	704	703	701	***	***	***	***	***	***	***	***	700	702	702	701	702	701	700	701	701	701	704	703	702
MIN	699	702	700	699	***	***	***	***	***	***	***	***	699	698	698	698	698	697	697	698	698	698	700	700	698

DAY	26	27	28	29	30	31
AVE	701	700	701	700	700	700
MAX	702	702	703	702	702	702
MIN	699	699	700	698	697	698

MONTHLY AVERAGE = 700.4 MONTHLY MAXIMUM = 703.5 MONTHLY MINIMUM = 696.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 69.6% OPERATIONAL RECOVERY RATE = 69.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
AUGUST - 2016

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	60	67	74	81	80	80	82	78	73	62	54	48	39	42	36	34	31	32	35	38	50	60	71	72	57
2	68	69	73	83	79	80	79	77	72	67	61	65	66	80	82	67	62	60	57	63	64	66	70	69	70
3	71	75	76	79	79	80	78	71	57	51	46	51	62	51	41	50	51	54	60	64	67	69	72	73	64
4	74	76	81	78	81	84	77	72	67	56	51	48	42	39	***	***	***	***	***	***	***	***	***	***	66
5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
12	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
13	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
14	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
15	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
16	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
17	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
18	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
19	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
20	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
27	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
28	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
29	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
30	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
31	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
HRAVE	68	72	76	80	80	81	79	74	67	59	53	53	52	53	53	51	48	49	50	55	60	65	71	71	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	57	70	64	66	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
MAX	82	83	80	84	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
MIN	31	57	41	39	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***

DAY	26	27	28	29	30	31
AVE	***	***	***	***	***	***
MAX	***	***	***	***	***	***
MIN	***	***	***	***	***	***

MONTHLY AVERAGE = 64.0 MONTHLY MAXIMUM = 84.4 MONTHLY MINIMUM = 30.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 11.6% OPERATIONAL RECOVERY RATE = 11.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
AUGUST - 2016

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.16	0.29	0.23	0.36	0.81	0.94	0.85	0.46	0.53	0.27	0.12	0.01	0.00	0.00	0.00	0.00	5.11
2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.35	0.69	0.56	0.37	0.03	0.05	0.16	0.23	0.19	0.14	0.08	0.00	0.00	0.00	0.00	0.00	2.93
3	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.12	0.53	0.55	0.71	0.51	0.39	0.92	0.79	0.17	0.10	0.06	0.03	0.00	0.00	0.00	0.00	0.00	4.97
4	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.10	0.38	0.49	0.86	0.90	0.88	0.62	0.50	0.21	0.21	0.18	0.10	0.00	0.00	0.00	0.00	0.00	5.51
5	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.28	0.51	0.70	0.86	1.04	0.93	0.55	0.25	0.17	0.06	0.01	0.01	0.00	0.00	0.00	0.00	0.00	5.40
6	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.29	0.44	0.68	0.83	0.93	0.97	0.96	0.87	0.52	0.45	0.27	0.09	0.00	0.00	0.00	0.00	0.00	7.37
7	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.30	0.51	0.70	0.85	0.93	0.97	0.93	0.59	0.35	0.33	0.36	0.11	0.00	0.00	0.00	0.00	0.00	7.03
8	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.52	0.71	0.87	0.94	0.97	0.94	0.85	0.53	0.41	0.30	0.10	0.00	0.00	0.00	0.00	0.00	7.51
9	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.17	0.31	0.32	0.11	0.05	0.20	0.55	0.79	0.55	0.39	0.29	0.10	0.00	0.00	0.00	0.00	0.00	3.90
10	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.04	0.03	0.22	0.59	0.92	0.95	0.92	0.83	0.53	0.38	0.30	0.08	0.00	0.00	0.00	0.00	0.00	5.87
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.11	0.40	0.46	0.76	0.85	0.55	0.32	0.29	0.09	0.00	0.00	0.00	0.00	0.00	3.86
12	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.49	0.69	0.83	0.91	0.95	0.92	0.83	0.58	0.31	0.31	0.09	0.00	0.00	0.00	0.00	0.00	7.28
13	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.28	0.29	0.66	0.85	0.90	0.96	0.91	0.84	0.60	0.34	0.31	0.04	***	***	***	***	***	7.08
14	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
15	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
16	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
17	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
18	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
19	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
20	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
27	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
28	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
29	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
30	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
31	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.17	0.35	0.52	0.64	0.70	0.73	0.77	0.69	0.42	0.31	0.24	0.08	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.11	2.93	4.97	5.51	5.40	7.37	7.03	7.51	3.90	5.87	3.86	7.28	7.08	***	***	***	***	***	***	***	***	***	***	***	***
MAX	0.94	0.69	0.92	0.90	1.04	0.97	0.97	0.97	0.79	0.95	0.85	0.95	0.96	***	***	***	***	***	***	***	***	***	***	***	***
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	***	***	***	***	***	***

DAY	26	27	28	29	30	31
TOT	***	***	***	***	***	***
MAX	***	***	***	***	***	***
MIN	***	***	***	***	***	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 41.3% OPERATIONAL RECOVERY RATE = 41.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
AUGUST - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.06
2	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.08
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04
8	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	0.02	0.00	0.00	0.00	0.00	0.02
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.06	0.05	0.00	0.00	0.08	0.00	0.04	0.14	0.00	0.13	0.25	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.06	0.04	0.00	0.00	0.08	0.00	0.04	0.14	0.00	0.06	0.17	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.15	0.00
MAX	0.00	0.00	0.00	0.00	0.15	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.92 MONTHLY MAXIMUM = 0.17 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
SEPTEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	4.3	2.5	2.4	2.4	2.7	2.6	2.7	2.3	2.2	2.8	2.7	1.7	2.4	2.2	5.9	5.6	3.9	5.8	9.5	7.6	8.4	4.8	3.9	3.2	3.9
2	3.8	4.5	4.3	5.7	4.9	3.4	3.2	3.7	4.2	4.5	3.3	2.8	1.7	1.9	2.2	3.3	2.6	4.1	5.1	3.0	2.0	3.1	2.6	2.6	3.4
3	3.3	3.2	3.1	3.1	2.7	3.2	3.1	3.0	3.7	1.9	2.6	1.9	2.9	2.9	3.1	6.0	4.5	5.1	6.1	5.7	2.3	2.8	2.9	1.6	3.4
4	2.2	1.9	2.0	2.0	3.4	3.7	3.2	2.5	2.3	2.2	3.5	3.4	3.1	3.8	3.2	4.0	5.7	6.7	6.6	5.9	3.2	2.2	3.6	3.9	3.5
5	3.2	3.1	2.5	3.3	2.7	2.4	2.7	2.9	2.3	1.9	1.6	3.3	3.2	4.4	5.8	4.8	6.8	7.0	6.4	2.6	3.1	4.2	2.5	1.4	3.5
6	3.6	2.2	0.9	1.0	2.2	2.8	2.6	1.0	1.7	1.3	1.6	2.3	2.3	2.9	2.7	2.9	1.5	0.8	6.8	7.5	3.6	3.7	3.8	3.5	2.7
7	6.2	6.6	7.5	5.0	4.0	4.0	4.8	5.4	4.1	3.9	3.8	3.9	4.8	7.1	6.0	3.8	4.9	3.2	2.2	2.4	1.8	1.6	1.0	1.3	4.1
8	1.3	1.0	0.9	1.1	2.0	1.5	1.3	1.7	2.0	2.8	2.4	3.1	3.8	4.9	4.5	5.5	6.0	5.9	5.8	2.7	2.9	2.5	2.7	2.0	2.9
9	2.5	3.3	2.7	3.0	2.9	2.4	2.6	2.2	1.7	1.5	2.2	3.6	4.2	4.7	5.2	5.6	5.7	7.3	6.0	4.5	3.2	1.6	1.6	2.2	3.4
10	3.0	3.1	4.0	4.1	3.2	2.7	3.9	3.1	1.2	1.2	1.2	1.4	1.8	2.2	2.5	2.4	2.1	2.0	2.3	2.7	2.1	2.3	3.3	3.4	2.6
11	3.0	3.0	2.6	3.1	3.8	4.9	3.2	3.5	2.9	3.2	2.3	2.1	3.0	4.0	5.1	5.4	6.7	6.6	5.8	3.5	2.5	3.0	5.9	5.4	3.9
12	4.3	5.7	4.9	3.4	2.9	2.1	1.8	2.1	2.1	2.4	2.2	2.5	6.0	3.1	5.6	3.8	4.7	5.1	4.8	5.7	5.0	4.6	5.4	6.9	4.0
13	4.2	4.1	4.5	4.0	4.3	3.6	4.6	5.6	4.4	1.7	2.7	3.2	2.1	6.1	5.5	7.0	6.0	6.0	4.9	4.5	3.0	3.2	2.9	3.3	4.2
14	3.1	3.1	2.9	3.1	3.7	4.5	3.5	3.2	3.0	2.5	2.3	2.6	1.7	2.0	3.7	5.0	5.4	5.7	5.6	3.8	2.9	2.9	2.8	2.1	3.4
15	3.0	3.7	2.1	2.6	3.4	3.2	2.6	1.8	1.4	1.0	1.2	2.4	2.7	4.5	5.9	7.5	8.2	7.0	6.2	3.5	1.8	3.3	3.1	4.1	3.6
16	4.3	3.8	3.6	3.1	2.4	2.7	2.7	2.0	2.0	2.1	1.6	1.6	1.3	2.2	2.1	1.7	2.9	4.9	5.5	3.7	2.0	2.1	3.2	3.7	2.8
17	4.3	3.8	3.3	2.8	2.8	2.7	3.2	2.5	2.6	2.4	2.0	1.8	1.6	2.6	2.2	1.4	2.1	1.6	1.9	3.0	4.2	2.1	3.4	3.8	2.7
18	4.5	4.5	3.5	3.7	3.2	3.0	3.2	3.3	3.2	2.8	2.8	2.5	1.9	1.7	1.5	1.9	2.1	5.2	5.7	5.9	4.9	2.3	3.3	4.0	3.4
19	3.5	3.1	3.3	4.2	3.8	3.2	3.4	2.2	1.5	***	2.1	1.0	1.7	2.3	5.5	8.6	8.7	8.1	6.7	5.5	5.6	4.0	4.8	5.2	4.3
20	2.4	2.3	1.7	1.7	1.3	2.4	3.3	3.1	2.5	1.9	0.8	1.0	1.4	3.5	4.6	5.1	4.5	5.2	6.3	5.7	4.1	2.6	1.2	1.1	2.9
21	1.6	2.3	3.0	3.2	3.1	2.9	3.3	3.0	2.1	1.6	2.2	1.4	3.1	3.1	3.0	3.3	4.3	4.1	5.2	3.9	3.8	5.4	6.1	5.5	3.4
22	5.0	3.2	2.7	2.5	3.0	2.8	2.4	2.4	1.3	0.9	1.8	2.7	3.7	6.8	8.4	8.7	9.6	8.9	6.6	2.9	1.6	2.3	2.7	2.3	4.0
23	4.2	3.0	1.3	2.2	3.7	4.0	4.7	7.8	8.4	8.1	8.4	9.2	9.7	4.8	7.2	6.6	4.3	4.2	3.3	3.0	3.3	3.6	3.4	3.2	5.1
24	3.5	3.2	2.6	3.1	3.0	1.5	1.3	2.0	2.0	2.3	1.5	1.5	2.8	3.6	4.0	5.3	4.5	5.8	5.8	5.3	4.2	2.0	1.3	2.2	3.1
25	2.1	2.7	2.6	3.6	3.4	4.3	4.7	4.6	4.4	5.7	4.9	4.4	3.7	5.1	6.4	7.0	6.4	6.7	5.0	3.2	3.2	2.4	4.1	4.1	4.4
26	2.6	5.1	5.0	6.9	8.6	5.0	4.8	6.1	7.8	5.3	7.1	5.5	4.9	8.6	8.9	4.1	4.6	8.9	9.4	8.1	9.2	10.7	10.9	12.4	7.1
27	10.0	9.9	9.6	9.3	8.8	8.5	9.3	8.1	8.2	5.5	6.8	7.6	7.4	6.6	7.5	8.6	7.5	7.3	5.7	4.8	5.7	5.8	3.5	3.5	7.3
28	3.1	3.0	2.8	4.3	4.6	4.5	6.6	7.0	7.4	6.4	8.9	7.7	6.3	6.7	7.4	4.2	3.1	7.5	7.3	6.4	1.9	3.9	3.8	2.9	5.3
29	2.4	1.9	1.6	2.8	1.6	1.0	2.6	4.4	2.9	6.2	4.7	4.2	2.8	3.8	2.4	0.9	1.5	4.4	4.8	6.4	4.2	4.5	4.2	3.7	3.3
30	3.4	3.1	3.2	5.3	6.6	7.5	7.3	8.0	6.8	5.4	3.4	3.1	2.3	1.4	3.5	2.9	7.3	5.6	2.8	1.0	1.9	2.5	2.8	3.4	4.2
HRAVE	3.6	3.5	3.2	3.5	3.6	3.4	3.6	3.7	3.4	3.2	3.2	3.2	3.3	4.0	4.7	4.8	4.9	5.6	5.5	4.5	3.6	3.4	3.6	3.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.9	3.4	3.4	3.5	3.5	2.7	4.1	2.9	3.4	2.6	3.9	4.0	4.2	3.4	3.6	2.8	2.7	3.4	4.3	2.9	3.4	4.0	5.1	3.1	4.4
MAX	9.5	5.7	6.1	6.7	7.0	7.5	7.5	6.0	7.3	4.1	6.7	6.9	7.0	5.7	8.2	5.5	4.3	5.9	8.7	6.3	6.1	9.6	9.7	5.8	7.0
MIN	1.7	1.7	1.6	1.9	1.4	0.8	1.0	0.9	1.5	1.2	2.1	1.8	1.7	1.7	1.0	1.3	1.4	1.5	1.0	0.8	1.4	0.9	1.3	1.3	2.1

DAY	26	27	28	29	30	31
AVE	7.1	7.3	5.3	3.3	4.2	***
MAX	12.4	10.0	8.9	6.4	8.0	***
MIN	2.6	3.5	1.9	0.9	1.0	***

MONTHLY AVERAGE = 3.9 MONTHLY MAXIMUM = 12.4 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.9% OPERATIONAL RECOVERY RATE = 99.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
SEPTEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	136	129	156	139	138	139	121	135	124	88	71	107	124	152	286	312	39	14	303	148	44	101	101	89	229
2	105	81	52	56	84	110	116	105	79	70	73	61	38	262	252	279	267	209	158	130	146	91	120	128	341
3	92	129	116	111	124	114	113	134	125	141	77	101	165	140	188	206	202	234	264	294	315	320	211	142	214
4	154	107	116	119	94	117	88	120	114	115	121	138	289	273	201	241	249	263	289	289	314	178	116	103	216
5	108	94	74	108	114	108	106	100	136	127	136	133	135	208	211	231	279	296	304	287	310	318	268	186	341
6	303	262	169	141	126	101	93	83	141	146	276	251	297	298	293	278	266	262	154	150	141	145	148	172	293
7	150	135	144	120	128	93	109	118	102	84	95	55	50	43	42	72	68	5	314	323	338	173	212	155	96
8	135	123	145	201	295	254	252	277	292	312	267	275	262	275	278	280	274	274	284	227	233	136	117	117	39
9	105	109	111	120	117	108	120	127	132	156	285	268	272	275	280	281	282	288	293	288	305	174	150	119	96
10	123	115	120	114	128	114	106	137	142	138	128	152	261	168	184	143	148	237	255	279	216	131	117	113	17
11	87	79	130	105	75	75	121	134	143	149	161	192	281	287	281	275	282	279	283	290	299	125	133	127	90
12	125	130	109	112	124	143	139	130	132	131	87	141	151	137	69	73	156	161	100	110	123	98	110	104	86
13	86	82	104	84	72	78	69	60	66	115	113	154	145	152	167	187	132	117	126	113	148	134	130	147	351
14	141	140	126	121	131	124	121	137	144	142	148	88	354	186	253	257	267	299	306	303	152	117	109	116	345
15	126	118	127	116	103	106	117	115	132	233	199	262	244	304	299	290	281	281	286	304	164	121	120	119	109
16	121	118	122	113	116	111	116	118	128	148	143	137	115	299	279	253	290	292	307	295	337	132	106	110	12
17	108	112	112	112	111	113	91	95	110	134	142	137	127	154	122	137	237	249	207	294	300	192	110	107	93
18	112	113	127	113	105	108	104	107	121	134	158	148	150	162	79	288	279	285	294	307	302	169	113	102	187
19	104	106	113	117	125	111	114	126	139	***	154	143	264	282	290	297	290	287	282	292	301	296	311	296	174
20	278	175	101	93	124	109	117	119	109	115	113	220	247	277	283	301	301	286	295	297	299	307	195	246	169
21	148	132	109	119	111	112	116	111	116	140	119	292	286	285	297	292	283	266	302	287	303	299	290	303	312
22	300	302	293	286	291	287	253	235	225	163	139	263	290	252	258	273	289	286	293	299	265	286	286	267	349
23	286	293	278	219	222	262	288	285	282	286	281	288	283	219	146	125	153	174	165	141	122	116	110	124	29
24	119	117	111	100	129	109	88	143	134	112	137	282	285	293	270	271	279	283	292	302	297	312	126	112	103
25	106	121	121	136	137	133	125	137	143	99	74	71	78	69	101	112	113	88	82	71	56	102	69	87	163
26	84	73	61	87	115	94	94	97	124	146	157	135	95	106	154	111	125	99	72	117	90	76	87	82	86
27	74	84	90	85	85	83	83	76	96	106	72	68	79	75	100	96	91	79	70	62	63	77	84	103	265
28	122	144	160	51	85	79	68	68	71	98	67	70	84	86	91	127	117	20	59	57	74	90	127	95	315
29	108	103	113	111	332	136	150	140	147	321	309	96	66	22	19	297	77	46	83	125	72	71	122	123	300
30	111	133	136	79	56	62	66	67	65	64	73	78	68	293	198	170	140	154	151	82	119	99	128	116	34

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.9% OPERATIONAL RECOVERY RATE = 99.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
SEPTEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	9	9	7	13	6	7	11	19	19	19	26	45	63	53	25	14	18	36	13	34	11	36	10	14	22
2	15	16	14	10	14	13	16	14	11	9	15	22	39	36	37	25	21	25	11	10	11	13	15	27	18
3	11	10	11	15	23	25	13	19	13	26	20	49	33	57	52	18	18	17	13	7	64	36	39	27	26
4	26	16	13	15	11	10	12	13	19	24	21	50	40	34	51	32	17	11	7	4	42	44	10	8	22
5	11	11	12	9	9	8	8	9	18	23	35	22	41	42	21	29	17	12	8	9	14	11	45	25	19
6	25	30	50	44	11	9	10	72	22	48	39	37	33	23	27	20	20	49	10	8	9	14	10	11	26
7	10	10	10	9	10	13	10	9	16	14	12	16	21	13	13	14	10	21	16	20	35	20	14	21	15
8	14	16	13	17	7	12	16	15	14	18	31	19	18	17	20	14	12	12	8	14	17	21	8	12	15
9	9	9	10	6	8	10	8	11	28	32	39	19	20	21	19	14	12	10	9	5	8	40	30	10	16
10	8	11	15	10	8	11	8	11	23	47	38	45	41	43	41	41	30	33	20	23	15	11	8	8	23
11	10	9	6	12	18	9	13	8	11	17	25	32	38	32	25	19	11	10	7	6	43	16	11	11	17
12	17	10	11	10	11	18	21	20	18	22	39	37	13	30	9	13	13	19	18	17	21	26	11	11	18
13	18	17	13	11	18	13	10	11	10	32	24	19	26	10	14	18	17	9	9	9	10	5	9	9	14
14	6	10	12	11	8	5	9	9	11	15	18	23	49	43	23	24	20	15	10	6	25	11	7	9	16
15	10	9	13	9	8	7	7	11	34	44	57	24	43	34	17	17	10	10	6	5	50	7	7	7	19
16	5	8	7	7	6	6	6	8	16	18	31	28	58	53	69	49	28	13	8	7	35	18	11	8	21
17	8	7	8	8	7	7	8	9	18	17	23	31	53	36	47	51	25	32	13	5	5	29	7	8	19
18	7	6	6	7	8	9	6	10	16	17	18	24	38	55	61	47	51	13	6	6	5	21	7	8	19
19	10	9	9	9	9	10	8	13	16	***	20	75	42	25	17	12	10	9	7	8	8	9	11	15	16
20	31	14	32	23	21	10	10	13	13	18	44	54	41	16	11	14	15	11	7	7	8	13	38	50	21
21	49	9	9	11	11	11	9	8	26	29	33	63	31	30	22	18	26	12	13	6	8	8	7	10	19
22	8	8	6	5	6	6	19	22	34	82	55	55	36	23	17	16	12	10	10	10	12	8	7	19	20
23	24	17	36	22	22	14	8	8	9	10	15	13	10	30	18	14	15	12	15	19	13	13	10	10	16
24	7	7	11	10	9	31	41	15	18	22	35	58	33	36	22	17	15	10	7	6	5	23	68	16	22
25	16	9	11	9	11	9	6	14	19	27	22	23	30	32	25	14	15	15	11	10	30	18	9	23	17
26	29	14	14	11	7	14	13	10	10	8	10	21	16	23	12	24	23	10	12	15	12	10	10	9	14
27	11	10	11	11	10	11	11	10	17	23	16	11	17	17	15	11	12	11	10	9	9	11	28	18	13
28	16	18	45	36	18	17	7	9	10	26	9	15	21	19	16	33	60	33	12	17	54	18	13	8	22
29	24	19	25	39	60	49	12	8	23	33	73	34	35	22	56	81	57	24	30	21	21	14	15	8	33
30	9	12	16	19	13	10	7	6	9	10	20	18	32	47	31	65	25	25	62	57	17	13	22	12	23
HRAVE	15	12	15	14	13	13	11	14	17	25	29	33	34	32	28	26	21	18	13	13	21	18	17	14	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	22	18	26	22	19	26	15	15	16	23	17	18	14	16	19	21	19	19	16	21	19	20	16	22	17
MAX	63	39	64	51	45	72	35	31	40	47	43	39	32	49	57	69	53	61	75	54	63	82	36	68	32
MIN	6	9	7	4	8	8	9	7	5	8	6	9	5	5	5	5	5	5	7	7	6	5	8	5	6

DAY	26	27	28	29	30	31
AVE	14	13	22	33	23	***
MAX	29	28	60	81	65	***
MIN	7	9	7	8	6	***

MONTHLY AVERAGE = 19.3 MONTHLY MAXIMUM = 81.9 MONTHLY MINIMUM = 4.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.9% OPERATIONAL RECOVERY RATE = 99.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
SEPTEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	27.9	27.8	27.4	27.2	27.3	27.2	27.0	27.3	29.0	31.5	32.6	34.0	35.4	36.9	34.2	34.2	35.4	32.5	24.3	23.3	23.8	24.0	23.2	23.8	29.1
2	24.0	24.1	25.2	25.6	24.4	23.5	23.4	25.4	27.3	28.9	31.1	32.3	33.5	35.0	36.4	36.2	36.5	35.3	32.8	31.8	31.2	30.7	29.6	29.2	29.7
3	28.9	27.7	26.6	25.8	24.4	23.7	24.1	25.7	27.7	30.7	33.1	34.9	36.8	37.9	38.7	37.9	37.8	37.7	35.6	33.2	32.8	32.8	31.2	29.1	31.4
4	28.2	27.5	26.2	24.8	23.4	22.2	22.9	23.3	26.3	30.3	33.7	36.0	36.4	37.1	38.3	38.2	37.9	36.8	34.7	32.2	31.6	30.5	28.8	27.7	30.6
5	26.4	25.4	23.0	22.7	21.6	20.6	20.7	23.4	25.8	29.0	31.8	36.0	37.7	39.8	40.2	39.9	38.8	37.5	35.7	33.8	32.8	32.0	31.3	29.7	30.6
6	28.9	27.0	26.8	25.8	24.4	23.8	23.5	23.8	27.0	30.1	31.8	33.0	33.7	34.0	34.5	34.3	34.0	33.7	32.6	31.4	30.7	29.9	29.0	28.4	29.7
7	28.1	27.4	25.6	24.0	23.1	22.9	22.8	22.2	21.3	21.2	21.7	22.2	23.0	22.8	21.8	21.6	21.4	22.1	22.1	22.7	23.0	22.0	22.3	22.0	22.9
8	22.2	22.0	21.9	21.7	22.1	21.8	21.8	22.4	23.1	24.5	26.0	27.2	28.5	29.9	30.9	31.3	31.7	31.4	30.2	28.6	28.1	27.1	26.2	25.6	26.1
9	25.1	24.5	24.0	23.2	22.7	22.2	22.2	23.4	25.5	27.5	29.3	31.7	33.7	34.8	35.5	35.9	36.0	35.3	34.0	32.4	31.4	30.5	29.8	28.3	29.1
10	26.9	26.1	25.0	24.4	24.0	23.2	23.0	24.5	26.5	28.9	31.3	33.6	35.5	36.5	37.5	37.5	37.3	36.3	35.6	34.2	33.1	31.3	30.1	29.2	30.5
11	28.8	28.3	27.1	26.5	26.9	26.7	25.2	26.4	28.8	30.9	32.6	33.9	35.1	36.8	37.5	37.5	37.2	36.5	34.7	32.9	31.6	29.2	28.1	27.1	31.1
12	26.3	25.8	25.3	24.6	24.0	23.5	23.6	24.0	25.1	28.3	30.1	31.9	30.6	26.8	30.0	31.3	31.1	28.1	24.2	22.2	21.8	21.5	21.0	22.1	26.0
13	21.9	21.9	21.8	21.1	20.3	19.9	19.8	20.9	22.5	25.4	27.5	29.5	30.6	31.4	31.1	29.8	28.2	26.9	25.4	24.7	23.9	23.1	22.7	22.3	24.7
14	21.8	21.6	21.3	21.1	20.2	20.5	20.5	22.1	23.9	26.1	27.6	29.6	31.0	32.5	33.4	34.5	34.0	32.6	31.5	30.3	28.4	26.9	26.0	25.3	26.8
15	23.9	23.3	22.3	21.6	21.0	20.3	19.8	21.4	23.4	25.8	28.5	30.9	32.8	33.0	33.6	33.8	33.2	32.3	30.4	28.9	27.6	25.5	24.5	23.2	26.7
16	21.9	20.9	20.1	19.2	18.2	17.2	17.1	18.6	21.6	24.3	27.1	29.9	31.9	32.7	33.0	33.4	33.4	32.9	31.1	29.3	28.3	26.2	24.8	23.3	25.7
17	22.4	21.8	20.5	19.6	18.5	17.9	18.0	20.1	22.9	25.5	28.6	31.3	33.6	34.8	35.0	35.0	35.4	34.9	33.5	31.7	30.5	28.7	26.4	25.4	27.2
18	23.9	23.2	21.6	20.4	20.1	19.5	19.0	21.2	24.0	27.3	30.3	33.1	35.6	37.0	37.9	37.8	38.2	37.6	35.1	33.5	32.6	30.1	28.9	27.2	29.0
19	25.5	24.1	23.0	21.9	20.9	20.6	20.4	20.9	22.4	***	30.2	32.2	34.7	36.8	37.3	35.7	34.2	33.1	32.0	31.0	30.3	29.7	28.7	27.7	28.4
20	27.2	26.2	26.0	26.2	25.3	25.2	24.6	24.8	25.4	26.9	28.0	29.9	31.1	31.7	31.7	31.8	32.5	31.5	29.9	29.1	28.5	27.9	27.2	26.8	28.1
21	25.8	25.2	24.7	24.2	24.0	23.9	23.6	24.6	27.4	28.5	31.8	33.2	34.0	34.6	34.7	35.1	35.3	34.7	33.2	31.9	31.2	30.3	28.1	27.2	29.5
22	26.5	25.8	25.3	25.0	24.7	24.1	23.5	24.4	25.9	27.9	29.8	31.1	31.9	33.8	33.6	32.6	31.1	29.9	28.3	27.6	27.2	26.6	26.2	25.7	27.9
23	24.6	24.7	24.1	23.4	23.3	23.1	22.5	22.8	23.5	24.2	25.5	26.3	23.4	22.6	21.5	21.9	23.8	24.2	22.8	21.3	20.4	19.4	18.9	18.0	22.7
24	16.7	16.3	15.6	15.2	14.1	14.1	13.3	14.4	17.7	21.2	24.2	26.5	28.0	29.1	29.8	29.9	29.6	28.6	26.6	25.5	24.7	24.0	22.6	20.9	22.0
25	19.6	18.5	18.1	16.6	16.1	15.8	16.0	18.5	21.9	26.1	28.8	29.9	31.2	32.1	32.3	32.0	32.0	31.7	30.8	30.0	28.9	27.5	26.8	25.7	25.3
26	26.6	26.5	26.4	25.9	25.3	24.8	24.5	24.6	24.1	22.9	23.0	22.1	24.1	25.1	22.0	22.0	22.2	22.9	23.1	21.9	21.3	21.4	21.3	21.4	23.6
27	21.3	20.9	20.7	20.1	19.6	19.2	19.5	19.8	20.3	16.4	16.9	20.3	23.4	25.5	27.3	27.0	27.1	26.7	26.3	25.5	24.9	24.6	23.9	23.4	22.5
28	22.0	21.2	21.1	21.8	21.3	21.6	21.6	22.6	24.9	27.2	27.7	29.4	31.6	32.4	31.8	30.1	28.5	22.8	21.6	21.1	21.2	21.1	21.1	21.5	24.5
29	21.4	21.5	21.2	21.2	20.8	20.9	20.5	20.8	21.9	22.1	22.4	24.8	27.8	29.6	31.0	31.6	31.3	30.2	28.4	23.4	23.5	22.9	21.9	21.2	24.3
30	21.0	20.6	20.2	21.1	22.0	21.6	21.5	22.3	23.9	25.9	27.7	29.4	30.2	30.3	28.7	30.8	25.3	21.3	20.3	21.3	21.2	20.7	20.2	19.6	23.6
HRAVE	24.5	23.9	23.3	22.7	22.1	21.7	21.5	22.5	24.4	26.4	28.4	30.2	31.6	32.4	32.7	32.7	32.4	31.3	29.6	28.2	27.5	26.6	25.7	24.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	29.1	29.7	31.4	30.6	30.6	29.7	22.9	26.1	29.1	30.5	31.1	26.0	24.7	26.8	26.7	25.7	27.2	29.0	28.4	28.1	29.5	27.9	22.7	22.0	25.3
MAX	36.9	36.5	38.7	38.3	40.2	34.5	28.1	31.7	36.0	37.5	37.5	31.9	31.4	34.5	33.8	33.4	35.4	38.2	37.3	32.5	35.3	33.8	26.3	29.9	32.3
MIN	23.2	23.4	23.7	22.2	20.6	23.5	21.2	21.7	22.2	23.0	25.2	21.0	19.8	20.2	19.8	17.1	17.9	19.0	20.4	24.6	23.6	23.5	18.0	13.3	15.8

DAY	26	27	28	29	30	31
AVE	23.6	22.5	24.5	24.3	23.6	***
MAX	26.6	27.3	32.4	31.6	30.8	***
MIN	21.3	16.4	21.1	20.5	19.6	***

MONTHLY AVERAGE = 27.0 MONTHLY MAXIMUM = 40.2 MONTHLY MINIMUM = 13.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.9% OPERATIONAL RECOVERY RATE = 99.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
SEPTEMBER - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.1	0.2	0.0	0.2	0.2	0.1	0.2	-0.1	-0.6	-1.3	-1.2	-1.1	-1.5	-1.6	-0.9	-1.2	-0.7	-0.2	0.2	0.2	0.2	0.2	0.1	0.2	-0.3
2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	-0.6	-0.9	-1.1	-1.5	-1.4	-1.1	-1.0	-1.1	-1.0	-0.8	-0.6	-0.2	0.0	0.2	0.2	0.4	0.2	-0.4
3	0.3	0.2	0.3	0.3	0.4	0.4	-0.1	-1.1	-1.5	-1.2	-1.7	-1.4	-1.8	-1.9	-1.5	-1.2	-1.0	-0.7	-0.2	0.2	0.2	0.3	0.6	0.4	-0.5
4	0.6	0.6	0.7	0.5	0.6	0.5	0.0	-0.8	-1.1	-1.5	-2.0	-1.8	-1.3	-1.4	-1.5	-1.2	-1.0	-0.7	-0.1	0.3	0.4	0.4	0.4	0.5	-0.4
5	0.6	0.6	0.5	0.6	0.5	0.6	0.0	-1.4	-1.3	-1.3	-1.1	-2.0	-2.0	-1.7	-1.8	-1.4	-1.1	-0.7	-0.1	0.5	0.6	0.4	0.4	0.4	-0.4
6	0.6	0.8	0.4	0.5	0.5	0.5	0.4	-0.5	-0.9	-1.1	-1.0	-1.1	-1.1	-1.0	-0.9	-0.7	-0.4	-0.3	-0.3	-0.2	0.0	-0.1	-0.1	-0.1	-0.3
7	-0.1	-0.1	-0.1	0.0	0.0	0.1	0.1	0.1	0.3	0.2	0.0	0.0	-0.1	0.1	0.0	-0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.1
8	0.2	0.1	0.1	0.0	0.2	0.0	0.0	-0.1	-0.2	-0.6	-0.7	-0.9	-0.9	-1.2	-1.3	-1.1	-0.9	-0.6	-0.1	0.2	0.2	0.3	0.2	0.3	-0.3
9	0.4	0.3	0.3	0.4	0.2	0.3	0.0	-0.8	-0.9	-0.8	-0.9	-1.0	-1.2	-1.3	-1.3	-1.2	-0.9	-0.5	0.0	0.3	0.5	0.3	0.3	0.3	-0.3
10	0.2	0.4	0.3	0.2	0.4	0.3	-0.1	-0.9	-0.7	-0.7	-0.9	-1.0	-1.0	-1.3	-1.4	-1.1	-0.8	-0.3	-0.1	0.3	0.4	0.3	0.4	0.2	-0.3
11	0.4	0.4	0.6	0.5	0.3	0.2	0.2	-0.7	-1.4	-1.6	-1.4	-1.3	-1.3	-1.4	-1.3	-1.1	-1.0	-0.6	-0.1	0.4	0.4	0.1	0.0	0.1	-0.4
12	0.1	0.1	0.1	0.1	0.3	0.3	0.0	-0.4	-0.6	-1.4	-1.4	-1.6	-1.9	-1.1	-1.2	-1.1	-0.8	-0.1	0.4	0.1	0.2	0.4	0.2	0.3	-0.4
13	0.5	0.5	0.4	0.5	0.6	0.4	0.2	0.0	-0.3	-0.9	-1.3	-1.4	-1.2	-0.8	-0.6	-0.7	-0.5	-0.3	-0.2	-0.1	-0.1	-0.1	0.1	0.4	-0.2
14	0.4	0.5	0.7	0.7	0.5	0.3	0.0	-0.9	-1.1	-1.1	-1.2	-1.3	-0.8	-1.0	-1.1	-1.0	-0.8	-0.4	0.0	0.3	0.2	0.2	0.2	0.3	-0.3
15	0.4	0.3	0.3	0.4	0.3	0.3	-0.1	-0.9	-0.8	-0.8	-0.9	-1.0	-1.3	-1.2	-1.2	-1.1	-0.9	-0.5	0.1	0.6	0.5	0.4	0.5	0.4	-0.3
16	0.3	0.4	0.3	0.3	0.5	0.5	0.0	-0.7	-1.1	-1.2	-1.2	-1.2	-1.0	-1.1	-1.1	-0.8	-0.7	-0.5	0.1	0.6	0.7	0.6	0.6	0.6	-0.2
17	0.3	0.3	0.2	0.4	0.4	0.3	0.0	-1.1	-1.6	-1.5	-1.5	-1.3	-1.4	-1.4	-1.3	-0.9	-0.7	-0.4	0.2	0.6	0.6	0.5	0.7	0.6	-0.3
18	0.5	0.3	0.6	0.6	0.3	0.4	0.0	-1.2	-1.6	-1.8	-1.9	-1.7	-1.4	-1.2	-1.1	-0.8	-0.7	-0.5	0.2	0.5	0.7	0.5	0.6	0.6	-0.3
19	0.8	0.7	0.5	0.3	0.6	0.3	0.1	-0.6	-0.7	***	-1.5	-1.0	-1.0	-1.0	-1.0	-0.7	-0.4	-0.1	0.1	0.1	0.1	0.2	0.1	0.0	-0.2
20	0.0	0.0	0.1	0.1	0.3	0.2	0.1	-0.2	-0.4	-0.7	-0.5	-0.7	-0.6	-0.8	-0.7	-0.8	-1.0	-0.4	-0.1	0.0	0.1	0.2	0.2	0.2	-0.2
21	0.2	0.2	0.2	0.1	0.1	0.1	0.0	-0.7	-1.2	-0.9	-1.4	-0.9	-1.2	-1.2	-1.0	-1.0	-0.8	-0.4	-0.1	0.1	0.2	0.1	0.0	0.0	-0.4
22	0.0	0.1	0.1	0.1	0.1	0.1	0.0	-0.5	-0.8	-0.8	-1.3	-1.3	-1.3	-1.3	-1.2	-1.1	-0.9	-0.6	-0.2	0.0	0.2	0.1	0.1	0.0	-0.4
23	0.1	0.1	0.1	0.2	0.2	0.2	0.1	-0.2	-0.4	-0.6	-0.8	-1.1	-0.5	-0.6	-0.9	-1.1	-0.8	-0.5	0.1	0.1	0.2	0.2	0.2	0.4	-0.2
24	0.5	0.3	0.6	0.5	0.9	0.3	0.4	-0.5	-1.1	-1.5	-1.2	-1.0	-1.1	-1.1	-1.2	-1.1	-0.9	-0.5	0.1	0.3	0.5	0.4	0.5	0.4	-0.2
25	0.6	0.5	0.5	0.8	0.6	0.4	0.1	-0.3	-0.8	-1.4	-1.6	-1.6	-1.6	-1.3	-1.1	-0.7	-0.3	0.1	0.4	0.6	0.4	0.5	0.6	0.4	-0.2
26	0.3	0.2	0.1	0.1	0.1	0.1	0.1	-0.1	-0.3	-0.6	-0.8	-0.6	-0.7	-0.6	-0.8	-0.5	-0.4	-0.1	0.0	0.0	0.1	0.0	0.0	0.0	-0.2
27	0.1	0.0	0.1	0.1	0.1	0.1	0.0	-0.1	-0.2	0.2	0.1	-0.8	-1.0	-1.0	-1.0	-0.5	-0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.4	-0.1
28	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.0	-0.9	-1.6	-1.3	-1.3	-1.7	-1.7	-1.0	-0.1	0.1	0.6	0.1	0.1	0.1	0.2	0.2	0.3	-0.2
29	0.3	0.4	0.4	0.2	0.1	0.2	0.3	-0.1	-0.4	0.0	-0.3	-0.8	-0.9	-0.7	-0.8	-0.6	-0.5	0.1	0.3	-0.1	0.1	0.1	0.1	0.0	-0.1
30	0.1	0.5	0.3	0.3	0.2	0.2	0.1	-0.3	-0.8	-1.0	-1.3	-1.6	-1.2	-0.6	-0.7	-0.7	-0.4	0.2	0.3	0.4	0.5	0.6	0.6	0.4	-0.2
HRAVE	0.3	0.3	0.3	0.3	0.3	0.3	0.1	-0.5	-0.8	-1.0	-1.1	-1.2	-1.2	-1.1	-1.1	-0.9	-0.7	-0.3	0.0	0.2	0.3	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.3	-0.4	-0.5	-0.4	-0.4	-0.3	0.1	-0.3	-0.3	-0.3	-0.4	-0.4	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3	-0.2	-0.2	-0.4	-0.4	-0.2	-0.2	-0.2
MAX	0.2	0.4	0.6	0.7	0.6	0.8	0.3	0.3	0.5	0.4	0.6	0.4	0.6	0.7	0.6	0.7	0.7	0.7	0.8	0.3	0.2	0.2	0.4	0.9	0.8
MIN	-1.6	-1.5	-1.9	-2.0	-2.0	-1.1	-0.1	-1.3	-1.3	-1.4	-1.6	-1.9	-1.4	-1.3	-1.3	-1.2	-1.6	-1.9	-1.5	-1.0	-1.4	-1.3	-1.1	-1.5	-1.6

DAY	26	27	28	29	30	31
AVE	-0.2	-0.1	-0.2	-0.1	-0.2	***
MAX	0.3	0.4	0.6	0.4	0.6	***
MIN	-0.8	-1.0	-1.7	-0.9	-1.6	***

MONTHLY AVERAGE = -0.3 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.9% OPERATIONAL RECOVERY RATE = 99.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
SEPTEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	701	701	701	701	701	701	701	701	702	702	701	701	700	699	699	698	698	698	700	701	701	701	701	701	700
2	701	701	701	700	700	701	701	701	701	701	701	701	700	699	698	697	697	697	697	697	698	698	698	698	699
3	699	698	698	698	699	699	699	699	700	700	699	699	698	697	696	696	695	695	695	695	696	696	696	697	697
4	697	697	697	697	697	697	698	698	698	698	697	697	696	696	695	695	695	695	695	695	695	696	696	696	696
5	696	696	696	696	696	696	697	697	697	697	697	696	695	695	694	694	694	694	694	695	695	696	696	697	696
6	697	698	698	698	698	699	699	700	700	700	700	699	699	699	698	698	698	698	698	698	699	700	700	700	699
7	700	700	700	701	701	701	701	702	702	702	702	702	702	701	701	701	701	701	701	702	702	702	703	703	701
8	703	703	703	703	703	703	704	704	704	704	704	704	703	702	702	701	701	700	700	701	701	701	702	702	702
9	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	699	700	700	701	701	701	701
10	701	701	701	701	702	702	703	703	703	704	704	703	703	702	702	701	701	701	701	702	702	703	703	703	702
11	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	700	700	700	700	700	700	701	701	701	702
12	701	701	701	701	701	701	701	702	702	702	701	701	700	700	699	698	698	698	699	699	700	700	700	701	700
13	701	701	700	700	701	701	701	701	702	702	702	701	701	699	699	699	700	700	700	701	701	701	701	702	701
14	702	702	702	702	702	702	702	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	701	701	701
15	701	701	701	701	701	701	701	702	702	702	701	701	700	700	699	699	699	699	699	699	700	700	700	700	700
16	700	700	700	700	701	701	701	702	702	702	701	701	700	700	699	699	699	699	699	699	700	700	700	700	700
17	700	701	701	701	701	701	702	702	702	702	702	702	702	701	701	700	700	699	699	699	700	700	701	701	701
18	701	701	701	701	702	702	702	703	703	703	703	702	702	701	701	700	700	700	700	700	701	702	702	702	701
19	702	702	702	702	702	703	703	703	704	***	703	702	702	701	701	700	701	701	701	702	702	703	703	703	702
20	702	702	702	702	702	702	702	703	703	703	703	702	702	701	701	701	700	700	700	701	701	701	701	701	702
21	701	701	700	700	700	700	701	701	701	701	701	700	700	699	698	698	697	697	697	698	698	698	699	699	699
22	699	699	699	699	699	699	699	699	699	699	699	698	698	697	697	696	696	696	697	697	697	697	698	698	698
23	698	698	698	698	698	698	699	699	699	700	700	700	700	700	700	700	700	700	700	700	701	701	701	702	700
24	702	702	702	702	702	703	703	703	703	703	703	702	702	701	700	700	700	700	700	701	701	701	702	702	702
25	701	702	702	702	702	702	702	703	703	703	703	702	702	701	701	701	700	700	701	701	702	702	702	703	702
26	703	704	703	703	703	704	704	705	705	705	705	705	705	704	704	704	704	703	703	703	704	704	704	703	704
27	703	703	703	703	703	703	704	704	705	706	704	704	703	702	701	700	700	700	700	701	701	701	701	701	702
28	701	701	701	701	701	702	***	***	703	703	703	702	702	701	701	701	701	702	703	702	703	703	703	704	702
29	704	704	704	704	704	704	704	704	705	706	706	705	704	704	703	703	702	702	703	704	704	704	705	705	704
30	705	705	704	704	704	704	704	705	705	705	704	704	703	702	702	701	702	702	702	702	702	702	703	703	703
HRAVE	701	701	701	701	701	701	702	702	702	702	702	701	701	700	700	699	699	699	699	700	700	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	699	697	696	696	699	701	702	701	702	702	700	701	701	700	700	701	701	702	702	699	698	700	702	702
MAX	702	701	700	698	697	700	703	704	702	704	704	702	702	703	702	702	702	703	704	703	701	699	702	703	703
MIN	698	697	695	695	694	697	700	700	699	701	700	698	699	700	699	699	699	700	700	700	697	696	698	700	700

DAY	26	27	28	29	30	31
AVE	704	702	702	704	703	***
MAX	705	706	704	706	705	***
MIN	703	700	701	702	701	***

MONTHLY AVERAGE = 700.7 MONTHLY MAXIMUM = 706.0 MONTHLY MINIMUM = 693.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
SEPTEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
12	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
13	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
14	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
15	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
16	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
17	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
18	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
19	***	***	***	***	***	***	***	***	***	***	20	17	12	9	11	15	15	15	17	20	23	23	32	43	19
20	47	47	47	47	47	49	49	46	44	38	35	29	25	25	28	30	28	31	37	40	41	44	45	46	39
21	50	51	54	54	55	56	56	52	41	40	31	31	32	31	30	29	29	30	34	38	36	38	51	58	42
22	63	66	69	71	73	76	77	72	62	53	43	39	36	25	24	31	39	42	46	49	51	53	55	60	53
23	71	71	74	74	68	66	71	72	65	62	54	49	53	49	58	52	40	39	42	55	64	70	72	73	61
24	73	73	70	68	70	71	71	63	47	37	27	14	12	10	10	10	10	11	14	14	15	18	19	23	35
25	24	27	29	32	34	35	36	31	26	19	15	14	14	13	13	14	14	15	16	18	20	22	21	24	22
26	27	32	33	34	36	37	38	36	37	45	45	54	44	35	48	50	47	39	37	40	42	42	43	41	40
27	41	43	44	46	47	48	45	43	43	80	77	59	46	40	34	35	35	36	36	39	40	41	46	49	46
28	56	59	60	56	59	57	58	54	49	43	41	36	31	30	32	37	46	76	80	81	84	84	85	83	57
29	84	85	86	87	90	88	90	88	83	82	80	67	52	44	39	36	35	41	48	67	66	66	76	83	69
30	83	84	84	75	69	70	69	65	58	51	45	40	38	37	47	29	50	80	87	80	79	85	85	87	66
HRAVE	56	58	59	58	59	59	60	57	50	50	43	37	33	29	31	31	32	38	41	45	47	49	52	56	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	19	39	42	53	61	35	22
MAX	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	43	49	58	77	74	73	36
MIN	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	9	25	29	24	39	10	13

DAY	26	27	28	29	30	31
AVE	40	46	57	69	66	***
MAX	54	80	85	90	87	***
MIN	27	34	30	35	29	***

MONTHLY AVERAGE = 46.8 MONTHLY MAXIMUM = 90.1 MONTHLY MINIMUM = 9.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 38.6% OPERATIONAL RECOVERY RATE = 38.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
SEPTEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
12	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
13	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.31	0.38	0.17	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.96
14	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.25	0.37	0.50	0.44	0.63	0.49	0.59	0.69	0.64	0.38	0.12	0.02	0.00	0.00	0.00	0.00	0.00	5.15
15	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.47	0.67	0.83	0.93	0.95	0.90	0.79	0.62	0.40	0.14	0.02	0.00	0.00	0.00	0.00	0.00	7.01
16	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.48	0.68	0.84	0.93	0.96	0.91	0.79	0.61	0.40	0.14	0.02	0.00	0.00	0.00	0.00	0.00	7.06
17	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.47	0.67	0.83	0.93	0.95	0.91	0.79	0.61	0.39	0.13	0.01	0.00	0.00	0.00	0.00	0.00	6.98
18	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.47	0.67	0.82	0.92	0.95	0.91	0.79	0.61	0.39	0.12	0.01	0.00	0.00	0.00	0.00	0.00	6.95
19	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.34	***	0.83	0.93	0.92	0.79	0.49	0.33	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.06
20	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.14	0.25	0.37	0.57	0.42	0.31	0.25	0.32	0.39	0.06	0.00	0.00	0.00	0.00	0.00	0.00	3.15
21	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.38	0.47	0.75	0.76	0.68	0.71	0.44	0.43	0.33	0.10	0.01	0.00	0.00	0.00	0.00	0.00	5.26
22	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.44	0.64	0.80	0.77	0.91	0.86	0.75	0.57	0.35	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.45
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.25	0.36	0.51	0.71	0.14	0.17	0.29	0.56	0.35	0.11	0.01	0.00	0.00	0.00	0.00	0.00	3.60
24	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.64	0.80	0.90	0.93	0.87	0.75	0.57	0.35	0.11	0.00	0.00	0.00	0.00	0.00	0.00	6.61
25	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.63	0.79	0.88	0.91	0.86	0.59	0.41	0.35	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.21
26	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.12	0.22	0.26	0.23	0.38	0.24	0.25	0.15	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.01
27	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.07	0.02	0.22	0.87	0.88	0.83	0.73	0.36	0.23	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.33
28	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.37	0.59	0.76	0.68	0.92	0.69	0.38	0.13	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.69
29	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.14	0.09	0.25	0.53	0.76	0.81	0.68	0.57	0.34	0.10	0.00	0.00	0.00	0.00	0.00	0.00	4.37
30	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.41	0.60	0.75	0.84	0.88	0.26	0.50	0.42	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.94
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.34	0.48	0.64	0.77	0.77	0.68	0.57	0.46	0.28	0.09	0.01	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	***	***	***	***	***	***	***	***	***	***	***	***	0.96	5.15	7.01	7.06	6.98	6.95	5.06	3.15	5.26	6.45	3.60	6.61	6.21
MAX	***	***	***	***	***	***	***	***	***	***	***	***	0.38	0.69	0.95	0.96	0.95	0.95	0.93	0.57	0.76	0.91	0.71	0.93	0.91
MIN	***	***	***	***	***	***	***	***	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	2.01	4.33	4.69	4.37	4.94	***
MAX	0.38	0.88	0.92	0.81	0.88	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 57.9% OPERATIONAL RECOVERY RATE = 57.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
SEPTEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.09	0.01	0.01	0.00	0.00	0.00	0.17
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.04	0.06	0.04	0.04	0.01	0.04	0.07	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.04	0.00	0.00	0.27
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.37
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.22	0.01	0.00	0.00	0.00	0.00	0.00	0.24
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.17	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.09	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.08	0.37	0.01	0.24	***
MAX	0.00	0.07	0.24	0.01	0.22	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 1.56 MONTHLY MAXIMUM = 0.24 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.9% OPERATIONAL RECOVERY RATE = 99.9%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

OCTOBER THROUGH DECEMBER 2016

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

January 2017

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period October through December 2016. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

The tower data was remotely collected and reviewed on a regular basis. There were no significant operational events occurred during the period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A calibration of the ST-10 meteorological equipment was performed on November 22, 2016, and the calibration results are presented in Appendix A. The calibrations demonstrate that the meteorological systems were operating within the acceptable DQO ranges, as listed in the project's QAPP Table B-1. The QAPP does not list calibration DQOs for the parameters collected at ST-10 that are not used in AERMOD dispersion modeling, those parameters being pressure, precipitation, and relative humidity. The DQOs that were used to validate these three additional parameters are listed in Tables 0-7 and 0-8 in EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems - Volume IV: Meteorological Measurements Version 2.0* (March 2008), which list PSD measurement DQOs.

A quality assurance performance audit was also conducted on the ST-10 meteorological tower on November 22, 2016, before any tower calibrations or adjustments were made. This audit was performed by independent personnel, using independent certified audit standards. The results from this audit are also presented in Appendix A, and indicate that the meteorological systems were operating within the acceptable DQO ranges.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software

screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.

- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were -3.1, -3.9, and -4.7 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, including any necessary data edits.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these quarterly data capture goals.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Jul-16	81.5	81.5	81.5	71.4	80.1	81.5	81.3
Aug-16	99.7	99.7	99.7	41.3	69.6	11.6	99.6
Sep-16	99.9	99.9	99.9	57.9	99.6	38.6	99.9
Oct-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Nov-16	99.6	99.6	99.6	99.6	99.2	99.6	99.6
Dec-16	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Jan-17							
Feb-17							
Mar-17							
Apr-17							
May-17							
Jun-17							
Quarter 1	93.8	93.8	93.8	56.7	83.1	43.5	93.7
Quarter 2	99.9	99.9	99.9	99.9	99.7	99.9	99.9
Quarter 3							
Quarter 4							
Total	96.8	96.8	96.8	78.2	91.4	71.5	96.8

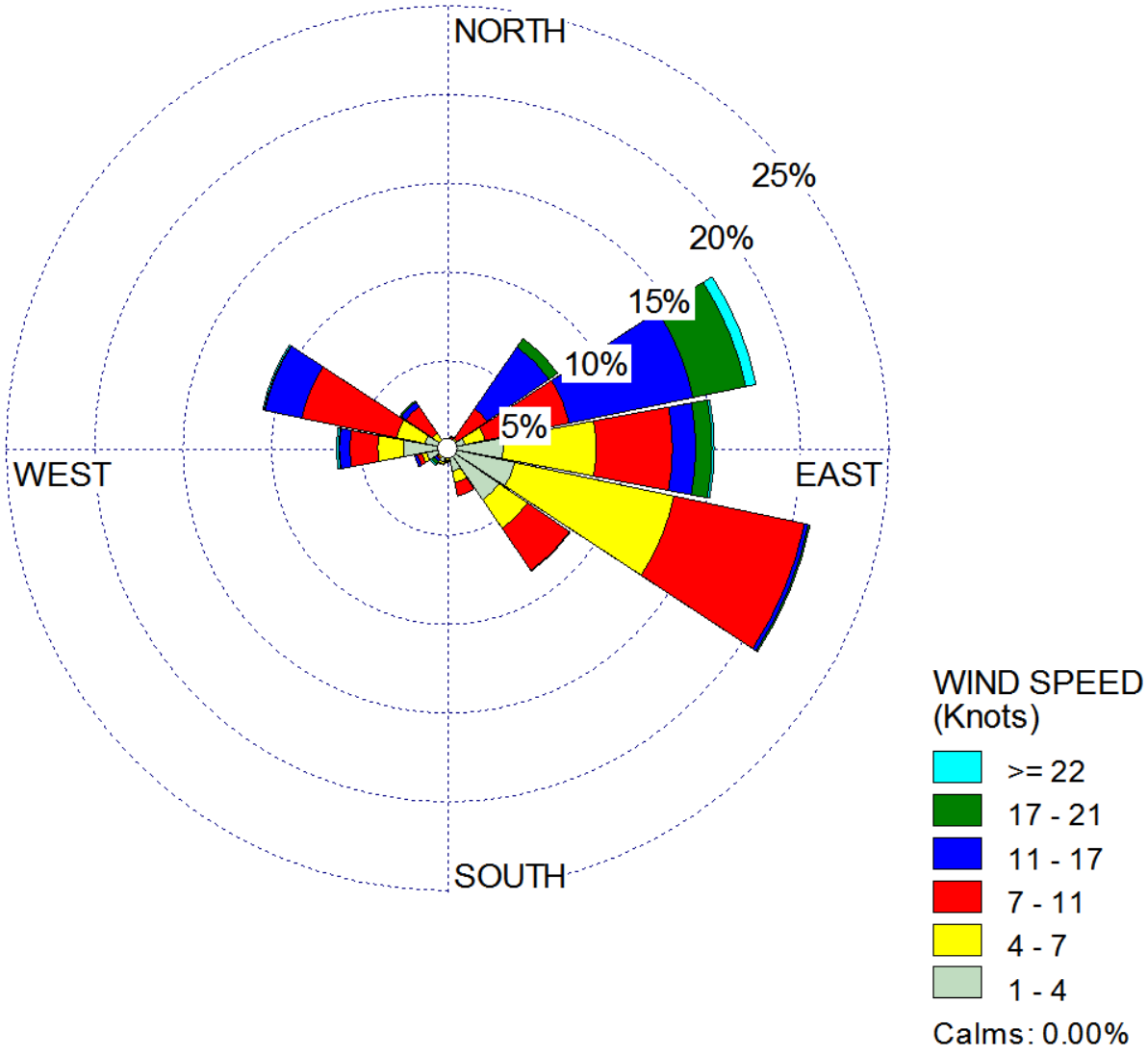
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix B presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours). This is similar to wind patterns previously observed for the October through December time period.

Figure 1 – 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Data Screening and Validation Results

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 11/22/2016 By: Rebecca Moore / Samantha Taylor

RM Young Wind Monitor AQ Sensor SN :	126168
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY102999
Pressure Sensor	Streamline Pro SN CU06012
Relative Humidity Sensor	Campbell CS215 SN E16175
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN 4015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Streamline Pro SN CU06012, temp. probe T060102
Relative Humidity Standard	Extech RH390 SN 130327978

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.4	0.4	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.7 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	4	3
45	41	44	3
90	86	90	4
135	131	133	2
180	176	178	2
225	221	222	1
270	266	268	2
315	311	311	0

Note: Readings adjusted for data logger offset

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic) = 349

Alignment (true) = 359

Data Logger Offset = -4

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 9 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.2	0.1	-0.1	0.1	-0.1	-0.01
19.9	19.9	0.0	19.9	0.0	0.09
42.4	42.7	0.3	42.7	0.3	0.03

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
N/A	N/A	0.00	0%

No Calibration solar radiation sensor available

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
52.4	58.4	6.0

For RH the DQO limit is ± 7%

BAROMETRIC PRESSURE SENSOR

Standard	Logger	Difference
703.3	704.04	0.7

Acceptable tolerance is 2.3 mm Hg

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.20	0.20	0.00

Note: Input 100 ml for a target of 0.20 inches (20 tips).

The water must be input over at least 5 minutes.

Input starts at 10:48 to 10:58, 20 tips counted.

Comments:

Calibration start 09:00

Calibration end 11:10

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 11/22/2016 Auditor: John Podrez

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 126168
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY102999
Wind Speed Audit Standard:	RM Young 18820 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton SN M100608

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.4	0.4	NA
311	3.6	3.7	0.1	2.8%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.7 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	1	0
45	41	41	0
90	86	85	-1
135	131	131	0
180	176	176	0
225	221	220	-1
270	266	265	-1
315	311	310	-1

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic) = 347

Alignment (true) = 357

Note - Data Logger program has offset of -4 degrees

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 9 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	0.1	0.0	0.1	0.0	-0.01
20.0	19.9	0.1	19.9	-0.1	0.09
42.5	42.7	0.2	42.7	0.2	0.03

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.58	0.61	0.03	1%

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

(Note - sensor mV readings are converted to kw/m2 by multiplying 0.09735) mVolt reading 6

Audit Std recertified Dec 8, 2016 - factor is 0.09735

Comments:

Audit starts 09:00, is over 11:10

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct-Dec 2016 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	16100204	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16100222	WIND SPD TOO CONSTANT 3 HR	0.11	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16100314	WIND SPD TOO CONSTANT 3 HR	0.09	Moderate to high wind speeds - WS is valid
4	WS	16100315	WIND SPD TOO CONSTANT 3 HR	0.11	Moderate to high wind speeds - WS is valid
4	WS	16100402	WIND SPD TOO CONSTANT 3 HR	0.11	Moderate to high wind speeds - WS is valid
4	WS	16100513	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16100817	WIND SPD TOO CONSTANT 3 HR	0.16	Moderate to high wind speeds - WS is valid
4	WS	16112008	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high wind speeds - WS is valid
4	WS	16113005	WIND SPD TOO CONSTANT 3 HR	0.07	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16113006	WIND SPD TOO CONSTANT 3 HR	0.18	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16120419	WIND SPD TOO CONSTANT 3 HR	0.07	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16122003	WIND SPD TOO CONSTANT 3 HR	0.16	Moderate to high wind speeds - WS is valid
4	WS	16122204	WIND SPD TOO CONSTANT 3 HR	0.09	Moderate to high wind speeds - WS is valid
4	WS	16122401	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16122402	WIND SPD TOO CONSTANT 3 HR	0.2	WD does vary and Sigma Theta is low to moderate - WS is valid
4	WS	16122818	WIND SPD TOO CONSTANT 3 HR	0.16	WD does vary and Sigma Theta is low to moderate - WS is valid
7	WD	16100907	WIND DIR TOO CONSTANT 3 HR	0.36	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16100908	WIND DIR TOO CONSTANT 3 HR	0.53	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16110914	WIND DIR TOO CONSTANT 3 HR	0.76	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16111905	WIND DIR TOO CONSTANT 3 HR	0.56	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16112007	WIND DIR TOO CONSTANT 3 HR	0.77	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16112600	WIND DIR TOO CONSTANT 3 HR	0.2	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16112601	WIND DIR TOO CONSTANT 3 HR	0.57	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16121007	WIND DIR TOO CONSTANT 3 HR	0.5	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16121902	WIND DIR TOO CONSTANT 3 HR	0.48	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16122717	WIND DIR TOO CONSTANT 3 HR	0.4	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16122718	WIND DIR TOO CONSTANT 3 HR	0.97	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	16122813	WIND DIR TOO CONSTANT 3 HR	0.8	WS is moderate to high, Sigma Theta varies - WD is valid
11	TP	16102009	HIGH RATE OF C CHANGE	5.34	Significant Change in Temperature and Winds during the hour - data is valid
11	TP	16102009	HIGH RATE OF C CHANGE	5.34	Significant Change in Temperature and Winds during the hour - data is valid
11	TP	16122416	HIGH RATE OF C CHANGE	11.27	Significant Change in Winds and rainfall during the hour - data is valid
11	TP	16122416	HIGH RATE OF C CHANGE	11.36	Significant Change in Winds and rainfall during the hour - data is valid
16	D1	16121815	DT + During Daytime	0.11	Slightly outside of QC - data is valid
16	D1	16122115	DT + During Daytime	0.11	Slightly outside of QC - Wind Shift - data is valid
16	D1	16122715	DT + During Daytime	0.11	Slightly outside of QC - Wind Shift - data is valid
16	D1	16122914	DT + During Daytime	0.13	Slightly outside of QC - Wind Shift - data is valid
17	D1	16112800	DT - During Nighttime	-0.19	Slightly outside of QC - Wind Shift - data is valid
19	RH	16100301	OUT OF LIMITS	96.6	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16100302	OUT OF LIMITS	97.1	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16100303	OUT OF LIMITS	98.5	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16100304	OUT OF LIMITS	99.4	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16100305	OUT OF LIMITS	99.9	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16100306	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16100307	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16110505	OUT OF LIMITS	96.3	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16110506	OUT OF LIMITS	98.5	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16112205	OUT OF LIMITS	97.6	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16112206	OUT OF LIMITS	99.8	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16112207	OUT OF LIMITS	98	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16112723	OUT OF LIMITS	95.5	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16112800	OUT OF LIMITS	97.6	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16112806	OUT OF LIMITS	96.8	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16121609	OUT OF LIMITS	96	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122115	OUT OF LIMITS	96	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122116	OUT OF LIMITS	96.4	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122122	OUT OF LIMITS	98.2	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122123	OUT OF LIMITS	97.9	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122200	OUT OF LIMITS	98.7	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122201	OUT OF LIMITS	99.6	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122202	OUT OF LIMITS	99.9	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122203	OUT OF LIMITS	99.1	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122204	OUT OF LIMITS	99.5	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122205	OUT OF LIMITS	98.2	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122206	OUT OF LIMITS	98	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122207	OUT OF LIMITS	99	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122208	OUT OF LIMITS	99.6	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122209	OUT OF LIMITS	99.6	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122210	OUT OF LIMITS	98.1	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122300	OUT OF LIMITS	96.9	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122301	OUT OF LIMITS	97.8	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122302	OUT OF LIMITS	99.6	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122303	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122304	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122305	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122306	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122307	OUT OF LIMITS	99.2	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122308	OUT OF LIMITS	96.2	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122323	OUT OF LIMITS	97	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122400	OUT OF LIMITS	96	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122401	OUT OF LIMITS	96.7	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122402	OUT OF LIMITS	98.5	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122403	OUT OF LIMITS	98.7	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122404	OUT OF LIMITS	97.9	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122405	OUT OF LIMITS	95.8	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122406	OUT OF LIMITS	98.1	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122407	OUT OF LIMITS	96.8	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122417	OUT OF LIMITS	97.2	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122418	OUT OF LIMITS	95.8	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct-Dec 2016 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

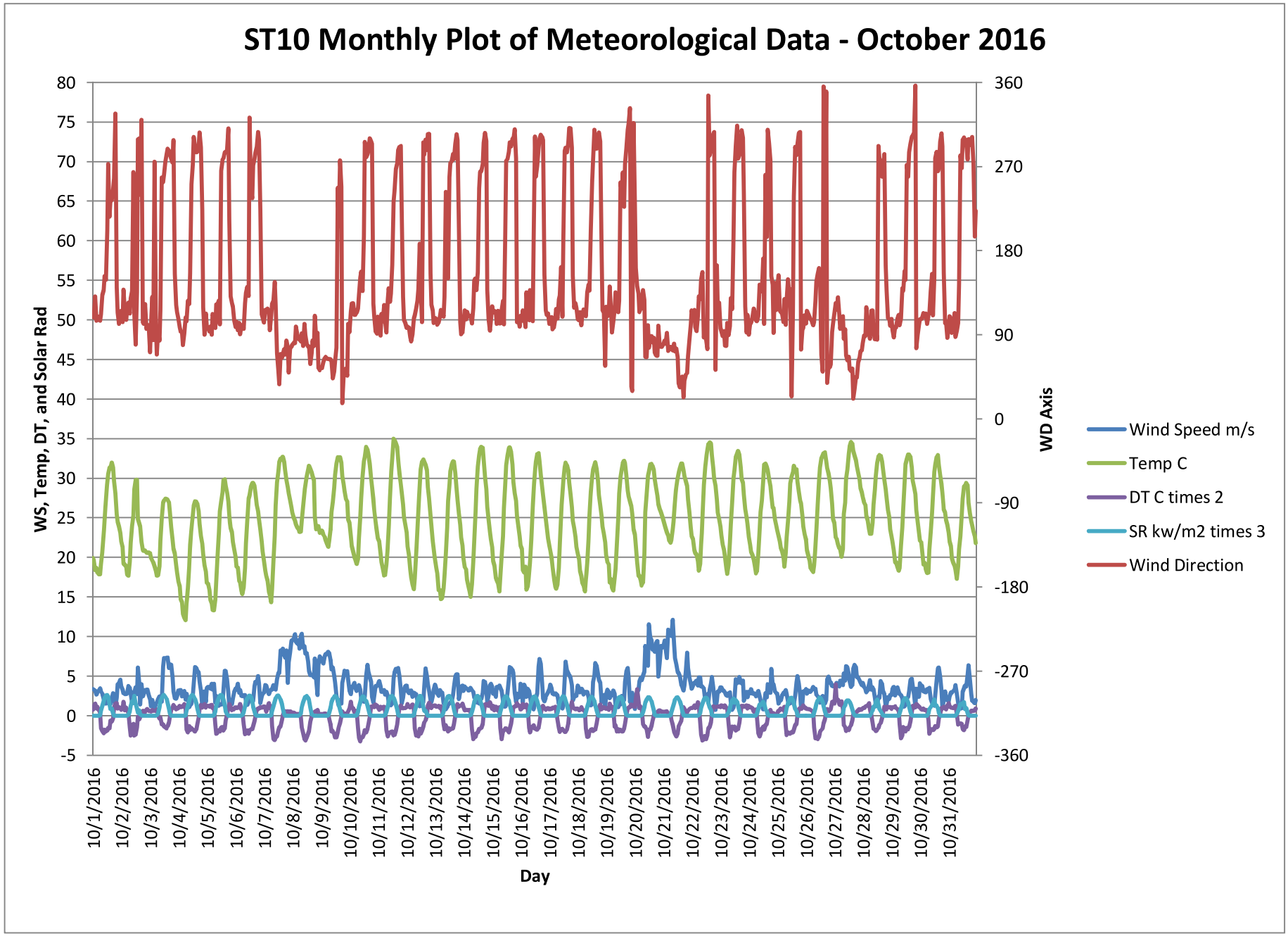
ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	16122419	OUT OF LIMITS	97.3	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16122506	OUT OF LIMITS	95.8	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123101	OUT OF LIMITS	97.2	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123102	OUT OF LIMITS	99.1	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123103	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123104	OUT OF LIMITS	99.9	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123105	OUT OF LIMITS	95.5	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123117	OUT OF LIMITS	98	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123118	OUT OF LIMITS	98.3	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123119	OUT OF LIMITS	98.4	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123120	OUT OF LIMITS	99.7	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123121	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123122	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
19	RH	16123123	OUT OF LIMITS	100	High RH in evening/morning hours, cooler temperatures and/or precip - data is valid
21	PR	16112111	OUT OF LIMITS	0.23	Relative Humidity and Temp Consistent with Precip - Data appears valid
21	PR	16122207	OUT OF LIMITS	0.24	Relative Humidity and Temp Consistent with Precip - Data appears valid

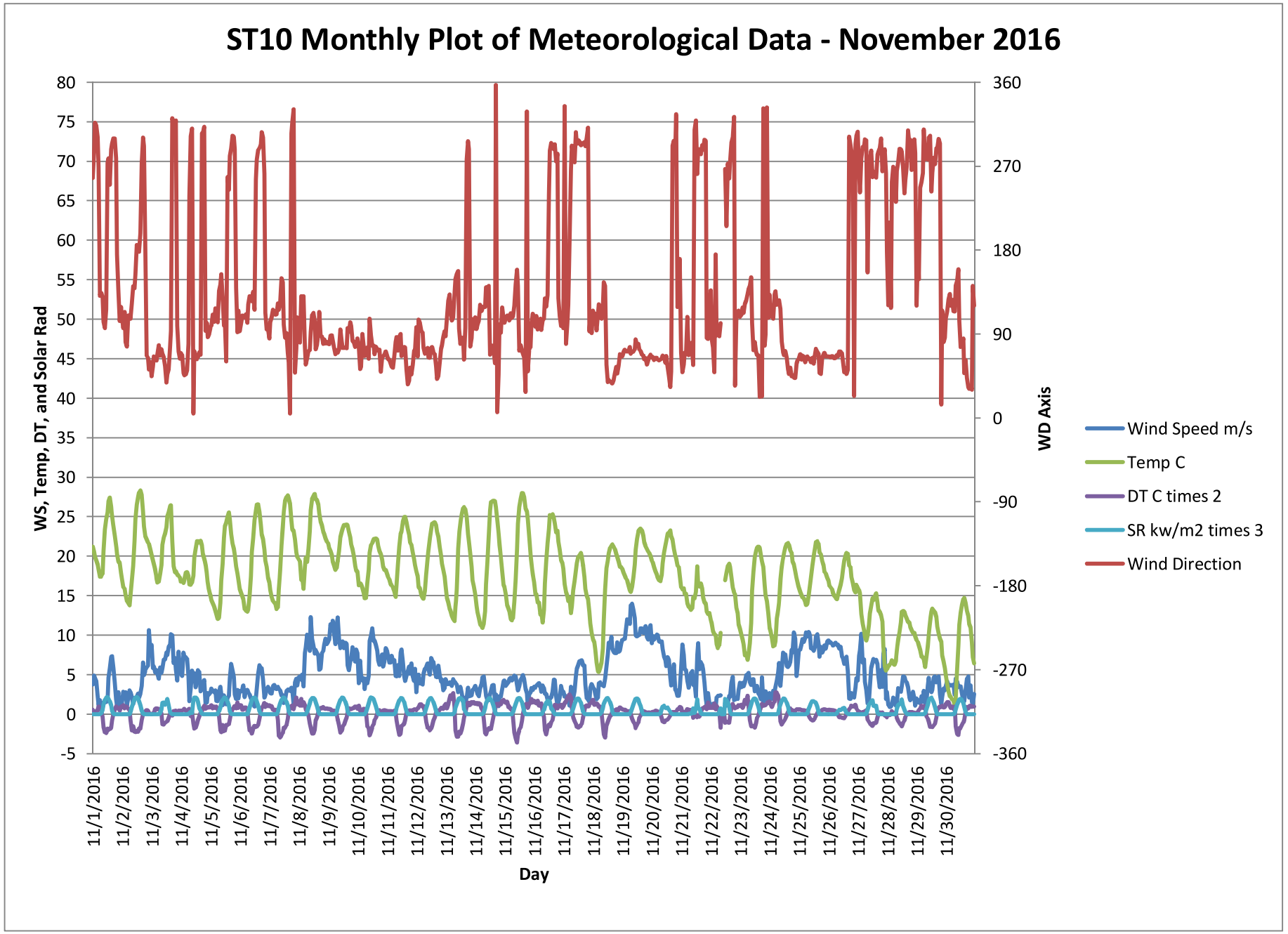
AZMET and ST10 Reported Precipitation Totals
(inches/month)

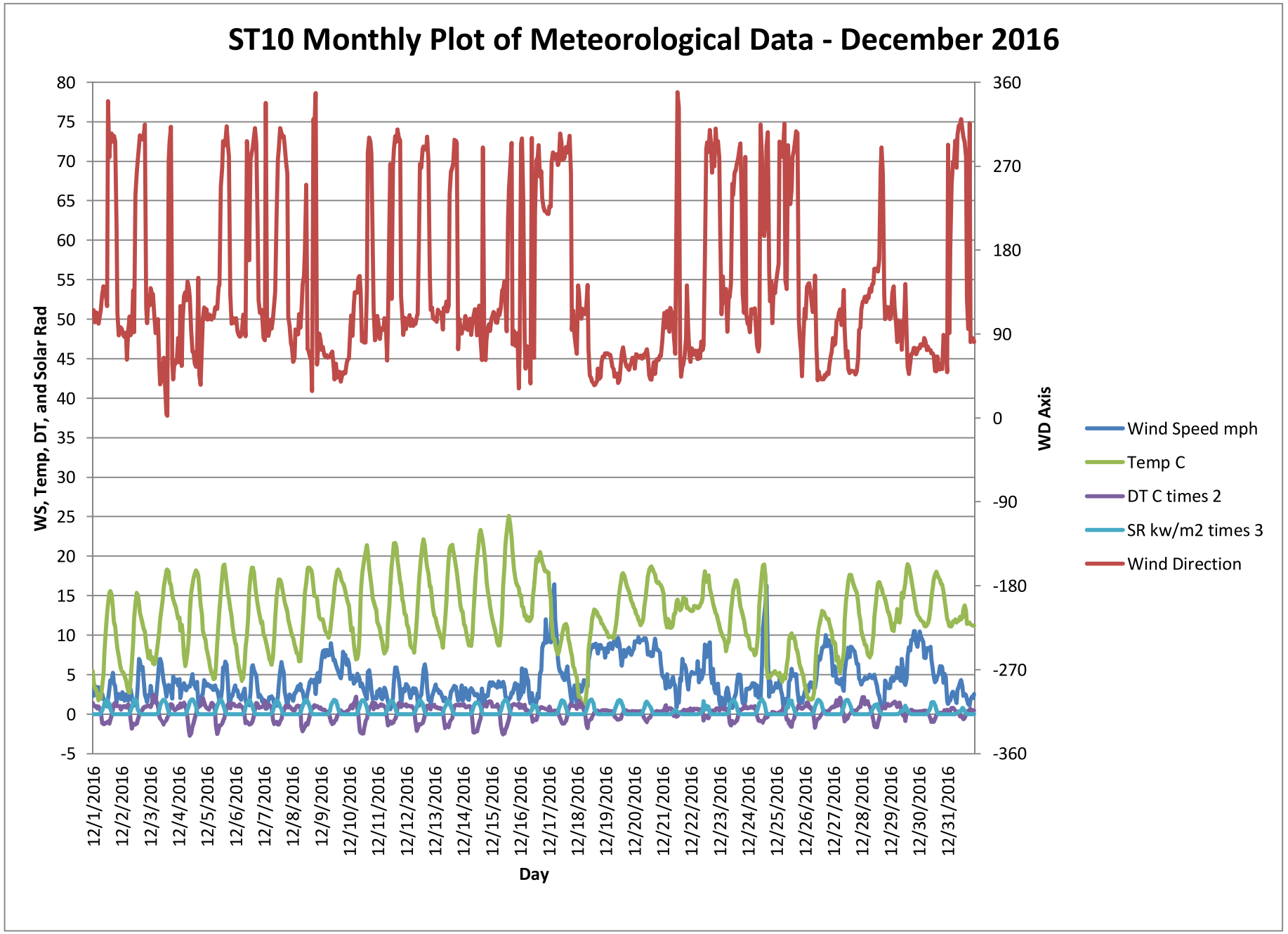
Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Jul-16	0.23	0.79	0.51	2.09
Aug-16	0.42	1.35	0.88	0.90
Sep-16	0.20	3.43	1.81	1.56
Oct-16	0.00	2.26	1.13	0.21
Nov-16	0.45	0.88	0.66	0.92
Dec-16	1.19	1.18	1.18	1.83
Jan-17				
Feb-17				
Mar-17				
Apr-17				
May-17				
Jun-17				
Totals	**2.48**	**9.89**	**6.18**	**7.51**

APPENDIX B

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - October 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
10/1/2016
10/2/2016
10/3/2016
10/4/2016
10/5/2016
10/6/2016
10/7/2016
10/8/2016
10/9/2016
10/10/2016
10/11/2016
10/12/2016
10/13/2016
10/14/2016
10/15/2016
10/16/2016
10/17/2016
10/18/2016
10/19/2016
10/20/2016
10/21/2016
10/22/2016
10/23/2016
10/24/2016
10/25/2016
10/26/2016
10/27/2016
10/28/2016
10/29/2016
10/30/2016
10/31/2016


ST10 Monthly Plot of Meteorological Data - November 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
11/1/2016
11/2/2016
11/3/2016
11/4/2016
11/5/2016
11/6/2016
11/7/2016
11/8/2016
11/9/2016
11/10/2016
11/11/2016
11/12/2016
11/13/2016
11/14/2016
11/15/2016
11/16/2016
11/17/2016
11/18/2016
11/19/2016
11/20/2016
11/21/2016
11/22/2016
11/23/2016
11/24/2016
11/25/2016
11/26/2016
11/27/2016
11/28/2016
11/29/2016
11/30/2016
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - December 2016
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
12/1/2016
12/2/2016
12/3/2016
12/4/2016
12/5/2016
12/6/2016
12/7/2016
12/8/2016
12/9/2016
12/10/2016
12/11/2016
12/12/2016
12/13/2016
12/14/2016
12/15/2016
12/16/2016
12/17/2016
12/18/2016
12/19/2016
12/20/2016
12/21/2016
12/22/2016
12/23/2016
12/24/2016
12/25/2016
12/26/2016
12/27/2016
12/28/2016
12/29/2016
12/30/2016
12/31/2016
Wind Speed mph
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
OCTOBER - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.3	3.3	3.2	2.7	3.0	3.2	3.4	3.0	2.8	2.1	1.6	1.5	1.7	2.0	1.9	1.4	2.2	2.8	2.5	1.2	2.3	4.0	4.1	4.6	2.7
2	3.7	3.3	2.8	2.8	2.8	2.8	3.7	3.5	2.8	1.6	3.0	2.9	3.6	2.8	6.1	4.2	1.4	4.0	2.4	2.8	3.2	3.2	3.3	2.6	3.1
3	2.1	1.2	2.0	1.1	0.9	1.5	1.7	2.0	2.4	1.9	1.8	6.2	7.3	7.3	7.3	7.3	6.0	6.4	6.4	4.9	3.1	2.2	2.2	2.5	3.7
4	3.2	3.2	3.2	2.4	2.7	3.1	2.1	2.8	2.0	1.1	1.4	1.5	2.5	4.0	6.1	5.9	5.6	5.4	4.3	3.2	1.3	2.1	3.1	1.8	3.1
5	3.5	3.7	3.6	3.4	4.1	3.3	4.0	1.6	2.5	1.9	1.3	1.4	1.4	1.5	3.2	5.7	5.6	4.6	2.8	1.2	2.0	1.5	2.2	3.0	2.9
6	3.4	3.3	4.1	2.9	3.2	2.5	2.4	2.5	2.6	1.8	1.3	1.7	2.1	2.0	1.9	1.9	3.8	4.3	4.1	5.0	4.1	1.6	2.4	2.8	2.8
7	2.9	3.9	3.8	3.2	2.7	3.0	3.3	3.3	3.8	3.7	3.3	4.6	5.4	5.4	8.3	7.7	8.5	7.8	7.3	8.2	4.2	6.8	7.9	9.4	5.3
8	9.6	9.6	10.3	9.3	9.1	9.5	8.5	10.0	10.4	8.6	8.8	7.8	7.9	6.9	5.7	5.1	5.2	5.1	4.8	7.2	4.5	2.6	6.4	7.5	7.5
9	7.2	7.0	6.6	7.5	7.8	7.7	8.0	7.9	7.0	5.9	6.1	5.1	4.2	2.5	1.8	1.3	1.9	1.5	4.1	4.9	5.7	5.3	5.6	4.5	5.3
10	3.2	2.7	3.6	3.8	4.1	3.5	3.1	3.4	3.8	3.2	2.2	1.9	1.8	2.4	5.1	6.4	5.6	4.9	4.3	2.4	1.6	2.5	3.7	3.7	3.5
11	3.9	4.3	3.7	3.0	3.1	3.2	2.7	3.0	2.5	1.7	1.5	1.3	1.5	4.7	5.5	5.9	5.5	6.0	5.0	3.2	1.5	2.3	3.2	3.8	3.4
12	3.8	3.1	2.8	3.1	3.2	2.4	2.9	2.8	2.8	1.9	1.9	1.2	1.7	1.2	1.8	3.6	5.9	5.0	4.0	3.1	2.0	1.7	2.5	3.3	2.8
13	3.9	3.3	2.8	2.5	3.2	2.9	2.9	1.6	1.8	0.8	1.0	1.4	1.5	1.7	1.7	2.6	3.6	4.9	5.2	5.2	2.1	3.0	3.5	3.8	2.8
14	3.1	3.7	3.5	3.4	3.2	3.2	3.5	3.2	3.0	2.3	2.4	1.7	1.7	1.5	2.3	2.1	2.9	4.4	4.2	3.3	1.7	2.5	3.9	4.0	2.9
15	3.6	2.8	3.1	2.4	3.6	3.6	3.8	3.5	3.1	1.9	1.2	1.1	1.4	2.9	4.7	6.1	6.0	5.8	5.3	2.9	1.7	2.8	2.2	2.4	3.3
16	4.0	2.7	1.6	3.9	3.5	2.4	3.4	3.1	2.5	1.2	1.1	0.8	1.6	2.1	2.8	6.2	7.2	6.4	4.0	2.2	1.8	2.3	2.5	3.0	3.0
17	3.4	3.9	3.4	2.8	2.7	2.8	2.7	2.5	1.5	1.8	1.3	0.9	1.4	4.6	6.8	5.8	5.4	5.2	4.8	3.9	1.9	2.3	2.6	2.5	3.2
18	3.8	3.3	3.0	3.4	3.3	2.7	2.9	3.0	3.0	2.4	1.5	1.3	1.4	4.2	5.1	6.7	6.3	5.3	4.5	4.1	1.7	2.2	2.6	1.0	3.3
19	2.6	3.3	3.0	2.2	2.6	2.6	3.2	2.7	1.2	1.7	1.1	1.4	1.4	2.5	2.4	2.0	4.3	5.6	6.0	4.9	1.8	2.6	2.9	1.7	2.7
20	0.9	2.6	2.9	3.3	4.3	4.8	4.5	5.1	5.6	8.8	7.8	6.3	11.5	9.9	9.5	8.4	8.5	8.1	9.1	9.4	5.0	6.6	8.8	8.6	6.7
21	8.7	9.5	8.6	7.3	10.9	10.7	10.5	10.1	12.1	9.0	7.2	6.5	5.5	5.4	4.9	3.9	3.7	3.2	3.8	5.6	8.0	6.0	4.8	4.0	7.1
22	3.4	3.8	4.2	4.1	4.4	3.8	4.8	4.8	3.7	3.7	3.4	2.5	2.5	2.7	1.6	3.3	4.1	4.9	3.6	2.4	0.8	1.9	3.1	3.0	3.4
23	3.5	3.6	3.2	3.1	3.0	2.5	2.5	2.8	3.0	1.6	0.7	1.0	1.9	4.6	4.1	4.1	4.9	4.2	4.1	4.4	1.9	2.7	3.0	2.3	3.0
24	3.0	2.8	3.3	2.8	2.8	2.7	2.4	2.6	3.1	2.5	1.9	1.2	0.8	1.4	2.8	2.3	4.0	3.8	2.9	5.9	4.0	4.0	3.0	2.8	2.9
25	2.8	1.5	2.0	1.9	2.6	2.9	2.7	3.3	2.7	1.8	1.5	1.5	2.0	2.0	1.5	2.6	4.3	5.0	4.1	2.7	0.9	1.6	3.1	3.0	2.5
26	3.3	2.8	3.2	3.0	3.0	3.3	3.6	3.4	3.4	2.7	2.4	2.3	1.6	1.9	2.5	1.7	1.5	2.0	4.5	4.9	4.2	4.2	3.7	3.7	3.0
27	3.8	3.6	4.2	3.9	3.7	4.4	4.4	3.8	5.4	4.4	6.2	6.1	5.2	4.3	3.6	3.9	5.9	6.4	6.1	4.9	4.8	4.5	4.2	3.9	4.7
28	4.2	3.6	3.4	2.9	3.2	3.9	4.5	3.3	3.6	3.3	2.2	1.4	1.2	2.4	2.3	4.4	4.0	3.1	2.7	1.2	1.5	2.3	2.1	2.6	2.9
29	2.6	3.3	3.7	2.6	3.2	3.5	3.0	2.7	2.6	2.2	1.1	1.2	1.4	2.1	2.4	3.1	4.5	4.6	3.8	2.7	1.1	3.4	2.4	2.4	2.7
30	4.1	3.8	3.7	3.1	3.1	3.0	3.3	3.2	3.5	2.1	1.7	1.5	1.2	2.5	4.4	6.0	6.1	4.9	3.2	1.0	1.9	3.0	2.2	1.9	3.1
31	1.8	2.4	3.0	2.9	3.1	3.2	3.9	2.8	1.6	1.2	0.9	0.9	3.0	3.5	3.8	3.7	5.2	6.4	4.7	2.8	1.8	1.8	1.6	2.0	2.8
HRAVE	3.8	3.7	3.7	3.4	3.7	3.7	3.8	3.7	3.6	2.9	2.6	2.5	2.9	3.4	4.0	4.4	4.8	4.9	4.5	3.9	2.7	3.1	3.5	3.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.7	3.1	3.7	3.1	2.9	2.8	5.3	7.5	5.3	3.5	3.4	2.8	2.8	2.9	3.3	3.0	3.2	3.3	2.7	6.7	7.1	3.4	3.0	2.9	2.5
MAX	4.6	6.1	7.3	6.1	5.7	5.0	9.4	10.4	8.0	6.4	6.0	5.9	5.2	4.4	6.1	7.2	6.8	6.7	6.0	11.5	12.1	4.9	4.9	5.9	5.0
MIN	1.2	1.4	0.9	1.1	1.2	1.3	2.7	2.6	1.3	1.6	1.3	1.2	0.8	1.5	1.1	0.8	0.9	1.0	1.1	0.9	3.2	0.8	0.7	0.8	0.9

DAY	26	27	28	29	30	31
AVE	3.0	4.7	2.9	2.7	3.1	2.8
MAX	4.9	6.4	4.5	4.6	6.1	6.4
MIN	1.5	3.6	1.2	1.1	1.0	0.9

MONTHLY AVERAGE = 3.6 MONTHLY MAXIMUM = 12.1 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
OCTOBER - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	113	108	131	105	108	109	105	112	133	138	153	149	202	273	216	234	234	246	257	327	141	114	102	110	226
2	115	103	138	115	106	116	124	113	129	137	264	112	79	136	299	300	240	320	104	102	123	96	99	100	80
3	71	100	130	84	275	100	69	95	84	116	258	254	261	275	284	289	287	283	278	274	298	155	122	114	263
4	107	98	94	93	79	91	108	105	126	123	156	251	272	301	290	285	286	293	307	291	224	119	90	113	79
5	99	97	94	99	90	112	107	97	122	122	127	101	266	276	279	285	285	288	311	213	131	124	120	105	351
6	98	104	95	103	90	99	101	97	124	135	141	131	322	247	236	271	278	285	291	307	299	223	112	109	320
7	103	117	115	118	115	95	110	123	126	147	122	70	51	37	70	65	69	74	69	84	76	49	75	77	247
8	79	81	81	99	90	86	85	83	91	78	102	89	80	78	77	58	70	84	78	110	86	92	54	52	341
9	55	54	61	65	66	64	64	64	63	61	43	50	61	76	247	206	277	248	17	46	49	54	46	102	317
10	93	115	123	124	111	111	114	119	132	151	158	137	195	297	280	283	287	300	297	294	123	109	93	91	119
11	110	103	89	112	105	122	106	92	127	140	125	134	165	233	244	267	273	287	291	292	222	130	106	103	319
12	97	99	98	87	83	91	108	111	118	127	139	188	141	104	296	283	299	288	304	305	155	122	116	103	357
13	108	106	101	103	109	116	115	109	131	243	220	150	259	274	276	283	278	294	305	298	205	103	91	93	334
14	103	116	107	114	110	109	110	102	119	147	150	138	157	247	264	265	273	295	306	297	138	107	94	105	221
15	120	114	115	115	102	116	102	102	116	126	101	199	276	278	286	296	292	300	299	310	279	104	106	99	287
16	110	105	116	109	98	135	108	105	138	120	104	189	302	259	271	290	299	304	302	298	154	116	111	113	2
17	102	103	109	96	98	106	118	108	127	132	162	109	193	286	290	285	295	311	311	290	153	119	124	119	274
18	107	106	114	100	110	117	114	110	136	144	137	202	254	276	309	289	289	297	306	297	179	116	114	57	207
19	120	110	113	142	115	92	104	117	135	133	114	127	253	241	264	227	273	289	310	316	333	35	30	316	282
20	228	161	142	134	114	117	126	138	127	66	66	100	76	88	88	82	86	71	68	67	100	79	77	77	241
21	79	84	81	92	73	74	77	76	73	81	72	75	66	38	34	40	45	23	41	47	49	68	84	100	31
22	116	109	116	99	94	111	131	128	150	157	87	90	85	75	346	282	289	296	305	307	52	164	119	124	122
23	97	94	89	94	78	78	103	89	99	129	118	195	264	292	314	278	283	287	309	301	240	121	93	111	209
24	90	102	103	108	118	114	105	104	110	144	143	137	172	102	261	194	310	295	277	153	144	92	145	117	51
25	139	154	116	114	112	103	128	101	127	149	132	139	24	116	238	291	282	294	305	307	74	95	98	111	127
26	102	116	112	109	107	105	100	104	126	147	155	162	159	69	51	355	195	350	39	55	55	59	93	102	159
27	113	124	117	130	111	96	107	110	86	96	68	62	66	53	51	54	21	32	45	44	61	66	72	73	20
28	81	89	89	120	98	92	86	115	116	93	85	97	85	292	279	276	259	265	283	164	138	108	107	100	263
29	107	95	87	98	98	107	111	100	107	140	137	158	149	272	259	285	295	302	303	306	357	76	90	101	193
30	106	107	108	113	109	113	102	110	112	137	155	111	150	279	286	265	269	297	306	292	156	102	104	87	131
31	98	110	106	92	99	113	88	94	102	144	282	268	299	301	299	294	277	299	299	293	302	273	195	222	95

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
OCTOBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	13	9	15	8	8	7	8	9	12	19	27	26	43	32	31	32	42	19	14	50	11	8	8	9	19
2	8	11	18	7	9	9	10	10	15	25	41	48	19	57	17	27	66	34	47	24	19	12	15	13	23
3	39	47	17	65	62	27	38	30	10	26	30	17	17	14	12	12	15	9	6	8	58	10	9	8	24
4	11	8	9	12	8	8	12	11	15	44	33	38	26	30	16	11	13	10	6	8	40	10	11	10	17
5	9	7	9	10	6	8	10	13	10	29	40	46	47	66	31	16	11	8	13	35	9	15	8	9	19
6	7	8	7	14	6	10	13	10	12	23	30	48	44	65	52	46	16	8	11	6	11	21	18	12	21
7	10	10	10	10	10	9	11	10	10	12	29	16	21	23	16	10	11	10	11	15	30	14	11	10	14
8	10	9	11	11	11	10	10	10	11	14	13	19	17	16	17	15	11	13	14	32	58	71	15	16	18
9	15	16	15	7	8	8	7	7	11	19	22	24	26	35	82	66	55	39	55	12	11	12	13	22	24
10	10	12	8	6	8	9	7	6	10	13	22	35	54	26	21	14	13	10	9	16	49	11	7	7	16
11	9	8	6	11	10	9	9	7	13	24	36	44	59	26	25	25	21	9	4	16	26	19	9	9	18
12	11	9	10	9	11	14	11	8	14	18	30	48	54	77	69	16	15	9	6	12	53	10	8	11	22
13	9	10	9	10	10	8	9	13	16	58	34	42	39	66	75	32	20	9	6	5	26	12	10	7	22
14	9	9	8	7	8	8	10	9	16	15	19	34	38	58	58	43	23	12	8	7	48	10	9	10	20
15	10	15	9	7	8	10	8	9	12	26	48	54	58	27	23	16	13	11	5	8	33	11	11	12	19
16	10	14	63	10	9	26	9	10	13	32	47	89	49	38	34	20	12	8	6	24	20	14	7	8	24
17	8	7	10	12	9	11	8	9	16	17	39	65	57	24	17	18	14	11	6	32	20	12	7	8	18
18	10	9	12	8	9	7	8	9	10	16	40	45	66	20	21	13	13	10	6	5	42	15	14	65	20
19	7	8	15	8	7	13	8	10	25	25	40	44	67	29	35	42	15	8	6	10	24	22	18	47	22
20	31	13	14	10	6	5	5	7	22	10	15	38	15	13	14	16	16	11	11	12	15	15	10	13	14
21	11	9	11	11	9	10	9	10	9	13	12	15	21	22	18	21	14	15	14	10	11	9	7	12	13
22	16	13	13	15	13	15	8	6	9	13	22	27	23	24	43	23	28	10	9	20	41	40	10	13	19
23	10	9	7	15	8	15	17	10	10	33	77	50	22	21	20	19	13	6	6	5	18	10	11	13	18
24	12	12	9	8	8	7	7	9	9	14	21	30	72	65	17	41	36	7	27	13	53	13	22	22	22
25	30	30	17	14	9	10	18	9	15	18	40	46	57	49	53	25	19	12	8	29	61	23	18	10	26
26	8	10	7	8	9	8	7	8	12	14	19	24	39	46	51	59	33	49	15	14	15	12	15	18	21
27	7	9	8	11	12	17	23	20	17	21	11	12	15	23	28	34	12	13	12	15	12	10	15	20	16
28	18	27	21	20	14	16	14	16	9	16	22	36	69	36	34	14	11	15	10	64	22	11	15	9	22
29	9	9	8	13	10	10	11	10	13	18	39	62	46	69	52	39	14	9	8	57	45	9	10	10	24
30	8	8	8	7	9	9	7	9	11	19	28	28	43	51	25	16	11	9	22	51	37	11	17	16	19
31	26	29	8	9	9	19	7	7	15	28	29	65	15	21	18	24	21	8	6	7	13	64	39	18	21
HRAVE	13	13	13	12	11	11	11	10	13	22	31	39	40	38	33	26	20	13	13	20	30	17	13	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19	23	24	17	19	21	14	18	24	16	18	22	22	20	19	24	18	20	22	14	13	19	18	22	26
MAX	50	66	65	44	66	65	30	71	82	54	59	77	75	58	58	89	65	66	67	38	22	43	77	72	61
MIN	7	7	6	6	6	6	9	9	7	6	4	6	5	7	5	6	6	5	6	5	7	6	5	7	8

DAY	26	27	28	29	30	31
AVE	21	16	22	24	19	21
MAX	59	34	69	69	51	65
MIN	7	7	9	8	7	6

MONTHLY AVERAGE = 19.9 MONTHLY MAXIMUM = 88.5 MONTHLY MINIMUM = 4.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
OCTOBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	19.9	19.6	18.4	18.7	18.1	17.8	17.9	19.2	20.7	22.9	24.8	27.4	29.4	30.5	31.4	31.2	31.9	31.3	29.7	28.1	25.4	24.5	23.9	23.1	24.4
2	22.0	21.3	19.2	19.1	18.9	17.8	17.7	19.5	21.8	23.9	25.3	28.6	29.8	29.8	24.9	24.3	23.9	22.0	20.9	20.8	20.9	20.6	20.5	20.7	22.3
3	20.5	20.0	19.6	19.4	18.9	18.3	17.7	17.7	18.9	22.1	24.9	26.9	27.2	27.4	27.3	27.3	27.0	25.8	23.8	22.2	21.1	20.5	19.0	18.1	22.2
4	16.9	16.3	14.7	14.3	12.9	12.4	12.1	14.2	16.1	18.8	21.6	23.5	25.3	26.5	27.1	27.0	26.8	25.8	24.2	22.7	21.7	20.4	19.0	18.2	19.9
5	16.8	16.6	15.9	14.7	14.2	13.4	13.3	14.7	17.0	20.2	23.2	25.8	27.1	28.2	29.7	29.9	29.1	28.2	27.1	25.3	23.7	23.2	22.0	21.0	21.7
6	20.1	18.9	18.7	17.1	16.8	15.8	15.4	16.2	18.7	21.8	24.7	27.4	27.8	28.9	29.3	29.4	29.0	28.1	26.6	25.8	24.8	23.5	22.0	20.8	22.8
7	19.5	18.3	17.7	17.1	15.7	15.3	14.3	15.9	19.5	22.8	26.5	29.5	30.8	32.0	32.5	32.6	32.7	32.0	31.0	29.8	28.8	28.1	27.2	26.4	24.8
8	25.6	25.0	24.6	24.2	23.8	23.6	23.2	23.2	24.6	26.5	28.2	29.2	30.1	31.0	31.5	31.2	30.7	30.2	29.7	25.1	23.6	23.9	24.0	23.1	26.5
9	23.3	23.4	22.9	22.6	22.2	21.7	21.4	22.1	23.5	25.7	27.0	28.8	30.5	31.9	32.6	32.7	32.7	31.9	30.3	29.2	28.4	27.4	27.1	24.8	26.8
10	24.3	22.7	21.5	20.8	20.0	19.7	19.2	19.8	22.4	25.1	27.5	30.2	32.1	32.7	34.0	33.6	33.0	31.8	29.9	29.0	27.4	25.8	24.4	23.3	26.3
11	22.4	22.0	20.5	19.4	18.6	17.7	17.7	19.1	21.2	23.9	27.2	30.2	32.5	35.0	34.8	34.4	33.9	32.5	30.5	29.3	28.2	26.6	25.1	24.1	26.1
12	23.1	21.4	20.3	18.5	17.4	16.5	16.0	17.4	20.5	23.3	26.4	28.8	31.1	32.1	32.3	32.1	31.7	31.0	28.9	27.3	25.2	23.9	22.1	20.8	24.5
13	19.8	18.7	18.0	15.9	15.9	14.7	14.9	16.1	17.6	20.4	23.8	27.1	29.1	30.9	31.7	32.1	32.1	30.7	28.6	27.2	25.5	24.1	22.5	21.5	23.3
14	19.9	18.8	18.5	17.2	16.4	15.7	15.0	16.6	19.5	22.0	25.7	28.7	31.5	32.9	33.6	34.0	33.8	32.4	30.2	28.6	26.4	24.7	23.2	22.3	24.5
15	21.3	19.5	18.9	17.5	17.1	16.7	15.7	17.5	20.2	22.7	26.2	29.3	31.6	32.9	33.8	33.9	33.3	31.8	29.5	28.1	27.1	25.2	24.0	22.6	24.9
16	21.5	21.0	18.4	18.1	18.8	15.9	16.4	17.9	19.4	22.7	26.0	28.6	30.8	32.1	33.0	33.2	32.2	30.4	28.8	27.8	26.4	24.8	23.9	22.4	24.6
17	21.4	20.8	20.0	18.8	17.5	16.4	16.0	16.6	18.7	21.8	25.0	28.1	29.9	31.4	32.0	31.6	31.0	29.5	28.0	26.3	24.6	23.7	22.6	21.4	23.9
18	20.5	19.7	18.3	17.6	16.8	16.5	15.7	17.2	19.3	22.3	25.3	28.3	30.1	31.0	31.6	32.0	31.2	29.6	27.9	26.5	25.2	23.9	23.0	21.9	23.8
19	20.3	19.4	19.1	16.8	17.2	16.2	15.8	17.4	18.6	21.8	24.9	28.0	30.1	31.2	31.8	32.2	31.9	30.3	28.4	27.7	27.1	26.4	25.5	23.5	24.2
20	22.8	21.5	19.4	17.7	17.7	17.1	16.5	16.8	20.4	25.7	27.9	30.2	30.8	31.7	31.8	31.6	31.0	29.9	28.8	27.8	26.7	26.1	25.7	25.3	25.0
21	24.7	24.2	23.7	23.2	22.7	22.1	21.9	22.2	23.6	25.5	27.1	29.0	30.0	30.6	31.3	31.9	31.8	31.0	30.3	29.6	29.0	27.3	25.7	23.8	26.8
22	22.7	22.3	20.9	20.5	20.3	19.5	18.3	19.1	21.6	25.1	28.7	30.5	32.5	33.6	34.3	34.5	34.3	32.9	31.3	29.9	29.0	27.3	25.6	24.9	26.7
23	23.9	22.8	21.6	20.9	20.0	18.6	17.9	19.0	21.9	24.2	27.0	30.1	31.0	32.7	33.1	33.5	33.0	31.4	29.9	29.4	27.9	26.1	25.1	24.2	26.0
24	22.6	21.6	20.7	20.3	19.7	19.0	18.0	18.2	20.4	23.4	25.7	27.2	29.7	31.7	31.9	31.4	30.9	29.9	29.0	27.8	26.3	26.2	24.8	24.0	25.0
25	23.4	22.7	22.0	21.2	20.7	20.1	18.8	20.5	22.5	24.5	27.0	29.4	30.2	30.7	31.6	30.9	31.1	29.6	28.3	27.2	26.8	25.3	23.9	22.9	25.5
26	22.3	20.9	20.2	19.6	18.7	18.4	18.1	19.0	21.1	23.6	27.0	29.3	31.3	32.5	32.9	33.2	33.2	32.2	31.3	30.6	29.6	28.7	26.8	24.8	26.1
27	24.3	22.5	22.4	21.6	21.1	21.0	20.1	21.1	25.5	26.9	29.9	31.1	33.1	34.0	34.6	34.4	33.4	32.8	32.2	31.5	30.7	29.9	28.8	28.2	28.0
28	27.7	27.0	26.6	25.2	24.7	23.5	23.0	23.0	24.4	26.7	28.6	30.3	31.9	32.8	32.9	32.8	32.1	31.2	29.8	28.6	27.5	26.0	25.1	23.6	27.7
29	22.6	22.0	20.9	19.4	19.4	18.8	18.3	18.7	21.5	23.8	26.2	29.4	31.8	32.4	33.0	33.0	32.7	31.3	29.7	28.9	28.0	26.0	24.5	23.1	25.6
30	22.1	21.9	20.8	19.1	19.3	18.5	18.0	18.1	21.0	23.2	25.6	27.8	30.8	31.7	32.6	32.9	31.7	30.4	29.3	28.1	26.1	25.6	24.7	24.1	25.1
31	23.1	22.0	21.4	19.9	19.3	19.0	18.4	17.3	18.9	21.0	22.7	25.5	27.4	28.9	28.9	29.4	29.1	26.9	25.6	24.6	24.1	23.3	22.7	21.8	23.4
HRAVE	22.0	21.1	20.2	19.2	18.7	18.0	17.5	18.4	20.7	23.4	26.1	28.5	30.2	31.4	31.7	31.7	31.4	30.1	28.7	27.5	26.2	25.1	24.0	22.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	24.4	22.3	22.2	19.9	21.7	22.8	24.8	26.5	26.8	26.3	26.1	24.5	23.3	24.5	24.9	24.6	23.9	23.8	24.2	25.0	26.8	26.7	26.0	25.0	25.5
MAX	31.9	29.8	27.4	27.1	29.9	29.4	32.7	31.5	32.7	34.0	35.0	32.3	32.1	34.0	33.9	33.2	32.0	32.0	32.2	31.8	31.9	34.5	33.5	31.9	31.6
MIN	17.8	17.7	17.7	12.1	13.3	15.4	14.3	23.1	21.4	19.2	17.7	16.0	14.7	15.0	15.7	15.9	16.0	15.7	15.8	16.5	21.9	18.3	17.9	18.0	18.8

DAY	26	27	28	29	30	31
AVE	26.1	28.0	27.7	25.6	25.1	23.4
MAX	33.2	34.6	32.9	33.0	32.9	29.4
MIN	18.1	20.1	23.0	18.3	18.0	17.3

MONTHLY AVERAGE = 24.8 MONTHLY MAXIMUM = 35.0 MONTHLY MINIMUM = 12.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
OCTOBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.4	0.6	0.8	0.4	0.6	0.4	0.2	-0.8	-1.0	-1.1	-0.9	-1.0	-0.9	-0.8	-0.8	-0.3	-0.4	-0.1	0.5	0.8	0.8	0.5	0.5	0.4	-0.1
2	0.4	0.5	0.9	0.3	0.5	0.4	0.2	-0.8	-1.2	-0.9	-0.5	-1.3	-1.2	-0.7	-0.1	-0.2	-0.1	0.2	0.3	0.2	0.2	0.4	0.4	0.3	-0.1
3	0.3	0.2	0.4	0.3	0.3	0.3	0.4	0.0	-0.2	-0.1	-0.6	-0.6	-0.7	-0.7	-0.8	-0.7	-0.4	-0.1	0.4	0.5	0.7	0.6	0.4	0.5	0.0
4	0.5	0.6	0.5	0.6	0.6	0.8	0.4	-0.9	-1.1	-0.6	-0.9	-0.8	-0.9	-0.9	-1.0	-0.9	-0.6	-0.1	0.4	0.7	0.5	0.6	0.7	0.5	-0.1
5	0.6	0.6	0.6	0.6	0.7	0.5	0.5	-0.6	-1.2	-1.0	-0.9	-1.0	-0.8	-0.7	-0.9	-0.8	-0.3	0.0	0.5	0.7	0.5	0.3	0.4	0.4	0.0
6	0.5	0.5	0.5	0.5	0.7	0.4	0.3	-0.6	-1.2	-1.0	-0.9	-1.1	-0.9	-0.9	-0.9	-0.6	-0.3	-0.1	0.4	0.4	0.5	0.5	0.5	0.5	-0.1
7	0.6	0.5	0.2	0.5	0.8	0.5	0.6	-0.6	-1.5	-1.5	-1.3	-1.3	-0.9	-0.8	-0.6	-0.3	0.0	0.2	0.3	0.2	0.3	0.2	0.3	0.2	-0.1
8	0.2	0.2	0.1	0.1	0.1	0.1	0.1	-0.1	-0.8	-1.1	-1.5	-1.6	-1.4	-1.1	-1.0	-0.4	0.0	0.1	0.2	0.2	0.3	0.4	0.1	0.1	-0.3
9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.2	-0.6	-1.0	-1.0	-1.1	-1.4	-1.4	-1.0	-0.8	-0.5	-0.1	0.3	0.2	0.1	0.1	0.1	0.2	-0.3
10	0.4	0.9	0.5	0.5	0.2	0.3	0.3	-0.8	-1.4	-1.6	-1.4	-1.4	-1.2	-0.9	-1.1	-0.8	-0.6	-0.1	0.6	0.5	0.6	0.5	0.7	0.6	-0.2
11	0.5	0.3	0.6	0.4	0.5	0.6	0.3	-0.9	-1.3	-1.1	-1.1	-1.0	-1.0	-1.3	-1.2	-0.9	-0.6	-0.1	0.4	0.6	0.5	0.5	0.5	0.5	-0.2
12	0.5	0.7	0.6	0.5	0.5	0.7	0.4	-0.8	-1.2	-1.2	-1.3	-0.8	-1.1	-0.9	-0.7	-0.4	-0.3	0.0	0.6	0.8	0.6	0.5	0.6	0.6	0.0
13	0.6	0.6	0.6	0.6	0.5	0.6	0.2	-0.5	-0.9	-0.6	-0.8	-1.0	-0.8	-0.9	-0.8	-0.8	-0.6	0.0	0.5	0.7	0.6	0.6	0.7	0.8	0.0
14	0.6	0.3	0.4	0.4	0.3	0.4	0.3	-0.9	-1.5	-1.2	-1.4	-1.1	-1.1	-0.8	-0.8	-0.8	-0.5	0.1	0.7	0.8	0.7	0.6	0.9	0.7	-0.1
15	0.4	0.6	0.3	0.6	0.5	0.3	0.6	-0.8	-1.5	-1.0	-0.9	-0.8	-0.8	-0.9	-1.1	-0.8	-0.5	0.1	0.5	0.6	0.6	0.8	0.7	0.6	-0.1
16	0.4	0.5	0.7	0.5	0.6	0.7	0.4	-0.8	-1.0	-0.7	-0.8	-0.6	-0.8	-0.9	-0.9	-0.8	-0.4	0.1	0.6	0.6	0.5	0.4	0.4	0.5	0.0
17	0.4	0.4	0.4	0.5	0.5	0.6	0.3	-0.3	-0.8	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.5	0.1	0.5	0.9	0.6	0.5	0.4	0.5	-0.1
18	0.4	0.3	0.4	0.5	0.4	0.3	0.3	-0.8	-1.3	-1.3	-1.0	-0.9	-0.9	-1.0	-0.9	-0.9	-0.5	0.0	0.5	0.7	0.4	0.5	0.6	0.5	-0.1
19	0.4	0.5	0.4	0.8	0.5	0.6	0.4	-0.7	-0.6	-1.0	-0.9	-1.0	-0.9	-1.0	-1.0	-0.8	-0.5	0.0	0.4	0.5	0.5	0.7	0.6	0.6	-0.1
20	0.6	1.1	1.7	0.9	0.5	0.6	0.5	-0.5	-0.7	-0.7	-0.9	-1.3	-0.9	-0.9	-0.6	-0.3	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.0
21	0.3	0.2	0.2	0.3	0.1	0.1	0.1	-0.2	-0.6	-1.0	-1.1	-1.3	-1.1	-0.7	-0.6	-0.3	0.1	0.5	0.5	0.3	0.2	0.3	0.4	0.5	-0.1
22	0.5	0.5	0.7	0.5	0.5	0.9	0.6	-0.4	-1.2	-1.6	-1.5	-1.3	-1.5	-1.2	-0.8	-0.7	-0.4	0.1	0.6	0.6	0.6	0.5	0.6	0.6	-0.1
23	0.5	0.6	0.6	0.5	0.7	0.5	0.4	-0.5	-1.4	-1.1	-0.7	-0.8	-0.7	-0.9	-0.9	-0.9	-0.5	0.2	0.6	0.6	0.6	0.6	0.6	0.5	0.0
24	0.6	0.5	0.5	0.5	0.2	0.3	0.4	-0.1	-1.1	-1.3	-1.1	-0.8	-0.7	-0.9	-0.6	-0.5	-0.1	0.1	0.3	0.1	0.0	0.2	0.0	0.0	-0.1
25	0.1	0.3	0.3	0.5	0.4	0.4	0.6	-0.7	-1.2	-1.1	-1.1	-1.1	-1.0	-1.1	-0.9	-0.6	-0.5	0.0	0.4	0.5	0.4	0.5	0.6	0.5	-0.2
26	0.4	0.4	0.4	0.4	0.4	0.3	0.3	-0.7	-1.4	-1.4	-1.5	-1.3	-1.1	-0.9	-0.8	-0.5	-0.2	0.3	0.4	0.3	0.4	0.4	0.9	0.9	-0.2
27	0.8	2.0	0.9	1.0	0.7	0.7	0.9	0.4	-0.6	-0.7	-1.0	-0.9	-0.9	-0.8	-0.6	-0.3	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.2
28	0.5	0.5	0.6	0.6	0.6	0.8	0.4	0.0	-0.5	-0.8	-0.9	-1.0	-0.9	-0.8	-0.6	-0.5	-0.2	0.2	0.6	0.5	0.4	0.6	0.5	0.5	0.0
29	0.4	0.6	0.5	0.6	0.5	0.4	0.3	-0.6	-1.4	-1.2	-0.7	-1.0	-1.0	-0.8	-0.9	-0.7	-0.4	0.2	0.6	0.5	0.5	0.7	0.6	0.6	-0.1
30	0.5	0.4	0.4	0.4	0.3	0.4	0.3	-0.3	-1.1	-0.9	-0.9	-0.9	-0.8	-0.7	-0.7	-0.7	-0.2	0.2	0.5	0.5	0.6	0.5	0.4	0.6	-0.1
31	0.8	0.6	0.5	0.5	0.5	0.5	0.6	0.1	-0.6	-0.6	-0.5	-0.5	-0.8	-0.9	-0.7	-0.7	-0.3	0.0	0.2	0.3	0.3	0.3	0.4	0.0	
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.5	-1.0	-1.0	-1.0	-1.0	-1.0	-0.9	-0.8	-0.6	-0.3	0.1	0.4	0.5	0.4	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.3	-0.3	-0.2	-0.2	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.2
MAX	0.8	0.9	0.7	0.8	0.7	0.7	0.8	0.4	0.3	0.9	0.6	0.8	0.8	0.9	0.8	0.7	0.9	0.7	0.8	1.7	0.5	0.9	0.7	0.6	0.6
MIN	-1.1	-1.3	-0.8	-1.1	-1.2	-1.2	-1.5	-1.6	-1.4	-1.6	-1.3	-1.3	-1.0	-1.5	-1.5	-1.0	-1.0	-1.3	-1.0	-1.3	-1.3	-1.6	-1.4	-1.3	-1.2

DAY	26	27	28	29	30	31
AVE	-0.2	0.2	0.0	-0.1	-0.1	0.0
MAX	0.9	2.0	0.8	0.7	0.6	0.8
MIN	-1.5	-1.0	-1.0	-1.4	-1.1	-0.9

MONTHLY AVERAGE = -0.1 MONTHLY MAXIMUM = 2.0 MONTHLY MINIMUM = -1.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
OCTOBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	703	703	703	703	703	703	703	704	704	704	704	703	702	701	701	700	700	700	700	700	701	701	701	701	702
2	702	702	702	702	702	702	702	702	702	702	702	701	701	700	700	700	700	700	700	700	700	700	699	699	701
3	699	699	699	699	699	699	699	699	699	699	699	699	698	698	697	697	697	697	697	697	698	698	698	698	698
4	698	698	698	698	698	698	699	699	700	699	699	699	698	698	697	697	697	697	697	698	698	698	699	699	698
5	699	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	699	699
6	699	699	699	699	699	700	700	701	701	701	701	700	700	699	699	699	699	699	699	699	700	700	700	700	700
7	700	701	701	701	701	701	701	702	702	702	702	701	700	699	699	698	698	698	698	699	700	700	700	700	700
8	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	700	700	701	701	702	702	701
9	702	702	702	702	702	703	703	703	704	704	703	703	702	702	701	701	701	701	701	701	702	702	702	702	702
10	702	702	702	702	702	703	703	704	704	704	703	703	702	701	701	701	701	701	701	701	702	702	702	702	702
11	702	702	702	702	703	703	703	704	704	704	703	703	702	700	700	700	700	700	700	701	701	701	702	702	702
12	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	700	700	700	700	700	701	701	701	701	701
13	701	701	702	702	702	702	702	703	704	704	703	703	702	701	701	700	700	700	701	701	701	702	702	702	702
14	702	702	702	702	703	703	703	703	703	703	703	702	701	700	700	699	699	699	699	700	700	700	700	701	701
15	701	701	701	701	701	702	702	702	702	702	702	702	701	700	699	699	699	699	699	699	700	700	701	701	701
16	701	701	702	701	701	702	702	702	702	702	702	701	701	700	699	698	698	699	699	699	699	700	700	700	700
17	700	700	700	700	700	700	700	700	701	701	700	700	699	698	698	698	697	697	698	698	698	699	699	699	699
18	699	699	700	699	700	700	701	701	701	701	701	700	700	699	698	698	698	698	698	699	699	699	700	700	699
19	700	701	701	701	701	702	702	702	703	703	703	702	701	701	700	700	700	700	700	701	701	702	702	702	701
20	702	702	702	702	703	703	704	704	704	704	704	703	703	702	702	702	702	702	702	702	703	703	703	703	703
21	703	703	703	703	703	704	704	704	704	704	704	703	702	701	700	700	700	700	700	700	700	701	701	701	702
22	701	701	701	701	701	701	702	702	702	702	702	701	700	700	699	699	699	699	699	700	700	701	701	701	701
23	702	702	702	702	703	703	703	704	704	704	704	704	703	702	702	702	702	702	702	703	703	703	703	704	703
24	704	704	704	704	704	705	705	705	706	706	705	705	704	703	703	703	702	702	702	703	703	703	704	704	704
25	703	704	703	704	703	704	704	704	705	705	704	704	703	702	702	702	702	702	702	702	703	703	703	703	703
26	704	704	704	704	704	704	704	705	705	705	705	704	703	702	702	701	701	701	701	702	702	702	703	703	703
27	703	703	703	703	703	703	704	704	704	704	704	703	702	701	701	700	700	700	700	701	701	701	701	701	702
28	701	701	701	701	701	701	701	702	703	703	702	702	701	701	700	700	700	700	701	701	701	702	702	702	701
29	702	702	702	703	703	703	703	704	704	704	704	703	703	702	702	702	702	702	702	702	703	703	703	703	703
30	703	703	703	703	703	703	704	704	704	704	704	704	703	702	702	701	701	701	701	701	702	702	702	702	702
31	702	702	702	701	701	701	702	702	702	702	702	702	701	700	699	699	698	698	699	699	700	700	700	700	701
HRAVE	701	701	702	701	702	702	702	703	703	703	702	702	701	700	700	700	700	700	700	700	701	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	702	701	698	698	699	700	700	701	702	702	702	701	702	701	701	700	699	699	701	703	702	701	703	704	703
MAX	704	702	699	700	700	701	702	702	704	704	704	703	704	703	702	702	701	701	703	704	704	702	704	706	705
MIN	700	699	697	697	697	699	698	699	701	701	700	700	700	699	699	698	697	698	700	702	700	699	702	702	702

DAY	26	27	28	29	30	31
AVE	703	702	701	703	702	701
MAX	705	704	703	704	704	702
MIN	701	700	700	702	701	698

MONTHLY AVERAGE = 701.2 MONTHLY MAXIMUM = 705.7 MONTHLY MINIMUM = 696.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
OCTOBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	83	85	89	87	90	91	89	81	71	59	50	40	35	32	30	28	24	24	25	30	37	41	43	44	54
2	48	51	58	61	61	65	64	57	47	39	39	31	27	29	59	65	67	81	91	92	89	93	93	93	62
3	93	97	97	99	99	100	100	100	95	68	53	36	34	33	29	20	20	22	18	18	21	22	27	33	56
4	36	39	48	49	58	60	60	48	39	32	23	18	16	14	14	15	15	17	19	22	25	29	33	37	32
5	42	40	43	48	49	54	54	48	40	31	25	20	20	18	16	16	17	18	22	24	29	31	34	36	32
6	37	41	41	47	48	53	55	51	43	32	26	25	25	21	21	22	23	26	29	29	30	33	38	43	35
7	47	49	46	49	55	59	60	52	39	31	25	20	19	18	17	17	16	17	18	19	21	22	21	26	32
8	32	34	36	40	42	44	45	46	44	40	35	33	32	30	27	29	30	32	33	45	49	48	45	49	38
9	48	49	49	50	52	54	57	55	50	44	42	39	35	29	25	24	23	24	32	37	39	43	44	49	41
10	48	50	52	54	57	60	61	55	45	39	35	29	22	19	16	15	16	18	21	22	26	30	31	33	36
11	35	37	40	45	46	49	49	43	37	30	25	20	17	13	14	16	15	15	17	17	17	19	22	24	28
12	25	28	30	32	34	37	40	36	30	25	21	18	13	10	12	12	12	9	11	14	15	17	21	22	22
13	23	25	27	31	32	34	34	31	26	23	18	13	12	11	10	10	9	11	13	15	17	20	21	22	20
14	25	28	29	31	33	35	36	32	26	22	19	15	12	10	9	9	8	9	11	12	15	18	18	21	20
15	23	26	28	30	30	33	32	30	26	22	17	15	13	13	12	12	12	13	16	19	20	22	24	26	21
16	29	30	34	37	34	40	39	34	31	25	20	17	15	15	14	14	15	17	19	22	23	27	29	31	25
17	32	33	35	36	39	42	44	41	35	28	24	20	17	15	13	13	14	17	18	20	23	26	26	29	27
18	29	30	33	34	36	37	39	35	30	24	20	18	16	17	16	14	16	18	21	23	24	28	29	33	26
19	34	35	35	39	40	42	44	39	34	28	24	21	18	17	14	14	14	16	19	21	22	16	16	22	26
20	22	17	19	24	27	28	29	30	24	12	12	12	14	14	15	16	17	19	21	23	25	26	26	26	21
21	26	26	27	29	29	30	30	30	28	25	23	21	20	20	19	18	17	19	20	21	23	24	27	29	24
22	31	33	35	36	37	38	40	39	34	28	23	20	18	16	15	15	15	16	19	22	24	24	28	27	26
23	28	30	32	34	37	40	42	38	32	28	24	21	20	18	15	14	14	17	20	20	23	26	26	29	26
24	29	32	34	36	39	42	41	40	38	30	25	24	21	20	20	23	24	26	28	31	33	32	36	41	31
25	43	47	50	52	54	54	58	51	44	38	32	29	26	25	24	26	25	28	31	33	36	38	40	42	39
26	45	47	50	52	54	55	56	52	44	38	31	27	24	20	20	19	20	22	22	24	25	26	28	31	35
27	33	35	36	37	38	38	39	36	28	26	21	20	18	17	16	17	18	19	20	21	21	22	23	23	26
28	23	23	24	26	27	29	30	29	27	24	20	18	16	17	18	19	20	21	22	25	27	30	32	33	24
29	35	36	37	41	42	44	45	42	35	31	26	23	19	18	17	16	16	18	20	22	24	25	28	31	29
30	31	33	33	38	38	39	40	39	34	28	25	22	19	19	18	19	20	22	24	28	29	30	29	31	29
31	33	35	36	39	40	40	41	44	39	34	31	26	25	23	24	24	26	31	36	39	42	43	45	47	35
HRAVE	37	39	41	43	45	47	48	45	38	32	27	23	21	19	19	19	19	21	24	26	28	30	32	34	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	54	62	56	32	32	35	32	38	41	36	28	22	20	20	21	25	27	26	26	21	24	26	26	31	39
MAX	91	93	100	60	54	55	60	49	57	61	49	40	34	36	33	40	44	39	44	30	30	40	42	42	58
MIN	24	27	18	14	16	21	16	27	23	15	13	9	9	8	12	14	13	14	14	12	17	15	14	20	24

DAY	26	27	28	29	30	31
AVE	35	26	24	29	29	35
MAX	56	39	33	45	40	47
MIN	19	16	16	16	18	23

MONTHLY AVERAGE = 31.5 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 8.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
OCTOBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.61	0.75	0.85	0.87	0.82	0.48	0.29	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.68
2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.41	0.60	0.52	0.84	0.52	0.31	0.13	0.22	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.83
3	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.33	0.60	0.71	0.86	0.87	0.80	0.69	0.52	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.88
4	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.61	0.76	0.85	0.87	0.82	0.70	0.51	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.14
5	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.41	0.60	0.75	0.84	0.86	0.81	0.69	0.45	0.18	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.87
6	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.39	0.60	0.74	0.82	0.85	0.79	0.65	0.38	0.18	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.63
7	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.40	0.59	0.74	0.83	0.84	0.79	0.67	0.50	0.27	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.90
8	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.35	0.57	0.71	0.80	0.82	0.76	0.66	0.33	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.20
9	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.56	0.71	0.80	0.82	0.77	0.67	0.47	0.26	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.61
10	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.57	0.73	0.81	0.79	0.67	0.62	0.43	0.25	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.49
11	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.38	0.58	0.73	0.81	0.83	0.75	0.65	0.47	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.70
12	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.39	0.59	0.74	0.83	0.83	0.69	0.38	0.20	0.21	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.13
13	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.39	0.58	0.73	0.82	0.84	0.78	0.66	0.48	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.78
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.57	0.72	0.81	0.82	0.76	0.64	0.46	0.25	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.64
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.57	0.72	0.81	0.82	0.76	0.64	0.46	0.25	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.61
16	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.56	0.71	0.80	0.81	0.76	0.60	0.38	0.25	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.44
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.37	0.56	0.71	0.79	0.81	0.75	0.63	0.45	0.23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.46
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.36	0.55	0.70	0.78	0.80	0.74	0.62	0.44	0.23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.43
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.36	0.55	0.69	0.78	0.80	0.73	0.61	0.43	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.36
20	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.54	0.69	0.77	0.78	0.72	0.60	0.42	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.28
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.53	0.67	0.76	0.77	0.71	0.60	0.42	0.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.19
22	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.33	0.51	0.66	0.74	0.76	0.70	0.53	0.35	0.23	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.97
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.32	0.50	0.64	0.73	0.56	0.67	0.58	0.41	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.77
24	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.29	0.47	0.44	0.48	0.58	0.52	0.25	0.19	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.36
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.31	0.50	0.64	0.73	0.75	0.65	0.51	0.27	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.69
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.32	0.49	0.65	0.73	0.75	0.69	0.57	0.39	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.91
27	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.31	0.41	0.59	0.65	0.64	0.59	0.46	0.26	0.13	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.18
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.21	0.38	0.38	0.58	0.68	0.44	0.27	0.19	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.31
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.31	0.49	0.63	0.71	0.73	0.67	0.56	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.77
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.28	0.36	0.45	0.47	0.67	0.43	0.43	0.31	0.12	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.64
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.20	0.30	0.49	0.47	0.52	0.56	0.27	0.33	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.34
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.53	0.66	0.75	0.76	0.69	0.55	0.38	0.20	0.04	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.68	3.83	5.88	6.14	5.87	5.63	5.90	5.20	5.61	5.49	5.70	5.13	5.78	5.64	5.61	5.44	5.46	5.43	5.36	5.28	5.19	4.97	4.77	3.36	4.69
MAX	0.87	0.84	0.87	0.87	0.86	0.85	0.84	0.82	0.82	0.81	0.83	0.83	0.84	0.82	0.82	0.81	0.81	0.80	0.80	0.78	0.77	0.76	0.73	0.58	0.75
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.91	4.18	3.31	4.77	3.64	3.34
MAX	0.75	0.65	0.68	0.73	0.67	0.56
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
OCTOBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.06	0.07	0.00	0.00	0.01	0.04	0.20
3	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.20	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.21 MONTHLY MAXIMUM = 0.07 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	3.7	4.9	4.5	4.1	2.3	1.1	1.8	0.7	0.8	1.4	1.6	1.5	1.6	4.6	5.8	7.2	7.3	5.8	4.0	1.9	1.1	2.8	0.8	1.1	3.0
2	1.5	2.8	2.2	2.8	1.1	2.0	3.0	2.8	2.1	1.3	2.0	2.0	2.1	2.6	2.1	2.6	3.5	6.5	5.0	5.5	5.9	6.1	10.6	8.2	3.6
3	8.8	5.9	6.0	5.3	5.5	5.2	4.5	5.9	5.2	5.8	6.9	6.9	7.8	7.5	8.5	8.7	10.1	10.0	6.5	7.1	5.6	4.3	7.9	5.8	6.7
4	5.1	4.8	7.8	7.1	7.2	7.0	4.8	1.6	3.2	5.5	4.2	5.1	3.4	4.5	5.6	5.4	2.9	3.1	3.8	4.3	1.4	1.5	2.7	2.5	4.4
5	2.7	3.2	3.0	2.8	3.0	1.7	1.6	2.8	3.5	2.6	1.1	2.4	2.1	1.2	2.0	2.3	4.5	6.3	5.6	4.7	2.6	1.9	3.0	2.0	2.9
6	3.0	2.9	3.2	3.6	2.2	3.0	3.0	2.8	2.5	2.0	1.8	1.3	1.0	2.0	3.2	5.1	6.2	5.9	5.8	4.3	2.1	2.5	3.2	3.4	3.2
7	3.2	2.6	2.6	3.5	3.7	3.3	3.2	3.5	3.2	3.0	2.4	2.4	1.4	1.8	2.9	3.1	3.1	3.0	3.3	3.0	1.2	4.0	4.5	3.7	3.0
8	4.6	4.7	4.4	5.0	3.5	7.7	8.4	10.1	9.3	8.0	12.3	9.5	8.7	7.7	8.1	7.8	7.4	5.6	5.8	7.8	8.0	8.8	9.6	8.8	7.6
9	9.2	9.4	11.4	10.7	11.8	10.2	8.9	11.4	12.2	9.6	8.4	8.7	9.2	8.3	9.0	8.9	6.3	5.6	6.7	7.1	8.5	7.3	6.6	8.2	8.9
10	7.7	3.9	6.8	4.9	4.2	4.5	3.2	4.5	3.9	4.8	9.2	9.9	10.9	9.2	9.3	8.8	8.0	6.9	6.2	6.9	7.6	6.0	6.7	8.4	6.8
11	7.9	7.4	6.6	6.6	7.4	6.7	6.8	4.8	4.8	6.2	4.8	7.7	8.2	6.6	4.7	4.2	4.9	5.4	6.0	5.1	6.4	4.8	4.2	5.7	6.0
12	2.8	4.8	5.0	3.9	3.9	3.8	5.1	5.7	6.0	6.4	5.7	5.0	7.1	6.8	6.6	5.5	4.7	4.7	6.2	4.9	4.1	4.4	3.0	3.3	5.0
13	4.4	3.8	3.8	4.0	4.0	3.6	4.4	4.1	4.0	3.8	2.8	3.0	3.5	2.6	1.6	2.1	1.6	2.1	3.4	2.3	2.3	2.4	3.1	3.2	3.2
14	3.6	3.0	2.5	2.3	3.3	3.8	4.7	4.7	3.4	2.4	1.8	1.8	2.5	2.9	3.7	3.7	1.6	2.5	1.9	1.0	2.3	2.2	3.2	4.1	2.9
15	4.2	3.6	3.8	4.1	4.4	4.6	4.3	4.4	4.9	4.8	3.7	3.0	3.5	4.4	4.6	4.9	4.3	3.2	2.7	1.0	2.5	2.7	3.3	3.0	3.8
16	3.5	3.4	3.6	3.7	3.9	3.4	2.8	3.6	3.3	2.6	2.6	1.9	1.3	2.1	2.1	2.8	4.4	4.3	2.2	1.1	1.5	2.2	3.6	2.8	2.9
17	2.9	2.2	2.3	2.2	1.8	1.1	3.5	1.9	2.0	2.9	4.8	5.8	6.2	6.7	6.7	6.8	6.2	6.1	3.8	2.0	1.8	1.5	3.3	3.8	3.7
18	3.4	3.2	2.6	1.9	2.1	3.9	4.0	3.7	3.7	3.5	4.5	6.0	7.5	9.1	8.6	9.8	8.3	7.9	7.7	7.8	9.1	7.9	8.1	9.0	6.0
19	9.4	9.5	9.6	10.6	12.0	11.9	11.4	13.8	14.0	13.2	12.2	10.0	9.8	9.9	10.0	10.9	10.8	10.3	10.4	11.1	9.8	9.4	10.7	11.2	10.9
20	9.0	9.9	9.4	9.9	10.1	10.0	9.2	9.1	9.2	8.2	7.3	6.9	6.1	7.2	6.8	4.7	3.7	4.0	6.3	3.1	3.0	2.3	2.3	3.2	6.7
21	5.7	8.8	7.5	5.7	5.5	4.2	3.3	4.2	5.2	5.5	3.7	4.0	2.2	7.4	9.0	5.7	6.6	6.2	5.7	4.0	1.9	1.2	2.7	1.3	4.9
22	1.2	1.0	1.3	1.4	0.8	2.1	2.3	2.3	2.4	***	***	***	1.3	1.1	1.4	2.3	2.2	4.0	4.7	1.7	1.8	2.1	1.9	3.1	2.0
23	4.0	3.4	4.0	3.5	4.0	5.0	4.8	5.2	4.1	3.7	4.4	4.4	2.9	3.4	3.6	2.6	2.3	1.9	4.7	1.5	2.0	2.9	2.3	1.4	3.4
24	2.6	2.5	1.9	3.0	2.8	3.5	4.2	5.3	6.5	3.6	5.6	7.8	7.5	7.6	6.1	6.0	6.1	6.7	8.1	7.8	10.4	9.6	4.8	5.9	5.7
25	8.1	8.2	8.9	9.5	9.1	9.7	10.3	9.9	10.4	9.9	8.3	8.3	8.0	8.6	9.8	10.1	8.9	7.3	8.5	7.8	8.2	8.7	8.3	9.1	8.9
26	9.4	9.1	9.1	8.9	8.7	8.9	9.1	8.8	8.8	8.3	8.5	7.3	7.1	6.4	7.1	7.3	5.4	2.0	1.9	2.7	2.3	2.1	3.4	4.6	6.5
27	4.2	7.4	8.1	10.2	6.5	6.9	4.1	3.0	1.4	1.6	3.4	5.8	6.5	7.0	6.7	6.9	6.3	4.8	3.4	5.6	3.5	7.6	8.3	1.9	5.5
28	2.8	1.2	0.9	0.9	1.3	2.1	1.6	1.1	1.3	3.3	2.9	2.8	3.5	4.8	4.7	4.2	4.1	3.4	2.1	1.8	2.0	2.8	2.0	1.1	2.4
29	2.0	1.8	1.5	1.4	2.2	1.6	2.9	1.4	1.7	3.6	4.6	3.0	2.8	3.1	4.6	4.8	4.1	4.6	4.8	2.5	1.3	2.2	3.2	3.0	2.9
30	3.5	4.1	3.5	3.6	3.7	3.7	3.7	2.5	4.5	4.2	3.4	3.4	3.5	2.6	1.7	1.6	3.1	4.5	4.8	2.1	3.6	1.6	1.2	2.5	3.2
HRAVE	4.8	4.8	4.9	4.9	4.7	4.9	4.8	4.8	4.9	4.9	5.0	5.1	5.0	5.3	5.6	5.6	5.3	5.1	5.1	4.3	4.1	4.2	4.6	4.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.0	3.6	6.7	4.4	2.9	3.2	3.0	7.6	8.9	6.8	6.0	5.0	3.2	2.9	3.8	2.9	3.7	6.0	10.9	6.7	4.9	2.0	3.4	5.7	8.9
MAX	7.3	10.6	10.1	7.8	6.3	6.2	4.5	12.3	12.2	10.9	8.2	7.1	4.4	4.7	4.9	4.4	6.8	9.8	14.0	10.1	9.0	4.7	5.2	10.4	10.4
MIN	0.7	1.1	4.3	1.4	1.1	1.0	1.2	3.5	5.6	3.2	4.2	2.8	1.6	1.0	1.0	1.1	1.1	1.9	9.4	2.3	1.2	0.8	1.4	1.9	7.3

DAY	26	27	28	29	30	31
AVE	6.5	5.5	2.4	2.9	3.2	***
MAX	9.4	10.2	4.8	4.8	4.8	***
MIN	1.9	1.4	0.9	1.3	1.2	***

MONTHLY AVERAGE = 4.9 MONTHLY MAXIMUM = 14.0 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	257	285	317	313	301	269	131	134	129	103	96	117	274	279	250	288	294	300	300	278	176	137	104	119	78
2	107	96	114	82	76	110	110	106	123	141	139	154	186	179	178	198	273	301	291	183	67	64	52	60	321
3	45	55	66	65	62	69	78	67	74	69	65	55	38	47	52	76	93	321	312	310	319	99	71	64	113
4	70	68	49	46	47	51	80	237	302	311	5	72	65	63	65	70	68	305	305	312	94	102	87	90	2
5	97	99	111	103	118	110	102	136	143	154	130	99	103	61	258	245	281	289	302	301	288	140	92	115	50
6	93	101	110	109	108	111	102	122	131	131	125	136	116	256	277	287	290	293	306	300	262	113	95	95	91
7	85	103	108	116	114	111	111	123	116	123	150	145	100	86	91	70	59	5	305	317	331	48	75	108	30
8	104	81	131	106	131	76	57	64	71	73	92	110	113	104	74	79	91	114	88	87	79	84	80	81	76
9	79	79	88	89	84	75	69	73	70	74	95	82	75	75	76	75	96	92	103	98	83	82	76	78	187
10	85	76	52	55	90	76	66	67	75	63	107	89	77	77	68	76	74	72	73	50	65	66	68	71	238
11	67	63	62	58	55	54	66	82	87	72	87	90	67	72	76	76	52	36	40	54	47	57	72	72	356
12	97	66	105	102	94	92	75	69	72	75	65	64	74	76	70	68	55	42	45	59	74	78	87	93	142
13	88	107	126	132	116	104	109	134	149	154	157	96	79	86	85	62	97	277	297	288	77	86	106	96	195
14	108	95	100	104	121	114	117	119	119	140	140	141	68	76	78	73	59	357	6	47	100	92	119	106	204
15	102	108	110	110	105	112	108	109	120	143	159	141	72	78	72	69	65	28	328	50	73	75	100	112	308
16	106	98	109	95	101	107	94	104	106	128	119	132	240	287	295	293	288	293	275	283	128	109	99	107	151
17	96	335	79	102	121	192	266	292	281	274	306	294	298	297	292	293	295	296	292	300	311	93	108	91	355
18	115	107	112	94	111	122	112	106	119	146	141	57	38	41	39	38	37	41	48	55	48	56	68	67	135
19	66	70	73	72	71	71	76	69	71	71	73	84	77	79	74	72	68	67	63	64	57	62	66	68	318
20	65	65	62	65	64	63	62	62	64	67	66	59	66	55	45	33	50	292	297	286	326	119	125	170	239
21	70	49	57	70	69	108	67	74	80	69	57	309	319	262	288	288	283	292	288	298	297	86	85	113	138
22	137	85	76	49	175	89	92	88	102	***	***	***	267	206	273	257	275	295	301	323	35	107	112	115	120
23	109	110	119	113	122	126	133	138	142	151	102	73	82	71	68	67	22	39	23	332	78	89	333	107	201
24	132	109	119	106	132	136	121	122	126	117	82	71	67	71	65	52	47	54	45	46	43	43	58	62	255
25	64	69	63	67	66	60	62	66	64	63	60	64	58	68	74	71	69	48	47	64	68	70	66	66	348
26	66	65	65	66	66	64	64	67	66	71	71	69	61	49	53	47	52	301	292	286	268	24	293	302	360
27	307	264	242	279	291	291	299	298	156	266	277	287	258	264	260	258	282	285	289	300	264	278	288	262	223
28	178	121	210	118	253	269	266	232	265	274	289	288	285	267	241	256	270	308	293	298	266	276	299	284	318
29	121	179	149	247	253	262	309	278	289	277	301	303	243	263	279	272	289	289	299	294	15	115	81	87	223
30	107	114	127	133	120	127	115	114	142	147	160	104	76	78	85	48	62	43	33	31	34	30	142	120	264

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	21	13	11	9	10	36	11	45	42	25	39	66	74	29	19	12	12	10	7	30	63	10	27	36	27
2	13	8	11	17	53	26	12	9	14	44	24	37	68	39	43	30	25	9	22	38	12	22	14	15	25
3	14	19	15	23	25	15	13	13	23	12	15	19	15	18	15	13	11	65	56	10	32	34	33	16	22
4	16	32	13	11	11	13	15	84	17	15	22	13	20	16	16	7	9	68	7	5	77	24	12	8	22
5	15	21	9	10	7	11	11	12	7	16	54	38	34	65	42	23	15	7	6	6	8	38	7	11	20
6	7	9	11	11	12	9	10	8	11	20	26	42	64	47	22	16	11	8	6	5	44	13	8	10	18
7	9	10	8	9	8	9	10	6	9	11	20	21	55	40	18	25	19	22	18	8	65	12	12	24	19
8	28	21	12	24	30	18	13	6	6	8	16	13	15	15	15	13	15	9	12	9	9	11	8	8	14
9	8	8	10	9	8	10	10	9	9	11	16	15	13	16	14	14	13	12	9	11	6	8	8	7	11
10	10	11	11	20	17	13	13	6	14	17	14	13	13	14	10	13	12	10	10	11	11	10	9	9	12
11	8	10	10	10	13	12	8	19	18	12	21	16	12	17	26	29	19	12	11	12	8	10	17	15	14
12	42	9	21	15	22	23	10	12	10	15	16	22	15	18	12	17	22	14	8	12	10	10	13	10	16
13	9	15	13	15	7	21	16	10	7	7	15	33	16	25	54	42	55	14	10	49	31	10	8	11	20
14	10	10	15	12	9	9	9	8	10	16	19	38	30	25	13	15	36	28	36	80	14	26	13	13	21
15	8	15	14	9	9	8	9	8	8	9	9	32	11	9	7	5	6	31	26	69	15	20	9	9	15
16	6	7	10	7	8	8	8	18	12	12	26	34	37	26	17	15	6	4	18	48	12	11	8	15	16
17	55	47	55	28	22	64	20	42	20	20	19	13	15	14	15	12	12	8	7	9	21	53	14	12	25
18	15	8	8	14	12	8	8	8	7	10	26	18	16	10	10	10	11	11	11	12	10	10	9	7	11
19	7	8	9	9	9	9	9	8	9	9	10	13	12	13	12	8	9	10	11	9	11	11	8	9	10
20	9	9	10	8	8	9	10	11	8	11	14	14	11	14	9	16	15	35	11	40	37	23	46	28	17
21	27	8	12	9	9	20	41	31	28	19	24	19	42	42	16	11	9	9	7	8	61	14	10	14	20
22	10	26	23	40	53	9	14	10	11	***	***	***	32	56	61	20	17	6	9	18	34	54	22	9	25
23	9	7	6	6	10	5	7	6	7	10	19	11	16	12	10	13	17	43	17	49	36	14	43	17	16
24	8	11	10	9	11	15	14	13	12	33	17	11	11	12	18	20	16	10	10	11	9	12	16	12	13
25	10	9	9	8	11	12	8	9	7	8	14	13	14	11	11	9	10	13	11	13	9	8	10	8	10
26	7	7	7	7	7	7	8	7	8	9	9	9	11	15	12	11	18	28	51	20	28	57	45	9	17
27	12	10	11	11	9	9	11	9	37	29	21	16	16	19	18	14	10	11	8	11	26	13	12	30	16
28	9	32	28	26	38	12	34	47	22	18	17	24	22	22	17	16	13	10	14	24	19	17	12	52	23
29	15	25	17	41	14	28	8	29	22	15	14	28	51	26	20	12	14	5	8	13	24	20	19	16	20
30	13	16	11	14	20	14	9	17	7	8	13	24	17	24	29	50	43	10	13	29	15	37	43	8	20
HRAVE	14	15	14	15	16	15	13	17	14	16	20	23	26	24	20	17	17	18	15	22	25	20	17	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	27	25	22	22	20	18	19	14	11	12	14	16	20	21	15	16	25	11	10	17	20	25	16	13	10
MAX	74	68	65	84	65	64	65	30	16	20	29	42	55	80	69	48	64	26	13	46	61	61	49	33	14
MIN	7	8	10	5	6	5	6	6	6	6	8	8	7	8	5	4	7	7	7	8	7	6	5	8	7

DAY	26	27	28	29	30	31
AVE	17	16	23	20	20	***
MAX	57	37	52	51	50	***
MIN	7	8	9	5	7	***

MONTHLY AVERAGE = 17.8 MONTHLY MAXIMUM = 84.1 MONTHLY MINIMUM = 4.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	21.2	20.5	19.9	19.4	19.0	18.3	17.4	17.4	17.8	20.6	23.4	24.7	25.6	26.9	27.4	26.3	25.1	23.8	22.6	21.4	20.3	19.3	19.1	17.9	21.5
2	17.1	16.1	15.9	15.1	14.3	14.0	13.8	15.0	16.9	18.8	21.9	24.7	26.5	27.5	28.0	28.3	27.7	25.6	23.8	22.5	22.1	21.7	21.6	20.9	20.8
3	20.1	19.5	19.0	18.3	17.1	16.7	16.8	17.8	18.9	21.4	22.3	22.8	23.7	25.0	25.5	26.2	26.5	21.9	18.7	18.0	18.1	17.7	17.5	17.3	20.3
4	16.8	16.8	16.6	17.1	17.9	18.0	17.4	16.4	16.4	16.6	17.5	19.9	20.9	21.9	21.9	21.7	21.9	21.3	20.3	19.7	19.0	17.7	16.5	15.7	18.6
5	15.0	14.4	14.1	13.6	13.1	12.6	12.0	12.2	14.1	17.0	19.0	22.4	23.8	24.2	25.0	25.5	24.7	22.8	21.6	20.9	20.2	18.7	17.8	17.1	18.4
6	15.9	15.3	14.9	14.6	13.3	13.1	13.0	13.3	14.9	17.4	20.5	22.3	24.6	25.8	26.5	26.5	25.6	24.0	22.8	22.1	20.8	19.5	18.6	17.3	19.3
7	16.6	15.7	14.8	14.3	14.1	14.1	13.3	13.5	15.8	18.2	21.4	23.6	25.6	27.0	27.5	27.7	27.3	26.6	24.5	23.4	23.2	22.1	20.5	19.9	20.5
8	19.6	19.3	17.0	17.4	15.9	18.6	19.8	19.3	20.9	23.2	25.8	27.2	27.5	27.9	27.2	27.1	26.5	25.4	24.4	23.9	23.1	22.8	22.2	21.9	22.7
9	21.6	21.1	20.6	20.1	19.3	18.8	18.2	18.5	19.4	20.6	22.4	23.1	23.5	24.0	23.9	24.0	23.9	23.1	22.3	21.5	20.9	20.0	18.8	18.2	21.2
10	18.0	16.3	16.5	16.5	16.0	15.4	14.7	14.7	16.7	18.2	20.4	21.4	21.7	22.1	22.2	22.2	22.1	21.3	20.6	20.2	19.5	18.7	18.2	18.2	18.8
11	17.7	17.4	17.0	16.4	16.3	16.1	15.6	14.9	16.4	18.9	21.2	22.8	23.2	24.3	24.9	25.0	24.3	23.4	22.7	21.8	21.4	20.5	19.6	18.9	20.0
12	18.1	17.5	16.1	15.9	15.1	14.7	14.6	15.6	17.6	19.8	20.9	22.0	23.4	24.1	24.2	24.3	23.9	23.1	22.5	21.2	20.0	19.0	18.3	17.4	19.6
13	16.2	14.7	14.2	13.4	13.1	12.5	12.1	11.8	13.6	16.2	20.1	22.7	24.3	25.3	26.1	26.2	25.9	25.0	22.8	21.8	20.3	18.6	17.0	16.1	18.7
14	15.2	13.7	12.9	12.2	11.4	11.2	10.9	11.5	13.0	16.4	19.2	22.5	25.8	26.9	27.0	27.0	27.0	26.2	24.6	23.0	21.4	20.0	18.1	16.4	18.9
15	16.1	15.2	13.8	13.3	13.0	12.1	11.9	12.1	14.2	17.1	20.8	24.1	26.2	27.2	28.0	28.0	27.4	26.1	25.6	24.7	22.3	20.6	19.0	17.8	19.9
16	16.7	15.2	15.2	14.2	14.1	12.6	12.9	11.6	13.2	16.6	19.4	21.7	23.4	25.2	25.0	25.3	24.8	24.1	23.0	23.2	21.8	20.8	19.5	19.1	19.1
17	18.4	16.4	15.4	15.0	14.4	14.7	12.8	13.7	15.7	16.8	18.2	19.1	19.9	20.1	20.4	19.9	18.8	17.4	15.9	15.0	14.5	12.9	11.5	10.3	16.1
18	9.5	9.1	8.2	6.6	5.5	5.3	5.9	6.5	8.3	11.9	15.8	18.5	19.5	20.4	21.0	21.4	21.5	21.2	20.9	20.3	19.9	19.4	18.6	18.6	14.7
19	18.4	17.9	17.5	17.2	17.0	16.3	15.7	15.5	16.2	17.3	18.9	20.8	22.2	23.1	23.3	23.5	23.2	22.6	21.8	21.3	20.9	20.6	20.4	20.0	19.7
20	19.5	19.2	18.6	18.1	17.7	17.3	17.0	16.8	17.6	19.1	20.4	21.3	21.9	22.8	23.0	23.3	22.5	22.0	20.9	20.1	19.7	18.8	18.6	17.6	19.7
21	16.1	15.8	15.9	15.2	15.2	14.1	13.6	13.5	13.2	13.4	14.8	14.7	15.4	18.7	16.5	16.2	16.5	15.9	14.8	14.1	14.0	13.0	12.7	12.8	14.8
22	11.9	11.5	10.5	10.1	10.0	8.9	8.4	8.7	10.3	***	***	***	16.9	17.9	18.7	19.0	18.6	17.4	16.0	15.4	15.2	13.5	12.8	11.4	13.5
23	10.8	10.1	9.4	8.9	7.4	7.7	6.9	7.5	9.0	11.5	15.7	18.0	19.9	20.7	21.0	21.2	21.0	20.0	19.3	18.6	16.3	15.0	14.2	12.8	14.3
24	10.9	10.5	9.7	8.6	8.7	9.2	12.1	13.2	14.1	17.0	18.7	19.6	20.4	21.1	21.5	21.6	21.5	20.8	20.4	19.4	18.9	18.1	17.2	16.6	16.2
25	16.0	15.5	15.1	14.8	14.7	14.3	13.8	14.0	15.1	16.4	17.4	18.7	20.0	21.0	21.8	21.9	21.6	20.5	20.2	19.4	18.8	18.0	17.8	17.3	17.7
26	16.9	16.3	16.0	15.8	15.3	14.9	14.8	14.6	15.1	15.8	16.4	17.2	18.2	19.5	20.1	20.4	20.3	18.8	18.6	17.3	16.6	15.7	15.4	16.4	16.9
27	16.1	15.7	15.2	12.7	11.5	10.6	9.8	9.3	10.0	11.3	12.7	13.7	14.7	14.5	14.9	15.3	14.1	13.2	13.0	12.5	11.7	8.6	6.1	5.5	12.2
28	5.7	6.1	6.3	6.5	6.8	6.4	6.3	6.8	8.0	9.5	10.4	11.6	13.0	13.1	12.9	12.5	12.1	11.7	11.6	11.1	10.6	10.3	10.3	9.8	9.5
29	9.4	9.1	8.7	8.1	7.3	7.2	7.0	6.0	7.3	8.6	10.1	11.6	12.9	13.4	13.1	12.9	12.3	11.1	10.2	9.6	9.2	7.4	6.6	5.8	9.4
30	4.9	3.8	2.9	2.2	2.2	1.9	1.7	1.1	2.0	5.5	8.7	11.3	12.9	13.9	14.6	14.7	14.1	13.1	12.4	11.4	10.9	9.1	7.2	6.4	7.9
HRAVE	15.6	14.9	14.3	13.7	13.2	12.9	12.7	12.8	14.1	16.3	18.4	20.1	21.2	22.2	22.4	22.5	22.1	21.0	20.0	19.2	18.4	17.3	16.4	15.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	21.5	20.8	20.3	18.6	18.4	19.3	20.5	22.7	21.2	18.8	20.0	19.6	18.7	18.9	19.9	19.1	16.1	14.7	19.7	19.7	14.8	13.5	14.3	16.2	17.7
MAX	27.4	28.3	26.5	21.9	25.5	26.5	27.7	27.9	24.0	22.2	25.0	24.3	26.2	27.0	28.0	25.3	20.4	21.5	23.5	23.3	18.7	19.0	21.2	21.6	21.9
MIN	17.4	13.8	16.7	15.7	12.0	13.0	13.3	15.9	18.2	14.7	14.9	14.6	11.8	10.9	11.9	11.6	10.3	5.3	15.5	16.8	12.7	8.4	6.9	8.6	13.8

DAY	26	27	28	29	30	31
AVE	16.9	12.2	9.5	9.4	7.9	***
MAX	20.4	16.1	13.1	13.4	14.7	***
MIN	14.6	5.5	5.7	5.8	1.1	***

MONTHLY AVERAGE = 17.4 MONTHLY MAXIMUM = 28.3 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.3	0.1	0.1	0.2	0.2	0.5	0.4	0.2	-0.2	-0.8	-1.1	-1.2	-0.9	-1.0	-1.0	-0.9	-0.4	0.0	0.3	0.5	0.4	0.4	0.2	0.5	-0.1
2	0.4	0.6	0.4	0.4	0.5	0.3	0.3	-0.4	-1.0	-0.8	-1.1	-1.1	-1.0	-1.1	-0.9	-0.9	-0.4	0.0	0.1	0.2	0.3	0.2	0.0	0.0	-0.2
3	0.0	0.0	0.1	0.3	0.4	0.3	0.3	0.3	0.0	-0.6	-0.7	-0.6	-0.5	-0.5	-0.2	0.0	0.1	-0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.0
4	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	-0.1	0.1	-0.6	-0.9	-0.9	-0.6	-0.4	-0.1	0.1	0.2	0.4	0.5	0.3	0.4	0.5	0.4	0.1
5	0.5	0.6	0.3	0.5	0.4	0.5	0.3	-0.1	-1.0	-1.1	-0.7	-1.1	-1.1	-0.7	-0.7	-0.6	-0.3	0.1	0.3	0.5	0.5	0.4	0.7	0.4	-0.1
6	0.6	0.6	0.3	0.3	0.4	0.4	0.3	-0.4	-1.0	-1.0	-1.2	-0.9	-0.7	-0.8	-0.8	-0.7	-0.3	0.2	0.4	0.5	0.7	0.4	0.6	0.5	-0.1
7	0.6	0.5	0.5	0.3	0.2	0.3	0.2	-0.4	-1.4	-1.5	-1.4	-1.2	-0.9	-0.9	-0.7	-0.3	0.2	0.4	0.5	0.6	0.3	0.7	1.1	0.6	-0.1
8	0.8	0.5	0.9	0.5	0.8	0.6	0.3	0.1	-0.1	-0.6	-0.8	-1.2	-1.2	-1.0	-0.4	-0.2	0.1	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.1
9	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.0	-0.3	-0.7	-1.2	-1.0	-0.9	-0.7	-0.4	-0.2	0.1	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.0
10	0.3	0.5	0.2	0.2	0.2	0.3	0.3	0.1	-0.8	-0.9	-1.3	-1.1	-0.8	-0.7	-0.4	-0.2	0.0	0.2	0.2	0.1	0.2	0.2	0.2	0.2	-0.1
11	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	-0.4	-0.9	-1.3	-1.2	-0.7	-0.7	-0.6	-0.4	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.3	-0.1
12	0.2	0.4	0.4	0.6	0.6	0.5	0.5	0.2	-0.5	-0.9	-0.9	-1.0	-0.9	-0.8	-0.4	-0.2	0.1	0.2	0.2	0.3	0.4	0.3	0.3	0.6	0.0
13	0.6	0.4	0.6	1.0	1.2	1.0	1.3	0.4	-1.0	-1.4	-1.4	-1.1	-1.2	-1.0	-0.6	-0.2	0.1	0.5	0.7	0.6	0.6	0.8	0.7	0.8	0.1
14	0.6	0.7	0.6	0.7	0.7	0.3	0.4	-0.3	-1.2	-1.3	-1.0	-0.9	-1.0	-0.9	-0.5	-0.1	0.2	0.6	0.6	0.5	0.6	0.6	0.9	0.9	0.1
15	0.8	0.7	0.8	0.5	0.5	0.3	0.3	-0.2	-1.2	-1.5	-1.8	-1.3	-1.0	-0.9	-0.4	0.0	0.4	0.6	0.7	0.4	0.6	0.7	1.0	0.7	0.0
16	0.8	0.7	0.7	0.8	0.6	0.6	0.7	0.2	-0.2	-1.0	-1.3	-0.9	-0.7	-0.8	-0.5	-0.4	0.1	0.6	0.6	0.4	0.5	0.5	0.6	0.4	0.1
17	0.5	0.7	0.8	1.0	1.1	1.2	1.1	0.4	-0.2	-0.4	-0.6	-0.8	-0.9	-0.8	-0.8	-0.6	-0.2	0.2	0.5	0.6	0.5	0.6	0.7	0.7	0.2
18	0.9	0.6	0.6	0.7	0.6	0.5	0.5	0.1	-0.7	-1.3	-1.5	-0.7	-0.5	-0.3	-0.1	0.0	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.1
19	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.0	-0.3	-0.5	-0.6	-0.9	-0.7	-0.6	-0.2	-0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	-0.1
20	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.0	-0.3	-0.5	-0.5	-0.4	-0.4	-0.4	-0.2	-0.1	0.0	0.2	0.1	0.1	0.2	0.3	0.3	0.4	0.0
21	0.4	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.3	0.2	-0.2	0.0	0.0	-0.2	-0.2	-0.2	0.2	0.3	0.4	0.5	0.5	0.3	0.8	0.4	0.2
22	0.4	0.5	0.4	0.7	0.3	0.5	0.4	0.2	-0.9	***	***	***	-0.5	-0.4	-0.5	-0.5	-0.2	0.4	0.6	0.5	0.3	0.4	0.5	0.6	0.2
23	0.5	0.6	0.4	0.6	0.9	0.6	1.2	0.5	-0.4	-0.8	-0.8	-0.8	-0.9	-0.5	-0.2	-0.1	0.2	0.5	0.7	0.5	0.6	0.6	0.7	0.8	0.2
24	0.8	0.7	0.4	0.7	0.8	1.4	1.4	1.2	0.8	-0.4	-0.6	-0.5	-0.4	-0.3	-0.1	0.1	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3
25	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	-0.1	-0.3	-0.3	-0.4	-0.4	-0.3	-0.2	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.1
26	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.0	-0.2	-0.2	-0.2	-0.2	-0.3	-0.1	0.0	0.1	0.3	0.4	0.5	0.5	0.5	0.6	0.4	0.2
27	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	-0.3	-0.5	-0.6	-0.7	-0.7	-0.6	-0.6	-0.5	-0.2	0.0	0.1	0.0	0.1	0.0	-0.1	0.0	-0.1
28	-0.2	0.0	-0.1	0.0	0.2	0.1	0.1	0.1	-0.2	-0.4	-0.6	-0.6	-0.8	-0.5	-0.4	-0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.1
29	0.0	0.1	0.2	0.3	0.5	0.4	0.5	0.4	-0.1	-0.3	-0.5	-0.8	-0.8	-0.8	-0.7	-0.6	-0.2	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.0
30	0.7	0.8	0.8	0.5	0.4	0.5	0.3	0.5	-0.8	-1.2	-1.3	-0.9	-0.9	-0.7	-0.5	-0.4	0.2	0.4	0.4	0.5	0.6	0.4	0.5	0.5	0.0
HRAVE	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1	-0.5	-0.7	-0.9	-0.8	-0.8	-0.7	-0.5	-0.3	0.0	0.3	0.4	0.4	0.4	0.4	0.5	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	-0.2	0.0	0.1	-0.1	-0.1	-0.1	0.1	0.0	-0.1	-0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1	-0.1	0.0	0.2	0.2	0.2	0.3	0.1
MAX	0.5	0.6	0.4	0.5	0.7	0.7	1.1	0.9	0.5	0.5	0.3	0.6	1.3	0.9	1.0	0.8	1.2	0.9	0.3	0.4	0.8	0.7	1.2	1.4	0.3
MIN	-1.2	-1.1	-0.7	-0.9	-1.1	-1.2	-1.5	-1.2	-1.2	-1.3	-1.3	-1.0	-1.4	-1.3	-1.8	-1.3	-0.9	-1.5	-0.9	-0.5	-0.2	-0.9	-0.9	-0.6	-0.4

DAY	26	27	28	29	30	31
AVE	0.2	-0.1	-0.1	0.0	0.0	***
MAX	0.6	0.3	0.2	0.5	0.8	***
MIN	-0.3	-0.7	-0.8	-0.8	-1.3	***

MONTHLY AVERAGE = 0.0 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = -1.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	700	700	700	700	700	700	700	701	701	701	701	700	700	699	699	699	699	699	699	700	700	700	701	701	700
2	701	701	701	701	701	701	701	702	702	702	702	701	700	700	700	700	699	700	701	702	702	703	703	703	701
3	703	704	704	704	704	704	704	704	705	705	704	704	703	702	701	701	701	702	702	703	703	703	703	703	703
4	704	704	703	703	703	703	704	704	705	705	705	704	704	703	703	703	703	703	703	704	704	704	704	704	704
5	704	704	704	704	704	704	704	704	704	704	704	703	702	702	701	701	701	701	702	702	702	703	703	703	703
6	703	703	703	703	703	703	704	704	705	704	704	704	703	703	702	702	702	703	703	703	704	704	704	704	703
7	704	704	704	704	705	705	705	706	706	706	706	705	704	704	703	703	703	703	704	704	704	705	705	705	704
8	705	705	705	705	706	706	706	707	707	707	707	707	706	705	705	705	705	705	706	706	706	706	707	707	706
9	707	707	707	707	707	707	707	707	707	707	707	706	706	705	704	704	704	704	705	705	705	706	706	706	706
10	706	706	706	706	706	706	706	707	707	707	706	705	705	704	704	704	704	704	705	705	705	706	706	706	706
11	706	706	706	706	706	706	707	707	708	707	707	706	706	705	704	704	705	705	705	705	706	706	706	706	706
12	706	706	706	707	707	707	707	707	708	707	707	707	705	705	704	704	704	704	704	705	705	705	705	706	706
13	706	705	705	705	705	705	706	706	707	707	707	706	705	704	704	704	703	704	704	704	705	705	705	705	705
14	705	705	705	706	706	706	706	707	707	707	707	706	705	705	704	704	704	704	704	705	705	705	705	705	705
15	706	706	706	706	706	706	706	706	***	***	***	704	703	702	701	701	701	701	701	701	701	701	701	701	703
16	701	701	701	701	701	700	701	701	701	701	700	700	699	698	697	697	696	696	697	696	696	696	696	696	699
17	696	696	696	696	696	697	697	698	699	699	700	700	699	699	699	699	699	699	700	700	701	701	702	702	699
18	703	703	703	703	704	704	705	705	706	706	706	706	705	704	704	704	703	704	704	705	705	705	706	706	704
19	706	706	706	706	706	706	707	707	707	707	707	707	706	705	704	704	704	704	704	704	704	704	704	704	705
20	704	704	704	704	704	704	704	704	704	704	704	703	703	702	701	701	701	701	701	701	702	702	702	702	703
21	702	701	701	700	700	700	700	700	700	700	700	699	699	698	698	699	699	700	700	701	701	701	701	702	700
22	702	702	702	702	702	702	703	703	704	***	***	***	703	703	702	703	703	703	704	704	704	704	704	704	703
23	704	704	704	704	704	704	704	705	705	705	705	704	703	703	702	702	702	702	703	703	703	703	704	704	704
24	704	704	704	704	704	705	705	705	706	706	706	705	704	704	703	703	703	703	703	703	703	704	704	705	704
25	705	705	705	705	705	705	706	706	706	706	706	706	705	705	704	704	704	704	704	705	705	705	705	705	705
26	705	705	705	705	704	704	704	704	704	704	704	703	702	701	700	699	699	700	700	700	700	700	700	700	702
27	700	700	700	700	701	701	701	701	702	701	701	700	700	699	699	698	698	698	698	698	698	698	699	699	699
28	699	699	699	699	699	699	699	699	700	700	700	699	698	698	697	696	696	696	696	696	696	697	697	697	698
29	697	697	697	697	697	697	698	698	699	700	700	700	700	700	700	700	700	701	701	702	702	702	703	703	700
30	703	703	703	703	703	703	703	703	704	704	704	703	702	701	701	701	701	700	700	700	700	700	701	701	702
HRAVE	703	703	703	703	703	703	704	704	704	704	704	704	703	702	702	702	702	702	702	702	703	703	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	701	703	704	703	703	704	706	706	706	706	706	705	705	703	699	699	704	705	703	700	703	704	704	705
MAX	701	703	705	705	704	705	706	707	707	707	708	708	707	707	706	701	702	706	707	704	702	704	705	706	706
MIN	699	699	701	703	701	702	703	705	704	704	704	704	703	704	701	696	696	703	704	701	698	702	702	703	704

DAY	26	27	28	29	30	31
AVE	702	699	698	700	702	***
MAX	705	702	700	703	704	***
MIN	699	698	696	697	700	***

MONTHLY AVERAGE = 702.9 MONTHLY MAXIMUM = 707.6 MONTHLY MINIMUM = 695.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.2% OPERATIONAL RECOVERY RATE = 99.2%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	53	54	48	47	47	51	57	56	54	43	37	36	33	26	23	27	31	33	35	38	40	41	45	47	42
2	49	51	52	52	55	55	56	51	41	36	30	28	25	23	22	21	23	27	32	39	42	43	43	46	39
3	50	51	54	62	71	74	72	63	57	46	45	45	44	40	38	34	31	49	65	72	69	73	67	65	56
4	70	75	77	74	70	70	73	81	83	81	81	59	50	44	45	45	44	52	61	64	69	76	82	86	67
5	88	90	91	93	94	96	99	95	81	66	55	43	35	32	31	30	34	40	43	46	48	54	65	66	63
6	76	79	75	75	85	85	82	79	65	55	45	39	33	29	29	30	33	37	41	43	48	55	59	66	56
7	68	71	74	73	71	72	75	72	59	48	41	36	31	27	24	23	25	27	36	41	41	37	43	45	48
8	44	43	50	49	54	45	40	42	38	32	25	22	21	20	21	21	22	25	26	27	28	26	25	25	32
9	25	26	27	27	28	30	32	31	29	27	24	23	22	21	20	19	19	19	20	20	21	23	25	26	24
10	25	30	29	31	36	40	42	42	37	34	31	30	29	29	30	30	31	32	34	35	38	40	42	42	34
11	43	44	45	47	48	48	50	51	47	41	35	32	31	28	25	25	27	30	30	33	32	34	36	37	37
12	39	40	43	44	46	48	48	45	40	36	34	32	29	26	25	24	25	27	27	31	34	36	38	40	36
13	42	45	45	47	50	52	53	54	47	40	33	28	25	21	17	15	15	17	21	26	29	32	36	38	35
14	39	44	47	51	50	51	49	46	39	31	26	22	16	13	12	12	12	13	15	18	21	23	25	29	29
15	31	32	35	36	35	37	36	34	30	30	27	18	16	16	16	16	17	19	19	19	23	26	30	30	26
16	32	36	35	39	34	39	37	40	36	24	22	20	17	15	16	18	18	18	19	19	22	22	23	23	26
17	25	28	32	34	34	32	37	42	37	31	27	20	16	15	13	13	12	13	15	17	18	21	22	24	24
18	25	26	28	33	36	32	32	31	27	20	15	10	10	10	10	10	10	12	14	15	15	15	16	16	20
19	16	17	16	17	18	19	21	22	22	21	20	18	17	17	17	17	17	18	19	19	20	20	20	21	19
20	22	22	23	24	24	25	25	25	25	23	22	21	21	20	21	21	22	23	25	30	33	33	33	45	25
21	63	62	62	69	69	80	89	90	94	94	88	92	89	62	75	78	59	58	60	64	67	74	77	75	74
22	79	84	92	94	94	98	100	98	89	***	***	***	45	36	36	34	38	44	52	56	57	67	70	76	68
23	74	76	75	77	85	79	79	75	69	61	46	38	32	30	28	26	27	31	33	33	45	49	49	58	53
24	64	70	72	80	73	64	46	33	30	22	17	15	14	12	11	13	15	18	19	20	20	21	21	22	33
25	22	22	23	23	23	24	23	23	21	20	21	20	20	19	18	18	19	23	23	23	23	24	25	27	22
26	28	30	31	32	33	35	36	37	37	37	38	38	38	37	36	37	37	41	38	40	42	46	45	35	37
27	33	39	51	53	54	56	59	61	58	50	45	41	37	38	37	35	40	46	46	49	55	84	95	96	52
28	98	92	93	93	93	95	97	95	87	71	64	54	43	38	39	42	43	44	40	49	50	57	63	69	67
29	72	74	77	82	83	81	76	84	76	67	55	46	33	28	29	29	30	34	36	39	43	53	58	62	56
30	65	66	67	70	68	68	70	75	66	49	39	31	26	23	19	18	20	24	26	29	30	36	42	44	45
HRAVE	49	51	52	54	55	56	56	56	51	43	37	33	30	27	26	26	27	30	32	35	37	41	44	46	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	42	39	56	67	63	56	48	32	24	34	37	36	35	29	26	26	24	20	19	25	74	68	53	33	22
MAX	57	56	74	86	99	85	75	54	32	42	51	48	54	51	37	40	42	36	22	45	94	100	85	80	27
MIN	23	21	31	44	30	29	23	20	19	25	25	24	15	12	16	15	12	10	16	20	58	34	26	11	18

DAY	26	27	28	29	30	31
AVE	37	52	67	56	45	***
MAX	46	96	98	84	75	***
MIN	28	33	38	28	18	***

MONTHLY AVERAGE = 41.4 MONTHLY MAXIMUM = 99.8 MONTHLY MINIMUM = 9.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.19	0.39	0.60	0.70	0.72	0.65	0.55	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.37
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.48	0.62	0.70	0.71	0.65	0.54	0.37	0.15	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.63
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.20	0.46	0.48	0.39	0.51	0.64	0.38	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.09	0.05	0.58	0.70	0.70	0.64	0.52	0.26	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.73
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.28	0.46	0.60	0.68	0.69	0.64	0.52	0.35	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.46
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.46	0.61	0.69	0.70	0.64	0.52	0.35	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.48
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.46	0.60	0.68	0.69	0.64	0.52	0.35	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.45
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.45	0.59	0.67	0.69	0.63	0.51	0.34	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.39
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.46	0.60	0.68	0.70	0.64	0.53	0.36	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.48
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.44	0.58	0.69	0.69	0.63	0.51	0.33	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.36
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.44	0.58	0.66	0.68	0.62	0.50	0.34	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.29
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.44	0.58	0.66	0.68	0.62	0.51	0.33	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.30
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.44	0.58	0.66	0.68	0.62	0.56	0.20	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.21
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.44	0.59	0.67	0.69	0.63	0.51	0.34	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.33
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.43	0.58	0.66	0.68	0.62	0.50	0.34	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.17	0.32	0.49	0.56	0.44	0.53	0.24	0.19	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.05
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.42	0.56	0.65	0.66	0.61	0.49	0.32	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.14
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.43	0.57	0.65	0.67	0.62	0.50	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.20
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.24	0.42	0.56	0.64	0.66	0.61	0.48	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.11
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.32	0.36	0.26	0.24	0.27	0.19	0.09	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.07	0.24	0.06	0.25	0.62	0.25	0.23	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.81
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.24	***	***	***	0.65	0.59	0.48	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.43
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.41	0.55	0.63	0.65	0.60	0.49	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.03
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.41	0.56	0.64	0.66	0.61	0.49	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.04
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.35	0.43	0.54	0.55	0.52	0.48	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.10	0.19	0.16	0.21	0.24	0.27	0.13	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.40	0.45	0.53	0.58	0.36	0.35	0.35	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.29
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.22	0.39	0.42	0.50	0.63	0.34	0.18	0.09	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.81
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.39	0.55	0.66	0.69	0.62	0.49	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.06
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.39	0.53	0.62	0.63	0.58	0.47	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.87
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.22	0.39	0.52	0.59	0.61	0.58	0.45	0.29	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.37	4.63	3.24	3.73	4.46	4.48	4.45	4.39	4.48	4.36	4.29	4.30	4.21	4.33	4.24	3.05	4.14	4.20	4.11	2.02	1.81	2.43	4.03	4.04	3.54
MAX	0.72	0.71	0.64	0.70	0.69	0.70	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.69	0.68	0.56	0.66	0.67	0.66	0.36	0.62	0.65	0.65	0.66	0.55
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	1.40	3.29	2.81	4.06	3.87	***
MAX	0.27	0.58	0.63	0.69	0.63	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
NOVEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.02	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.08
4	0.00	0.02	0.09	0.03	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
21	0.00	0.01	0.00	0.00	0.00	0.02	0.03	0.04	0.15	0.04	0.00	0.23	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.00	0.08
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.08	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.56	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.03	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.23	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.08	0.01	0.00	0.00	***
MAX	0.00	0.07	0.01	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.92 MONTHLY MAXIMUM = 0.23 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 99.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
DECEMBER - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.0	2.3	2.9	3.5	3.0	3.4	3.1	2.8	2.5	1.9	1.8	1.6	1.0	1.9	3.1	4.3	4.3	5.2	3.9	3.5	1.4	2.3	2.5	2.5	2.8
2	1.9	2.8	2.3	1.7	2.5	2.0	1.7	2.7	3.2	2.2	1.2	1.1	1.4	1.9	3.5	7.0	6.7	5.6	5.9	4.6	2.5	2.0	1.5	2.4	2.9
3	2.4	3.6	2.4	1.7	1.5	1.5	2.7	4.5	6.8	7.0	6.3	4.9	4.1	3.5	2.2	2.9	3.7	3.2	3.0	2.0	4.8	4.0	4.3	4.4	3.6
4	3.6	4.4	2.0	3.1	3.4	3.9	3.3	3.0	3.5	3.4	3.5	4.2	5.1	3.9	3.6	3.2	4.1	1.3	1.3	1.3	2.3	2.6	4.3	4.0	3.3
5	3.6	3.8	3.7	3.5	3.6	3.3	3.1	3.6	3.2	3.0	2.3	1.5	1.9	3.2	5.9	5.9	6.6	6.2	3.6	1.4	1.6	2.4	2.3	3.1	3.4
6	3.6	3.0	3.0	2.2	2.1	1.8	2.4	2.7	3.2	1.8	1.3	1.6	1.1	2.7	5.8	6.2	5.5	5.2	4.8	3.1	2.1	2.5	2.2	1.6	3.0
7	1.8	1.2	0.7	0.8	1.7	2.1	2.1	2.3	2.0	1.3	1.2	1.1	2.2	3.7	5.5	6.6	5.9	5.2	2.9	2.0	0.9	1.8	2.5	2.2	2.5
8	2.3	1.7	2.6	2.6	3.1	3.6	3.1	3.8	3.1	2.9	2.0	1.5	1.7	2.7	3.2	4.1	4.4	4.2	4.1	4.3	2.6	4.8	5.2	4.1	3.2
9	5.7	6.8	7.9	8.1	7.2	8.1	8.1	7.4	7.5	9.0	7.7	6.8	6.9	6.2	5.8	5.5	4.9	4.5	5.2	7.9	7.2	7.5	6.3	6.9	6.9
10	6.3	4.4	4.5	4.8	3.9	4.2	4.2	5.1	4.9	4.3	3.5	3.9	3.2	2.9	2.3	1.9	5.4	5.6	4.3	3.1	1.9	2.0	2.2	2.0	3.8
11	2.9	2.8	3.2	2.1	1.9	2.2	3.4	2.9	2.0	1.5	0.8	0.6	1.1	2.1	4.1	5.9	5.9	5.3	4.4	3.0	0.9	2.5	3.2	2.9	2.8
12	3.8	3.7	3.5	2.5	2.0	2.7	3.3	2.7	3.2	2.7	1.5	1.1	2.0	2.4	4.2	5.6	6.3	5.2	3.3	1.8	1.9	1.2	2.3	2.6	3.0
13	3.1	3.8	3.1	3.1	2.6	2.8	2.4	2.0	1.6	2.1	1.6	1.3	1.3	1.7	2.8	3.0	3.2	3.6	3.5	2.6	1.7	2.3	2.7	3.6	2.6
14	1.7	2.3	3.3	2.6	2.0	1.8	3.1	3.3	3.0	2.8	2.4	2.4	2.6	2.1	1.4	1.4	3.2	2.2	1.4	2.3	2.2	2.3	3.7	4.0	2.5
15	3.6	4.1	3.8	3.5	3.7	3.3	4.2	3.8	3.4	3.7	4.1	3.4	2.4	1.7	1.6	2.0	2.0	2.7	2.6	3.2	3.9	3.2	3.8	1.9	3.2
16	2.1	2.4	5.8	2.8	4.1	5.6	4.8	4.1	2.3	1.4	2.7	1.9	1.6	1.0	1.5	2.6	2.0	5.1	5.6	8.4	9.0	9.0	12.0	9.1	4.4
17	10.0	9.4	9.1	15.0	15.1	16.5	12.0	10.0	7.0	5.9	5.4	5.3	4.8	4.4	4.3	5.3	6.0	4.6	3.5	2.0	1.5	2.9	3.6	3.0	6.9
18	1.4	1.8	3.7	3.5	2.8	3.4	4.3	4.0	4.0	3.5	6.7	7.7	8.5	8.4	8.8	8.5	8.9	8.3	7.7	8.8	8.8	8.3	8.4	8.2	6.2
19	7.2	8.4	7.8	8.8	9.0	8.4	8.2	9.0	9.5	9.4	8.6	9.7	8.9	7.1	6.2	7.4	8.1	7.3	7.8	8.2	8.4	7.8	7.5	8.0	8.2
20	8.2	9.2	9.2	9.1	9.7	9.0	9.2	9.4	9.4	9.6	9.6	8.9	7.5	7.5	7.8	7.3	7.4	8.2	9.6	8.4	8.1	8.1	7.8	6.3	8.5
21	4.9	4.6	4.7	3.2	5.1	3.6	3.4	3.5	4.2	4.7	4.0	3.5	0.8	1.7	1.5	4.5	4.2	7.0	6.1	6.3	5.7	4.4	3.1	4.8	4.1
22	4.9	5.3	5.1	5.1	5.1	5.2	6.7	4.0	5.6	4.4	4.9	5.2	8.8	7.2	7.5	8.6	9.1	5.2	3.9	5.7	3.2	2.7	2.6	3.9	5.4
23	1.7	1.1	2.1	1.1	1.5	1.2	2.7	3.4	2.5	1.5	1.8	0.8	1.6	2.2	2.6	3.8	5.0	5.0	4.9	2.3	1.4	1.1	1.6	3.2	2.3
24	3.2	3.2	3.3	3.5	3.9	3.8	3.8	2.4	3.6	2.1	3.2	2.2	6.0	10.8	12.5	14.1	16.2	7.7	2.2	4.2	3.2	2.8	3.0	3.4	5.2
25	3.9	3.3	3.5	4.4	3.1	2.3	1.2	1.6	1.9	1.2	1.4	4.1	4.4	5.7	5.1	4.8	5.1	5.1	3.0	1.6	2.1	1.6	1.4	2.1	3.1
26	2.7	3.3	2.7	2.9	3.8	4.1	3.9	3.4	3.2	3.3	4.5	6.6	7.3	6.8	7.7	8.4	8.4	8.9	10.0	8.6	9.4	8.7	8.6	7.6	6.0
27	4.9	6.1	5.8	4.0	4.4	3.9	3.8	4.5	3.6	3.0	5.3	6.8	7.4	8.4	7.2	8.5	8.5	8.2	7.9	7.3	6.4	6.3	4.5	4.2	5.9
28	3.8	4.2	4.3	4.6	4.5	4.5	4.7	5.0	4.8	4.5	4.6	5.0	4.2	3.5	2.7	2.2	1.3	1.2	1.3	1.0	4.3	3.8	3.4	3.3	3.6
29	3.3	4.5	4.7	4.2	4.4	4.6	5.9	4.7	4.5	4.2	7.0	5.7	4.1	3.7	4.6	7.3	8.4	8.1	9.4	9.4	10.4	10.5	9.1	8.5	6.3
30	9.5	10.5	9.9	9.5	9.1	7.1	7.1	8.4	8.1	8.4	8.5	6.9	5.7	4.8	4.0	4.3	4.8	5.0	6.0	6.1	5.9	4.0	5.1	4.6	6.8
31	1.7	1.3	1.8	1.8	2.5	2.8	2.3	2.1	1.4	3.1	3.5	4.0	4.3	3.5	2.3	2.6	2.4	1.8	1.3	1.1	1.9	2.2	2.0	2.5	2.3
HRAVE	4.0	4.2	4.3	4.2	4.3	4.3	4.3	4.3	4.2	3.9	4.0	3.9	4.0	4.2	4.6	5.4	5.7	5.2	4.7	4.4	4.1	4.1	4.3	4.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.8	2.9	3.6	3.3	3.4	3.0	2.5	3.2	6.9	3.8	2.8	3.0	2.6	2.5	3.2	4.4	6.9	6.2	8.2	8.5	4.1	5.4	2.3	5.2	3.1
MAX	5.2	7.0	7.0	5.1	6.6	6.2	6.6	5.2	9.0	6.3	5.9	6.3	3.8	4.0	4.2	12.0	16.5	8.9	9.7	9.7	7.0	9.1	5.0	16.2	5.7
MIN	1.0	1.1	1.5	1.3	1.4	1.1	0.7	1.5	4.5	1.9	0.6	1.1	1.3	1.4	1.6	1.0	1.5	1.4	6.2	6.3	0.8	2.6	0.8	2.1	1.2

DAY	26	27	28	29	30	31
AVE	6.0	5.9	3.6	6.3	6.8	2.3
MAX	10.0	8.5	5.0	10.5	10.5	4.3
MIN	2.7	3.0	1.0	3.3	4.0	1.1

MONTHLY AVERAGE = 4.3 MONTHLY MAXIMUM = 16.5 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
DECEMBER - 2016

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	109	116	103	113	109	101	110	116	132	141	131	133	120	340	279	301	305	297	303	296	206	111	89	97	278
2	97	94	89	86	92	62	93	109	89	94	137	92	239	263	276	292	303	300	299	301	315	118	102	131	143
3	121	139	132	133	110	91	101	106	57	36	41	55	64	35	4	2	276	296	312	58	41	61	58	60	280
4	86	60	120	56	103	130	135	126	147	139	129	94	71	71	59	55	69	150	47	35	78	106	118	106	32
5	117	105	111	110	105	109	107	117	119	117	140	143	248	268	297	292	295	313	291	280	133	101	107	106	43
6	101	107	93	89	87	89	93	111	109	88	297	268	169	276	285	290	302	311	294	201	126	113	116	110	189
7	86	83	338	89	88	93	105	96	106	124	136	215	278	289	311	305	301	302	293	275	262	108	99	80	113
8	77	60	64	95	92	90	111	97	110	144	152	179	250	74	72	67	62	29	321	310	348	57	71	90	353
9	83	73	76	68	66	67	65	65	66	69	71	55	42	58	43	45	50	39	44	49	48	48	59	63	90
10	63	93	110	88	122	135	134	134	149	152	136	82	86	81	81	138	284	301	295	284	183	115	83	89	225
11	109	100	85	95	96	94	107	103	61	108	209	272	127	269	287	302	296	309	301	297	130	107	89	107	233
12	95	106	105	110	99	106	99	103	101	108	112	197	272	268	288	291	289	288	302	275	153	116	119	107	107
13	106	108	103	116	112	113	111	95	118	116	125	114	120	239	264	268	273	298	297	294	73	106	97	90	132
14	97	96	109	98	94	105	106	89	104	109	116	117	88	91	121	83	62	290	90	62	84	96	100	93	271
15	106	109	114	109	103	102	116	110	119	137	137	146	126	93	213	245	270	295	79	93	78	77	91	32	211
16	78	295	300	231	85	53	77	71	72	37	300	72	64	219	276	280	293	259	264	236	226	222	221	219	311
17	219	227	226	274	285	281	278	283	271	275	305	295	277	278	280	291	285	290	303	261	94	115	88	80	223
18	69	142	134	109	107	117	113	111	118	143	73	46	43	39	37	35	36	39	53	42	44	60	66	66	57
19	69	69	69	68	68	64	55	52	44	45	48	38	41	58	69	75	69	60	55	54	52	57	59	64	206
20	64	53	68	67	65	65	67	63	64	68	69	74	66	46	41	41	51	60	47	61	63	62	67	67	13
21	81	103	113	97	115	108	92	118	113	109	87	69	240	349	333	66	44	55	58	67	85	142	93	65	196
22	60	75	70	68	72	67	63	72	64	82	73	77	171	289	295	285	309	297	263	293	270	310	293	297	255
23	279	202	111	152	123	137	138	93	130	130	144	251	240	262	266	273	278	289	295	228	134	113	280	111	99
24	101	99	92	117	117	113	118	101	77	71	78	314	279	217	195	216	291	306	157	125	147	102	141	134	290
25	144	155	165	296	282	280	290	316	147	138	293	262	229	245	280	287	299	307	306	105	87	70	45	86	86
26	117	106	140	144	145	136	121	114	121	153	78	40	50	43	41	42	42	46	45	48	47	57	66	70	302
27	86	78	80	104	105	112	117	100	111	137	94	65	72	53	48	50	51	50	50	47	50	64	94	97	90
28	116	124	126	130	124	131	129	139	135	143	144	160	160	161	157	170	267	290	262	132	106	112	119	115	107
29	106	108	134	141	119	103	81	104	103	103	73	103	100	144	86	55	47	59	68	69	75	75	68	72	74
30	75	75	79	77	78	86	82	73	77	74	73	69	69	67	50	50	66	58	52	55	53	89	77	81	193
31	49	293	91	184	252	275	273	297	268	304	314	314	321	309	302	296	280	127	95	316	82	86	85	81	225

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
DECEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	8	8	12	7	8	9	9	10	9	17	43	43	54	33	18	14	15	7	5	4	29	10	8	9	16
2	22	6	9	17	8	26	16	7	7	15	42	37	48	33	18	9	8	6	5	5	12	19	18	16	17
3	18	16	12	23	42	33	25	11	15	16	20	22	23	30	58	38	9	7	8	38	14	22	20	40	23
4	26	12	58	50	14	11	11	13	11	12	11	13	14	23	25	28	7	31	44	30	11	12	6	9	20
5	6	7	8	8	8	8	10	11	9	10	19	34	28	18	10	14	8	6	15	53	39	8	11	12	15
6	11	9	10	13	9	12	12	9	8	33	29	19	52	35	12	12	13	6	6	31	7	8	16	15	16
7	12	15	55	49	18	12	11	10	10	19	39	53	25	17	17	11	10	7	7	9	40	43	10	17	21
8	17	38	18	34	12	6	9	5	9	12	24	47	26	30	17	9	14	10	27	5	21	13	12	13	18
9	12	9	10	7	9	9	9	10	10	8	11	16	13	13	14	12	13	14	15	10	11	13	12	9	11
10	11	16	13	16	17	10	12	6	7	9	21	11	12	14	16	33	8	7	6	32	15	8	15	17	14
11	10	7	8	11	15	11	11	8	26	17	41	51	38	21	16	13	10	6	6	12	49	16	10	12	18
12	6	12	7	9	11	8	9	9	9	11	30	38	20	18	14	15	9	6	6	20	12	11	8	9	13
13	14	7	8	9	8	9	10	10	9	11	18	29	36	30	12	11	7	5	5	6	33	8	10	7	13
14	10	10	8	7	9	10	7	7	9	11	18	19	14	21	28	29	33	5	29	12	13	18	8	7	14
15	6	6	8	8	7	9	7	8	6	8	11	12	19	30	49	18	8	8	28	8	9	11	8	29	13
16	41	31	6	27	23	22	17	16	56	33	14	50	49	44	43	14	14	11	11	11	12	14	12	12	24
17	13	12	11	10	7	7	7	9	10	9	16	16	17	16	13	12	9	6	6	35	27	14	10	13	13
18	48	17	5	7	9	10	8	8	7	17	17	16	13	13	12	12	11	13	14	12	10	10	9	12	13
19	12	9	9	8	9	13	15	17	15	14	16	14	18	21	16	11	8	13	13	12	12	13	14	10	13
20	12	12	10	11	8	9	7	10	10	10	13	13	15	14	15	14	13	12	10	11	10	11	7	9	11
21	11	21	10	38	17	9	21	27	22	10	13	26	55	45	50	17	26	10	11	8	14	34	25	7	22
22	9	13	8	9	9	8	7	49	9	22	9	11	18	14	11	10	10	14	28	10	11	9	8	6	13
23	34	26	12	29	31	51	11	11	10	18	19	46	30	18	22	13	7	6	6	20	19	31	35	10	21
24	8	7	12	11	10	11	14	22	17	29	40	50	19	15	15	18	8	13	57	17	50	34	19	11	21
25	12	21	11	40	22	31	43	19	31	23	47	19	21	14	11	12	11	8	12	28	35	49	55	32	25
26	13	14	12	11	5	4	6	8	8	12	21	16	18	18	12	10	10	12	10	12	10	11	9	9	11
27	17	10	19	18	14	19	20	19	22	29	23	15	12	12	13	10	9	11	11	11	14	11	13	12	15
28	13	9	7	6	6	4	6	5	6	7	8	6	9	9	11	10	20	19	22	35	16	9	9	8	11
29	12	10	14	8	15	18	11	19	19	26	11	14	24	19	20	14	11	12	10	12	9	10	10	9	14
30	8	9	9	8	9	8	10	9	9	9	8	10	11	18	21	19	11	12	11	14	12	16	11	32	12
31	52	60	19	41	28	20	26	18	33	10	10	11	12	14	18	17	30	18	28	31	14	12	7	8	22
HRAVE	16	15	13	18	13	14	13	13	14	16	21	25	25	22	20	15	12	10	15	18	19	16	14	14	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16	17	23	20	15	16	21	18	11	14	18	13	13	14	13	24	13	13	13	11	22	13	21	21	25
MAX	54	48	58	58	53	52	55	47	16	33	51	38	36	33	49	56	35	48	21	15	55	49	51	57	55
MIN	4	5	7	6	6	6	7	5	7	6	6	6	5	5	6	6	6	5	8	7	7	6	6	7	8

DAY	26	27	28	29	30	31
AVE	11	15	11	14	12	22
MAX	21	29	35	26	32	60
MIN	4	9	4	8	8	7

MONTHLY AVERAGE = 16.3 MONTHLY MAXIMUM = 59.9 MONTHLY MINIMUM = 3.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
DECEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	5.5	4.1	3.2	3.0	2.4	1.8	2.0	2.0	3.5	5.0	7.8	10.5	12.8	13.9	15.3	15.6	15.1	13.4	11.7	11.1	9.3	8.2	7.3	6.2	7.9
2	5.7	5.4	5.3	4.8	4.3	3.6	2.9	2.7	4.1	6.4	9.1	12.1	14.0	15.3	15.1	14.1	12.8	12.1	11.4	10.9	10.4	8.9	8.1	7.1	8.6
3	8.0	6.9	7.2	6.4	6.3	6.8	7.7	9.0	10.5	12.0	13.3	14.6	16.1	17.1	18.1	18.3	18.0	16.7	16.3	15.1	14.6	14.0	13.5	12.9	12.5
4	12.1	12.2	10.6	11.3	10.3	7.4	6.1	6.7	7.9	10.0	12.8	15.3	16.4	17.1	17.8	18.2	18.0	17.4	16.2	13.9	12.7	10.6	9.9	9.4	12.5
5	8.4	7.6	6.8	5.9	5.3	5.1	4.4	4.6	6.0	9.2	11.3	13.4	15.4	17.4	18.6	18.9	18.1	16.7	15.1	14.6	13.4	12.4	11.2	10.0	11.2
6	9.0	8.7	7.1	5.9	5.5	4.9	4.2	4.5	6.3	8.4	9.9	12.3	15.4	17.4	18.5	18.5	17.8	16.5	15.1	13.9	13.2	12.3	11.5	11.7	11.2
7	10.1	9.7	9.2	8.5	7.7	7.0	6.7	6.2	7.3	9.9	12.2	14.8	16.3	17.0	17.0	16.5	15.8	14.9	14.2	13.6	12.9	12.0	11.3	10.5	11.7
8	10.0	9.7	8.8	8.4	7.7	7.6	6.7	6.7	8.2	10.6	13.1	15.3	16.6	18.3	18.6	18.5	18.2	17.8	16.1	15.0	14.9	14.7	13.6	12.3	12.8
9	12.0	12.0	12.0	11.1	10.6	10.3	9.9	9.7	10.4	11.4	13.0	14.5	16.1	17.2	18.1	18.3	18.0	17.2	16.8	16.6	16.3	15.5	14.7	14.2	14.0
10	13.7	11.9	10.6	10.9	8.9	8.0	6.9	7.1	7.7	10.7	14.6	17.3	18.8	19.7	20.4	21.4	20.5	18.5	17.2	16.3	14.6	14.3	13.7	13.1	14.0
11	11.7	11.3	10.8	9.9	9.2	8.1	7.7	8.0	8.5	11.6	13.8	16.2	18.8	20.3	21.6	21.7	21.0	19.5	18.3	16.8	16.4	14.5	14.1	12.7	14.3
12	12.5	11.4	11.0	9.8	8.7	8.3	8.4	7.8	9.5	11.8	14.4	16.5	18.4	20.2	21.6	22.1	21.3	19.4	18.6	17.8	16.1	16.1	14.5	13.4	14.6
13	12.4	12.1	11.5	10.9	10.4	9.9	9.4	8.4	9.9	12.0	14.2	17.1	19.7	20.9	21.3	21.5	20.7	19.8	18.7	18.1	16.4	15.0	13.8	13.0	14.9
14	12.9	11.4	11.1	10.4	9.4	8.7	9.2	8.6	10.2	12.8	15.4	17.7	19.6	21.1	22.6	23.3	22.5	21.9	20.5	18.8	17.0	15.6	14.6	13.6	15.4
15	12.6	12.0	11.3	10.7	10.0	9.1	8.7	8.7	9.9	12.6	16.1	18.7	21.4	23.1	24.5	25.1	23.9	22.4	20.6	18.5	17.3	16.7	16.3	16.0	16.1
16	15.0	15.1	13.6	13.5	12.4	12.6	11.9	12.3	11.7	12.0	12.4	14.7	16.2	17.5	19.6	19.3	19.7	20.5	19.8	19.3	18.7	18.2	18.1	18.0	15.9
17	17.9	15.9	14.6	11.8	9.6	9.6	8.7	8.0	7.5	7.9	8.7	9.5	10.3	11.0	11.3	11.4	10.8	9.6	8.9	7.9	7.4	6.1	5.7	5.0	9.8
18	4.7	2.7	2.1	2.1	1.5	1.0	1.0	1.1	2.4	4.2	8.1	9.6	10.8	12.1	12.7	13.2	13.2	12.9	12.4	12.4	11.9	11.5	11.4	11.0	7.8
19	10.8	10.5	10.0	9.7	9.8	9.8	9.7	9.6	10.3	11.2	12.8	14.1	15.6	16.6	17.5	17.8	17.6	17.0	16.3	16.0	15.6	14.9	14.4	14.1	13.4
20	13.5	13.3	12.7	12.4	12.0	11.7	11.3	11.6	12.2	13.5	14.7	16.3	17.4	18.2	18.5	18.7	18.4	18.0	17.7	16.8	16.6	16.7	16.4	16.3	15.2
21	15.9	15.2	13.1	11.7	11.0	12.0	11.7	10.9	10.9	11.4	12.6	12.8	14.1	14.5	13.8	13.1	13.3	13.9	14.7	14.6	14.5	13.4	13.5	13.2	13.2
22	13.2	13.0	13.1	13.7	13.6	13.7	13.4	13.6	13.7	14.1	14.7	16.9	18.1	16.7	16.8	17.6	15.9	15.4	14.6	14.1	13.4	12.8	12.6	11.9	14.4
23	11.3	10.7	10.2	9.8	9.6	9.1	8.0	8.9	9.1	10.6	13.1	14.6	15.7	16.3	16.9	16.8	16.1	14.5	13.7	13.0	12.5	11.9	10.8	9.9	12.2
24	10.0	9.4	8.5	8.2	8.2	8.1	7.5	7.6	8.8	10.6	13.8	15.9	17.9	18.8	18.9	17.3	6.1	4.6	4.7	4.7	5.0	5.1	5.1	5.4	9.6
25	5.2	5.0	4.8	5.2	4.5	4.1	4.6	5.0	4.5	6.1	7.3	9.3	10.0	10.2	9.6	9.8	9.1	8.4	7.9	6.9	6.2	5.8	5.3	4.8	6.7
26	3.7	3.3	2.4	2.0	1.8	1.8	2.0	1.9	2.8	4.9	8.3	10.0	10.9	11.6	12.5	13.1	12.9	12.5	12.3	12.0	12.1	11.5	10.8	10.5	7.8
27	9.0	9.1	8.9	6.8	7.2	6.0	5.3	6.4	6.8	7.8	11.9	14.4	15.8	16.9	17.6	17.6	17.2	16.5	16.0	15.8	15.3	14.2	12.7	11.8	12.0
28	10.5	9.8	9.2	8.8	8.7	7.7	7.4	7.1	7.5	8.6	10.1	12.3	13.9	15.7	16.5	16.7	16.2	16.0	15.2	14.9	14.5	13.8	13.0	12.9	12.0
29	12.2	11.4	10.6	10.5	11.6	11.6	13.3	12.3	11.6	12.6	15.3	14.7	15.6	16.6	18.4	19.0	18.7	17.8	17.2	16.1	15.1	14.3	13.2	12.6	14.3
30	12.4	12.2	11.9	11.8	11.6	11.2	11.1	11.2	11.4	12.1	13.4	14.8	16.0	17.0	17.6	18.0	17.7	17.3	17.0	16.5	16.4	15.4	14.6	13.3	14.3
31	12.1	11.8	11.1	11.1	11.1	11.7	11.8	12.0	11.6	11.8	11.9	12.3	12.0	12.2	13.2	13.8	13.0	11.4	11.6	11.6	11.4	11.3	11.2	11.2	11.8
HRAVE	10.8	10.2	9.5	8.9	8.4	8.0	7.7	7.8	8.5	10.1	12.3	14.1	15.7	16.7	17.4	17.6	16.7	15.8	15.1	14.3	13.6	12.8	12.2	11.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.9	8.6	12.5	12.5	11.2	11.2	11.7	12.8	14.0	14.0	14.3	14.6	14.9	15.4	16.1	15.9	9.8	7.8	13.4	15.2	13.2	14.4	12.2	9.6	6.7
MAX	15.6	15.3	18.3	18.2	18.9	18.5	17.0	18.6	18.3	21.4	21.7	22.1	21.5	23.3	25.1	20.5	17.9	13.2	17.8	18.7	15.9	18.1	16.9	18.9	10.2
MIN	1.8	2.7	6.3	6.1	4.4	4.2	6.2	6.7	9.7	6.9	7.7	7.8	8.4	8.6	8.7	11.7	5.0	1.0	9.6	11.3	10.9	11.9	8.0	4.6	4.1

DAY	26	27	28	29	30	31
AVE	7.8	12.0	12.0	14.3	14.3	11.8
MAX	13.1	17.6	16.7	19.0	18.0	13.8
MIN	1.8	5.3	7.1	10.5	11.1	11.1

MONTHLY AVERAGE = 12.3 MONTHLY MAXIMUM = 25.1 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
DECEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.7	0.5	0.5	0.5	0.4	0.5	0.3	0.2	-0.6	-0.6	-0.6	-0.6	-0.6	-0.5	-0.6	-0.4	-0.1	0.3	0.6	0.7	0.5	0.5	0.5	0.5	0.1
2	0.3	0.4	0.5	0.5	0.4	0.4	0.6	0.4	-0.3	-0.9	-0.6	-0.6	-0.6	-0.6	-0.4	-0.1	0.1	0.2	0.3	0.4	0.5	0.4	0.5	0.5	0.1
3	0.5	0.5	0.7	1.2	1.2	1.0	0.8	0.6	-0.1	-0.3	-0.4	-0.6	-0.7	-0.5	-0.4	-0.2	-0.1	0.4	0.6	0.6	0.4	0.3	0.3	0.3	0.3
4	0.5	0.4	0.7	0.4	0.6	0.7	0.6	0.3	-0.2	-1.1	-1.4	-1.2	-0.8	-0.6	-0.3	0.0	0.4	0.4	0.5	0.5	0.8	1.0	0.7	0.5	0.1
5	0.4	0.4	0.3	0.4	0.7	0.7	0.6	0.3	-0.7	-1.2	-1.0	-0.7	-0.7	-0.6	-0.4	-0.2	0.1	0.4	0.6	0.5	0.4	0.7	0.6	0.6	0.1
6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.3	-0.1	-0.6	-0.4	-0.6	-0.6	-0.6	-0.5	-0.4	-0.1	0.3	0.7	0.6	0.4	0.4	0.5	0.5	0.1
7	0.6	0.9	0.4	0.4	0.6	0.6	0.5	0.4	-0.4	-0.6	-0.6	-0.5	-0.7	-0.7	-0.4	-0.3	0.0	0.2	0.3	0.5	0.5	0.4	0.5	0.4	0.1
8	0.3	0.3	0.2	0.4	0.5	0.5	0.5	0.5	-0.7	-1.1	-0.9	-0.8	-0.6	-0.6	-0.4	-0.1	0.2	0.4	0.4	0.6	0.5	0.5	0.5	0.4	0.1
9	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	-0.2	-0.5	-0.6	-0.6	-0.4	-0.4	-0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.0
10	0.3	0.4	0.6	0.4	0.7	0.8	1.1	0.3	0.0	-1.0	-1.2	-1.2	-1.2	-0.9	-0.5	-0.3	0.0	0.3	0.5	0.6	0.7	0.3	0.7	0.5	0.1
11	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.3	-0.3	-0.7	-0.5	-0.5	-0.6	-0.6	-0.5	-0.3	-0.1	0.4	0.7	0.6	0.5	0.6	0.6	0.5	0.2
12	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	-0.4	-1.0	-0.9	-0.6	-0.7	-0.6	-0.6	-0.4	-0.1	0.3	0.5	0.5	0.3	0.3	0.5	0.5	0.1
13	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.3	-0.3	-0.9	-0.8	-0.7	-0.8	-0.6	-0.4	-0.2	0.1	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.1
14	0.5	0.6	0.5	0.4	0.5	0.5	0.5	0.3	-0.5	-1.1	-1.2	-1.1	-1.1	-0.8	-0.5	-0.2	0.4	0.6	0.6	0.6	0.5	0.8	0.8	0.8	0.1
15	0.7	0.5	0.5	0.5	0.5	0.6	0.4	0.2	-0.7	-1.1	-1.3	-1.2	-1.0	-0.8	-0.5	-0.3	0.2	0.5	0.6	0.6	0.6	0.6	0.5	0.7	0.0
16	0.4	0.6	0.4	0.4	0.6	0.3	0.3	0.2	0.1	0.0	-0.1	-0.5	-0.3	-0.3	-0.4	-0.1	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2
17	0.2	0.5	0.2	0.0	0.0	0.2	0.2	0.2	0.1	-0.1	-0.3	-0.5	-0.6	-0.6	-0.6	-0.4	-0.1	0.3	0.5	0.7	0.5	0.5	0.5	0.5	0.1
18	0.3	0.5	0.8	0.4	0.7	0.5	0.2	0.2	-0.6	-0.9	-0.4	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1
19	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.1	0.0	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1
20	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	-0.1	-0.2	-0.4	-0.5	-0.4	-0.2	-0.2	-0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.0
21	0.2	0.2	0.3	0.6	0.2	0.3	0.3	0.4	0.3	0.0	-0.1	0.0	-0.2	-0.2	0.0	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.3	0.2	0.2
22	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	-0.4	-0.1	-0.2	-0.2	-0.3	0.1	0.2	0.2	0.1	0.2	0.3	0.4	0.4	0.2
23	0.2	0.4	0.4	0.3	0.3	0.4	0.3	0.2	0.0	-0.5	-0.7	-0.4	-0.5	-0.6	-0.4	-0.4	-0.1	0.2	0.3	0.3	0.3	0.4	0.6	0.4	0.0
24	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.3	-0.1	-0.4	-0.4	-0.4	-0.5	-0.6	-0.4	-0.2	-0.2	-0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.0
25	0.0	0.0	0.1	0.1	0.2	0.1	0.4	0.3	0.1	-0.3	-0.4	-0.6	-0.7	-0.8	-0.4	-0.3	0.0	0.3	0.3	0.6	0.4	0.4	0.3	0.4	0.0
26	0.5	0.5	0.7	0.7	0.4	0.5	0.3	0.2	-0.4	-0.9	-0.5	-0.3	-0.3	-0.2	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.1
27	0.5	0.5	0.5	0.9	0.5	0.8	1.0	0.7	0.3	-0.1	-0.5	-0.3	-0.3	-0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.3
28	0.8	1.1	1.1	0.6	0.8	0.8	0.6	0.5	0.2	0.0	-0.4	-0.8	-0.8	-0.8	-0.6	-0.2	0.2	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.3
29	0.5	0.6	0.7	0.7	0.8	0.7	0.4	0.6	0.8	0.4	0.1	-0.1	0.0	-0.4	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.3
30	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	-0.1	-0.3	-0.5	-0.5	-0.5	-0.3	-0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.0
31	0.3	0.2	0.1	0.2	0.4	0.4	0.3	0.2	0.1	0.1	0.0	-0.1	-0.1	-0.2	-0.3	-0.2	0.0	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1
HRAVE	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.3	-0.1	-0.5	-0.5	-0.6	-0.6	-0.5	-0.3	-0.2	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.0	0.0	0.0
MAX	0.7	0.6	1.2	1.0	0.7	0.7	0.9	0.6	0.4	1.1	0.7	0.6	0.6	0.8	0.7	0.6	0.7	0.8	0.2	0.2	0.6	0.4	0.6	0.5	0.6
MIN	-0.6	-0.9	-0.7	-1.4	-1.2	-0.6	-0.7	-1.1	-0.6	-1.2	-0.7	-1.0	-0.9	-1.2	-1.3	-0.5	-0.6	-0.9	-0.3	-0.5	-0.2	-0.4	-0.7	-0.6	-0.8

DAY	26	27	28	29	30	31
AVE	0.1	0.3	0.3	0.3	0.0	0.1
MAX	0.7	1.0	1.1	0.8	0.2	0.4
MIN	-0.9	-0.5	-0.8	-0.4	-0.5	-0.3

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = -1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
DECEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	701	701	701	701	701	700	701	701	701	702	701	700	699	699	699	698	698	698	698	699	699	699	699	699	700
2	699	698	698	698	698	698	698	699	699	700	700	699	698	698	698	698	698	698	699	699	699	699	698	699	698
3	699	699	699	698	698	698	699	699	700	700	700	700	699	699	698	698	699	699	700	700	700	701	701	701	699
4	701	701	702	702	702	702	702	703	703	703	703	703	702	701	701	701	701	701	701	701	701	701	701	701	702
5	701	701	701	700	700	700	700	701	701	701	701	700	700	699	698	698	698	698	699	699	699	700	700	700	700
6	700	700	700	700	700	700	700	700	700	701	701	700	699	698	698	698	698	698	699	699	699	699	700	700	699
7	700	700	700	700	700	700	701	701	702	702	703	702	701	701	701	701	702	702	702	703	703	703	704	704	702
8	704	704	704	704	704	705	705	706	706	707	707	707	706	705	705	705	705	705	705	706	706	706	707	707	705
9	707	707	707	707	707	707	707	708	708	708	708	707	706	706	705	705	704	704	705	704	705	705	705	705	706
10	705	705	705	705	705	705	705	705	705	706	706	705	704	703	702	702	702	702	703	703	703	703	703	703	704
11	703	703	703	703	703	703	703	703	704	704	704	704	703	702	701	701	701	702	702	702	702	702	703	703	703
12	703	702	702	702	702	702	702	703	703	704	704	703	702	701	701	701	701	701	702	702	702	703	703	703	702
13	703	703	703	703	703	703	703	704	704	705	705	704	704	703	702	702	702	702	703	703	703	704	704	704	703
14	704	704	704	704	704	704	705	705	705	706	706	705	704	703	703	703	703	703	703	703	704	704	704	704	704
15	704	704	704	704	704	704	704	704	704	704	704	703	702	701	701	701	700	700	700	700	700	701	701	701	702
16	701	701	701	701	700	700	700	700	700	700	700	700	699	698	697	696	696	696	696	695	695	695	695	695	698
17	694	694	693	693	693	695	697	699	700	701	702	702	702	702	702	702	702	703	703	704	704	704	704	704	700
18	704	704	704	704	704	704	705	705	706	706	706	705	704	704	703	703	703	704	704	705	705	706	706	706	705
19	707	707	707	707	707	707	707	708	708	709	709	709	708	707	707	707	707	707	707	707	708	708	708	709	707
20	709	709	709	709	709	709	709	709	710	710	709	708	707	707	706	706	705	705	705	705	705	706	706	706	707
21	706	706	706	707	706	706	706	706	706	706	706	706	705	705	704	704	704	703	703	703	704	704	704	704	705
22	703	703	702	702	702	701	701	701	701	701	701	700	699	700	700	700	700	701	701	702	703	703	703	703	701
23	703	703	703	703	703	703	703	704	704	704	704	704	703	702	702	702	702	702	702	702	702	701	701	701	703
24	700	700	699	699	698	698	697	697	697	697	697	696	694	693	692	692	694	696	697	697	697	697	698	698	697
25	698	698	698	699	699	700	701	701	702	703	703	703	703	703	703	703	703	703	704	704	704	705	705	705	702
26	705	705	705	705	705	706	706	707	707	708	708	707	706	706	705	705	705	706	706	706	706	707	707	707	706
27	707	707	707	707	707	707	707	707	708	708	708	707	706	705	705	704	704	704	704	705	705	706	706	706	706
28	706	706	706	706	706	706	706	707	707	707	708	707	707	706	706	705	705	705	706	706	706	707	707	707	706
29	707	706	706	706	706	706	706	707	707	708	708	708	707	706	706	706	706	706	706	707	707	708	708	708	707
30	707	707	706	706	706	706	705	705	705	705	705	704	703	701	701	700	700	700	700	699	699	699	699	699	703
31	699	699	699	699	699	699	699	699	699	700	700	700	700	699	699	699	699	699	699	699	699	699	699	699	699
HRAVE	703	703	703	703	703	703	703	703	704	704	704	703	703	702	702	701	702	702	702	702	702	703	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	698	699	702	700	699	702	705	706	704	703	702	703	704	702	698	700	705	707	707	705	701	703	697	702
MAX	702	700	701	703	701	701	704	707	708	706	704	704	705	706	704	701	704	706	709	710	707	703	704	700	705
MIN	698	698	698	701	698	698	700	704	704	702	701	701	702	703	700	695	693	703	707	705	703	699	701	692	698

DAY	26	27	28	29	30	31
AVE	706	706	706	707	703	699
MAX	708	708	708	708	707	700
MIN	705	704	705	706	699	699

MONTHLY AVERAGE = 702.6 MONTHLY MAXIMUM = 709.6 MONTHLY MINIMUM = 691.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
DECEMBER - 2016

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	50	56	65	63	61	69	61	60	53	46	40	33	28	25	23	21	22	23	26	27	33	39	45	51	43
2	51	53	54	57	60	63	68	70	62	51	40	29	26	20	21	24	27	30	31	32	34	40	44	46	43
3	43	44	43	48	49	50	47	44	38	34	32	30	28	28	27	28	28	31	31	34	32	32	32	31	36
4	31	29	34	28	29	40	49	46	41	38	30	21	19	17	15	15	16	18	22	26	29	33	35	38	29
5	42	45	48	50	54	54	58	55	49	38	33	29	27	24	19	15	16	19	20	22	25	27	30	33	35
6	35	36	41	46	47	50	52	51	42	38	36	32	30	29	28	29	32	37	40	44	47	51	52	53	41
7	58	62	64	67	71	74	77	79	73	58	50	47	43	42	44	47	50	53	56	58	62	65	67	69	60
8	71	72	73	75	78	78	81	82	73	60	51	45	43	36	35	35	37	38	44	49	49	45	47	53	56
9	53	51	51	54	55	55	56	56	53	49	43	40	37	34	33	34	35	36	38	39	39	40	41	42	44
10	44	49	54	53	60	62	66	66	61	51	40	34	31	29	28	27	30	36	39	41	45	47	49	51	45
11	55	59	60	64	66	70	71	69	64	50	43	36	30	29	29	31	32	35	40	44	46	51	52	57	49
12	57	61	63	67	73	74	73	77	68	55	45	40	37	32	30	30	33	38	41	42	47	50	53	57	52
13	61	61	63	63	67	70	69	77	68	54	47	40	34	33	34	34	36	38	41	43	49	54	58	60	52
14	63	66	67	69	74	78	75	76	68	54	46	41	37	34	31	27	31	31	35	41	46	50	53	56	52
15	58	58	57	60	63	67	63	62	56	43	35	31	29	26	22	20	22	25	31	37	39	40	39	36	43
16	41	42	54	67	85	84	91	88	94	96	95	82	74	69	55	50	48	41	40	41	45	47	48	50	64
17	55	72	83	88	78	59	56	51	51	49	47	43	42	42	41	41	39	44	48	52	57	65	69	71	56
18	70	81	83	85	88	89	87	86	79	69	48	40	37	32	29	28	30	32	33	33	35	35	35	34	54
19	33	33	34	34	33	34	36	37	35	34	30	27	25	23	23	23	24	25	27	28	29	29	30	30	30
20	31	32	32	33	34	35	35	35	33	31	29	27	25	25	25	26	25	26	28	28	29	28	28	29	30
21	30	35	59	77	84	80	85	90	88	91	84	85	83	82	93	96	96	91	86	85	84	95	98	98	82
22	99	100	100	99	100	98	98	99	100	100	98	89	84	91	83	74	81	80	84	86	88	92	90	94	92
23	97	98	100	100	100	100	100	99	96	88	77	64	58	55	53	56	62	71	76	80	85	90	92	97	83
24	96	97	99	99	98	96	98	97	92	82	68	60	49	43	36	40	94	97	96	97	95	95	94	91	84
25	90	91	93	89	92	95	96	93	95	87	76	60	52	48	49	47	49	52	55	63	70	71	73	77	73
26	82	84	87	89	89	89	90	92	88	78	58	51	48	47	44	42	43	46	47	47	47	48	49	51	64
27	59	58	60	72	70	76	80	74	71	69	53	43	39	37	36	36	37	39	41	42	42	44	51	56	53
28	63	67	71	74	76	80	81	82	82	77	72	60	55	49	47	48	52	52	55	55	54	56	59	60	64
29	62	66	70	73	65	65	53	58	64	58	43	49	48	48	38	35	35	36	35	43	48	53	57	59	53
30	61	61	63	64	64	66	66	65	64	61	57	52	49	46	45	46	47	50	51	51	54	58	66	75	58
31	94	97	99	100	100	96	91	86	92	91	93	88	90	89	81	76	82	98	98	98	100	100	100	100	93
HRAVE	59	62	65	68	70	71	71	71	67	61	53	47	43	41	39	38	42	44	46	49	51	54	56	58	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	43	43	36	29	35	41	60	56	44	45	49	52	52	52	43	64	56	54	30	30	82	92	83	84	73
MAX	69	70	50	49	58	53	79	82	56	66	71	77	77	78	67	96	88	89	37	35	98	100	100	99	96
MIN	21	20	27	15	15	28	42	35	33	27	29	30	33	27	20	40	39	28	23	25	30	74	53	36	47

DAY	26	27	28	29	30	31
AVE	64	53	64	53	58	93
MAX	92	80	82	73	75	100
MIN	42	36	47	35	45	76

MONTHLY AVERAGE = 55.2 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 15.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
DECEMBER - 2016

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.17	0.29	0.43	0.54	0.60	0.32	0.44	0.24	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.17
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.14	0.30	0.42	0.62	0.62	0.54	0.21	0.09	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.37	0.51	0.59	0.61	0.56	0.46	0.30	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.71
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.37	0.52	0.61	0.63	0.58	0.47	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.36	0.49	0.59	0.61	0.54	0.42	0.25	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.28	0.39	0.52	0.58	0.54	0.42	0.27	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.22
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.34	0.46	0.57	0.54	0.47	0.30	0.22	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.13
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.35	0.49	0.57	0.60	0.55	0.45	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.35	0.49	0.58	0.60	0.56	0.40	0.23	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.34	0.49	0.57	0.59	0.56	0.44	0.28	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.32	0.46	0.54	0.57	0.53	0.44	0.28	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.43
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.31	0.45	0.55	0.58	0.54	0.46	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.42
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.28	0.40	0.55	0.57	0.51	0.31	0.19	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.05
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.30	0.43	0.48	0.49	0.49	0.41	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.34	0.48	0.56	0.61	0.58	0.46	0.25	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.52
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.17	0.39	0.28	0.34	0.35	0.11	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.81
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.23	0.40	0.57	0.59	0.55	0.44	0.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.49	0.58	0.61	0.57	0.47	0.24	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.59
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.31	0.48	0.57	0.60	0.56	0.46	0.31	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.60
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.25	0.46	0.52	0.47	0.37	0.29	0.20	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.82
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.11	0.19	0.15	0.10	0.07	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.04	0.16	0.54	0.18	0.35	0.20	0.32	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.35	0.48	0.57	0.60	0.56	0.46	0.30	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.49
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.33	0.47	0.56	0.64	0.56	0.47	0.22	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.43
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.32	0.29	0.60	0.52	0.57	0.38	0.26	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.09
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.32	0.44	0.58	0.60	0.56	0.47	0.32	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.57
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.33	0.48	0.58	0.61	0.56	0.44	0.29	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.56
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.16	0.27	0.38	0.39	0.41	0.28	0.14	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.12	0.12	0.16	0.22	0.35	0.23	0.12	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.47
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.14	0.30	0.48	0.52	0.51	0.40	0.18	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.10	0.13	0.11	0.25	0.24	0.14	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.27	0.39	0.51	0.51	0.49	0.38	0.23	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.17	3.00	3.71	3.81	3.57	3.22	3.13	3.60	3.50	3.54	3.43	3.42	3.05	3.18	3.52	1.81	3.24	3.59	3.60	2.82	0.76	1.87	3.49	3.43	3.09
MAX	0.60	0.62	0.61	0.63	0.61	0.58	0.57	0.60	0.60	0.59	0.57	0.58	0.57	0.49	0.61	0.39	0.59	0.61	0.60	0.52	0.19	0.54	0.60	0.64	0.60
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	3.57	3.56	2.17	1.47	2.67	1.10
MAX	0.60	0.61	0.41	0.35	0.52	0.25
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
DECEMBER - 2016

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.05	0.02	0.01	0.00	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
17	0.00	0.05	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.03	0.01	0.00	0.00	0.03	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.06	0.05	0.26
22	0.10	0.06	0.05	0.05	0.02	0.01	0.00	0.24	0.00	0.04	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.05	0.09	0.02	0.00	0.00	0.00	0.00	0.21
25	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
31	0.03	0.05	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.11	0.01	0.02	0.01	0.00	0.00	0.00	0.38
HRAVE	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.10	0.00	0.00	0.00	0.26	0.65	0.00	0.21	0.03
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.05	0.00	0.00	0.00	0.06	0.24	0.00	0.09	0.02
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.03	0.38
MAX	0.00	0.00	0.00	0.00	0.03	0.11
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.83 MONTHLY MAXIMUM = 0.24 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

JANUARY THROUGH MARCH 2018

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

June 2018

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period January through March 2018. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the calibration data and data screening results. Appendix B presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

On January 4, 2018, an "as-found" calibration was performed on the ST-10 wind sensor, the sensor was replaced with a new sensor, and an "as-left" calibration of the new sensor was performed. On January 9, 2018, an "as-left" bearing check was performed on the new sensor. All calibration results were within QC tolerances. There were no other significant operational events during the reporting period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

Calibrations of the wind sensors were performed on January 4 and 9, 2018, and the calibration results are presented in Appendix A.

A quality assurance performance audit was not performed during the reporting period.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses.

Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were 0.0, -3.5, and -4.4 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, and no data edits were required.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these quarterly data capture goals.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Jan-18	99.1	99.1	99.1	99.1	99.1	99.1	99.1
Feb-18	100	100	100	100	100	100	100
Mar-18	100	100	100	100	99.5	99.5	100
Apr-18							
May-18							
Jun-18							
Jul-18							
Aug-18							
Sep-18							
Oct-18							
Nov-18							
Dec-18							
Quarter 1	99.7	99.7	99.7	99.7	99.5	99.5	99.7
Quarter 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Quarter 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Quarter 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	99.7	99.7	99.7	99.7	99.5	99.5	99.7

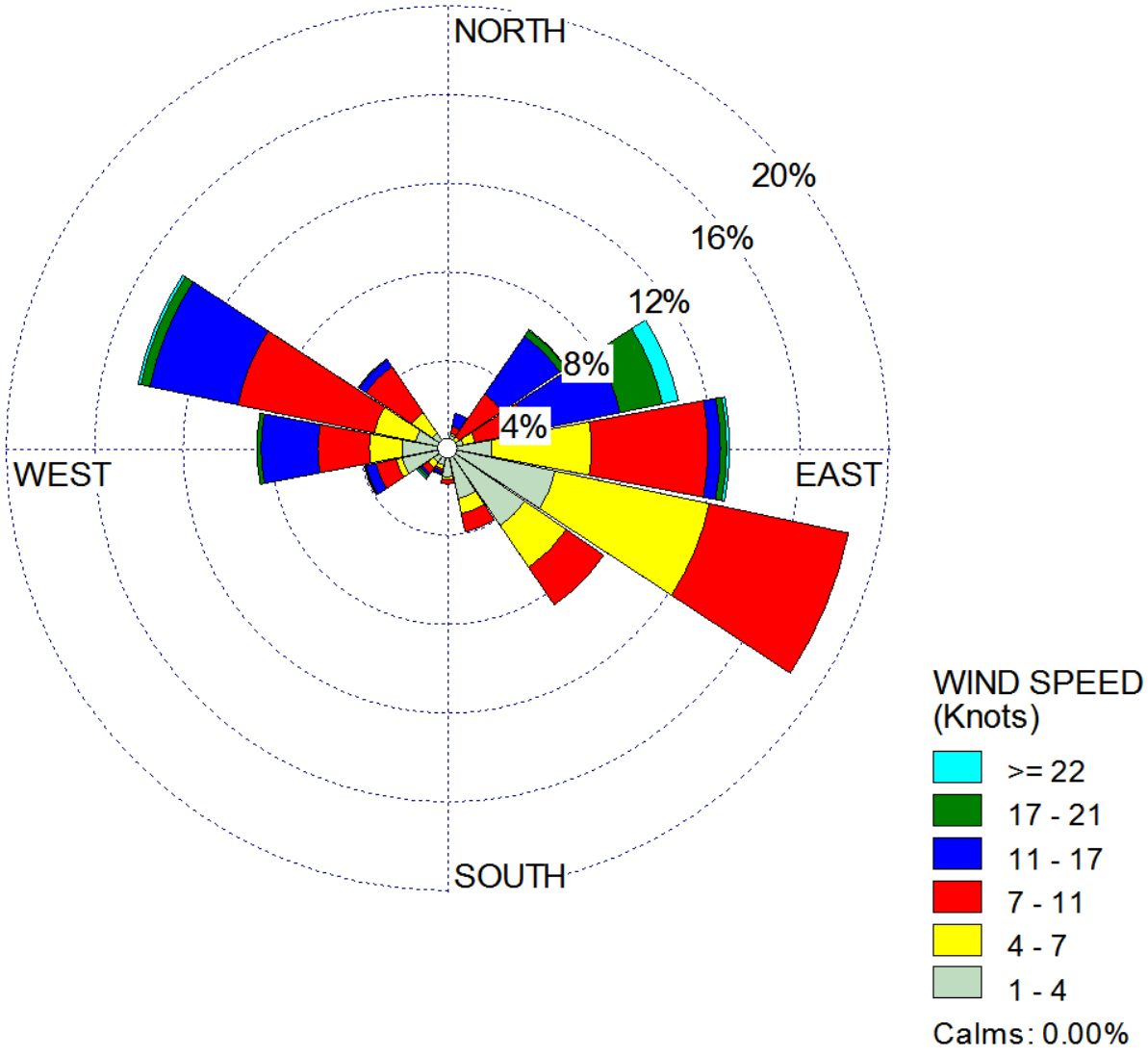
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix B presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly valid 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east-southeast (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours with higher wind speeds). This is similar to wind patterns previously observed at the monitoring site.

Figure 1 – 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Jan-March 2018 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	18010523	WIND SPD TOO CONSTANT 3 HR	0.2	Steady WD also - WS is valid
4	WS	18011715	WIND SPD TOO CONSTANT 3 HR	0.16	Steady WD also - WS is valid
4	WS	18012619	WIND SPD TOO CONSTANT 3 HR	0.13	Steady WD also - WS is valid
4	WS	18021503	WIND SPD TOO CONSTANT 3 HR	0.18	Period of light winds - WS is valid
4	WS	18022607	WIND SPD TOO CONSTANT 3 HR	0.18	Steady WD also - WS is valid
4	WS	18030304	WIND SPD TOO CONSTANT 3 HR	0.16	Steady WD also - WS is valid
4	WS	18030405	WIND SPD TOO CONSTANT 3 HR	0.18	Steady WD also - WS is valid
4	WS	18030802	WIND SPD TOO CONSTANT 3 HR	0.2	Steady WD also - WS is valid
4	WS	18030822	WIND SPD TOO CONSTANT 3 HR	0.07	Steady WD also - WS is valid
4	WS	18031808	WIND SPD TOO CONSTANT 3 HR	0.16	Steady WD also - WS is valid
4	WS	18031903	WIND SPD TOO CONSTANT 3 HR	0.2	Steady WD also - WS is valid
4	WS	18032615	WIND SPD TOO CONSTANT 3 HR	0.11	Steady WD also - WS is valid
4	WS	18033101	WIND SPD TOO CONSTANT 3 HR	0.13	Steady WD also - WS is valid
7	WD	18010512	WIND DIR TOO CONSTANT 3 HR	0.9	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	18011418	WIND DIR TOO CONSTANT 3 HR	0.73	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	18012704	WIND DIR TOO CONSTANT 3 HR	0.9	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	18020907	WIND DIR TOO CONSTANT 3 HR	0.2	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	18021005	WIND DIR TOO CONSTANT 3 HR	0.9	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	18021923	WIND DIR TOO CONSTANT 3 HR	0.9	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	18022705	WIND DIR TOO CONSTANT 3 HR	0.7	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	18031508	WIND DIR TOO CONSTANT 3 HR	0.4	WS is moderate to high, Sigma Theta varies - WD is valid
7	WD	18031814	WIND DIR TOO CONSTANT 3 HR	0.3	WS is moderate to high, Sigma Theta varies - WD is valid
11	TP	18012710	HIGH RATE OF C CHANGE	6.2	Wind shift, morning transition - data is valid
11	TP	18012710	HIGH RATE OF C CHANGE	5.99	Wind shift, morning transition - data is valid
11	TP	18020809	HIGH RATE OF C CHANGE	5.72	Wind shift, morning transition - data is valid
11	TP	18021917	HIGH RATE OF C CHANGE	7.07	Wind shift, morning transition - data is valid
11	TP	18021917	HIGH RATE OF C CHANGE	6.85	Wind shift, morning transition - data is valid

AZMET and ST10 Reported Precipitation Totals
(inches/month)

Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Jan-18	0.13	0.08	0.10	0.36
Feb-18	0.16	1.59	0.87	1.55
Mar-18	0.00	0.02	0.01	0.11
Apr-18				
May-18				
Jun-18				
Jul-18				
Aug-18				
Sep-18				
Oct-18				
Nov-18				
Dec-18				
Totals	0.29	1.69	0.99	2.02

Asarco Hayden
Anemometer
Semi-Annua/AnnualMaintenance Tasks

Monitor Information

Verification Date	1/4/18	Verification Time	1110
Site ID	ST-10	Site Name	Meteorological Station
Operator	SK/KF	Cornerstone Present	Yes (No)

Verification Standard

Barometric Pressure Standard Used	Model: Streamline Pro	Serial No: CU06012	Calibration Date: 6/30/2016
Flow Reference Standard Used	Model: Streamline Pro	Serial No: CU06012	Calibration Date: 7/1/2016
Temperature Standard Used	Model: Streamline Pro	Serial No: CU06012	Calibration Date: 6/30/2016
Relative Humidity Sensor	Model: Psychrometer	Serial No: CP96792	Calibration Date: 6/27/2013
Wind Sensor Standard Used			
Wind Direction Standard Used			

Wind Sensor

6 Month Maintenance Task

Wind Speed Sensor Data

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %	Pass/Fail ±.5mph or 5%	Operator's Initials
0	0	0	0	0	Pass	SK
400	4.6	4.6	0	0	Pass	SK
900	10.3	10.3	0	0	Pass	SK
1500	17.2	17.2	0	0	Pass	SK
3000	34.4	34.4	0	0	Pass	SK
6000	68.7	68.7	0	0	Pass	SK

Wind Direction Sensor Data

~~Fixture Index~~ ~~Target Direction~~ (degrees)	Target	Logger Direction (degrees)	Difference (degrees)	Pass/Fail ± 3° Linearity	Operator's Initials
5	1	2.98	1.98	Pass	SK
45	41	42.1	1.1	Pass	SK
90	86	87.6	1.6	Pass	SK
135	131	132.8	1.8	Pass	SK
180	176	177.2	1.2	Pass	SK
225	221	221.6	0.6	Pass	SK
270	266	265.9	0.1	Pass	SK
315	311	310.3	0.7	Pass	SK
360	356	357.1	1.1	Pass	SK

12 Month Maintenance Task	Yes	(No)	Date	24 Month Maintenance Task	Date
Replace wind speed sensor bearings				Factory overhaul of wind speed sensor	

Notes: ~~As~~ As found
verification for anemometer that is currently at station. ~~Being~~ Being taken down today (1/4/18)

Orientation: facing North 349°

Operator's Signature SK/KF Date/Time 1/4/18 1110

Operator's Signature _____ Date/Time _____

Reviewer's Signature _____ Date/Time _____

Asarco Hayden
Anemometer
Semi-Annua/AnnualMaintenance Tasks

Monitor Information

Verification Date	1/4/18	Verification Time	1200
Site ID	ST-10	Site Name	Meteorological Station
Operator	~~1200~~ SK/KF	Cornerstone Present	Yes (No)

Verification Standard

Barometric Pressure Standard Used	Model: Streamline Pro	Serial No: CU06012	Calibration Date: 6/30/2016
Flow Reference Standard Used	Model: Streamline Pro	Serial No: CU06012	Calibration Date: 7/1/2016
Temperature Standard Used	Model: Streamline Pro	Serial No: CU06012	Calibration Date: 6/30/2016
Relative Humidity Sensor	Model: Psychrometer	Serial No: CP96792	Calibration Date: 6/27/2013
Wind Sensor Standard Used			
Wind Direction Standard Used			

Wind Sensor

6 Month Maintenance Task

Wind Speed Sensor Data

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %	Pass/Fail ±.5mph or 5%	Operator's Initials
0	0	0	0	0	~~Pass~~	SK
400	4.6	4.6	0	0	Pass	SK
900	10.3	10.3	0	0	Pass	SK
1500	17.2	17.2	0	0	Pass	SK
3000	34.4	34.4	0	0	Pass	SK
6000	68.7	68.7	0	0	Pass	SK

Wind Direction Sensor Data

~~Target Direction~~ Fixture Index (degrees)	Target Dir	Logger Direction (degrees) SK	Logger Direction (degrees) KF	Difference (degrees)		Pass/Fail ± 3° Linearity	Operator's Initials
5	1	3.1	1.5	2.1	0.5	Pass	SK
45	41	42.8	42.0	1.8	1.0	Pass	SK
90	86	88.8	86.9	~~2.8 1.2~~	0.9	~~1.2~~ Pass	SK
135	131	131.6	130.7	~~0.6 3.4~~	0.3	Pass	SK
180	176	175.3	175.1	0.7	0.9	Pass	SK
225	221	221.1	220.7	0.1	0.3	Pass	SK
270	266	266.7	265.8	0.7	0.2	Pass	SK
315	311	312.0	311.1	1.0	0.1	Pass	SK
360	356	357.2	357.2	0.8	1.2	Pass	SK

12 Month Maintenance Task	Yes	No	Date	24 Month Maintenance Task	Date
Replace wind speed sensor bearings				Factory overhaul of wind speed sensor	

Notes: J1 jumper snipped.

For anemometer installed on 1/4/18
S/N: WM158704
Red: P1 Ground: 16/17 SL/91H
Black: 41/H5 = White: X3
Green 17.91H

target	logger
5°	1°
45°	41°
90°	86°
135°	131
180°	176
225°	221
270°	266
315°	311
360°	356°

Operator's Signature _____ Date/Time 1/4/18 1200

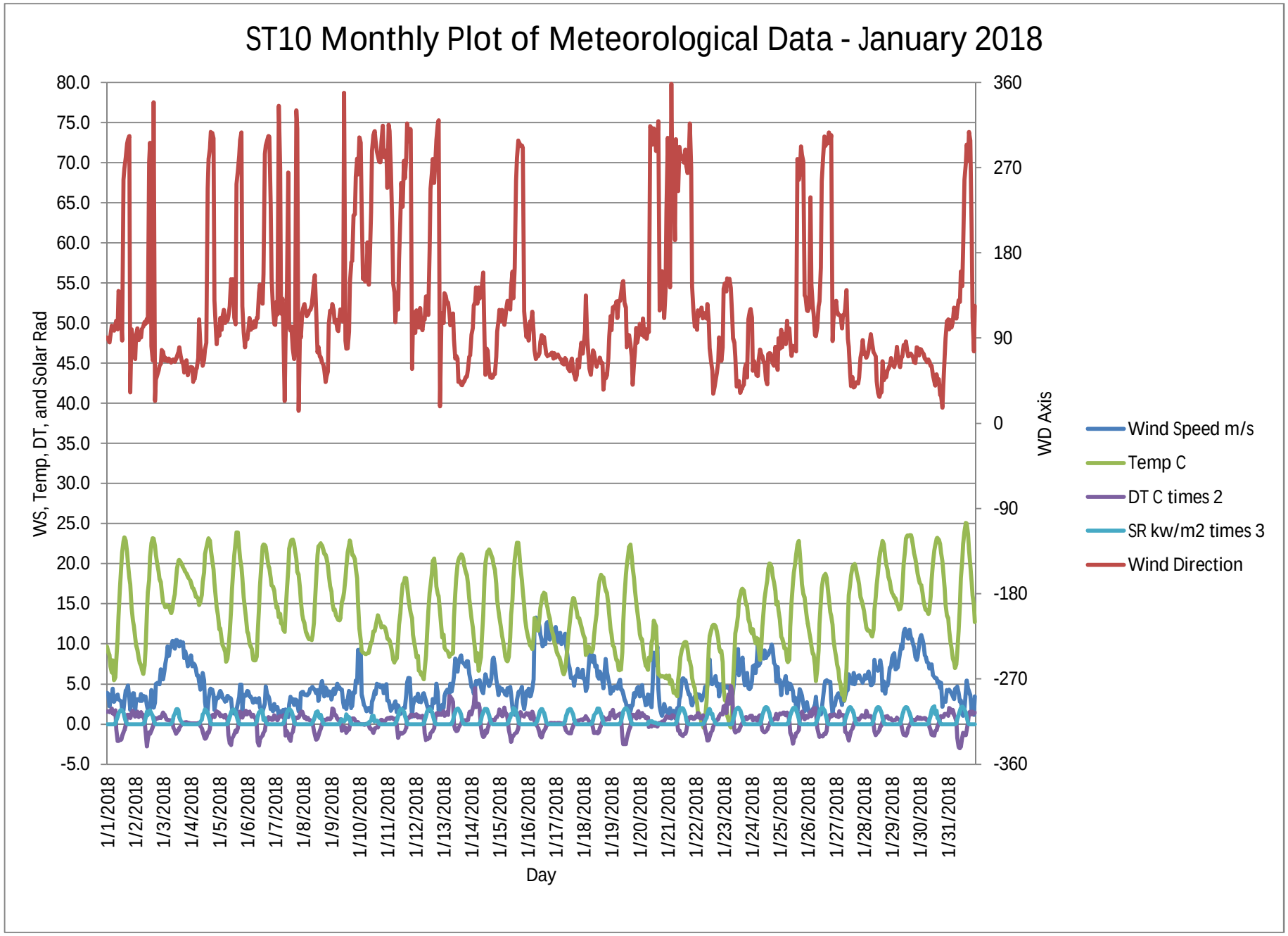
Operator's Signature _____ Date/Time _____

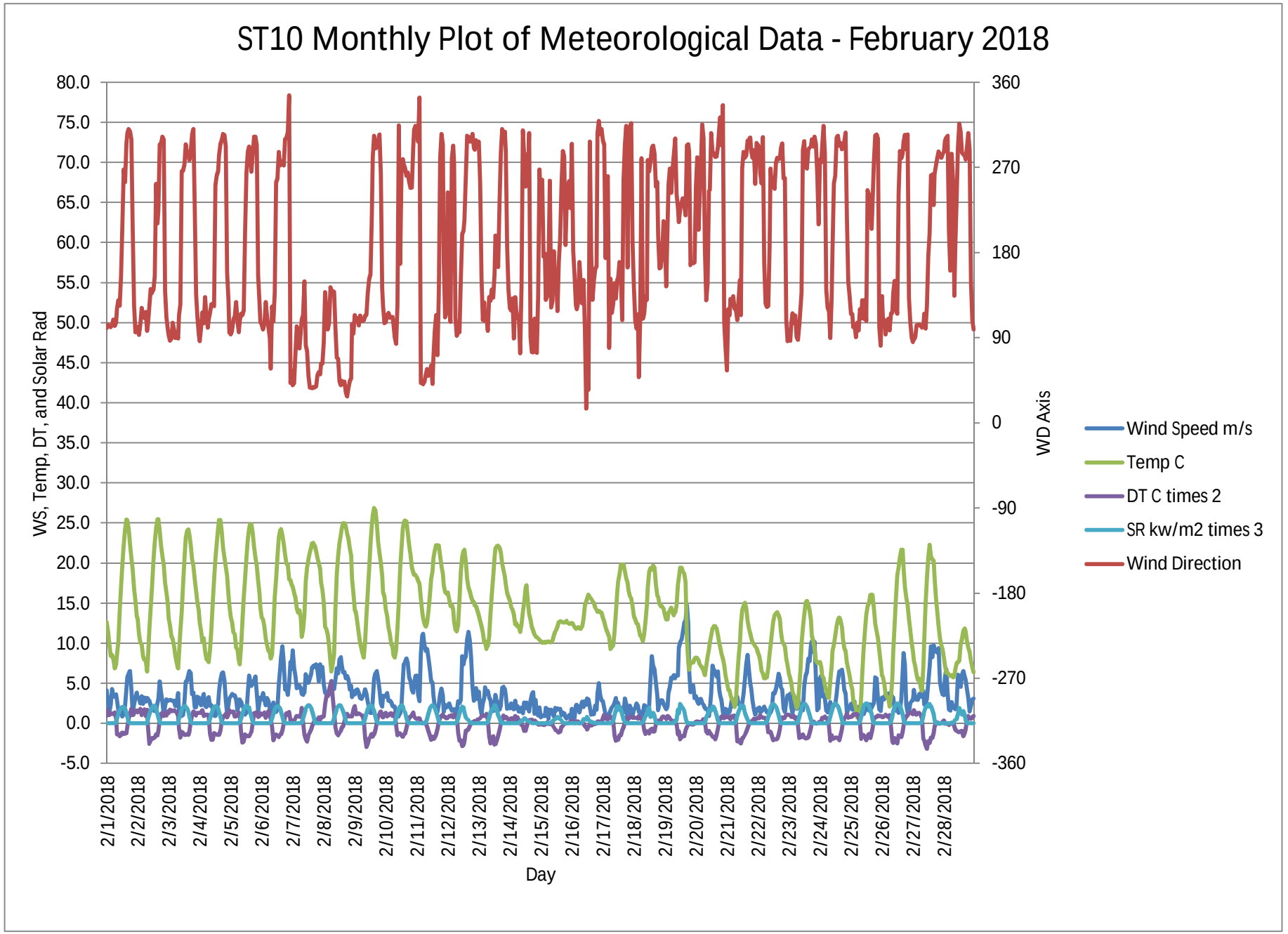
Reviewer's Signature _____ Date/Time _____

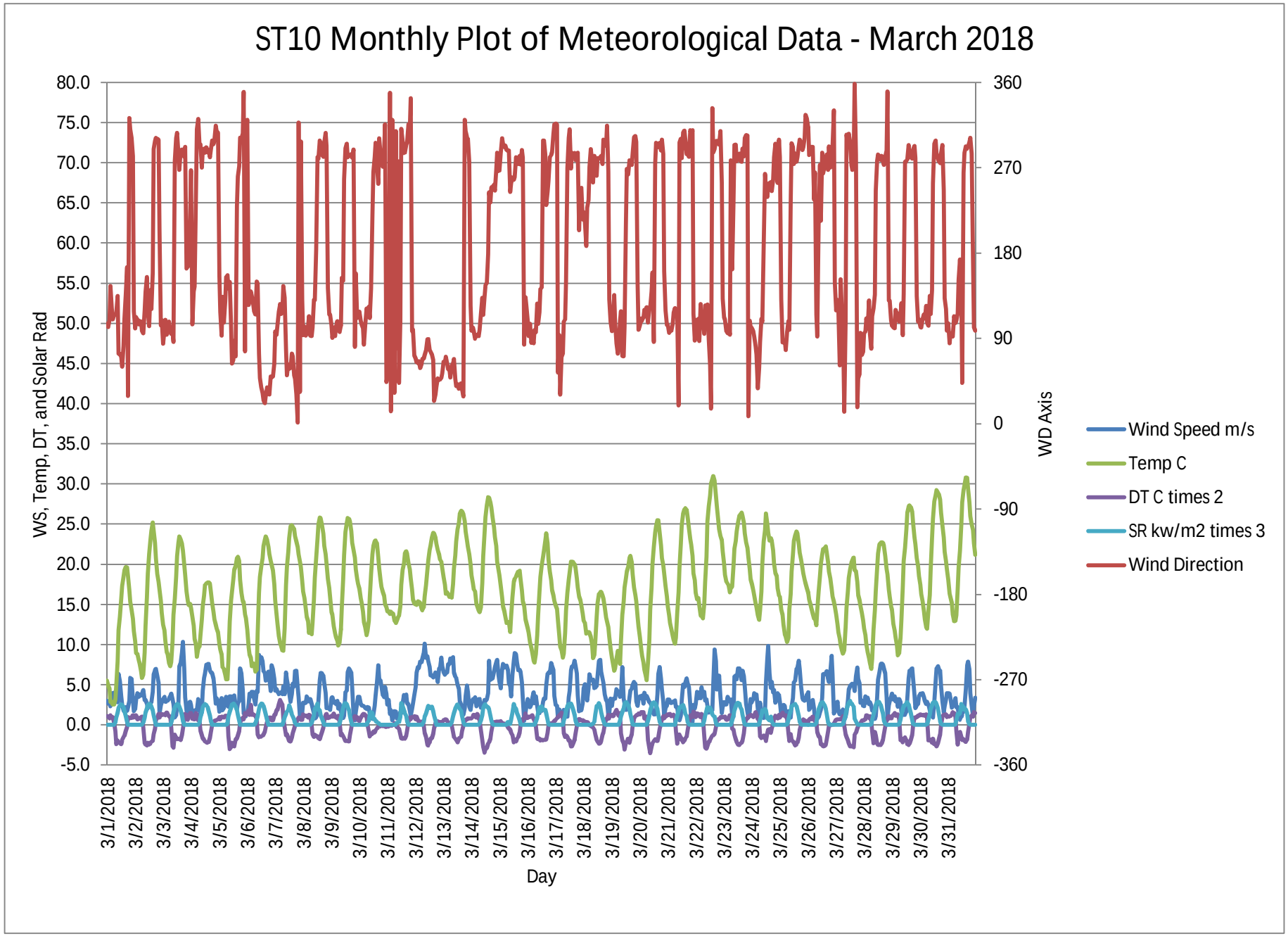
Per J. Podraz, the ~~logger~~ target directions should be seen on the logger as the following values. 5° ~~on~~ on the target (calibration device) should read 1° on the data logger.

APPENDIX B

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - January 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
1/1/2018
1/2/2018
1/3/2018
1/4/2018
1/5/2018
1/6/2018
1/7/2018
1/8/2018
1/9/2018
1/10/2018
1/11/2018
1/12/2018
1/13/2018
1/14/2018
1/15/2018
1/16/2018
1/17/2018
1/18/2018
1/19/2018
1/20/2018
1/21/2018
1/22/2018
1/23/2018
1/24/2018
1/25/2018
1/26/2018
1/27/2018
1/28/2018
1/29/2018
1/30/2018
1/31/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - February 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
2/1/2018
2/2/2018
2/3/2018
2/4/2018
2/5/2018
2/6/2018
2/7/2018
2/8/2018
2/9/2018
2/10/2018
2/11/2018
2/12/2018
2/13/2018
2/14/2018
2/15/2018
2/16/2018
2/17/2018
2/18/2018
2/19/2018
2/20/2018
2/21/2018
2/22/2018
2/23/2018
2/24/2018
2/25/2018
2/26/2018
2/27/2018
2/28/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - March 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
3/1/2018
3/2/2018
3/3/2018
3/4/2018
3/5/2018
3/6/2018
3/7/2018
3/8/2018
3/9/2018
3/10/2018
3/11/2018
3/12/2018
3/13/2018
3/14/2018
3/15/2018
3/16/2018
3/17/2018
3/18/2018
3/19/2018
3/20/2018
3/21/2018
3/22/2018
3/23/2018
3/24/2018
3/25/2018
3/26/2018
3/27/2018
3/28/2018
3/29/2018
3/30/2018
3/31/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
JANUARY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.9	3.8	2.2	2.8	3.4	4.4	2.8	3.2	3.3	3.7	3.1	2.9	2.8	1.8	1.7	2.8	4.2	4.4	4.8	3.2	1.8	2.8	3.8	3.9	3.2
2	1.5	3.0	3.1	3.0	2.9	3.7	2.9	3.5	3.4	3.4	2.3	1.9	1.3	1.9	4.2	2.7	2.0	2.7	5.0	5.1	5.1	5.0	6.8	5.8	3.4
3	5.6	6.7	7.6	8.5	9.7	8.5	9.6	9.6	10.4	10.2	9.4	10.5	10.5	10.2	9.7	10.3	10.0	10.2	8.2	9.1	8.4	7.2	7.8	7.7	9.0
4	8.6	7.2	7.5	7.4	6.8	6.1	6.0	5.2	4.3	5.1	***	***	***	***	1.7	3.2	4.2	4.4	4.3	3.6	1.8	2.8	3.3	3.2	4.8
5	3.9	4.1	3.7	3.3	3.2	2.8	2.8	3.5	3.4	3.3	3.1	2.0	1.4	1.3	1.2	1.7	2.6	3.4	4.9	4.9	1.8	3.6	3.5	3.6	3.0
6	4.2	4.1	3.4	3.4	3.2	2.7	3.1	3.2	2.7	2.8	3.2	2.2	1.6	1.6	2.0	2.5	4.7	3.8	3.5	3.0	1.9	2.2	1.6	2.5	2.9
7	1.8	2.0	2.1	1.0	1.0	1.6	1.0	1.8	1.0	1.8	1.0	0.9	2.5	3.4	2.8	3.1	2.4	3.1	3.0	2.5	1.6	1.6	3.9	4.0	2.1
8	4.0	3.7	3.6	3.6	3.7	3.8	4.4	4.5	4.6	4.3	4.3	3.8	4.2	2.9	3.8	4.7	5.3	4.3	3.5	4.6	4.4	3.6	4.1	4.0	4.1
9	3.1	3.7	4.4	3.7	4.3	5.1	4.4	4.6	4.3	4.3	2.7	2.1	2.8	***	***	***	3.8	2.0	2.2	4.0	3.9	5.4	5.2	9.3	4.1
10	7.6	9.4	3.7	3.0	2.4	2.1	1.6	2.0	2.0	1.7	1.4	2.8	3.3	4.1	3.8	5.0	4.8	4.9	4.6	4.8	4.8	3.8	4.0	5.0	3.9
11	3.0	2.9	2.4	1.7	2.0	2.3	2.6	2.8	1.5	2.3	2.0	1.3	1.5	1.7	2.1	2.0	3.6	5.2	5.8	5.7	3.3	0.9	2.4	3.0	2.7
12	3.3	3.0	3.8	2.8	3.1	2.7	3.5	3.8	3.4	2.8	2.3	1.9	2.1	1.6	1.9	3.1	2.6	3.1	5.1	3.9	1.7	2.2	1.8	2.4	2.8
13	2.1	3.5	4.0	4.3	4.0	3.9	5.1	4.1	5.0	5.9	8.2	7.2	6.5	7.6	8.2	8.6	7.7	7.6	7.5	7.2	7.8	7.8	6.3	5.7	6.1
14	4.6	4.3	3.8	4.5	5.4	5.1	5.4	5.5	4.6	4.2	3.8	5.4	6.2	5.5	5.4	4.7	5.1	5.6	8.0	8.3	7.3	5.6	4.9	3.7	5.3
15	4.7	4.2	4.4	4.2	4.1	3.7	3.6	4.5	4.1	4.6	3.7	2.1	1.4	1.2	2.0	3.0	3.8	4.1	4.1	4.7	2.8	1.9	2.6	4.1	3.5
16	3.6	4.4	3.5	3.6	4.3	5.6	12.1	13.3	12.1	13.1	12.1	11.2	10.4	9.7	10.2	9.9	12.4	12.7	10.9	10.5	11.1	11.3	11.8	11.0	9.6
17	12.1	11.3	10.3	11.3	11.4	10.0	10.2	10.7	11.2	9.9	8.6	7.6	6.9	5.8	5.8	5.7	4.8	6.0	6.1	6.9	5.9	6.2	5.8	6.8	8.2
18	5.8	5.3	4.1	4.7	7.0	8.4	9.3	8.6	7.7	8.5	7.2	7.2	5.9	5.7	6.6	6.2	5.3	4.5	6.8	8.1	6.5	5.6	5.1	3.8	6.4
19	4.6	4.2	4.7	4.5	4.7	4.4	5.1	5.5	4.3	4.2	3.8	3.0	2.7	2.0	2.1	2.3	1.5	2.3	2.4	3.8	3.4	3.9	4.5	4.7	3.7
20	3.5	3.9	4.8	3.6	3.3	2.3	2.4	3.7	3.6	2.7	2.1	4.5	8.9	7.3	8.4	9.6	4.4	2.2	1.6	1.0	1.7	2.5	1.8	1.7	3.8
21	1.2	1.1	2.0	0.7	1.2	1.6	1.5	1.2	2.0	1.3	3.2	3.6	5.3	5.7	5.6	5.5	5.0	4.2	3.7	3.7	2.7	2.3	2.9	3.5	2.9
22	3.4	3.8	3.3	3.7	3.5	3.0	3.5	3.6	4.7	4.0	4.9	5.3	8.0	5.1	5.0	5.4	5.5	6.0	4.8	5.0	3.4	4.6	5.0	5.1	4.6
23	4.5	4.7	4.6	4.7	4.5	4.7	3.8	3.4	4.1	5.8	8.4	8.9	9.4	6.1	7.4	6.8	8.3	5.8	4.9	5.3	6.3	4.5	4.3	4.5	5.6
24	5.4	7.2	7.3	6.4	7.4	9.9	7.3	7.6	9.3	8.6	8.1	9.2	8.2	8.8	8.6	9.1	9.2	9.9	9.3	7.6	7.3	5.3	7.1	5.3	7.9
25	5.5	3.6	4.7	5.1	5.2	6.0	3.8	5.2	4.4	5.0	4.6	4.1	2.9	3.3	2.0	1.5	3.0	4.3	3.9	3.5	2.5	1.6	2.0	2.7	3.8
26	2.0	1.5	1.1	1.4	1.9	2.0	2.4	3.4	1.5	1.7	1.7	1.2	1.9	3.4	4.9	5.3	5.5	5.3	5.3	5.3	3.0	1.2	2.2	2.3	2.8
27	3.2	3.5	3.8	3.3	3.2	2.4	3.7	2.9	3.5	4.1	4.3	6.2	5.3	5.7	5.0	6.4	4.9	5.6	5.9	5.8	6.1	5.6	5.4	5.1	4.6
28	5.5	6.1	5.7	6.2	6.5	5.6	4.9	4.9	5.3	8.0	7.0	7.1	6.6	6.9	7.9	6.9	4.2	5.3	3.8	4.7	4.8	5.3	7.0	7.2	6.0
29	8.2	8.7	8.8	6.8	7.0	7.1	8.2	9.0	9.9	9.4	11.4	11.9	11.1	11.0	10.6	11.8	10.8	10.6	9.9	9.6	8.4	8.0	8.4	9.8	9.4
30	10.6	11.1	10.5	9.9	8.5	8.4	7.7	7.6	6.9	7.2	7.5	6.1	5.9	5.8	5.7	5.2	5.3	4.5	5.2	2.2	3.2	3.0	2.8	4.2	6.5
31	4.1	4.3	4.1	3.9	3.5	3.1	4.4	4.5	4.7	3.9	2.8	2.9	1.5	1.1	1.9	4.0	5.4	4.4	4.1	3.6	1.8	2.8	1.1	3.4	3.4
HRAVE	4.7	4.8	4.6	4.4	4.6	4.6	4.8	5.1	4.9	5.1	4.9	4.9	5.0	4.8	4.9	5.3	5.2	5.2	5.2	5.2	4.4	4.2	4.5	4.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.2	3.4	9.0	4.8	3.0	2.9	2.1	4.1	4.1	3.9	2.7	2.8	6.1	5.3	3.5	9.6	8.2	6.4	3.7	3.8	2.9	4.6	5.6	7.9	3.8
MAX	4.8	6.8	10.5	8.6	4.9	4.7	4.0	5.3	9.3	9.4	5.8	5.1	8.6	8.3	4.7	13.3	12.1	9.3	5.5	9.6	5.7	8.0	9.4	9.9	6.0
MIN	1.7	1.3	5.6	1.7	1.2	1.6	0.9	2.9	2.0	1.4	0.9	1.6	2.1	3.7	1.2	3.5	4.8	3.8	1.5	1.0	0.7	3.0	3.4	5.3	1.5

DAY	26	27	28	29	30	31
AVE	2.8	4.6	6.0	9.4	6.5	3.4
MAX	5.5	6.4	8.0	11.9	11.1	5.4
MIN	1.1	2.4	3.8	6.8	2.2	1.1

MONTHLY AVERAGE = 4.8 MONTHLY MAXIMUM = 13.3 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JANUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	91	88	86	93	103	99	98	104	108	99	140	137	109	87	257	269	280	295	299	303	33	99	89	79	64
2	68	93	100	88	93	91	100	102	107	105	110	107	276	296	81	66	339	24	47	51	56	61	62	77	145
3	75	66	69	66	66	68	66	64	66	67	65	68	71	75	80	71	65	65	54	59	66	51	56	57	328
4	59	59	44	47	57	59	69	110	81	68	***	***	***	***	248	279	290	308	307	301	130	101	84	102	256
5	93	111	99	113	120	106	112	108	113	124	152	151	152	112	104	253	266	283	299	307	123	96	80	93	122
6	89	97	111	99	105	101	108	102	111	111	138	146	134	127	158	285	293	298	304	302	231	153	122	105	302
7	104	128	115	335	269	116	132	102	24	89	139	265	103	98	102	79	68	83	330	311	13	96	91	117	311
8	122	126	118	113	115	119	120	125	133	149	156	119	75	81	71	70	65	62	56	43	49	55	105	119	155
9	118	126	119	106	109	99	98	113	120	112	108	349	87	***	***	***	149	169	171	220	221	261	279	263	140
10	302	296	228	153	156	150	159	191	146	171	223	288	304	309	298	287	283	276	276	298	314	282	281	288	211
11	249	315	309	267	210	147	138	107	136	120	172	217	254	229	277	258	281	317	298	311	310	57	108	118	306
12	95	119	102	101	122	107	98	111	110	134	131	114	183	248	264	279	254	279	299	315	320	18	103	116	289
13	106	138	134	127	127	116	103	107	116	89	68	71	68	43	45	41	40	43	45	49	50	57	70	71	223
14	94	101	124	128	144	126	144	132	139	145	159	88	51	79	77	54	49	48	48	52	52	70	97	108	203
15	120	108	120	112	104	110	124	129	129	120	144	160	132	164	256	280	299	297	293	293	291	118	106	91	66
16	103	87	107	104	118	96	77	68	71	71	74	86	93	85	91	81	73	71	71	72	73	75	68	74	64
17	69	71	73	70	68	67	63	62	69	67	61	58	55	65	68	55	52	46	51	67	59	73	85	74	93
18	82	96	135	91	71	58	51	61	77	75	66	60	65	65	69	64	64	36	52	47	51	69	92	113	263
19	98	123	123	122	129	111	129	129	136	147	150	127	122	80	83	93	84	70	41	63	75	101	85	93	14
20	105	99	93	111	91	99	89	100	97	314	310	294	311	310	287	301	319	119	145	161	138	111	140	224	99
21	301	172	143	358	259	261	194	300	252	246	292	285	280	279	275	289	272	264	286	317	270	144	119	102	220
22	108	99	119	114	117	122	111	111	117	111	126	108	79	66	55	31	38	45	53	65	91	81	66	80	56
23	142	148	139	153	147	153	143	113	90	85	70	39	40	45	32	36	38	41	57	62	48	110	118	121	280
24	111	55	65	59	51	50	68	78	72	71	64	64	47	41	73	74	74	68	63	61	81	73	57	90	48
25	79	99	80	95	87	84	108	90	100	85	71	82	79	77	76	279	257	263	292	284	277	135	134	120	245
26	119	122	239	147	124	115	93	92	101	124	129	164	256	281	303	293	297	296	307	296	304	87	110	122	52
27	129	118	114	114	113	100	114	114	121	141	90	81	53	39	49	38	39	43	43	42	48	69	77	88	205
28	73	75	69	73	77	87	94	84	75	74	71	44	33	28	32	33	65	46	54	48	56	58	61	69	185
29	63	61	59	66	81	71	62	59	70	71	82	79	86	76	71	72	74	72	69	65	64	80	79	72	308
30	78	78	75	74	68	68	65	67	65	61	61	51	44	40	52	47	46	30	30	17	40	70	90	108	342
31	110	99	109	101	107	122	118	111	119	130	128	160	145	184	257	274	295	277	308	299	202	112	76	124	138

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JANUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	7	6	11	10	9	7	10	7	7	8	10	16	22	21	48	13	6	5	6	24	21	8	9	9	12
2	19	7	9	7	11	7	8	7	8	7	15	21	41	51	13	49	50	23	12	14	13	13	12	10	18
3	9	9	8	8	7	9	7	8	8	10	11	9	10	13	12	9	9	9	14	11	11	14	14	12	10
4	13	11	10	10	11	12	12	17	11	8	***	***	***	***	41	19	13	8	6	15	33	8	7	10	14
5	7	8	9	7	7	7	7	8	8	11	11	19	36	48	46	40	11	6	4	19	27	7	9	6	15
6	6	7	9	8	9	7	10	9	9	10	17	20	30	36	24	15	8	6	5	9	23	6	17	8	13
7	11	9	13	34	52	18	22	11	35	12	30	34	47	18	40	25	22	8	22	16	50	18	9	11	24
8	7	8	7	8	7	8	10	7	8	9	8	13	11	15	8	7	11	13	23	14	12	22	16	7	11
9	7	7	7	6	8	10	12	11	11	11	31	56	46	***	***	***	10	14	31	21	14	15	16	14	17
10	9	8	18	24	12	10	14	13	15	10	26	13	16	12	13	11	13	7	6	10	10	11	10	6	12
11	26	14	24	38	24	10	11	11	17	13	25	27	29	42	23	23	11	8	9	6	7	51	9	8	19
12	7	9	7	15	8	8	6	8	9	12	16	22	24	25	18	18	15	10	4	28	26	12	22	11	14
13	18	9	12	8	8	15	20	18	13	17	9	13	14	12	12	13	12	11	10	9	9	11	5	6	12
14	12	12	16	13	6	7	6	5	5	8	11	18	20	14	12	20	12	8	7	9	11	11	10	9	11
15	8	7	6	8	5	6	7	5	6	7	11	21	38	58	25	17	12	6	5	5	27	14	7	5	13
16	10	7	8	8	10	15	8	7	9	8	9	13	14	12	12	12	9	9	9	9	8	9	8	9	10
17	7	8	9	8	9	11	12	12	8	11	17	18	20	22	20	22	18	13	14	12	14	11	13	8	13
18	9	8	16	20	9	11	9	11	10	8	14	13	14	14	8	9	9	12	15	9	9	10	9	14	11
19	11	12	6	5	6	6	4	5	4	7	11	16	24	17	16	18	29	43	36	11	12	13	8	7	14
20	13	8	8	11	8	18	14	10	34	10	28	28	9	10	10	10	26	29	17	22	25	47	16	34	18
21	47	40	25	52	47	39	22	43	32	33	21	25	16	15	17	17	15	10	6	11	16	13	8	9	24
22	8	10	13	7	8	8	6	7	6	10	9	17	11	16	21	17	14	11	11	11	12	9	10	12	11
23	7	6	4	6	13	6	15	17	13	11	12	12	12	22	14	18	14	15	12	10	11	19	15	12	12
24	13	12	10	14	12	6	15	14	9	12	15	12	15	15	11	11	9	8	12	13	9	10	13	19	12
25	10	20	16	14	14	12	20	13	15	15	12	12	20	18	34	39	24	9	5	6	52	16	12	11	18
26	14	49	50	19	12	11	9	7	15	16	20	33	32	27	19	18	12	10	7	4	14	31	10	9	19
27	6	7	6	7	8	10	7	7	7	11	22	16	21	19	20	14	15	11	11	10	10	8	6	8	11
28	8	8	9	7	7	8	11	14	11	9	13	17	15	15	14	17	19	11	9	12	13	12	9	7	11
29	9	9	8	11	8	10	9	9	8	10	11	13	14	12	11	9	10	9	8	9	11	8	7	7	10
30	9	7	7	7	7	6	11	9	10	12	16	19	18	16	14	15	9	12	9	27	15	17	16	10	12
31	8	7	7	8	9	6	6	9	6	9	18	14	44	46	29	13	12	7	5	10	25	7	28	6	14
HRAVE	11	11	12	13	12	10	11	11	12	11	16	19	23	23	20	18	15	12	11	13	18	15	12	10	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	12	18	10	14	15	13	24	11	17	12	19	14	12	11	13	10	13	11	14	18	24	11	12	12	18
MAX	48	51	14	41	48	36	52	23	56	26	51	28	20	20	58	15	22	20	43	47	52	21	22	19	52
MIN	5	7	7	6	4	5	8	7	6	6	6	4	5	5	5	7	7	8	4	8	6	6	4	6	5

DAY	26	27	28	29	30	31
AVE	19	11	11	10	12	14
MAX	50	22	19	14	27	46
MIN	4	6	7	7	6	5

MONTHLY AVERAGE = 14.0 MONTHLY MAXIMUM = 58.1 MONTHLY MINIMUM = 3.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JANUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	9.7	9.0	8.6	7.2	6.4	8.0	5.4	5.9	7.9	10.7	13.5	16.8	19.7	21.4	22.8	23.3	22.8	21.4	20.0	18.2	17.4	14.5	12.9	12.3	14.0
2	10.8	9.8	9.3	8.2	7.6	7.3	6.8	6.2	7.3	9.3	13.8	16.4	17.9	20.8	22.5	23.2	23.1	22.2	21.1	20.0	19.0	18.1	17.7	16.5	14.8
3	15.1	14.9	14.6	14.9	14.6	14.7	14.2	13.8	14.5	15.4	16.2	18.2	19.4	20.2	20.5	20.2	19.9	19.5	19.3	19.0	18.8	18.4	18.1	17.9	17.2
4	17.6	17.0	16.9	16.5	15.9	15.9	15.6	14.8	15.3	16.1	***	***	***	***	22.7	23.2	22.9	21.7	20.5	19.3	17.6	15.7	14.6	13.5	17.7
5	11.9	11.9	10.6	9.8	9.5	9.0	7.8	8.1	9.2	11.4	14.3	16.8	19.3	21.0	22.6	23.9	23.9	21.9	20.6	19.6	18.2	15.8	14.3	13.3	15.2
6	11.6	11.3	10.1	9.7	9.4	8.1	8.0	7.9	8.4	11.2	14.4	17.1	19.6	22.1	22.4	22.3	22.1	20.9	19.7	19.4	18.2	17.3	17.1	16.6	15.2
7	15.5	14.5	14.6	13.4	13.7	12.6	12.4	11.8	11.5	14.0	16.8	19.3	21.8	22.6	22.9	23.0	22.4	21.6	20.6	19.0	18.6	17.0	15.3	13.7	17.0
8	13.0	12.6	11.6	11.2	10.8	10.6	10.6	10.5	11.0	12.6	14.9	18.0	21.1	22.1	22.4	22.5	22.2	21.7	21.2	21.1	20.7	19.7	18.6	17.2	16.6
9	16.5	15.1	14.2	14.3	13.5	13.2	13.0	13.0	13.3	15.2	15.8	16.5	18.2	***	***	***	22.9	22.0	21.1	21.0	20.5	19.4	18.2	15.1	16.8
10	11.9	10.5	9.1	8.9	8.8	8.7	8.7	8.8	9.0	9.4	10.2	10.4	11.5	11.6	12.1	13.0	13.6	13.0	12.6	12.0	12.2	12.1	12.0	11.4	10.9
11	10.7	10.6	10.4	9.7	8.9	8.0	7.7	7.9	8.2	10.4	12.4	13.8	15.6	17.4	17.7	18.2	18.2	17.2	15.6	14.4	13.9	13.1	11.1	10.1	12.6
12	9.5	8.4	8.5	6.7	6.5	6.2	6.0	5.6	6.8	8.6	10.9	14.0	16.4	17.3	18.8	20.4	20.6	19.1	17.2	16.2	15.9	14.0	12.1	10.8	12.4
13	11.2	9.6	9.2	9.1	8.9	8.4	8.7	8.7	8.9	13.2	16.3	18.1	19.9	20.4	20.9	21.1	21.1	20.5	19.8	19.0	18.5	17.6	15.6	14.7	15.0
14	13.2	12.0	10.8	9.2	7.8	8.8	6.7	7.4	8.3	10.6	13.6	18.3	20.1	21.2	21.5	21.8	21.4	21.0	20.6	19.9	19.2	17.5	15.4	14.1	15.0
15	13.3	12.2	11.0	10.4	9.4	8.5	8.0	7.9	8.5	10.8	13.6	15.5	18.2	20.5	21.8	22.6	22.6	21.5	19.4	18.0	16.5	14.8	13.1	11.9	14.6
16	11.1	10.6	9.8	9.8	9.4	10.8	13.2	12.2	11.8	11.7	13.2	14.5	15.5	16.1	16.4	16.2	15.2	14.5	13.8	13.1	12.4	11.6	11.0	10.2	12.7
17	9.6	9.1	8.6	8.4	7.9	7.2	6.6	6.2	6.7	7.8	9.5	10.9	12.5	14.0	15.0	15.7	15.6	14.8	14.0	13.3	13.2	12.8	12.1	11.4	11.0
18	11.0	10.6	8.6	8.9	9.7	9.3	9.1	9.0	9.4	10.9	12.5	13.8	15.6	17.5	18.1	18.6	18.3	18.3	17.2	16.7	16.3	14.8	13.6	11.8	13.3
19	11.2	9.8	9.6	8.7	7.9	7.9	6.8	6.7	6.8	8.9	12.5	16.2	18.6	19.9	21.1	22.1	22.4	20.9	19.5	18.2	16.8	15.1	14.2	12.9	13.9
20	11.2	10.7	10.6	9.3	8.2	7.3	7.2	6.8	8.3	7.9	10.1	10.6	12.9	12.6	12.2	8.1	6.2	6.1	5.9	6.0	5.9	5.9	5.7	6.0	8.4
21	5.7	6.0	5.0	5.5	5.1	3.9	4.1	3.7	3.5	5.5	6.9	8.4	9.2	9.7	10.1	10.3	10.2	9.3	8.1	7.8	7.1	5.8	5.0	4.5	6.7
22	3.4	2.7	1.4	1.3	1.0	0.0	-0.2	-0.5	0.8	2.7	5.0	9.4	10.9	11.6	12.2	12.4	12.4	12.2	11.6	10.6	9.5	9.0	9.1	7.7	6.5
23	4.4	3.0	2.9	1.1	0.5	-0.1	-0.4	1.4	5.3	8.7	11.3	12.2	13.5	15.3	16.1	16.6	16.9	16.7	15.9	14.9	14.8	13.1	12.6	11.7	9.5
24	11.3	11.8	10.8	10.1	10.8	10.6	9.2	8.0	10.0	12.1	14.2	15.7	16.9	17.9	19.3	20.0	19.9	19.4	18.5	17.7	16.6	14.9	15.2	14.1	14.4
25	13.0	10.9	10.7	10.1	9.4	9.4	8.0	7.7	8.0	12.1	15.3	17.5	18.9	20.0	21.1	22.3	22.8	21.6	19.3	17.5	16.3	15.8	14.6	13.2	14.8
26	12.5	11.6	10.6	9.7	8.8	8.7	7.2	5.3	6.8	9.2	12.5	15.3	17.0	18.1	18.6	18.7	18.2	17.1	15.5	14.0	13.4	12.4	10.6	9.3	12.5
27	8.4	7.4	6.8	5.6	4.9	3.7	4.1	3.0	4.2	6.9	13.1	16.1	17.4	18.5	19.5	19.8	20.0	19.4	18.7	18.0	17.4	15.9	15.3	14.8	12.5
28	14.1	13.2	12.0	11.7	11.7	11.6	11.2	10.9	11.8	14.2	15.9	17.4	19.0	20.7	21.5	22.1	22.8	22.4	20.8	20.0	19.2	18.4	17.8	16.8	16.6
29	16.4	16.1	15.8	15.6	15.0	14.9	14.3	14.4	15.0	16.8	20.0	21.6	23.1	23.5	23.4	23.6	23.6	23.2	22.1	21.3	20.6	19.5	18.7	18.0	19.0
30	17.5	17.3	16.3	15.4	14.6	14.2	14.2	13.8	14.2	15.9	18.0	20.1	21.6	22.3	23.0	23.2	23.0	22.4	21.4	20.3	19.0	17.0	14.9	13.6	18.0
31	13.1	11.7	10.2	9.6	8.2	7.7	7.0	7.5	9.0	11.6	15.0	18.2	20.3	22.4	24.0	25.1	25.0	23.7	21.8	19.8	17.7	16.0	14.9	12.7	15.5
HRAVE	11.8	11.0	10.3	9.7	9.2	8.9	8.4	8.2	9.0	11.0	13.4	15.6	17.4	18.6	19.4	19.8	19.7	18.9	17.9	16.9	16.2	14.9	13.9	12.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	14.0	14.8	17.2	17.7	15.2	15.2	17.0	16.6	16.8	10.9	12.6	12.4	15.0	15.0	14.6	12.7	11.0	13.3	13.9	8.4	6.7	6.5	9.5	14.4	14.8
MAX	23.3	23.2	20.5	23.2	23.9	22.4	23.0	22.5	22.9	13.6	18.2	20.6	21.1	21.8	22.6	16.4	15.7	18.6	22.4	12.9	10.3	12.4	16.9	20.0	22.8
MIN	5.4	6.2	13.8	13.5	7.8	7.9	11.5	10.5	13.0	8.7	7.7	5.6	8.4	6.7	7.9	9.4	6.2	8.6	6.7	5.7	3.5	-0.5	-0.4	8.0	7.7

DAY	26	27	28	29	30	31
AVE	12.5	12.5	16.6	19.0	18.0	15.5
MAX	18.7	20.0	22.8	23.6	23.2	25.1
MIN	5.3	3.0	10.9	14.3	13.6	7.0

MONTHLY AVERAGE = 13.8 MONTHLY MAXIMUM = 25.1 MONTHLY MINIMUM = -0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JANUARY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.8	0.8	0.7	0.8	1.0	0.7	0.6	0.9	-0.3	-1.0	-1.0	-1.0	-1.0	-0.7	-0.5	-0.4	-0.1	0.6	0.6	0.6	0.4	0.7	0.8	0.7	0.2
2	0.5	0.6	0.8	0.4	0.6	0.8	0.5	0.6	0.2	-0.4	-1.4	-0.9	-0.5	-0.6	-0.4	-0.2	0.0	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.1
3	0.7	0.6	0.5	0.3	0.3	0.2	0.2	0.2	0.1	-0.2	-0.4	-0.6	-0.5	-0.4	-0.2	-0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	-0.1	-0.3	***	***	***	***	-0.5	-0.5	-0.3	0.3	0.6	0.6	0.4	0.7	0.8	0.8	0.1
5	0.6	0.5	0.6	0.5	0.4	0.6	0.4	0.3	-0.7	-1.2	-1.3	-0.9	-0.8	-0.7	-0.4	-0.5	-0.2	0.4	0.8	0.5	0.4	0.7	0.6	0.8	0.1
6	0.6	0.7	0.8	0.6	0.5	0.6	0.4	0.4	0.0	-1.1	-1.4	-1.0	-0.8	-0.7	-0.6	-0.4	0.0	0.2	0.4	0.3	0.4	0.3	0.3	0.6	0.0
7	0.4	0.4	0.2	0.4	0.5	0.5	0.5	0.6	0.3	-0.7	-0.4	-0.6	-0.9	-1.1	-0.7	-0.5	-0.1	0.4	0.4	0.4	0.4	0.6	0.8	0.8	0.1
8	0.6	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.1	-0.4	-0.6	-1.0	-0.9	-0.7	-0.4	-0.3	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.0
9	0.4	1.0	0.9	0.6	0.6	0.3	0.2	0.2	0.3	-0.4	-0.3	-0.2	-0.2	***	***	***	-0.1	0.3	0.4	0.4	0.3	0.1	0.1	0.1	0.2
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.3	-0.5	-0.3	-0.2	-0.2	-0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.0
11	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.4	-0.1	-0.9	-0.7	-0.6	-0.6	-0.6	-0.5	-0.4	-0.3	0.3	0.4	0.4	0.6	0.6	0.6	0.5	0.1
12	0.6	0.6	0.4	0.5	0.4	0.5	0.5	0.3	-0.6	-1.0	-1.0	-0.9	-0.9	-0.6	-0.5	-0.5	-0.3	0.5	0.7	0.7	0.6	0.7	0.6	0.6	0.1
13	0.8	0.5	0.6	0.7	0.6	1.8	1.7	1.6	1.4	0.0	-0.3	-0.4	-0.4	-0.2	-0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.8	0.5
14	0.6	1.0	1.2	2.2	1.1	1.3	1.3	1.0	-0.2	-0.5	-0.8	-0.7	-0.4	-0.6	-0.3	0.0	0.2	0.3	0.3	0.2	0.2	0.4	0.5	0.6	0.4
15	0.9	0.6	0.5	0.6	1.0	0.7	0.6	0.4	-0.4	-0.8	-1.1	-0.8	-0.7	-0.6	-0.5	-0.5	-0.2	0.3	0.7	0.6	0.5	0.5	0.6	0.7	0.1
16	0.6	0.7	0.5	0.3	0.8	0.5	0.2	0.0	-0.1	-0.2	-0.5	-0.7	-0.8	-0.6	-0.4	-0.3	-0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0
17	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	-0.2	-0.4	-0.5	-0.6	-0.6	-0.6	-0.3	-0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.3	0.2	-0.1
18	0.3	0.3	0.5	0.4	0.2	0.1	0.1	0.1	-0.3	-0.6	-0.6	-0.5	-0.6	-0.5	-0.2	-0.1	0.2	0.4	0.3	0.3	0.3	0.4	0.3	0.7	0.1
19	0.6	0.9	0.4	0.4	0.5	0.5	0.6	0.7	0.5	-0.8	-1.2	-1.2	-1.2	-0.9	-0.6	-0.4	-0.2	0.6	0.6	0.6	0.5	0.4	0.6	0.8	0.1
20	0.4	0.5	0.7	0.5	0.6	0.4	0.4	0.4	-0.2	0.0	-0.2	0.1	0.0	-0.1	-0.1	-0.2	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.5	0.2
21	0.4	0.4	0.4	0.4	0.6	0.5	0.4	0.4	0.1	-0.4	-0.4	-0.6	-0.6	-0.7	-0.6	-0.6	-0.4	0.1	0.4	0.4	0.4	0.4	0.3	0.3	0.1
22	0.5	0.4	0.7	0.4	0.3	0.4	0.6	0.4	-0.4	-0.6	-1.0	-1.0	-0.8	-0.5	-0.4	-0.2	0.0	0.1	0.2	0.3	0.5	0.6	0.6	0.6	0.1
23	1.1	1.2	0.7	1.4	1.8	1.3	2.4	2.0	0.7	-0.3	-0.5	-0.4	-0.4	-0.4	-0.2	0.0	0.1	0.3	0.4	0.4	0.3	0.4	0.4	0.5	0.5
24	0.5	0.2	0.3	0.4	0.2	0.2	0.5	0.5	-0.1	-0.4	-0.5	-0.5	-0.5	-0.3	-0.2	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.3	0.6	0.1
25	0.7	0.6	0.6	0.7	0.7	0.5	0.7	0.6	0.2	-0.5	-0.8	-1.2	-1.0	-0.8	-0.6	-0.5	-0.4	0.2	0.7	0.8	0.5	0.3	0.5	0.5	0.1
26	0.4	0.5	0.8	0.5	0.8	1.0	1.0	0.8	-0.2	-0.6	-0.8	-0.7	-0.8	-0.8	-0.6	-0.6	-0.4	0.1	0.4	0.6	0.5	0.5	0.6	0.6	0.1
27	0.5	0.5	0.4	0.8	0.5	0.6	0.5	0.6	-0.5	-0.6	-0.8	-1.0	-0.6	-0.4	-0.3	-0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.1
28	0.4	0.4	0.8	0.5	0.5	0.5	0.5	0.4	0.0	-0.4	-0.7	-0.5	-0.5	-0.4	-0.2	-0.1	0.1	0.3	0.5	0.5	0.5	0.3	0.3	0.3	0.2
29	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.2	-0.1	-0.4	-0.6	-0.7	-0.7	-0.5	-0.2	-0.1	0.1	0.3	0.3	0.2	0.2	0.3	0.4	0.3	0.0
30	0.4	0.3	0.3	0.4	0.4	0.3	0.2	0.2	-0.2	-0.4	-0.7	-0.7	-0.7	-0.4	-0.4	-0.2	0.0	0.4	0.5	0.4	0.4	0.6	0.6	0.6	0.1
31	0.5	1.0	0.9	0.7	0.9	0.6	0.5	0.2	-0.9	-1.4	-1.5	-1.4	-0.8	-0.6	-0.7	-0.7	-0.4	0.2	0.7	0.8	0.6	0.8	0.6	0.7	0.1
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	-0.1	-0.6	-0.7	-0.7	-0.7	-0.6	-0.4	-0.3	-0.1	0.3	0.4	0.4	0.4	0.4	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.2	0.0	0.1	0.1	0.5	0.4	0.1	0.0	-0.1	0.1	0.1	0.2	0.1	0.1	0.5	0.1	0.1
MAX	1.0	0.8	0.7	0.8	0.8	0.8	0.8	0.6	1.0	0.3	0.6	0.7	1.8	2.2	1.0	0.8	0.3	0.7	0.9	0.7	0.6	0.7	2.4	0.6	0.8
MIN	-1.0	-1.4	-0.6	-0.5	-1.3	-1.4	-1.1	-1.0	-0.4	-0.5	-0.9	-1.0	-0.4	-0.8	-1.1	-0.8	-0.6	-0.6	-1.2	-0.2	-0.7	-1.0	-0.5	-0.5	-1.2

DAY	26	27	28	29	30	31
AVE	0.1	0.1	0.2	0.0	0.1	0.1
MAX	1.0	0.8	0.8	0.4	0.6	1.0
MIN	-0.8	-1.0	-0.7	-0.7	-0.7	-1.5

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 2.4 MONTHLY MINIMUM = -1.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JANUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	705	705	705	705	705	705	706	706	706	707	707	706	705	704	704	704	703	703	704	704	705	705	705	705	705
2	705	705	705	705	705	705	705	705	706	706	706	706	705	704	703	703	703	703	703	704	704	704	705	705	705
3	705	705	706	705	705	705	705	706	706	706	706	706	705	704	703	703	703	703	703	704	704	704	704	704	705
4	704	704	704	704	704	704	705	705	705	706	***	***	***	***	703	703	703	703	704	704	704	705	705	706	704
5	706	706	706	706	706	707	707	707	707	708	707	707	706	705	705	704	704	704	705	705	705	706	706	706	706
6	706	706	706	705	705	705	706	706	706	706	706	706	705	704	703	703	703	703	703	703	703	703	703	703	704
7	703	702	702	702	702	702	703	703	704	704	704	704	703	702	702	702	702	702	703	703	703	704	704	704	703
8	704	704	704	704	704	704	704	704	704	704	704	704	703	702	701	701	701	701	701	701	701	702	702	702	703
9	701	701	701	701	700	700	701	701	701	701	701	701	700	***	***	***	696	696	696	696	696	696	697	697	699
10	697	698	698	699	699	699	699	700	700	701	701	701	701	700	700	700	701	701	701	701	702	703	703	703	700
11	703	703	704	704	704	705	705	706	707	707	708	707	707	706	705	705	705	706	706	706	707	707	707	707	706
12	707	706	706	706	706	706	706	707	707	707	707	707	706	705	704	704	704	704	705	705	705	705	706	706	706
13	706	706	706	707	707	707	707	708	708	708	708	708	707	706	705	705	705	705	705	705	706	706	706	706	706
14	706	706	706	706	706	706	707	707	708	708	708	707	706	705	704	704	704	704	704	704	704	705	705	705	706
15	705	705	705	704	704	704	705	705	705	705	705	705	704	703	702	702	702	702	703	703	703	704	704	704	704
16	704	704	704	704	704	705	705	705	706	707	707	707	707	706	705	705	705	705	706	706	706	707	707	707	706
17	707	707	707	707	707	707	708	708	708	709	709	708	707	706	706	705	705	705	706	706	706	707	707	707	707
18	707	706	706	706	706	706	706	706	707	707	707	707	706	705	704	704	703	703	703	703	703	703	704	704	705
19	704	703	703	703	703	703	703	703	704	704	704	703	702	701	700	700	699	699	699	699	699	699	700	699	702
20	699	699	699	699	699	699	699	699	699	699	700	699	698	698	698	699	700	700	700	701	701	701	701	702	699
21	702	702	702	702	703	703	703	704	705	705	706	706	705	705	705	705	705	705	706	706	707	707	707	707	705
22	707	707	707	707	707	707	707	707	707	708	707	707	706	705	705	704	704	704	704	704	704	705	705	705	706
23	704	704	704	704	704	704	704	705	705	706	706	706	705	704	704	704	704	704	705	705	705	706	706	707	705
24	707	707	707	707	707	707	707	707	707	707	708	707	706	705	705	704	704	704	704	704	704	704	704	705	706
25	705	704	704	704	703	703	703	704	704	704	704	703	702	701	700	700	700	700	700	701	701	701	702	702	702
26	702	702	702	702	702	702	703	703	704	704	705	704	704	703	703	703	703	703	704	704	704	705	705	705	703
27	705	705	705	705	705	705	706	706	707	707	707	707	706	705	705	704	704	704	705	705	705	706	706	706	705
28	706	706	707	706	706	707	707	708	708	708	708	708	707	706	705	705	705	705	705	705	706	706	706	707	706
29	707	707	707	707	708	708	708	709	709	709	709	708	707	707	706	705	705	705	705	706	706	706	707	707	707
30	707	706	706	706	706	705	705	706	706	706	706	706	704	703	703	702	702	702	702	702	702	702	703	703	704
31	703	702	702	702	702	703	703	703	703	704	703	703	702	701	700	700	700	700	700	700	701	701	702	702	702
HRAVE	704	704	704	704	704	704	705	705	705	706	706	705	704	704	703	703	703	703	703	703	704	704	704	704	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	705	705	705	704	706	704	703	703	699	700	706	706	706	706	704	706	707	705	702	699	705	706	705	706	702
MAX	707	706	706	706	708	706	704	704	701	703	708	707	708	708	705	707	709	707	704	702	707	708	707	708	705
MIN	703	703	703	703	704	703	702	701	696	697	703	704	705	704	702	704	705	703	699	698	702	704	704	704	700

DAY	26	27	28	29	30	31
AVE	703	705	706	707	704	702
MAX	705	707	708	709	707	704
MIN	702	704	705	705	702	700

MONTHLY AVERAGE = 704.2 MONTHLY MAXIMUM = 709.1 MONTHLY MINIMUM = 695.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JANUARY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	27	28	29	31	33	30	34	33	30	24	22	18	15	13	13	13	14	15	16	18	20	23	24	25	23
2	28	28	29	30	31	32	33	34	32	28	22	18	18	15	12	13	13	15	14	14	15	15	15	15	22
3	17	18	18	19	21	21	23	24	23	21	20	18	16	15	15	16	16	15	14	14	14	14	14	15	18
4	15	15	15	17	21	24	25	22	24	25	***	***	***	***	26	27	25	27	29	31	35	38	39	41	26
5	43	45	46	49	51	52	55	55	50	43	37	31	28	25	20	18	19	20	21	25	28	29	30	32	36
6	34	36	38	39	41	43	44	43	42	34	29	25	22	20	21	21	22	24	26	26	27	28	30	31	31
7	32	33	33	36	35	37	37	40	40	35	30	28	26	26	26	26	28	29	31	33	34	37	39	40	33
8	43	44	47	47	47	48	49	49	47	43	38	31	26	26	26	25	26	29	29	28	29	30	32	36	36
9	39	40	42	41	42	43	43	44	44	39	39	39	37	***	***	***	29	32	36	39	40	47	56	77	42
10	99	99	100	100	100	100	100	100	100	100	98	97	89	87	83	76	72	72	76	80	78	76	77	81	89
11	85	87	87	89	92	96	98	98	96	83	75	65	60	49	44	42	43	46	57	67	72	73	77	80	73
12	79	84	80	89	87	89	88	88	80	67	58	47	39	37	31	31	33	38	45	50	52	56	65	69	62
13	68	70	69	67	65	66	60	60	60	42	32	28	26	25	24	23	23	23	24	25	27	28	32	35	42
14	39	42	45	51	55	51	57	53	50	44	38	27	23	21	21	21	22	23	22	24	25	28	32	36	35
15	37	42	44	46	49	52	53	48	46	39	32	30	26	22	21	20	20	20	25	29	33	36	40	42	35
16	46	46	50	49	50	45	35	37	38	38	34	31	29	28	26	26	28	28	29	30	30	31	32	33	35
17	34	35	35	35	35	37	38	39	37	35	32	30	28	26	25	25	25	26	27	28	28	29	30	31	31
18	33	35	40	39	37	37	36	36	36	32	30	28	26	23	22	22	22	23	24	24	25	28	31	34	30
19	36	40	41	44	45	45	45	45	43	39	32	25	22	20	19	18	19	21	24	25	27	30	31	34	32
20	37	40	39	42	45	47	49	49	44	46	41	41	49	59	56	74	93	94	97	95	97	99	97	87	63
21	87	79	80	78	76	81	76	78	78	65	56	49	45	40	38	36	36	36	40	42	42	46	51	53	58
22	60	64	69	70	69	77	78	78	69	58	49	34	25	23	22	24	24	24	26	28	29	29	30	33	45
23	46	53	54	58	60	62	63	57	42	32	26	24	21	19	16	15	14	15	15	16	16	19	23	25	33
24	26	25	27	27	24	24	25	27	23	19	17	17	15	14	13	12	13	14	14	13	15	17	17	18	19
25	20	22	22	22	23	23	27	26	26	21	17	15	15	14	14	13	12	13	16	17	19	20	21	23	19
26	26	28	28	30	34	36	39	41	38	31	27	23	22	22	20	19	20	21	24	27	30	32	35	36	29
27	38	41	42	45	47	49	47	51	44	36	24	20	19	17	16	15	14	14	15	15	16	18	18	19	28
28	19	19	21	20	21	21	22	22	20	16	15	15	14	12	11	11	11	12	13	13	14	18	20	21	17
29	22	22	21	20	19	19	20	19	18	17	14	14	12	12	12	12	12	13	14	16	17	18	19	21	17
30	22	24	24	25	26	27	27	28	27	24	21	19	17	17	17	17	17	18	18	20	22	24	27	29	22
31	30	32	35	36	39	39	40	38	34	27	24	20	18	16	15	12	12	13	16	18	20	22	25	25	25
HRAVE	41	42	43	45	46	47	47	47	45	39	34	30	28	26	24	24	25	26	28	30	31	33	36	38	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	23	22	18	26	36	31	33	36	42	89	73	62	42	35	35	35	31	30	32	63	58	45	33	19	19
MAX	34	34	24	41	55	44	40	49	77	100	98	89	70	57	53	50	39	40	45	99	87	78	63	27	27
MIN	13	12	14	15	18	20	26	25	29	72	42	31	23	21	20	26	25	22	18	37	36	22	14	12	12

DAY	26	27	28	29	30	31
AVE	29	28	17	17	22	25
MAX	41	51	22	22	29	40
MIN	19	14	11	12	17	12

MONTHLY AVERAGE = 35.7 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 10.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JANUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.31	0.44	0.53	0.58	0.56	0.48	0.30	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.49
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.23	0.51	0.37	0.47	0.56	0.46	0.33	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.17
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.29	0.40	0.59	0.63	0.57	0.29	0.14	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.11
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.18	***	***	***	***	0.48	0.34	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.26
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.31	0.47	0.57	0.61	0.59	0.50	0.36	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.74
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.48	0.52	0.59	0.54	0.17	0.25	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.05
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.29	0.46	0.57	0.63	0.59	0.54	0.34	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.70
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.19	0.29	0.49	0.53	0.38	0.26	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.78
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.19	0.13	0.11	0.18	***	***	***	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.86
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.11	0.14	0.33	0.35	0.11	0.13	0.13	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.46
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.33	0.48	0.59	0.62	0.60	0.51	0.37	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.84
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.34	0.49	0.60	0.64	0.61	0.52	0.38	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.92
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.34	0.50	0.61	0.65	0.62	0.54	0.39	0.17	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.01
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.32	0.48	0.61	0.63	0.62	0.53	0.37	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.89
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.26	0.43	0.41	0.66	0.62	0.53	0.39	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.65
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.25	0.48	0.58	0.63	0.60	0.47	0.27	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.46
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.33	0.49	0.59	0.64	0.62	0.53	0.39	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.96
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.37	0.44	0.50	0.64	0.64	0.55	0.41	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.97
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.34	0.50	0.61	0.66	0.63	0.55	0.41	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.02
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.11	0.12	0.09	0.08	0.06	0.04	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.67
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.52	0.62	0.67	0.64	0.55	0.40	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.15
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.23	0.40	0.59	0.62	0.42	0.42	0.22	0.12	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.19
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.36	0.52	0.63	0.68	0.66	0.58	0.44	0.24	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.32
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.37	0.54	0.65	0.70	0.68	0.59	0.44	0.25	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.45
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.37	0.51	0.64	0.66	0.68	0.58	0.44	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.35
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.35	0.51	0.63	0.69	0.67	0.58	0.43	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.35
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.37	0.53	0.65	0.70	0.68	0.59	0.45	0.25	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.46
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.36	0.54	0.65	0.70	0.68	0.60	0.46	0.26	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.49
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.38	0.55	0.66	0.71	0.69	0.61	0.47	0.27	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.59
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.36	0.58	0.70	0.74	0.42	0.55	0.25	0.17	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.03
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.38	0.55	0.67	0.72	0.70	0.61	0.47	0.28	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.64
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.30	0.45	0.55	0.60	0.57	0.48	0.35	0.17	0.02	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.49	3.17	3.11	1.26	3.74	3.05	3.70	2.78	0.86	1.46	3.84	3.92	4.01	3.89	3.65	3.46	3.96	3.97	4.02	0.67	4.15	3.19	4.32	4.45	4.35
MAX	0.58	0.56	0.63	0.48	0.61	0.59	0.63	0.53	0.19	0.35	0.62	0.64	0.65	0.63	0.66	0.63	0.64	0.64	0.66	0.12	0.67	0.62	0.68	0.70	0.68
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.35	4.46	4.49	4.59	4.03	4.64
MAX	0.69	0.70	0.70	0.71	0.74	0.72
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JANUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
10	0.05	0.04	0.04	0.03	0.03	0.04	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.05
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.36 MONTHLY MAXIMUM = 0.05 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.1% OPERATIONAL RECOVERY RATE = 99.1%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
FEBRUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	4.1	2.7	1.4	2.2	4.2	3.5	3.3	3.6	2.9	1.6	1.6	1.4	0.9	1.2	2.2	4.3	5.7	6.2	6.5	4.2	1.2	2.4	3.1	3.8	3.1
2	3.2	3.1	2.5	3.4	2.4	3.2	2.7	3.1	3.1	2.8	2.2	1.8	1.7	1.5	1.5	2.5	3.0	5.2	3.9	2.7	1.1	2.1	3.0	2.8	2.7
3	2.8	2.9	2.9	2.8	2.8	2.2	2.6	3.8	1.5	1.6	0.9	1.0	2.6	5.2	5.3	6.1	6.5	6.3	3.7	3.8	2.0	2.0	3.3	3.2	3.2
4	2.8	2.2	2.9	3.7	2.2	2.0	3.0	3.2	2.2	2.2	1.8	0.9	0.9	2.0	2.4	4.0	5.4	6.2	6.3	5.4	2.9	1.2	2.3	3.1	3.0
5	3.4	3.7	3.5	3.5	3.0	1.6	2.3	3.0	2.7	2.1	1.9	1.1	1.3	3.8	6.0	5.4	4.7	4.9	5.3	5.9	3.8	1.5	2.6	3.2	3.3
6	3.0	3.8	2.9	2.2	3.1	2.8	1.8	0.7	1.5	2.6	1.4	1.4	1.9	4.8	6.8	8.2	9.6	7.6	4.2	4.5	3.5	5.0	7.7	6.8	4.1
7	9.1	7.0	5.9	4.4	4.6	4.7	4.4	3.7	3.5	3.8	6.1	5.2	5.1	5.6	6.2	7.0	7.2	7.0	7.4	6.7	5.2	7.4	6.3	7.0	5.9
8	4.9	3.8	3.8	3.9	3.8	3.9	3.6	4.7	4.3	5.4	6.8	6.2	8.0	8.2	7.3	6.4	6.4	5.7	5.9	5.5	4.2	4.7	3.2	4.0	5.2
9	3.6	4.2	4.2	3.8	3.2	3.0	3.3	3.6	4.2	3.7	2.7	2.0	1.3	1.3	2.8	5.6	6.2	6.5	5.5	4.2	2.5	2.1	3.5	3.3	3.6
10	3.4	3.8	2.8	2.8	2.7	2.2	2.1	2.1	1.3	1.6	0.8	1.2	2.2	5.4	7.3	7.6	8.1	7.5	5.7	5.3	4.2	3.8	4.9	5.9	4.0
11	5.9	3.6	2.8	8.6	10.9	11.2	9.8	9.1	9.3	8.2	6.8	5.2	5.1	3.5	2.1	1.6	1.4	2.4	3.7	4.3	3.5	1.4	2.3	2.0	5.2
12	2.1	2.5	2.0	1.6	1.7	1.8	1.0	1.5	2.8	2.5	3.0	8.4	7.4	8.0	8.4	10.5	11.4	10.3	8.1	4.5	2.8	3.1	4.4	3.0	4.7
13	3.9	2.0	1.2	2.5	3.1	4.5	3.6	4.1	3.3	2.9	1.6	1.5	2.7	3.6	2.8	2.6	1.7	2.2	4.4	4.6	4.3	3.5	1.8	2.2	2.9
14	1.9	2.5	1.9	1.8	2.8	1.9	2.2	1.5	1.5	2.0	1.2	2.6	1.9	2.6	2.4	1.5	2.8	3.5	3.9	1.2	2.9	1.5	1.0	2.0	2.1
15	0.8	1.0	0.9	0.9	1.9	1.7	0.6	1.7	1.7	1.4	0.9	1.9	1.6	1.9	1.8	1.8	1.0	1.4	1.2	0.7	0.6	0.8	1.0	0.6	1.2
16	1.8	0.3	0.7	2.2	2.3	2.1	1.4	2.2	2.7	2.0	2.8	2.3	3.1	3.0	2.0	1.1	1.2	1.1	2.2	1.7	3.7	5.0	3.5	2.9	2.2
17	2.8	1.9	1.1	0.7	0.5	1.2	1.6	1.9	2.2	2.5	3.2	2.0	2.5	1.7	2.0	1.4	1.4	3.1	2.4	0.5	1.5	2.2	1.7	0.9	1.8
18	1.8	1.8	2.5	2.2	1.4	1.5	0.7	1.3	2.3	2.1	1.6	1.2	2.2	5.5	8.4	7.1	6.7	5.1	3.6	1.6	2.5	2.9	2.9	2.4	3.0
19	2.1	1.7	2.1	3.8	4.5	5.7	5.6	6.0	5.6	6.0	5.9	9.4	10.1	10.4	11.4	12.4	12.8	14.7	12.4	6.6	3.9	4.7	4.7	3.1	6.9
20	3.4	2.8	2.4	3.0	3.0	2.5	2.3	1.9	1.7	1.8	0.9	1.8	3.8	7.2	6.6	6.5	5.8	6.5	4.2	3.5	2.8	1.4	0.9	1.8	3.3
21	1.7	1.2	1.4	2.0	3.0	2.1	2.4	3.1	3.3	2.4	2.3	2.0	2.5	3.7	5.5	7.4	8.5	6.7	5.0	4.4	2.8	1.8	1.1	1.7	3.3
22	1.9	2.0	1.4	1.5	1.8	2.1	1.8	1.3	1.4	1.1	1.3	1.8	3.8	3.7	4.3	5.1	6.2	5.5	4.5	4.2	1.9	1.4	2.7	3.5	2.8
23	3.2	3.7	2.0	1.3	2.6	2.3	1.8	3.2	2.4	1.8	1.6	1.7	4.6	5.9	6.4	8.1	7.8	9.8	10.2	8.9	10.1	5.6	1.6	1.9	4.5
24	5.5	5.9	3.4	3.6	3.1	1.6	1.3	2.1	2.7	1.5	1.9	2.3	2.3	3.6	5.3	6.5	6.6	6.7	5.9	4.2	3.7	1.3	1.8	2.0	3.5
25	2.4	1.7	2.7	2.7	1.1	1.7	2.1	2.0	2.4	1.7	1.1	1.5	2.2	2.3	1.6	2.3	1.9	2.1	2.6	5.8	5.6	3.1	1.8	1.5	2.3
26	3.1	3.2	3.0	3.7	3.6	3.7	3.8	3.7	3.2	3.2	1.8	1.6	2.1	1.3	1.7	3.0	6.4	8.8	7.4	2.3	1.3	1.3	2.5	2.8	3.3
27	2.9	4.1	3.0	2.9	2.9	3.6	3.3	4.2	4.0	2.4	2.5	3.1	5.0	7.0	9.6	8.3	9.7	9.3	8.9	8.9	9.4	5.2	4.2	3.6	5.3
28	3.5	5.7	6.8	3.8	1.7	1.6	2.7	2.0	1.9	1.7	2.4	6.1	5.4	4.6	6.0	6.5	5.8	5.5	4.3	3.2	1.5	2.2	3.0	3.1	3.8
HRAVE	3.2	3.0	2.6	2.9	3.0	2.9	2.7	3.0	2.9	2.7	2.5	2.8	3.4	4.2	4.9	5.4	5.8	6.0	5.3	4.3	3.4	2.9	3.0	3.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.1	2.7	3.2	3.0	3.3	4.1	5.9	5.2	3.6	4.0	5.2	4.7	2.9	2.1	1.2	2.2	1.8	3.0	6.9	3.3	3.3	2.8	4.5	3.5	2.3
MAX	6.5	5.2	6.5	6.3	6.0	9.6	9.1	8.2	6.5	8.1	11.2	11.4	4.6	3.9	1.9	5.0	3.2	8.4	14.7	7.2	8.5	6.2	10.2	6.7	5.8
MIN	0.9	1.1	0.9	0.9	1.1	0.7	3.5	3.2	1.3	0.8	1.4	1.0	1.2	1.0	0.6	0.3	0.5	0.7	1.7	0.9	1.1	1.1	1.3	1.3	1.1

DAY	26	27	28	29	30	31
AVE	3.3	5.3	3.8	***	***	***
MAX	8.8	9.7	6.8	***	***	***
MIN	1.3	2.4	1.5	***	***	***

MONTHLY AVERAGE = 3.6 MONTHLY MAXIMUM = 14.7 MONTHLY MINIMUM = 0.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
FEBRUARY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	100	104	103	101	103	109	102	106	121	129	124	155	210	268	254	295	306	310	308	300	204	124	96	96	349
2	102	93	105	122	111	111	117	97	105	123	142	137	140	155	253	211	224	294	296	303	299	139	111	99	50
3	92	87	89	106	98	90	94	89	114	125	266	267	273	295	285	284	278	287	305	311	227	136	111	93	280
4	86	100	117	106	133	112	100	109	116	125	126	123	251	262	266	283	294	299	305	304	292	159	130	96	80
5	93	98	109	113	128	108	96	107	115	114	119	202	265	286	292	285	265	284	303	303	294	156	127	107	249
6	104	99	105	128	111	100	90	58	123	107	138	254	258	287	272	276	276	272	300	301	307	346	42	55	131
7	40	42	73	102	86	79	97	109	114	149	81	75	50	37	37	36	38	37	38	50	53	51	63	63	161
8	84	138	120	99	106	143	137	140	139	100	69	68	44	40	44	41	43	33	28	37	44	47	104	95	153
9	114	108	111	103	113	108	108	108	113	114	138	152	157	219	280	304	290	292	298	305	264	143	123	105	228
10	106	114	116	111	112	112	105	90	84	124	314	168	265	279	273	269	261	264	254	248	249	290	310	314	17
11	313	297	344	42	42	41	43	51	57	50	54	60	41	69	97	114	71	137	280	305	295	170	111	118	77
12	244	121	107	280	293	275	110	92	97	96	152	199	203	214	259	304	303	297	298	305	291	289	299	297	313
13	297	254	153	109	127	108	112	97	133	129	141	133	157	198	193	165	231	285	311	303	308	287	187	140	297
14	122	119	131	89	133	121	110	112	73	143	309	281	250	284	254	306	91	75	74	110	91	74	134	268	76
15	233	257	176	179	130	134	162	256	122	129	182	145	154	118	171	196	252	287	281	188	223	248	255	227	97
16	295	182	156	124	120	127	170	144	126	151	100	15	53	35	297	179	130	150	162	166	306	319	305	310	141
17	299	294	174	255	261	79	153	116	126	147	132	151	153	170	157	109	257	294	314	164	275	312	317	192	45
18	144	108	100	115	48	109	280	110	116	134	130	278	266	277	290	293	284	250	254	198	163	165	180	213	321
19	195	144	210	251	269	243	268	284	300	242	228	212	226	233	237	230	219	293	294	286	166	169	168	169	110
20	249	280	204	233	270	315	301	184	129	147	244	246	306	285	285	281	282	291	312	323	294	336	105	78	25
21	55	120	114	131	124	134	121	120	109	131	151	114	269	286	280	283	298	299	301	287	280	288	253	296	163
22	294	290	264	253	302	169	126	123	123	186	269	249	257	248	275	280	279	280	290	295	258	259	109	86	117
23	91	87	104	116	105	114	91	88	103	123	138	288	298	273	269	288	291	292	300	292	303	295	263	210	44
24	278	275	293	314	284	141	122	118	90	132	185	253	261	301	303	293	296	289	291	297	307	216	149	134	267
25	115	115	101	104	91	106	98	120	111	130	110	130	108	246	238	241	205	233	276	304	305	300	101	82	12
26	134	111	109	93	105	110	98	115	117	137	150	121	115	242	287	280	285	297	304	289	305	132	106	90	350
27	85	87	90	103	103	104	103	101	103	115	99	124	176	201	262	263	230	263	272	280	287	284	280	285	16
28	286	298	301	304	202	161	284	257	134	184	235	291	316	308	286	283	282	278	291	306	289	148	108	99	286

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
FEBRUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	11	11	18	13	7	10	8	8	11	13	27	27	45	28	17	18	9	9	6	10	60	9	8	8	16
2	9	8	14	9	11	10	11	7	7	11	18	29	24	35	36	22	24	10	5	6	24	39	6	7	16
3	7	6	8	9	9	17	13	8	14	19	34	33	22	16	16	14	10	10	8	5	23	12	9	11	14
4	11	10	6	8	11	18	7	8	9	10	24	45	53	26	19	15	14	10	7	7	27	21	7	6	16
5	6	8	7	8	7	16	14	10	8	12	21	39	33	18	12	15	13	8	5	5	23	11	6	9	13
6	9	7	9	9	7	10	12	33	12	9	34	22	17	16	16	12	9	9	9	8	18	20	13	16	14
7	14	17	15	10	8	14	16	14	13	24	19	20	25	19	17	14	13	12	10	10	15	10	9	8	14
8	14	15	11	21	22	13	23	12	16	19	12	12	15	13	12	15	13	12	7	9	10	10	15	7	14
9	8	6	7	7	8	7	7	8	7	10	17	31	44	53	25	15	13	9	7	8	18	5	7	8	14
10	8	10	12	10	7	13	10	10	22	35	63	52	26	21	15	15	13	11	9	9	11	8	7	8	17
11	11	13	18	12	12	12	17	16	15	20	18	23	21	26	43	66	55	27	9	7	6	21	9	32	21
12	25	39	39	45	18	51	41	14	11	18	42	16	19	17	15	11	8	9	8	11	14	13	7	8	21
13	7	36	18	20	13	12	14	8	12	14	28	36	44	33	43	47	40	24	6	6	7	5	28	13	21
14	8	8	13	19	9	10	15	20	51	34	64	32	38	20	11	35	12	12	10	29	13	33	40	9	23
15	30	13	36	19	16	46	39	40	19	25	32	13	13	23	15	12	18	11	12	22	38	19	16	26	23
16	19	39	31	11	9	6	14	7	7	15	20	42	30	29	14	36	18	20	8	22	7	9	11	12	18
17	10	33	21	36	29	47	11	12	9	8	17	21	23	46	32	44	38	11	36	46	19	8	18	38	26
18	21	11	10	13	27	16	30	39	14	14	21	54	21	12	9	12	9	17	17	48	12	19	11	31	20
19	18	19	23	13	12	11	12	7	16	12	17	15	12	16	12	12	14	11	9	10	38	11	11	12	14
20	17	13	22	13	13	15	10	29	22	24	58	38	41	15	15	16	13	11	14	14	10	36	48	14	22
21	21	33	17	9	9	8	18	10	12	21	21	30	54	20	25	16	10	11	9	8	6	6	21	14	17
22	24	9	20	27	31	14	14	16	14	42	36	33	30	33	25	26	14	11	7	4	33	39	8	7	22
23	7	7	17	14	9	10	8	6	15	21	38	40	20	18	21	14	16	11	9	8	11	17	22	21	16
24	9	8	7	9	32	14	17	9	9	32	38	33	44	36	21	13	13	9	8	6	6	30	11	5	17
25	8	9	10	11	46	14	10	9	15	19	43	46	48	45	47	30	35	17	9	6	5	18	43	16	23
26	6	8	8	6	8	8	8	7	10	14	28	38	31	68	42	32	26	9	7	10	12	45	11	9	19
27	9	6	18	11	7	7	9	7	10	20	21	23	29	20	15	14	15	11	11	11	8	8	9	7	13
28	16	15	9	11	13	51	24	46	12	43	41	18	15	18	15	13	14	11	7	5	52	10	12	11	20
HRAVE	13	15	16	14	15	17	15	15	14	20	30	31	30	26	22	22	18	12	10	13	19	18	15	13	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16	16	14	16	13	14	14	14	14	17	21	21	21	23	23	18	26	20	14	22	17	22	16	17	23
MAX	60	39	34	53	39	34	25	23	53	63	66	51	47	64	46	42	47	54	38	58	54	42	40	44	48
MIN	6	5	5	6	5	7	8	7	5	7	6	7	5	8	11	6	8	9	7	10	6	4	6	5	5

DAY	26	27	28	29	30	31
AVE	19	13	20	***	***	***
MAX	68	29	52	***	***	***
MIN	6	6	5	***	***	***

MONTHLY AVERAGE = 18.0 MONTHLY MAXIMUM = 68.3 MONTHLY MINIMUM = 4.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
FEBRUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	12.6	11.5	9.9	8.4	8.5	7.9	6.8	7.4	8.6	10.2	13.9	17.0	19.9	22.3	24.2	25.4	25.3	24.3	22.4	20.7	19.1	16.8	15.3	13.4	15.5
2	13.1	11.1	10.1	9.8	8.4	7.9	7.8	6.5	8.3	11.7	14.4	17.1	20.2	22.6	24.3	25.4	25.5	24.1	22.2	20.9	19.8	17.5	16.4	14.9	15.8
3	13.1	12.2	10.9	10.5	9.6	8.4	7.5	6.9	8.6	11.6	13.9	17.3	20.4	23.2	24.0	24.2	23.6	22.3	20.5	19.7	18.0	16.5	15.1	14.0	15.5
4	12.6	11.5	10.1	10.6	9.0	8.0	7.9	7.7	9.2	11.7	15.1	17.9	20.5	22.5	24.4	25.4	25.4	24.0	21.9	20.7	19.5	18.4	16.0	14.8	16.0
5	13.3	12.6	11.4	11.1	9.4	9.2	7.8	7.4	9.5	12.6	15.7	18.1	20.7	22.9	24.3	24.8	24.9	23.8	22.0	20.7	19.6	17.8	16.2	14.4	16.3
6	13.2	13.0	12.0	10.5	9.7	9.1	8.8	8.1	8.6	11.8	15.8	17.9	20.8	23.2	24.1	24.3	23.5	22.4	21.0	19.9	19.8	18.0	17.9	17.4	16.3
7	17.0	16.3	15.7	14.4	13.8	14.1	13.2	10.8	11.6	13.5	17.8	19.5	20.5	21.3	22.0	22.4	22.5	22.2	21.5	20.6	19.9	19.3	17.6	16.7	17.7
8	15.1	12.1	11.8	11.0	9.6	7.6	6.5	7.4	8.6	14.3	18.5	20.9	22.5	23.5	24.3	25.0	25.0	24.6	23.7	23.0	21.8	21.0	18.0	16.2	17.2
9	14.2	13.7	12.4	11.2	10.0	9.2	8.8	8.2	10.1	13.5	16.4	19.2	22.4	24.7	26.0	26.9	26.6	25.0	22.6	21.3	20.0	18.5	16.3	15.8	17.2
10	14.2	13.4	12.0	11.2	9.9	9.6	8.6	8.2	9.2	11.8	15.1	19.3	21.9	24.4	25.0	25.3	25.2	23.8	22.2	21.0	19.5	18.9	18.5	18.5	16.9
11	18.2	17.8	17.4	15.6	14.0	13.1	12.5	12.1	12.6	14.0	15.9	18.0	19.0	20.6	21.5	22.2	22.2	22.1	20.9	19.6	18.7	17.2	16.4	16.2	17.4
12	16.3	15.5	14.7	14.8	14.2	12.7	11.7	11.4	12.2	15.4	18.9	20.8	21.5	21.7	20.3	18.0	17.0	16.5	15.8	15.3	15.1	14.7	14.6	14.0	16.0
13	13.5	12.7	12.1	11.4	10.1	10.2	9.3	9.6	10.8	13.7	16.2	18.3	20.7	21.8	22.1	22.2	21.9	21.3	19.9	19.1	18.3	17.4	16.3	15.8	16.0
14	15.4	14.6	14.2	13.6	12.4	12.5	12.1	12.1	11.4	12.4	13.9	15.1	16.8	17.2	15.3	13.6	12.9	12.0	11.6	11.1	10.9	10.7	10.6	10.4	13.0
15	10.3	10.1	10.1	10.1	10.1	10.2	10.2	10.1	10.1	10.4	11.0	11.5	11.6	12.1	12.7	12.7	12.7	12.6	12.6	12.6	12.8	12.5	12.4	12.5	11.4
16	12.5	12.3	12.0	11.8	11.9	12.0	11.8	11.8	12.1	13.0	14.7	15.2	15.6	16.1	15.8	15.6	15.3	15.0	14.4	14.2	13.9	14.0	13.9	13.8	13.7
17	13.2	12.7	11.9	11.5	11.2	10.8	9.3	9.5	9.7	11.4	13.8	16.4	17.7	18.5	19.7	19.8	19.8	19.0	18.1	17.5	16.6	15.9	15.6	14.7	14.8
18	13.3	13.0	12.5	12.4	11.8	10.9	10.7	10.3	11.2	12.8	14.8	17.0	18.9	19.4	19.2	19.7	19.4	17.3	16.0	15.8	14.9	14.6	14.6	14.3	14.8
19	13.5	13.0	13.0	13.8	14.0	14.4	13.9	13.5	13.8	14.7	17.3	18.1	19.4	19.4	18.9	18.7	17.6	10.5	7.6	6.7	7.7	7.6	7.6	8.1	13.5
20	8.2	8.1	7.9	7.4	7.1	6.9	6.6	6.0	7.2	8.3	9.2	10.1	11.0	11.8	12.1	12.1	11.8	11.0	10.0	9.5	8.6	8.1	7.2	6.0	8.9
21	5.1	4.2	4.1	3.5	3.0	2.8	2.0	2.6	5.8	8.2	10.1	12.4	14.1	14.6	15.0	14.3	12.8	11.8	11.2	10.7	10.1	9.9	9.6	9.4	8.6
22	8.8	8.4	7.8	6.6	6.2	5.6	5.6	5.7	6.9	8.7	9.7	11.2	12.7	13.5	13.8	13.8	13.6	12.9	11.5	10.3	9.9	9.6	8.1	7.2	9.5
23	6.2	5.6	5.1	3.9	3.5	2.6	1.9	2.3	4.5	7.0	9.9	11.8	13.6	14.9	15.3	14.8	14.1	12.9	10.9	10.3	9.3	7.8	7.6	7.6	8.5
24	7.7	6.9	5.9	5.7	4.7	4.0	3.4	3.2	5.3	7.1	9.0	9.8	10.9	12.1	12.9	13.2	12.8	12.0	10.6	9.5	9.0	7.5	6.7	5.9	8.2
25	4.9	4.2	2.8	2.5	1.9	0.7	0.7	1.0	3.5	6.1	9.1	11.4	13.5	14.6	15.0	16.0	16.1	16.0	14.4	12.4	11.5	10.6	9.1	7.6	8.6
26	6.0	5.8	5.0	3.7	3.3	3.1	2.1	3.2	5.6	8.9	12.2	15.6	18.5	19.5	20.7	21.7	21.7	19.4	17.0	15.7	14.8	13.0	11.6	10.1	11.6
27	8.9	7.8	7.1	6.1	5.4	5.6	4.5	4.0	7.0	10.4	14.9	18.1	20.7	22.3	20.8	20.4	20.3	18.2	15.7	13.9	12.1	10.6	9.8	9.1	12.2
28	8.1	7.3	6.3	6.3	6.1	5.9	6.0	5.7	5.9	6.7	7.5	7.7	7.8	9.8	10.5	11.6	11.9	11.5	10.2	9.5	8.9	7.7	7.0	6.3	8.0
HRAVE	11.7	11.0	10.2	9.6	8.9	8.4	7.8	7.6	8.9	11.1	13.7	15.8	17.6	18.9	19.4	19.6	19.3	18.2	16.7	15.8	15.0	14.0	13.1	12.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15.5	15.8	15.5	16.0	16.3	16.3	17.7	17.2	17.2	16.9	17.4	16.0	16.0	13.0	11.4	13.7	14.8	14.8	13.5	8.9	8.6	9.5	8.5	8.2	8.6
MAX	25.4	25.5	24.2	25.4	24.9	24.3	22.5	25.0	26.9	25.3	22.2	21.7	22.2	17.2	12.8	16.1	19.8	19.7	19.4	12.1	15.0	13.8	15.3	13.2	16.1
MIN	6.8	6.5	6.9	7.7	7.4	8.1	10.8	6.5	8.2	8.2	12.1	11.4	9.3	10.4	10.1	11.8	9.3	10.3	6.7	6.0	2.0	5.6	1.9	3.2	0.7

DAY	26	27	28	29	30	31
AVE	11.6	12.2	8.0	***	***	***
MAX	21.7	22.3	11.9	***	***	***
MIN	2.1	4.0	5.7	***	***	***

MONTHLY AVERAGE = 13.5 MONTHLY MAXIMUM = 26.9 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
FEBRUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.5	0.8	0.5	0.6	0.6	0.6	0.7	0.3	-0.7	-0.7	-0.8	-0.8	-0.6	-0.7	-0.6	-0.6	-0.2	0.3	0.6	0.9	0.5	0.6	0.8	0.8	0.1
2	0.7	0.8	0.9	0.5	0.7	0.9	0.4	0.8	-0.2	-1.3	-1.1	-0.9	-0.9	-0.9	-0.7	-0.8	-0.5	0.2	0.6	0.6	0.4	0.6	0.5	0.7	0.1
3	0.6	0.8	0.8	0.8	0.8	0.7	0.7	0.5	-0.3	-0.9	-0.5	-0.6	-0.7	-0.7	-0.7	-0.7	-0.5	0.1	0.5	0.7	0.6	0.5	0.6	0.7	0.2
4	0.7	0.6	0.8	0.5	0.5	0.6	0.6	0.4	-0.7	-1.0	-1.0	-0.6	-0.7	-0.7	-0.7	-0.7	-0.5	0.1	0.4	0.5	0.6	0.4	0.6	0.8	0.1
5	0.7	0.7	0.7	0.4	0.4	0.5	0.7	0.6	-0.6	-1.2	-1.1	-0.7	-0.8	-0.8	-0.8	-0.7	-0.5	0.0	0.6	0.6	0.7	0.4	0.5	0.6	0.0
6	0.6	0.6	0.7	0.3	0.5	0.8	0.6	0.3	-0.2	-1.0	-0.8	-0.7	-0.8	-0.9	-0.7	-0.7	-0.4	0.0	0.4	0.6	0.5	0.7	0.2	0.2	0.0
7	0.1	0.2	0.3	0.5	0.4	0.4	0.5	1.0	0.1	-0.7	-1.0	-1.1	-0.8	-0.6	-0.4	-0.2	0.0	0.2	0.2	0.2	0.4	0.2	0.4	0.4	0.0
8	0.4	1.2	1.7	1.7	2.1	2.4	2.6	1.6	0.7	-0.2	-0.6	-0.8	-0.6	-0.5	-0.3	-0.2	0.1	0.4	0.6	0.4	0.5	0.4	0.4	0.9	0.6
9	1.1	0.6	0.6	0.6	0.6	0.5	0.5	0.2	-0.9	-1.5	-1.2	-1.0	-0.8	-0.7	-0.8	-0.7	-0.4	0.0	0.4	0.6	0.8	0.4	0.4	0.6	0.0
10	0.6	0.4	0.5	0.6	0.6	0.5	0.6	0.6	-0.1	-0.7	-0.6	-0.6	-0.8	-0.8	-0.7	-0.6	-0.3	0.1	0.4	0.4	0.6	0.7	0.4	0.3	0.1
11	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	-0.2	-0.5	-0.7	-1.0	-0.9	-1.0	-0.9	-0.7	-0.3	0.1	0.4	0.4	0.5	0.4	0.4	0.3	-0.1
12	0.3	0.4	0.4	0.5	0.4	0.5	0.5	0.6	-0.6	-1.1	-1.1	-1.4	-1.3	-1.1	-0.5	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.2	0.1	0.2	-0.2
13	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.2	-0.8	-1.2	-0.9	-0.8	-1.4	-1.3	-1.0	-0.8	-0.4	-0.1	0.3	0.5	0.3	0.4	0.3	0.2	-0.1
14	0.2	0.3	0.3	0.2	0.4	0.3	0.4	0.2	0.1	-0.1	-0.2	-0.5	-0.5	-0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	-0.1	-0.1	0.1
15	-0.1	0.0	-0.1	-0.1	-0.1	0.1	0.0	-0.1	0.0	-0.1	-0.2	-0.4	-0.4	-0.5	-0.6	-0.5	-0.2	-0.2	0.0	0.0	0.0	0.0	0.1	0.1	-0.1
16	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	-0.2	-0.2	-0.4	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.1	0.1	0.1	0.0
17	0.3	0.5	0.3	0.3	0.3	0.4	0.4	0.3	0.1	-0.7	-1.1	-1.0	-1.0	-0.8	-0.8	-0.4	-0.2	0.1	0.3	0.2	0.3	0.4	0.4	0.3	0.0
18	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.1	-0.4	-0.6	-0.5	-0.5	-0.6	-0.4	-0.3	-0.5	-0.5	-0.1	0.1	0.2	0.1	0.2	0.4	0.4	0.0
19	0.4	0.3	0.4	0.4	0.3	0.2	0.1	0.1	0.0	-0.1	-0.7	-0.5	-1.0	-0.9	-0.8	-0.8	-0.4	-0.2	-0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1
20	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	-0.5	-0.6	-0.5	-0.6	-0.7	-0.8	-0.9	-1.0	-0.7	-0.3	0.1	0.2	0.4	0.4	0.3	0.4	-0.2
21	0.4	0.4	0.3	0.3	0.5	0.4	0.5	0.1	-1.1	-1.1	-1.0	-1.2	-0.9	-0.9	-0.7	-0.5	-0.3	-0.1	0.1	0.1	0.2	0.3	0.2	0.3	-0.2
22	0.3	0.3	0.5	0.4	0.3	0.4	0.3	0.1	-0.6	-0.5	-0.5	-0.8	-1.1	-1.0	-1.0	-1.0	-0.7	-0.3	0.1	0.4	0.3	0.3	0.5	0.6	-0.1
23	0.5	0.5	0.4	0.4	0.4	0.3	0.4	-0.1	-0.9	-0.9	-0.9	-0.7	-0.9	-0.9	-0.9	-0.9	-0.6	-0.3	0.0	0.1	0.1	0.0	0.0	0.1	-0.2
24	0.1	0.1	0.3	0.3	0.4	0.3	0.3	-0.2	-1.1	-0.7	-1.0	-0.9	-0.9	-0.9	-0.9	-1.1	-0.7	-0.4	0.1	0.3	0.4	0.6	0.4	0.4	-0.2
25	0.4	0.4	0.6	0.6	0.5	0.6	0.4	0.0	-1.0	-0.9	-0.7	-0.8	-1.1	-0.8	-0.7	-0.9	-0.6	-0.3	0.3	0.4	0.4	0.5	0.5	0.5	-0.1
26	0.4	0.4	0.4	0.5	0.5	0.4	0.5	-0.2	-1.1	-1.2	-0.9	-1.0	-1.2	-0.7	-0.8	-0.9	-0.5	-0.2	0.2	0.5	0.5	0.6	0.7	0.6	-0.1
27	0.6	0.8	0.6	0.6	0.6	0.6	0.5	0.3	-1.0	-1.0	-1.4	-1.6	-1.1	-1.2	-0.9	-0.9	-0.6	-0.2	0.0	0.1	0.0	0.0	0.0	0.1	-0.2
28	0.2	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.2	-0.4	-0.5	-0.5	-0.6	-0.5	-0.5	-0.8	-0.6	-0.4	0.2	0.4	0.3	0.3	0.4	0.5	-0.1
HRAVE	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.3	-0.4	-0.8	-0.8	-0.8	-0.8	-0.8	-0.7	-0.6	-0.4	-0.1	0.2	0.3	0.3	0.3	0.3	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.6	0.0	0.1	-0.1	-0.2	-0.1	0.1	-0.1	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.1
MAX	0.9	0.9	0.8	0.8	0.7	0.8	1.0	2.6	1.1	0.7	0.5	0.6	0.6	0.4	0.1	0.2	0.5	0.4	0.4	0.4	0.5	0.6	0.5	0.6	0.6
MIN	-0.8	-1.3	-0.9	-1.0	-1.2	-1.0	-1.1	-0.8	-1.5	-0.8	-1.0	-1.4	-1.4	-0.5	-0.6	-0.4	-1.1	-0.6	-1.0	-1.0	-1.2	-1.1	-0.9	-1.1	-1.1

DAY	26	27	28	29	30	31
AVE	-0.1	-0.2	-0.1	***	***	***
MAX	0.7	0.8	0.5	***	***	***
MIN	-1.2	-1.6	-0.8	***	***	***

MONTHLY AVERAGE = 0.0 MONTHLY MAXIMUM = 2.6 MONTHLY MINIMUM = -1.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
FEBRUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	702	702	703	703	703	703	703	704	704	705	705	704	704	703	702	702	702	702	703	703	704	704	705	705	703
2	705	705	705	705	705	706	706	706	707	707	707	707	706	705	704	703	703	703	703	704	704	704	704	704	705
3	704	704	704	704	704	704	704	704	705	705	705	704	703	702	701	701	701	701	702	702	703	703	703	703	703
4	703	703	703	703	703	703	704	704	705	705	705	704	703	702	701	701	701	701	701	702	702	703	703	703	703
5	703	703	702	702	702	702	702	702	703	703	703	702	701	700	699	699	699	699	699	699	700	700	700	701	701
6	701	701	701	701	700	700	701	702	702	702	702	702	701	700	700	700	700	700	701	702	702	703	704	704	701
7	705	705	705	706	706	706	707	708	708	709	709	708	707	706	706	705	705	705	705	705	706	706	706	706	706
8	706	706	706	706	706	706	706	706	706	706	706	705	704	703	703	702	702	702	702	702	702	702	703	703	704
9	702	702	702	702	702	702	702	703	703	703	703	702	701	700	699	698	698	698	699	699	699	699	700	699	701
10	699	699	699	699	699	699	699	699	700	699	699	698	697	696	695	694	694	694	695	695	696	696	697	697	697
11	697	697	698	698	698	699	699	700	701	701	701	700	700	698	698	697	697	697	697	697	698	698	698	699	698
12	698	698	698	698	698	698	698	699	699	699	699	699	698	698	698	698	698	698	699	700	701	701	702	702	699
13	702	702	703	703	703	703	704	704	705	705	706	705	705	704	704	704	704	704	704	704	705	705	705	706	704
14	706	705	705	705	705	705	705	705	705	706	706	706	705	705	705	705	704	704	704	705	705	705	705	705	705
15	705	704	704	703	703	703	703	703	704	704	705	705	704	704	703	703	703	704	704	704	704	705	705	705	704
16	705	705	705	705	704	704	704	705	705	705	705	704	704	703	703	703	703	703	703	703	704	704	705	705	704
17	705	705	705	705	704	704	705	705	706	706	706	705	705	704	703	703	703	703	703	703	703	703	703	702	704
18	702	702	702	701	701	701	701	701	701	702	701	701	700	699	698	698	698	698	698	698	698	698	697	697	700
19	697	697	697	696	696	696	696	696	696	696	696	695	695	694	694	693	693	694	696	697	697	698	698	699	696
20	699	699	700	700	700	701	701	701	702	702	702	702	702	702	702	702	702	702	702	703	703	703	703	703	702
21	703	703	703	703	702	702	702	703	704	704	704	703	702	702	701	701	701	702	702	702	702	703	703	703	702
22	703	703	703	703	703	704	704	705	706	706	707	707	706	705	705	704	704	704	704	704	705	705	705	705	704
23	705	704	704	704	704	704	704	704	704	704	704	703	703	702	701	701	701	701	701	702	702	703	703	704	703
24	704	704	704	705	705	705	706	706	707	707	707	707	706	705	704	704	704	704	704	704	704	704	704	704	705
25	704	704	704	704	704	704	705	706	706	707	706	706	705	705	704	704	704	704	704	704	704	704	704	704	705
26	704	704	704	703	703	703	703	703	704	703	703	702	701	700	699	699	698	698	699	699	699	699	700	700	701
27	700	699	699	699	699	699	699	699	700	700	700	699	698	697	697	697	697	697	698	699	700	700	701	701	699
28	701	701	701	700	700	701	701	702	702	703	703	704	704	704	704	704	704	704	704	705	705	705	706	706	706	703
HRAVE	702	702	702	702	702	702	703	703	703	704	704	703	703	702	701	701	701	701	701	702	702	702	702	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	703	705	703	703	701	701	706	704	701	697	698	699	704	705	704	704	704	700	696	702	702	704	703	705	705
MAX	705	707	705	705	703	704	709	706	703	700	701	702	706	706	705	705	706	702	699	703	704	707	705	707	707
MIN	702	703	701	701	699	700	705	702	698	694	697	698	702	704	703	703	702	697	693	699	701	703	701	704	704

DAY	26	27	28	29	30	31
AVE	701	699	703	***	***	***
MAX	704	701	706	***	***	***
MIN	698	697	700	***	***	***

MONTHLY AVERAGE = 702.2 MONTHLY MAXIMUM = 708.5 MONTHLY MINIMUM = 693.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
FEBRUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	25	28	31	33	31	31	35	31	26	24	20	16	14	13	10	10	10	11	12	14	17	19	19	22	21
2	22	24	26	26	28	29	29	32	28	21	18	16	14	12	11	11	11	13	15	17	21	21	23	23	20
3	25	26	28	30	31	33	34	34	33	27	25	22	19	16	15	15	16	17	19	22	22	25	27	28	25
4	30	33	35	34	35	39	40	40	35	29	25	22	20	19	18	17	17	19	23	24	27	28	32	33	28
5	35	37	40	40	43	45	49	47	41	32	27	25	22	20	18	18	18	18	21	23	24	26	28	32	30
6	34	35	36	39	41	43	44	47	43	33	26	25	22	20	19	19	21	22	25	27	27	30	28	28	31
7	26	26	25	28	29	28	29	34	32	30	21	19	18	17	16	13	12	12	13	16	15	15	16	17	21
8	20	24	24	25	27	28	30	29	27	21	17	16	14	13	13	12	12	12	12	11	12	13	16	18	19
9	21	21	22	23	25	26	26	27	23	19	16	15	13	11	10	10	10	12	14	15	16	18	20	22	18
10	23	24	25	26	28	27	30	30	28	23	20	16	15	15	14	13	12	13	15	16	19	20	20	19	20
11	19	21	24	32	37	36	37	35	32	27	21	18	17	17	17	18	18	21	22	25	27	30	31	34	26
12	39	42	47	52	53	55	57	58	50	41	36	32	31	29	33	47	50	51	53	56	56	57	59	62	48
13	64	67	69	72	75	76	78	77	67	54	46	39	31	28	27	26	25	27	33	34	38	41	43	44	49
14	46	46	46	47	48	48	50	49	50	47	47	42	40	44	61	77	87	92	95	100	100	100	100	100	65
15	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
16	100	100	100	100	100	100	100	100	100	99	87	85	83	78	86	88	90	94	98	100	100	97	97	96	95
17	96	97	99	100	100	100	100	100	100	99	89	77	71	63	53	50	54	60	64	68	71	76	77	81	81
18	87	90	92	94	97	99	100	100	97	89	79	70	61	54	51	51	51	63	70	71	83	87	82	80	79
19	83	87	86	83	83	81	84	79	78	73	61	48	45	44	44	43	43	79	91	92	81	80	82	75	72
20	68	53	56	51	50	50	49	57	56	49	42	36	33	33	32	31	30	31	33	34	35	39	47	56	44
21	61	64	66	68	73	75	82	79	63	51	43	39	37	37	36	36	37	37	37	37	40	40	42	42	51
22	44	44	45	53	53	51	50	46	43	35	27	26	25	25	24	25	25	27	31	36	39	40	46	50	38
23	54	57	60	67	69	73	79	77	64	52	40	37	33	30	30	32	33	37	40	40	49	61	63	61	52
24	46	42	49	52	54	58	63	65	54	45	40	36	29	26	28	27	26	27	30	33	34	37	39	43	41
25	49	55	59	61	66	72	72	70	56	45	35	26	22	20	18	18	17	17	19	26	28	30	35	40	40
26	42	45	49	52	54	55	59	57	47	36	29	23	19	17	16	15	13	17	20	23	26	29	33	36	34
27	38	41	43	46	48	48	51	54	43	33	22	17	15	14	15	15	13	23	35	42	54	63	67	73	38
28	89	93	95	90	94	96	94	97	94	89	85	76	78	60	52	47	44	43	49	55	58	63	70	74	74
HRAVE	50	51	53	54	56	57	59	59	54	47	41	36	34	31	31	31	32	36	39	41	43	46	48	50	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	21	20	25	28	30	31	21	19	18	20	26	48	49	65	100	95	81	79	72	44	51	38	52	41	40
MAX	35	32	34	40	49	47	34	30	27	30	37	62	78	100	100	100	100	100	92	68	82	53	79	65	72
MIN	10	11	15	17	18	19	12	11	10	12	17	29	25	40	100	78	50	51	43	30	36	24	30	26	17

DAY	26	27	28	29	30	31
AVE	34	38	74	***	***	***
MAX	59	73	97	***	***	***
MIN	13	13	43	***	***	***

MONTHLY AVERAGE = 45.0 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 9.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
FEBRUARY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.37	0.53	0.62	0.67	0.68	0.60	0.44	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.44
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.53	0.67	0.72	0.73	0.60	0.40	0.22	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.48
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.38	0.55	0.67	0.71	0.70	0.61	0.47	0.28	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.62
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.39	0.55	0.68	0.72	0.70	0.61	0.47	0.29	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.69
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.40	0.56	0.68	0.73	0.62	0.65	0.47	0.28	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.66
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.40	0.56	0.68	0.72	0.70	0.61	0.47	0.28	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.70
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.41	0.58	0.70	0.75	0.73	0.65	0.50	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00	4.94
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.41	0.58	0.70	0.75	0.73	0.65	0.50	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00	4.95
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.42	0.59	0.71	0.76	0.74	0.66	0.52	0.29	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.01
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.42	0.58	0.70	0.75	0.70	0.55	0.45	0.22	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.64
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.58	0.69	0.75	0.73	0.64	0.50	0.30	0.08	0.00	0.00	0.00	0.00	0.00	0.00	4.90
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.42	0.61	0.70	0.65	0.46	0.25	0.17	0.14	0.04	0.00	0.00	0.00	0.00	0.00	0.00	3.70
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.45	0.58	0.59	0.76	0.74	0.54	0.33	0.20	0.06	0.00	0.00	0.00	0.00	0.00	0.00	4.51
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.11	0.12	0.20	0.19	0.14	0.10	0.08	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.05
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.13	0.17	0.20	0.27	0.21	0.19	0.12	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.41
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.18	0.17	0.15	0.28	0.17	0.08	0.06	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.21
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.35	0.55	0.72	0.57	0.67	0.59	0.38	0.18	0.06	0.00	0.00	0.00	0.00	0.00	0.00	4.19
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.16	0.28	0.36	0.58	0.66	0.27	0.32	0.44	0.31	0.05	0.00	0.00	0.00	0.00	0.00	0.00	3.47
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.14	0.57	0.42	0.81	0.72	0.63	0.52	0.23	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.17
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.24	0.35	0.55	0.56	0.54	0.70	0.68	0.53	0.34	0.12	0.00	0.00	0.00	0.00	0.00	0.00	4.64
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.30	0.49	0.62	0.75	0.64	0.72	0.44	0.29	0.15	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.50
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.27	0.47	0.64	0.75	0.80	0.78	0.69	0.54	0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00	5.46
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.47	0.64	0.76	0.81	0.79	0.70	0.53	0.34	0.13	0.00	0.00	0.00	0.00	0.00	0.00	5.51
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.48	0.65	0.77	0.82	0.80	0.71	0.56	0.36	0.14	0.01	0.00	0.00	0.00	0.00	0.00	5.66
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.49	0.66	0.78	0.83	0.81	0.72	0.57	0.38	0.15	0.01	0.00	0.00	0.00	0.00	0.00	5.76
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.49	0.66	0.78	0.83	0.81	0.73	0.57	0.38	0.15	0.01	0.00	0.00	0.00	0.00	0.00	5.77
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.30	0.50	0.67	0.73	0.70	0.81	0.72	0.57	0.37	0.13	0.01	0.00	0.00	0.00	0.00	0.00	5.57
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.13	0.16	0.38	0.64	0.45	0.37	0.50	0.35	0.15	0.01	0.00	0.00	0.00	0.00	0.00	3.22
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.37	0.52	0.62	0.67	0.64	0.55	0.43	0.26	0.07	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.44	4.48	4.62	4.69	4.66	4.70	4.94	4.95	5.01	4.64	4.90	3.70	4.51	1.05	1.41	1.21	4.19	3.47	4.17	4.64	4.50	5.46	5.51	5.66	5.76
MAX	0.68	0.73	0.71	0.72	0.73	0.72	0.75	0.75	0.76	0.75	0.75	0.70	0.76	0.20	0.27	0.28	0.72	0.66	0.81	0.70	0.75	0.80	0.81	0.82	0.83
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.77	5.57	3.22	***	***	***
MAX	0.83	0.81	0.64	***	***	***
MIN	0.00	0.00	0.00	***	***	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
FEBRUARY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.02	0.03	0.03	0.04	0.05	0.12	0.06	0.11	0.50
15	0.09	0.10	0.12	0.09	0.11	0.07	0.06	0.10	0.09	0.02	0.00	0.00	0.02	0.02	0.03	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.95	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.07	***	***	***
MAX	0.00	0.00	0.03	***	***	***
MIN	0.00	0.00	0.00	***	***	***

MONTHLY TOTAL = 1.55 MONTHLY MAXIMUM = 0.12 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
MARCH - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	3.0	2.7	3.0	2.3	3.2	3.9	4.0	3.3	3.8	2.8	6.4	5.4	3.5	2.5	1.8	1.7	2.2	1.8	2.2	3.0	5.9	5.7	3.0	1.7	3.3
2	2.0	3.1	3.9	3.5	3.8	3.7	3.8	4.3	3.1	3.1	2.7	2.0	2.4	2.6	2.8	4.1	6.2	6.7	7.0	6.1	5.2	1.4	2.4	2.8	3.7
3	3.2	3.5	2.9	3.0	3.0	3.2	3.5	3.9	3.2	2.6	0.9	1.2	2.5	2.7	7.2	7.7	9.0	10.3	7.0	3.4	1.8	1.4	2.5	2.8	3.9
4	2.4	1.2	1.0	1.8	1.8	1.8	3.2	2.4	1.1	1.6	4.2	5.8	6.3	7.5	7.5	7.6	6.8	6.6	6.4	5.7	4.6	2.6	3.3	3.0	4.0
5	1.6	2.3	3.3	1.8	2.1	2.8	3.5	2.5	2.2	3.5	3.5	3.0	3.2	3.7	2.5	1.9	2.7	2.9	7.0	6.4	4.3	1.4	1.2	1.1	2.9
6	1.4	2.6	3.9	3.6	4.1	4.1	3.3	2.5	4.2	4.1	8.7	7.7	8.4	7.8	6.7	6.4	5.5	5.9	6.6	5.8	4.2	7.4	6.8	5.7	5.3
7	4.3	4.5	4.1	3.8	4.0	4.1	3.8	4.8	3.8	6.5	5.6	4.7	4.0	2.9	3.8	5.1	4.8	6.7	6.7	4.7	3.5	0.9	1.2	1.5	4.2
8	2.8	2.7	2.7	3.5	3.3	2.9	3.2	2.6	2.1	1.5	0.8	0.9	1.6	3.0	5.6	6.5	6.4	6.1	5.2	4.0	2.1	2.1	2.1	1.9	3.1
9	3.3	3.5	2.7	2.9	2.6	3.0	2.0	2.6	1.7	1.1	0.8	1.2	4.0	4.3	6.5	7.1	6.9	6.5	4.7	1.2	0.6	1.6	2.7	3.5	3.2
10	3.5	2.7	2.4	2.4	2.3	2.1	2.0	2.2	2.1	1.4	1.1	0.8	1.2	2.4	3.7	5.3	7.4	5.7	5.5	4.8	3.7	3.4	4.7	3.9	3.2
11	2.6	3.1	1.4	1.8	0.6	1.1	1.7	1.6	0.8	1.0	0.9	1.6	1.5	2.7	3.7	3.3	3.8	2.7	2.5	1.8	1.1	2.0	2.6	3.7	2.1
12	4.7	6.4	7.2	7.1	7.9	7.8	8.2	8.9	10.1	8.4	8.6	7.9	7.2	6.2	6.1	5.9	6.0	6.5	6.3	5.3	6.9	7.0	8.4	7.3	7.2
13	6.6	6.3	6.4	6.5	7.6	7.6	8.2	7.9	8.4	6.5	6.0	5.8	5.0	4.5	2.9	2.5	1.8	1.2	2.0	3.6	4.9	4.1	2.3	1.9	5.0
14	2.7	3.1	3.2	3.5	2.3	2.5	3.2	3.2	2.2	2.5	2.2	3.1	3.0	3.2	3.9	8.0	5.7	5.8	5.8	6.7	7.2	7.8	8.1	6.2	4.4
15	5.4	4.6	6.9	7.6	7.1	7.3	7.4	6.8	5.3	4.8	3.6	6.3	8.0	8.9	8.8	7.8	6.8	6.8	6.6	5.3	3.3	0.5	1.5	2.3	5.8
16	3.2	3.0	2.2	2.6	3.3	4.1	2.7	3.5	2.3	1.6	1.5	2.0	1.8	2.8	3.3	3.2	5.0	6.4	6.5	6.5	7.7	7.3	6.8	3.6	3.9
17	2.5	2.4	0.9	1.9	1.6	1.1	1.0	1.9	1.4	1.0	1.0	3.4	4.2	6.7	7.2	7.2	8.0	7.4	6.4	3.7	1.7	2.1	1.8	2.6	3.3
18	4.5	5.1	3.8	3.0	4.6	6.3	5.6	5.6	5.6	4.6	4.6	4.8	6.1	7.9	8.1	6.6	5.8	5.2	3.8	3.1	3.0	1.1	1.4	3.3	4.7
19	2.4	3.2	3.3	3.3	4.4	4.2	4.0	3.5	3.7	7.2	3.3	2.7	1.9	2.7	1.9	3.4	4.3	4.5	4.9	5.4	5.1	3.0	2.4	3.1	3.7
20	3.5	3.4	3.7	2.6	4.0	3.3	3.6	3.2	2.8	2.8	2.4	1.6	1.3	1.3	1.7	3.8	6.3	7.2	5.7	4.4	2.8	1.1	2.1	2.4	3.2
21	3.2	3.2	2.9	2.7	2.8	2.9	3.1	2.3	2.2	0.8	0.6	1.2	3.1	5.0	4.7	5.3	5.8	5.2	4.6	2.5	0.7	0.4	2.5	2.0	2.9
22	2.6	4.1	3.3	4.0	3.3	4.7	3.7	4.1	3.1	3.1	2.4	1.5	1.9	2.1	1.9	5.1	9.4	7.9	4.4	4.5	6.2	3.5	1.5	2.3	3.8
23	2.8	2.6	2.5	3.5	3.1	3.0	3.2	1.2	1.0	5.9	6.1	5.7	7.0	7.0	6.6	5.6	6.7	6.0	4.8	2.6	1.6	0.9	1.7	3.2	3.9
24	2.8	3.2	3.9	3.5	3.8	2.0	1.4	2.7	1.7	1.5	0.8	1.7	5.2	8.2	9.8	6.4	4.6	5.3	4.0	4.3	2.8	3.2	3.9	3.7	3.8
25	2.8	1.2	2.1	2.5	2.3	1.1	0.9	1.7	1.6	0.9	2.2	3.3	5.3	5.5	7.0	7.2	8.0	7.0	4.8	3.4	3.1	3.0	3.0	3.8	3.5
26	4.1	1.9	2.2	2.7	3.1	2.0	0.6	0.9	0.8	1.0	1.6	1.9	3.4	6.3	6.3	6.3	6.7	5.7	5.3	6.6	8.6	6.2	1.4	1.8	3.6
27	1.9	2.9	1.7	1.3	1.6	1.8	1.9	0.6	1.0	1.5	3.0	4.4	4.8	5.0	5.1	4.9	4.2	6.1	7.2	5.7	5.1	2.8	3.0	2.4	3.3
28	2.3	3.5	2.8	3.4	2.6	2.8	2.4	1.8	1.9	0.7	1.1	3.4	5.6	6.5	7.6	7.6	7.5	7.0	6.4	3.6	0.9	2.4	3.0	3.4	3.8
29	3.9	3.2	3.5	3.0	3.2	2.3	3.2	2.8	1.6	1.4	1.3	1.3	1.6	3.3	5.8	6.7	6.8	7.0	5.7	3.7	2.1	2.5	2.6	3.6	3.4
30	3.9	3.8	3.9	3.5	3.0	2.6	2.8	2.5	1.8	1.5	1.4	0.9	2.9	5.4	7.0	7.3	7.0	6.8	4.8	2.9	1.6	2.3	3.2	3.9	3.6
31	3.9	3.9	3.3	2.1	2.4	2.6	3.3	2.2	2.2	1.4	0.6	0.9	1.3	1.7	2.3	4.4	7.3	7.9	6.9	4.0	2.4	1.1	2.4	3.4	3.1
HRAVE	3.2	3.3	3.3	3.2	3.4	3.4	3.4	3.2	2.9	2.9	2.9	3.2	3.8	4.6	5.2	5.5	6.0	6.0	5.4	4.3	3.7	3.0	3.1	3.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.3	3.7	3.9	4.0	2.9	5.3	4.2	3.1	3.2	3.2	2.1	7.2	5.0	4.4	5.8	3.9	3.3	4.7	3.7	3.2	2.9	3.8	3.9	3.8	3.5
MAX	6.4	7.0	10.3	7.6	7.0	8.7	6.7	6.5	7.1	7.4	3.8	10.1	8.4	8.1	8.9	7.7	8.0	8.1	7.2	7.2	5.8	9.4	7.0	9.8	8.0
MIN	1.7	1.4	0.9	1.0	1.1	1.4	0.9	0.8	0.6	0.8	0.6	4.7	1.2	2.2	0.5	1.5	0.9	1.1	1.9	1.1	0.4	1.5	0.9	0.8	0.9

DAY	26	27	28	29	30	31
AVE	3.6	3.3	3.8	3.4	3.6	3.1
MAX	8.6	7.2	7.6	7.0	7.3	7.9
MIN	0.6	0.6	0.7	1.3	0.9	0.6

MONTHLY AVERAGE = 3.8 MONTHLY MAXIMUM = 10.3 MONTHLY MINIMUM = 0.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MARCH - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	105	102	109	145	122	110	115	115	117	135	74	74	71	60	82	110	136	165	29	322	311	302	282	118	356
2	101	112	110	105	108	108	98	95	119	139	155	119	103	141	121	159	289	298	302	301	299	204	104	109	280
3	85	99	109	94	100	108	97	95	97	86	277	302	307	285	268	288	289	285	281	292	164	166	169	216	159
4	267	105	140	145	243	311	321	293	295	270	287	290	286	292	287	289	281	289	299	295	299	315	308	307	96
5	156	118	93	134	107	129	155	157	143	149	103	63	68	87	71	230	261	272	302	300	306	350	76	303	104
6	320	125	136	139	135	127	119	115	150	147	74	49	38	33	25	22	29	39	31	31	50	49	50	63	165
7	97	94	104	118	126	116	120	145	133	79	51	63	58	59	74	71	52	48	31	1	318	33	298	131	267
8	93	102	93	94	102	113	93	92	102	130	131	184	281	280	299	297	283	282	297	307	293	144	116	115	132
9	104	91	101	92	102	108	99	97	104	154	151	258	290	295	281	283	282	284	281	289	81	159	111	114	210
10	118	109	105	101	83	104	121	113	123	112	143	221	266	281	296	272	253	301	284	283	271	289	316	44	228
11	50	56	349	13	320	289	32	309	79	277	43	109	311	299	285	286	294	297	316	311	343	98	99	72	342
12	69	65	64	66	59	63	68	69	72	77	89	89	78	76	73	67	24	31	39	48	46	47	48	53	293
13	66	65	70	64	58	57	49	61	64	68	47	40	42	37	40	43	37	29	321	308	302	301	277	124	173
14	98	102	98	90	93	94	93	99	116	133	115	134	145	148	179	244	233	249	250	252	246	268	286	266	338
15	267	286	301	295	292	293	289	288	288	244	253	260	257	260	281	275	274	282	273	289	281	84	133	124	91
16	108	92	105	86	92	85	99	97	127	106	118	142	144	299	299	283	231	244	256	281	283	287	306	316	63
17	317	315	54	93	31	71	74	108	110	150	270	301	311	269	286	282	286	278	279	286	204	247	249	215	339
18	223	212	188	228	236	271	289	276	254	282	269	262	280	280	280	282	274	300	295	293	314	266	132	107	97
19	98	106	136	107	85	74	81	109	119	72	71	102	211	269	263	278	277	273	285	302	304	297	147	99	313
20	104	111	109	111	120	119	123	107	122	123	140	159	86	274	296	292	293	296	288	300	284	161	119	104	17
21	105	96	97	98	105	117	122	115	117	19	296	301	280	306	309	299	284	287	281	310	306	310	116	88	18
22	109	102	110	87	126	105	109	95	125	124	126	89	62	16	333	286	290	298	298	296	294	308	254	132	199
23	112	110	98	95	103	94	278	163	235	294	294	277	280	285	278	277	290	282	301	304	304	8	109	102	250
24	101	97	92	82	73	37	59	86	111	108	187	264	247	239	249	254	255	245	257	281	296	262	254	300	81
25	281	131	86	86	88	78	97	108	99	232	296	292	274	285	276	281	293	300	295	289	292	302	326	321	117
26	313	283	285	292	292	237	265	115	92	209	273	214	286	264	271	277	284	268	292	270	279	293	330	149	332
27	120	130	118	62	152	115	111	12	107	305	293	306	297	273	268	282	358	284	17	48	53	96	73	76	62
28	95	97	111	100	130	95	79	113	122	136	246	277	284	281	278	283	278	273	281	288	350	130	130	109	157
29	103	101	101	120	115	116	108	115	127	93	136	276	277	279	294	281	287	280	289	293	280	135	108	110	304
30	102	102	111	115	111	124	107	103	135	116	141	253	295	299	285	280	277	275	285	294	246	132	121	98	335
31	106	85	95	94	92	113	106	109	116	152	173	138	43	265	286	293	290	292	297	301	285	172	102	98	292

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MARCH - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	10	11	10	12	7	7	8	8	8	18	11	20	27	37	53	43	29	23	18	19	6	4	28	11	18
2	11	10	7	9	8	7	6	5	7	13	16	33	30	35	42	40	13	10	7	5	7	45	12	9	16
3	10	11	11	8	7	7	7	7	9	13	48	55	27	31	17	13	13	7	5	3	32	14	10	14	16
4	18	19	19	16	34	51	14	19	41	39	22	18	16	16	14	16	14	12	9	6	7	18	10	18	19
5	27	9	8	22	13	10	8	12	13	14	23	31	36	25	35	46	22	19	7	5	6	38	32	31	21
6	26	14	7	10	6	6	7	12	6	20	14	19	14	15	16	17	17	13	10	11	12	9	9	8	12
7	16	13	17	14	9	17	19	7	18	12	18	19	27	29	18	10	14	6	10	15	9	52	40	14	18
8	9	7	7	7	9	10	7	9	11	22	53	50	44	27	16	13	12	8	9	9	45	7	12	8	17
9	10	8	9	8	10	8	9	8	12	28	41	53	23	23	17	13	12	9	7	20	24	24	8	8	16
10	8	12	16	13	12	7	9	9	10	20	34	53	32	16	13	17	18	14	12	8	22	15	12	24	17
11	42	30	41	46	41	17	23	28	25	19	32	23	55	26	22	26	17	18	10	13	37	29	15	11	27
12	13	7	10	10	11	10	7	8	9	12	13	15	14	14	17	18	17	15	12	13	9	11	9	11	12
13	10	11	7	10	11	11	10	12	10	13	17	19	22	25	33	32	49	32	39	16	6	7	41	9	19
14	7	10	9	8	13	8	7	7	8	12	22	18	25	36	33	15	19	17	11	9	9	9	6	11	14
15	9	7	7	7	6	8	7	8	9	16	21	21	16	18	14	19	17	12	12	7	15	46	7	8	13
16	7	8	11	14	9	7	10	10	14	23	47	50	57	48	35	35	24	17	11	7	6	6	7	23	20
17	19	17	34	9	37	17	35	9	16	35	55	38	30	21	15	19	10	13	8	5	18	20	17	12	21
18	12	10	11	16	13	11	9	13	16	21	19	21	20	16	17	22	16	16	10	5	8	54	38	10	17
19	19	13	16	8	11	10	12	15	16	9	20	25	43	30	65	53	20	15	8	7	5	9	23	9	19
20	12	10	6	8	7	8	6	8	12	17	23	45	59	57	43	30	15	9	7	6	13	33	10	9	19
21	6	8	7	8	7	8	8	9	13	51	53	39	20	23	22	18	13	13	6	9	42	26	16	21	19
22	11	8	8	8	9	8	11	7	10	14	27	28	27	27	31	15	10	9	10	7	7	9	32	5	14
23	8	9	11	12	11	34	25	44	52	16	15	17	18	19	18	17	12	15	9	7	12	20	12	10	18
24	11	7	19	14	9	33	15	10	18	27	56	30	22	16	12	16	18	15	11	7	11	21	11	11	18
25	36	43	9	9	13	25	20	13	19	41	29	31	23	21	18	15	18	11	9	6	5	9	8	8	18
26	10	19	11	14	5	21	31	12	50	56	61	48	55	23	19	22	19	14	11	10	10	11	33	16	24
27	13	9	20	47	11	13	7	40	39	35	28	25	29	26	27	34	36	37	21	12	10	20	12	12	24
28	12	8	9	8	10	9	11	10	20	55	55	21	19	21	16	17	17	15	9	9	53	13	11	7	18
29	7	8	8	17	8	13	8	9	19	35	41	40	41	32	21	17	16	12	11	6	30	11	10	8	18
30	8	9	9	6	10	9	9	9	22	30	36	77	43	31	19	17	18	15	9	6	31	9	8	8	19
31	9	7	11	16	9	8	7	10	16	25	49	50	46	55	37	28	13	10	9	7	25	39	9	6	21
HRAVE	14	12	13	13	12	13	12	12	18	25	32	33	31	27	25	23	18	15	11	9	17	21	16	12	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	18	16	16	19	21	12	18	17	16	17	27	12	19	14	13	20	21	17	19	19	19	14	18	18	18
MAX	53	45	55	51	46	26	52	53	53	53	55	18	49	36	46	57	55	54	65	59	53	32	52	56	43
MIN	4	5	3	6	5	6	6	7	7	7	10	7	6	6	6	6	5	5	5	6	6	5	7	7	5

DAY	26	27	28	29	30	31
AVE	24	24	18	18	19	21
MAX	61	47	55	41	77	55
MIN	5	7	7	6	6	6

MONTHLY AVERAGE = 18.1 MONTHLY MAXIMUM = 76.7 MONTHLY MINIMUM = 3.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MARCH - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	5.5	4.9	4.5	2.9	2.8	2.5	2.5	3.2	4.9	7.9	11.8	13.4	15.7	17.3	18.4	19.2	19.7	19.6	18.5	16.8	15.3	14.3	13.2	11.7	11.1
2	10.4	8.9	8.8	8.1	7.6	6.7	5.8	6.3	9.0	12.3	15.9	18.8	21.3	23.1	24.2	25.2	24.2	22.7	20.7	18.8	17.8	16.8	15.4	13.9	15.1
3	12.5	11.7	10.5	9.1	8.8	7.8	7.3	7.8	10.4	13.7	15.7	18.4	21.0	22.6	23.5	23.1	22.5	21.7	19.9	18.7	16.6	15.4	14.9	15.1	15.4
4	14.6	13.5	12.4	10.7	9.9	8.5	9.5	9.8	11.2	13.1	14.8	16.1	17.4	17.6	17.7	17.7	17.5	16.6	15.2	14.1	13.1	12.5	12.0	11.5	13.6
5	10.1	9.4	8.8	7.2	7.0	6.3	5.7	5.7	7.9	12.8	15.5	16.6	18.1	19.3	19.7	20.7	20.9	20.4	18.1	16.4	15.4	15.2	13.8	13.3	13.5
6	11.9	9.7	8.8	8.3	7.3	7.6	7.6	6.6	6.8	11.4	16.5	18.4	19.7	20.8	22.3	23.1	23.5	23.0	22.2	21.2	20.4	19.9	19.2	17.5	15.6
7	15.5	13.7	12.6	11.1	10.2	9.9	9.3	9.2	12.0	17.4	19.6	21.5	23.2	24.7	24.9	24.7	24.4	23.5	22.9	22.1	21.2	20.3	19.6	17.9	18.0
8	16.6	15.8	14.4	13.5	12.9	11.5	11.9	11.3	12.7	15.6	18.3	20.8	23.2	25.0	25.8	25.7	24.9	23.8	22.3	21.3	20.1	18.2	17.1	15.9	18.3
9	14.1	13.7	12.3	11.4	11.0	10.5	9.9	10.3	11.9	14.7	18.2	21.1	24.0	25.1	25.8	25.7	25.3	24.1	22.7	21.8	20.8	19.4	18.2	17.6	17.9
10	16.9	15.8	15.2	14.1	12.8	12.2	11.2	11.7	13.0	15.8	18.9	21.3	22.2	22.8	23.0	22.6	20.8	19.5	18.0	17.2	16.5	16.1	15.0	14.7	17.0
11	14.1	14.1	13.8	14.1	13.9	13.9	13.0	12.7	13.0	13.4	13.6	14.8	17.5	19.3	20.0	21.3	21.6	21.3	20.1	19.4	18.2	16.8	15.6	15.1	16.3
12	15.0	15.0	15.4	15.3	15.2	14.6	14.2	14.6	16.0	17.4	19.2	20.5	21.8	22.3	23.3	23.9	23.8	23.3	22.5	21.8	21.2	20.6	20.3	19.5	19.0
13	18.4	17.5	16.4	16.5	16.4	15.9	16.1	15.8	17.5	19.5	21.1	22.9	24.4	25.1	26.2	26.6	26.6	26.2	25.3	24.1	23.0	22.1	21.3	20.0	21.0
14	18.7	17.7	16.9	16.6	15.1	14.8	14.2	14.0	14.7	17.7	21.0	23.9	25.9	27.3	28.4	28.3	27.7	27.1	25.7	24.6	23.4	22.3	20.3	19.3	21.1
15	18.6	17.3	15.9	14.7	14.1	13.5	12.7	12.8	12.8	11.6	13.5	16.0	17.8	18.2	18.5	18.7	19.1	19.2	18.1	16.7	15.4	14.8	13.1	12.7	15.7
16	12.0	11.4	10.3	9.5	9.0	8.0	7.8	8.8	11.2	13.7	16.5	18.4	19.9	21.0	21.7	22.9	23.8	22.6	20.6	19.1	18.0	16.8	16.1	15.4	15.6
17	14.9	14.4	13.1	11.1	9.8	9.3	8.4	8.9	11.4	14.3	16.5	18.0	19.0	20.3	20.3	20.3	20.0	19.6	18.3	17.1	16.0	15.5	14.9	13.9	15.2
18	13.0	12.7	11.3	11.4	11.6	11.4	11.0	9.9	8.3	8.8	10.4	13.4	15.2	16.3	16.5	16.6	16.1	15.7	14.7	13.4	12.9	12.1	10.9	9.5	12.6
19	8.3	7.7	6.8	7.1	8.2	9.2	9.0	7.6	10.4	13.7	15.3	17.1	18.2	19.1	19.7	20.8	21.0	20.3	18.8	17.1	16.2	15.4	13.4	12.2	13.9
20	10.9	9.4	8.6	7.8	6.8	6.2	5.6	7.8	10.5	14.4	17.1	20.0	22.1	24.0	24.8	25.5	25.5	23.9	22.3	20.8	19.8	18.9	17.3	16.0	16.1
21	14.8	13.6	12.7	11.9	11.1	10.5	10.1	10.8	14.0	16.5	19.6	22.5	24.8	26.3	26.8	27.0	26.8	25.9	24.5	23.1	22.4	21.1	18.9	18.0	18.9
22	16.5	15.7	15.8	14.9	13.6	13.5	13.3	15.1	17.8	20.9	25.3	27.2	28.6	30.0	30.6	31.0	30.3	28.5	27.2	25.5	24.4	23.5	23.0	21.6	22.2
23	20.1	18.7	17.8	17.6	17.4	16.5	17.0	17.2	19.8	22.0	22.9	24.1	25.2	26.0	26.2	26.4	26.0	25.2	23.9	22.7	22.0	20.9	19.4	18.1	21.4
24	17.5	16.7	16.1	15.1	14.6	13.6	13.1	14.2	16.6	20.1	22.9	24.2	26.3	25.1	24.0	23.0	23.2	22.9	21.7	20.1	18.9	18.5	17.0	16.1	19.2
25	15.9	14.4	13.7	12.4	11.3	11.0	10.3	10.9	14.4	16.3	19.1	21.2	22.8	23.6	24.1	23.8	22.5	21.5	20.6	19.6	18.8	18.0	17.6	17.0	17.5
26	16.5	15.6	15.0	14.5	13.9	13.2	13.3	12.4	14.2	16.6	18.5	20.0	21.2	21.9	22.0	22.2	21.5	20.3	19.1	18.3	17.0	16.0	15.3	14.8	17.2
27	13.8	12.5	11.5	10.8	9.9	9.3	8.9	9.3	12.1	14.6	16.6	18.3	19.4	20.2	20.5	20.8	19.2	19.1	17.8	16.2	15.5	14.8	14.0	13.0	14.9
28	12.0	11.2	10.0	9.0	8.3	7.7	7.0	8.2	11.9	14.3	16.7	19.5	21.3	22.4	22.6	22.7	22.7	22.3	21.1	19.4	18.7	16.8	15.9	14.8	15.7
29	14.3	12.6	11.7	10.9	9.9	8.6	8.9	10.8	13.1	17.2	20.5	22.1	24.3	26.4	27.1	27.3	27.1	26.5	25.1	23.3	22.5	20.7	19.8	18.5	18.7
30	17.5	16.3	15.4	14.2	13.2	12.2	11.9	14.3	16.2	19.4	23.3	25.7	27.8	28.6	29.2	29.0	28.7	28.0	26.5	24.9	23.4	21.5	20.4	19.4	21.1
31	18.1	16.4	15.8	15.2	13.8	12.9	13.0	13.6	17.0	19.6	21.6	24.9	27.7	29.2	29.8	30.8	30.7	29.4	27.7	26.0	25.0	24.3	22.6	21.1	21.9
HRAVE	14.5	13.5	12.7	11.8	11.2	10.6	10.3	10.7	12.7	15.4	17.9	20.0	21.8	22.9	23.5	23.8	23.5	22.7	21.4	20.0	19.0	18.1	17.0	16.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	11.1	15.1	15.4	13.6	13.5	15.6	18.0	18.3	17.9	17.0	16.3	19.0	21.0	21.1	15.7	15.6	15.2	12.6	13.9	16.1	18.9	22.2	21.4	19.2	17.5
MAX	19.7	25.2	23.5	17.7	20.9	23.5	24.9	25.8	25.8	23.0	21.6	23.9	26.6	28.4	19.2	23.8	20.3	16.6	21.0	25.5	27.0	31.0	26.4	26.3	24.1
MIN	2.5	5.8	7.3	8.5	5.7	6.6	9.2	11.3	9.9	11.2	12.7	14.2	15.8	14.0	11.6	7.8	8.4	8.3	6.8	5.6	10.1	13.3	16.5	13.1	10.3

DAY	26	27	28	29	30	31
AVE	17.2	14.9	15.7	18.7	21.1	21.9
MAX	22.2	20.8	22.7	27.3	29.2	30.8
MIN	12.4	8.9	7.0	8.6	11.9	12.9

MONTHLY AVERAGE = 17.1 MONTHLY MAXIMUM = 31.0 MONTHLY MINIMUM = 2.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MARCH - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.6	0.5	0.4	0.6	0.5	0.5	0.2	-0.4	-1.2	-1.0	-1.1	-1.1	-1.2	-1.0	-0.8	-0.7	-0.4	-0.1	0.5	0.4	0.4	0.4	0.6	0.4	-0.1
2	0.6	0.6	0.3	0.4	0.4	0.4	0.5	-0.2	-1.1	-1.2	-1.3	-1.1	-1.2	-1.2	-1.1	-1.0	-0.6	-0.2	0.2	0.4	0.7	0.5	0.7	0.6	-0.2
3	0.6	0.6	0.6	0.8	0.7	0.6	0.5	-0.2	-1.3	-1.4	-0.6	-0.8	-0.9	-0.9	-0.9	-0.9	-0.6	-0.2	0.3	0.7	0.6	0.3	0.6	0.7	0.0
4	0.7	0.4	0.4	0.3	0.8	0.6	0.3	0.2	-0.4	-0.6	-0.8	-0.9	-1.0	-1.1	-1.1	-1.1	-0.8	-0.5	0.0	0.2	0.3	0.3	0.3	0.3	-0.1
5	0.5	0.4	0.5	0.5	0.4	0.6	0.6	0.6	-0.7	-1.5	-1.4	-1.1	-1.2	-1.3	-0.9	-0.8	-0.7	-0.4	0.2	0.3	0.4	0.3	0.7	0.6	-0.1
6	0.7	0.9	0.6	1.2	0.6	0.6	0.6	0.6	0.4	-0.6	-0.8	-0.8	-0.7	-0.7	-0.6	-0.4	-0.1	0.2	0.3	0.5	0.4	0.3	0.3	0.6	0.2
7	0.6	0.9	0.9	1.3	1.5	1.4	1.3	0.4	-0.1	-0.6	-0.6	-0.8	-1.0	-1.0	-0.8	-0.5	-0.2	0.0	0.1	0.3	0.5	0.4	0.3	0.3	0.2
8	0.6	0.6	0.6	0.6	0.4	0.6	0.5	0.0	-0.6	-0.8	-0.6	-0.7	-0.7	-0.8	-0.9	-0.7	-0.4	-0.2	0.3	0.6	0.7	0.4	0.5	0.5	0.0
9	0.6	0.5	0.7	0.5	0.4	0.4	0.6	0.2	-0.6	-0.6	-0.7	-0.8	-1.0	-1.0	-1.0	-1.0	-0.6	-0.2	0.2	0.3	0.5	0.5	0.5	0.3	-0.1
10	0.2	0.5	0.5	0.6	0.7	0.6	0.5	0.0	-0.4	-0.7	-0.6	-0.6	-0.4	-0.5	-0.3	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0
11	-0.1	-0.1	0.0	-0.1	-0.1	0.0	0.1	0.0	-0.1	-0.2	-0.2	-0.6	-0.8	-0.9	-0.8	-0.9	-0.6	-0.3	0.2	0.5	0.3	0.5	0.5	0.6	-0.1
12	0.4	0.5	0.3	0.2	0.1	0.2	0.2	-0.1	-0.5	-0.8	-1.2	-1.3	-1.1	-0.9	-0.8	-0.6	-0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	-0.2
13	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.0	-0.4	-0.8	-0.9	-0.9	-1.1	-0.9	-0.8	-0.8	-0.4	-0.1	0.2	0.3	0.3	0.4	0.4	0.4	-0.1
14	0.4	0.5	0.6	0.5	0.5	0.7	0.5	0.3	-0.3	-0.9	-1.4	-1.7	-1.5	-1.4	-1.2	-1.1	-0.9	-0.4	0.0	0.2	0.2	0.2	0.2	0.2	-0.3
15	0.2	0.2	0.1	0.1	0.1	0.1	0.0	-0.2	-0.2	-0.3	-0.5	-0.6	-1.1	-1.0	-1.0	-0.9	-0.7	-0.5	0.0	0.2	0.4	0.4	0.7	0.4	-0.2
16	0.4	0.5	0.5	0.5	0.6	0.4	0.2	-0.1	-0.8	-0.9	-0.9	-1.0	-0.9	-1.0	-0.9	-0.9	-0.9	-0.5	0.0	0.1	0.1	0.1	0.2	0.2	-0.2
17	0.3	0.4	0.5	0.5	0.6	0.8	0.4	-0.5	-0.8	-0.7	-0.8	-1.0	-1.0	-1.3	-1.4	-1.1	-0.9	-0.5	-0.1	0.3	0.4	0.3	0.3	0.3	-0.2
18	0.2	0.2	0.2	0.2	0.1	0.0	-0.1	-0.1	-0.2	-0.3	-0.6	-0.9	-1.0	-1.2	-1.1	-1.0	-0.6	-0.5	0.0	0.4	0.3	0.6	0.4	0.6	-0.2
19	0.6	0.5	0.6	0.8	0.9	0.7	0.6	0.7	-0.5	-0.9	-1.1	-1.5	-1.1	-1.0	-0.9	-1.1	-0.9	-0.6	-0.1	0.3	0.5	0.6	0.6	0.7	-0.1
20	0.6	0.8	0.8	0.8	0.4	0.5	0.5	-0.9	-1.5	-1.8	-1.4	-1.1	-1.0	-0.9	-1.0	-1.0	-0.8	-0.2	0.1	0.4	0.5	0.4	0.5	0.6	-0.2
21	0.6	0.6	0.7	0.6	0.6	0.6	0.4	-0.3	-1.2	-0.6	-0.6	-0.8	-0.9	-1.1	-1.0	-0.8	-0.7	-0.4	0.1	0.6	0.5	0.5	0.8	0.8	0.0
22	0.5	0.7	0.7	0.6	0.5	0.7	0.5	-0.7	-1.4	-1.5	-1.3	-1.0	-1.0	-0.9	-0.7	-0.6	-0.6	-0.1	0.2	0.3	0.3	0.5	0.4	0.5	-0.1
23	0.5	0.5	0.3	0.3	0.4	0.6	0.5	-0.2	-0.3	-0.6	-0.9	-1.0	-1.2	-1.3	-1.2	-1.1	-1.0	-0.5	0.0	0.4	0.4	0.5	0.6	0.6	-0.2
24	0.6	0.5	0.6	0.8	0.6	0.4	0.2	-0.7	-0.8	-0.8	-0.7	-0.8	-1.0	-0.5	-0.3	-0.3	-0.5	-0.2	0.1	0.4	0.6	0.5	0.4	0.6	0.0
25	0.4	0.6	0.8	0.6	0.6	0.6	0.4	-0.5	-1.0	-0.6	-0.9	-1.0	-1.1	-1.3	-1.2	-1.1	-0.8	-0.3	0.0	0.2	0.3	0.3	0.2	0.2	-0.2
26	0.2	0.3	0.4	0.4	0.5	0.3	0.2	0.2	-0.4	-0.7	-0.8	-1.2	-1.2	-1.3	-1.3	-1.2	-0.9	-0.4	-0.1	0.0	0.0	0.0	0.0	0.2	-0.3
27	0.3	0.3	0.4	0.3	0.3	0.5	0.5	-0.1	-0.6	-0.7	-1.0	-1.1	-1.4	-1.3	-1.4	-1.4	-0.7	-0.5	-0.2	-0.1	0.0	0.1	0.3	0.3	-0.3
28	0.3	0.3	0.6	0.6	0.4	0.6	0.2	-0.4	-1.1	-0.4	-0.7	-1.1	-1.3	-1.2	-1.3	-1.2	-0.9	-0.6	-0.1	0.3	0.3	0.5	0.5	0.4	-0.2
29	0.5	0.6	0.8	0.6	0.6	0.7	0.4	-0.9	-0.9	-1.1	-1.0	-0.8	-0.9	-1.2	-1.2	-1.2	-0.9	-0.6	0.0	0.5	0.4	0.5	0.6	0.6	-0.2
30	0.7	0.6	0.6	0.6	0.6	0.6	0.4	-1.0	-0.9	-0.9	-1.1	-0.9	-1.2	-1.2	-1.4	-1.1	-0.9	-0.6	0.0	0.5	0.6	0.6	0.6	0.5	-0.2
31	0.5	0.5	0.5	0.7	0.8	0.7	0.5	-0.4	-1.2	-0.7	-0.4	-0.7	-0.9	-0.9	-1.0	-1.0	-0.9	-0.4	0.1	0.5	0.6	0.5	0.8	0.7	-0.1
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.2	-0.7	-0.8	-0.9	-1.0	-1.0	-1.0	-1.0	-0.9	-0.7	-0.3	0.1	0.3	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	-0.2	0.0	-0.1	-0.1	0.2	0.2	0.0	-0.1	0.0	-0.1	-0.2	-0.1	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	0.0	-0.1	-0.2	0.0	-0.2
MAX	0.6	0.7	0.8	0.8	0.7	1.2	1.5	0.7	0.7	0.7	0.6	0.5	0.4	0.7	0.7	0.6	0.8	0.6	0.9	0.8	0.8	0.7	0.6	0.8	0.8
MIN	-1.2	-1.3	-1.4	-1.1	-1.5	-0.8	-1.0	-0.9	-1.0	-0.7	-0.9	-1.3	-1.1	-1.7	-1.1	-1.0	-1.4	-1.2	-1.5	-1.8	-1.2	-1.5	-1.3	-1.0	-1.3

DAY	26	27	28	29	30	31
AVE	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1
MAX	0.5	0.5	0.6	0.8	0.7	0.8
MIN	-1.3	-1.4	-1.3	-1.2	-1.4	-1.2

MONTHLY AVERAGE = -0.1 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = -1.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MARCH - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	706	707	707	706	706	706	706	706	707	706	706	705	705	704	703	703	702	702	702	702	703	703	703	703	704
2	703	703	703	703	703	703	703	703	704	704	704	703	703	701	701	700	700	700	700	700	701	701	701	701	702
3	701	701	701	701	701	701	702	702	702	702	702	702	702	701	700	700	700	700	700	700	701	701	701	701	701
4	701	702	702	702	702	702	702	702	703	703	703	703	703	702	702	702	702	702	702	702	703	703	704	704	702
5	704	704	704	703	704	704	704	704	704	704	704	704	703	703	702	702	702	702	702	702	702	703	703	703	703
6	703	703	703	703	703	703	703	704	704	704	704	704	703	702	702	701	701	701	701	701	702	702	702	702	703
7	703	703	703	703	703	703	703	703	703	703	703	703	702	702	701	701	700	700	701	701	701	702	702	702	702
8	702	702	702	702	702	702	702	703	703	703	703	703	702	701	700	700	700	700	700	700	700	701	701	701	701
9	700	701	700	700	700	700	700	700	701	701	701	701	700	699	699	699	698	699	699	699	699	699	700	700	700
10	700	700	700	700	700	700	701	701	702	702	701	701	701	700	700	700	701	701	701	702	702	702	702	702	701
11	702	702	702	702	701	702	702	703	703	704	704	704	704	703	703	702	702	702	703	703	703	704	704	704	703
12	704	704	704	703	703	704	704	704	704	705	704	704	703	703	702	701	701	700	701	701	701	701	702	702	703
13	702	702	701	701	701	701	702	702	702	702	702	702	701	700	700	700	699	699	699	700	700	700	701	701	701
14	701	701	701	700	700	700	700	701	701	701	701	701	700	699	698	698	698	697	697	697	698	698	699	699	699
15	699	699	699	698	698	699	699	699	700	701	701	701	700	700	699	699	699	699	699	700	700	700	701	701	700
16	701	701	701	701	701	701	***	***	***	701	701	700	700	699	698	697	697	697	698	698	699	699	700	700	699
17	700	700	699	699	699	699	700	701	701	701	701	701	700	699	699	698	698	698	698	699	699	699	700	700	699
18	700	700	700	700	700	700	701	702	703	703	703	703	703	702	702	702	702	702	702	703	703	703	703	703	702
19	703	703	703	703	702	702	703	703	703	703	703	703	703	702	701	701	701	701	701	701	702	702	702	703	702
20	703	703	702	702	702	702	703	703	703	703	702	702	701	700	700	699	699	699	699	700	700	700	700	701	701
21	701	701	701	701	701	701	701	702	702	702	702	702	702	701	701	701	701	701	701	702	702	703	703	703	702
22	703	703	703	703	703	703	703	704	704	704	704	703	702	702	701	701	701	701	701	702	702	702	702	702	702
23	702	702	702	701	701	702	702	703	703	703	703	703	703	702	701	701	701	701	701	701	701	701	701	701	702
24	701	701	701	700	700	700	700	701	701	700	700	700	699	699	700	700	699	699	699	699	700	700	700	700	700
25	700	700	700	699	699	699	700	700	700	700	700	700	699	698	698	697	697	697	697	697	698	698	698	698	699
26	698	698	698	698	698	698	698	698	699	699	699	698	698	697	697	696	696	697	697	697	698	699	699	699	698
27	699	699	699	699	699	700	700	701	701	701	701	701	700	700	700	700	700	700	701	701	702	702	702	702	700
28	702	702	702	702	702	702	703	703	703	703	703	702	702	701	701	700	700	700	700	701	701	702	702	702	702
29	702	702	702	702	702	702	703	703	704	704	703	703	702	702	701	700	700	700	700	701	701	702	702	702	702
30	702	702	702	702	703	703	703	***	704	704	704	703	703	702	702	701	701	701	701	701	702	702	702	702	702
31	702	702	703	703	703	703	703	703	704	704	703	703	702	701	701	700	700	700	700	700	700	700	700	700	702
HRAVE	702	702	701	701	701	701	702	702	703	703	702	702	702	701	700	700	700	700	700	700	701	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	704	702	701	702	703	703	702	701	700	701	703	703	701	699	700	699	699	702	702	701	702	702	702	700	699
MAX	707	704	702	704	704	704	703	703	701	702	704	705	702	701	701	701	701	703	703	703	703	704	703	701	700
MIN	702	700	700	701	702	701	700	700	698	700	701	700	699	697	698	697	698	700	701	699	701	701	701	699	697

DAY	26	27	28	29	30	31
AVE	698	700	702	702	702	702
MAX	699	702	703	704	704	704
MIN	696	699	700	700	701	700

MONTHLY AVERAGE = 701.3 MONTHLY MAXIMUM = 706.7 MONTHLY MINIMUM = 696.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MARCH - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	82	84	83	88	92	93	90	85	74	60	49	44	38	33	30	28	27	28	32	37	40	42	46	56	57
2	62	68	67	70	72	75	78	74	60	47	37	29	23	17	15	16	20	24	27	28	27	31	36	41	43
3	48	51	55	62	64	69	69	65	52	41	37	31	25	20	17	19	18	17	19	21	25	27	28	29	38
4	31	35	39	41	44	52	56	58	53	48	43	40	37	37	37	37	36	38	42	44	46	48	49	48	43
5	54	59	63	68	72	72	68	66	54	33	21	19	18	15	14	14	14	14	15	16	18	20	23	21	35
6	24	28	27	30	32	32	34	38	40	29	13	13	13	13	12	12	11	11	12	13	14	15	16	19	21
7	22	25	27	31	35	35	36	38	32	18	15	14	13	12	11	12	12	12	12	14	17	19	19	20	21
8	23	25	28	30	33	37	36	38	34	29	24	19	15	13	13	12	11	11	13	16	17	18	22	25	23
9	26	27	30	32	34	35	38	37	34	27	21	17	13	12	11	12	13	14	16	19	22	22	25	25	23
10	26	29	30	33	37	39	41	42	37	29	24	21	20	21	23	24	30	35	43	46	53	59	71	76	37
11	79	80	83	82	84	84	97	100	100	99	100	96	81	68	64	55	51	51	57	59	67	75	81	82	78
12	81	78	71	68	66	64	61	57	48	43	38	35	32	31	30	29	30	31	32	33	34	35	35	37	46
13	40	43	46	45	45	46	44	45	41	36	34	31	29	28	25	24	24	26	28	29	32	34	36	40	35
14	44	48	50	50	55	58	60	61	57	45	35	28	26	25	24	23	24	26	28	28	30	30	34	36	39
15	42	48	51	51	50	51	54	54	54	71	58	40	36	33	33	34	32	30	30	33	37	40	44	45	44
16	47	50	55	58	60	63	***	***	***	40	34	30	25	23	23	20	19	22	24	28	34	37	38	36	36
17	33	29	37	46	50	52	56	51	40	32	28	30	31	28	27	26	28	29	32	32	35	37	39	41	36
18	44	52	52	48	46	50	55	63	79	78	63	42	31	26	24	22	23	24	27	30	31	32	35	39	42
19	43	47	46	49	43	34	33	37	31	20	17	13	12	13	12	12	12	13	15	17	17	17	21	24	25
20	26	29	32	34	35	38	39	34	28	22	18	17	14	12	11	11	11	12	14	15	16	18	20	22	22
21	24	26	29	30	33	34	35	34	28	23	20	16	14	14	14	15	16	17	18	20	22	24	26	28	23
22	31	33	33	35	38	39	41	36	31	26	21	20	19	18	18	18	17	18	21	23	24	25	26	28	27
23	31	33	35	36	36	39	37	37	32	34	35	34	30	27	26	26	27	26	28	30	32	35	37	39	33
24	41	43	45	47	47	51	53	47	41	35	31	28	25	25	15	16	16	17	18	19	17	17	20	22	31
25	24	27	30	32	35	38	40	38	33	31	32	29	21	18	16	18	21	23	23	24	24	24	25	25	27
26	24	25	26	26	28	30	31	34	30	26	25	22	20	18	18	19	20	21	23	25	28	32	35	37	26
27	41	44	48	49	52	55	56	50	38	33	28	24	22	20	20	20	24	23	28	35	37	39	42	44	36
28	47	49	51	53	54	59	58	52	41	32	24	21	18	14	13	13	13	13	14	16	17	18	19	21	30
29	22	25	27	28	30	34	33	29	25	20	16	16	15	14	14	13	14	15	16	18	19	21	23	25	21
30	26	27	29	31	34	36	37	***	28	23	19	17	16	15	14	14	13	14	15	17	18	20	22	23	22
31	24	26	27	29	32	33	34	32	27	23	20	16	13	13	13	12	12	12	14	15	16	17	19	20	21
HRAVE	39	42	43	46	47	49	50	49	43	37	32	28	24	22	21	20	21	22	24	26	28	30	33	35	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	57	43	38	43	35	21	21	23	23	37	78	46	35	39	44	36	36	42	25	22	23	27	33	31	27
MAX	93	78	69	58	72	40	38	38	38	76	100	81	46	61	71	63	56	79	49	39	35	41	39	53	40
MIN	27	15	17	31	14	11	11	11	11	20	51	29	24	23	30	19	26	22	12	11	14	17	26	15	16

DAY	26	27	28	29	30	31
AVE	26	36	30	21	22	21
MAX	37	56	59	34	37	34
MIN	18	20	13	13	13	12

MONTHLY AVERAGE = 33.6 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 10.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MARCH - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.51	0.67	0.79	0.85	0.82	0.73	0.58	0.38	0.12	0.01	0.00	0.00	0.00	0.00	0.00	5.85
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.51	0.69	0.81	0.86	0.84	0.75	0.59	0.39	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.52	0.69	0.81	0.86	0.84	0.75	0.60	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	6.05
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.52	0.69	0.81	0.86	0.83	0.74	0.59	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	6.03
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.33	0.54	0.71	0.84	0.88	0.86	0.77	0.61	0.41	0.18	0.01	0.00	0.00	0.00	0.00	0.00	6.19
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.23	0.36	0.66	0.81	0.88	0.86	0.79	0.57	0.43	0.19	0.01	0.00	0.00	0.00	0.00	0.00	5.86
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.45	0.53	0.63	0.81	0.63	0.43	0.36	0.22	0.07	0.00	0.00	0.00	0.00	0.00	0.00	4.56
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.20	0.40	0.66	0.72	0.88	0.62	0.61	0.41	0.26	0.12	0.01	0.00	0.00	0.00	0.00	0.00	4.97
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.28	0.43	0.71	0.84	0.90	0.85	0.74	0.60	0.35	0.12	0.01	0.00	0.00	0.00	0.00	0.00	5.88
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.18	0.41	0.52	0.48	0.25	0.25	0.17	0.12	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00	2.60
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.09	0.13	0.34	0.91	0.77	0.60	0.48	0.38	0.15	0.01	0.00	0.00	0.00	0.00	0.00	3.95
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.47	0.65	0.78	0.76	0.69	0.76	0.57	0.38	0.19	0.01	0.00	0.00	0.00	0.00	0.00	5.72
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.33	0.49	0.66	0.74	0.84	0.73	0.66	0.58	0.36	0.11	0.01	0.00	0.00	0.00	0.00	0.00	5.60
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.18	0.41	0.70	0.83	0.84	0.75	0.73	0.63	0.38	0.18	0.01	0.00	0.00	0.00	0.00	0.00	5.70
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.04	0.05	0.22	0.50	0.86	0.71	0.65	0.49	0.37	0.19	0.02	0.00	0.00	0.00	0.00	0.00	4.22
16	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.30	0.51	0.71	0.57	0.76	0.65	0.63	0.62	0.47	0.20	0.01	0.00	0.00	0.00	0.00	0.00	5.58
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.59	0.75	0.87	0.78	0.89	0.79	0.62	0.42	0.19	0.02	0.00	0.00	0.00	0.00	0.00	6.47
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.13	0.44	0.78	0.75	0.90	0.75	0.53	0.28	0.18	0.02	0.00	0.00	0.00	0.00	0.00	4.81
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.53	0.68	0.88	0.94	0.92	0.82	0.64	0.44	0.20	0.03	0.00	0.00	0.00	0.00	0.00	6.61
20	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.40	0.61	0.78	0.89	0.94	0.91	0.81	0.65	0.41	0.13	0.02	0.00	0.00	0.00	0.00	0.00	6.74
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.58	0.70	0.76	0.79	0.83	0.64	0.45	0.36	0.14	0.02	0.00	0.00	0.00	0.00	0.00	5.83
22	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.38	0.58	0.74	0.61	0.72	0.64	0.43	0.38	0.34	0.08	0.01	0.00	0.00	0.00	0.00	0.00	5.11
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.40	0.61	0.76	0.87	0.92	0.89	0.75	0.64	0.42	0.16	0.03	0.00	0.00	0.00	0.00	0.00	6.65
24	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.38	0.61	0.57	0.65	0.60	0.27	0.25	0.19	0.34	0.13	0.03	0.00	0.00	0.00	0.00	0.00	4.23
25	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.40	0.57	0.77	0.81	0.83	0.87	0.78	0.60	0.35	0.13	0.02	0.00	0.00	0.00	0.00	0.00	6.35
26	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.37	0.63	0.80	0.90	0.94	0.92	0.82	0.66	0.45	0.12	0.02	0.00	0.00	0.00	0.00	0.00	6.72
27	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.42	0.63	0.80	0.92	1.00	0.89	0.85	0.75	0.26	0.15	0.05	0.00	0.00	0.00	0.00	0.00	6.94
28	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.44	0.64	0.81	0.92	0.96	0.93	0.84	0.67	0.46	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.15
29	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.65	0.76	0.82	0.89	0.95	0.84	0.68	0.47	0.19	0.04	0.00	0.00	0.00	0.00	0.00	6.98
30	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.65	0.82	0.92	0.96	0.93	0.84	0.68	0.47	0.15	0.04	0.00	0.00	0.00	0.00	0.00	7.15
31	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.46	0.44	0.49	0.86	0.81	0.64	0.71	0.64	0.47	0.16	0.03	0.00	0.00	0.00	0.00	0.00	5.92
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.31	0.49	0.65	0.77	0.83	0.78	0.69	0.55	0.37	0.15	0.02	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.85	6.00	6.05	6.03	6.19	5.86	4.56	4.97	5.88	2.60	3.95	5.72	5.60	5.70	4.22	5.58	6.47	4.81	6.61	6.74	5.83	5.11	6.65	4.23	6.35
MAX	0.85	0.86	0.86	0.86	0.88	0.88	0.81	0.88	0.90	0.52	0.91	0.78	0.84	0.84	0.86	0.76	0.89	0.90	0.94	0.94	0.83	0.74	0.92	0.65	0.87
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.72	6.94	7.15	6.98	7.15	5.92
MAX	0.94	1.00	0.96	0.95	0.96	0.86
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MARCH - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.11 MONTHLY MAXIMUM = 0.05 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

APRIL THROUGH JUNE 2018

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

August 2018

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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Appendix B – Data Screening and Validation Results
Appendix C – Monthly Data Tables

1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period April through June 2018. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses instrument calibration and audit results, data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the audit results, and Appendix B the data screening results. Appendix C presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

There were no significant operational events during the reporting period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A performance audit of all equipment was performed on May 30, 2018. Audit results are presented in Appendix A. The results indicate that the meteorological systems were operating within the acceptable DQO ranges.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data

were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were -2.6, -3.3, and -4.2 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix B presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, and no data edits were required.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these quarterly data capture goals.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Jan-18	99.1	99.1	99.1	99.1	99.1	99.1	99.1
Feb-18	100	100	100	100	100	100	100
Mar-18	100	100	100	100	99.5	99.5	100
Apr-18	100	100	100	100	100	100	100
May-18	99.5	99.5	99.5	99.5	100	100	99.5
Jun-18	100	100	100	100	100	100	100
Jul-18							
Aug-18							
Sep-18							
Oct-18							
Nov-18							
Dec-18							
Quarter 1	99.7	99.7	99.7	99.7	99.5	99.5	99.7
Quarter 2	99.8	99.8	99.8	99.8	100.0	100.0	99.8
Quarter 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Quarter 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	99.8	99.8	99.8	99.8	99.8	99.8	99.8

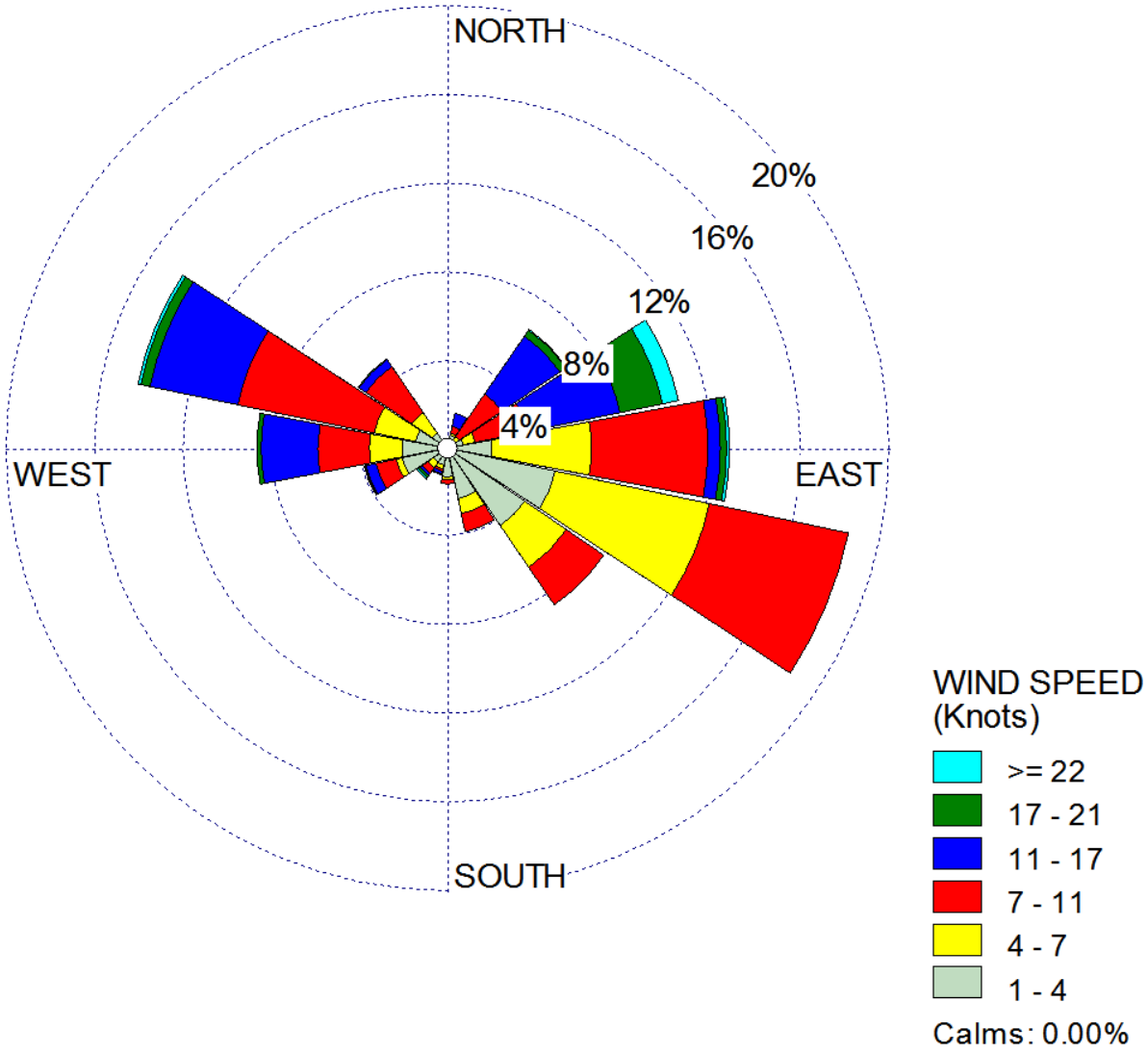
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix C presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly valid 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east-southeast (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours with higher wind speeds). This is similar to wind patterns previously observed at the monitoring site.

Figure 1 – Quarterly 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Audit Results

AMSTECH

WIND SPEED SENSOR AUDIT REPORT

PART A: ANCILLARY INFORMATION

Project: RTP / ASARCO - ST10 **Date:** 30-May-2018 **Auditor:** D. Meisters
Site ID: ST10 **Start (MST):** 1130 **Witness:** K. Ford
Location: Hayden, AZ **END (MST):** 1156 S. Cooper

- ***STATION WIND SPEED SENSOR IDENTIFICATION and APPLICATION***

Make: R.M.YOUNG **Range, mps:** 0 to 50
Model: 05305 **Sensor Height, m:** 10 (not measured)
SN: 158704 **Propeller SN:** 76663

- ***AUDIT EQUIPMENT IDENTIFICATION and DESCRIPTION***

Item: R.M.Y., 18802, high rpm motor **SN:** CA02444 **Exp.:** 16-Jan-2019
Item: R.M.Y., 18310, propeller torque disk **SN:** N/A **Exp.:** N/A

PART B: AUDIT TEST RESULTS

- ***KNOWN AUDIT INPUT vs. OBSERVED STATION RESPONSE***

Starting Torque Threshold: 0.1 gm-cm = 0.16 mps.

Audit Inputs		Station Response	
Motor rpm	Known mps	DAS mps	Error mps
0.0	0.00	0.00	0.00
400	2.05	2.05	0.00
1,200	6.14	6.14	0.00
4,000	20.48	20.48	0.00
8,000	40.96	40.96	0.00

- ***AUDITOR COMMENTS or OBSERVATIONS***

DAS time = 0945; Local standard time = 0940.
The data loger time is approximately 5 minutes and 30 seconds fast.
1035 - Tower down; instruments removed.
1050 - Tower up; to allow solar audit and sight vane alignment rod.
1240 - Tower down; instruments reinstalled.
1300 - Tower up. All parameters on-line.
No problems found with the WS response.

- ***AUDIT LIMIT CRITERIA and PASS/FAIL RESULTS***

Audit Limit Category	To PASS, the observed response must be....	Pass/Fail
Accuracy	±0.20 mps + 5% of known input per audit test point	PASS
Starting torque threshold	≤0.5 mps.	PASS

AMS TECH

WIND DIRECTION SENSOR AUDIT REPORT

PART A: ANCILLARY INFORMATION

Project: RTP / ASARCO - ST10 **Date:** 30-May-2018 **Auditor:** D. Meisters
Site ID: ST10 **Start (MST):** 1130 **Witness:** K. Ford
Location: Hayden, AZ **END (MST):** 1156 S. Cooper

- ***STATION WIND DIRECTION SENSOR IDENTIFICATION and APPLICATION***

Make: R.M.YOUNG **Range, deg:** 0 to 360
Model: 05305 **Sensor Height, m:** 10 (not measured)
SN: 158704

- ***AUDIT EQUIPMENT IDENTIFICATION and DESCRIPTION***

Item: Brunton, F-5008, pocket transit **SN:** 5080897160 **Exp.:** 12-Feb-2019
Item: R.M.Y., 18331, vane torque device **SN:** N/A **Exp.:** N/A
Item: R.M.Y., 18112, vane angle stand **SN:** N/A **Exp.:** N/A

PART B: AUDIT TEST RESULTS

- ***KNOWN AUDIT INPUT vs. OBSERVED STATION RESPONSE***

Starting Torque Threshold: 5.0 gm-cm = 0.37 mps.
Local Magnetic Declination: 9° 46' deg. east (from NOAA-NCEI on 5/29/18)

ACCURACY TEST

Audit Input Degrees	Station Response DAS Degrees	Station Response Error Degrees
356	357	1
176	173	-3
266	265	-1
86	86	0

LINEARITY TEST (Degree Change Test)

Change Input Degrees	Station Response DAS Degrees	Station Response Change* Error	Change Input Degrees	Station Response DAS Degrees	Station Response Change* Error
5	5	N/A	240	237	-1
30	29	-1	270	267	0
60	60	1	300	298	1
90	90	0	330	328	0
120	119	-1	350	348	0
150	148	-1	270	268	0
180	178	0	180	178	0
210	208	0	90	89	1

* Input change error in degrees.

- ***AUDITOR COMMENTS***

Crossarm alignment = 176 / 356 deg true
No problems found.

- ***AUDIT LIMIT CRITERIA and PASS/FAIL RESULTS***

Audit Limit Category	To PASS, the observed response must be....	Pass/Fail
Accuracy	±5 degrees error per audit direction input.	PASS
Linearity	±3 degrees change error per audit test point.	PASS
Starting torque threshold	≤0.5 mps.	PASS

AMS TECH

TEMPERATURE / ΔTEMPERATURE PROBE AUDIT REPORT

PART A: ANCILLARY INFORMATION

Project: RTP / ASARCO - ST10 **Date:** 30-May-2018 **Auditor:** D. Meisters
Site ID: ST10 **Start (MST):** 1048 **Witness:** K. Ford
Location: Hayden, AZ **END (MST):** 1115 S. Cooper

- ***STATION TEMP/ DELTA TEMP PROBE IDENTIFICATION and APPLICATION***

Make: R.M. Young **Range, °C:** -50 to +50
Model: 41342 **2-m Probe SN:** 022530
10-m Probe SN: 022586

- ***AUDIT EQUIPMENT IDENTIFICATION and DESCRIPTION***

Item: YSI, 4600, Digital thermometer **SN:** 11L105727 **EXP.:** 23-Mar-2019
Item: Insulated flask with mechanical stirring. **SN:** N/A **EXP.:** N/A

PART B: AUDIT TEST RESULTS

- ***KNOWN AUDIT INPUT vs. OBSERVED STATION RESPONSE***

(Note: Water baths were mechanically stirred to ensure uniform temperature within insulated flask.)

AUDIT INPUTS		2-Meter Probe		10-Meter Probe		Δ Temp	
Water Bath	Audit Deg. C	DAS Deg. C	Error Deg. C	DAS Deg. C	Error Deg. C	DAS Deg. C	Error Deg. C
Ice	-0.02	-0.01	0.01	0.03	0.05	0.04	0.04
Cool	20.08	20.03	-0.05	20.03	-0.05	0.00	0.00
Hot	41.62	41.23	-0.39	41.20	-0.42	-0.03	-0.03
	Mean Absolute Error =		0.15		0.17		0.02

- ***AUDITOR COMMENTS or OBSERVATIONS***

Aspirator fans were found operational.
No problems found.

- ***AUDIT LIMIT CRITERIA and PASS/FAIL RESULTS***

Audit Limit Category	To PASS, the observed response must be....	Pass/Fail
Accuracy (2-meter probe)	±0.50 degrees C error per audit temperature input.	PASS
Accuracy (10-meter probe)	±0.50 degrees C error per audit temperature input.	PASS
Accuracy (ΔT system)	±0.10 degrees C error per audit temperature input.	PASS

AMS TECH

SOLAR RADIATION SENSOR AUDIT REPORT

PART A: ANCILLARY INFORMATION

Project: RTP / ASARCO - ST10 **Date:** 30-May-2018 **Auditor:** D. Meisters
Site ID: ST10 **Start (MST):** 1043 **Witness:** K. Ford
Location: Hayden, AZ **END (MST):** 1245 S. Cooper

- ***STATION SOLAR RADIATION SENSOR IDENTIFICATION and APPLICATION***

Make: Li-Cor **Range, W/m^2:** 0 - 1400
Model: Pyranometer **Sensor Height, m:** 2.0
SN:

- ***AUDIT EQUIPMENT IDENTIFICATION and DESCRIPTION***

Item: Kipp & Zonen, CM21, Pyranometer **SN:** 020991 **Expiration:** 29-Sep-2018

PART B: AUDIT TEST RESULTS

- ***KNOWN AUDIT INPUT vs. OBSERVED STATION RESPONSE***

(Note: Audit pyranometer is placed immediately next to station solar radiation sensor during test period.)

REPORT PERIOD hhmm	AUDIT VALUE W/m^2	STATION RESPONSE		
		DAS W/m^2	Error W/m^2	Error %
Covered	0	0	0	N/A
1043	975	958	-17	-1.7
1100	995	977	-18	-1.8
1115	1020	999	-21	-2.1
1130	1030	1012	-18	-1.7
1200	1058	1050	-8	-0.8
1230	1069	1067	-2	-0.2

- ***AUDITOR COMMENTS or OBSERVATIONS***

No problems found.

- ***AUDIT LIMIT CRITERIA and PASS/FAIL RESULTS***

Audit Limit Category	To PASS, the observed response must be....	Pass/Fail
Accuracy	±5% error per audit point.	PASS

AMS TECH

BAROMETRIC PRESSURE SENSOR AUDIT REPORT

PART A: ANCILLARY INFORMATION

Project: RTP / ASARCO - ST10 **Date:** 30-May-2018 **Auditor:** D. Meisters
Site ID: ST10 **Start (MST):** 1120 **Witness:** K. Ford
Location: Hayden, AZ **END (MST):** 1121 S. Cooper

- ***STATION BAROMETRIC PRESSURE SENSOR IDENTIFICATION and APPLICATION***

Make: Met One **Range, hPa:** 600 - 1100
Model: 092 **Sensor Height, m:** 2.0
SN: N01914

- ***AUDIT EQUIPMENT IDENTIFICATION and DESCRIPTION***

Item: A.I.R., HB-1A, Digital barometer **SN:** 0J1498 **Exp.:** 17-Aug-2018

PART B: AUDIT TEST RESULTS

- ***KNOWN AUDIT INPUT vs. OBSERVED STATION RESPONSE***

(Note: Audit barometer is held at the same elevation as the station barometer)

AUDIT	STATION RESPONSE		
INPUT	DAS	Error	Error
mb	mb	mb	%
696.3	698.0	1.7	0.24

- ***AUDITOR COMMENTS or OBSERVATIONS***

No problems found.

- ***AUDIT LIMIT CRITERIA and PASS/FAIL RESULTS***

Audit Limit Category	To PASS, the observed response must be....	Pass/Fail
Accuracy	±3 mb error	PASS

AMS TECH

RELATIVE HUMIDITY PROBE AUDIT REPORT

PART A: ANCILLARY INFORMATION

Project: RTP / ASARCO - ST10 **Date:** 30-May-2018 **Auditor:** D. Meisters
Site ID: ST10 **Start (MST):** 1050 **Witness:** K. Ford
Location: Hayden, AZ **END (MST):** 1145 S. Cooper

- ***STATION RELATIVE HUMIDITY SENSOR IDENTIFICATION and APPLICATION***

Make: CSI **Range, %RH:** 0-100
Model: 215 **Probe Height, m:** 2.0
SN: E16175

- ***AUDIT EQUIPMENT IDENTIFICATION and DESCRIPTION***

Item: Rotronic, HC2-S, Digital RH meter **SN:** 0061151668 **Exp.:** 2-Oct-2018

PART B: AUDIT TEST RESULTS

- ***KNOWN AUDIT INPUT vs. OBSERVED STATION RESPONSE***

AUDIT INPUTS		STN. RESPONSE	
Test Environ.	Known %RH	DAS %RH	Error %RH
Ambient 1	8.6	12.7	4.1

- ***AUDITOR COMMENTS or OBSERVATIONS***

No problems found.

- ***AUDIT LIMIT CRITERIA and PASS/FAIL RESULTS***

Audit Limit Category	To PASS, the observed response must be....	Pass/Fail
Accuracy (Ambient)	±7% RH error per audit point. (> 5% error = WARN)	PASS

AMS TECH

PRECIPITATION GAUGE AUDIT REPORT

PART A: ANCILLARY INFORMATION

Project: RTP / ASARCO - ST10 **Date:** 30-May-2018 **Auditor:** D. Meisters
Site ID: ST10 **Start (MST):** 1130 **Witness:** K. Ford
Location: Hayden, AZ **END (MST):** 1300 S. Cooper

- ***STATION TIPPING BUCKET RAIN GAUGE IDENTIFICATION and APPLICATION***

Make: Met One **Gauge Height, m:** 1.2
Model: 360 **Gauge Diameter, in.:** 6.0
SN: N2486

- ***CALIBRATION EQUIPMENT IDENTIFICATION and DESCRIPTION***

Item: Distilled water, variable drip device **SN:** N/A
Item: Class B, 250 ml volumetric flask **SN:** N/A

PART B: AUDIT TEST RESULTS

- ***KNOWN INPUT vs. OBSERVED STATION RESPONSE***

(Note: Distilled water was dripped into the gauge at a constant rate equal to ~0.5 inch per hour)

	Known Inputs		Station Response		
	ml	inch	Stn. inch	Error inch	Error %
10 Manual Tips =	0.0	0.10	0.10	0.00	N/A
Distilled H_2O Tips =	750	1.62	1.50	-0.12	-7.4

- ***COMMENTS or OBSERVATIONS***

No problems found.

- ***CALIBRATION LIMIT CRITERIA and PASS/FAIL RESULTS***

Audit Limit Category	To PASS, the observed response must be....	Primary
Accuracy	±10% error	PASS

Certificate of Accuracy

Transfer Standard Type: Electronic Thermometer

Certificate No: T 050217.02

Transfer standard model: Measurement Specialties Model 4600-1.2.6 Thermometer
Serial number: 11L105727 Probe SN: 12057744
submitted by/owner: AMSTech, LLC
1539 Purple Sage Court
Fort Collins, CO 80526

Was compared to Precision Absolute Reference Thermometer:
NIST traceable Hg-in-glass thermometer. Serial number: 3L9452

Date: March 23, 2018

Lab temperature: 24.2 °C
Lab pressure: 661.85 mm Hg

Reference Standard (inch Hg)	Transfer Standard (inch Hg)	Difference from Reference (inch Hg)	Transfer Standard Correction* (inch Hg)	
-30.32	-30.28	0.04	-0.04	
0.00	0.04	0.04	-0.04	
9.21	9.21	0.00	0.00	ambient
26.08	26.08	0.00	0.00	
43.42	43.42	0.00	0.00	

Note:
If no sign is given on the correction, the true pressure is higher than the indicated pressure. If the sign is negative, the true pressure is lower than the indicated pressure.

Transfer Standard adjustments made? YES ☐ **NO** ■

Reference barometer (inch Hg)	Transfer Standard (inch Hg)	Difference from Reference (inch Hg)	Transfer Standard Correction* (inch Hg)

Certified By: RLS Date: March 23, 2018

Roger L. Sanders

Chinook Engineering
a division of Inter-Mountain Laboratories, Inc.
555 Absaraka Street
Sheridan, Wyoming 82801 USA
(307) 674-7506
chinook@imlinc.com

Certificate of Accuracy

Transfer Standard Type: Barometric Pressure/Altimeter

Certificate No: B **081717. 03**

Transfer standard model: AIR Model HB-1A Barometer / Altimeter
Serial number: 0J1498
submitted by/owner: AMSTech, LLC
1539 Purple Sage Court
Fort Collins, CO 80526

Was compared to Precision Absolute Reference Barometer:
Model No. 355-AI0900 Serial number: 913930-M1
Certified accuracy of ± 0.007"Hg
NIST traceable to Ruska Deadweight Tester SN 38342/C-85

Date: August 17, 2017

Lab temperature: 24.2 °C
Lab pressure: 661.85 mm Hg

Reference barometer (inch Hg)	Transfer Standard (inch Hg)	Difference from Reference (inch Hg)	Transfer Standard Correction* (inch Hg)	
23.000	23.000	0.000	0.000	
24.000	24.000	0.000	0.000	
26.057	26.056	-0.001	0.001	ambient
29.000	29.000	0.000	0.000	
32.000	32.000	0.000	0.000	

Note:
If no sign is given on the correction, the true pressure is higher than the indicated pressure. If the sign is negative, the true pressure is lower than the indicated pressure.

Transfer Standard adjustments made? YES ☐ **NO** ■

Reference barometer (inch Hg)	Transfer Standard (inch Hg)	Difference from Reference (inch Hg)	Transfer Standard Correction* (inch Hg)

Certified By: Roger L. Sanders Date: August 17, 2017

Roger L. Sanders

Chinook Engineering
a division of Inter-Mountain Laboratories, Inc.
555 Absaraka Street
Sheridan, Wyoming 82801 USA
(307) 674-7506
chinook@imlinc.com

KIPP & ZONEN
SINCE 1830

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER	201709020991
PYRANOMETER MODEL	CM 21
SERIAL NUMBER	020991
SENSITIVITY	10.39 µV/W/m² at normal incidence on horizontal pyranometer
IMPEDANCE	39 Ω
REFERENCE PYRANOMETER	Kipp & Zonen CMP 21 sn 100418 active from 01 January 2017
CALIBRATION DATE	29 September 2017
CLASSIFICATION	ISO 9060, Secondary Standard

Calibration procedure

The indoor calibration procedure is based on a side-by-side comparison with a reference pyranometer under an artificial sun fed by an AC voltage stabiliser. It embodies a 150 W Metal-Halide high-pressure gas discharge lamp. Behind the lamp is a reflector with a diameter of 16.2 cm. The reflector is 1 m above the pyranometers producing a vertical beam. The reference and test pyranometers are mounted horizontally on a table, which can rotate. The irradiance at the pyranometers is approximately 500 W/m². During the calibration procedure the reference and test pyranometer are interchanged to correct for any non-homogeneity of the beam. Temperature of calibration: 22±2 °C.

Hierarchy of traceability

The reference pyranometer was compared with the sun and sky radiation as source under clear sky conditions using the "alternating sun-and-shade method" ISO 9846 paragraph 5. The measurements were performed in Bohemia NY (latitude: 40.780°, longitude: -73.105°, altitude: 26m above sea level). Dates of measurements: 2016, August 22,23,24.
The receiver surface was pointed directly at the sun using a solar tracker. During the comparisons, the instrument received tilted global radiation intensities from 745 to 987 with a mean of 914 W/m² and tilted diffuse radiation intensities from 75 to 109 with a mean of 95 W/m².
The ambient temperature ranged from +21.6 to +31.4 with a mean of +26.3 °C.
The direct radiation on the reference pyranometer as obtained with the alternating-sun-shade method was compared to the DNI measured by the absolute cavity pyrheliometer PMO6 SN 103. The PMO6 is calibrated against the World Standard Group (WSG), maintained at the WRC Davos every International Pyrheliometer Comparison (IPC). The PMO6 participates every IPC since 2005 and it participates in the yearly NPC hosted by NREL in Golden, Colorado to verify its stability. WRR factor of PMO6: 0.997916 (from the last IPC, IPC-2015).

This calibration proved that the reference pyranometer has been stable and that the original sensitivity 9.80 ± 0.12 µV/W/m² is valid and will be applied (see PMOD calibration details). Observed sensitivity differences between the consecutive years are well within the calibration uncertainty.

PMOD calibration details: The reference pyranometer was compared with the sun and sky radiation as source under mainly clear sky conditions using the "continuous sun-and-shade method". The pyranometer was installed horizontally. During the comparisons, the global radiation ranged from 665 to 1082 with a mean of 897 W/m². The solar zenith angle varied from 25.3 to 50.0 with a mean of 33.7 degrees. The ambient temperature ranged from +15.3 to +25.3 with a mean of +20.7 °C. The sensitivity calculation is based on 626 individual measurements. The readings of the WSG are referred to the World Radiometric Reference (WRR). The estimated uncertainty of the WRR relative to SI is ±0.3%. The obtained sensitivity value and its expanded uncertainty (95% level of confidence) are valid for similar conditions and are:9.80 ± 0.12 µV/W/m².
The measurements were performed in Davos (latitude: 46.8143°, longitude: -9.8458°, altitude: 1558m above sea level). Dates of measurements: 15-19, 25 July 2014.
Global radiation data were calculated from the direct solar radiation as measured with the absolute cavity pyrheliometer PMO2 (member of the WSG, WRR-Factor: 0.998623, based on the last IPC-2010) and from the diffuse radiation as measured with a continuous disk shaded pyranometer Kipp & Zonen CM22 SN 020059 (ventilated with heated air).

Justification of total instrument calibration uncertainty

The combined uncertainty of the result of the calibration is the positive "root sum square" of two uncertainties.
1. The expanded uncertainty due to random effects and instrumental errors during the calibration of the reference CMP 21 is ± 0.12/9.80 = ± 1.22%. (See traceability text).
2. Based on experience, the expanded uncertainty of the transfer procedure (calibration by comparison) is estimated to be ±0.5%.
The estimated combined expanded uncertainty is the positive "root sum square" of these two uncertainties: $\sqrt{(1.22^2 + 0.5^2)} = \pm 1.32\%$.

Notice

The calibration certificate supplied with the instrument is valid at the date of first use. Even though the calibration certificate is dated relative to manufacture, or recalibration, the instrument does not undergo any sensitivity changes when kept in the original packing. From the moment the instrument is taken from its packaging and exposed to irradiance the sensitivity may deviate with time. See the 'non-stability' value (% change in sensitivity per year) given in the radiometer specifications.

Delft, The Netherlands, 29 September 2017

Joop Mes

J. Mes
(in charge of calibration facility)

Victor Cassella
(in charge of test)

R.M. Young Company
2801 Aero Park Drive
Traverse City, Michigan 49686 USA

CERTIFICATE OF CALIBRATION AND TESTING

Model: 18802/18811
Serial Number: CA02444

Description: Anemometer Drive - 2 motors, 20 to 15,000 RPM
(18802 comprised of 18820A Control Unit and 18830A Motor Assembly)
(18811 comprised of 18820A Control Unit and 18831A Motor Assembly)

R. M. Young Company certifies that the above equipment was inspected and calibrated prior to shipment in accordance with established manufacturing and testing procedures. Standards established by R.M. Young Company for calibrating the measuring and test equipment used in controlling product quality are traceable to the National Institute of Standards and Technology.

Nominal Motor RPM RPM	27106D Output Frequency Hz (1)	Calculated RPM (2)	Indicated RPM (3)
18802	☑ Clockwise and Counterclockwise rotation verified.		
300	50	300	300
2700	450	2700	2700
5100	850	5100	5100
7500	1250	7500	7500
10200	1700	10200	10200
12600	2100	12600	12600
15000	2500	15000	15000
18811	☑ Clockwise and Counterclockwise rotation verified.		
30.0	5	30.0	30.0
150.0	25	150.0	150.0
300.0	50	300.0	300.0
450.0	75	450.0	450.0
600.0	100	600.0	600.0
750.0	125	750.0	750.0
990.0	165	990.0	990.0

(1) Measured output frequency of YOUNG model 27106D standard anemometer attached to motor shaft.
(2) YOUNG model 27106D produces 10 pulsed per revolution of the anemometer shaft.
(3) Indicated on the Control Unit LCD.

* Indicates out of tolerance.

☐ New Unit ☑ Service / Repair Unit ☐ As found
☑ No calibration adjustments required ☐ As left

Traceable frequency meter used for calibration:
Model: 34405A Serial Number: 53020093

Date: 16 January 2018
Calibration Interval: One year

Tested By : SS

BRUNTON®

2255 Brunton Court
Riverton, Wy 825001

CERTIFICATE OF CALIBRATION

Equipment Owner

Name: AMS Tech, LLC/David Meisters

Address: 1539 Purple Sage Ct
Fort Collins, CO 80526

This is to certify that the below listed product has been calibrated to comply with manufacturing process controls as established by Brunton Outdoor Inc. The accuracy and stability of all standards maintained by the Brunton Outdoor Group are traceable to the Serial number.

This unit has been calibrated to Brunton Outdoor Specifications this 12th Day February 20 18.

Description Pocket Transit
Purchase Order RMA 17574
Order Number SO-118421
Model Number F-5008
Serial Number 5080897160
Calibration Date February 12, 2018
Recalibration Date February 12, 2019

Signed Patty Brogdon
Quality Control Coordinator

www.brunton.com

CALIBRATION AND TESTING STATEMENT

Model 18112 Vane Angle Bench Stand
Model 18212 Vane Angle Fixture
Model 18310 Propeller Torque Disc
Model 18312 Cup Wheel Torque Disc
Model 18331 Vane Torque Gauge

R. M. Young Company certifies that the above calibration accessories are inspected and calibrated prior to shipment in accordance with established manufacturing and testing procedures. Standards established by R.M. Young Company for calibrating the measuring and test equipment used in controlling product quality are traceable to the National Institute of Standards and Technology.

Statement Date: 12 August 2010

R.M. Young Company

Ryan Phillips

R.M. YOUNG COMPANY 2801 Aero Park Drive, Traverse City Michigan 49686-9171 USA
TEL: (231) 946-3980 FAX: (231) 946-4772 Email: met.sales@youngusa.com
ISO9001:2008 Certified

250 ml Volumetric Flask Used for Precipitation Gauge Water Volume Measurement



Representative photo only
Thermo Scientific Nalgene Class B polypropylene volumetric flask 250 mL

Thermo Scientific Nalgene Class B volumetric flask, 250 mL

EW-06108-40

These Class B polypropylene volumetric flasks meet ASTM Standard E288 and ISO Standard 384. Flasks have polypropylene screw closures and are leak-proof. Sturdy, heat-resistant flasks are autoclavable. Model 06108-30 has an extra graduation at 203 mL. All flasks are calibrated at 20degC. No meniscus.

Specifications	
Capacity (mL)	250
Tolerance (mL)	±0.24
Material	Polypropylene
Height (cm)	22.2
Quantity	1
Brand	Thermo Scientific Nalgene
Manufacturer number	4000-0250

APPENDIX B

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for April-June 2018 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

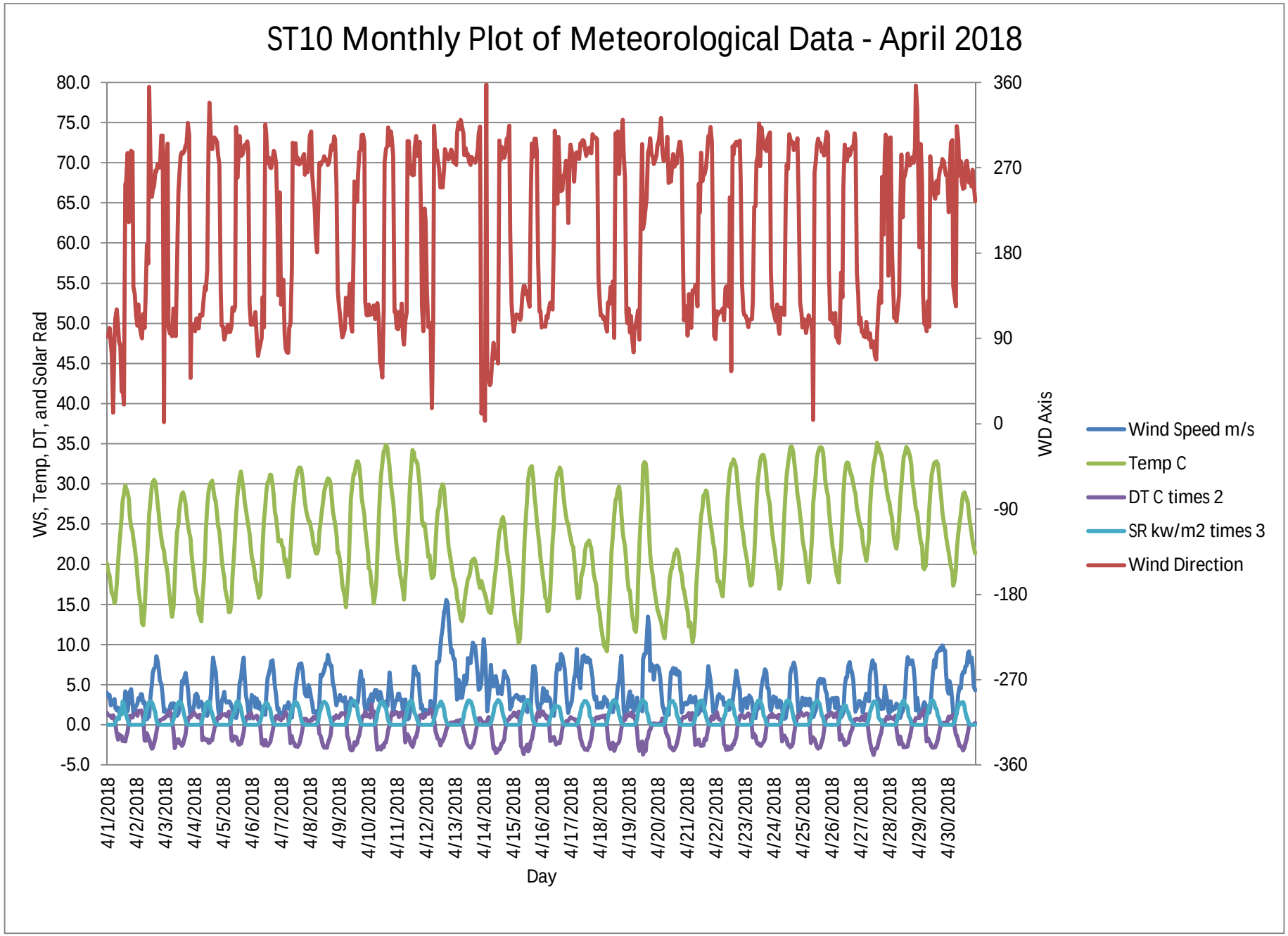
ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	18041203	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable evening period - WS is valid
4	WS	18041800	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable evening period - WS is valid
4	WS	18041809	WIND SPD TOO CONSTANT 3 HR	0.04	Light to moderate winds in stable evening period - WS is valid
4	WS	18043008	WIND SPD TOO CONSTANT 3 HR	0.11	Light to moderate winds in stable evening period - WS is valid
4	WS	18060401	WIND SPD TOO CONSTANT 3 HR	0.09	Light to moderate winds in stable evening period - WS is valid
4	WS	18060402	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable evening period - WS is valid
11	TP	18050508	HIGH RATE OF C CHANGE	5.55	Wind shift, morning transition - data is valid
11	T2	18050508	HIGH RATE OF C CHANGE	5.06	Wind shift, morning transition - data is valid
11	TP	18050608	HIGH RATE OF C CHANGE	5.19	Wind shift, morning transition - data is valid
15	D1	18051311	DT LARGE READING	-2.02	Strong insolation, surface temperature increasing quickly near solar noon - data is valid
15	D1	18052012	DT LARGE READING	-2.15	Strong insolation, surface temperature increasing quickly near solar noon - data is valid
15	D1	18052013	DT LARGE READING	-2.25	Strong insolation, surface temperature increasing quickly near solar noon - data is valid
15	D1	18052111	DT LARGE READING	-2.19	Strong insolation, surface temperature increasing quickly near solar noon - data is valid
15	D1	18052310	DT LARGE READING	-2.14	Strong insolation, surface temperature increasing quickly near solar noon - data is valid
15	D1	18052312	DT LARGE READING	-2.21	Strong insolation, surface temperature increasing quickly near solar noon - data is valid
19	RH	18061600	OUT OF LIMITS	99.7	Precipitation and cooler temperatures - RH data is valid
19	RH	18061601	OUT OF LIMITS	99.8	Precipitation and cooler temperatures - RH data is valid
19	RH	18061602	OUT OF LIMITS	98.2	Precipitation and cooler temperatures - RH data is valid
19	RH	18061603	OUT OF LIMITS	99.8	Precipitation and cooler temperatures - RH data is valid
19	RH	18061604	OUT OF LIMITS	99.3	Precipitation and cooler temperatures - RH data is valid
19	RH	18061605	OUT OF LIMITS	100	Precipitation and cooler temperatures - RH data is valid
19	RH	18061606	OUT OF LIMITS	100	Precipitation and cooler temperatures - RH data is valid
19	RH	18061607	OUT OF LIMITS	99.8	Precipitation and cooler temperatures - RH data is valid
19	RH	18061608	OUT OF LIMITS	96.9	Precipitation and cooler temperatures - RH data is valid
19	RH	18061609	OUT OF LIMITS	99.7	Precipitation and cooler temperatures - RH data is valid

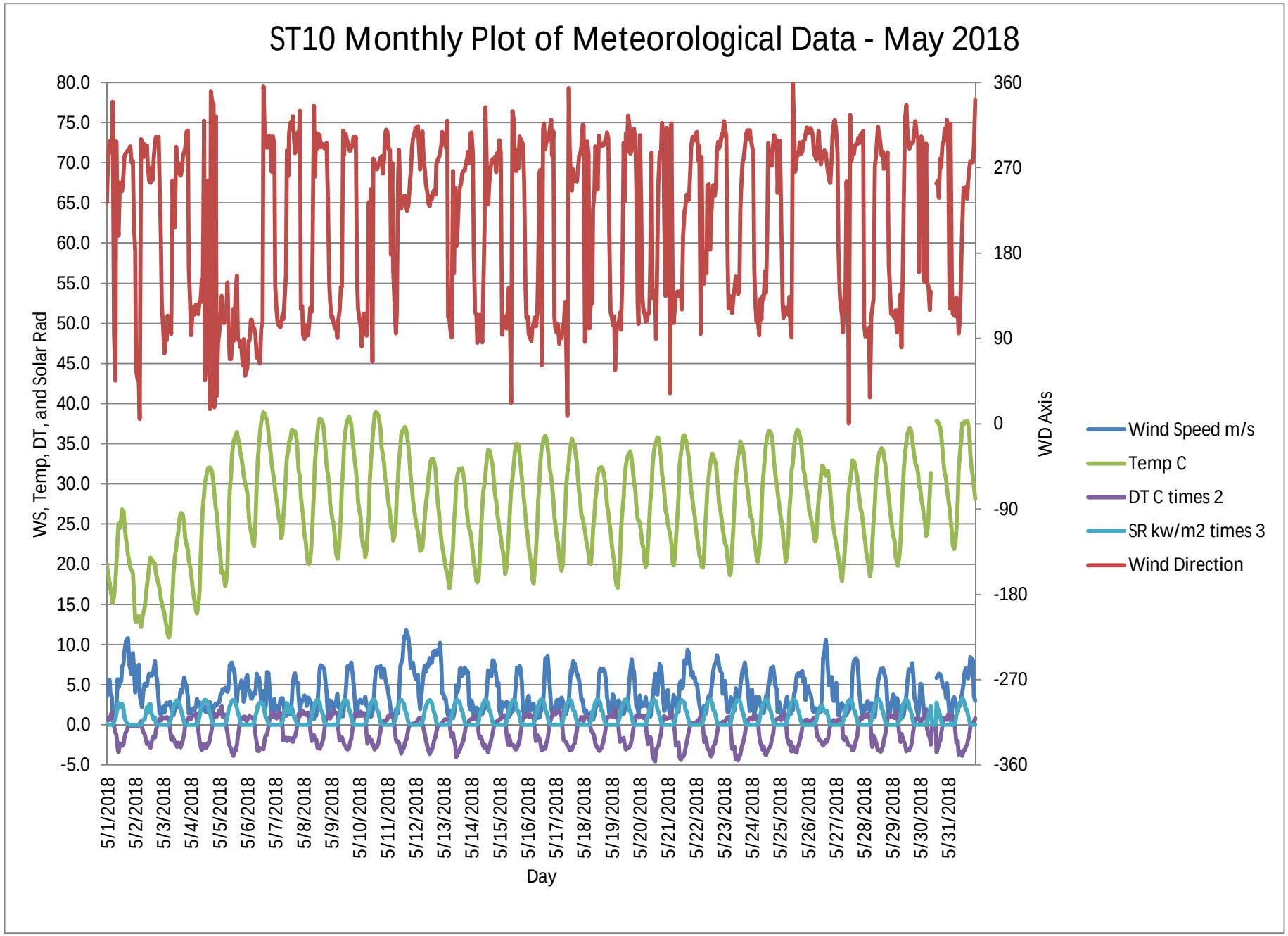
AZMET and ST10 Reported Precipitation Totals
(inches/month)

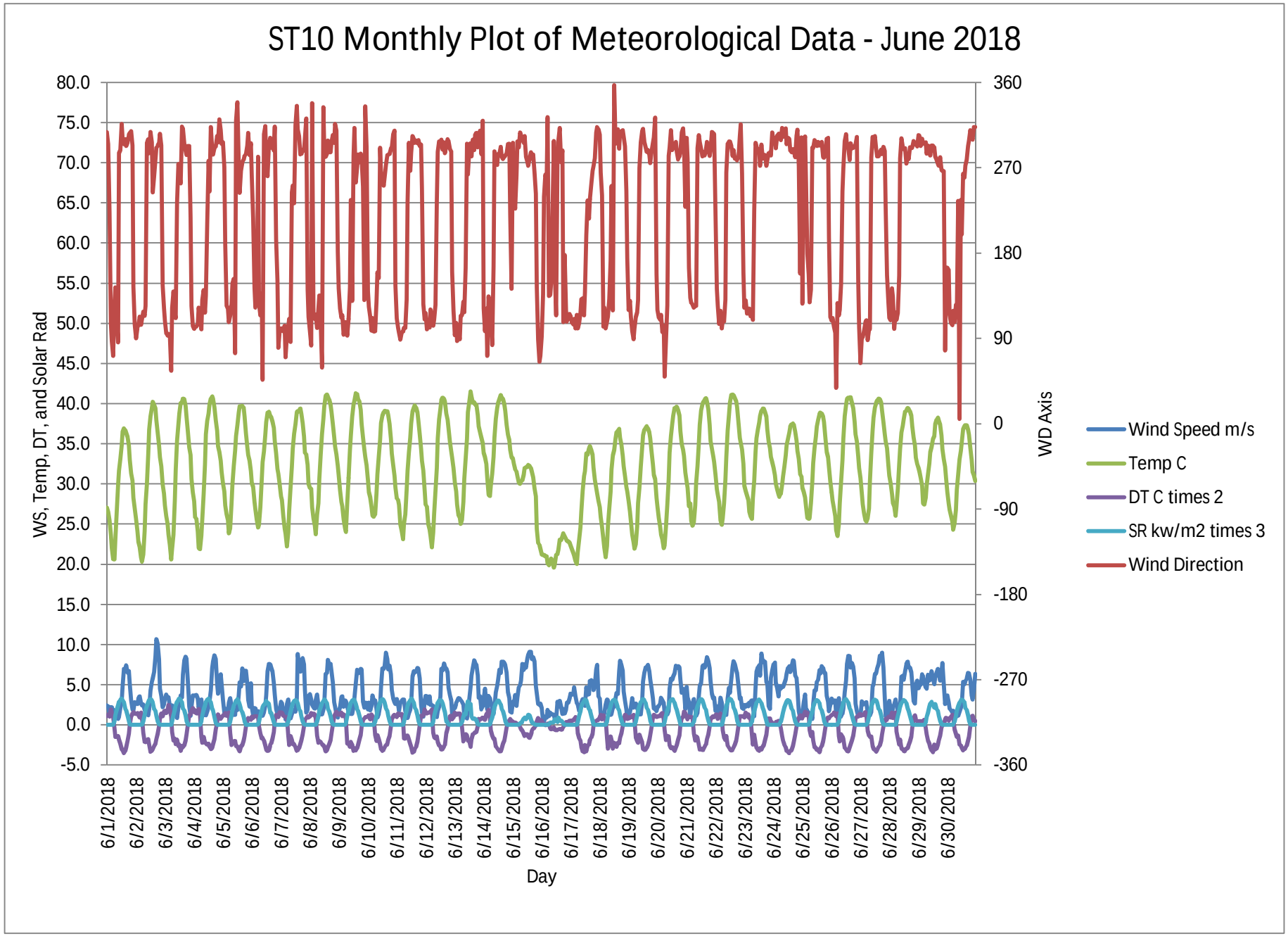
Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Jan-18	0.13	0.08	0.10	0.36
Feb-18	0.16	1.59	0.87	1.55
Mar-18	0.00	0.02	0.01	0.11
Apr-18	0.00	0.00	0.00	0.00
May-18	0.01	0.00	0.00	0.01
Jun-18	0.05	0.57	0.31	0.67
Jul-18				
Aug-18				
Sep-18				
Oct-18				
Nov-18				
Dec-18				
Totals	0.35	2.26	1.30	2.70

APPENDIX C

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - April 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
4/1/2018
4/2/2018
4/3/2018
4/4/2018
4/5/2018
4/6/2018
4/7/2018
4/8/2018
4/9/2018
4/10/2018
4/11/2018
4/12/2018
4/13/2018
4/14/2018
4/15/2018
4/16/2018
4/17/2018
4/18/2018
4/19/2018
4/20/2018
4/21/2018
4/22/2018
4/23/2018
4/24/2018
4/25/2018
4/26/2018
4/27/2018
4/28/2018
4/29/2018
4/30/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - May 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
5/1/2018
5/2/2018
5/3/2018
5/4/2018
5/5/2018
5/6/2018
5/7/2018
5/8/2018
5/9/2018
5/10/2018
5/11/2018
5/12/2018
5/13/2018
5/14/2018
5/15/2018
5/16/2018
5/17/2018
5/18/2018
5/19/2018
5/20/2018
5/21/2018
5/22/2018
5/23/2018
5/24/2018
5/25/2018
5/26/2018
5/27/2018
5/28/2018
5/29/2018
5/30/2018
5/31/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - June 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
6/1/2018
6/2/2018
6/3/2018
6/4/2018
6/5/2018
6/6/2018
6/7/2018
6/8/2018
6/9/2018
6/10/2018
6/11/2018
6/12/2018
6/13/2018
6/14/2018
6/15/2018
6/16/2018
6/17/2018
6/18/2018
6/19/2018
6/20/2018
6/21/2018
6/22/2018
6/23/2018
6/24/2018
6/25/2018
6/26/2018
6/27/2018
6/28/2018
6/29/2018
6/30/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
APRIL - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.0	3.5	3.7	2.5	2.6	2.8	3.2	2.1	1.8	2.1	1.6	1.3	1.4	1.7	1.8	4.2	3.9	1.7	2.8	4.0	4.5	2.8	1.5	1.9	2.6
2	2.3	2.7	3.3	3.1	3.8	3.8	2.7	2.8	1.9	0.7	1.2	1.0	3.5	5.0	6.4	7.0	7.2	8.5	7.8	6.6	5.5	5.2	3.7	1.6	4.1
3	2.0	1.7	1.3	1.1	2.2	2.6	2.1	2.7	2.6	1.6	1.2	1.4	2.3	2.8	5.5	5.1	5.8	6.4	5.7	4.5	2.6	0.9	1.7	1.8	2.8
4	2.5	3.7	3.9	3.5	2.2	2.5	2.9	2.7	1.6	1.5	1.3	1.2	2.1	2.4	3.7	6.8	8.4	7.4	6.6	4.0	2.2	0.9	1.3	2.9	3.2
5	3.4	4.1	3.0	2.8	2.8	2.9	2.7	2.3	2.0	1.2	0.9	0.9	1.5	3.2	5.2	5.8	7.5	8.4	6.2	3.6	2.8	1.8	0.8	2.7	3.3
6	3.7	2.9	3.4	2.2	3.3	2.1	2.8	1.9	2.2	1.6	1.6	1.2	3.4	5.8	6.4	7.1	7.9	8.0	6.4	4.9	3.7	1.9	2.1	1.4	3.7
7	1.3	1.5	1.4	2.3	2.3	2.0	2.8	2.4	1.8	0.9	2.0	2.3	4.6	5.8	6.7	7.5	7.6	7.7	6.7	4.8	4.0	3.5	3.6	4.9	3.8
8	4.3	3.3	2.8	1.5	1.6	1.7	1.2	0.9	2.5	6.2	6.1	6.5	6.9	7.7	7.7	8.7	7.9	7.4	7.4	5.2	4.6	3.6	2.4	3.2	4.6
9	3.1	3.7	3.3	3.0	2.9	3.5	1.6	2.8	2.4	2.6	3.3	2.8	2.5	2.4	2.6	2.7	3.0	5.3	6.7	5.6	5.6	2.6	1.9	2.4	3.3
10	1.9	3.1	3.3	3.8	2.8	3.7	4.3	4.3	3.4	3.0	4.1	3.7	2.9	2.5	2.4	2.9	2.3	3.8	6.5	4.8	3.8	1.5	2.4	3.0	3.4
11	3.1	3.8	3.9	3.1	3.1	1.6	2.1	3.2	1.3	0.7	0.9	1.8	2.1	4.7	7.2	7.3	6.5	6.1	6.4	3.8	2.0	2.5	1.5	1.3	3.3
12	1.9	1.7	1.8	1.7	3.0	2.0	1.9	2.0	4.0	7.8	7.7	7.9	9.8	11.0	12.1	14.1	14.3	15.5	15.2	13.4	10.9	9.0	9.4	8.2	7.8
13	8.1	5.2	3.1	5.6	5.2	3.4	3.4	4.4	6.1	5.0	5.7	8.3	7.9	7.7	8.9	10.2	9.8	9.9	8.1	6.3	4.4	4.6	5.3	8.4	6.5
14	10.7	9.2	5.2	1.7	3.2	5.0	7.4	5.5	4.8	5.4	6.1	5.1	3.9	4.7	4.2	3.8	5.5	6.7	6.3	6.1	5.6	4.1	1.9	2.3	5.2
15	3.3	3.3	3.6	3.7	3.7	3.2	3.4	3.0	3.4	3.5	2.4	1.9	1.6	3.0	2.9	2.4	4.9	7.3	7.3	6.3	3.1	2.1	1.1	2.5	3.4
16	2.7	4.6	4.4	3.0	4.2	3.0	3.4	3.2	2.2	1.2	1.1	1.9	6.1	7.5	7.0	6.9	8.8	8.6	7.9	7.0	4.7	2.8	1.5	2.2	4.4
17	2.5	3.0	4.8	5.8	6.5	9.4	6.3	5.7	4.6	6.8	8.6	8.7	8.4	7.8	8.4	7.8	8.1	6.9	5.8	4.0	3.1	3.5	2.1	2.2	5.9
18	2.2	2.7	2.2	2.6	3.5	3.3	3.1	2.3	2.2	2.2	2.1	1.6	2.5	2.3	3.1	4.8	5.4	7.0	8.6	5.1	1.9	0.7	1.5	1.9	3.1
19	3.5	4.2	2.2	3.6	1.6	1.9	2.5	3.4	2.3	2.5	1.9	1.7	8.1	8.8	8.9	10.5	13.5	11.9	6.8	7.6	7.3	5.6	7.2	7.3	5.6
20	7.4	7.1	6.0	4.7	2.5	1.9	1.4	1.4	2.0	1.3	4.1	6.5	6.7	7.1	6.4	6.9	6.2	6.7	6.5	4.3	1.5	2.2	2.4	2.7	4.4
21	2.5	2.6	3.0	3.6	2.9	2.8	3.3	3.5	2.5	1.3	1.5	1.8	2.4	2.3	1.8	2.5	4.0	4.8	7.3	6.3	5.5	3.6	1.6	2.0	3.1
22	1.8	2.7	3.5	3.8	3.3	3.2	3.5	2.5	2.7	2.4	1.9	1.9	2.2	2.9	3.0	3.9	5.1	6.7	6.2	5.0	4.4	1.9	1.7	2.7	3.3
23	3.2	3.3	2.1	3.1	3.7	3.4	2.9	1.8	0.9	0.9	1.7	2.2	2.1	2.7	4.7	5.6	6.0	6.9	6.5	4.7	4.5	2.3	1.7	2.5	3.3
24	3.5	3.3	3.4	2.2	2.2	3.0	2.9	2.0	1.0	0.8	0.9	1.7	2.4	3.0	6.3	7.1	7.4	7.8	7.0	5.3	3.2	1.0	2.0	2.5	3.4
25	3.4	2.9	2.4	3.3	2.7	2.4	3.3	2.7	1.7	1.0	1.5	1.8	3.1	5.3	5.7	5.8	5.2	5.7	5.6	4.3	3.9	2.2	1.5	2.9	3.3
26	3.2	3.3	3.3	2.1	3.4	3.3	1.0	2.2	0.9	1.2	1.4	4.8	5.9	5.9	7.3	7.8	7.0	6.5	5.6	2.9	1.6	2.0	2.3	3.0	3.7
27	2.8	2.7	1.5	2.3	3.4	3.9	3.3	3.0	6.2	7.2	8.1	7.1	7.5	5.6	3.6	3.1	3.0	2.0	2.2	2.0	4.8	4.2	3.2	1.7	3.9
28	1.4	2.9	1.8	2.2	2.0	2.2	2.7	2.2	2.2	0.9	1.4	1.7	2.4	3.9	7.0	8.4	8.1	7.6	7.9	8.0	7.1	5.2	1.8	3.4	3.9
29	2.1	1.0	1.6	1.5	2.4	2.8	2.5	2.2	1.6	1.5	2.1	4.2	6.5	8.1	7.1	8.8	9.1	9.1	9.5	9.3	9.9	9.4	9.2	6.5	5.3
30	4.5	3.9	5.5	4.7	3.0	1.6	1.4	1.4	1.4	3.8	4.7	4.6	6.0	6.6	6.5	7.2	7.4	9.0	9.1	7.8	8.4	7.2	4.7	4.3	5.2
HRAVE	3.4	3.5	3.2	3.0	3.1	3.0	2.9	2.7	2.5	2.6	3.0	3.3	4.3	5.0	5.7	6.4	6.9	7.2	7.0	5.6	4.6	3.4	2.8	3.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	2.6	4.1	2.8	3.2	3.3	3.7	3.8	4.6	3.3	3.4	3.3	7.8	6.5	5.2	3.4	4.4	5.9	3.1	5.6	4.4	3.1	3.3	3.3	3.4	3.3
MAX	4.5	8.5	6.4	8.4	8.4	8.0	7.7	8.7	6.7	6.5	7.3	15.5	10.2	10.7	7.3	8.8	9.4	8.6	13.5	7.4	7.3	6.7	6.9	7.8	5.8
MIN	1.3	0.7	0.9	0.9	0.8	1.2	0.9	0.9	1.6	1.5	0.7	1.7	3.1	1.7	1.1	1.1	2.1	0.7	1.6	1.3	1.3	1.7	0.9	0.8	1.0

DAY	26	27	28	29	30	31
AVE	3.7	3.9	3.9	5.3	5.2	***
MAX	7.8	8.1	8.4	9.9	9.1	***
MIN	0.9	1.5	0.9	1.0	1.4	***

MONTHLY AVERAGE = 4.1 MONTHLY MAXIMUM = 15.5 MONTHLY MINIMUM = 0.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
APRIL - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	92	92	101	83	73	12	92	111	120	104	87	82	34	39	20	252	256	285	213	279	288	287	144	137	112
2	115	104	126	103	94	90	116	101	131	189	169	355	276	239	246	251	267	266	274	270	271	304	304	2	247
3	197	281	295	101	95	98	92	121	110	93	170	244	261	283	286	285	287	293	295	317	304	48	104	102	18
4	106	98	111	111	101	115	113	114	131	145	141	162	299	339	303	290	298	302	300	296	284	273	142	104	163
5	102	89	93	100	104	97	97	104	123	119	124	313	259	286	303	282	284	288	294	294	298	290	127	104	55
6	106	105	112	118	91	72	77	84	91	133	101	316	306	275	280	271	270	278	288	284	274	218	136	244	43
7	126	140	152	95	81	75	75	100	106	163	296	290	296	275	281	273	275	278	281	285	262	265	265	277	193
8	304	308	264	246	225	198	181	236	275	273	276	278	282	279	278	273	276	288	294	289	303	300	253	141	193
9	128	114	100	91	95	101	133	114	126	148	105	97	180	256	251	234	262	287	289	304	305	297	128	115	309
10	114	126	115	122	116	125	111	111	127	110	64	62	49	120	276	289	292	312	294	308	301	283	118	120	156
11	101	100	117	103	127	92	83	108	117	298	298	264	272	262	263	292	304	283	285	297	219	124	98	227	315
12	214	139	102	103	106	16	107	315	283	288	279	270	249	257	249	268	290	284	283	279	283	289	286	276	179
13	275	273	307	318	311	321	313	306	284	291	283	285	275	273	282	280	277	276	280	289	306	313	11	22	93
14	14	3	358	45	54	40	44	68	86	69	75	76	64	299	278	292	290	281	285	300	301	314	203	127	237
15	105	97	109	115	112	115	110	113	135	145	145	137	139	131	123	247	295	282	301	301	287	172	119	119	143
16	101	103	104	102	114	111	121	128	125	121	197	309	265	232	302	264	246	246	262	264	277	274	212	281	242
17	295	286	280	255	283	286	283	279	296	294	299	298	290	283	285	291	290	285	305	301	302	302	300	154	18
18	128	115	114	110	112	104	97	128	126	144	127	150	91	306	299	308	264	291	302	321	285	259	118	106	231
19	121	96	114	90	76	100	105	113	119	89	224	295	205	214	229	237	285	291	301	284	282	274	279	283	196
20	294	298	312	323	287	277	281	283	302	254	274	256	276	284	271	281	275	288	297	297	281	165	109	124	46
21	123	93	137	109	101	140	139	146	146	124	253	223	286	256	262	264	270	283	303	304	313	297	158	93	218
22	89	119	114	117	119	119	121	109	142	145	125	123	239	55	293	284	295	297	295	294	299	256	147	119	146
23	115	114	109	102	108	110	111	130	228	230	276	282	317	272	313	299	294	290	288	299	304	307	160	123	29
24	118	111	108	126	101	95	122	117	117	115	233	273	269	305	301	296	297	289	293	292	301	227	128	117	131
25	102	111	106	96	105	114	108	109	94	4	265	278	292	300	293	296	287	290	283	296	308	305	158	110	215
26	117	108	106	117	92	89	86	99	160	133	250	294	279	277	289	283	286	292	291	306	299	159	137	106	16
27	112	97	97	92	91	107	97	89	95	81	82	87	72	68	95	123	140	128	260	200	285	305	302	156	339
28	265	302	183	153	112	116	108	122	137	218	284	218	259	262	270	285	276	273	275	281	275	291	357	332	129
29	248	186	295	252	137	105	104	98	129	102	282	258	248	241	237	256	243	260	269	271	279	277	267	262	31
30	264	223	263	297	299	145	134	124	314	301	262	277	255	248	249	273	277	267	254	256	250	268	251	235	43

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
APRIL - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	6	7	11	51	12	24	15	13	10	14	20	29	36	49	58	52	21	45	19	13	8	33	28	22	25
2	17	13	7	11	7	8	9	10	15	52	42	72	40	33	19	18	17	13	9	8	11	9	12	56	21
3	48	57	57	50	11	13	9	8	14	24	62	51	52	44	20	20	17	11	10	8	19	48	14	9	28
4	7	7	6	7	10	8	7	10	20	29	40	50	56	35	45	16	14	11	9	9	7	33	17	8	19
5	7	6	14	11	8	7	7	8	15	26	39	41	63	33	33	21	15	9	8	6	10	22	31	12	19
6	9	8	10	10	10	20	10	14	11	26	29	59	33	18	18	17	13	12	9	6	5	32	19	58	19
7	25	20	20	13	9	9	9	17	15	44	43	51	26	24	18	18	15	11	8	6	8	12	11	13	19
8	19	12	27	43	37	25	34	43	21	12	17	20	18	15	22	13	15	14	11	8	7	16	25	8	20
9	19	8	10	9	9	9	19	9	10	17	26	36	45	58	40	43	28	26	8	6	5	39	14	15	21
10	19	11	9	9	11	11	8	8	12	20	21	31	54	60	35	35	39	15	10	7	8	45	8	7	20
11	7	6	8	12	6	27	17	9	36	36	45	38	43	36	24	14	15	16	9	5	13	8	19	60	21
12	32	39	39	45	13	31	39	41	17	11	13	19	20	16	16	14	11	10	8	8	8	9	8	7	20
13	8	12	16	10	11	11	12	13	13	20	23	15	17	16	18	12	12	11	9	8	9	8	19	16	13
14	15	14	25	55	13	12	13	17	18	32	14	27	33	45	26	26	20	11	10	7	7	10	25	12	20
15	9	9	8	7	9	12	8	10	12	15	25	40	55	45	41	62	25	10	8	8	27	15	43	7	21
16	8	8	7	12	7	9	7	8	25	32	40	34	27	18	21	23	18	13	13	12	11	26	46	24	19
17	10	24	12	11	11	8	9	8	13	13	11	14	18	17	13	14	13	13	14	9	6	6	43	13	14
18	9	7	10	10	8	6	8	10	19	24	40	51	41	54	24	24	20	12	10	11	23	64	14	19	22
19	10	9	15	14	26	23	13	8	15	18	34	44	19	21	14	15	12	10	17	9	9	7	7	6	16
20	9	9	10	13	15	19	35	37	29	55	24	23	20	15	23	15	22	17	12	9	15	11	10	12	19
21	10	9	15	6	7	13	12	10	16	44	41	50	52	46	50	43	19	13	8	7	6	9	29	14	22
22	20	23	15	7	8	7	7	11	13	22	36	42	54	40	55	29	23	17	9	6	5	27	10	6	21
23	9	9	13	10	9	8	10	13	42	48	36	38	52	42	33	22	18	13	8	6	6	11	22	8	20
24	7	7	8	11	16	11	8	13	32	64	57	47	57	43	23	17	13	10	10	4	7	22	8	8	21
25	8	10	9	8	8	11	12	10	19	72	44	40	30	25	29	21	21	15	9	6	6	13	28	8	19
26	8	11	12	16	9	8	21	13	30	34	40	17	16	17	12	12	10	9	7	10	20	16	7	8	15
27	11	10	17	18	10	10	8	18	15	15	15	15	15	38	42	33	27	32	27	27	25	14	50	34	22
28	30	46	31	20	10	8	8	11	20	50	36	58	59	47	19	14	15	14	12	8	7	10	39	23	25
29	32	47	24	49	15	9	8	10	25	58	51	37	18	21	19	16	15	13	10	10	7	8	9	11	22
30	10	8	20	6	7	25	17	30	40	20	24	29	22	22	21	22	20	12	12	11	10	8	10	10	17
HRAVE	14	16	16	18	11	13	13	15	20	31	33	37	36	33	28	23	18	15	11	9	10	20	21	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	25	21	28	19	19	19	19	20	21	20	21	20	13	20	21	19	14	22	16	19	22	21	20	21	19
MAX	58	72	62	56	63	59	51	43	58	60	60	45	23	55	62	46	43	64	44	55	52	55	52	64	72
MIN	6	7	8	6	6	5	6	7	5	7	5	7	8	7	7	7	6	6	6	9	6	5	6	4	6

DAY	26	27	28	29	30	31
AVE	15	22	25	22	17	***
MAX	40	50	59	58	40	***
MIN	7	8	7	7	6	***

MONTHLY AVERAGE = 20.0 MONTHLY MAXIMUM = 72.2 MONTHLY MINIMUM = 4.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
APRIL - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	20.1	19.2	18.6	17.3	16.4	16.1	15.1	15.6	17.5	20.2	21.9	23.9	26.0	27.8	28.8	29.8	29.4	29.0	28.1	26.0	24.6	24.1	23.1	22.1	22.5
2	20.5	18.5	17.1	15.7	14.6	12.7	12.4	14.4	16.8	20.1	23.7	26.2	28.0	29.7	30.2	30.5	30.2	29.2	27.4	25.9	24.5	23.3	22.2	21.7	22.3
3	20.5	19.9	18.8	17.4	15.7	14.2	13.5	14.6	18.3	21.2	24.0	25.1	26.7	28.0	28.8	28.9	28.4	27.5	26.3	24.9	23.9	23.2	21.3	19.7	22.1
4	18.4	17.2	16.3	15.7	13.9	13.5	12.9	15.4	17.7	20.9	24.2	27.2	29.0	29.6	30.2	30.4	29.6	28.4	27.8	26.1	24.8	24.1	22.2	20.7	22.3
5	19.3	18.3	16.9	16.0	15.1	14.1	14.1	15.4	18.3	20.7	23.7	26.0	28.5	29.9	30.9	31.5	30.3	29.2	27.9	26.7	25.6	24.9	23.9	22.0	22.9
6	20.9	20.2	19.2	18.2	17.6	16.4	15.9	16.1	19.4	22.3	25.5	27.2	28.9	30.2	30.5	31.2	31.1	30.0	28.4	26.7	25.7	24.2	22.9	22.9	23.8
7	23.0	22.4	22.0	20.3	20.7	19.5	18.4	18.5	21.9	24.6	26.6	28.3	30.2	31.0	31.6	32.1	32.0	31.8	30.6	28.8	27.7	26.6	25.9	25.4	25.8
8	25.2	24.3	23.9	22.6	22.0	21.4	21.4	22.0	24.0	25.4	26.8	28.1	29.1	29.7	30.4	30.7	30.6	30.0	28.6	26.7	25.6	25.1	23.8	21.4	25.8
9	21.5	20.4	18.8	17.4	16.6	15.9	14.7	16.9	19.3	24.3	28.1	29.7	31.1	31.2	32.3	32.8	32.8	32.1	30.2	28.3	27.2	26.1	24.5	23.0	24.8
10	21.4	19.5	19.2	17.4	16.9	15.1	16.2	18.2	21.2	25.5	29.2	31.0	32.5	34.0	34.2	34.8	34.6	33.5	32.2	30.0	29.0	27.8	25.8	23.9	26.0
11	22.1	20.7	20.2	18.6	17.7	16.7	15.6	18.2	20.5	23.2	26.9	30.6	32.1	34.2	33.9	33.0	32.9	32.5	31.5	29.8	27.6	25.5	24.8	25.0	25.6
12	24.0	22.6	21.0	21.1	19.5	18.3	18.4	18.8	22.4	25.4	26.6	27.2	29.1	29.4	30.0	29.4	27.8	26.1	23.7	22.2	21.2	20.2	19.4	18.2	23.4
13	17.7	16.9	15.8	14.9	13.9	13.3	12.9	13.6	15.1	16.5	17.5	18.2	18.5	19.3	20.4	20.6	20.7	20.5	19.7	18.5	17.7	17.1	17.9	17.2	17.3
14	16.7	16.3	15.6	15.0	14.2	14.0	13.9	15.2	17.0	18.1	19.4	21.1	22.6	24.1	24.7	25.5	25.9	25.0	23.6	21.8	20.6	19.8	18.7	17.2	19.4
15	15.6	14.3	13.1	12.1	11.5	10.2	10.9	13.5	16.2	20.2	23.1	26.0	28.5	30.6	31.7	32.1	32.2	30.8	28.4	26.9	25.4	23.8	22.4	20.9	21.7
16	19.7	18.2	17.6	15.8	15.5	14.1	14.3	16.5	19.1	22.7	24.9	27.4	30.3	31.4	31.2	32.1	31.6	30.0	28.7	27.2	26.0	25.4	25.0	23.9	23.7
17	23.3	22.4	22.1	20.8	19.2	16.6	15.8	15.9	17.2	18.5	19.1	20.1	21.6	22.5	22.7	22.9	22.4	22.0	20.5	19.0	18.1	17.4	16.2	14.6	19.6
18	13.8	12.5	11.4	10.4	9.8	9.5	9.1	11.0	14.9	18.5	21.5	23.6	26.1	27.9	28.2	29.2	29.7	28.7	26.2	24.0	23.1	22.2	20.2	18.5	19.6
19	16.9	16.7	15.2	13.6	12.7	11.9	11.6	13.6	17.8	22.5	25.8	27.8	32.2	32.7	32.5	31.6	27.8	23.3	21.1	19.5	18.5	17.4	16.1	15.1	20.6
20	14.4	13.9	13.2	12.9	11.9	11.1	10.8	12.6	14.3	16.0	18.1	19.2	19.7	20.4	21.3	21.6	21.8	21.5	20.5	19.3	18.7	17.1	16.7	15.8	16.8
21	14.7	14.2	12.2	12.8	11.7	10.2	11.2	13.5	17.0	19.7	21.7	23.9	26.0	27.0	28.5	28.6	29.2	29.0	27.5	25.9	25.1	24.0	22.6	22.1	20.8
22	20.6	18.6	17.9	17.9	17.1	16.3	16.0	18.8	21.3	25.0	28.4	30.6	31.7	32.5	32.6	33.0	32.6	32.0	30.7	28.7	27.2	26.3	24.6	23.5	25.2
23	22.4	21.5	20.4	19.2	18.2	17.3	17.5	18.8	21.0	24.6	27.4	30.5	31.8	32.8	33.4	33.6	33.5	32.8	31.1	29.2	28.3	27.3	25.5	23.9	25.9
24	22.6	21.7	20.5	19.6	18.2	16.9	17.6	19.8	22.5	26.4	29.3	31.1	32.5	33.7	34.5	34.7	34.1	33.2	31.7	30.0	28.7	27.7	26.1	24.7	26.6
25	23.2	22.2	21.3	20.1	19.0	17.7	18.4	21.1	23.9	27.6	29.4	31.4	33.2	34.0	34.5	34.6	34.5	33.9	32.5	30.4	29.2	28.4	26.8	24.9	27.2
26	23.4	22.1	21.3	19.9	19.0	18.3	17.7	20.6	22.0	25.9	28.7	31.2	32.4	32.7	32.6	31.8	31.3	30.9	30.0	29.1	28.8	27.0	26.2	25.4	26.2
27	24.8	24.3	22.8	21.8	21.0	20.5	21.7	23.1	26.7	29.6	31.0	32.4	33.1	34.2	35.1	34.5	34.0	33.7	33.2	32.0	31.3	30.2	29.0	28.0	28.7
28	27.8	26.5	25.8	24.4	23.0	22.3	21.9	23.2	25.9	28.0	29.9	32.0	33.3	33.9	34.6	34.3	34.0	33.4	32.4	30.6	29.3	27.8	26.9	26.4	28.7
29	24.8	24.0	22.8	22.3	19.6	19.4	19.7	21.5	23.9	27.1	28.8	31.1	32.0	32.6	32.7	32.8	32.5	31.4	29.5	27.8	26.5	25.3	24.5	23.5	26.5
30	22.4	21.5	20.7	19.7	19.0	17.4	17.9	19.4	21.9	23.7	25.1	26.3	27.6	28.7	29.0	28.6	28.1	27.5	26.2	24.9	23.8	22.9	22.0	21.3	23.6
HRAVE	20.7	19.7	18.7	17.7	16.7	15.7	15.6	17.2	19.8	22.8	25.2	27.1	28.8	29.9	30.4	30.6	30.2	29.3	27.9	26.2	25.1	24.1	22.9	21.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	22.5	22.3	22.1	22.3	22.9	23.8	25.8	25.8	24.8	26.0	25.6	23.4	17.3	19.4	21.7	23.7	19.6	19.6	20.6	16.8	20.8	25.2	25.9	26.6	27.2
MAX	29.8	30.5	28.9	30.4	31.5	31.2	32.1	30.7	32.8	34.8	34.2	30.0	20.7	25.9	32.2	32.1	23.3	29.7	32.7	21.8	29.2	33.0	33.6	34.7	34.6
MIN	15.1	12.4	13.5	12.9	14.1	15.9	18.4	21.4	14.7	15.1	15.6	18.2	12.9	13.9	10.2	14.1	14.6	9.1	11.6	10.8	10.2	16.0	17.3	16.9	17.7

DAY	26	27	28	29	30	31
AVE	26.2	28.7	28.7	26.5	23.6	***
MAX	32.7	35.1	34.6	32.8	29.0	***
MIN	17.7	20.5	21.9	19.4	17.4	***

MONTHLY AVERAGE = 23.5 MONTHLY MAXIMUM = 35.1 MONTHLY MINIMUM = 9.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
APRIL - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.8	0.6	0.6	0.6	0.4	0.6	0.4	0.1	-0.6	-0.9	-0.6	-0.8	-0.7	-1.0	-1.0	-1.0	-0.8	-0.4	0.2	0.6	0.6	0.4	0.6	0.7	0.0
2	0.7	0.6	0.9	0.9	0.9	0.8	0.5	-1.0	-1.0	-0.5	-0.8	-0.9	-1.2	-1.5	-1.4	-1.1	-0.8	-0.5	0.0	0.2	0.3	0.3	0.4	0.4	-0.2
3	0.5	0.5	0.6	0.7	0.9	0.7	0.3	-0.4	-1.4	-1.1	-0.9	-0.9	-1.1	-1.1	-1.3	-1.2	-0.9	-0.6	-0.1	0.3	0.5	0.5	0.6	0.7	-0.2
4	0.8	0.6	0.6	0.5	0.6	0.6	0.3	-0.9	-0.8	-0.9	-0.9	-0.9	-1.1	-1.1	-0.9	-0.9	-0.6	-0.2	-0.1	0.4	0.4	0.4	0.5	0.7	-0.1
5	0.6	0.6	0.7	0.5	0.6	0.8	0.3	-0.9	-1.0	-0.7	-0.8	-0.7	-1.0	-1.2	-1.2	-1.2	-0.8	-0.4	0.0	0.4	0.6	0.5	0.6	0.8	-0.1
6	0.5	0.4	0.5	0.5	0.6	0.3	0.3	-0.1	-1.2	-1.0	-1.3	-0.9	-1.2	-1.3	-1.2	-1.1	-0.8	-0.4	0.0	0.3	0.6	0.6	0.4	0.3	-0.2
7	0.3	0.4	0.4	0.6	0.8	0.6	0.5	-0.2	-1.1	-0.7	-1.0	-1.1	-1.3	-1.3	-1.4	-1.2	-0.9	-0.6	-0.2	0.3	0.4	0.4	0.3	0.2	-0.3
8	0.2	0.3	0.3	0.5	0.4	0.5	0.5	0.0	-0.6	-0.7	-1.1	-1.4	-1.4	-1.4	-1.4	-1.1	-0.9	-0.6	-0.1	0.3	0.5	0.4	0.6	0.5	-0.2
9	0.4	0.6	0.7	0.7	0.7	0.7	0.7	-0.7	-0.9	-1.4	-1.6	-1.6	-1.4	-1.1	-1.2	-1.1	-0.8	-0.6	-0.1	0.4	0.6	0.6	0.8	0.5	-0.2
10	0.6	0.6	0.4	1.3	0.7	0.8	0.1	-1.0	-1.5	-1.4	-1.5	-1.5	-1.3	-1.4	-1.1	-1.1	-0.7	-0.3	0.0	0.5	0.8	0.6	0.7	0.8	-0.2
11	0.8	0.7	0.5	0.8	0.6	0.8	0.3	-1.1	-0.7	-0.6	-0.8	-1.1	-1.2	-1.4	-1.1	-0.8	-0.8	-0.4	0.0	0.5	0.6	0.6	0.4	0.5	-0.1
12	0.7	0.7	0.7	0.8	1.0	0.9	0.4	0.3	-0.4	-0.6	-0.9	-0.9	-1.3	-1.1	-1.0	-0.8	-0.6	-0.3	-0.1	0.0	0.1	0.1	0.1	0.2	-0.1
13	0.2	0.2	0.3	0.2	0.2	0.3	0.2	-0.3	-0.4	-0.9	-1.1	-1.3	-1.4	-1.4	-1.4	-1.2	-1.0	-0.6	-0.2	0.2	0.4	0.4	0.3	0.2	-0.3
14	0.2	0.1	0.2	0.2	0.5	0.2	0.0	-0.7	-1.5	-1.4	-1.8	-1.7	-1.5	-1.5	-1.4	-1.1	-1.1	-0.9	-0.3	0.2	0.3	0.4	0.5	0.5	-0.5
15	0.6	0.8	0.7	0.5	0.5	0.8	-0.3	-1.4	-1.5	-1.8	-1.5	-1.4	-1.2	-1.6	-1.4	-1.0	-0.9	-0.4	0.0	0.3	0.6	0.8	0.5	0.6	-0.3
16	0.8	0.8	0.6	0.6	0.4	0.5	0.3	-1.0	-1.0	-0.8	-0.8	-0.9	-1.2	-1.1	-1.1	-1.1	-0.8	-0.2	0.0	0.1	0.2	0.2	0.2	0.4	-0.2
17	0.5	0.4	0.4	0.3	0.3	0.1	0.0	-0.2	-0.8	-1.0	-1.3	-1.4	-1.5	-1.5	-1.6	-1.4	-1.2	-0.9	-0.3	0.1	0.3	0.4	0.5	0.4	-0.4
18	0.5	0.5	0.5	0.6	0.4	0.6	-0.1	-0.9	-1.3	-1.5	-1.5	-1.1	-1.6	-1.4	-1.2	-1.2	-1.0	-0.8	-0.2	0.2	0.4	0.3	0.6	0.5	-0.4
19	0.6	0.6	0.8	0.5	0.5	0.6	0.2	-0.4	-1.3	-1.6	-1.3	-1.0	-1.9	-1.5	-1.6	-1.0	-0.8	-0.4	-0.3	-0.1	0.0	0.1	0.1	0.1	-0.4
20	0.0	0.1	0.1	0.1	0.4	0.4	0.0	-0.5	-0.7	-0.8	-1.3	-1.5	-1.4	-1.6	-1.5	-1.4	-1.2	-0.9	-0.4	0.1	0.3	0.5	0.5	0.4	-0.4
21	0.6	0.6	0.7	0.3	0.7	0.7	0.1	-1.3	-1.2	-1.1	-0.9	-1.2	-1.3	-1.3	-1.3	-0.9	-0.9	-0.6	-0.2	0.2	0.3	0.5	0.3	0.6	-0.3
22	0.4	0.8	0.6	0.3	0.3	0.3	0.1	-1.2	-1.3	-1.6	-1.3	-1.5	-1.5	-1.5	-1.2	-1.2	-1.0	-0.8	-0.3	0.2	0.5	0.6	0.6	0.6	-0.4
23	0.4	0.5	0.5	0.7	0.6	0.6	-0.2	-0.8	-0.6	-0.7	-1.0	-1.2	-1.2	-1.3	-1.3	-1.1	-1.1	-0.8	-0.2	0.3	0.4	0.6	0.5	0.7	-0.2
24	0.5	0.5	0.5	0.4	0.6	0.6	-0.1	-1.0	-0.7	-0.7	-0.8	-1.0	-1.2	-1.3	-1.4	-1.3	-1.1	-0.7	-0.1	0.3	0.6	0.5	0.7	0.8	-0.2
25	0.6	0.6	0.6	0.7	0.7	0.6	0.2	-1.1	-1.0	-0.8	-0.9	-1.2	-1.4	-1.5	-1.4	-1.4	-1.1	-0.8	-0.4	0.3	0.6	0.5	0.5	0.7	-0.3
26	0.7	0.6	0.5	0.6	0.7	0.7	0.1	-0.9	-0.6	-0.9	-0.9	-1.3	-1.2	-1.1	-1.1	-0.7	-0.5	-0.3	0.0	0.3	0.3	0.4	0.3	0.3	-0.2
27	0.3	0.5	0.4	0.3	0.6	0.7	0.0	-0.7	-1.0	-1.5	-1.7	-1.9	-1.5	-1.4	-1.5	-1.1	-0.8	-0.5	-0.2	0.2	0.2	0.4	0.5	0.4	-0.4
28	0.5	0.5	0.4	0.4	0.3	0.6	-0.2	-0.8	-1.2	-0.7	-1.1	-1.2	-1.4	-1.4	-1.4	-1.3	-1.0	-0.7	-0.3	0.1	0.2	0.2	0.4	0.4	-0.4
29	0.5	0.4	0.6	0.8	0.6	0.9	-0.3	-1.0	-0.8	-1.0	-1.1	-1.4	-1.4	-1.4	-1.4	-1.2	-0.9	-0.6	-0.2	0.1	0.1	0.1	0.1	0.1	-0.3
30	0.2	0.5	0.4	0.5	0.6	0.6	-0.1	-0.6	-0.7	-1.0	-1.3	-1.3	-1.4	-1.6	-1.4	-1.2	-0.9	-0.4	-0.1	0.0	0.0	0.0	0.1	0.1	-0.4
HRAVE	0.5	0.5	0.5	0.5	0.6	0.6	0.1	-0.7	-1.0	-1.0	-1.1	-1.2	-1.3	-1.3	-1.3	-1.1	-0.9	-0.6	-0.1	0.2	0.4	0.4	0.4	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.0	-0.2	-0.2	-0.1	-0.1	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.3	-0.5	-0.3	-0.2	-0.4	-0.4	-0.4	-0.4	-0.3	-0.4	-0.2	-0.2	-0.3
MAX	0.8	0.9	0.9	0.8	0.8	0.6	0.8	0.6	0.8	1.3	0.8	1.0	0.4	0.5	0.8	0.8	0.5	0.6	0.8	0.5	0.7	0.8	0.7	0.8	0.7
MIN	-1.0	-1.5	-1.4	-1.1	-1.2	-1.3	-1.4	-1.4	-1.6	-1.5	-1.4	-1.3	-1.4	-1.8	-1.8	-1.2	-1.6	-1.6	-1.9	-1.6	-1.3	-1.6	-1.3	-1.4	-1.5

DAY	26	27	28	29	30	31
AVE	-0.2	-0.4	-0.4	-0.3	-0.4	***
MAX	0.7	0.7	0.6	0.9	0.6	***
MIN	-1.3	-1.9	-1.4	-1.4	-1.6	***

MONTHLY AVERAGE = -0.3 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = -1.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
APRIL - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	700	700	700	700	700	700	700	700	700	700	700	700	699	698	698	697	697	697	696	697	697	698	698	698	699
2	698	698	698	697	697	697	698	698	698	698	698	697	696	695	695	694	694	694	694	694	695	696	696	696	696
3	696	697	697	697	697	698	699	699	700	700	700	700	700	699	699	699	699	699	699	699	700	700	701	701	699
4	701	701	701	701	701	702	702	703	703	703	703	702	701	700	700	699	699	699	699	700	700	701	701	701	701
5	701	701	701	701	701	701	702	702	702	702	702	701	700	700	699	698	698	698	698	698	698	699	699	699	700
6	699	699	699	699	699	699	699	700	700	700	699	699	698	698	697	696	696	696	696	697	697	698	698	698	698
7	699	699	699	699	699	699	699	699	700	700	700	699	698	698	697	697	697	696	697	697	698	698	698	698	698
8	698	698	698	698	698	698	698	699	699	699	699	699	698	698	698	697	697	697	697	698	698	699	699	699	698
9	699	699	699	700	700	700	701	702	702	702	702	701	701	701	700	700	699	700	700	701	701	702	702	702	701
10	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	700	700	700	700	701	701	701	701	702
11	701	701	701	701	701	701	702	702	702	702	702	701	700	700	699	699	698	698	698	698	698	699	699	699	700
12	699	699	698	698	698	698	698	698	698	698	698	698	697	696	695	694	694	694	695	695	696	697	698	699	697
13	699	699	700	700	701	701	702	703	704	704	704	704	704	703	703	702	702	702	703	703	703	704	705	705	702
14	705	705	706	706	706	706	707	707	707	707	707	706	706	705	704	703	703	703	703	703	704	704	704	704	705
15	704	704	703	703	703	703	704	704	704	703	703	702	701	700	699	699	698	698	699	699	700	700	700	700	701
16	701	701	701	701	701	701	701	701	701	701	701	701	700	700	699	698	698	698	699	699	699	700	700	700	700
17	700	700	700	700	700	701	701	702	702	702	702	702	702	702	702	701	701	701	701	701	702	702	702	703	701
18	703	703	703	703	703	703	704	704	704	704	703	703	702	702	701	700	700	700	700	700	701	701	701	701	702
19	701	700	700	700	700	700	700	700	700	700	699	698	697	696	696	695	695	696	697	697	698	698	699	699	699
20	699	700	700	701	701	701	701	702	702	702	702	702	702	702	702	701	701	701	702	702	703	703	703	704	702
21	704	704	704	704	703	704	704	704	704	704	704	703	702	702	701	700	700	700	700	700	701	701	702	702	702
22	701	701	701	701	701	701	701	701	701	701	701	700	699	699	698	698	698	698	698	698	699	699	700	700	700
23	700	700	701	701	701	701	702	702	702	703	702	702	701	700	700	699	699	699	699	699	700	700	700	701	701
24	701	701	701	701	701	702	702	702	702	702	702	701	701	700	699	699	699	699	699	699	700	700	701	701	701
25	701	701	701	701	701	702	702	703	703	703	702	702	701	701	700	700	699	699	699	699	700	700	700	700	701
26	700	700	700	700	700	700	701	701	701	701	700	700	699	699	699	698	698	698	698	698	698	699	699	699	699
27	699	699	699	699	699	700	700	701	701	701	700	700	699	698	698	697	697	696	696	696	697	697	697	698	698
28	698	698	698	698	698	698	698	699	699	699	698	698	697	696	696	695	695	695	695	696	696	697	698	698	697
29	698	698	698	699	699	699	699	700	700	699	699	698	698	698	697	696	696	696	696	696	697	697	698	698	698
30	699	699	698	698	699	699	699	699	699	699	699	699	698	698	697	696	696	696	696	696	697	697	697	697	698
HRAVE	700	700	700	700	700	701	701	701	701	701	701	701	700	699	699	698	698	698	698	699	699	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	699	696	699	701	700	698	698	698	701	702	700	697	702	705	701	700	701	702	699	702	702	700	701	701	701
MAX	700	698	701	703	702	700	700	699	702	704	702	699	705	707	704	701	703	704	701	704	704	701	703	702	703
MIN	696	694	696	699	698	696	696	697	699	700	698	694	699	703	698	698	700	700	695	699	700	698	699	699	699

DAY	26	27	28	29	30	31
AVE	699	698	697	698	698	***
MAX	701	701	699	700	699	***
MIN	698	696	695	696	696	***

MONTHLY AVERAGE = 699.8 MONTHLY MAXIMUM = 706.8 MONTHLY MINIMUM = 693.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
APRIL - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	21	22	23	25	27	28	29	29	26	22	21	18	16	14	13	11	12	12	12	13	11	10	11	11	18
2	12	14	16	18	19	21	22	20	18	16	12	11	11	10	10	9	9	8	9	10	12	13	17	19	14
3	19	20	21	23	26	27	29	26	21	17	15	16	16	14	13	13	13	14	15	17	18	20	23	25	19
4	26	26	28	29	32	33	34	29	25	21	17	15	14	14	14	13	14	14	16	19	20	22	24	26	22
5	27	28	30	32	34	35	35	32	28	24	20	19	17	16	14	13	13	14	16	19	20	22	23	25	23
6	26	28	29	30	31	33	34	34	28	23	19	17	16	14	15	14	14	16	17	19	19	19	21	22	22
7	24	25	25	28	28	29	30	30	26	23	21	20	20	20	19	19	18	19	21	22	26	30	33	37	25
8	37	38	38	40	39	38	38	36	33	38	36	35	32	28	26	21	20	19	17	18	20	21	21	24	30
9	25	26	28	30	32	33	36	31	27	20	13	10	9	8	8	8	8	8	9	11	11	12	14	16	18
10	17	18	19	21	22	24	23	21	17	14	11	10	10	9	9	9	9	9	9	11	11	12	15	17	14
11	16	18	19	21	23	24	26	22	19	18	14	10	9	8	7	8	9	8	8	10	11	14	15	14	15
12	15	17	19	20	21	24	23	23	20	18	16	16	13	13	13	11	11	11	13	14	18	11	12	14	16
13	15	16	18	18	18	20	19	16	12	10	9	9	9	9	8	9	9	9	10	10	11	12	11	11	13
14	12	13	14	15	16	17	17	17	16	15	13	12	10	10	10	9	9	10	11	12	13	15	15	16	13
15	18	19	21	22	23	25	24	21	17	14	11	10	8	6	6	6	6	6	7	8	9	10	11	13	13
16	13	14	14	16	17	18	19	16	14	11	10	9	6	6	7	6	5	5	6	6	6	7	7	8	10
17	8	10	11	13	14	30	37	36	33	29	26	23	20	19	17	16	16	15	13	15	15	15	18	17	19
18	19	21	23	25	25	26	25	23	19	16	13	12	10	10	9	8	7	8	10	12	11	13	14	16	16
19	17	17	19	20	22	23	23	20	16	13	12	11	8	8	8	7	11	17	20	20	22	27	30	32	18
20	35	37	39	42	44	45	46	41	36	31	27	23	23	23	21	21	21	22	24	26	28	29	31	32	31
21	33	35	37	38	40	41	40	35	28	25	22	20	19	18	16	16	16	16	18	21	22	23	25	27	26
22	28	30	31	31	32	34	34	29	24	20	17	14	11	11	12	12	12	12	12	14	15	16	18	21	20
23	20	20	23	24	25	26	26	23	21	19	16	13	11	11	11	12	11	11	11	13	14	16	16	20	17
24	21	21	22	22	25	26	26	23	19	15	13	12	11	10	9	9	9	9	10	11	14	14	17	18	16
25	19	20	21	21	22	25	24	20	18	15	14	12	10	11	11	10	10	10	11	13	15	16	16	18	16
26	20	21	22	24	23	24	27	22	20	16	15	14	14	13	14	14	15	15	17	18	18	19	20	23	19
27	23	23	26	26	26	27	26	24	19	16	15	14	14	13	12	13	14	14	15	16	17	18	19	20	19
28	21	23	23	24	28	30	30	27	23	20	17	16	15	15	14	15	15	15	15	17	18	20	20	17	20
29	17	19	21	23	27	29	27	24	21	17	14	11	11	9	8	8	7	9	9	11	13	11	11	12	15
30	13	15	17	18	20	22	23	20	20	19	18	17	16	15	15	16	17	16	17	20	26	27	26	23	19
HRAVE	21	22	23	25	26	28	28	26	22	19	17	15	14	13	12	12	12	12	13	15	16	17	18	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	18	14	19	22	23	22	25	30	18	14	15	16	13	13	13	10	19	16	18	31	26	20	17	16	16
MAX	29	22	29	34	35	34	37	40	36	24	26	24	20	17	25	19	37	26	32	46	41	34	26	26	25
MIN	10	8	13	13	13	14	18	17	8	9	7	11	8	9	6	5	8	7	7	21	16	11	11	9	10

DAY	26	27	28	29	30	31
AVE	19	19	20	15	19	***
MAX	27	27	30	29	27	***
MIN	13	12	14	7	13	***

MONTHLY AVERAGE = 18.6 MONTHLY MAXIMUM = 45.7 MONTHLY MINIMUM = 5.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
APRIL - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.24	0.31	0.25	0.57	0.43	0.95	0.88	0.57	0.39	0.22	0.05	0.00	0.00	0.00	0.00	0.00	4.97
2	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.47	0.68	0.84	0.94	0.98	0.94	0.85	0.68	0.47	0.21	0.04	0.00	0.00	0.00	0.00	0.00	7.38
3	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.46	0.66	0.83	0.93	0.97	0.94	0.81	0.66	0.40	0.19	0.05	0.00	0.00	0.00	0.00	0.00	7.18
4	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.46	0.67	0.83	0.94	0.98	0.93	0.64	0.46	0.33	0.12	0.07	0.00	0.00	0.00	0.00	0.00	6.71
5	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.37	0.46	0.60	0.87	0.97	0.94	0.85	0.68	0.36	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.60
6	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.13	0.38	0.57	0.79	0.88	0.93	0.88	0.71	0.66	0.40	0.16	0.02	0.00	0.00	0.00	0.00	0.00	6.54
7	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.44	0.61	0.77	0.91	0.96	0.92	0.83	0.67	0.41	0.21	0.05	0.00	0.00	0.00	0.00	0.00	6.93
8	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.20	0.46	0.65	0.82	0.92	0.96	0.93	0.83	0.68	0.42	0.23	0.05	0.00	0.00	0.00	0.00	0.00	7.20
9	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.40	0.65	0.87	0.97	1.01	0.97	0.88	0.71	0.43	0.25	0.06	0.00	0.00	0.00	0.00	0.00	7.43
10	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.49	0.70	0.86	0.94	0.96	0.92	0.77	0.72	0.37	0.20	0.06	0.00	0.00	0.00	0.00	0.00	7.31
11	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27	0.49	0.69	0.86	0.98	1.01	0.95	0.59	0.47	0.37	0.19	0.06	0.00	0.00	0.00	0.00	0.00	6.99
12	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.46	0.68	0.76	0.78	0.94	0.95	0.85	0.64	0.35	0.16	0.03	0.00	0.00	0.00	0.00	0.00	6.92
13	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.30	0.52	0.73	0.89	0.99	1.02	0.98	0.88	0.72	0.41	0.26	0.07	0.00	0.00	0.00	0.00	0.00	7.85
14	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.52	0.73	0.89	0.99	1.02	0.99	0.89	0.73	0.41	0.27	0.07	0.00	0.00	0.00	0.00	0.00	7.88
15	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.30	0.52	0.73	0.89	0.99	1.03	1.00	0.89	0.73	0.41	0.17	0.04	0.00	0.00	0.00	0.00	0.00	7.78
16	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.31	0.40	0.60	0.63	0.80	0.79	0.74	0.75	0.69	0.37	0.13	0.03	0.00	0.00	0.00	0.00	0.00	6.30
17	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.50	0.71	0.87	0.96	1.00	0.97	0.88	0.71	0.36	0.28	0.08	0.00	0.00	0.00	0.00	0.00	7.67
18	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.53	0.74	0.90	1.00	1.03	0.99	0.90	0.74	0.40	0.29	0.08	0.00	0.00	0.00	0.00	0.00	8.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.24	0.51	0.73	0.89	0.99	1.03	0.95	0.90	0.57	0.41	0.09	0.08	0.00	0.00	0.00	0.00	0.00	7.45
20	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.51	0.72	0.87	0.97	1.00	0.96	0.87	0.70	0.42	0.28	0.08	0.00	0.00	0.00	0.00	0.00	7.75
21	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.53	0.73	0.89	0.98	1.01	0.99	0.87	0.58	0.36	0.21	0.06	0.00	0.00	0.00	0.00	0.00	7.62
22	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.32	0.46	0.75	0.89	0.99	1.02	0.86	0.88	0.69	0.38	0.29	0.08	0.00	0.00	0.00	0.00	0.00	7.69
23	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.54	0.74	0.89	0.99	1.02	0.99	0.86	0.66	0.38	0.31	0.05	0.00	0.00	0.00	0.00	0.00	7.85
24	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.55	0.75	0.91	1.00	1.03	0.99	0.90	0.71	0.41	0.25	0.05	0.00	0.00	0.00	0.00	0.00	7.97
25	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.32	0.55	0.75	0.89	0.98	1.01	0.99	0.89	0.70	0.41	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.97
26	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.27	0.50	0.63	0.76	0.82	0.79	0.61	0.53	0.32	0.23	0.13	0.04	0.00	0.00	0.00	0.00	0.00	5.73
27	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.31	0.50	0.70	0.85	0.95	0.98	0.95	0.84	0.30	0.21	0.20	0.06	0.00	0.00	0.00	0.00	0.00	6.91
28	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.54	0.73	0.88	0.98	1.01	0.82	0.81	0.67	0.36	0.29	0.09	0.00	0.00	0.00	0.00	0.00	7.61
29	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.57	0.75	0.88	1.00	1.01	0.93	0.72	0.66	0.36	0.31	0.07	0.00	0.00	0.00	0.00	0.00	7.73
30	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.56	0.76	0.89	0.93	0.88	0.94	0.77	0.52	0.33	0.18	0.04	0.00	0.00	0.00	0.00	0.00	7.26
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.48	0.68	0.82	0.93	0.96	0.93	0.82	0.63	0.38	0.22	0.06	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.97	7.38	7.18	6.71	6.60	6.54	6.93	7.20	7.43	7.31	6.99	6.92	7.85	7.88	7.78	6.30	7.67	8.00	7.45	7.75	7.62	7.69	7.85	7.97	7.97
MAX	0.95	0.98	0.97	0.98	0.97	0.93	0.96	0.96	1.01	0.96	1.01	0.95	1.02	1.02	1.03	0.80	1.00	1.03	1.03	1.00	1.01	1.02	1.02	1.03	1.01
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.73	6.91	7.61	7.73	7.26	***
MAX	0.82	0.98	1.01	1.01	0.94	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
APRIL - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.00 MONTHLY MAXIMUM = 0.00 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
MAY - 2018

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	3.5	5.1	5.6	3.8	3.5	1.3	0.8	1.5	1.9	5.7	4.7	5.3	5.4	7.3	7.6	9.1	10.3	10.7	10.8	7.4	7.0	6.3	8.9	7.3	5.9
2	4.1	5.5	7.2	7.5	3.6	2.7	2.2	4.1	5.1	5.1	4.9	5.7	6.3	6.2	6.2	6.3	6.9	7.9	6.3	5.4	3.1	1.5	1.2	1.6	4.9
3	2.3	1.5	2.3	2.8	2.5	2.7	2.9	2.0	1.3	1.2	1.9	2.1	2.8	2.2	3.0	4.4	4.1	4.8	5.9	5.3	4.8	3.5	1.4	1.9	2.9
4	1.5	1.7	2.1	1.9	2.3	3.2	2.7	2.8	2.1	2.4	1.9	1.8	2.2	1.6	2.1	2.3	2.8	2.3	1.5	2.0	2.3	2.6	2.4	2.7	2.2
5	2.9	3.5	3.9	4.4	4.2	4.6	4.2	4.1	4.6	7.4	7.6	7.8	6.8	6.9	4.7	2.8	4.4	4.5	4.6	5.5	5.1	2.9	3.7	5.7	4.9
6	6.2	4.2	4.3	3.4	3.2	3.8	4.1	3.9	6.3	5.0	5.9	4.8	2.8	2.8	4.2	2.1	2.3	6.6	6.4	4.8	2.1	0.9	2.5	3.2	4.0
7	1.9	2.3	2.3	1.8	3.0	3.2	3.3	2.8	1.5	1.1	1.3	1.8	2.2	1.4	3.1	5.2	6.3	6.4	5.2	5.2	3.6	1.4	2.5	3.1	3.0
8	3.1	3.7	3.4	2.4	3.4	3.2	3.0	2.4	1.0	0.7	1.2	1.2	2.6	4.6	7.0	7.4	7.3	7.2	6.9	5.1	4.1	1.1	1.1	3.0	3.6
9	3.0	2.5	2.1	2.6	2.8	3.8	2.2	2.1	1.6	1.1	1.1	2.3	3.6	6.0	7.3	6.9	7.1	7.7	6.7	5.2	2.9	1.2	1.1	2.8	3.6
10	3.1	3.1	2.7	3.0	2.7	3.5	2.4	2.2	1.2	1.2	1.0	1.6	2.2	5.1	6.5	7.2	7.2	7.1	7.3	5.9	6.2	7.0	6.0	5.1	4.2
11	4.8	3.7	2.6	1.5	1.1	1.4	1.1	1.9	1.9	1.5	3.7	7.2	7.7	8.2	10.9	10.8	11.8	11.4	10.8	8.9	7.1	7.6	7.7	6.5	5.9
12	5.7	6.2	6.2	3.5	2.0	3.8	5.0	6.7	7.3	6.6	7.6	7.3	8.3	7.7	7.8	9.1	9.2	8.6	9.0	9.3	8.8	10.2	7.6	3.9	7.0
13	3.8	3.2	3.2	1.6	1.2	1.8	1.2	1.3	0.8	1.3	2.4	4.9	4.1	5.0	7.0	7.0	6.1	6.3	7.1	6.5	6.8	6.6	2.4	1.9	3.9
14	3.0	2.4	0.8	1.3	2.1	1.0	1.9	1.8	1.2	1.4	1.7	2.2	2.1	4.1	6.8	6.6	6.6	6.1	8.1	7.9	7.2	6.1	4.9	5.2	3.8
15	1.9	1.2	2.8	2.3	2.7	2.3	2.9	2.4	1.0	1.2	1.6	1.7	2.3	3.2	5.4	7.1	6.4	7.3	6.9	5.2	2.2	1.0	1.6	2.5	3.1
16	3.2	3.6	1.7	2.0	2.6	2.6	1.6	1.9	0.9	1.1	0.9	1.5	2.0	2.7	4.6	8.3	8.3	8.5	7.2	4.7	2.1	1.6	1.5	1.9	3.2
17	2.5	3.1	1.8	2.1	3.2	3.4	2.9	1.7	1.7	1.3	2.1	2.6	4.7	6.9	6.4	7.9	7.6	7.0	6.4	6.1	5.5	4.3	3.2	3.1	4.1
18	2.2	1.5	1.7	1.2	1.1	0.7	1.5	1.1	0.7	1.3	1.8	2.6	2.5	6.1	7.0	6.6	6.7	6.9	6.6	5.5	3.5	2.6	1.4	1.6	3.1
19	2.7	3.8	3.2	1.4	2.5	2.8	3.1	2.5	1.3	1.3	1.4	1.8	2.6	2.8	3.1	5.7	6.9	8.1	6.8	6.6	3.8	2.3	2.2	1.3	3.3
20	3.7	2.2	2.7	2.7	2.3	3.4	2.5	2.5	1.7	1.0	1.5	3.3	4.8	6.3	3.9	3.8	5.4	7.6	7.2	6.1	3.0	1.7	2.2	2.5	3.5
21	4.3	1.8	0.9	1.3	2.5	3.7	3.4	3.2	1.8	1.6	5.0	5.4	4.5	4.8	8.0	7.7	7.7	9.3	8.9	7.3	6.2	6.6	5.8	5.9	4.9
22	5.1	5.0	3.4	2.6	1.7	0.9	1.1	2.4	1.3	1.8	2.9	3.6	3.3	4.2	5.4	6.8	7.6	7.7	8.6	8.2	7.2	6.7	6.4	3.9	4.5
23	5.1	5.5	2.8	1.6	1.6	2.3	3.4	3.1	2.6	1.8	4.5	3.6	4.0	3.2	4.8	6.0	6.9	7.1	7.8	6.6	5.0	3.5	1.8	3.8	4.1
24	4.4	2.2	1.3	2.0	3.5	3.1	3.4	2.6	2.1	1.9	1.5	2.6	3.5	3.2	4.7	5.3	7.0	6.8	7.2	6.4	4.8	4.5	1.6	2.9	3.7
25	2.5	0.8	1.6	1.0	2.1	2.8	3.5	2.2	2.0	1.4	2.4	1.9	3.6	4.3	6.0	6.4	6.4	6.0	6.3	6.7	5.3	5.8	3.1	4.7	3.7
26	4.8	4.0	3.8	3.2	1.8	1.6	2.1	1.5	1.7	1.9	2.0	1.7	4.3	8.3	9.2	10.6	9.5	6.8	4.9	5.6	5.9	3.5	3.0	4.1	4.4
27	5.3	2.7	1.2	1.6	2.3	2.7	2.5	2.0	1.2	1.2	1.5	1.8	2.2	2.8	6.3	7.9	8.1	8.3	8.0	6.4	3.8	2.6	1.4	1.0	3.5
28	2.5	1.9	2.3	3.0	2.4	1.7	2.6	2.7	1.3	1.0	2.2	4.0	5.4	6.2	7.0	6.8	7.0	6.6	5.9	4.6	2.3	1.0	1.4	2.7	3.5
29	3.0	3.8	3.3	1.3	3.3	3.0	1.8	2.4	0.8	1.0	1.2	2.5	3.7	5.2	6.9	6.8	6.7	7.7	6.5	3.3	2.9	2.0	1.2	1.9	3.4
30	5.1	5.1	3.6	1.5	1.0	1.9	1.1	1.4	1.2	1.9	***	***	***	***	5.9	6.0	6.3	6.3	6.1	5.1	4.6	4.8	3.4	5.2	3.9
31	3.1	1.2	0.5	1.4	3.0	3.4	3.0	2.3	1.5	2.3	2.4	3.4	4.1	5.1	6.4	7.0	6.3	5.8	6.9	8.4	8.3	8.0	3.6	3.0	4.2
HRAVE	3.6	3.2	2.8	2.4	2.5	2.7	2.6	2.5	2.0	2.2	2.7	3.3	3.9	4.8	6.0	6.6	6.9	7.1	6.9	6.0	4.8	3.9	3.2	3.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.9	4.9	2.9	2.2	4.9	4.0	3.0	3.6	3.6	4.2	5.9	7.0	3.9	3.8	3.1	3.2	4.1	3.1	3.3	3.5	4.9	4.5	4.1	3.7	3.7
MAX	10.8	7.9	5.9	3.2	7.8	6.6	6.4	7.4	7.7	7.3	11.8	10.2	7.1	8.1	7.3	8.5	7.9	7.0	8.1	7.6	9.3	8.6	7.8	7.2	6.7
MIN	0.8	1.2	1.2	1.5	2.8	0.9	1.1	0.7	1.1	1.0	1.1	2.0	0.8	0.8	1.0	0.9	1.3	0.7	1.3	1.0	0.9	0.9	1.6	1.3	0.8

DAY	26	27	28	29	30	31
AVE	4.4	3.5	3.5	3.4	3.9	4.2
MAX	10.6	8.3	7.0	7.7	6.3	8.4
MIN	1.5	1.0	1.0	0.8	1.0	0.5

MONTHLY AVERAGE = 4.0 MONTHLY MAXIMUM = 11.8 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MAY - 2018

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	234	282	296	299	286	340	94	45	298	212	198	255	247	245	264	281	286	287	288	289	292	276	277	212	111
2	182	56	48	44	5	300	292	281	295	291	293	272	256	254	270	257	279	296	303	297	302	259	195	126	182
3	101	75	95	88	114	104	103	95	256	214	207	292	276	275	264	262	268	282	287	290	308	309	164	127	175
4	93	114	123	115	126	123	116	129	129	152	128	319	46	81	256	130	16	350	340	337	18	324	29	85	31
5	98	110	135	111	106	115	115	149	105	68	68	84	121	88	140	156	90	88	82	80	61	89	51	54	89
6	59	87	88	109	109	98	101	95	70	73	72	64	101	108	356	299	304	291	301	304	290	266	303	295	264
7	146	120	109	104	102	104	115	110	133	158	288	262	307	317	314	324	299	285	288	307	296	330	121	124	296
8	93	90	103	93	93	102	122	118	185	335	260	307	291	306	304	291	295	292	290	295	296	238	149	129	338
9	112	113	106	100	103	91	109	119	144	144	309	283	306	300	296	291	288	291	292	302	296	302	147	122	220
10	111	102	82	106	116	102	93	109	234	142	248	65	279	276	270	268	273	275	281	282	264	280	306	310	43
11	308	290	288	178	275	164	126	95	116	260	289	238	227	237	240	241	229	225	231	253	265	292	300	306	204
12	312	309	314	296	268	292	308	276	269	251	243	234	229	240	237	244	246	242	274	278	281	285	294	308	134
13	295	297	292	319	113	110	100	91	266	159	249	187	205	237	249	254	263	267	267	273	279	287	275	306	27
14	307	285	183	117	115	86	101	115	109	86	136	207	334	269	231	250	268	274	279	276	281	266	285	285	70
15	299	286	94	103	107	114	100	122	143	95	22	330	319	281	267	288	269	303	301	297	295	255	142	112	92
16	113	96	91	87	101	105	112	103	117	160	264	268	61	310	317	290	298	298	300	311	320	283	308	112	31
17	97	102	105	84	94	91	103	104	129	95	8	354	291	254	246	268	256	258	255	266	282	286	292	315	325
18	315	86	115	298	284	101	129	127	227	246	292	287	247	304	292	293	295	293	297	301	307	300	199	117	269
19	113	104	114	57	98	104	106	117	99	156	296	234	306	288	325	313	285	290	303	311	299	252	127	105	106
20	304	231	137	118	119	108	108	116	117	167	286	133	141	133	90	192	253	286	288	317	308	218	135	312	347
21	292	189	32	317	133	106	123	137	140	134	136	141	121	198	224	229	242	236	237	268	293	302	299	299	354
22	306	308	278	293	95	282	147	148	181	159	252	252	184	215	241	251	240	250	287	297	290	296	306	303	234
23	319	312	303	170	122	135	133	117	135	141	155	150	137	139	224	259	275	281	291	306	310	300	310	302	8
24	293	286	165	123	108	111	93	131	110	134	132	160	138	204	296	281	285	272	294	304	299	299	243	294	35
25	298	215	129	111	118	122	119	115	134	97	91	359	319	266	279	286	284	297	285	288	298	299	305	313	336
26	307	307	312	310	305	284	284	278	287	309	284	274	282	282	288	286	276	265	258	254	279	305	318	321	321
27	309	285	185	137	123	115	96	129	150	256	205	0	326	277	294	284	291	295	295	301	296	305	307	309	197
28	104	92	95	95	102	28	113	120	131	272	279	301	313	305	293	283	287	269	272	277	286	167	149	117	18
29	115	115	111	120	96	119	120	137	81	164	230	322	336	311	296	290	296	296	297	311	319	304	302	160	259
30	282	303	299	151	253	296	148	145	120	140	***	***	***	***	253	256	238	280	271	294	298	311	304	321	242
31	289	122	316	145	116	114	113	133	122	95	110	169	208	248	248	250	237	255	270	277	276	276	294	342	208

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MAY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	13	6	7	10	19	28	46	47	24	19	30	23	25	19	20	14	10	9	9	10	11	24	12	22	19
2	25	16	12	9	33	9	23	15	11	13	18	15	16	18	19	21	15	12	11	9	9	18	18	8	16
3	10	16	10	7	12	10	10	16	35	48	52	49	41	63	44	27	29	16	11	7	6	8	32	9	24
4	19	15	18	19	8	7	9	10	24	21	63	66	72	53	61	57	48	33	49	21	35	12	28	27	32
5	12	13	9	7	7	8	13	13	20	8	12	18	24	27	42	57	26	26	12	9	17	21	17	10	18
6	12	13	15	19	17	13	14	16	9	14	16	16	45	40	31	56	52	13	8	6	11	48	27	8	22
7	18	8	8	9	6	7	10	13	30	45	57	35	30	53	51	19	18	14	13	8	10	45	9	13	22
8	8	8	13	20	8	10	9	12	33	69	37	62	48	26	20	16	14	12	10	6	5	25	18	6	21
9	10	10	8	8	8	6	10	13	24	53	56	41	36	22	18	15	18	11	10	7	6	16	37	7	19
10	8	7	21	18	12	10	9	12	27	46	56	55	62	27	21	17	21	15	11	7	9	7	10	16	21
11	10	11	37	32	29	27	29	12	22	41	40	19	19	18	16	16	14	14	12	11	10	7	8	9	19
12	9	7	8	18	59	24	11	11	11	22	19	19	16	22	21	18	17	15	11	8	7	7	8	11	16
13	5	7	6	15	39	16	17	43	52	64	50	28	32	33	22	24	24	18	16	11	8	8	14	41	25
14	15	24	39	7	16	24	15	18	30	47	61	58	46	43	22	22	17	19	11	9	8	14	9	10	24
15	18	29	8	9	10	10	9	12	39	43	38	43	48	47	26	18	27	14	13	8	7	54	4	10	23
16	8	7	16	8	10	8	23	12	68	35	55	61	55	52	40	14	16	12	11	10	25	18	44	10	26
17	8	14	16	19	7	7	12	16	23	46	43	51	26	23	27	16	22	19	14	11	6	6	10	19	19
18	56	23	9	29	22	37	12	24	50	43	46	50	59	31	18	17	16	14	13	8	7	9	25	36	27
19	9	9	29	43	11	10	10	16	37	51	45	54	54	71	48	28	15	11	12	10	10	29	10	36	27
20	9	27	7	6	12	8	11	11	25	52	37	48	35	21	42	39	21	14	10	11	9	15	10	30	21
21	15	35	39	27	17	6	9	11	25	51	22	20	32	34	17	17	20	14	11	12	10	11	9	9	20
22	8	10	27	29	45	40	22	11	38	58	46	47	41	33	31	25	15	16	10	9	8	9	10	12	25
23	11	9	15	30	20	8	9	10	18	34	21	27	54	38	26	22	16	16	11	9	10	9	16	12	19
24	8	12	53	7	10	7	11	13	21	42	48	39	35	58	31	28	20	14	10	9	8	6	31	28	23
25	12	37	7	49	7	7	6	14	23	41	44	51	29	30	24	20	18	15	15	8	7	8	15	9	21
26	18	14	10	8	19	24	43	33	28	34	38	47	53	16	13	9	11	15	15	10	9	11	9	12	21
27	8	19	23	12	8	9	10	16	46	43	46	46	41	47	24	15	15	13	10	9	6	10	12	26	21
28	7	9	7	6	10	32	6	11	28	45	41	28	21	23	19	22	13	14	11	7	6	30	10	6	17
29	6	8	11	23	7	7	11	12	46	47	50	42	33	29	20	17	15	12	10	13	8	6	26	19	20
30	25	19	11	40	27	42	30	21	36	40	***	***	***	***	21	22	16	15	18	9	6	8	15	11	22
31	12	29	42	37	8	9	12	10	26	26	39	45	39	26	24	24	24	18	10	7	7	9	35	21	22
HRAVE	13	15	17	19	17	15	15	16	30	40	41	40	39	35	28	24	20	15	13	9	10	16	17	16	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19	16	24	32	18	22	22	21	19	21	19	16	25	24	23	26	19	27	27	21	20	25	19	23	21
MAX	47	33	63	72	57	56	57	69	56	62	41	59	64	61	54	68	51	59	71	52	51	58	54	58	51
MIN	6	8	6	7	7	6	6	5	6	7	7	7	5	7	4	7	6	7	9	6	6	8	8	6	6

DAY	26	27	28	29	30	31
AVE	21	21	17	20	22	22
MAX	53	47	45	50	42	45
MIN	8	6	6	6	6	7

MONTHLY AVERAGE = 21.6 MONTHLY MAXIMUM = 72.3 MONTHLY MINIMUM = 3.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MAY - 2018

	HOUR																						DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	20.1	18.7	17.8	17.0	15.9	15.2	16.0	17.8	19.7	23.3	25.0	24.5	25.6	26.8	26.6	25.1	23.4	22.2	21.1	20.2	19.6	19.3	18.9	16.8	20.7
2	13.1	12.8	13.2	13.5	13.0	12.2	13.1	13.9	14.6	15.6	17.3	18.2	19.9	20.8	20.5	20.4	20.2	20.0	18.9	18.1	17.5	17.0	15.7	15.2	16.4
3	14.5	13.8	13.0	12.2	11.3	10.9	11.5	13.8	16.3	18.8	20.8	22.0	23.1	24.0	25.6	26.4	26.3	26.1	24.9	23.2	22.4	21.8	20.5	19.7	19.3
4	19.0	17.3	16.1	15.3	14.3	13.9	14.7	16.6	20.5	24.2	27.0	28.6	30.2	31.0	31.8	32.0	32.0	31.9	31.4	30.1	28.7	27.0	26.5	24.2	24.3
5	22.0	21.1	18.9	19.2	18.4	17.3	17.8	19.6	25.2	29.1	31.2	33.6	35.1	35.5	36.0	36.5	35.7	35.1	34.2	33.2	32.1	31.0	30.2	29.8	28.2
6	28.9	26.5	24.9	24.1	23.5	22.6	22.3	25.0	30.2	32.7	34.8	36.2	37.8	38.4	39.0	38.7	38.3	38.0	36.5	35.1	33.8	32.6	31.4	30.3	31.7
7	29.1	28.0	27.3	25.7	25.0	23.2	23.9	25.9	28.1	31.4	33.3	34.2	35.3	35.7	36.7	36.7	36.3	36.5	35.8	33.6	31.7	30.9	28.4	26.9	30.8
8	26.0	23.6	22.7	21.3	20.1	20.0	20.6	22.8	25.3	29.1	32.5	34.5	36.5	37.6	38.2	38.1	37.9	37.2	36.0	34.0	32.3	31.2	29.9	27.5	29.8
9	26.4	25.6	25.0	23.1	21.4	20.7	20.7	23.1	26.4	29.5	32.1	34.8	36.6	37.7	38.0	38.4	38.0	37.4	36.1	34.2	32.7	31.8	30.0	27.8	30.3
10	26.7	25.9	23.6	22.2	22.7	20.9	21.8	23.9	26.1	30.4	33.2	35.4	37.0	38.7	38.9	38.9	38.6	38.0	36.8	34.7	33.6	32.4	30.8	30.0	30.9
11	28.9	27.4	26.5	24.6	24.8	23.0	23.5	25.4	28.6	31.0	32.9	34.6	36.2	36.7	36.9	37.1	36.6	36.0	34.5	32.5	30.8	29.4	28.0	26.7	30.5
12	25.5	24.8	24.0	23.2	21.7	21.8	22.1	24.0	25.7	27.6	29.0	30.6	31.9	32.8	33.1	33.1	32.7	31.9	30.0	27.7	26.3	24.6	23.1	22.2	27.1
13	21.3	20.3	19.4	18.9	18.1	17.0	17.7	20.0	22.1	25.2	27.4	30.2	31.1	31.8	31.9	31.9	32.0	31.1	30.0	28.2	26.6	25.2	24.4	23.9	25.2
14	23.0	21.4	20.1	19.4	17.9	17.8	18.3	20.3	24.0	27.0	29.0	30.0	31.2	33.2	34.2	34.2	33.7	33.1	32.2	30.2	28.8	27.8	26.3	25.2	26.6
15	24.4	23.5	22.1	21.5	20.0	18.8	19.7	22.1	24.0	27.4	29.3	30.7	32.5	33.8	34.9	35.0	34.8	33.6	32.5	30.7	29.4	27.8	26.0	24.6	27.5
16	23.3	22.2	20.9	19.8	18.3	17.6	18.9	21.5	24.6	27.6	30.5	32.7	34.6	35.2	35.6	36.0	35.6	34.7	33.6	31.8	30.9	29.8	28.0	26.0	27.9
17	24.6	23.1	22.7	20.9	19.9	19.2	20.0	23.3	26.1	29.5	31.4	32.5	34.1	35.0	35.6	35.2	34.8	33.8	32.7	31.0	29.1	27.5	26.2	25.7	28.1
18	25.1	24.2	22.9	22.3	21.3	20.2	20.0	22.0	24.4	26.1	28.0	29.3	31.0	31.9	32.0	32.1	31.9	31.5	30.5	28.9	27.4	26.4	25.2	24.0	26.6
19	22.2	21.4	20.3	18.5	17.5	17.0	18.2	20.9	24.2	26.6	28.3	30.7	32.4	33.0	33.6	33.9	34.0	33.0	31.9	30.3	29.2	27.3	25.6	25.5	26.5
20	25.0	23.8	22.7	22.0	20.4	19.6	19.9	22.4	25.5	27.8	29.1	32.2	34.0	34.9	35.2	35.8	35.7	34.5	33.2	31.3	30.3	29.0	26.6	26.1	28.2
21	25.1	24.3	23.9	22.6	20.1	19.9	20.9	23.0	25.6	28.5	32.2	33.7	34.6	35.9	36.1	35.7	35.1	34.2	33.0	31.0	29.1	28.0	26.9	25.9	28.6
22	24.6	23.4	22.1	21.2	20.5	19.7	19.6	21.5	24.5	27.3	29.7	30.9	32.4	33.0	33.8	33.4	33.0	32.5	31.1	29.1	27.6	26.6	25.5	24.4	27.0
23	23.3	22.6	22.2	20.5	19.6	18.6	19.0	22.1	24.9	27.4	30.8	31.9	33.4	34.1	35.3	34.8	34.6	33.7	32.4	30.5	29.4	28.3	27.0	25.9	27.6
24	25.6	24.0	23.2	21.9	21.0	20.3	21.4	22.9	26.2	29.5	31.5	33.6	35.0	36.0	36.3	36.6	36.4	36.0	34.5	32.6	31.2	30.0	29.0	27.6	29.3
25	26.5	25.5	24.4	23.0	21.6	20.3	21.2	23.5	26.7	28.9	31.7	32.7	34.5	35.7	36.5	36.8	36.5	36.0	35.3	33.3	31.9	31.1	30.0	29.0	29.7
26	28.0	26.8	26.1	25.4	24.7	23.4	22.8	23.3	25.9	27.9	29.4	30.8	32.2	32.2	31.5	31.0	31.6	31.6	30.7	28.9	26.9	25.3	24.2	23.5	27.7
27	22.5	21.5	20.9	19.8	18.6	17.9	19.3	20.9	23.2	25.2	27.6	29.0	30.4	31.8	33.0	32.9	32.5	31.7	30.7	29.4	28.1	27.0	26.3	25.0	26.1
28	23.7	22.6	21.4	20.5	19.5	18.4	19.6	22.3	25.2	27.6	30.3	31.9	33.0	33.9	34.2	34.5	34.2	33.5	32.5	30.8	29.7	28.3	27.0	25.5	27.5
29	24.6	23.5	22.9	21.0	20.3	19.8	20.8	22.8	25.9	29.3	31.7	33.7	35.3	36.1	36.6	36.9	36.7	35.8	34.5	33.4	32.6	32.2	31.4	29.8	29.5
30	29.3	28.2	27.3	26.0	25.4	23.5	23.7	25.9	28.9	31.4	***	***	***	***	37.8	37.8	37.5	37.0	36.2	34.4	32.3	31.3	30.6	29.4	30.7
31	28.2	27.0	25.8	24.0	22.4	21.9	22.7	24.3	27.8	31.7	33.8	35.6	37.5	37.4	37.8	37.7	37.8	37.5	35.9	33.7	31.8	30.8	29.6	28.1	30.9
HRAVE	24.2	23.0	22.1	21.0	20.0	19.1	19.7	21.8	24.7	27.6	29.7	31.3	32.8	33.7	34.3	34.3	34.0	33.4	32.2	30.5	29.2	28.0	26.7	25.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20.7	16.4	19.3	24.3	28.2	31.7	30.8	29.8	30.3	30.9	30.5	27.1	25.2	26.6	27.5	27.9	28.1	26.6	26.5	28.2	28.6	27.0	27.6	29.3	29.7
MAX	26.8	20.8	26.4	32.0	36.5	39.0	36.7	38.2	38.4	38.9	37.1	33.1	32.0	34.2	35.0	36.0	35.6	32.1	34.0	35.8	36.1	33.8	35.3	36.6	36.8
MIN	15.2	12.2	10.9	13.9	17.3	22.3	23.2	20.0	20.7	20.9	23.0	21.7	17.0	17.8	18.8	17.6	19.2	20.0	17.0	19.6	19.9	19.6	18.6	20.3	20.3

DAY	26	27	28	29	30	31
AVE	27.7	26.1	27.5	29.5	30.7	30.9
MAX	32.2	33.0	34.5	36.9	37.8	37.8
MIN	22.8	17.9	18.4	19.8	23.5	21.9

MONTHLY AVERAGE = 27.4 MONTHLY MAXIMUM = 39.0 MONTHLY MINIMUM = 10.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MAY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.4	0.4	0.3	0.5	0.8	0.4	-0.1	-0.5	-0.6	-1.4	-1.7	-1.1	-1.3	-1.3	-1.2	-0.8	-0.5	-0.3	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	-0.4
2	-0.1	-0.1	-0.1	-0.1	0.1	0.2	-0.1	-0.5	-0.6	-0.8	-1.2	-1.1	-1.2	-1.4	-1.1	-0.9	-0.7	-0.8	-0.3	0.0	0.2	0.4	0.4	0.3	-0.4
3	0.5	0.4	0.4	0.5	0.5	0.4	-0.4	-0.9	-0.7	-0.9	-1.1	-1.2	-1.4	-1.1	-1.3	-1.4	-1.1	-0.9	-0.5	0.0	0.2	0.4	0.4	0.4	-0.4
4	0.4	0.6	0.6	0.6	0.7	0.3	-0.2	-1.0	-1.3	-1.6	-1.2	-1.2	-1.4	-1.4	-1.1	-1.2	-0.9	-0.6	-0.1	0.4	0.7	0.5	0.5	0.6	-0.3
5	0.9	0.8	1.2	0.5	0.7	0.6	-0.1	-0.5	-1.0	-1.3	-1.5	-1.7	-1.9	-1.7	-1.6	-1.2	-0.7	-0.2	0.3	0.4	0.3	0.5	0.5	0.3	-0.3
6	0.3	0.4	0.6	0.4	0.4	0.4	0.2	-0.6	-1.1	-1.6	-1.6	-1.5	-1.4	-1.4	-1.5	-0.8	-0.7	-0.6	-0.1	0.3	0.6	0.6	0.5	0.8	-0.3
7	0.4	0.4	0.5	0.8	0.8	0.6	-0.1	-1.0	-0.8	-0.8	-1.0	-0.8	-1.0	-0.8	-1.0	-1.1	-0.8	-0.8	-0.4	0.2	0.7	0.5	0.7	0.8	-0.2
8	0.9	0.6	0.7	0.6	0.8	0.7	-0.3	-1.0	-0.7	-0.6	-0.9	-0.9	-1.4	-1.4	-1.5	-1.4	-1.1	-0.8	-0.4	0.2	0.5	0.4	0.8	0.4	-0.2
9	0.7	0.6	0.9	0.8	0.8	0.7	-0.2	-1.0	-1.0	-0.8	-1.0	-1.2	-1.3	-1.5	-1.5	-1.4	-1.1	-0.9	-0.4	0.2	0.7	0.6	0.6	0.7	-0.3
10	0.6	0.8	0.6	0.6	0.7	0.6	-0.6	-1.2	-0.7	-0.9	-0.9	-1.3	-1.2	-1.5	-1.4	-1.4	-1.1	-0.8	-0.4	0.1	0.2	0.2	0.3	0.3	-0.3
11	0.3	0.6	0.5	0.6	0.5	0.5	-0.2	-0.9	-1.1	-1.0	-1.1	-1.5	-1.8	-1.6	-1.4	-1.1	-1.0	-0.7	-0.2	0.0	0.0	0.0	0.1	0.1	-0.4
12	0.1	0.2	0.3	0.4	0.4	0.4	0.1	-0.3	-0.5	-1.0	-1.3	-1.5	-1.8	-1.7	-1.5	-1.3	-1.0	-0.7	-0.4	-0.1	0.0	0.0	0.1	0.2	-0.5
13	0.3	0.3	0.3	0.3	0.3	0.3	-0.3	-0.8	-0.5	-0.9	-1.3	-2.0	-1.9	-1.7	-1.5	-1.3	-1.2	-0.9	-0.5	-0.1	0.0	0.1	0.3	0.3	-0.5
14	0.4	0.4	0.5	0.4	0.5	0.3	-0.5	-0.8	-0.7	-1.0	-1.3	-1.5	-1.2	-1.4	-1.7	-1.4	-1.2	-0.9	-0.5	0.0	0.1	0.1	0.2	0.3	-0.5
15	0.4	0.4	0.6	0.6	0.6	0.5	-0.6	-1.2	-0.6	-1.0	-1.3	-1.3	-1.3	-1.5	-1.5	-1.5	-1.2	-0.9	-0.5	0.1	0.4	0.6	0.5	0.7	-0.4
16	0.5	0.7	0.5	0.6	0.6	0.5	-0.2	-1.0	-0.6	-0.9	-0.9	-1.1	-1.6	-1.5	-1.4	-1.5	-1.2	-0.9	-0.5	0.1	0.4	0.6	0.9	0.6	-0.3
17	0.6	0.8	0.8	0.9	0.8	0.6	-0.6	-1.0	-1.0	-1.1	-1.3	-1.4	-1.6	-1.5	-1.5	-1.3	-1.1	-0.8	-0.4	0.0	0.2	0.3	0.5	0.3	-0.4
18	0.2	0.5	0.5	0.5	0.5	0.4	-0.3	-0.5	-0.5	-0.8	-1.1	-1.4	-1.5	-1.6	-1.6	-1.5	-1.2	-1.0	-0.6	0.0	0.5	0.5	0.5	0.6	-0.4
19	0.6	0.5	0.5	1.0	0.4	0.4	-0.3	-1.1	-0.9	-0.9	-0.8	-1.2	-1.5	-1.4	-1.4	-1.4	-1.3	-0.9	-0.5	0.0	0.4	0.6	0.5	0.5	-0.3
20	0.5	0.6	0.5	0.4	0.6	0.3	-0.6	-1.2	-1.0	-0.7	-1.0	-1.8	-2.2	-2.2	-1.5	-1.4	-1.3	-0.9	-0.5	0.1	0.4	0.6	0.4	0.4	-0.5
21	0.4	0.5	0.5	0.7	0.6	0.2	-0.5	-1.3	-1.2	-1.1	-2.0	-2.2	-2.0	-2.0	-1.8	-1.5	-1.1	-0.8	-0.4	0.0	0.1	0.1	0.1	0.1	-0.6
22	0.1	0.2	0.3	0.3	0.6	0.4	-0.1	-1.1	-0.7	-1.1	-1.5	-1.5	-1.8	-1.9	-1.8	-1.4	-1.2	-0.9	-0.6	-0.1	0.0	0.1	0.1	0.2	-0.6
23	0.1	0.2	0.4	0.5	0.5	0.5	-0.4	-1.5	-1.5	-1.4	-2.1	-1.9	-2.2	-1.9	-1.9	-1.4	-1.2	-0.9	-0.6	-0.1	0.2	0.3	0.4	0.4	-0.6
24	0.3	0.5	0.4	0.4	0.5	0.3	-0.6	-1.0	-1.3	-1.5	-1.3	-1.8	-1.9	-1.6	-1.6	-1.4	-1.2	-0.9	-0.6	0.0	0.3	0.4	0.4	0.4	-0.5
25	0.3	0.3	0.6	0.6	0.7	0.4	-0.8	-1.0	-1.2	-1.0	-1.7	-1.3	-1.5	-1.7	-1.7	-1.4	-1.3	-1.0	-0.6	-0.1	0.2	0.2	0.3	0.3	-0.5
26	0.2	0.2	0.2	0.3	0.3	0.5	0.3	-0.3	-0.7	-0.8	-1.0	-1.0	-1.2	-1.2	-1.2	-0.9	-1.1	-0.8	-0.5	0.0	0.1	0.3	0.3	0.2	-0.3
27	0.2	0.3	0.3	0.3	0.4	0.3	-0.8	-0.9	-0.8	-0.9	-1.2	-1.2	-1.3	-1.3	-1.5	-1.5	-1.3	-1.0	-0.7	-0.1	0.3	0.4	0.4	0.6	-0.5
28	0.5	0.5	0.6	0.7	0.5	0.5	-0.7	-1.4	-0.7	-0.8	-1.0	-1.4	-1.5	-1.6	-1.7	-1.5	-1.4	-0.9	-0.6	0.0	0.4	0.6	0.5	0.6	-0.4
29	0.6	0.5	0.4	0.8	0.7	0.3	-0.5	-1.0	-0.6	-0.8	-1.0	-1.2	-1.6	-1.5	-1.6	-1.5	-1.4	-1.0	-0.4	0.1	0.4	0.4	0.5	0.3	-0.4
30	0.2	0.2	0.4	0.4	0.5	0.8	-0.2	-0.6	-0.8	-1.2	***	***	***	***	-1.7	-1.4	-1.2	-1.0	-0.6	0.0	0.4	0.4	0.4	0.3	-0.2
31	0.6	0.4	0.5	0.5	0.6	0.3	-0.5	-1.1	-1.0	-1.9	-1.6	-1.8	-1.9	-1.6	-1.6	-1.4	-1.2	-0.9	-0.6	-0.1	0.1	0.1	0.2	0.4	-0.6
HRAVE	0.4	0.4	0.5	0.5	0.6	0.4	-0.3	-0.9	-0.9	-1.1	-1.3	-1.4	-1.6	-1.5	-1.5	-1.3	-1.1	-0.8	-0.4	0.0	0.3	0.3	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	-0.2	-0.2	-0.3	-0.3	-0.4	-0.5	-0.5	-0.5	-0.4	-0.3	-0.4	-0.4	-0.3	-0.5	-0.6	-0.6	-0.6	-0.5	-0.5
MAX	0.8	0.4	0.5	0.7	1.2	0.8	0.8	0.9	0.9	0.8	0.6	0.4	0.3	0.5	0.7	0.9	0.9	0.6	1.0	0.6	0.7	0.6	0.5	0.5	0.7
MIN	-1.7	-1.4	-1.4	-1.6	-1.9	-1.6	-1.1	-1.5	-1.5	-1.5	-1.8	-1.8	-2.0	-1.7	-1.5	-1.6	-1.6	-1.6	-1.5	-2.2	-2.2	-1.9	-2.2	-1.9	-1.7

DAY	26	27	28	29	30	31
AVE	-0.3	-0.5	-0.4	-0.4	-0.2	-0.6
MAX	0.5	0.6	0.7	0.8	0.8	0.6
MIN	-1.2	-1.5	-1.7	-1.6	-1.7	-1.9

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = -2.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MAY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	697	697	697	697	697	697	697	698	698	698	697	697	697	696	696	696	696	696	697	697	698	698	698	699	697
2	700	699	698	698	698	699	699	700	700	700	700	700	700	700	700	700	700	700	701	701	702	702	703	703	700
3	703	703	703	703	703	704	704	705	705	705	705	704	704	704	703	703	703	703	703	703	704	704	705	705	704
4	705	705	705	705	705	705	706	706	706	706	705	705	704	704	703	703	702	702	702	702	702	703	703	703	704
5	703	703	703	703	703	704	704	704	704	704	703	703	702	701	700	700	699	699	699	700	700	701	701	701	702
6	701	701	701	701	702	702	702	703	703	703	702	702	701	701	700	700	699	699	699	699	700	700	701	701	701
7	701	702	702	702	702	702	703	703	704	704	703	703	702	702	701	700	700	700	699	700	700	700	700	701	701
8	701	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	699	698	698	699	699	699	700	700	700
9	700	700	700	700	700	701	701	701	701	701	701	700	700	699	698	698	697	697	697	697	698	698	698	698	699
10	699	699	698	698	699	699	699	700	700	700	699	699	698	697	696	696	696	695	695	695	696	696	697	697	698
11	697	697	697	697	697	697	698	698	698	697	697	697	696	695	695	694	694	694	694	695	695	696	696	697	696
12	697	697	697	697	697	698	698	699	699	699	699	699	698	698	697	697	697	697	697	698	698	699	700	700	698
13	700	700	700	700	700	701	701	701	701	701	701	701	700	700	699	699	698	698	698	699	699	700	700	700	700
14	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	697	697	698	698	699	700	700	700
15	700	701	700	700	701	701	701	702	702	702	702	701	701	700	700	699	699	699	699	699	700	700	701	701	700
16	701	700	700	701	701	701	701	702	702	702	701	701	700	699	699	698	698	697	697	697	698	698	698	698	700
17	698	698	698	698	699	699	699	699	699	699	699	698	698	698	697	697	696	696	696	696	696	697	697	697	698
18	698	698	697	698	698	698	698	699	699	699	698	698	698	697	697	697	696	696	696	696	697	697	697	698	697
19	698	698	698	698	698	699	699	699	699	699	699	698	698	697	697	696	696	696	696	696	697	697	698	698	698
20	698	698	699	699	699	699	700	700	700	700	700	699	698	698	697	697	696	696	696	696	696	697	697	698	698
21	698	698	698	698	698	698	698	698	698	698	697	697	696	695	695	695	694	694	694	695	695	696	697	697	697
22	697	697	697	698	698	698	699	699	699	699	698	698	698	697	697	696	696	696	696	697	698	698	699	699	698
23	700	699	700	700	700	700	700	700	701	700	700	700	699	699	698	698	698	698	698	699	699	700	701	701	700
24	702	702	702	702	702	702	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	702	702	702
25	702	702	702	702	703	703	703	703	703	703	703	702	702	701	700	700	699	699	699	699	699	700	700	700	701
26	700	700	699	699	699	699	699	699	700	699	699	699	698	698	697	697	697	697	697	697	697	698	698	698	698
27	698	698	698	698	699	699	699	699	700	699	699	699	698	698	697	697	697	697	697	697	698	698	698	699	698
28	699	699	699	699	699	700	700	700	700	700	700	699	699	698	698	698	698	697	697	698	698	698	698	699	699
29	699	698	698	698	699	699	699	699	699	699	698	698	697	697	696	696	696	695	695	695	696	696	696	697	697
30	697	697	697	697	698	698	698	699	699	699	698	698	698	697	696	696	696	696	696	696	696	697	697	698	697
31	698	698	698	698	698	699	699	699	699	699	698	698	698	698	697	697	697	696	696	697	697	698	698	699	698
HRAVE	700	699	699	700	700	700	700	701	701	700	700	700	699	699	698	698	698	697	698	698	698	699	699	699	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	697	700	704	704	702	701	701	700	699	698	696	698	700	700	700	700	698	697	698	698	697	698	700	702	701
MAX	699	703	705	706	704	703	704	702	701	700	698	700	701	701	702	702	699	699	699	700	698	699	701	703	703
MIN	696	698	703	702	699	699	699	698	697	695	694	697	698	697	699	697	696	696	696	696	694	696	698	700	699

DAY	26	27	28	29	30	31
AVE	698	698	699	697	697	698
MAX	700	700	700	699	699	699
MIN	697	697	697	695	696	696

MONTHLY AVERAGE = 699.2 MONTHLY MAXIMUM = 705.9 MONTHLY MINIMUM = 693.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MAY - 2018

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	24	26	28	31	33	37	33	30	26	19	17	19	15	14	14	16	19	25	26	26	27	28	30	44	25
2	77	79	70	66	70	75	69	63	58	56	48	40	31	29	29	30	31	33	36	38	39	41	44	47	50
3	48	51	53	56	58	60	56	48	42	34	27	26	24	22	19	18	17	18	21	23	25	27	28	29	35
4	33	33	36	37	39	40	36	32	26	22	18	15	14	12	11	11	10	9	10	12	12	14	16	15	21
5	18	19	20	22	22	23	22	20	16	13	13	11	9	9	8	8	8	9	10	10	11	12	13	13	14
6	13	15	17	17	18	19	19	17	14	12	11	10	9	9	9	9	10	10	12	13	14	15	16	16	14
7	17	19	21	22	21	22	23	20	18	15	14	14	13	13	13	13	13	11	10	12	13	14	17	17	16
8	17	19	20	22	23	23	22	20	17	15	12	10	10	9	8	8	8	8	8	8	9	10	11	12	14
9	14	15	14	16	18	17	19	16	13	12	10	10	8	8	8	8	8	8	9	11	11	13	14	17	12
10	18	17	18	20	20	21	20	18	16	13	12	11	10	9	8	8	8	8	9	11	12	12	16	18	14
11	19	21	21	23	24	25	24	22	18	15	14	14	13	13	12	12	12	12	13	19	21	18	21	22	18
12	23	25	27	27	30	27	27	25	23	21	19	16	14	14	12	12	13	14	18	19	19	21	23	24	20
13	25	26	26	29	31	31	30	25	23	19	17	14	13	13	12	11	11	11	12	14	15	15	15	17	19
14	20	21	22	24	26	27	24	21	17	16	18	17	17	17	15	15	16	17	16	17	18	18	20	21	19
15	21	22	22	23	25	26	24	21	19	15	14	14	12	12	11	11	11	11	12	13	14	16	17	20	17
16	21	20	23	23	25	26	23	20	16	14	13	11	9	10	9	8	8	9	10	11	13	13	15	17	15
17	16	17	19	22	20	20	20	17	15	13	11	11	9	8	7	8	9	9	10	12	13	14	14	14	14
18	14	20	26	25	23	26	24	19	17	14	13	11	10	9	8	9	9	9	10	11	13	14	15	17	15
19	19	18	19	23	21	22	20	17	15	15	14	11	11	10	11	11	10	10	11	13	14	15	19	19	15
20	17	18	21	23	24	25	22	21	17	16	15	13	11	10	9	7	7	10	11	12	13	13	15	16	15
21	16	19	22	23	23	25	21	19	16	15	10	9	7	6	5	6	7	8	10	14	19	23	24	26	16
22	26	23	25	26	29	31	29	26	22	19	15	13	11	11	11	11	12	13	13	14	16	19	20	22	19
23	27	27	28	30	32	32	31	27	23	20	16	15	14	12	10	11	11	11	12	13	15	15	18	20	20
24	21	23	24	25	26	27	24	22	18	16	15	13	12	12	12	11	11	11	13	13	14	14	15	16	17
25	18	19	21	26	28	27	24	20	17	16	13	13	13	13	12	11	11	13	14	15	16	16	18	18	17
26	18	19	19	18	19	22	22	21	19	15	14	12	11	11	13	13	12	12	12	12	16	18	20	22	16
27	25	26	27	29	32	32	28	25	23	21	17	17	16	15	14	14	15	15	16	17	18	21	22	24	21
28	25	25	27	27	29	32	28	24	20	19	16	14	13	12	11	11	12	14	15	16	17	18	19	23	19
29	22	23	24	26	26	28	26	22	20	16	15	14	13	12	11	11	11	11	13	14	16	16	17	18	18
30	20	19	20	23	23	24	24	21	18	15	14	13	11	10	8	8	8	8	8	10	10	11	11	13	15
31	15	17	19	18	22	22	20	18	15	13	11	10	7	8	7	6	6	6	7	9	11	12	15	17	13
HRAVE	23	24	25	27	28	29	27	24	20	18	16	14	13	12	11	11	11	12	13	15	16	17	19	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	25	50	35	21	14	14	16	14	12	14	18	20	19	19	17	15	14	15	15	15	16	19	20	17	17
MAX	44	79	60	40	23	19	23	23	19	21	25	30	31	27	26	26	22	26	23	25	26	31	32	27	28
MIN	14	29	17	9	8	9	10	8	8	8	12	12	11	15	11	8	7	8	10	7	5	11	10	11	11

DAY	26	27	28	29	30	31
AVE	16	21	19	18	15	13
MAX	22	32	32	28	24	22
MIN	11	14	11	11	8	6

MONTHLY AVERAGE = 18.5 MONTHLY MAXIMUM = 79.0 MONTHLY MINIMUM = 5.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MAY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.24	0.44	0.75	0.90	0.72	0.76	0.87	0.64	0.34	0.15	0.05	0.01	0.00	0.00	0.00	0.00	0.00	6.02
2	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.20	0.22	0.44	0.74	0.51	0.84	0.87	0.49	0.32	0.23	0.30	0.06	0.00	0.00	0.00	0.00	0.00	5.33
3	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.55	0.75	0.91	0.99	1.02	0.99	0.89	0.67	0.45	0.31	0.10	0.00	0.00	0.00	0.00	0.00	8.09
4	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.58	0.77	0.92	1.01	1.04	1.01	0.92	0.66	0.49	0.34	0.12	0.00	0.00	0.00	0.00	0.00	8.37
5	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.58	0.77	0.92	1.01	1.04	1.01	0.91	0.67	0.51	0.33	0.12	0.00	0.00	0.00	0.00	0.00	8.37
6	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.56	0.77	0.88	0.92	0.94	0.83	0.85	0.47	0.32	0.25	0.07	0.00	0.00	0.00	0.00	0.00	7.36
7	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.31	0.55	0.68	0.90	0.50	0.60	0.53	0.73	0.57	0.30	0.34	0.12	0.00	0.00	0.00	0.00	0.00	6.27
8	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.36	0.58	0.78	0.93	1.02	1.05	1.01	0.91	0.64	0.54	0.33	0.12	0.00	0.00	0.00	0.00	0.00	8.43
9	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.37	0.60	0.79	0.94	1.02	1.04	1.01	0.92	0.63	0.55	0.34	0.12	0.00	0.00	0.00	0.00	0.00	8.49
10	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.59	0.78	0.93	1.01	1.04	1.01	0.91	0.64	0.55	0.33	0.11	0.00	0.00	0.00	0.00	0.00	8.44
11	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.28	0.57	0.78	0.92	1.00	1.02	0.98	0.89	0.63	0.52	0.33	0.10	0.00	0.00	0.00	0.00	0.00	8.17
12	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.58	0.77	0.92	1.00	1.03	0.99	0.90	0.63	0.54	0.32	0.11	0.00	0.00	0.00	0.00	0.00	8.32
13	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.59	0.78	0.93	1.01	1.04	1.00	0.91	0.64	0.61	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.55
14	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.59	0.77	0.92	1.02	1.04	0.99	0.90	0.60	0.55	0.33	0.12	0.00	0.00	0.00	0.00	0.00	8.37
15	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.59	0.79	0.93	1.01	1.04	1.00	0.91	0.61	0.56	0.34	0.13	0.01	0.00	0.00	0.00	0.00	8.47
16	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.60	0.80	0.94	1.03	1.05	1.01	0.92	0.62	0.57	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.60
17	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.39	0.61	0.80	0.94	1.02	1.06	1.02	0.93	0.61	0.57	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.63
18	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.79	0.94	1.02	1.05	1.02	0.93	0.60	0.57	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.57
19	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.79	0.94	1.03	1.05	1.01	0.91	0.59	0.57	0.34	0.13	0.01	0.00	0.00	0.00	0.00	8.52
20	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.59	0.79	0.93	1.02	1.05	1.01	0.92	0.62	0.57	0.35	0.13	0.01	0.00	0.00	0.00	0.00	8.52
21	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.80	0.92	0.98	1.04	1.00	0.92	0.63	0.57	0.37	0.14	0.01	0.00	0.00	0.00	0.00	8.53
22	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.59	0.78	0.92	1.01	1.05	1.00	0.91	0.63	0.57	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.49
23	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.59	0.78	0.93	1.00	1.04	1.01	0.92	0.65	0.57	0.35	0.15	0.01	0.00	0.00	0.00	0.00	8.55
24	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.78	0.93	1.02	1.05	1.00	0.91	0.66	0.57	0.36	0.15	0.01	0.00	0.00	0.00	0.00	8.59
25	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.40	0.61	0.80	0.94	1.02	1.06	1.01	0.92	0.65	0.57	0.34	0.16	0.01	0.00	0.00	0.00	0.00	8.67
26	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.20	0.44	0.53	0.74	0.77	0.80	0.67	0.56	0.49	0.58	0.38	0.16	0.01	0.00	0.00	0.00	0.00	6.40
27	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.38	0.60	0.79	0.93	1.01	1.05	1.00	0.91	0.65	0.58	0.37	0.17	0.02	0.00	0.00	0.00	0.00	8.62
28	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.39	0.60	0.79	0.94	1.02	1.07	1.02	0.93	0.65	0.57	0.36	0.16	0.01	0.00	0.00	0.00	0.00	8.68
29	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.34	0.57	0.79	0.93	1.01	1.06	0.98	0.92	0.66	0.59	0.32	0.09	0.01	0.00	0.00	0.00	0.00	8.45
30	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.39	0.60	0.78	***	***	***	***	0.93	0.65	0.59	0.38	0.17	0.01	0.00	0.00	0.00	0.00	4.67
31	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.39	0.61	0.80	0.94	1.04	1.09	1.03	0.88	0.66	0.60	0.39	0.17	0.01	0.00	0.00	0.00	0.00	8.77
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.57	0.76	0.91	0.96	1.00	0.96	0.87	0.60	0.52	0.33	0.13	0.01	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.02	5.33	8.09	8.37	8.37	7.36	6.27	8.43	8.49	8.44	8.17	8.32	8.55	8.37	8.47	8.60	8.63	8.57	8.52	8.52	8.53	8.49	8.55	8.59	8.67
MAX	0.90	0.87	1.02	1.04	1.04	0.94	0.90	1.05	1.04	1.04	1.02	1.03	1.04	1.04	1.04	1.05	1.06	1.05	1.05	1.05	1.04	1.05	1.04	1.05	1.06
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.40	8.62	8.68	8.45	4.67	8.77
MAX	0.80	1.05	1.07	1.06	0.93	1.09
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MAY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.01 MONTHLY MAXIMUM = 0.01 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.5% OPERATIONAL RECOVERY RATE = 99.5%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
JUNE - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	2.4	2.3	1.1	2.2	2.2	1.6	1.8	1.6	1.1	0.7	1.0	2.1	2.9	4.8	7.0	6.8	7.4	6.5	6.7	5.1	3.1	1.9	1.8	2.8	3.2
2	2.7	2.6	3.2	3.6	2.7	2.4	2.5	2.0	1.6	1.8	1.2	1.9	4.3	5.4	5.8	6.6	8.6	10.7	10.1	8.2	4.5	3.6	2.2	2.6	4.2
3	3.2	3.8	3.5	3.4	2.3	1.3	2.4	2.2	1.4	1.4	0.9	2.2	2.4	3.7	3.5	6.2	8.0	8.5	8.2	5.4	2.3	1.1	2.2	3.6	3.5
4	3.7	3.6	3.7	3.3	2.2	3.1	3.2	2.0	1.2	1.4	1.2	1.7	2.3	2.9	4.3	7.1	7.9	8.6	8.2	5.1	3.9	4.9	6.3	5.1	4.0
5	3.1	1.5	2.0	2.0	1.8	2.7	3.3	2.4	1.6	1.2	1.2	3.0	1.9	3.7	5.3	4.8	7.0	5.4	6.7	6.7	5.1	3.1	2.3	5.2	3.5
6	2.2	1.2	2.1	2.0	1.3	1.7	1.4	1.1	1.4	1.1	1.6	2.4	3.7	6.7	7.6	7.5	7.1	6.6	5.2	3.8	2.0	1.3	1.1	2.0	3.1
7	2.9	2.7	1.7	1.9	0.7	2.5	3.1	2.2	0.8	1.4	1.7	1.9	1.7	3.3	8.8	7.6	6.6	8.1	8.3	7.5	4.3	1.5	1.9	3.6	3.6
8	3.8	3.1	2.5	2.2	2.0	3.1	3.8	2.4	1.7	1.3	1.3	1.9	2.7	6.3	6.5	8.1	7.4	7.6	6.7	5.3	2.8	2.2	1.3	0.9	3.6
9	1.6	2.2	3.4	3.6	2.2	3.0	2.9	2.3	1.6	2.0	1.3	1.3	2.2	3.4	5.2	6.9	6.5	6.5	7.0	6.8	2.9	2.2	2.7	2.7	3.4
10	1.9	2.8	1.8	2.5	3.7	3.0	3.0	2.0	0.9	1.4	2.3	4.7	7.0	7.0	7.3	9.0	8.2	6.9	7.4	6.3	4.3	3.3	2.8	2.6	4.2
11	3.2	2.5	1.7	2.8	3.0	3.2	3.2	1.7	1.0	0.8	1.5	1.9	2.7	6.0	6.7	6.5	6.7	7.1	6.9	5.8	2.5	1.6	1.0	3.0	3.5
12	3.6	3.5	2.7	3.6	2.5	2.5	2.4	1.6	1.3	1.0	1.7	2.2	3.6	7.0	6.8	7.6	7.2	7.0	6.5	4.6	3.7	3.0	1.4	2.0	3.7
13	2.1	2.6	2.9	3.3	3.2	3.1	2.9	2.5	1.1	0.9	0.8	1.8	3.2	4.7	6.1	7.2	8.1	7.8	7.5	6.1	3.4	3.6	1.9	2.3	3.7
14	3.2	4.5	2.8	1.9	3.6	3.3	2.8	2.0	1.4	2.2	4.1	4.8	5.6	6.8	6.4	7.9	7.9	7.7	7.4	6.5	4.1	3.3	1.7	1.5	4.3
15	2.9	2.6	3.7	2.4	3.5	4.6	4.9	5.5	7.6	6.8	7.5	7.1	8.3	8.7	9.1	9.1	8.2	8.4	7.9	4.8	4.0	2.6	2.5	2.7	5.6
16	2.1	0.5	0.4	1.0	0.9	1.9	1.1	1.5	1.4	1.3	1.2	0.8	0.7	2.9	2.3	3.0	2.3	1.3	2.0	1.4	1.9	2.8	2.7	3.3	1.7
17	3.9	3.8	3.8	4.7	3.5	2.7	2.6	1.7	2.0	2.7	3.2	3.1	2.4	4.7	3.8	3.8	5.4	5.6	5.2	4.3	5.0	6.9	7.5	3.6	4.0
18	3.2	1.3	0.7	1.3	1.4	2.5	3.2	3.0	2.0	1.2	1.4	2.2	2.3	3.3	3.9	3.8	6.7	8.0	7.4	6.7	4.1	3.0	1.9	0.9	3.1
19	1.2	1.6	2.2	3.3	2.1	2.3	2.6	2.1	1.8	1.3	1.3	2.8	5.4	6.5	7.2	7.1	7.5	6.7	5.7	4.6	3.3	2.0	1.9	1.7	3.5
20	2.2	2.4	2.7	3.4	3.1	2.7	1.5	1.7	1.3	1.8	4.5	5.8	5.7	6.0	6.4	7.3	7.1	7.3	7.1	5.6	4.0	4.5	4.3	2.0	4.2
21	4.7	3.4	2.8	1.0	2.0	2.6	3.2	2.1	1.2	1.5	3.6	4.8	5.2	7.2	7.4	7.2	7.8	8.4	7.9	7.1	5.4	3.9	3.3	3.4	4.5
22	1.8	2.3	1.7	1.8	3.4	2.7	1.9	1.5	1.4	1.2	3.3	4.6	4.0	5.6	7.3	7.9	7.5	6.8	6.4	4.8	3.3	3.4	2.1	2.0	3.7
23	2.5	2.2	2.5	2.3	2.8	2.9	3.0	2.2	1.1	4.7	6.6	7.1	7.4	6.1	8.9	7.8	8.0	7.9	5.3	5.2	2.4	2.0	5.9	6.8	4.7
24	7.5	7.8	5.2	4.6	3.6	4.8	4.5	4.7	4.7	5.2	5.7	6.4	7.1	7.3	6.6	7.2	8.0	7.9	6.2	5.8	4.4	1.7	0.8	1.0	5.4
25	1.5	2.8	3.8	1.9	1.7	1.4	1.5	1.3	0.7	2.6	4.3	4.3	5.4	5.6	6.8	6.4	7.3	7.1	6.6	6.4	3.6	2.9	1.7	2.5	3.8
26	3.2	2.7	3.0	3.1	1.2	2.0	3.3	2.1	1.0	1.3	2.0	4.0	5.5	7.6	8.6	8.5	7.1	7.7	7.2	5.8	2.7	1.7	1.1	1.4	3.9
27	1.1	3.0	2.5	2.6	2.7	2.8	1.4	1.4	1.2	1.7	4.8	5.0	6.3	6.5	7.0	7.6	8.6	8.5	9.0	7.1	3.3	1.1	1.0	2.1	4.1
28	3.0	2.0	1.1	2.2	2.5	3.1	2.5	1.7	2.1	2.2	6.0	6.1	5.6	6.6	7.5	7.8	7.2	7.1	6.5	5.2	3.0	2.7	5.0	5.5	4.3
29	4.5	4.9	5.0	6.3	6.1	5.2	4.7	4.5	6.2	5.5	5.8	6.7	5.8	5.1	5.9	6.5	7.0	6.5	5.5	6.6	7.7	5.1	2.6	3.4	5.5
30	3.7	2.8	2.0	1.8	1.5	1.8	1.2	1.0	1.0	1.1	1.6	2.2	2.5	5.4	5.1	5.4	5.8	6.5	6.4	5.6	3.7	3.2	4.4	6.3	3.4
HRAVE	3.0	2.8	2.6	2.7	2.5	2.8	2.7	2.2	1.8	2.0	2.8	3.6	4.2	5.6	6.4	6.9	7.2	7.2	6.8	5.7	3.7	2.9	2.6	2.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.2	4.2	3.5	4.0	3.5	3.1	3.6	3.6	3.4	4.2	3.5	3.7	3.7	4.3	5.6	1.7	4.0	3.1	3.5	4.2	4.5	3.7	4.7	5.4	3.8
MAX	7.4	10.7	8.5	8.6	7.0	7.6	8.8	8.1	7.0	9.0	7.1	7.6	8.1	7.9	9.1	3.3	7.5	8.0	7.5	7.3	8.4	7.9	8.9	8.0	7.3
MIN	0.7	1.2	0.9	1.2	1.2	1.1	0.7	0.9	1.3	0.9	0.8	1.0	0.8	1.4	2.4	0.4	1.7	0.7	1.2	1.3	1.0	1.2	1.1	0.8	0.7

DAY	26	27	28	29	30	31
AVE	3.9	4.1	4.3	5.5	3.4	***
MAX	8.6	9.0	7.8	7.7	6.5	***
MIN	1.0	1.0	1.1	2.6	1.0	***

MONTHLY AVERAGE = 3.9 MONTHLY MAXIMUM = 10.7 MONTHLY MINIMUM = 0.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JUNE - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	308	295	223	106	87	72	127	144	114	86	285	289	316	301	295	300	293	297	304	306	309	293	144	105	139
2	90	101	103	113	104	110	118	114	124	296	300	285	308	297	244	261	279	291	293	296	306	294	146	122	331
3	109	95	93	95	93	56	122	140	117	112	234	274	264	253	314	312	296	288	284	293	293	218	124	104	99
4	100	103	102	105	122	110	100	130	141	117	135	212	277	245	313	290	284	291	292	303	297	321	310	295	273
5	297	271	189	125	122	107	114	126	148	153	74	320	339	275	244	267	275	278	282	285	293	307	283	296	187
6	260	217	144	123	125	282	126	115	137	46	305	314	278	261	294	302	291	296	288	313	195	151	80	99	147
7	100	98	98	103	70	93	102	110	86	244	251	232	315	335	310	304	284	284	289	288	301	322	142	113	209
8	98	83	338	115	110	115	101	122	135	107	59	334	290	282	285	298	287	286	297	305	296	316	309	182	302
9	143	121	112	114	94	107	107	93	110	144	236	130	282	312	254	270	284	276	285	279	250	130	335	292	102
10	140	123	113	98	111	97	98	129	160	154	291	266	258	251	260	273	283	284	284	290	291	305	309	146	300
11	111	101	96	89	96	97	101	101	131	234	296	267	286	304	300	296	299	296	299	293	294	247	126	110	273
12	117	100	108	101	121	113	104	110	125	234	287	298	294	300	289	297	285	293	300	298	290	287	161	120	354
13	94	106	87	93	89	114	115	129	118	164	295	263	288	296	282	299	289	304	307	291	296	309	284	320	169
14	121	98	121	72	134	113	111	83	166	287	275	273	285	285	292	282	279	281	282	285	295	295	221	142	331
15	296	246	227	262	298	292	307	303	302	296	303	282	277	272	280	286	280	284	265	243	145	89	65	72	264
16	92	137	239	263	258	323	135	136	150	224	298	161	115	278	298	312	276	288	107	178	120	108	110	116	46
17	114	107	105	111	100	115	101	106	117	131	132	114	138	199	235	217	237	252	267	272	280	307	313	311	147
18	304	265	241	103	122	101	108	113	132	172	251	119	357	295	304	311	290	308	307	310	303	293	245	175	226
19	120	130	113	98	89	100	112	118	131	270	297	308	311	297	291	287	289	284	275	287	296	302	323	158	183
20	120	112	110	115	97	103	50	88	125	283	291	309	289	293	296	297	287	279	281	286	307	312	297	229	294
21	301	279	165	133	128	126	123	124	125	290	304	297	290	282	286	283	290	297	289	283	289	308	306	305	221
22	221	142	125	105	119	101	109	108	131	265	296	298	298	293	282	289	280	280	278	280	303	316	264	160	226
23	122	130	116	116	121	114	121	110	225	296	293	290	289	272	295	279	283	283	272	278	285	286	283	307	274
24	298	301	291	304	306	305	299	312	302	308	312	295	301	300	288	286	290	288	281	304	310	272	158	302	41
25	127	295	303	256	179	158	128	141	291	291	299	294	293	297	294	295	297	281	281	286	301	302	197	113	358
26	109	112	102	96	38	127	115	120	148	245	270	298	305	293	291	278	296	290	291	293	295	302	152	102	262
27	64	91	91	98	107	109	88	99	100	281	302	300	303	289	282	282	286	289	284	292	287	227	157	128	188
28	112	109	143	134	100	117	110	117	156	280	301	292	289	291	274	284	279	292	291	292	298	295	294	293	359
29	304	303	293	301	296	295	297	285	293	288	283	293	293	292	282	279	274	272	281	268	267	267	77	157	12
30	165	162	115	106	104	119	107	125	115	235	5	236	200	264	260	272	278	293	299	310	303	299	313	313	111

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JUNE - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	10	13	35	11	13	25	17	14	50	69	50	46	35	38	16	16	15	15	13	9	8	48	18	11	25
2	11	11	12	8	9	11	10	16	30	25	47	62	23	36	23	17	16	11	9	8	9	12	14	9	18
3	8	8	7	8	12	38	10	12	23	31	59	42	40	60	41	19	14	13	9	8	26	20	13	9	22
4	8	11	7	11	7	7	7	13	33	34	50	50	55	51	37	22	16	11	10	8	6	10	8	6	20
5	7	21	14	11	8	10	9	10	20	44	54	45	63	37	36	25	20	22	11	9	6	8	22	9	22
6	21	37	9	7	41	20	11	18	32	56	42	53	32	22	17	16	13	18	11	9	44	31	42	18	26
7	9	11	16	11	36	12	7	17	43	45	38	65	79	65	16	17	22	12	10	8	9	19	46	8	26
8	7	15	42	18	10	7	10	9	27	33	44	41	42	18	27	19	17	14	12	9	9	9	25	49	21
9	18	13	11	8	12	11	9	11	22	24	45	73	59	41	47	17	32	16	13	8	32	18	29	33	25
10	28	10	33	11	11	9	10	19	50	43	50	23	19	21	20	15	19	15	10	8	5	7	8	35	20
11	8	9	17	26	9	9	9	11	41	47	44	57	39	19	18	17	16	15	12	8	8	15	28	7	20
12	8	7	18	14	10	10	10	15	46	35	32	44	40	20	21	17	17	14	10	8	6	8	24	19	19
13	14	11	13	9	15	9	7	12	34	46	50	41	25	25	19	14	13	13	13	10	6	9	36	49	20
14	21	17	37	51	19	8	11	46	45	28	22	21	22	17	20	15	15	11	10	8	6	7	22	31	21
15	23	34	15	20	10	7	10	10	11	14	13	11	10	13	11	12	9	11	10	12	14	13	10	10	13
16	14	11	20	10	30	27	33	14	15	23	43	23	39	22	21	19	12	28	34	12	10	9	11	10	20
17	8	10	10	10	14	16	17	23	22	21	22	34	50	23	44	29	25	22	13	10	9	9	9	37	20
18	11	18	55	28	10	10	8	12	20	33	55	47	44	39	40	26	23	14	13	10	7	7	27	47	25
19	24	10	9	9	10	8	7	12	26	38	42	35	18	17	15	18	14	13	11	8	7	11	10	32	17
20	11	10	9	7	11	11	19	21	35	47	15	17	20	17	14	18	14	12	9	6	7	7	5	21	15
21	21	16	6	15	8	5	8	12	34	39	21	22	22	16	14	15	13	14	9	7	5	9	9	8	15
22	17	10	13	12	8	9	14	19	28	41	21	21	30	22	15	15	14	17	11	8	7	8	19	12	16
23	15	31	8	10	8	9	9	20	38	17	15	14	13	21	16	15	14	15	16	10	24	30	13	8	16
24	9	8	7	8	9	6	11	15	20	18	21	19	20	19	22	15	16	14	11	11	9	18	10	43	15
25	33	17	6	25	9	8	11	18	66	31	23	27	23	24	17	18	17	10	14	7	8	10	16	11	19
26	6	8	9	9	30	43	8	15	32	45	27	20	22	15	13	15	18	17	12	10	6	24	17	43	19
27	39	7	12	12	10	9	17	21	29	45	20	20	16	18	17	15	12	14	11	9	17	31	15	6	18
28	7	23	56	8	8	8	11	17	22	34	17	19	20	20	16	17	13	13	13	10	7	3	6	8	16
29	8	10	11	8	6	8	10	14	12	16	23	18	18	22	30	18	19	15	19	12	10	19	37	12	16
30	8	11	20	26	21	11	22	25	39	60	62	66	60	31	23	24	21	20	12	10	10	8	14	10	26
HRAVE	14	14	18	14	14	13	12	16	31	36	36	36	33	27	23	18	17	15	12	9	11	15	19	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	25	18	22	20	22	26	26	21	25	20	20	19	20	21	13	20	20	25	17	15	15	16	16	15	19
MAX	69	62	60	55	63	56	79	49	73	50	57	46	50	51	34	43	50	55	42	47	39	41	38	43	66
MIN	8	8	7	6	6	7	7	7	8	5	7	6	6	6	7	9	8	7	7	5	5	7	8	6	6

DAY	26	27	28	29	30	31
AVE	19	18	16	16	26	***
MAX	45	45	56	37	66	***
MIN	6	6	3	6	8	***

MONTHLY AVERAGE = 19.7 MONTHLY MAXIMUM = 78.7 MONTHLY MINIMUM = 3.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JUNE - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	27.1	26.5	25.5	23.7	22.1	20.7	20.6	23.2	26.5	29.8	31.7	33.1	34.8	36.5	36.9	36.7	36.4	35.8	34.8	33.0	31.3	30.4	28.3	26.9	29.7
2	25.6	24.1	22.8	22.2	20.8	20.3	21.2	24.1	27.5	30.0	33.7	36.8	38.4	39.4	40.2	39.8	39.4	38.0	36.3	34.8	33.3	32.2	30.0	28.8	30.8
3	27.3	26.0	25.0	23.7	22.4	20.6	21.9	23.7	27.9	31.7	35.4	37.5	38.8	40.0	40.1	40.6	40.6	39.7	38.4	36.5	34.5	33.6	30.6	29.0	31.9
4	27.9	25.9	25.6	24.1	22.0	21.9	23.6	25.6	28.7	32.4	36.2	37.9	38.8	39.9	40.6	40.9	40.6	39.6	38.0	36.6	34.7	33.9	32.9	31.5	32.5
5	30.1	29.1	27.4	26.2	25.5	23.9	24.5	27.6	30.0	32.2	34.2	36.0	37.3	38.9	39.7	39.7	39.7	39.5	38.3	36.3	34.6	33.6	32.9	31.6	32.9
6	30.1	29.6	27.8	26.8	25.6	24.6	25.0	27.1	30.4	32.7	34.1	36.1	37.7	38.9	39.0	38.4	38.3	37.7	37.0	35.3	33.8	31.9	31.3	29.9	32.5
7	28.4	27.9	26.0	24.5	23.8	22.2	24.0	26.7	29.5	32.2	34.4	36.2	37.4	38.9	39.0	39.0	39.4	38.8	37.6	35.9	33.9	33.7	32.4	30.0	32.2
8	29.5	29.4	27.1	25.7	24.8	23.8	26.1	27.6	30.6	33.6	36.2	38.1	39.7	40.9	41.1	40.9	40.5	39.8	39.0	37.5	35.8	34.7	33.7	32.2	33.7
9	31.1	29.3	27.8	27.2	25.6	24.5	24.0	27.6	30.8	34.2	36.0	38.4	39.9	40.3	41.3	41.2	40.6	40.3	39.2	37.4	35.8	34.3	33.4	32.3	33.9
10	30.5	29.0	28.4	27.1	26.1	26.0	26.2	28.8	31.2	33.4	35.5	37.6	38.5	38.9	39.1	39.1	39.1	38.5	37.5	35.7	33.8	32.3	31.0	29.6	33.0
11	28.2	28.0	27.4	24.9	24.1	23.1	25.0	26.2	29.3	31.7	33.9	35.8	37.6	39.0	39.5	39.8	39.5	38.9	37.9	36.2	34.4	32.9	31.6	29.2	32.2
12	27.5	27.2	25.0	24.4	23.5	22.1	24.0	26.3	29.1	32.0	35.6	38.1	39.4	40.4	40.7	40.6	40.2	38.8	38.0	36.9	35.3	34.0	33.3	32.0	32.7
13	30.2	29.1	27.4	26.1	25.8	25.0	25.6	27.8	30.6	33.1	35.6	39.0	40.2	41.5	40.9	40.1	40.2	39.9	39.8	38.5	37.1	36.4	35.8	35.1	34.2
14	33.9	33.3	32.5	30.8	28.7	28.5	29.8	31.2	33.4	35.8	38.1	39.4	40.0	40.5	41.1	40.8	40.6	39.9	39.1	37.3	36.1	35.4	34.2	33.3	35.6
15	33.2	32.6	31.8	31.5	31.0	30.2	30.0	30.3	30.5	31.1	32.0	32.1	32.1	32.4	32.2	32.0	31.5	30.8	29.5	28.4	24.4	22.7	22.4	21.9	29.9
16	21.2	21.1	21.1	21.0	21.0	20.1	19.9	20.2	20.7	20.3	19.6	20.0	21.1	21.3	21.8	23.1	23.0	23.5	23.9	23.5	23.2	22.9	22.8	22.7	21.6
17	22.3	21.9	21.4	21.1	20.4	20.0	21.5	23.0	24.6	26.6	29.2	31.0	31.6	33.8	33.7	34.4	34.7	34.2	33.6	32.1	30.5	29.5	28.8	27.9	27.8
18	27.1	25.9	24.6	23.1	22.0	20.9	22.3	24.8	27.0	29.0	31.8	33.6	34.2	35.7	36.4	36.6	36.9	35.7	34.9	33.5	32.2	31.0	29.6	29.1	29.9
19	27.9	26.5	25.4	23.7	22.7	22.0	22.6	24.7	27.6	29.5	32.1	34.4	36.0	36.8	37.0	37.2	36.9	36.4	35.7	34.0	32.4	31.2	30.6	28.3	30.5
20	27.2	25.7	24.7	23.7	23.1	22.0	22.4	24.7	27.5	30.6	33.9	36.0	37.5	38.5	39.4	39.6	39.6	39.2	38.5	36.6	35.0	34.2	33.5	31.4	31.8
21	30.3	29.5	27.2	27.6	25.5	24.8	25.3	27.3	30.1	32.2	35.1	37.3	39.1	39.9	40.2	40.5	40.7	40.2	39.3	37.4	35.3	34.4	33.5	32.7	33.6
22	31.1	29.4	28.7	27.8	25.5	24.9	25.7	27.6	30.5	33.3	36.7	38.6	40.1	41.1	41.1	41.1	40.7	40.3	39.6	37.7	35.8	35.1	34.3	32.5	34.1
23	29.8	29.1	28.5	28.0	26.6	26.0	25.6	28.2	30.4	34.0	35.7	36.8	37.6	38.5	39.1	39.4	39.4	39.0	38.3	36.8	35.3	34.4	33.4	32.7	33.4
24	32.0	31.1	30.0	29.3	28.7	28.4	28.7	29.9	30.9	32.2	33.5	34.8	35.7	36.4	37.1	37.4	37.5	37.4	36.5	35.4	34.1	33.1	31.3	30.9	33.0
25	29.5	29.0	28.3	27.2	25.8	25.7	25.7	27.6	30.2	32.6	34.5	35.9	37.1	38.0	38.7	38.9	38.8	38.4	37.7	35.8	34.0	33.3	32.1	30.3	32.7
26	29.0	28.0	27.0	26.0	24.3	23.5	25.0	27.6	30.3	33.0	35.7	38.4	39.8	40.6	40.8	40.7	40.8	40.1	39.4	37.8	36.2	35.3	33.4	32.0	33.5
27	30.8	28.8	27.5	26.3	25.5	25.3	25.7	26.9	30.3	33.8	36.7	38.3	39.5	40.1	40.4	40.6	40.5	40.1	39.1	37.7	36.2	35.3	34.5	32.3	33.8
28	31.0	30.1	28.8	27.6	27.2	26.0	27.2	29.4	32.4	34.3	36.4	37.3	38.1	39.0	39.1	39.4	39.4	39.0	38.5	37.2	35.8	34.8	33.2	32.5	33.9
29	32.0	31.5	30.7	29.7	27.6	27.4	28.3	29.8	31.2	32.6	34.0	34.6	35.6	36.0	37.4	38.0	38.2	37.8	37.4	36.0	34.3	33.1	32.1	30.8	33.2
30	29.0	27.6	26.8	26.0	25.4	24.3	25.1	26.8	29.3	31.1	33.1	34.1	35.2	36.8	37.2	37.3	37.3	36.7	36.1	34.5	33.0	31.6	31.1	30.3	31.5
HRAVE	29.0	28.1	26.9	25.9	24.8	24.0	24.7	26.7	29.3	31.7	34.0	35.8	37.0	38.0	38.4	38.5	38.4	37.8	37.0	35.4	33.7	32.7	31.6	30.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	29.7	30.8	31.9	32.5	32.9	32.5	32.2	33.7	33.9	33.0	32.2	32.7	34.2	35.6	29.9	21.6	27.8	29.9	30.5	31.8	33.6	34.1	33.4	33.0	32.7
MAX	36.9	40.2	40.6	40.9	39.7	39.0	39.4	41.1	41.3	39.1	39.8	40.7	41.5	41.1	33.2	23.9	34.7	36.9	37.2	39.6	40.7	41.1	39.4	37.5	38.9
MIN	20.6	20.3	20.6	21.9	23.9	24.6	22.2	23.8	24.0	26.0	23.1	22.1	25.0	28.5	21.9	19.6	20.0	20.9	22.0	22.0	24.8	24.9	25.6	28.4	25.7

DAY	26	27	28	29	30	31
AVE	33.5	33.8	33.9	33.2	31.5	***
MAX	40.8	40.6	39.4	38.2	37.3	***
MIN	23.5	25.3	26.0	27.4	24.3	***

MONTHLY AVERAGE = 32.1 MONTHLY MAXIMUM = 41.5 MONTHLY MINIMUM = 19.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JUNE - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.6	0.6	0.5	0.9	0.7	0.5	-0.2	-0.8	-0.8	-0.7	-0.9	-1.2	-1.5	-1.5	-1.8	-1.6	-1.4	-1.0	-0.6	0.0	0.5	0.7	0.8	0.7	-0.3
2	0.7	0.8	0.6	0.5	0.8	0.5	-0.5	-1.0	-1.1	-1.0	-0.9	-1.2	-1.7	-1.6	-1.5	-1.4	-1.2	-0.9	-0.6	-0.1	0.4	0.7	0.5	0.8	-0.4
3	0.9	0.8	0.9	1.2	0.9	0.5	-0.4	-1.0	-0.9	-1.2	-0.9	-1.3	-1.2	-1.6	-1.3	-1.4	-1.3	-1.0	-0.6	0.0	0.6	0.6	0.9	1.0	-0.2
4	0.8	0.9	0.7	0.8	1.0	0.7	-0.8	-1.1	-0.8	-1.1	-1.1	-1.2	-1.2	-1.4	-1.5	-1.4	-1.2	-0.9	-0.3	0.1	0.7	0.4	0.4	0.5	-0.3
5	0.6	0.6	0.7	0.6	0.6	0.8	-0.5	-1.2	-1.1	-1.0	-1.0	-1.3	-1.3	-1.5	-1.7	-1.3	-1.2	-1.0	-0.7	-0.1	0.2	0.4	0.4	0.3	-0.4
6	0.5	0.4	0.5	0.6	0.5	0.5	-0.1	-0.5	-0.8	-0.8	-1.0	-1.3	-1.5	-1.6	-1.6	-1.3	-1.2	-0.9	-0.4	0.2	0.6	0.6	0.5	0.8	-0.3
7	0.8	0.8	0.6	0.5	0.5	0.5	-0.7	-1.2	-0.7	-1.0	-1.2	-1.2	-1.4	-1.6	-1.6	-1.5	-1.2	-1.0	-0.6	-0.1	0.3	0.4	0.5	0.4	-0.4
8	0.5	0.7	0.6	0.7	0.6	0.4	-0.7	-1.1	-1.0	-1.0	-1.2	-1.3	-1.4	-1.7	-1.6	-1.4	-1.2	-0.9	-0.6	0.0	0.5	0.6	0.8	0.7	-0.4
9	0.6	0.7	0.8	0.5	0.6	0.6	0.3	-1.2	-1.1	-1.4	-1.1	-1.2	-1.6	-1.5	-1.6	-1.4	-1.3	-0.9	-0.6	-0.1	0.3	0.4	0.5	0.5	-0.4
10	0.5	0.6	0.3	0.6	0.6	0.4	-0.6	-1.0	-0.6	-0.9	-1.2	-1.5	-1.6	-1.6	-1.5	-1.3	-1.2	-0.9	-0.7	-0.1	0.3	0.5	0.6	0.6	-0.4
11	0.5	0.7	0.6	0.6	0.7	0.3	-0.8	-0.9	-0.7	-0.7	-0.9	-1.2	-1.4	-1.7	-1.7	-1.5	-1.4	-1.0	-0.6	0.0	0.6	0.6	0.6	1.0	-0.4
12	0.9	0.7	0.8	0.8	0.9	1.0	-0.5	-0.8	-0.8	-0.7	-1.1	-1.3	-1.4	-1.5	-1.5	-1.4	-1.2	-0.5	-0.2	0.1	0.6	0.6	0.3	0.4	-0.3
13	0.8	0.6	0.7	0.7	0.7	0.5	-0.2	-1.0	-0.7	-0.6	-0.7	-1.0	-1.0	-1.4	-0.9	-0.6	-0.5	-0.5	-0.4	-0.1	0.4	0.3	0.4	0.4	-0.2
14	0.4	0.3	0.6	0.7	0.9	0.4	-0.3	-0.7	-0.9	-0.9	-1.3	-1.5	-1.5	-1.6	-1.6	-1.5	-1.2	-1.0	-0.7	-0.2	0.2	0.3	0.4	0.3	-0.4
15	0.2	0.1	0.1	0.1	0.1	0.0	-0.1	-0.3	-0.4	-0.6	-0.7	-0.6	-0.6	-0.7	-0.8	-0.6	-0.4	-0.2	-0.2	-0.1	0.2	0.4	0.2	0.3	-0.2
16	0.3	0.1	0.1	0.0	0.0	0.1	0.1	-0.2	-0.3	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	0.0	0.2	0.1	0.2	0.2	-0.1
17	0.2	0.2	0.3	0.4	0.5	0.3	-0.5	-0.8	-1.0	-1.4	-1.6	-1.7	-1.2	-1.7	-1.3	-1.2	-1.0	-0.8	-0.6	-0.1	0.2	0.2	0.2	0.3	-0.5
18	0.5	0.6	0.3	0.6	0.4	0.4	-0.8	-1.5	-1.2	-0.7	-0.9	-1.5	-1.1	-1.3	-1.4	-1.1	-1.1	-0.8	-0.5	-0.1	0.3	0.6	0.6	0.4	-0.4
19	0.4	0.5	0.4	0.6	0.6	0.3	-0.8	-1.0	-1.1	-0.6	-0.9	-1.1	-1.5	-1.6	-1.5	-1.4	-1.3	-1.0	-0.6	-0.1	0.4	0.6	0.5	0.5	-0.4
20	0.6	0.5	0.5	0.6	0.7	0.3	-0.3	-0.9	-0.7	-0.7	-1.2	-1.5	-1.4	-1.5	-1.6	-1.4	-1.2	-0.9	-0.6	0.0	0.4	0.5	0.8	0.7	-0.3
21	0.5	0.4	0.5	0.5	0.5	0.4	-0.6	-1.0	-0.7	-0.8	-1.2	-1.5	-1.5	-1.5	-1.6	-1.4	-1.2	-0.9	-0.6	-0.1	0.4	0.5	0.5	0.5	-0.4
22	0.6	0.7	0.4	0.6	0.7	0.6	-0.3	-0.8	-0.9	-0.7	-1.3	-1.4	-1.5	-1.6	-1.6	-1.5	-1.2	-1.0	-0.6	-0.1	0.5	0.5	0.6	0.5	-0.4
23	0.5	0.8	0.6	0.7	0.4	0.4	-0.6	-1.2	-0.6	-1.1	-1.4	-1.6	-1.6	-1.5	-1.5	-1.4	-1.3	-0.9	-0.6	-0.1	0.4	0.4	0.2	0.1	-0.5
24	0.1	0.1	0.2	0.2	0.2	0.2	-0.2	-0.7	-1.0	-1.2	-1.4	-1.6	-1.7	-1.8	-1.6	-1.6	-1.3	-1.0	-0.6	-0.1	0.2	0.4	0.6	0.5	-0.5
25	0.4	0.6	0.8	0.6	0.8	0.6	-0.3	-0.7	-0.4	-1.0	-1.4	-1.4	-1.6	-1.5	-1.7	-1.5	-1.3	-1.0	-0.7	-0.2	0.3	0.4	0.4	0.5	-0.4
26	0.6	0.6	0.8	0.7	0.5	0.7	-0.7	-1.0	-0.6	-0.7	-0.9	-1.4	-1.5	-1.6	-1.6	-1.4	-1.2	-1.0	-0.7	-0.1	0.4	0.5	0.5	0.6	-0.4
27	0.7	0.6	0.6	0.6	0.8	0.7	-0.3	-0.7	-0.8	-0.7	-1.3	-1.5	-1.6	-1.7	-1.6	-1.4	-1.3	-1.0	-0.6	-0.1	0.2	0.4	0.3	0.5	-0.4
28	0.5	0.4	0.8	0.4	0.6	0.8	-0.4	-0.8	-1.2	-0.9	-1.4	-1.5	-1.6	-1.6	-1.5	-1.5	-1.2	-1.0	-0.7	-0.2	0.3	0.6	0.4	0.2	-0.4
29	0.2	0.2	0.2	0.2	0.2	0.3	-0.2	-0.6	-1.0	-1.2	-1.4	-1.6	-1.7	-1.2	-1.5	-1.5	-1.2	-1.0	-0.7	-0.2	0.0	0.0	0.3	0.4	-0.5
30	0.4	0.3	0.4	0.5	0.6	0.5	-0.3	-0.6	-0.8	-0.7	-1.2	-1.3	-1.4	-1.6	-1.5	-1.5	-1.3	-1.0	-0.8	-0.1	0.4	0.6	0.3	0.2	-0.4
HRAVE	0.5	0.5	0.5	0.6	0.6	0.5	-0.4	-0.9	-0.8	-0.9	-1.1	-1.3	-1.4	-1.5	-1.5	-1.3	-1.2	-0.9	-0.6	-0.1	0.4	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.3	-0.4	-0.2	-0.3	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.2	-0.4	-0.2	-0.1	-0.5	-0.4	-0.4	-0.3	-0.4	-0.4	-0.5	-0.5	-0.4
MAX	0.9	0.8	1.2	1.0	0.8	0.8	0.8	0.8	0.8	0.6	1.0	1.0	0.8	0.9	0.4	0.3	0.5	0.6	0.6	0.8	0.5	0.7	0.8	0.6	0.8
MIN	-1.8	-1.7	-1.6	-1.5	-1.7	-1.6	-1.6	-1.7	-1.6	-1.6	-1.7	-1.5	-1.4	-1.6	-0.8	-0.3	-1.7	-1.5	-1.6	-1.6	-1.6	-1.6	-1.6	-1.8	-1.7

DAY	26	27	28	29	30	31
AVE	-0.4	-0.4	-0.4	-0.5	-0.4	***
MAX	0.8	0.8	0.8	0.4	0.6	***
MIN	-1.6	-1.7	-1.6	-1.7	-1.6	***

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = -1.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JUNE - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	699	699	699	699	700	700	701	701	701	701	701	701	700	700	699	699	699	699	699	699	699	700	700	700	700
2	700	700	700	701	701	701	701	702	702	701	701	700	700	699	699	698	698	698	698	699	699	699	700	700	700
3	700	700	700	700	700	701	701	701	701	700	700	700	699	699	698	698	697	697	698	698	698	699	699	699	699
4	699	699	700	700	700	701	701	701	701	701	700	700	699	699	698	698	698	697	698	698	698	698	699	699	699
5	699	700	700	700	700	701	701	701	701	701	700	700	699	699	698	697	697	697	696	697	697	698	698	699	699
6	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	697	698	698	698	698	698
7	698	698	699	699	699	700	701	701	701	701	701	700	700	699	699	698	698	698	698	698	699	699	700	700	699
8	700	700	700	700	700	701	701	702	702	701	701	701	700	700	699	699	698	698	698	698	699	699	700	700	700
9	700	700	700	700	700	700	701	701	701	701	701	701	700	699	698	698	697	697	696	697	697	698	698	699	699
10	699	699	699	699	699	699	699	700	699	699	699	698	698	697	697	696	696	696	696	696	697	697	698	698	698
11	698	698	698	698	699	699	699	700	700	700	699	699	698	698	697	697	696	696	696	697	697	697	698	698	698
12	698	698	698	699	699	699	699	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	698	698
13	698	698	698	698	698	699	699	699	700	699	699	699	699	698	698	697	697	696	696	697	697	697	698	697	698
14	698	697	698	698	698	698	698	699	699	699	699	698	698	697	696	696	696	695	695	696	696	697	697	697	697
15	697	697	698	698	698	698	699	698	698	699	698	698	698	698	697	697	696	696	697	697	698	699	698	698	698
16	698	698	697	697	697	697	698	698	698	698	699	699	699	699	698	698	698	698	698	698	698	699	699	699	698
17	699	699	699	699	700	700	700	701	701	700	700	700	699	699	699	698	698	698	698	698	698	699	699	700	699
18	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	699	698	698	698	699	699	699	699	699	700
19	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	699	699	698	698	699	699	699	699	700	700
20	700	700	700	700	700	700	701	701	701	701	700	700	700	699	699	698	698	698	698	698	699	699	699	700	699
21	700	700	700	701	701	701	701	702	701	701	701	700	700	700	699	699	698	698	698	698	698	699	699	699	700
22	699	699	699	699	699	699	700	700	700	700	700	699	698	698	697	697	696	696	696	696	696	697	697	697	698
23	697	697	697	697	698	698	699	699	700	699	699	699	699	698	697	697	697	697	697	697	697	697	698	698	698
24	698	698	698	699	699	700	700	701	701	701	701	701	700	700	700	699	699	698	698	698	698	699	699	699	699
25	699	700	700	700	701	701	701	702	702	702	702	701	701	700	700	699	699	698	698	699	699	699	700	700	700
26	700	700	700	700	700	701	701	702	702	702	702	701	701	700	700	699	699	699	698	699	699	699	700	700	700
27	700	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	698	698	699	699	699	700
28	699	699	699	699	699	700	700	701	701	701	700	700	700	699	699	698	697	697	697	697	697	698	698	699	699
29	699	699	699	700	700	700	701	701	701	701	700	700	699	699	698	698	697	697	697	697	698	699	700	700	699
30	700	700	700	701	701	701	702	702	702	702	702	701	701	700	700	699	699	699	699	699	700	700	701	701	700
HRAVE	699	699	699	699	699	700	700	700	701	700	700	700	699	699	698	698	698	697	697	698	698	698	699	699	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	700	699	699	699	698	699	700	699	698	698	698	698	697	698	698	699	700	700	699	700	698	698	699	700
MAX	701	702	701	701	701	700	701	702	701	700	700	700	700	699	699	699	701	701	701	701	702	700	700	701	702
MIN	699	698	697	697	696	697	698	698	696	696	696	697	696	695	696	697	698	698	698	698	698	696	697	698	698

DAY	26	27	28	29	30	31
AVE	700	700	699	699	700	***
MAX	702	701	701	701	702	***
MIN	698	698	697	697	699	***

MONTHLY AVERAGE = 699.0 MONTHLY MAXIMUM = 702.0 MONTHLY MINIMUM = 695.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JUNE - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	19	18	19	22	22	25	21	18	14	12	10	9	9	7	6	7	7	7	8	10	11	12	14	16	13
2	15	16	17	18	19	21	17	15	12	11	9	8	8	8	7	8	8	9	9	10	11	11	13	16	12
3	17	16	16	18	20	23	19	17	14	11	9	8	7	6	6	6	6	6	6	7	8	8	10	11	11
4	11	13	14	14	16	17	13	13	10	9	8	7	6	6	6	6	7	7	8	9	10	10	9	11	10
5	13	14	13	15	17	20	18	15	13	13	16	15	14	15	17	17	15	14	15	16	16	17	18	19	16
6	20	21	23	26	27	28	26	23	19	18	18	18	19	18	15	14	13	11	10	12	13	14	16	16	18
7	17	16	20	22	24	24	21	20	17	14	12	12	13	13	12	12	12	12	12	13	15	16	16	19	16
8	18	18	20	21	23	23	19	18	16	14	12	11	11	10	10	10	11	11	11	11	12	13	13	14	15
9	15	16	18	19	20	21	22	17	16	14	11	10	10	10	10	10	10	11	11	12	12	16	15	15	14
10	18	21	22	25	28	28	23	24	22	18	14	10	10	9	9	9	9	9	10	12	13	14	15	16	16
11	17	18	19	19	20	21	19	19	15	13	11	10	9	7	6	6	6	7	6	7	9	11	12	13	13
12	15	14	15	16	17	20	17	15	12	11	10	9	8	8	8	8	8	9	8	8	9	9	10	11	11
13	13	13	14	16	15	17	16	14	12	10	9	8	8	9	10	11	12	12	12	13	14	14	14	15	13
14	16	16	17	19	20	22	20	18	16	16	15	14	14	14	14	14	14	14	15	17	18	20	21	22	17
15	24	25	28	33	35	36	38	39	39	36	32	30	30	31	33	30	31	34	41	44	75	93	94	95	43
16	100	100	98	100	99	100	100	100	97	100	100	100	96	97	96	86	89	85	83	86	90	93	92	81	94
17	78	76	76	77	80	82	75	63	57	49	41	33	31	21	24	24	23	24	25	28	30	26	21	22	45
18	23	26	32	38	42	48	44	38	31	24	20	20	20	19	18	17	18	20	21	21	20	21	24	26	26
19	29	32	33	39	43	45	39	34	26	22	19	15	15	14	13	12	12	12	14	17	19	21	22	23	24
20	27	30	32	33	34	36	37	33	26	21	17	14	13	12	11	12	12	12	11	13	15	15	15	17	21
21	19	21	23	25	30	31	30	27	23	20	18	16	14	13	13	12	12	12	12	14	15	16	17	17	19
22	18	20	22	25	28	28	27	24	21	17	14	11	10	8	8	7	7	8	9	11	13	14	14	15	16
23	18	20	22	24	26	28	25	23	21	19	18	18	17	17	15	14	15	16	17	18	20	21	26	29	20
24	31	31	32	33	33	33	32	38	38	34	32	29	26	23	22	21	20	18	18	19	21	22	24	26	27
25	28	29	28	28	30	30	31	28	26	24	22	20	19	18	16	14	13	12	13	14	15	15	16	19	21
26	21	21	22	23	25	26	23	20	17	15	14	11	11	11	11	11	10	10	11	13	15	16	17	20	16
27	24	21	22	24	24	26	23	24	18	15	14	12	12	12	11	10	11	10	11	12	13	13	14	16	16
28	18	19	19	20	21	24	23	20	18	18	17	17	15	15	14	15	15	16	16	17	19	20	22	24	19
29	26	27	26	29	31	37	43	42	39	35	31	30	28	26	24	22	20	19	20	20	17	13	14	15	26
30	18	27	27	29	35	35	39	33	29	20	16	15	14	12	10	11	10	11	11	13	14	15	16	16	20
HRAVE	24	25	26	28	30	32	30	28	24	22	20	18	17	16	16	15	15	15	16	17	19	21	21	23	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	13	12	11	10	16	18	16	15	14	16	13	11	13	17	43	94	45	26	24	21	19	16	20	27	21
MAX	25	21	23	17	20	28	24	23	22	28	21	20	17	22	95	100	82	48	45	37	31	28	29	38	31
MIN	6	7	6	6	13	10	12	10	10	9	6	8	8	14	24	81	21	17	12	11	12	7	14	18	12

DAY	26	27	28	29	30	31
AVE	16	16	19	26	20	***
MAX	26	26	24	43	39	***
MIN	10	10	14	13	10	***

MONTHLY AVERAGE = 21.7 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 5.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JUNE - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.41	0.62	0.81	0.95	1.04	1.08	1.03	0.95	0.67	0.61	0.39	0.17	0.02	0.00	0.00	0.00	0.00	8.92
2	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.39	0.61	0.79	0.94	1.03	1.07	1.01	0.92	0.66	0.58	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.71
3	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.40	0.62	0.80	0.95	1.04	1.09	1.03	0.94	0.68	0.60	0.39	0.17	0.02	0.00	0.00	0.00	0.00	8.90
4	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.40	0.62	0.80	0.95	1.04	1.09	1.03	0.93	0.69	0.59	0.32	0.09	0.01	0.00	0.00	0.00	0.00	8.73
5	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.58	0.77	0.89	0.98	1.07	0.95	0.84	0.63	0.53	0.35	0.15	0.01	0.00	0.00	0.00	0.00	8.28
6	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.37	0.58	0.71	0.82	0.88	1.00	0.91	0.87	0.51	0.49	0.31	0.11	0.01	0.00	0.00	0.00	0.00	7.71
7	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.31	0.52	0.76	0.90	0.99	1.03	0.98	0.89	0.66	0.57	0.37	0.16	0.02	0.00	0.00	0.00	0.00	8.31
8	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.57	0.73	0.91	1.00	1.05	1.00	0.90	0.67	0.57	0.36	0.16	0.02	0.00	0.00	0.00	0.00	8.44
9	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.36	0.59	0.79	0.92	1.00	1.05	1.01	0.86	0.65	0.59	0.37	0.16	0.02	0.00	0.00	0.00	0.00	8.43
10	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.37	0.59	0.78	0.93	1.03	1.07	1.02	0.91	0.69	0.59	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.70
11	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.61	0.79	0.94	1.04	1.08	1.03	0.93	0.71	0.61	0.40	0.19	0.02	0.00	0.00	0.00	0.00	8.88
12	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.37	0.58	0.77	0.92	1.01	0.99	1.01	0.89	0.65	0.53	0.16	0.10	0.02	0.00	0.00	0.00	0.00	8.14
13	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.34	0.45	0.44	0.80	0.97	0.66	0.87	0.37	0.25	0.26	0.25	0.19	0.03	0.00	0.00	0.00	0.00	6.00
14	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.30	0.54	0.73	0.88	0.97	1.01	0.96	0.85	0.67	0.56	0.36	0.17	0.02	0.00	0.00	0.00	0.00	8.19
15	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.09	0.13	0.26	0.30	0.23	0.30	0.42	0.39	0.23	0.12	0.05	0.03	0.00	0.00	0.00	0.00	0.00	2.61
16	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.10	0.10	0.11	0.23	0.22	0.12	0.31	0.16	0.17	0.12	0.07	0.00	0.00	0.00	0.00	0.00	1.83
17	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.36	0.57	0.75	0.90	0.99	1.04	1.01	0.81	0.67	0.60	0.39	0.18	0.02	0.00	0.00	0.00	0.00	8.42
18	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.37	0.59	0.78	0.92	1.01	1.05	1.01	0.89	0.71	0.60	0.39	0.18	0.02	0.00	0.00	0.00	0.00	8.66
19	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.38	0.60	0.79	0.94	1.03	1.07	1.02	0.91	0.72	0.62	0.41	0.19	0.03	0.00	0.00	0.00	0.00	8.85
20	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.38	0.59	0.78	0.94	1.03	1.08	1.03	0.91	0.72	0.61	0.40	0.19	0.02	0.00	0.00	0.00	0.00	8.82
21	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.37	0.58	0.78	0.93	1.02	1.07	1.02	0.91	0.71	0.61	0.40	0.19	0.03	0.00	0.00	0.00	0.00	8.75
22	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.38	0.61	0.79	0.95	1.04	1.09	1.05	0.93	0.73	0.63	0.41	0.19	0.03	0.00	0.00	0.00	0.00	8.97
23	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.37	0.58	0.77	0.92	1.00	1.04	1.00	0.90	0.70	0.60	0.38	0.18	0.02	0.00	0.00	0.00	0.00	8.59
24	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.34	0.52	0.74	0.88	0.98	1.03	0.99	0.89	0.69	0.59	0.38	0.15	0.02	0.00	0.00	0.00	0.00	8.32
25	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.54	0.75	0.90	0.99	1.04	1.00	0.90	0.70	0.61	0.40	0.19	0.03	0.00	0.00	0.00	0.00	8.53
26	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.37	0.59	0.78	0.93	1.02	1.07	1.02	0.92	0.70	0.61	0.40	0.19	0.03	0.00	0.00	0.00	0.00	8.76
27	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.36	0.57	0.76	0.91	1.00	1.05	1.01	0.91	0.69	0.60	0.39	0.18	0.03	0.00	0.00	0.00	0.00	8.57
28	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.36	0.57	0.75	0.89	0.98	1.03	1.00	0.90	0.67	0.58	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.42
29	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.32	0.51	0.75	0.88	0.96	0.85	0.72	0.86	0.66	0.58	0.38	0.18	0.02	0.00	0.00	0.00	0.00	7.79
30	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.58	0.76	0.92	1.01	1.06	1.02	0.95	0.69	0.62	0.41	0.19	0.03	0.00	0.00	0.00	0.00	8.72
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.54	0.72	0.86	0.95	0.98	0.94	0.84	0.63	0.55	0.35	0.16	0.02	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	8.92	8.71	8.90	8.73	8.28	7.71	8.31	8.44	8.43	8.70	8.88	8.14	6.00	8.19	2.61	1.83	8.42	8.66	8.85	8.82	8.75	8.97	8.59	8.32	8.53
MAX	1.08	1.07	1.09	1.09	1.07	1.00	1.03	1.05	1.05	1.07	1.08	1.01	0.97	1.01	0.42	0.31	1.04	1.05	1.07	1.08	1.07	1.09	1.04	1.03	1.04
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	8.76	8.57	8.42	7.79	8.72	***
MAX	1.07	1.05	1.03	0.96	1.06	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JUNE - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.02	0.03	0.11
16	0.04	0.01	0.01	0.00	0.00	0.04	0.00	0.00	0.00	0.08	0.15	0.05	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.67 MONTHLY MAXIMUM = 0.17 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

JULY THROUGH SEPTEMBER 2018

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

December 2018

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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Appendix B – Monthly Data Tables

1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period July through September 2018. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

A power failure at the site began on July 28, 2018, at 0700, resulting in loss of pressure and relative humidity data. The data logger battery backup lasted until July 31, 2018, when all parameters became inoperative. Power was restored on August 3, 2018, at 1300 (note that pressure and relative humidity sensors came back online a few hours later at 2100). There were no other significant operational events during the reporting period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

Neither calibrations or audits were performed during the reporting quarter.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were -2.6, -3.8, and -4.7 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review, and no data edits were required.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these quarterly data capture goals.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Jan-18	99.1	99.1	99.1	99.1	99.1	99.1	99.1
Feb-18	100	100	100	100	100	100	100
Mar-18	100	100	100	100	99.5	99.5	100
Apr-18	100	100	100	100	100	100	100
May-18	99.5	99.5	99.5	99.5	100	100	99.5
Jun-18	100	100	100	100	100	100	100
Jul-18	98.0	98.0	98.0	98.0	88.0	88.0	98.0
Aug-18	91.7	91.7	91.7	91.7	90.6	90.6	91.7
Sep-18	100	100	100	100	100	100	100
Oct-18							
Nov-18							
Dec-18							
Quarter 1	99.7	99.7	99.7	99.7	99.5	99.5	99.7
Quarter 2	99.8	99.8	99.8	99.8	100.0	100.0	99.8
Quarter 3	96.5	96.5	96.5	96.5	92.8	92.8	96.5
Quarter 4							
Total	98.7	98.7	98.7	98.7	97.4	97.4	98.7

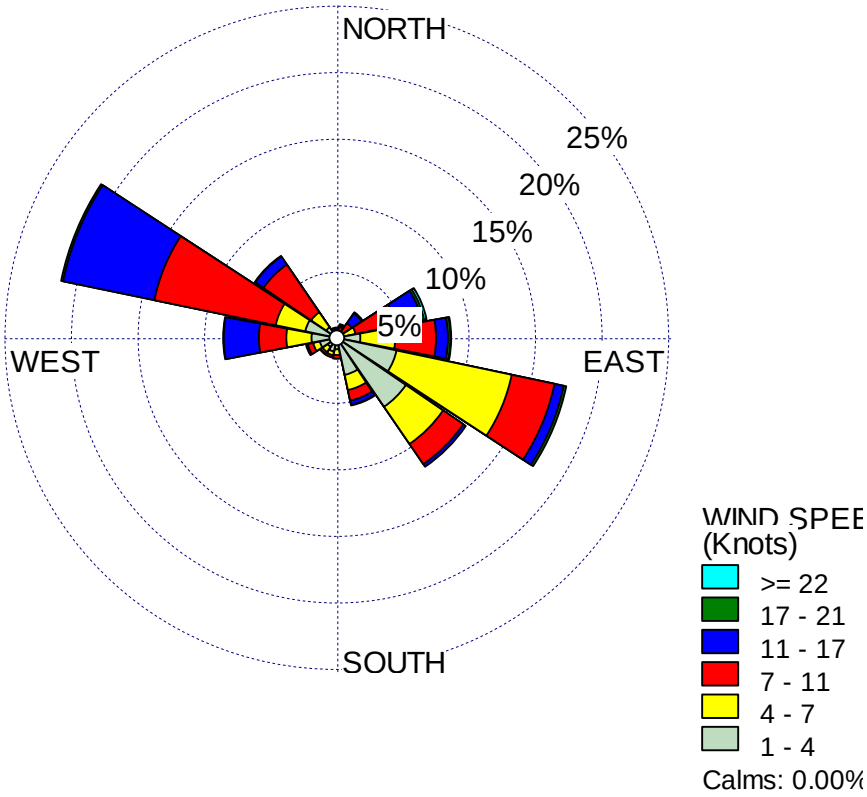
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix C presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly valid 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east-southeast (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours with higher wind speeds). This is similar to wind patterns previously observed at the monitoring site.

Figure 1 – Quarterly 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for July - Sept 2018 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	18070706	WIND SPD TOO CONSTANT 3 HR	0.11	Light to moderate winds in stable early morning period - WS is valid
4	WS	18071310	WIND SPD TOO CONSTANT 3 HR	0.13	Light morning winds, WD does vary - WS is valid
4	WS	18071602	WIND SPD TOO CONSTANT 3 HR	0.11	Light to moderate winds in stable early morning period - WS is valid
4	WS	18072608	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable early morning period - WS is valid
4	WS	18072616	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high wind speeds - WS is valid
4	WS	18073007	WIND SPD TOO CONSTANT 3 HR	0.13	Light to moderate winds in stable early morning period - WS is valid
4	WS	18082406	WIND SPD TOO CONSTANT 3 HR	0.07	Light to moderate winds in stable early morning period - WS is valid
4	WS	18082410	WIND SPD TOO CONSTANT 3 HR	0.13	Light to moderate winds in stable early morning period - WS is valid
4	WS	18091004	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable early morning period - WS is valid
7	WD	18071901	WIND DIR TOO CONSTANT 3 HR	0.8	Moderate to high steady wind speeds - WD is valid
7	WD	18071921	WIND DIR TOO CONSTANT 3 HR	0.9	Moderate to high steady wind speeds - WD is valid
7	WD	18072215	WIND DIR TOO CONSTANT 3 HR	0.5	Moderate to high steady wind speeds - WD is valid
7	WD	18072810	WIND DIR TOO CONSTANT 3 HR	0.97	Moderate to high steady wind speeds - WD is valid
7	WD	18073014	WIND DIR TOO CONSTANT 3 HR	0.6	Moderate to high steady wind speeds - WD is valid
7	WD	18080617	WIND DIR TOO CONSTANT 3 HR	0.8	Moderate to high steady wind speeds - WD is valid
11	TP	18070514	HIGH RATE OF C CHANGE	6.18	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18070515	HIGH RATE OF C CHANGE	5.89	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18071014	HIGH RATE OF C CHANGE	5.38	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18072518	HIGH RATE OF C CHANGE	5	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18072820	HIGH RATE OF C CHANGE	8.73	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18073017	HIGH RATE OF C CHANGE	7.14	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18080718	HIGH RATE OF C CHANGE	6.65	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18080719	HIGH RATE OF C CHANGE	5.04	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18081018	HIGH RATE OF C CHANGE	5.55	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18081217	HIGH RATE OF C CHANGE	8.39	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18082122	HIGH RATE OF C CHANGE	6.09	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18082417	HIGH RATE OF C CHANGE	8.48	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18090116	HIGH RATE OF C CHANGE	5.01	Afternoon transition from strong insolation, also wind shifts - Temp OK
11	TP	18093019	HIGH RATE OF C CHANGE	5.99	Afternoon transition from strong insolation, also wind shifts - Temp OK
15	D1	18070513	DT LARGE READING	-2.01	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	18070710	DT LARGE READING	-2.18	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	18070711	DT LARGE READING	-2.33	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	18072811	DT LARGE READING	-2.13	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	18072812	DT LARGE READING	-2.32	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	18072813	DT LARGE READING	-2.08	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	18070515	DT + During Daytime	0.22	Wind Shift, after rain event - data is valid
16	D1	18071015	DT + During Daytime	0.12	Wind Shift, after rain event - data is valid
16	D1	18090415	DT + During Daytime	0.57	Wind Shift, after rain event - data is valid
17	D1	18070922	DT - During Nighttime	-0.18	Still transitioning from daytime high temperatures - data is valid
17	D1	18070923	DT - During Nighttime	-0.14	Still transitioning from daytime high temperatures - data is valid
17	D1	18071000	DT - During Nighttime	-0.12	Still transitioning from daytime high temperatures - data is valid
17	D1	18071001	DT - During Nighttime	-0.14	Still transitioning from daytime high temperatures - data is valid
17	D1	18071002	DT - During Nighttime	-0.13	Still transitioning from daytime high temperatures - data is valid
17	D1	18071004	DT - During Nighttime	-0.14	Still transitioning from daytime high temperatures - data is valid
17	D1	18071222	DT - During Nighttime	-0.11	Still transitioning from daytime high temperatures - data is valid
17	D1	18071422	DT - During Nighttime	-0.12	Still transitioning from daytime high temperatures - data is valid
17	D1	18071622	DT - During Nighttime	-0.14	Still transitioning from daytime high temperatures - data is valid
17	D1	18071623	DT - During Nighttime	-0.11	Still transitioning from daytime high temperatures - data is valid
17	D1	18071700	DT - During Nighttime	-0.14	Still transitioning from daytime high temperatures - data is valid
17	D1	18072722	DT - During Nighttime	-0.2	Still transitioning from daytime high temperatures - data is valid
17	D1	18072723	DT - During Nighttime	-0.12	Still transitioning from daytime high temperatures - data is valid
17	D1	18072800	DT - During Nighttime	-0.11	Still transitioning from daytime high temperatures - data is valid
17	D1	18080802	DT - During Nighttime	-0.14	Still transitioning from daytime high temperatures - data is valid
17	D1	18080922	DT - During Nighttime	-0.24	Still transitioning from daytime high temperatures - data is valid
17	D1	18081022	DT - During Nighttime	-0.12	Still transitioning from daytime high temperatures - data is valid
17	D1	18081200	DT - During Nighttime	-0.17	Still transitioning from daytime high temperatures - data is valid
17	D1	18081201	DT - During Nighttime	-0.27	Still transitioning from daytime high temperatures - data is valid
17	D1	18081501	DT - During Nighttime	-0.14	Still transitioning from daytime high temperatures - data is valid
17	D1	18081502	DT - During Nighttime	-0.19	Still transitioning from daytime high temperatures - data is valid
17	D1	18081503	DT - During Nighttime	-0.17	Still transitioning from daytime high temperatures - data is valid
17	D1	18081504	DT - During Nighttime	-0.15	Still transitioning from daytime high temperatures - data is valid
17	D1	18090200	DT - During Nighttime	-0.16	Still transitioning from daytime high temperatures - data is valid
19	RH	18071015	OUT OF LIMITS	97.3	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071016	OUT OF LIMITS	98.8	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071017	OUT OF LIMITS	98	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071018	OUT OF LIMITS	96.3	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071019	OUT OF LIMITS	96.3	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071021	OUT OF LIMITS	95.9	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071022	OUT OF LIMITS	96.4	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071023	OUT OF LIMITS	98.1	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071100	OUT OF LIMITS	100	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071101	OUT OF LIMITS	100	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071102	OUT OF LIMITS	99.4	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071103	OUT OF LIMITS	98.3	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071104	OUT OF LIMITS	95.9	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071105	OUT OF LIMITS	99.6	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071106	OUT OF LIMITS	97	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18071507	OUT OF LIMITS	96.9	After rain event - data is reasonable and valid
19	RH	18071508	OUT OF LIMITS	99.6	After rain event - data is reasonable and valid
19	RH	18082419	OUT OF LIMITS	98.7	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18082420	OUT OF LIMITS	97.5	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18082505	OUT OF LIMITS	97.9	After rain event - data is reasonable and valid
19	RH	18082506	OUT OF LIMITS	97.8	After rain event - data is reasonable and valid
19	RH	18090205	OUT OF LIMITS	98.1	After rain event - data is reasonable and valid
19	RH	18090206	OUT OF LIMITS	99.4	After rain event - data is reasonable and valid
19	RH	18091915	OUT OF LIMITS	100	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18091916	OUT OF LIMITS	100	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18091917	OUT OF LIMITS	100	After rain event - starting into cooler evening hours - data is reasonable and valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for July - Sept 2018 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	18091918	OUT OF LIMITS	100	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18091919	OUT OF LIMITS	100	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18091920	OUT OF LIMITS	98.8	After rain event - starting into cooler evening hours - data is reasonable and valid
19	RH	18092003	OUT OF LIMITS	96.1	After rain event - data is reasonable and valid
19	RH	18092004	OUT OF LIMITS	100	After rain event - data is reasonable and valid
19	RH	18092005	OUT OF LIMITS	99.4	After rain event - data is reasonable and valid
19	RH	18092006	OUT OF LIMITS	99.8	After rain event - data is reasonable and valid
19	RH	18092007	OUT OF LIMITS	96	After rain event - data is reasonable and valid
21	PR	18071507	OUT OF LIMITS	0.26	Large Temp Drop, wind shifts, higher RH - Precip data is reasonable
21	PR	18072900	OUT OF LIMITS	0.4	Large Temp Drop, wind shifts, higher RH - Precip data is reasonable
21	PR	18072901	OUT OF LIMITS	0.25	Large Temp Drop, wind shifts, higher RH - Precip data is reasonable
21	PR	18072902	OUT OF LIMITS	0.22	Large Temp Drop, wind shifts, higher RH - Precip data is reasonable
21	PR	18082418	OUT OF LIMITS	0.41	Large Temp Drop, wind shifts, higher RH - Precip data is reasonable
21	PR	18091915	OUT OF LIMITS	0.28	Large Temp Drop, wind shifts, higher RH - Precip data is reasonable
21	PR	18091916	OUT OF LIMITS	0.93	Large Temp Drop, wind shifts, higher RH - Precip data is reasonable

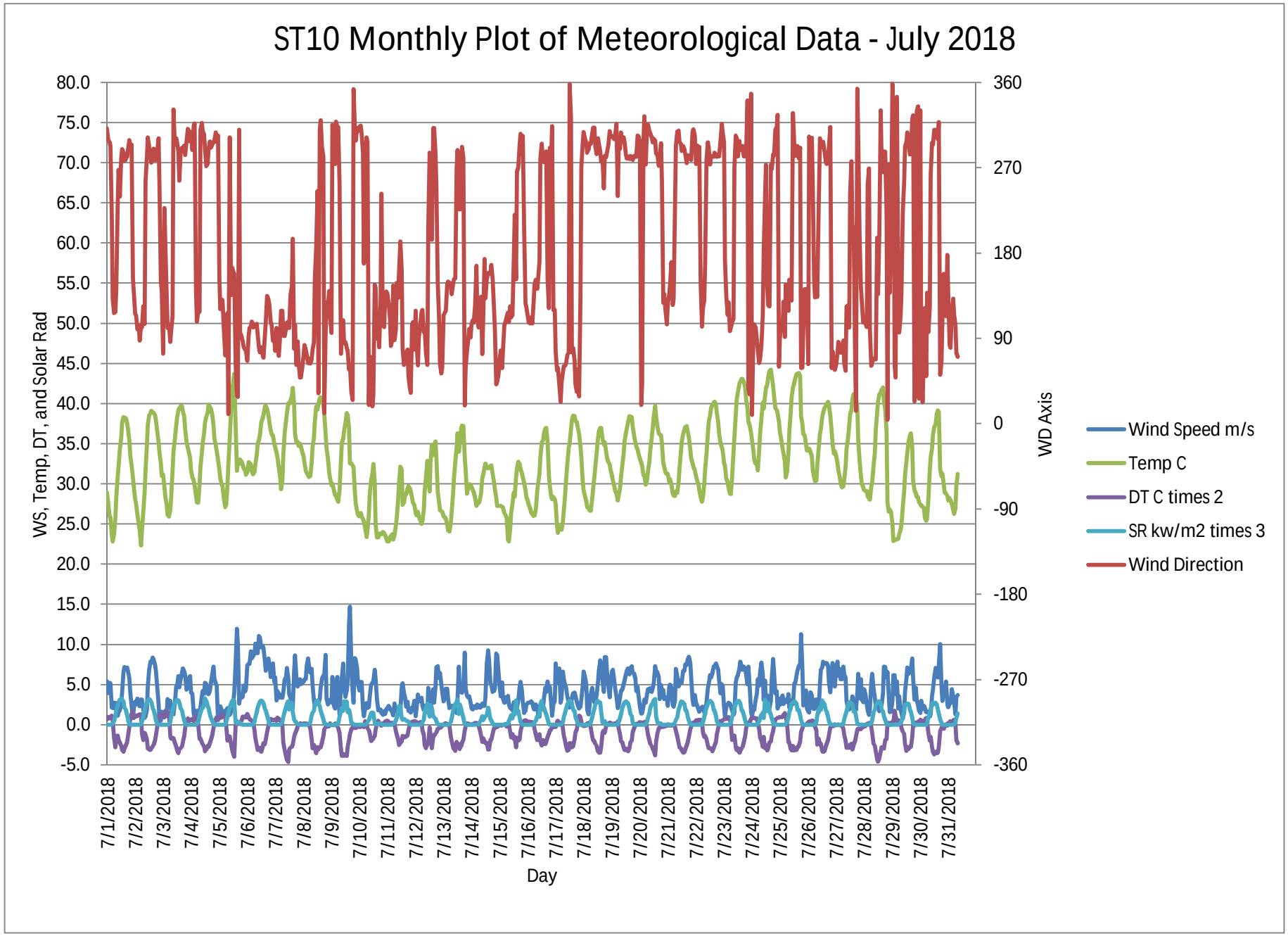
AZMET and ST10 Reported Precipitation Totals

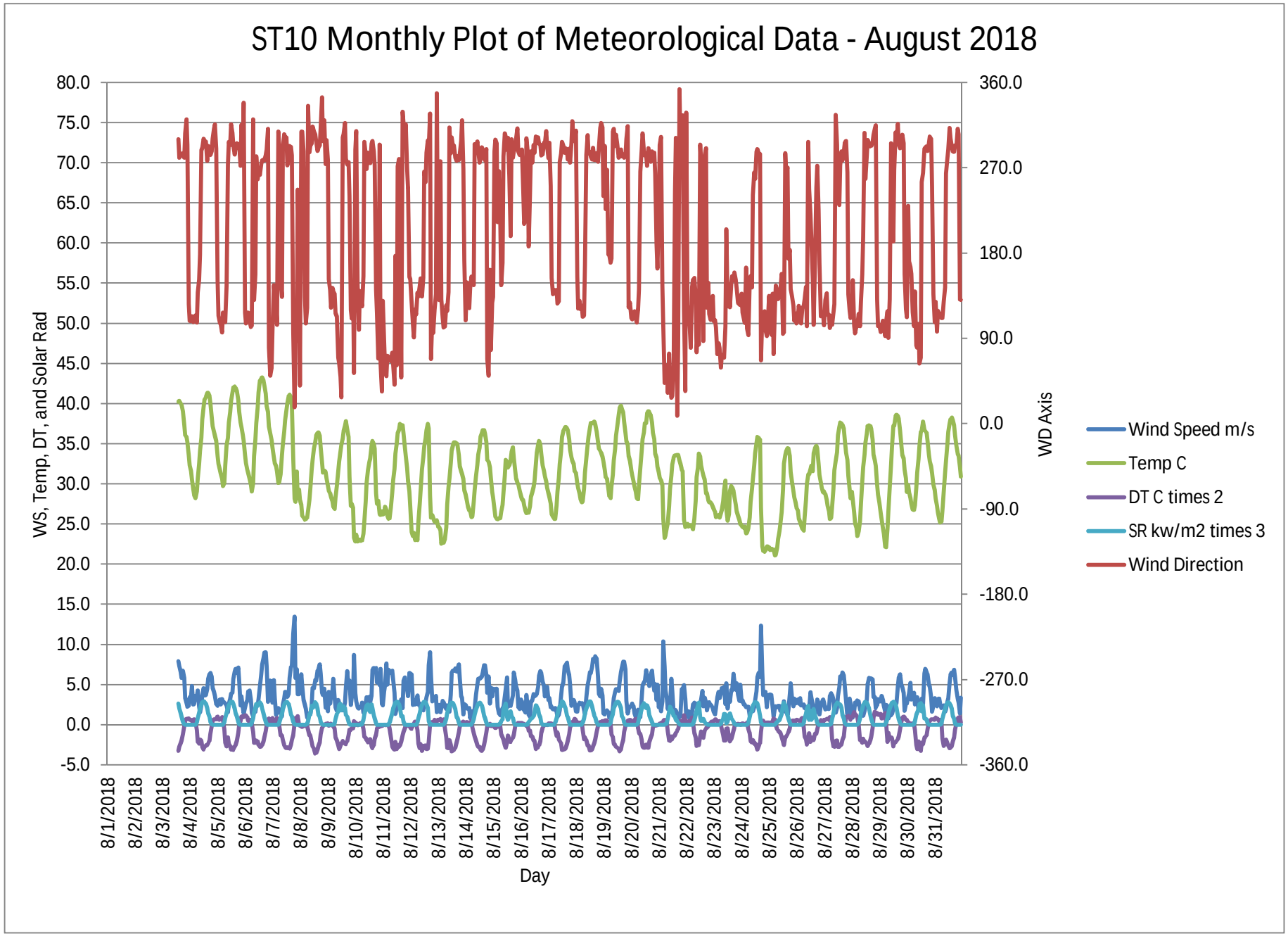
(inches/month)

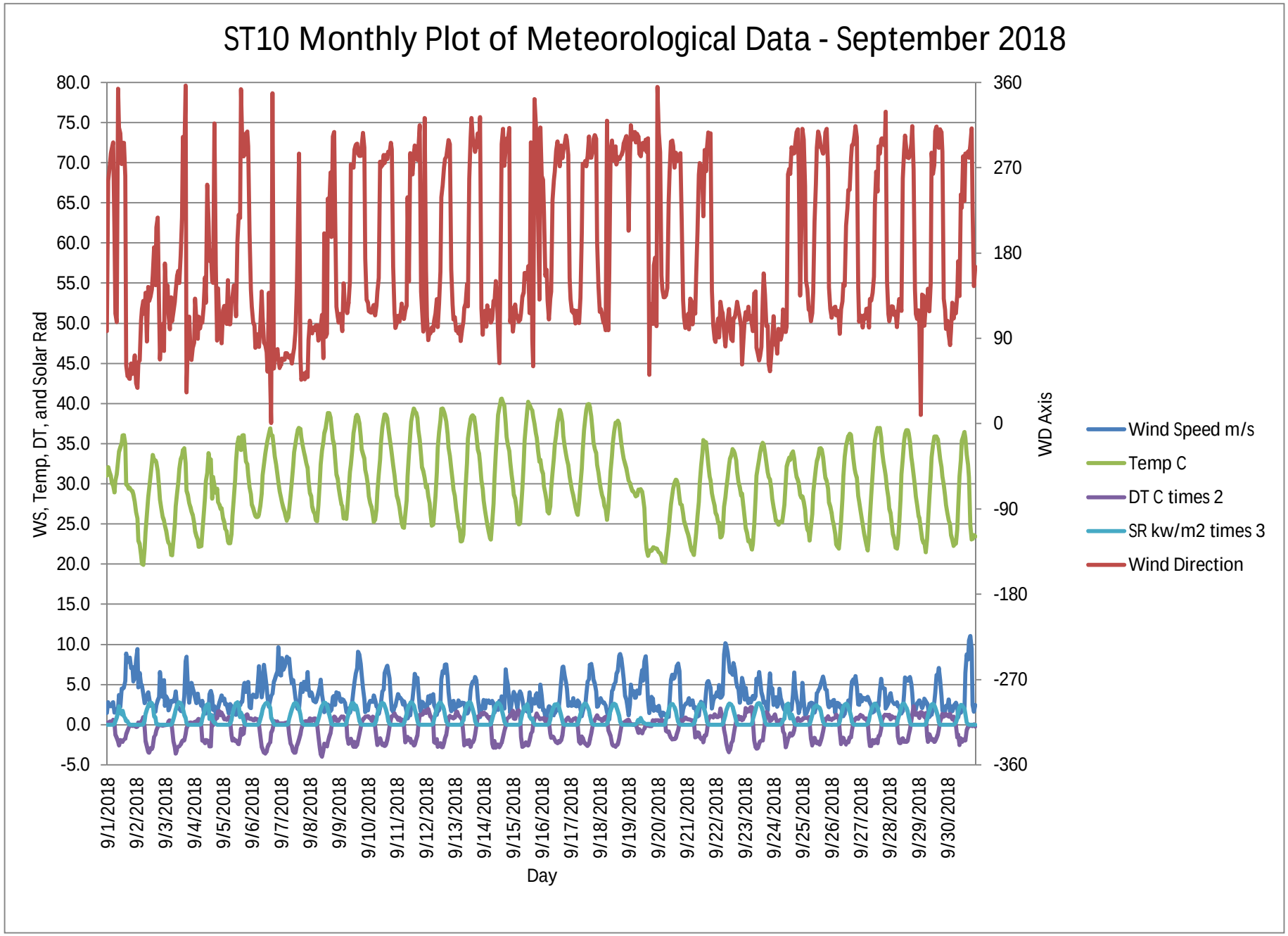
Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Jan-18	0.13	0.08	0.10	0.36
Feb-18	0.16	1.59	0.87	1.55
Mar-18	0.00	0.02	0.01	0.11
Apr-18	0.00	0.00	0.00	0.00
May-18	0.01	0.00	0.00	0.01
Jun-18	0.05	0.57	0.31	0.67
Jul-18	0.42	0.50	0.46	1.58
Aug-18	0.72	0.86	0.79	0.94
Sep-18	0.74	2.34	1.54	1.64
Oct-18				
Nov-18				
Dec-18				
Totals	2.23	5.95	4.09	6.86

APPENDIX B

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - July 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
7/1/2018
7/2/2018
7/3/2018
7/4/2018
7/5/2018
7/6/2018
7/7/2018
7/8/2018
7/9/2018
7/10/2018
7/11/2018
7/12/2018
7/13/2018
7/14/2018
7/15/2018
7/16/2018
7/17/2018
7/18/2018
7/19/2018
7/20/2018
7/21/2018
7/22/2018
7/23/2018
7/24/2018
7/25/2018
7/26/2018
7/27/2018
7/28/2018
7/29/2018
7/30/2018
7/31/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - August 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360.0
270.0
180.0
90.0
0.0
-90.0
-180.0
-270.0
-360.0
8/1/2018
8/2/2018
8/3/2018
8/4/2018
8/5/2018
8/6/2018
8/7/2018
8/8/2018
8/9/2018
8/10/2018
8/11/2018
8/12/2018
8/13/2018
8/14/2018
8/15/2018
8/16/2018
8/17/2018
8/18/2018
8/19/2018
8/20/2018
8/21/2018
8/22/2018
8/23/2018
8/24/2018
8/25/2018
8/26/2018
8/27/2018
8/28/2018
8/29/2018
8/30/2018
8/31/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - September 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
360
270
180
90
0
-90
-180
-270
-360
9/1/2018
9/2/2018
9/3/2018
9/4/2018
9/5/2018
9/6/2018
9/7/2018
9/8/2018
9/9/2018
9/10/2018
9/11/2018
9/12/2018
9/13/2018
9/14/2018
9/15/2018
9/16/2018
9/17/2018
9/18/2018
9/19/2018
9/20/2018
9/21/2018
9/22/2018
9/23/2018
9/24/2018
9/25/2018
9/26/2018
9/27/2018
9/28/2018
9/29/2018
9/30/2018
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
JULY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	5.4	3.9	5.2	5.1	2.1	2.1	2.8	2.7	1.5	1.1	1.5	1.8	2.7	4.1	6.6	7.2	7.0	7.1	6.6	5.8	4.1	2.3	0.8	2.0	3.8
2	2.9	2.5	3.2	2.8	2.3	3.2	3.1	1.9	0.8	1.0	1.8	4.8	6.9	7.8	7.7	8.3	8.1	7.4	6.7	4.6	2.6	0.5	0.5	1.6	3.9
3	1.5	0.9	1.0	1.5	3.2	2.5	3.0	1.8	1.4	1.3	2.6	4.7	4.8	6.1	4.6	5.6	6.5	7.0	6.6	6.1	4.4	4.6	5.7	6.1	3.9
4	4.0	3.9	1.4	1.0	1.7	1.5	1.7	1.6	2.1	3.5	4.2	3.9	5.2	5.0	3.9	3.8	4.3	5.1	6.2	7.2	5.6	5.2	4.9	0.6	3.6
5	2.0	2.3	1.8	1.1	1.6	0.9	1.9	2.1	1.1	1.2	1.6	2.5	3.0	4.0	7.6	11.9	10.1	2.6	3.5	3.4	3.5	4.9	4.2	4.5	3.5
6	7.4	7.6	7.6	9.2	8.2	8.5	8.8	10.1	9.9	8.9	11.0	10.9	9.7	9.8	9.5	8.0	6.7	7.9	8.2	7.6	5.9	6.1	7.6	5.3	8.4
7	5.9	3.0	4.2	3.9	3.4	3.4	3.3	4.0	5.6	5.9	7.1	5.8	3.9	3.3	1.9	2.2	6.6	8.6	5.9	4.7	5.1	5.7	5.0	5.4	4.8
8	5.3	5.7	5.7	7.3	8.2	7.3	6.5	6.9	4.9	3.0	2.3	2.6	2.8	2.7	3.2	4.6	5.7	6.1	6.3	8.7	3.3	2.5	3.1	2.8	4.9
9	2.8	5.9	2.5	2.0	4.7	6.0	3.6	1.3	5.0	5.8	7.6	4.5	3.5	4.3	5.4	12.6	14.7	7.8	4.2	2.7	8.3	8.0	7.0	5.0	5.6
10	4.2	5.3	5.3	2.0	1.1	2.0	2.7	2.0	2.2	3.5	5.0	5.3	5.4	6.8	5.7	3.2	1.8	1.8	1.9	1.5	1.2	1.7	1.3	1.9	3.1
11	2.0	2.3	1.9	1.8	1.6	1.2	2.6	1.7	1.9	1.6	2.1	1.8	4.7	5.1	4.0	3.5	2.2	2.8	1.7	2.0	1.5	2.1	2.1	3.0	2.4
12	1.0	2.0	3.8	2.9	3.1	3.3	2.4	1.8	2.2	2.4	1.5	4.6	1.3	1.4	3.8	4.4	2.7	4.6	7.2	7.3	5.8	6.4	5.0	4.0	3.6
13	2.9	3.4	4.5	4.5	3.2	2.1	2.3	2.2	2.4	2.4	2.4	1.4	3.2	7.2	4.1	4.8	4.0	4.8	9.0	4.6	3.6	3.4	3.5	2.8	3.7
14	2.0	1.9	2.3	2.3	2.1	2.5	2.4	2.1	2.2	2.6	2.4	2.4	3.5	7.6	9.2	8.0	5.2	5.0	4.1	4.2	4.6	8.9	8.7	6.6	4.3
15	4.4	3.5	5.3	3.2	2.7	2.9	3.5	3.6	2.6	2.1	2.2	1.8	2.8	2.8	2.2	2.1	3.1	4.8	5.3	4.3	2.8	1.5	1.8	2.5	3.1
16	2.7	2.8	2.8	2.9	2.7	2.0	1.9	2.5	2.2	1.3	1.0	2.3	2.7	2.2	3.3	4.6	4.1	5.3	4.3	4.7	2.6	1.1	2.6	3.0	2.8
17	7.6	6.0	5.2	7.0	2.7	3.2	6.6	5.7	4.9	4.6	3.5	2.9	2.1	2.4	3.3	3.9	4.0	3.5	2.8	2.4	2.0	2.2	3.2	4.7	4.0
18	6.6	5.9	5.1	1.9	1.3	2.2	3.8	4.6	3.7	2.8	2.8	3.7	5.3	6.8	8.0	7.4	5.5	4.1	8.4	8.4	6.6	4.8	3.4	4.9	4.9
19	6.7	6.8	5.5	4.6	3.5	2.0	2.5	3.4	4.2	4.4	5.0	5.5	6.2	6.7	7.0	6.3	6.9	7.3	6.5	6.4	5.8	4.2	4.7	3.6	5.2
20	2.3	1.4	1.4	2.3	3.1	2.7	3.8	4.4	4.2	4.6	4.1	4.7	5.3	7.3	6.7	6.5	5.9	3.2	4.9	4.2	4.3	3.2	3.4	3.2	4.0
21	2.4	4.6	5.0	4.6	2.5	2.2	2.9	6.9	6.1	4.8	5.1	5.5	5.3	6.7	6.8	7.5	7.4	8.1	8.4	7.7	5.9	3.1	2.4	3.7	5.2
22	2.7	2.4	1.9	1.6	2.0	2.2	2.2	1.5	1.3	2.8	4.5	5.1	6.2	5.9	6.4	7.2	7.2	7.6	7.3	6.8	5.5	3.9	5.0	4.8	4.3
23	2.2	1.0	2.3	2.5	2.8	2.7	2.3	1.8	1.2	1.5	5.3	5.8	6.2	6.9	7.8	7.2	6.8	7.2	7.0	6.2	5.0	7.2	4.7	1.6	4.4
24	1.0	1.9	1.8	3.0	3.9	5.7	4.8	6.5	7.7	6.3	3.0	5.5	2.9	3.7	2.2	2.1	2.9	5.8	8.2	6.5	3.9	4.2	2.0	3.2	4.1
25	2.5	3.1	3.7	2.6	3.0	3.1	2.8	3.8	2.1	2.5	3.0	2.6	5.1	5.2	6.1	6.7	7.3	7.4	11.3	7.0	2.4	3.6	4.3	2.1	4.3
26	1.7	1.5	4.0	3.6	2.1	2.0	3.1	3.1	3.1	1.5	5.1	6.8	7.1	7.9	7.6	7.7	7.7	7.3	5.3	4.0	6.2	7.7	5.8	4.8	4.9
27	7.0	7.8	6.1	6.9	5.7	5.7	7.2	6.2	5.8	3.0	2.1	1.9	2.6	2.6	3.5	2.3	2.9	1.8	4.0	6.3	3.3	5.7	3.1	2.8	4.4
28	4.4	3.8	2.5	1.8	1.2	2.0	5.3	6.3	4.6	3.3	2.2	2.3	2.4	1.7	2.4	2.5	3.9	7.2	7.2	5.9	6.6	3.5	1.6	1.6	3.6
29	2.9	6.1	6.2	3.8	5.4	2.0	3.5	2.0	1.4	0.8	1.5	4.1	5.6	7.1	6.3	6.5	7.0	8.2	5.7	3.1	4.6	3.1	2.4	1.7	4.2
30	1.5	3.0	1.9	2.3	2.1	1.6	1.6	1.6	1.0	1.3	3.6	4.3	5.9	7.1	6.9	5.9	7.5	10.0	4.8	3.0	4.3	4.0	5.4	2.5	3.9
31	2.2	2.6	2.7	4.4	3.5	2.8	1.3	3.5	3.7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	3.0
HRAVE	3.5	3.7	3.7	3.4	3.1	3.0	3.4	3.5	3.3	3.1	3.6	4.1	4.5	5.3	5.5	5.8	5.9	5.9	6.0	5.2	4.4	4.2	3.8	3.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.8	3.9	3.9	3.6	3.5	8.4	4.8	4.9	5.6	3.1	2.4	3.6	3.7	4.3	3.1	2.8	4.0	4.9	5.2	4.0	5.2	4.3	4.4	4.1	4.3
MAX	7.2	8.3	7.0	7.2	11.9	11.0	8.6	8.7	14.7	6.8	5.1	7.3	9.0	9.2	5.3	5.3	7.6	8.4	7.3	7.3	8.4	7.6	7.8	8.2	11.3
MIN	0.8	0.5	0.9	0.6	0.9	5.3	1.9	2.3	1.3	1.1	1.2	1.0	1.4	1.9	1.5	1.0	2.0	1.3	2.0	1.4	2.2	1.3	1.0	1.0	2.1

DAY	26	27	28	29	30	31
AVE	4.9	4.4	3.6	4.2	3.9	3.0
MAX	7.9	7.8	7.2	8.2	10.0	4.4
MIN	1.5	1.8	1.2	0.8	1.0	1.3

MONTHLY AVERAGE = 4.2 MONTHLY MAXIMUM = 14.7 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JULY - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	311	300	297	293	219	133	116	118	142	228	268	240	281	289	286	277	278	281	289	299	294	294	154	138	70
2	116	114	100	104	88	103	102	124	105	256	280	302	292	282	275	282	290	278	278	287	301	249	150	140	118
3	74	227	189	135	101	105	86	98	113	332	295	301	297	287	257	286	291	288	294	284	298	311	309	298	75
4	308	289	314	317	142	108	118	118	310	317	309	305	290	272	274	290	298	291	294	296	299	307	298	304	264
5	153	121	131	130	99	72	97	117	10	302	136	165	160	158	64	30	28	310	96	92	86	81	78	77	345
6	66	93	101	103	108	102	105	104	105	95	80	75	81	73	70	92	107	135	131	126	107	104	87	89	146
7	77	101	83	71	94	119	119	93	92	100	107	107	101	136	145	195	79	104	62	87	64	49	49	58	159
8	72	83	78	73	64	69	63	68	78	86	152	185	246	32	310	320	291	283	11	97	128	124	140	112	290
9	96	315	309	274	319	312	313	251	74	94	109	85	86	79	77	57	62	34	25	353	311	299	312	309	99
10	313	314	306	285	169	280	302	297	19	71	55	18	31	147	143	90	94	81	127	242	105	102	131	140	171
11	138	127	111	82	88	146	88	99	148	133	160	192	162	79	62	68	74	78	50	38	32	104	107	78	125
12	119	85	61	91	103	117	120	97	100	74	62	208	286	255	194	311	312	286	251	149	110	63	53	59	41
13	114	117	119	147	150	149	147	137	147	152	153	270	289	244	226	269	292	280	19	59	76	85	100	91	89
14	105	109	107	125	167	112	101	124	134	73	110	174	132	152	159	158	160	167	153	122	99	41	45	52	339
15	70	77	59	78	104	108	112	117	107	124	112	114	174	220	152	266	271	295	306	304	304	203	126	122	282
16	114	107	106	112	106	128	147	152	143	153	171	280	295	276	276	279	287	153	122	291	281	314	120	120	200
17	76	56	59	41	23	43	54	60	61	64	72	75	358	324	75	80	66	41	33	57	29	131	271	295	73
18	308	301	296	286	289	295	295	306	312	312	292	285	301	295	287	276	280	248	282	281	286	294	309	303	122
19	303	303	300	303	316	240	293	290	307	298	302	297	284	279	281	279	283	280	278	282	281	282	304	303	265
20	297	20	41	298	324	273	313	316	309	306	303	297	300	299	285	284	272	280	296	256	128	137	119	105	318
21	126	136	146	170	125	132	228	293	308	309	297	296	288	293	289	284	275	283	283	280	278	307	310	304	205
22	274	293	292	292	148	102	121	130	169	278	297	291	273	282	282	282	286	282	281	284	282	298	316	307	2
23	297	173	134	115	128	98	101	107	111	271	304	302	282	298	289	289	293	282	282	286	341	37	31	348	238
24	9	87	105	102	89	77	64	68	83	115	181	238	273	146	125	124	273	269	284	283	309	312	326	60	196
25	90	105	102	129	92	147	132	119	152	143	130	328	294	282	284	293	280	291	59	59	99	142	124	142	11
26	63	303	295	302	254	152	133	137	134	223	301	292	295	297	288	276	274	278	292	313	59	76	64	57	228
27	63	74	86	77	75	81	88	63	56	124	125	102	243	277	210	204	74	13	353	304	199	144	129	107	151
28	108	106	102	252	269	99	61	65	69	68	68	196	137	202	330	276	265	287	287	220	4	273	138	215	141
29	359	332	60	49	345	140	96	112	136	223	255	292	297	307	294	284	286	321	325	24	49	329	335	26	82
30	330	71	22	79	122	50	138	97	123	263	296	294	310	309	309	300	318	51	65	108	158	116	113	178	282
31	135	83	80	118	132	115	104	75	71	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	331

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JULY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	8	10	5	5	22	9	8	14	26	55	48	59	42	36	16	18	16	13	14	9	5	30	23	7	21
2	6	8	8	12	10	8	7	18	48	33	38	21	20	20	22	18	15	14	12	8	7	31	31	11	18
3	47	29	26	19	9	9	9	14	26	61	31	25	26	24	32	29	21	16	14	9	6	7	10	8	21
4	9	7	45	49	16	9	15	23	26	22	23	31	23	17	28	32	27	17	11	9	8	5	6	53	21
5	9	7	12	36	19	26	11	13	31	47	58	49	43	34	36	20	18	58	20	20	13	21	13	19	26
6	6	10	9	10	8	10	10	11	13	16	15	15	17	15	14	16	16	13	12	8	8	8	8	13	12
7	9	24	11	18	29	13	10	12	16	16	15	20	37	36	51	49	29	29	19	16	13	16	19	15	22
8	15	10	13	9	12	10	12	14	15	49	46	41	50	33	28	41	19	15	28	13	16	11	11	11	22
9	31	12	18	35	19	9	9	36	19	19	15	24	35	28	20	20	13	19	20	25	11	7	9	7	19
10	9	9	9	38	20	14	9	11	26	21	21	20	23	21	15	14	16	23	20	9	21	14	16	11	17
11	12	11	14	13	25	24	8	18	17	36	36	51	33	32	13	9	13	9	19	19	19	16	10	10	19
12	39	14	16	15	11	9	13	21	20	32	64	34	59	41	21	28	29	15	34	12	20	11	13	13	24
13	22	14	13	8	11	13	12	15	20	23	31	64	37	18	21	19	31	15	22	52	16	20	14	13	22
14	17	14	11	11	11	9	11	13	17	16	38	21	20	13	11	12	12	11	11	11	12	12	9	10	14
15	12	18	9	17	14	20	15	14	14	15	19	24	21	20	43	45	30	14	11	9	8	16	8	8	18
16	13	11	10	11	11	9	14	13	18	25	40	31	32	40	28	21	22	33	11	30	15	39	12	12	21
17	12	16	17	11	25	21	12	13	12	12	22	32	59	56	48	39	36	29	33	17	19	39	31	24	26
18	9	9	9	8	16	5	8	14	17	24	30	28	20	17	13	17	14	19	8	9	6	7	11	7	14
19	8	8	8	8	11	24	16	15	15	24	22	19	24	18	18	17	18	11	9	9	8	12	10	9	14
20	10	30	32	19	13	20	10	16	19	18	20	22	26	18	17	9	8	11	10	27	14	18	11	11	17
21	15	11	11	19	33	34	26	11	13	20	17	20	21	16	18	15	14	11	10	8	8	9	9	8	16
22	8	12	10	25	11	10	8	21	41	28	21	26	20	19	21	15	14	12	11	9	7	7	10	9	16
23	25	37	12	11	9	11	12	12	37	46	16	18	17	15	13	14	12	12	11	8	17	14	35	24	18
24	45	50	15	12	19	11	21	8	11	24	48	17	44	27	59	47	37	14	9	8	8	9	30	34	25
25	25	20	12	15	13	21	12	14	41	33	33	56	21	23	17	21	19	27	14	15	26	13	12	18	22
26	26	44	14	10	34	13	11	13	16	51	22	16	20	15	17	15	14	13	17	20	16	11	12	11	19
27	10	9	11	11	10	11	11	9	13	30	34	62	42	41	30	59	33	50	26	19	24	15	26	13	25
28	10	14	11	28	38	12	16	10	15	26	46	50	37	56	53	49	33	15	11	29	23	40	25	28	28
29	33	24	25	23	31	47	11	22	25	38	23	16	13	13	13	13	13	20	41	27	14	22	25	23	23
30	48	19	31	25	65	35	19	23	45	41	22	23	18	17	16	19	23	19	34	52	28	16	13	35	29
31	42	12	17	11	13	18	24	12	12	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	18
HRAVE	19	17	15	17	19	16	13	15	22	30	30	31	30	26	25	25	21	19	17	17	14	17	16	16	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	21	18	21	21	26	12	22	22	19	17	19	24	22	14	18	21	26	14	14	17	16	16	18	25	22
MAX	59	48	61	53	58	17	51	50	36	38	51	64	64	38	45	40	59	30	24	32	34	41	46	59	56
MIN	5	6	6	5	7	6	9	9	7	9	8	9	8	9	8	9	11	5	8	8	8	7	8	8	12

DAY	26	27	28	29	30	31
AVE	19	25	28	23	29	18
MAX	51	62	56	47	65	42
MIN	10	9	10	11	13	11

MONTHLY AVERAGE = 20.2 MONTHLY MAXIMUM = 64.6 MONTHLY MINIMUM = 4.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JULY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	29.0	27.7	26.1	25.7	23.6	22.8	23.6	25.9	28.4	30.8	32.1	34.3	35.8	37.6	38.3	38.2	38.2	37.6	36.9	35.4	33.6	32.3	30.8	29.6	31.4
2	28.0	27.5	26.1	25.0	24.2	22.3	24.1	26.5	29.0	31.7	34.8	37.4	38.5	38.8	39.1	38.9	38.9	38.6	37.9	36.5	35.2	33.8	32.5	31.0	32.3
3	31.1	29.5	28.4	27.4	26.1	25.9	26.7	28.4	31.6	34.0	35.5	37.2	38.2	39.1	39.5	39.7	39.6	39.0	38.3	36.8	35.3	34.5	34.0	33.2	33.7
4	31.7	30.9	30.4	29.8	28.5	27.7	27.6	29.9	32.1	33.8	35.2	36.2	37.6	38.3	38.8	39.9	39.6	39.4	38.7	37.2	35.6	34.8	34.1	33.0	34.2
5	31.8	30.7	29.9	29.7	28.1	27.1	27.3	29.8	32.5	35.6	39.2	41.4	42.8	43.7	37.5	31.6	32.8	32.5	33.0	32.8	32.4	31.9	31.7	31.1	33.2
6	31.4	32.7	32.6	32.4	31.6	31.2	31.5	32.5	33.6	34.9	35.5	36.0	37.6	38.1	38.6	39.6	39.7	39.3	38.5	37.7	36.7	36.2	36.0	35.0	35.4
7	34.5	33.9	33.3	32.0	30.8	29.3	30.4	33.6	36.3	37.8	38.7	40.0	40.0	40.3	41.0	41.9	39.9	36.2	35.2	35.2	34.7	35.0	34.6	34.0	35.8
8	33.4	32.6	31.6	31.4	31.1	30.9	31.0	32.6	34.6	35.7	37.7	39.6	39.3	39.9	40.7	40.8	40.5	39.8	38.7	36.2	34.4	33.2	31.4	30.7	35.3
9	29.8	30.0	29.3	28.6	28.7	28.0	27.8	29.3	32.8	35.1	35.6	36.7	37.6	38.8	38.6	36.8	32.5	32.6	32.3	32.0	29.0	27.5	26.6	26.2	31.8
10	26.0	26.4	26.0	25.6	25.3	24.5	23.4	24.2	26.2	28.6	30.5	31.3	32.5	30.3	25.0	23.3	23.3	23.7	23.9	23.7	24.0	23.9	23.7	23.2	25.8
11	22.9	22.9	23.3	23.5	23.7	23.1	23.6	24.8	25.8	28.0	30.2	32.1	31.7	27.4	27.6	28.4	28.7	29.4	29.7	29.4	29.0	28.3	27.6	27.4	27.0
12	26.4	26.1	26.5	26.0	25.5	25.0	25.4	26.7	29.1	30.9	32.9	31.1	29.0	32.7	34.8	33.6	34.7	35.3	33.3	29.0	27.7	26.7	26.6	26.5	29.2
13	26.0	25.8	25.7	24.9	24.2	24.1	25.0	26.6	28.7	30.6	32.8	34.5	36.3	34.0	35.0	36.8	37.3	37.2	33.3	31.7	28.8	29.3	29.9	29.9	30.3
14	29.6	29.2	28.9	28.3	27.3	27.7	27.6	27.9	28.7	30.8	31.1	32.0	32.5	32.1	31.9	32.1	32.1	32.3	31.2	30.2	29.4	28.3	27.3	27.2	29.8
15	27.2	27.3	27.2	27.0	26.4	26.1	25.8	23.0	22.9	24.4	26.4	27.5	28.9	28.5	30.8	32.0	32.7	32.5	31.9	31.3	30.8	30.1	29.2	28.3	28.2
16	27.9	27.5	27.0	26.4	26.2	25.9	26.0	26.9	29.1	30.0	31.2	33.3	35.0	35.4	36.3	36.8	37.0	35.3	31.0	29.7	28.4	28.1	28.4	28.1	30.3
17	27.5	24.7	23.9	24.6	24.3	24.3	25.3	26.6	28.6	30.3	32.7	34.4	35.0	36.8	37.9	38.5	38.4	37.8	37.7	37.0	36.2	34.7	33.3	30.4	31.7
18	29.2	28.5	27.8	27.1	27.1	26.7	26.6	28.1	29.4	30.8	32.1	33.9	35.7	36.5	37.0	37.0	35.6	34.9	35.2	34.0	33.3	32.7	32.4	31.7	31.8
19	31.0	30.4	29.8	29.1	28.8	27.9	28.6	29.5	30.8	32.3	33.8	35.3	36.3	36.9	37.8	38.4	38.3	38.3	37.2	36.1	35.2	34.7	34.2	33.7	33.5
20	33.1	32.6	32.2	31.1	31.0	29.9	30.5	31.5	32.7	34.1	35.6	37.2	38.5	39.7	38.4	37.1	36.3	36.1	36.0	35.1	32.6	32.1	31.4	31.2	34.0
21	31.2	30.3	30.6	29.9	28.9	28.6	28.5	29.0	28.9	30.2	31.9	33.8	35.2	36.2	36.7	37.1	37.2	36.7	35.7	34.3	33.1	32.6	32.2	31.7	32.5
22	30.9	30.4	29.9	29.2	28.3	27.7	28.3	30.0	31.9	33.7	36.2	37.7	38.5	39.4	39.9	40.1	40.2	39.8	38.8	37.6	36.3	35.1	34.5	34.1	34.5
23	32.6	32.3	30.6	30.2	29.5	28.8	28.7	30.9	34.0	35.8	38.6	40.4	41.5	42.4	42.6	43.1	43.1	42.8	42.0	40.5	39.4	37.8	37.3	36.3	36.7
24	35.4	34.2	33.0	32.5	32.4	31.7	34.2	36.2	38.1	40.1	39.3	41.0	41.9	42.4	43.3	44.0	44.2	43.4	42.2	40.9	39.5	39.2	38.7	37.7	38.6
25	36.4	35.5	34.4	33.8	32.8	30.8	31.5	33.9	36.4	38.9	40.8	42.0	42.5	43.1	43.6	43.7	43.8	43.4	38.4	37.5	36.2	36.1	34.9	34.1	37.7
26	34.2	34.4	33.9	33.4	31.8	30.8	30.3	30.4	32.2	34.3	36.2	36.8	38.3	38.8	39.4	39.7	40.0	40.2	39.8	38.5	36.5	35.0	33.8	34.0	35.5
27	33.5	32.5	31.6	30.9	30.0	29.5	29.7	30.6	32.1	34.3	35.5	37.2	38.7	39.2	40.5	41.2	40.5	40.7	39.5	35.4	32.9	31.0	30.0	29.6	34.4
28	29.2	29.1	29.1	28.4	28.1	28.0	29.6	30.1	32.2	33.9	36.7	38.8	40.3	41.2	41.4	41.8	42.0	40.3	39.3	36.5	27.7	26.5	26.8	26.4	33.5
29	25.1	22.9	23.0	23.0	23.1	23.2	23.7	24.3	24.9	27.1	29.0	31.0	32.7	33.9	35.3	36.0	36.3	34.5	30.4	29.2	28.8	28.4	28.3	27.7	28.4
30	27.4	27.3	27.1	27.0	25.8	25.4	25.7	28.2	31.7	33.3	34.4	36.0	37.2	37.4	38.5	39.2	39.0	31.9	30.9	31.3	30.0	29.0	28.8	28.5	31.3
31	27.9	28.2	28.0	27.5	26.7	26.2	27.0	29.8	31.3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	28.1
HRAVE	30.0	29.5	28.9	28.4	27.7	27.1	27.6	29.0	30.9	32.7	34.4	35.9	36.9	37.3	37.5	37.6	37.4	36.7	35.6	34.3	32.8	31.9	31.4	30.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	31.4	32.3	33.7	34.2	33.2	35.4	35.8	35.3	31.8	25.8	27.0	29.2	30.3	29.8	28.2	30.3	31.7	31.8	33.5	34.0	32.5	34.5	36.7	38.6	37.7
MAX	38.3	39.1	39.7	39.9	43.7	39.7	41.9	40.8	38.8	32.5	32.1	35.3	37.3	32.5	32.7	37.0	38.5	37.0	38.4	39.7	37.2	40.2	43.1	44.2	43.8
MIN	22.8	22.3	25.9	27.6	27.1	31.2	29.3	30.7	26.2	23.2	22.9	25.0	24.1	27.2	22.9	25.9	23.9	26.6	27.9	29.9	28.5	27.7	28.7	31.7	30.8

DAY	26	27	28	29	30	31
AVE	35.5	34.4	33.5	28.4	31.3	28.1
MAX	40.2	41.2	42.0	36.3	39.2	31.3
MIN	30.3	29.5	26.4	22.9	25.4	26.2

MONTHLY AVERAGE = 32.5 MONTHLY MAXIMUM = 44.2 MONTHLY MINIMUM = 22.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JULY - 2018

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.3	0.5	0.4	0.5	0.6	0.3	-0.8	-1.4	-0.8	-0.7	-0.9	-1.1	-1.3	-1.6	-1.7	-1.5	-1.3	-1.1	-0.7	-0.2	0.4	0.6	0.8	0.4	-0.4
2	0.5	0.5	0.6	0.6	0.6	0.6	-0.6	-1.0	-0.5	-0.6	-0.9	-1.5	-1.5	-1.6	-1.4	-1.4	-1.3	-1.0	-0.7	-0.1	0.5	0.6	0.5	0.6	-0.4
3	0.5	0.5	0.9	0.7	0.5	0.7	-0.8	-0.9	-0.8	-0.8	-1.1	-1.4	-1.6	-1.8	-1.5	-1.5	-1.3	-1.1	-0.7	-0.2	0.3	0.4	0.2	0.2	-0.4
4	0.3	0.4	0.2	0.3	0.4	0.6	0.0	-0.9	-0.9	-1.1	-1.2	-1.3	-1.6	-1.6	-1.3	-1.4	-1.1	-0.9	-0.7	-0.2	0.1	0.3	0.5	0.4	-0.5
5	0.4	0.5	0.4	0.6	0.6	0.5	0.0	-1.0	-0.7	-0.7	-1.2	-1.6	-1.8	-2.0	-0.1	0.2	0.1	0.1	0.1	0.2	0.5	0.5	0.5	0.4	-0.1
6	0.6	0.5	0.4	0.3	0.2	0.2	-0.3	-0.9	-1.3	-1.6	-1.6	-1.5	-1.7	-1.4	-1.1	-1.2	-0.9	-0.5	-0.1	0.2	0.4	0.3	0.3	0.3	-0.4
7	0.3	0.2	0.4	0.4	0.3	0.3	-0.1	-1.1	-1.6	-2.0	-2.2	-2.3	-1.6	-1.4	-1.4	-1.2	-0.8	-0.6	-0.4	-0.1	-0.1	0.1	0.1	0.0	-0.6
8	0.1	0.1	0.0	0.1	0.0	0.0	-0.2	-0.9	-1.5	-1.3	-1.4	-1.8	-1.4	-1.6	-1.4	-1.4	-1.1	-0.7	-0.3	-0.1	-0.1	-0.1	-0.1	0.1	-0.6
9	0.0	0.0	0.0	0.1	0.0	-0.1	-0.2	-0.6	-1.5	-1.9	-1.8	-1.9	-1.9	-1.9	-1.4	-0.9	-0.6	-0.3	-0.2	0.0	-0.2	-0.2	-0.2	-0.1	-0.7
10	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	0.0	-0.2	-0.3	-0.5	-1.0	-0.9	-0.9	-0.8	-0.3	0.1	0.2	0.2	0.0	-0.1	0.1	0.1	0.2	0.2	-0.2
11	0.2	0.2	0.1	0.1	0.1	0.1	0.1	-0.4	-0.6	-0.9	-1.3	-1.1	-1.0	-0.7	-0.8	-0.8	-0.7	-0.7	-0.3	0.0	0.1	0.2	0.2	0.2	-0.3
12	0.2	0.1	0.1	0.1	0.2	0.2	-0.3	-0.6	-1.3	-1.5	-1.3	-1.2	-0.2	-0.6	-1.5	-0.8	-0.7	-0.6	-0.5	-0.2	-0.2	-0.2	-0.1	-0.1	-0.5
13	0.0	0.1	0.1	0.0	0.0	-0.1	-0.7	-1.0	-1.4	-1.5	-1.6	-1.1	-1.4	-1.2	-1.5	-1.3	-1.1	-0.9	-0.4	-0.1	0.1	0.1	0.0	0.0	-0.6
14	0.0	0.0	0.0	0.1	0.1	0.1	-0.1	-0.3	-0.6	-1.1	-0.9	-1.0	-1.2	-1.1	-1.6	-1.5	-0.9	-1.0	-0.6	-0.2	-0.2	-0.2	-0.1	-0.1	-0.5
15	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	0.1	0.0	-0.4	-0.8	-0.6	-0.9	-0.8	-1.4	-0.8	-1.0	-0.9	-0.4	-0.1	0.1	0.2	0.3	0.2	-0.3
16	0.2	0.2	0.2	0.1	0.2	0.1	-0.3	-0.6	-1.0	-0.7	-0.6	-1.0	-1.3	-1.0	-1.1	-1.2	-1.1	-0.8	-0.6	-0.4	-0.3	-0.1	-0.1	-0.1	-0.5
17	-0.1	0.1	0.2	0.1	0.1	0.1	-0.2	-0.7	-1.0	-1.4	-1.6	-1.6	-1.1	-1.2	-1.4	-1.3	-0.9	-0.5	-0.3	0.1	0.6	0.5	0.2	-0.1	-0.5
18	-0.1	-0.1	-0.1	0.1	0.1	0.1	-0.2	-0.7	-1.0	-1.0	-1.2	-1.3	-1.7	-1.7	-1.7	-1.4	-0.5	-0.4	-0.5	-0.1	0.0	0.1	0.1	0.1	-0.5
19	0.1	0.1	0.1	0.1	0.1	0.2	-0.3	-0.6	-1.0	-1.1	-1.4	-1.6	-1.5	-1.6	-1.6	-1.4	-1.1	-1.0	-0.5	-0.2	0.0	0.0	0.0	0.1	-0.6
20	0.2	0.1	0.1	0.2	0.1	0.2	-0.3	-0.6	-1.0	-1.2	-1.3	-1.5	-1.6	-1.9	-1.1	-0.5	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1	-0.5
21	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.2	-0.4	-0.7	-1.1	-1.4	-1.5	-1.6	-1.8	-1.7	-1.5	-1.3	-1.1	-0.7	-0.3	-0.1	0.0	0.1	0.1	-0.6
22	0.3	0.3	0.2	0.3	0.3	0.2	-0.5	-0.8	-0.7	-0.9	-1.3	-1.5	-1.5	-1.5	-1.7	-1.4	-1.3	-1.1	-0.6	-0.2	0.1	0.2	0.2	0.3	-0.5
23	0.3	0.4	0.4	0.4	0.5	0.3	0.0	-0.9	-0.8	-0.7	-1.4	-1.6	-1.5	-1.7	-1.7	-1.5	-1.4	-1.1	-0.7	-0.2	0.1	0.1	0.1	0.3	-0.5
24	0.4	0.4	0.4	0.4	0.4	0.1	-0.3	-0.8	-1.0	-1.4	-0.8	-1.5	-1.3	-1.6	-1.5	-1.1	-1.0	-0.7	-0.4	-0.1	0.3	0.4	0.4	0.4	-0.4
25	0.5	0.5	0.5	0.6	0.7	0.6	0.0	-1.1	-1.1	-1.5	-1.6	-1.3	-1.6	-1.5	-1.6	-1.4	-1.3	-1.0	-0.5	-0.2	0.0	0.0	0.0	0.1	-0.5
26	0.1	0.2	0.2	0.2	0.2	0.1	-0.1	-0.3	-1.2	-0.9	-1.2	-1.2	-1.6	-1.7	-1.7	-1.4	-1.2	-1.0	-0.6	-0.2	-0.1	-0.1	-0.1	0.0	-0.6
27	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.6	-1.0	-1.4	-1.4	-1.4	-1.2	-1.2	-1.5	-1.2	-1.0	-0.8	-0.3	-0.2	-0.3	-0.3	-0.2	-0.1	-0.6
28	-0.1	-0.1	0.0	0.1	0.1	0.1	-0.2	-0.5	-1.2	-1.3	-1.7	-2.1	-2.3	-2.1	-1.6	-1.4	-1.5	-1.5	-1.0	-0.9	0.1	0.1	0.0	0.1	-0.8
29	0.2	0.1	0.9	0.6	0.2	0.1	0.3	0.1	-0.2	-0.4	-0.6	-1.2	-1.6	-1.4	-1.5	-1.4	-1.4	-0.8	0.0	-0.1	0.1	0.1	0.2	0.2	-0.3
30	0.3	0.3	0.2	0.1	0.2	0.4	0.2	-0.5	-1.0	-0.8	-1.4	-1.7	-1.9	-1.7	-1.8	-1.7	-1.4	-0.4	-0.3	-0.1	-0.3	-0.1	0.0	-0.1	-0.6
31	0.1	0.2	0.2	0.2	0.2	0.3	0.0	-1.0	-1.2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-0.1
HRAVE	0.2	0.2	0.2	0.2	0.2	0.2	-0.2	-0.7	-0.9	-1.1	-1.3	-1.4	-1.4	-1.5	-1.4	-1.2	-1.0	-0.7	-0.4	-0.2	0.1	0.1	0.1	0.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.4	-0.4	-0.4	-0.5	-0.1	-0.4	-0.6	-0.6	-0.7	-0.2	-0.3	-0.5	-0.6	-0.5	-0.3	-0.5	-0.5	-0.5	-0.6	-0.5	-0.6	-0.5	-0.5	-0.4	-0.5
MAX	0.8	0.6	0.9	0.6	0.6	0.6	0.4	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.3	0.2	0.6	0.1	0.2	0.2	0.1	0.3	0.5	0.4	0.7
MIN	-1.7	-1.6	-1.8	-1.6	-2.0	-1.7	-2.3	-1.8	-1.9	-1.0	-1.3	-1.5	-1.6	-1.6	-1.4	-1.3	-1.6	-1.7	-1.6	-1.9	-1.8	-1.7	-1.7	-1.6	-1.6

DAY	26	27	28	29	30	31
AVE	-0.6	-0.6	-0.8	-0.3	-0.6	-0.1
MAX	0.2	0.0	0.1	0.9	0.4	0.3
MIN	-1.7	-1.5	-2.3	-1.6	-1.9	-1.2

MONTHLY AVERAGE = -0.5 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = -2.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JULY - 2018

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	701	701	701	702	702	702	703	703	703	703	703	703	702	701	701	701	700	700	700	700	700	701	701	701	702
2	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	698	698	699	699	699	700	700	700
3	700	700	700	700	701	701	701	702	702	702	702	701	701	700	700	699	699	699	699	699	699	700	700	701	700
4	701	701	701	702	702	703	703	704	704	704	704	703	703	702	702	701	701	700	700	701	701	701	702	702	702
5	702	702	702	702	703	703	704	704	704	704	703	703	702	702	702	703	703	704	703	703	703	703	704	704	703
6	704	704	704	704	705	705	706	706	706	706	706	705	704	704	703	702	702	701	701	702	702	703	703	703	704
7	703	703	703	703	703	704	704	704	704	704	704	703	702	701	701	700	699	700	700	700	701	701	702	702	702
8	702	702	701	701	702	702	702	703	703	703	702	702	701	701	700	699	698	698	698	699	700	701	701	701	701
9	702	702	703	702	703	703	704	704	704	704	703	703	702	701	701	700	701	701	701	702	703	703	704	704	702
10	704	704	704	704	704	704	705	705	705	705	704	704	703	703	703	703	703	702	702	702	703	703	703	703	703
11	703	703	703	703	703	703	703	703	703	703	703	702	702	702	701	701	701	701	701	701	701	702	702	702	702
12	702	702	702	702	702	703	703	704	704	704	704	703	703	702	701	701	701	701	701	702	703	704	704	704	703
13	704	704	704	704	704	704	704	704	704	704	704	704	703	702	702	701	701	701	701	701	702	703	703	703	703
14	703	703	702	702	702	703	703	703	704	703	704	704	703	703	702	702	701	701	701	702	702	702	703	703	702
15	702	702	702	702	702	702	703	704	704	704	704	704	704	704	703	702	701	701	701	701	702	702	702	702	702
16	702	702	702	702	702	702	703	703	703	703	703	702	702	701	700	700	699	700	700	701	702	702	702	702	702
17	703	703	702	703	703	703	703	704	704	704	703	703	702	702	701	700	700	699	699	700	701	701	702	703	702
18	703	703	703	704	704	704	704	705	704	704	704	703	703	702	701	701	701	701	701	701	701	702	702	702	703
19	702	702	702	702	702	703	703	703	703	703	703	702	702	701	700	700	699	699	699	699	700	700	701	701	701
20	701	701	701	701	701	701	701	702	702	702	702	701	701	700	700	699	699	699	699	699	700	701	701	701	700
21	701	701	701	702	702	702	703	703	704	703	703	703	702	702	701	701	701	701	701	701	702	703	703	703	702
22	703	703	703	703	703	703	703	704	704	703	703	703	702	702	701	701	700	700	700	700	701	702	702	702	702
23	702	701	701	701	701	701	702	702	702	701	701	701	700	700	699	699	699	699	699	699	700	701	701	701	700
24	701	701	701	701	701	702	702	702	702	702	703	703	702	701	701	700	700	700	700	700	701	701	702	702	701
25	702	702	702	702	702	703	703	703	704	703	703	703	702	701	701	700	700	699	700	700	701	702	702	702	702
26	702	702	702	702	702	703	703	703	703	703	703	702	702	701	700	700	699	699	699	700	700	701	701	701	701
27	701	701	701	702	702	702	702	702	703	703	703	702	702	701	700	699	699	698	699	700	700	701	702	701	701
28	701	702	702	702	703	703	703	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	702
29	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
30	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
31	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
HRAVE	702	702	702	702	702	703	703	703	703	703	703	703	702	701	701	700	700	700	700	700	701	702	702	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	702	700	700	702	703	704	702	701	702	703	702	703	703	702	702	702	702	703	701	700	702	702	700	701	702
MAX	703	702	702	704	704	706	704	703	704	705	703	704	704	704	704	703	704	705	703	702	704	704	702	703	704
MIN	700	698	699	700	702	701	699	698	700	702	701	701	701	701	701	699	699	701	699	699	701	700	699	700	699

DAY	26	27	28	29	30	31
AVE	701	701	702	***	***	***
MAX	703	703	703	***	***	***
MIN	699	698	701	***	***	***

MONTHLY AVERAGE = 701.8 MONTHLY MAXIMUM = 706.2 MONTHLY MINIMUM = 698.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 88.0% OPERATIONAL RECOVERY RATE = 88.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JULY - 2018

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	18	19	20	19	22	25	23	20	17	15	13	12	10	8	7	7	7	8	9	11	12	14	14	15	14
2	18	19	18	20	22	22	19	17	16	13	11	10	10	10	11	11	11	11	12	13	14	15	16	17	15
3	18	19	19	21	23	23	20	20	17	15	15	14	13	13	13	13	13	14	15	16	18	19	20	20	17
4	22	23	25	26	26	30	29	25	23	21	19	18	15	14	15	14	15	15	15	17	19	20	21	24	20
5	23	26	27	27	30	34	29	24	22	19	17	16	16	15	30	41	35	38	35	35	36	36	36	38	29
6	36	34	35	36	39	40	40	37	34	32	31	30	27	25	23	20	20	20	20	22	23	24	24	25	29
7	26	27	28	31	32	34	32	28	25	23	22	21	21	20	19	18	21	27	29	28	29	26	27	29	26
8	30	33	37	36	37	38	38	35	31	29	25	22	23	20	20	20	21	23	22	26	33	38	42	45	30
9	48	46	49	53	52	56	58	51	38	32	30	28	26	23	21	25	34	32	33	33	47	55	62	63	41
10	65	63	62	64	66	76	83	78	69	55	48	46	42	51	80	97	99	98	96	96	93	96	96	98	76
11	100	100	99	98	96	100	97	88	80	65	54	47	47	57	57	56	58	56	55	58	60	64	67	68	72
12	72	75	68	70	73	77	77	70	56	50	44	56	63	48	43	44	41	37	42	51	59	65	63	63	59
13	69	69	69	74	75	74	68	62	55	50	43	39	34	41	39	33	30	29	41	47	63	59	54	53	53
14	53	54	55	58	62	61	61	59	57	51	49	47	44	47	49	47	47	47	50	53	57	61	64	65	54
15	64	64	65	66	70	72	76	97	100	92	79	73	66	68	53	46	44	46	47	49	51	54	58	62	65
16	63	66	70	73	73	74	73	69	58	53	49	42	37	37	36	36	36	40	52	56	62	65	65	66	56
17	67	83	89	81	84	83	75	69	59	52	44	39	38	34	29	27	27	30	30	31	32	34	40	53	51
18	59	64	67	72	71	73	73	66	61	55	51	46	41	39	38	38	40	43	42	45	47	48	49	50	53
19	53	56	58	61	63	65	63	61	56	52	48	44	42	41	39	36	35	33	35	40	42	43	44	45	48
20	46	47	48	52	52	55	54	51	47	44	40	37	34	31	33	36	36	38	39	41	50	52	56	57	45
21	56	60	59	58	56	54	54	53	55	51	45	40	37	36	36	35	34	35	37	39	42	42	43	43	46
22	45	47	48	50	53	56	52	47	39	36	30	26	24	23	23	22	22	22	23	25	26	27	29	30	34
23	33	33	35	37	38	39	39	35	30	27	24	22	21	21	20	20	19	19	20	21	23	26	26	28	27
24	30	32	33	35	34	36	31	28	24	21	22	21	19	19	17	16	16	18	19	19	21	21	22	24	24
25	25	26	28	29	32	33	33	30	26	23	20	20	20	20	19	18	18	18	25	27	29	28	32	34	25
26	34	33	34	35	38	40	42	43	39	34	31	29	28	27	27	27	26	25	25	27	28	31	34	33	32
27	35	38	43	46	49	52	50	49	44	37	33	29	28	26	24	23	23	22	24	34	42	48	52	54	38
28	57	58	59	61	62	63	51	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	59
29	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
30	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
31	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
HRAVE	45	47	48	50	51	53	51	49	44	39	35	32	31	30	30	31	31	31	33	36	39	41	43	44	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	14	15	17	20	29	29	26	30	41	76	72	59	53	54	65	56	51	53	48	45	46	34	27	24	25
MAX	25	22	23	30	41	40	34	45	63	99	100	77	75	65	100	74	89	73	65	57	60	56	39	36	34
MIN	7	10	13	14	15	20	18	20	21	42	47	37	29	44	44	36	27	38	33	31	34	22	19	16	18

DAY	26	27	28	29	30	31
AVE	32	38	59	***	***	***
MAX	43	54	63	***	***	***
MIN	25	22	51	***	***	***

MONTHLY AVERAGE = 40.2 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 6.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 88.0% OPERATIONAL RECOVERY RATE = 88.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JULY - 2018

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.38	0.60	0.78	0.94	1.03	1.09	1.05	0.96	0.70	0.63	0.41	0.20	0.03	0.00	0.00	0.00	0.00	8.93
2	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.36	0.57	0.77	0.92	1.01	1.06	1.01	0.93	0.68	0.61	0.40	0.19	0.03	0.00	0.00	0.00	0.00	8.67
3	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.58	0.72	0.90	0.99	1.04	1.00	0.92	0.67	0.60	0.39	0.18	0.02	0.00	0.00	0.00	0.00	8.49
4	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.35	0.49	0.66	0.69	0.82	1.09	0.99	0.78	0.68	0.42	0.30	0.16	0.03	0.00	0.00	0.00	0.00	7.58
5	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.33	0.52	0.71	0.87	0.96	1.02	0.98	0.12	0.05	0.10	0.06	0.08	0.01	0.00	0.00	0.00	0.00	5.93
6	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.31	0.53	0.70	0.86	0.95	1.01	0.97	0.90	0.67	0.59	0.38	0.18	0.02	0.00	0.00	0.00	0.00	8.18
7	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.32	0.54	0.72	0.86	0.97	0.64	0.77	0.91	0.52	0.21	0.15	0.09	0.01	0.00	0.00	0.00	0.00	6.83
8	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.39	0.50	0.57	0.86	0.95	1.01	0.89	0.77	0.58	0.40	0.21	0.07	0.01	0.00	0.00	0.00	0.00	7.31
9	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.33	0.53	0.70	0.57	0.97	0.96	0.94	0.53	0.61	0.44	0.09	0.04	0.01	0.00	0.00	0.00	0.00	6.78
10	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.19	0.29	0.49	0.49	0.48	0.10	0.02	0.02	0.04	0.05	0.04	0.01	0.00	0.00	0.00	0.00	2.33
11	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.17	0.27	0.49	0.78	0.75	0.27	0.20	0.25	0.19	0.17	0.15	0.10	0.01	0.00	0.00	0.00	0.00	3.86
12	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.18	0.52	0.69	0.88	0.58	0.34	0.82	0.68	0.35	0.30	0.25	0.14	0.01	0.00	0.00	0.00	0.00	5.83
13	0.00	0.00	0.00	0.00	0.00	0.02	0.12	0.25	0.55	0.72	0.86	0.95	1.04	0.44	0.84	0.64	0.48	0.27	0.02	0.00	0.00	0.00	0.00	0.00	7.20
14	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.18	0.36	0.19	0.27	0.36	0.39	0.70	0.55	0.22	0.18	0.05	0.00	0.00	0.00	0.00	0.00	3.54
15	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.14	0.28	0.38	0.25	0.50	0.43	1.00	0.66	0.57	0.27	0.10	0.01	0.00	0.00	0.00	0.00	4.66
16	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.17	0.35	0.31	0.48	0.85	0.98	0.63	0.71	0.51	0.43	0.25	0.04	0.00	0.00	0.00	0.00	0.00	5.80
17	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.31	0.50	0.66	0.86	0.94	1.00	0.98	0.88	0.61	0.55	0.32	0.18	0.02	0.00	0.00	0.00	0.00	7.91
18	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.30	0.46	0.67	0.84	0.94	0.99	0.94	0.91	0.55	0.10	0.08	0.15	0.01	0.00	0.00	0.00	0.00	7.04
19	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.28	0.43	0.69	0.84	0.93	0.97	0.94	0.87	0.63	0.44	0.35	0.10	0.01	0.00	0.00	0.00	0.00	7.59
20	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.47	0.69	0.85	0.93	1.01	1.07	0.34	0.08	0.03	0.03	0.05	0.00	0.00	0.00	0.00	0.00	5.94
21	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.16	0.28	0.62	0.73	0.93	0.97	0.94	0.86	0.61	0.55	0.35	0.16	0.02	0.00	0.00	0.00	0.00	7.27
22	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.53	0.71	0.86	0.95	1.00	0.96	0.89	0.61	0.57	0.38	0.15	0.03	0.00	0.00	0.00	0.00	8.05
23	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.34	0.51	0.71	0.86	0.95	0.99	0.96	0.89	0.60	0.58	0.38	0.18	0.02	0.00	0.00	0.00	0.00	8.06
24	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.28	0.41	0.51	0.27	1.04	0.96	0.55	0.87	0.57	0.41	0.26	0.09	0.02	0.00	0.00	0.00	0.00	6.37
25	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.29	0.51	0.69	0.85	0.93	0.98	0.95	0.87	0.62	0.61	0.38	0.21	0.04	0.00	0.00	0.00	0.00	8.04
26	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.10	0.40	0.57	0.72	0.61	1.01	0.96	0.86	0.60	0.54	0.34	0.15	0.01	0.00	0.00	0.00	0.00	6.90
27	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.43	0.54	0.76	0.93	0.89	0.89	0.83	0.54	0.56	0.37	0.05	0.01	0.00	0.00	0.00	0.00	7.09
28	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.19	0.48	0.59	0.83	0.92	0.98	0.97	0.88	0.63	0.56	0.36	0.20	0.04	0.00	0.00	0.00	0.00	7.70
29	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.16	0.28	0.56	0.84	0.83	0.87	0.86	0.61	0.52	0.28	0.06	0.01	0.00	0.00	0.00	0.00	5.94
30	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.29	0.47	0.66	0.80	0.92	0.86	0.91	0.85	0.61	0.45	0.22	0.08	0.00	0.00	0.00	0.00	0.00	7.18
31	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.28	0.47	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.85
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.25	0.44	0.60	0.74	0.85	0.88	0.82	0.76	0.53	0.42	0.26	0.12	0.02	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	8.93	8.67	8.49	7.58	5.93	8.18	6.83	7.31	6.78	2.33	3.86	5.83	7.20	3.54	4.66	5.80	7.91	7.04	7.59	5.94	7.27	8.05	8.06	6.37	8.04
MAX	1.09	1.06	1.04	1.09	1.02	1.01	0.97	1.01	0.97	0.49	0.78	0.88	1.04	0.70	1.00	0.98	1.00	0.99	0.97	1.07	0.97	1.00	0.99	1.04	0.98
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.90	7.09	7.70	5.94	7.18	0.85
MAX	1.01	0.93	0.98	0.87	0.92	0.47
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JULY - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.13
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
29	0.40	0.25	0.22	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.00
HRAVE	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.13	0.00	0.07	0.00	0.00	0.29	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.07	0.00	0.00	0.26	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.01	0.90	0.00	0.00
MAX	0.00	0.00	0.01	0.40	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.58 MONTHLY MAXIMUM = 0.40 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
AUGUST - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7.9	7.3	6.6	5.8	6.7	5.8	3.4	2.7	2.2	2.4	5.1
4	3.3	3.5	4.8	2.5	2.6	3.6	3.5	4.2	2.2	1.5	2.4	3.6	4.5	3.6	3.7	4.4	5.7	6.3	6.4	5.9	4.6	4.1	3.6	2.6	3.9
5	2.4	2.6	3.1	2.5	3.2	2.8	2.8	2.7	2.4	1.5	2.6	3.2	3.8	4.0	5.7	6.6	6.9	6.4	7.1	5.4	2.4	3.5	2.1	1.4	3.6
6	2.1	2.6	3.0	4.2	4.3	3.1	1.5	1.1	1.8	1.6	2.3	2.4	3.2	4.7	6.3	7.5	8.3	9.0	9.0	7.3	2.9	4.1	5.5	4.8	4.3
7	2.8	5.6	3.4	1.2	1.5	2.1	1.5	1.5	1.0	2.5	3.3	4.1	4.0	3.5	3.8	5.8	7.2	7.3	11.3	13.4	5.8	6.9	3.8	3.8	4.5
8	4.1	6.3	4.8	3.1	2.5	1.9	0.9	0.7	1.4	1.3	2.4	4.6	4.6	5.6	5.5	6.7	6.9	7.5	6.4	4.0	3.7	4.4	2.1	2.5	3.9
9	1.7	4.1	2.6	3.6	4.1	5.7	3.3	2.2	1.7	3.1	2.7	2.2	2.0	1.8	1.9	2.7	4.7	6.7	4.7	5.5	2.5	3.4	3.7	8.7	3.5
10	3.9	2.9	2.2	2.0	2.2	2.2	2.7	1.5	2.1	2.7	3.4	2.9	3.5	2.8	3.6	6.7	7.1	6.6	7.1	5.2	5.8	4.9	6.9	2.6	3.9
11	2.4	4.1	4.9	7.6	5.0	6.8	6.5	6.6	6.8	5.6	4.0	1.3	2.1	2.2	2.5	2.3	3.1	2.1	5.4	5.9	4.6	4.3	3.6	6.4	4.4
12	6.4	6.2	2.5	3.1	2.5	2.8	3.6	2.5	2.6	1.9	1.9	1.8	2.6	2.8	3.4	4.0	7.4	9.0	6.2	2.9	3.2	3.0	3.6	1.6	3.7
13	2.0	2.4	1.5	2.1	3.0	2.8	2.3	2.0	2.4	2.1	1.6	3.8	6.4	6.7	6.8	7.0	6.6	6.9	7.5	5.8	3.6	3.3	1.3	2.6	3.9
14	2.4	2.0	2.0	2.1	0.8	1.6	1.7	1.1	2.0	3.8	5.0	5.7	5.7	5.8	6.0	6.5	7.4	7.4	6.2	4.0	6.0	2.6	4.6	3.5	4.0
15	4.5	4.4	4.4	4.5	2.2	1.4	1.2	1.6	2.0	2.2	3.5	4.4	5.9	2.2	2.5	2.3	2.8	3.7	6.5	5.6	4.8	4.2	2.2	2.0	3.4
16	3.1	2.9	2.0	1.8	1.5	3.7	2.2	1.2	0.9	2.9	3.0	3.8	3.5	3.7	3.8	4.7	6.1	6.7	6.4	5.4	4.8	3.5	4.4	4.7	3.6
17	3.1	3.3	2.2	2.2	1.9	2.0	2.0	1.6	0.9	1.2	1.8	3.6	4.7	5.3	7.2	7.5	7.7	6.9	6.2	5.0	2.3	2.5	3.1	2.8	3.6
18	1.7	1.6	2.5	2.7	2.6	2.7	2.6	1.8	1.3	3.3	4.9	5.5	6.5	6.4	7.2	8.2	7.9	8.5	8.2	6.0	3.8	3.5	4.5	3.6	4.5
19	1.4	1.3	1.5	1.8	1.6	0.9	0.9	1.1	2.0	3.3	4.1	4.4	4.4	4.2	5.3	6.6	7.0	7.8	7.8	6.9	3.0	1.4	1.8	2.2	3.5
20	2.3	2.6	2.3	1.5	0.9	1.2	1.8	1.3	0.9	3.2	4.8	5.2	5.4	6.8	5.7	6.0	4.8	6.2	6.7	5.4	4.2	5.1	3.1	5.0	3.9
21	2.2	2.6	1.7	2.9	10.4	7.2	4.3	3.2	2.0	2.9	2.2	5.7	4.2	1.5	1.9	1.7	1.2	0.6	1.2	1.0	4.4	4.4	4.9	3.2	3.2
22	1.1	0.9	1.7	0.9	0.5	1.6	2.5	2.7	2.2	2.6	1.7	1.9	2.6	3.1	4.2	2.3	3.4	2.7	1.8	2.6	2.8	2.5	2.4	2.1	2.2
23	1.6	1.3	2.1	3.4	4.1	3.3	4.0	4.5	4.5	4.7	2.6	5.2	2.0	3.5	2.8	4.3	4.2	6.3	5.4	4.4	5.1	3.7	3.0	5.0	3.8
24	2.9	3.0	2.5	2.5	2.2	2.2	2.2	1.1	1.7	1.7	1.7	2.3	3.0	4.2	5.9	6.4	6.0	12.3	6.4	3.7	4.1	4.1	2.2	3.6	3.7
25	3.4	3.7	3.7	2.1	1.0	2.0	2.3	2.2	2.4	2.3	1.7	1.9	2.3	2.9	1.6	2.1	1.2	1.9	3.8	5.2	3.3	2.3	3.2	2.7	2.6
26	2.8	3.2	2.6	3.3	2.4	2.4	2.5	2.1	1.9	1.9	1.3	2.0	4.0	3.3	2.5	1.5	1.3	1.9	3.2	2.6	1.3	2.4	2.7	3.1	2.4
27	2.7	1.9	2.1	2.0	2.0	3.5	3.9	3.7	3.1	2.0	1.5	2.1	3.6	4.6	6.0	5.8	6.5	6.1	4.9	2.9	1.0	1.8	3.2	2.6	3.3
28	1.2	0.9	1.7	2.8	2.5	3.0	2.9	1.9	1.8	1.6	1.1	1.7	2.2	3.1	5.0	5.8	5.6	5.8	5.6	3.5	3.4	2.0	2.4	3.2	2.9
29	2.9	2.9	3.6	3.0	2.3	1.6	2.5	2.3	0.8	1.4	1.1	1.3	2.0	2.3	2.6	2.7	4.8	5.8	6.3	4.9	4.6	3.9	1.7	2.6	2.9
30	2.6	3.4	3.9	5.2	3.1	3.7	4.0	2.5	2.8	3.4	1.7	2.8	2.9	3.2	2.6	6.4	6.9	6.5	6.3	5.0	4.7	3.4	1.6	2.3	3.8
31	3.3	2.5	2.3	3.2	3.2	2.6	2.1	2.1	2.4	1.6	2.0	2.9	3.2	5.2	6.2	6.5	6.2	6.8	5.9	4.3	3.2	2.8	1.4	3.3	3.6
HRAVE	2.7	3.0	2.8	2.8	2.7	2.9	2.7	2.3	2.1	2.5	2.6	3.3	3.7	3.9	4.5	5.1	5.6	6.1	6.1	5.0	3.8	3.5	3.1	3.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	***	***	5.1	3.9	3.6	4.3	4.5	3.9	3.5	3.9	4.4	3.7	3.9	4.0	3.4	3.6	3.6	4.5	3.5	3.9	3.2	2.2	3.8	3.7	2.6
MAX	***	***	7.9	6.4	7.1	9.0	13.4	7.5	8.7	7.1	7.6	9.0	7.5	7.4	6.5	6.7	7.7	8.5	7.8	6.8	10.4	4.2	6.3	12.3	5.2
MIN	***	***	2.2	1.5	1.4	1.1	1.0	0.7	1.7	1.5	1.3	1.6	1.3	0.8	1.2	0.9	0.9	1.3	0.9	0.9	0.6	0.5	1.3	1.1	1.0

DAY	26	27	28	29	30	31
AVE	2.4	3.3	2.9	2.9	3.8	3.6
MAX	4.0	6.5	5.8	6.3	6.9	6.8
MIN	1.3	1.0	0.9	0.8	1.6	1.4

MONTHLY AVERAGE = 3.6 MONTHLY MAXIMUM = 13.4 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 91.7% OPERATIONAL RECOVERY RATE = 91.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
AUGUST - 2018

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	300	281	283	285	285	280	306	321	294	126	106
4	109	108	113	107	111	114	107	139	152	178	288	291	301	297	298	277	293	284	284	288	300	311	316	290	235
5	152	114	107	105	96	117	109	107	145	274	297	294	316	307	293	284	291	296	291	294	272	315	287	338	236
6	116	106	117	117	108	102	103	321	130	157	282	258	266	263	274	278	278	278	283	289	311	80	50	59	206
7	99	146	135	125	104	308	291	150	134	292	305	302	302	273	283	293	292	283	97	17	85	96	247	176	283
8	40	308	308	287	134	106	122	335	286	293	295	313	308	305	298	288	291	293	312	344	298	320	274	299	49
9	278	152	141	122	143	140	137	117	113	70	64	50	28	302	305	317	279	274	276	240	120	111	145	54	285
10	289	309	148	99	140	130	124	156	297	284	269	286	276	275	295	298	287	272	141	117	69	294	63	34	68
11	130	86	58	50	71	70	68	66	75	62	41	177	62	272	279	221	49	329	317	297	316	269	249	155	339
12	152	128	104	91	120	115	138	134	145	153	134	154	266	255	286	299	291	327	68	113	96	120	137	349	306
13	146	131	277	131	111	101	102	125	119	139	312	285	302	292	293	281	277	282	278	284	298	320	268	173	140
14	109	149	140	122	143	155	149	146	295	288	298	288	275	279	291	289	282	278	289	68	51	162	78	128	96
15	134	287	300	296	213	266	213	146	170	282	306	303	289	301	261	198	300	280	287	291	301	312	287	283	102
16	283	289	245	211	217	301	286	187	243	287	275	294	286	303	299	302	295	294	283	284	296	295	309	293	137
17	280	296	251	154	136	138	141	141	127	129	276	285	297	293	286	290	287	279	290	275	296	319	298	299	347
18	309	155	121	130	121	124	113	114	167	283	304	286	287	282	279	291	278	278	285	276	291	312	317	312	323
19	240	293	226	268	179	178	170	174	308	311	293	305	294	281	288	289	282	284	281	283	300	314	123	127	81
20	112	110	116	118	111	106	120	142	266	289	306	287	283	283	272	291	280	276	287	280	286	264	190	164	145
21	222	294	303	146	103	43	49	62	33	74	46	27	29	59	244	301	8	81	353	298	307	325	119	34	155
22	328	112	122	100	80	144	152	154	134	75	105	83	295	273	156	87	283	290	122	148	116	109	116	135	12
23	108	109	102	74	85	80	59	72	72	69	103	205	124	143	123	148	156	151	159	152	143	127	126	125	344
24	137	117	110	106	164	100	93	150	156	144	241	265	258	286	290	285	285	67	114	100	118	99	92	104	111
25	135	119	94	137	73	122	145	140	132	140	140	158	95	96	285	264	270	174	183	142	134	125	108	116	237
26	106	112	124	113	106	122	124	131	144	103	297	248	220	193	153	104	171	249	272	225	168	113	118	115	108
27	104	130	138	115	115	101	113	104	117	126	326	294	243	231	273	287	278	287	295	298	265	137	119	111	90
28	118	151	103	95	103	103	116	103	128	158	198	307	258	282	299	296	292	293	297	305	311	315	132	103	308
29	104	97	102	109	104	92	108	119	91	131	296	287	192	268	307	298	316	295	291	294	305	296	157	121	302
30	112	230	171	165	158	118	103	139	83	80	105	63	69	255	265	289	291	292	288	296	303	301	250	137	194
31	107	129	97	119	115	116	111	111	129	144	264	280	289	312	301	292	287	287	293	293	311	306	131	130	55

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 91.7% OPERATIONAL RECOVERY RATE = 91.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
AUGUST - 2018

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	17	16	17	15	10	7	7	10	26	9	14
4	8	8	6	37	25	7	10	11	25	34	26	24	21	44	32	24	20	13	11	8	7	7	8	20	18
5	8	10	8	11	9	10	14	15	21	39	24	23	23	35	19	15	15	14	13	10	16	9	12	29	17
6	10	9	8	10	8	11	36	35	27	36	30	32	26	25	18	18	12	10	8	8	64	25	13	10	20
7	14	13	14	34	18	39	43	13	37	28	31	26	30	43	29	20	14	28	18	41	32	26	56	25	28
8	21	9	8	22	16	15	27	52	28	33	28	16	26	17	22	16	18	12	19	24	12	12	27	23	21
9	34	13	11	14	12	12	11	22	27	28	39	39	44	57	43	35	26	15	14	60	32	12	10	24	26
10	29	27	17	20	19	15	13	30	21	25	17	33	26	23	24	18	12	25	10	12	23	40	14	16	21
11	18	12	17	14	10	8	10	11	9	19	25	83	50	68	54	43	30	68	26	9	12	24	26	10	27
12	21	23	15	13	23	20	12	14	23	30	38	44	49	36	31	25	16	46	29	22	13	17	23	37	26
13	32	21	65	26	10	7	14	14	20	29	40	34	16	15	16	15	14	12	9	8	12	13	25	8	20
14	12	11	12	13	42	12	10	27	28	24	19	20	16	22	18	18	12	10	24	18	13	30	16	22	19
15	26	24	10	10	20	37	28	15	23	41	23	21	14	52	28	43	25	18	10	8	8	7	11	18	22
16	14	9	18	20	21	14	16	15	33	17	16	15	19	21	25	20	18	17	9	8	10	10	9	8	16
17	8	11	22	9	9	11	9	16	36	49	41	22	25	21	14	14	15	14	12	8	11	11	7	5	17
18	19	15	5	8	8	8	9	20	47	23	19	24	24	20	16	14	12	10	11	8	10	9	10	8	15
19	32	24	20	27	30	19	11	31	24	24	25	22	26	21	16	15	14	10	9	8	11	47	16	9	20
20	12	9	17	11	34	8	9	18	38	23	19	20	19	15	23	17	21	13	9	7	7	25	33	11	17
21	19	10	36	9	18	14	42	28	22	16	49	22	22	55	34	24	27	41	19	20	6	18	46	27	26
22	24	37	18	17	42	37	12	7	16	17	39	43	41	11	21	23	27	11	38	9	9	11	7	14	22
23	15	16	11	14	21	21	15	11	10	10	24	14	27	12	14	12	11	8	9	10	11	13	15	9	14
24	18	11	12	13	9	12	11	32	24	34	45	36	48	35	27	17	17	21	32	16	10	12	31	14	22
25	19	7	9	22	35	16	7	10	13	10	17	15	20	24	44	35	50	24	17	8	11	17	13	13	19
26	11	12	8	9	12	12	8	12	23	27	54	31	14	19	27	38	59	45	16	11	28	8	10	11	21
27	14	14	11	7	8	8	8	11	20	40	49	43	50	24	20	19	19	11	10	7	13	8	9	13	18
28	38	35	17	18	6	9	10	11	18	25	53	54	42	40	25	20	20	14	11	7	6	45	9	7	23
29	10	10	7	9	10	19	9	12	36	37	43	44	49	41	53	38	31	14	9	6	6	5	24	9	22
30	29	45	20	11	14	12	12	18	18	14	53	51	33	25	46	14	14	13	10	7	6	8	18	8	21
31	7	10	13	9	9	9	12	12	16	44	27	32	30	22	21	17	16	11	9	7	7	16	12	7	16
HRAVE	19	16	16	16	18	15	15	19	24	28	33	32	30	30	27	22	21	19	15	13	14	17	19	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	***	***	14	18	17	20	28	21	26	21	27	26	20	19	22	16	17	15	20	17	26	22	14	22	19
MAX	***	***	26	44	39	64	56	52	60	40	83	49	65	42	52	33	49	47	47	38	55	43	27	48	50
MIN	***	***	7	6	8	8	13	8	10	10	8	12	7	10	7	8	5	5	8	7	6	7	8	9	7

DAY	26	27	28	29	30	31
AVE	21	18	23	22	21	16
MAX	59	50	54	53	53	44
MIN	8	7	6	5	6	7

MONTHLY AVERAGE = 20.4 MONTHLY MAXIMUM = 83.1 MONTHLY MINIMUM = 4.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 91.7% OPERATIONAL RECOVERY RATE = 91.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
AUGUST - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	40.2	40.3	40.0	39.8	39.0	37.3	36.0	35.8	35.2	33.5	37.7
4	32.3	31.6	30.5	29.3	28.6	28.2	29.0	30.7	32.5	34.1	35.7	38.0	39.6	40.5	40.8	41.3	41.4	41.0	40.0	38.3	37.2	36.5	36.0	35.3	35.4
5	33.5	32.5	31.8	31.2	30.7	29.7	30.1	32.3	34.8	35.7	37.6	38.9	40.3	41.3	42.0	42.1	41.9	41.5	40.5	39.0	37.6	37.0	36.1	35.3	36.4
6	33.6	32.6	31.7	31.3	30.6	29.9	29.1	30.1	33.4	35.5	37.6	39.5	41.4	42.9	43.1	43.2	42.8	42.2	41.2	39.6	38.9	37.1	36.3	35.4	36.6
7	34.5	33.3	32.6	32.2	31.5	30.1	30.2	31.2	33.6	35.0	36.5	37.9	39.2	40.1	40.9	41.1	40.8	39.9	33.2	28.2	27.8	31.5	28.2	29.3	34.1
8	28.0	27.4	26.0	25.8	25.5	25.6	25.8	26.7	28.0	29.4	31.7	32.9	34.4	35.2	36.0	36.3	36.4	35.9	34.5	32.7	31.4	31.6	31.5	30.7	30.8
9	29.8	29.1	28.8	28.4	27.9	27.1	26.9	28.3	29.8	31.6	32.8	34.0	34.9	35.6	36.6	37.2	37.8	36.8	35.9	30.9	27.3	27.5	27.0	23.3	31.0
10	22.9	23.7	22.8	23.0	23.0	22.9	22.9	23.8	25.4	27.8	30.1	31.7	32.7	33.2	34.7	35.3	35.0	34.4	28.8	27.5	27.9	26.2	26.1	26.6	27.8
11	26.2	26.4	27.2	26.7	26.1	25.6	25.7	27.1	28.9	30.4	31.9	33.8	35.1	36.3	36.8	37.5	37.3	37.3	36.3	34.5	33.5	32.0	30.4	29.1	31.3
12	27.2	24.0	23.5	23.9	23.0	23.5	23.0	25.2	27.5	29.2	31.8	33.3	34.7	35.7	36.7	37.5	36.9	28.5	25.8	26.1	25.7	25.3	25.2	25.4	28.3
13	24.6	24.6	24.2	22.5	23.0	22.7	23.2	24.6	27.4	29.6	30.6	32.6	34.2	34.8	35.1	35.1	35.1	34.8	33.5	32.2	31.5	31.2	30.6	29.2	29.5
14	28.6	27.8	27.2	26.7	26.6	25.9	26.0	27.8	29.2	30.9	32.4	33.6	34.5	35.8	36.3	36.7	36.7	36.2	35.2	33.0	32.7	32.0	30.8	29.0	31.3
15	28.2	26.9	25.9	25.6	25.5	25.7	25.7	26.5	27.4	28.9	31.0	33.0	32.6	32.0	32.3	33.0	34.0	34.6	33.2	31.7	30.7	30.2	30.0	29.1	29.7
16	28.5	28.1	27.9	27.3	26.6	26.3	26.5	26.4	27.2	28.4	28.9	29.6	30.4	32.5	33.9	34.9	35.3	34.8	33.7	32.3	31.6	31.0	30.3	29.5	30.1
17	28.8	28.4	27.6	26.3	25.9	25.6	25.6	27.3	29.1	30.8	32.5	34.1	35.8	36.5	36.8	37.1	36.9	36.6	35.6	34.2	33.3	32.9	32.5	31.6	31.7
18	31.4	30.1	29.5	28.8	28.1	27.7	27.8	29.4	31.4	33.1	34.9	35.9	37.0	37.5	37.5	37.6	37.8	37.4	36.5	35.2	34.4	34.1	33.9	33.4	33.3
19	32.8	31.7	30.9	30.6	29.4	28.5	28.2	29.7	31.1	32.9	34.3	36.0	37.3	38.6	39.4	39.7	39.3	38.9	37.7	36.3	35.3	34.9	33.5	32.9	34.2
20	31.7	31.1	30.3	29.7	29.0	28.3	28.1	29.8	32.0	34.1	35.6	36.4	37.5	37.6	38.7	39.0	39.0	38.6	37.6	36.4	35.6	33.8	33.2	32.1	34.0
21	31.4	30.8	30.5	29.8	25.6	23.3	23.6	24.6	25.1	27.2	29.4	31.0	32.4	33.2	33.6	33.5	33.6	33.6	32.9	32.5	31.8	31.6	25.5	24.6	29.6
22	24.9	25.0	24.6	24.8	24.8	24.6	24.3	25.6	27.9	30.8	32.0	33.7	33.4	32.3	31.5	31.0	30.5	28.8	28.8	28.0	27.7	27.7	27.5	27.1	28.2
23	26.9	26.5	25.9	26.1	26.1	25.8	26.3	26.8	27.8	29.2	30.4	26.8	25.4	26.3	29.0	29.7	29.6	29.1	28.4	27.4	26.6	26.0	25.5	25.0	27.2
24	24.9	24.6	24.5	24.7	23.8	24.0	24.5	25.8	27.8	29.4	30.6	32.3	33.8	35.1	35.8	35.7	35.5	27.0	22.2	21.7	21.5	21.7	22.2	22.2	27.1
25	22.1	21.8	22.0	21.7	21.8	21.1	21.2	22.0	23.1	24.0	24.9	26.5	29.3	32.5	33.6	34.0	34.5	34.4	33.5	31.5	30.2	29.1	28.3	27.7	27.1
26	27.0	26.7	25.7	25.2	24.9	24.4	24.2	25.9	28.0	30.0	31.1	31.2	31.8	32.3	31.6	33.8	34.4	34.7	34.4	32.5	31.0	30.2	29.5	28.9	29.6
27	29.1	28.7	28.0	27.3	26.6	25.6	25.8	27.2	29.4	31.7	32.8	33.9	36.0	37.0	37.7	37.5	37.4	36.8	35.6	33.9	33.0	31.0	29.3	28.2	31.6
28	29.0	28.0	26.4	25.1	24.6	23.5	24.1	25.3	27.4	30.3	32.1	33.6	35.1	36.2	37.2	37.3	37.2	36.8	35.5	33.6	32.9	32.3	29.9	28.6	30.9
29	27.6	26.4	25.6	24.5	23.8	22.2	22.1	24.4	26.6	29.5	32.4	34.6	37.2	37.2	38.4	38.6	38.4	38.1	36.6	34.7	33.6	33.1	31.7	30.7	31.2
30	29.0	29.8	28.9	28.2	27.5	26.8	26.8	27.3	29.5	31.4	33.1	34.7	36.4	36.6	37.8	36.8	36.5	36.3	35.3	33.7	32.8	32.2	31.4	29.9	32.0
31	29.2	28.2	27.2	26.4	25.6	25.2	25.3	26.6	29.0	31.4	32.9	34.9	36.5	37.5	38.0	38.3	37.9	37.2	36.1	34.8	33.7	33.5	32.1	30.9	32.0
HRAVE	28.7	28.1	27.4	26.9	26.3	25.7	25.8	27.1	28.9	30.8	32.4	33.7	35.0	35.8	36.6	36.9	36.9	35.9	34.4	32.7	31.8	31.3	30.3	29.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	***	***	37.7	35.4	36.4	36.6	34.1	30.8	31.0	27.8	31.3	28.3	29.5	31.3	29.7	30.1	31.7	33.3	34.2	34.0	29.6	28.2	27.2	27.1	27.1
MAX	***	***	40.3	41.4	42.1	43.2	41.1	36.4	37.8	35.3	37.5	37.5	35.1	36.7	34.6	35.3	37.1	37.8	39.7	39.0	33.6	33.7	30.4	35.8	34.5
MIN	***	***	33.5	28.2	29.7	29.1	27.8	25.5	23.3	22.8	25.6	23.0	22.5	25.9	25.5	26.3	25.6	27.7	28.2	28.1	23.3	24.3	25.0	21.5	21.1

DAY	26	27	28	29	30	31
AVE	29.6	31.6	30.9	31.2	32.0	32.0
MAX	34.7	37.7	37.3	38.6	37.8	38.3
MIN	24.2	25.6	23.5	22.1	26.8	25.2

MONTHLY AVERAGE = 31.2 MONTHLY MAXIMUM = 43.2 MONTHLY MINIMUM = 21.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 91.7% OPERATIONAL RECOVERY RATE = 91.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
AUGUST - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-1.6	-1.4	-1.2	-1.0	-0.6	-0.1	0.2	0.4	0.4	0.4	-0.5
4	0.3	0.3	0.2	0.3	0.3	0.2	-0.3	-1.1	-1.2	-0.9	-1.0	-1.4	-1.5	-1.5	-1.3	-1.3	-1.2	-1.0	-0.6	-0.1	0.2	0.3	0.3	0.3	-0.5
5	0.5	0.3	0.3	0.3	0.5	0.3	-0.3	-1.1	-1.4	-0.8	-1.2	-1.3	-1.5	-1.4	-1.6	-1.4	-1.3	-1.0	-0.5	0.0	0.2	0.5	0.5	0.5	-0.4
6	0.6	0.6	0.5	0.3	0.2	0.3	0.1	-0.5	-1.1	-1.1	-1.0	-1.1	-1.3	-1.4	-1.3	-1.3	-1.0	-0.8	-0.4	0.0	0.2	0.4	0.1	0.2	-0.4
7	0.4	0.2	0.2	0.2	0.4	0.3	-0.1	-0.6	-0.7	-0.9	-1.2	-1.4	-1.5	-1.4	-1.5	-1.5	-1.2	-0.9	-0.6	0.1	0.4	0.3	0.5	0.0	-0.4
8	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.3	-0.6	-0.7	-1.1	-1.4	-1.5	-1.8	-1.8	-1.6	-1.3	-1.1	-0.6	-0.2	-0.1	0.0	0.1	0.1	-0.6
9	0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.3	-0.8	-1.0	-1.3	-1.5	-1.3	-1.1	-1.0	-1.1	-1.1	-1.2	-1.0	-0.6	-0.3	-0.3	-0.2	-0.2	0.2	-0.6
10	0.0	0.1	0.0	0.0	0.1	0.1	0.1	-0.3	-0.8	-0.8	-1.0	-1.1	-0.9	-0.9	-1.3	-1.5	-1.3	-0.9	-0.6	-0.3	-0.1	-0.1	-0.1	0.0	-0.5
11	-0.1	0.0	0.0	0.0	0.0	0.0	-0.2	-0.8	-1.4	-1.5	-1.5	-1.1	-1.5	-1.3	-1.4	-1.3	-1.0	-0.7	-0.4	-0.2	-0.1	-0.1	-0.1	-0.1	-0.6
12	-0.2	-0.3	-0.1	0.0	0.2	0.1	-0.3	-1.2	-1.5	-1.2	-1.6	-1.3	-1.3	-1.3	-1.5	-1.5	-1.1	0.0	0.2	0.2	0.2	0.3	0.2	0.2	-0.5
13	0.3	0.3	0.3	0.2	0.2	0.3	-0.2	-0.8	-1.4	-1.5	-1.0	-1.3	-1.6	-1.6	-1.6	-1.4	-1.1	-0.9	-0.5	-0.1	0.0	0.1	0.2	0.1	-0.5
14	0.1	0.2	0.1	0.1	0.1	0.2	-0.2	-0.6	-0.7	-1.0	-1.3	-1.4	-1.4	-1.5	-1.6	-1.6	-1.2	-1.0	-0.5	-0.1	-0.1	0.0	-0.1	-0.1	-0.6
15	-0.1	-0.1	-0.2	-0.2	-0.2	0.0	-0.1	-0.6	-0.8	-0.9	-1.3	-1.4	-1.1	-0.7	-1.0	-1.1	-1.0	-0.8	-0.6	-0.1	0.0	0.1	0.1	0.1	-0.5
16	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.4	-0.4	-0.7	-0.7	-1.0	-1.0	-1.5	-1.4	-1.4	-1.3	-1.0	-0.5	-0.2	-0.1	0.0	0.0	0.0	-0.5
17	0.1	0.1	0.1	0.1	0.1	0.1	-0.3	-0.7	-0.5	-0.9	-1.0	-1.1	-1.6	-1.6	-1.5	-1.5	-1.2	-1.0	-0.6	-0.2	0.1	0.2	0.2	0.4	-0.5
18	0.3	0.1	0.1	0.1	0.1	0.2	-0.3	-0.9	-0.8	-1.0	-1.3	-1.3	-1.6	-1.6	-1.5	-1.4	-1.1	-0.9	-0.5	-0.1	0.1	0.2	0.2	0.2	-0.5
19	0.2	0.2	0.3	0.2	0.1	0.1	0.0	-0.6	-0.8	-1.2	-1.3	-1.4	-1.4	-1.5	-1.6	-1.6	-1.2	-1.0	-0.5	-0.1	0.1	0.3	0.2	0.3	-0.5
20	0.2	0.2	0.2	0.3	0.3	0.3	-0.2	-0.5	-0.6	-1.0	-1.3	-1.4	-1.4	-1.2	-1.4	-1.4	-1.1	-0.8	-0.6	-0.2	0.0	-0.1	0.0	-0.1	-0.5
21	0.0	0.1	0.1	0.2	0.2	0.3	0.2	0.1	-0.4	-1.0	-1.0	-0.7	-0.9	-0.8	-0.6	-0.5	-0.4	-0.3	0.1	0.2	0.2	0.1	0.6	0.2	-0.2
22	0.2	0.1	0.2	0.2	0.1	0.4	0.1	-0.5	-0.8	-1.3	-1.1	-1.3	-0.7	-0.4	-0.7	-0.8	-0.4	-0.2	-0.2	-0.1	0.0	0.1	0.2	0.2	-0.3
23	0.2	0.3	0.3	0.2	0.2	0.2	0.0	-0.3	-0.6	-1.0	-1.0	-0.3	-0.2	-0.8	-1.0	-0.9	-0.7	-0.4	-0.2	0.0	0.0	0.1	0.0	0.0	-0.2
24	0.0	0.1	0.0	0.0	0.1	0.1	-0.3	-0.5	-1.0	-1.1	-1.0	-1.2	-1.2	-1.4	-1.5	-1.3	-1.1	-0.4	0.2	0.2	0.1	0.1	0.1	0.1	-0.5
25	0.1	0.0	0.1	0.2	0.4	0.3	0.0	-0.3	-0.4	-0.4	-0.5	-0.8	-1.0	-1.3	-0.8	-0.7	-0.6	-0.5	-0.2	0.2	0.3	0.2	0.2	0.2	-0.2
26	0.3	0.3	0.2	0.2	0.3	0.4	-0.2	-0.7	-0.9	-1.2	-0.8	-0.5	-1.1	-0.9	-0.8	-1.0	-0.6	-0.6	-0.3	0.1	0.1	0.3	0.2	0.2	-0.3
27	0.3	0.3	0.3	0.3	0.3	0.5	-0.1	-0.9	-1.4	-1.4	-1.0	-1.0	-1.4	-1.4	-1.3	-1.2	-0.9	-0.7	-0.2	0.5	0.5	0.6	0.4	0.3	-0.4
28	0.5	0.5	0.8	0.6	0.6	0.5	0.0	-0.9	-0.9	-1.1	-0.9	-1.0	-1.1	-1.2	-1.3	-1.2	-1.0	-0.7	-0.2	0.4	0.8	0.6	0.7	0.6	-0.2
29	0.6	0.7	0.4	0.5	0.6	0.7	0.1	-1.1	-0.5	-0.9	-0.8	-0.9	-1.3	-1.1	-1.1	-1.0	-0.9	-0.7	-0.3	0.2	0.4	0.5	0.5	0.3	-0.2
30	0.3	0.2	0.1	0.0	0.1	0.1	0.0	-0.3	-1.3	-1.5	-1.0	-1.4	-1.6	-1.1	-1.2	-0.8	-0.8	-0.6	-0.3	0.1	0.2	0.3	0.3	0.3	-0.4
31	0.3	0.4	0.4	0.3	0.2	0.3	0.1	-0.9	-1.3	-1.1	-0.9	-1.1	-1.3	-1.5	-1.4	-1.3	-1.1	-0.8	-0.3	0.1	0.3	0.4	0.5	0.1	-0.4
HRAVE	0.2	0.2	0.2	0.2	0.2	0.2	-0.1	-0.6	-0.9	-1.1	-1.1	-1.1	-1.3	-1.2	-1.3	-1.2	-1.0	-0.8	-0.4	0.0	0.1	0.2	0.2	0.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	***	***	-0.5	-0.5	-0.4	-0.4	-0.4	-0.6	-0.6	-0.5	-0.6	-0.5	-0.5	-0.6	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.2	-0.3	-0.2	-0.5	-0.2
MAX	***	***	0.4	0.3	0.5	0.6	0.5	0.1	0.2	0.1	0.0	0.3	0.3	0.2	0.1	0.1	0.4	0.3	0.3	0.3	0.6	0.4	0.3	0.2	0.4
MIN	***	***	-1.6	-1.5	-1.6	-1.4	-1.5	-1.8	-1.5	-1.5	-1.5	-1.6	-1.6	-1.6	-1.4	-1.5	-1.6	-1.6	-1.6	-1.4	-1.0	-1.3	-1.0	-1.5	-1.3

DAY	26	27	28	29	30	31
AVE	-0.3	-0.4	-0.2	-0.2	-0.4	-0.4
MAX	0.4	0.6	0.8	0.7	0.3	0.5
MIN	-1.2	-1.4	-1.3	-1.3	-1.6	-1.5

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = -1.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 91.7% OPERATIONAL RECOVERY RATE = 91.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
AUGUST - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	698	699	699
4	699	698	698	699	699	700	700	700	700	700	700	699	698	698	697	697	696	696	696	696	697	697	697	698	698
5	697	698	698	698	698	699	699	700	700	700	699	699	699	698	697	697	697	697	696	697	698	698	698	698	698
6	698	698	698	699	699	699	700	700	700	700	700	699	698	697	697	696	696	696	696	696	697	698	699	699	698
7	699	699	699	699	699	699	699	700	700	700	700	699	698	698	697	696	696	696	697	698	700	699	700	702	699
8	701	701	701	702	703	703	703	703	703	702	702	701	701	700	700	699	699	699	699	700	700	700	701	701	701
9	701	702	702	702	703	703	703	703	703	703	703	702	702	701	701	700	700	700	700	701	702	703	703	703	702
10	703	703	703	703	703	703	703	703	703	703	703	703	702	701	701	700	700	700	701	701	702	701	701	702	702
11	702	702	702	702	702	701	702	702	703	702	702	702	701	700	699	699	698	698	698	699	700	701	701	701	701
12	702	703	702	702	702	702	702	703	703	703	702	702	701	700	699	698	698	699	698	699	700	701	701	701	701
13	701	701	701	701	701	701	701	702	702	701	701	701	701	700	699	699	698	698	698	698	698	699	699	699	700
14	699	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	699	699	700	699
15	700	700	700	700	700	700	701	701	701	702	702	701	701	701	700	699	699	699	699	700	700	701	701	701	700
16	701	701	701	702	702	703	703	704	704	704	704	703	703	703	702	701	701	701	701	702	703	703	703	703	702
17	703	703	703	703	703	704	704	704	704	704	704	703	703	702	701	701	701	701	701	701	702	702	702	702	703
18	702	702	702	702	702	703	703	703	703	703	703	702	702	701	700	700	699	699	699	699	700	700	700	700	701
19	700	700	700	700	700	700	701	701	701	701	701	700	699	699	698	698	697	697	697	697	698	699	699	699	699
20	699	699	699	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	699	700	700	701	701	700
21	701	701	701	701	702	702	702	703	703	703	703	703	702	702	701	701	700	700	700	701	701	702	702	702	702
22	703	702	702	702	702	703	703	704	704	704	704	703	703	702	702	702	701	701	701	702	702	702	703	703	702
23	702	702	702	702	702	703	703	703	704	703	703	703	703	702	701	701	701	700	701	701	701	702	702	701	702
24	701	701	701	701	701	701	701	701	702	702	701	701	700	699	698	698	698	699	701	701	702	702	701	701	701
25	701	701	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	699	699	700	700	701	701	701	701
26	701	701	701	701	701	701	702	702	702	702	702	702	701	701	701	700	699	699	699	699	699	700	700	700	701
27	700	700	700	700	700	700	700	701	701	701	701	700	700	700	699	698	698	698	698	698	698	699	699	699	699
28	699	699	699	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	699	699	700	700	700	700
29	700	700	700	700	701	701	701	702	702	702	702	701	701	700	700	699	699	698	699	699	700	700	701	701	700
30	701	702	702	702	702	702	703	703	703	702	702	701	701	700	700	699	699	699	699	699	699	700	700	700	701
31	700	700	700	700	700	700	701	701	701	701	700	700	699	698	697	697	696	696	696	696	696	697	697	697	698
HRAVE	701	701	701	701	701	701	701	702	702	702	702	701	701	700	699	699	698	698	699	699	700	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	***	***	699	698	698	698	699	701	702	702	701	701	700	699	700	702	703	701	699	700	702	702	702	701	701
MAX	***	***	699	700	700	700	702	703	703	703	703	703	702	700	702	704	704	703	701	701	703	704	704	702	702
MIN	***	***	698	696	696	696	696	699	700	700	698	698	698	697	699	701	701	699	697	698	700	701	700	698	699

DAY	26	27	28	29	30	31
AVE	701	699	700	700	701	698
MAX	702	701	701	702	703	701
MIN	699	698	698	698	699	696

MONTHLY AVERAGE = 700.3 MONTHLY MAXIMUM = 703.9 MONTHLY MINIMUM = 695.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 90.6% OPERATIONAL RECOVERY RATE = 90.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
AUGUST - 2018

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	31	34	33
4	37	39	42	46	49	51	48	46	42	36	33	29	27	24	23	23	23	23	23	26	28	28	29	30	34
5	33	37	38	39	40	43	42	38	33	31	29	27	24	24	23	22	22	21	23	22	25	26	26	28	30
6	32	33	34	35	38	41	41	41	34	29	25	22	19	18	17	17	17	16	17	19	22	26	27	29	27
7	31	33	36	38	41	43	42	39	34	35	33	30	28	26	24	24	25	26	37	55	57	37	60	51	37
8	59	63	72	73	72	71	70	66	58	53	42	41	39	37	37	36	35	36	39	37	38	38	39	44	50
9	48	51	50	51	52	57	59	53	46	42	38	34	31	30	28	27	27	31	32	46	56	55	54	80	45
10	84	75	86	87	85	88	88	84	76	64	53	46	42	39	35	36	38	37	55	59	53	61	60	58	62
11	60	61	55	52	55	56	57	52	46	42	39	34	31	28	26	24	22	23	28	34	38	43	48	50	42
12	50	59	59	64	68	66	73	64	54	45	39	36	33	31	29	27	29	57	69	70	72	71	71	69	54
13	72	72	74	85	82	84	82	71	56	47	43	41	39	36	35	36	36	37	39	43	46	48	50	54	54
14	57	60	63	66	66	70	71	64	59	54	49	45	42	39	37	36	35	36	38	33	33	36	40	50	49
15	52	63	70	69	69	69	67	66	60	55	47	42	41	40	40	39	33	33	37	39	42	43	45	47	50
16	51	52	53	58	64	70	70	71	66	62	61	59	57	49	45	42	40	41	42	49	52	52	56	58	55
17	58	60	63	69	72	73	74	66	57	50	46	43	38	37	36	36	35	35	37	40	43	45	45	48	50
18	50	51	54	57	60	61	61	54	48	45	41	38	35	34	34	34	33	33	34	37	38	39	38	38	44
19	39	43	43	43	47	51	52	48	45	42	39	36	33	30	29	29	30	29	32	34	36	37	40	42	39
20	45	46	48	50	54	56	55	49	43	38	36	35	33	33	30	29	28	29	31	34	36	38	38	40	40
21	38	38	39	40	69	84	82	74	75	63	53	45	41	36	37	37	38	38	42	43	45	45	76	83	53
22	81	82	87	87	88	86	88	81	69	51	44	39	41	46	51	52	53	59	60	62	64	65	65	67	65
23	69	71	76	74	71	72	68	67	62	56	51	72	81	75	60	57	57	56	59	66	68	72	74	76	67
24	76	78	78	76	82	83	82	73	63	56	51	46	41	38	37	36	36	57	93	99	98	94	90	92	69
25	92	93	91	92	92	98	98	92	86	80	75	69	56	39	34	33	32	33	39	46	52	58	62	65	67
26	69	71	75	79	80	82	83	73	63	52	49	52	51	47	48	39	38	39	39	46	53	57	60	62	59
27	60	59	60	63	65	69	68	63	55	46	41	35	30	26	22	20	18	18	19	22	24	28	32	35	41
28	33	35	39	43	44	48	48	44	40	34	30	30	29	26	24	23	22	20	20	22	23	24	27	31	32
29	33	35	39	42	44	51	50	45	40	35	28	24	20	19	17	17	18	18	21	23	25	26	29	32	30
30	35	45	50	49	49	52	52	50	43	39	36	32	26	26	23	27	27	27	28	31	33	34	36	40	37
31	42	43	46	49	52	54	53	48	42	37	36	32	28	28	27	26	26	27	28	31	34	35	37	40	38
HRAVE	53	55	58	60	62	65	65	60	53	47	42	40	37	34	32	32	31	33	38	42	44	45	48	51	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	***	***	33	34	30	27	37	50	45	62	42	54	54	49	50	55	50	44	39	40	53	65	67	69	67
MAX	***	***	34	51	43	41	60	73	80	88	61	73	85	71	70	71	74	61	52	56	84	88	81	99	98
MIN	***	***	31	23	21	16	24	35	27	35	22	27	35	33	33	40	35	33	29	28	36	39	51	36	32

DAY	26	27	28	29	30	31
AVE	59	41	32	30	37	38
MAX	83	69	48	51	52	54
MIN	38	18	20	17	23	26

MONTHLY AVERAGE = 47.0 MONTHLY MAXIMUM = 98.7 MONTHLY MINIMUM = 16.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 90.6% OPERATIONAL RECOVERY RATE = 90.6%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
AUGUST - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.87	0.66	0.48	0.33	0.13	0.01	0.00	0.00	0.00	0.00	2.48
4	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.49	0.67	0.83	0.93	0.97	0.94	0.87	0.68	0.48	0.33	0.13	0.01	0.00	0.00	0.00	0.00	7.70
5	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.29	0.49	0.68	0.83	0.92	0.96	0.95	0.85	0.68	0.48	0.33	0.12	0.01	0.00	0.00	0.00	0.00	7.68
6	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.49	0.69	0.85	0.78	0.86	0.93	0.86	0.68	0.46	0.32	0.12	0.01	0.00	0.00	0.00	0.00	7.42
7	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.27	0.45	0.66	0.81	0.91	0.95	0.93	0.85	0.68	0.43	0.35	0.12	0.01	0.00	0.00	0.00	0.00	7.51
8	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.15	0.44	0.43	0.79	0.70	0.75	0.94	0.88	0.67	0.41	0.32	0.12	0.01	0.00	0.00	0.00	0.00	6.65
9	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.45	0.54	0.80	0.85	0.59	0.67	0.76	0.69	0.42	0.33	0.12	0.01	0.00	0.00	0.00	0.00	6.54
10	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.19	0.42	0.66	0.77	0.85	0.57	0.51	0.84	0.67	0.40	0.25	0.08	0.00	0.00	0.00	0.00	0.00	6.25
11	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.48	0.66	0.82	0.92	0.96	0.94	0.86	0.70	0.35	0.35	0.12	0.00	0.00	0.00	0.00	0.00	7.50
12	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.47	0.66	0.81	0.91	0.95	0.93	0.85	0.69	0.17	0.00	0.01	0.00	0.00	0.00	0.00	0.00	6.80
13	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.48	0.66	0.80	0.89	0.92	0.90	0.81	0.65	0.32	0.28	0.09	0.00	0.00	0.00	0.00	0.00	7.15
14	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.41	0.64	0.79	0.88	0.91	0.89	0.81	0.66	0.37	0.28	0.09	0.00	0.00	0.00	0.00	0.00	7.05
15	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.15	0.22	0.63	0.76	0.87	0.34	0.20	0.36	0.55	0.36	0.28	0.10	0.00	0.00	0.00	0.00	0.00	4.88
16	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.17	0.23	0.27	0.34	0.48	0.80	0.77	0.65	0.44	0.29	0.07	0.00	0.00	0.00	0.00	0.00	4.61
17	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.42	0.66	0.76	0.76	0.96	0.90	0.76	0.66	0.39	0.31	0.12	0.00	0.00	0.00	0.00	0.00	7.03
18	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.47	0.67	0.81	0.90	0.96	0.93	0.74	0.57	0.37	0.29	0.09	0.00	0.00	0.00	0.00	0.00	7.15
19	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.28	0.44	0.68	0.82	0.91	0.95	0.92	0.83	0.68	0.35	0.29	0.09	0.00	0.00	0.00	0.00	0.00	7.30
20	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.45	0.65	0.80	0.90	0.84	0.69	0.80	0.66	0.38	0.23	0.12	0.00	0.00	0.00	0.00	0.00	6.84
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.26	0.54	0.74	0.62	0.58	0.37	0.33	0.20	0.16	0.09	0.02	0.00	0.00	0.00	0.00	0.00	3.99
22	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.41	0.59	0.79	0.90	0.31	0.17	0.16	0.23	0.10	0.04	0.01	0.00	0.00	0.00	0.00	0.00	3.92
23	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.14	0.25	0.44	0.42	0.06	0.13	0.38	0.46	0.29	0.22	0.12	0.04	0.00	0.00	0.00	0.00	0.00	2.99
24	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.31	0.48	0.56	0.80	0.89	0.93	0.91	0.87	0.65	0.36	0.09	0.01	0.00	0.00	0.00	0.00	0.00	6.94
25	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.16	0.19	0.29	0.44	0.82	0.91	0.82	0.68	0.38	0.25	0.09	0.00	0.00	0.00	0.00	0.00	5.18
26	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.24	0.44	0.65	0.78	0.20	0.58	0.20	0.36	0.65	0.37	0.23	0.08	0.00	0.00	0.00	0.00	0.00	4.84
27	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.46	0.66	0.81	0.91	0.90	0.85	0.83	0.68	0.41	0.25	0.06	0.00	0.00	0.00	0.00	0.00	7.13
28	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.47	0.67	0.81	0.91	0.95	0.92	0.82	0.67	0.39	0.24	0.07	0.00	0.00	0.00	0.00	0.00	7.24
29	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.48	0.67	0.82	0.92	0.96	0.93	0.84	0.68	0.38	0.24	0.06	0.00	0.00	0.00	0.00	0.00	7.32
30	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.40	0.49	0.63	0.85	0.90	0.55	0.80	0.25	0.25	0.22	0.06	0.00	0.00	0.00	0.00	0.00	5.57
31	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.46	0.65	0.80	0.89	0.93	0.89	0.81	0.66	0.38	0.23	0.05	0.00	0.00	0.00	0.00	0.00	7.06
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.22	0.41	0.59	0.74	0.78	0.78	0.75	0.74	0.60	0.36	0.25	0.08	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	***	***	2.48	7.70	7.68	7.42	7.51	6.65	6.54	6.25	7.50	6.80	7.15	7.05	4.88	4.61	7.03	7.15	7.30	6.84	3.99	3.92	2.99	6.94	5.18
MAX	***	***	0.87	0.97	0.96	0.93	0.95	0.94	0.85	0.85	0.96	0.95	0.92	0.91	0.87	0.80	0.96	0.96	0.95	0.90	0.74	0.90	0.46	0.93	0.91
MIN	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.84	7.13	7.24	7.32	5.57	7.06
MAX	0.78	0.91	0.95	0.96	0.90	0.93
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 91.7% OPERATIONAL RECOVERY RATE = 91.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
AUGUST - 2018

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.02
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.07
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.17	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.28
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.41	0.03	0.00	0.00	0.00	0.00	0.47
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	***	***	0.00	0.00	0.00	0.00	0.02	0.00	0.07	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.04	0.47	0.00
MAX	***	***	0.00	0.00	0.00	0.00	0.01	0.00	0.06	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.04	0.41	0.00
MIN	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.94 MONTHLY MAXIMUM = 0.41 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 91.7% OPERATIONAL RECOVERY RATE = 91.7%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (m/s)
SEPTEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	1.4	2.8	2.5	2.3	2.5	2.8	1.5	1.8	1.7	2.1	3.7	2.2	4.5	4.5	4.7	5.4	8.9	7.8	8.1	8.4	7.1	7.2	5.4	5.7	4.4
2	8.1	9.4	4.7	6.4	5.0	4.8	3.8	2.7	3.0	3.6	4.0	3.4	2.4	2.6	2.5	1.8	1.6	2.4	3.0	3.4	6.5	4.8	3.5	5.6	4.1
3	2.3	3.5	3.2	1.8	2.3	3.0	2.8	2.9	3.3	4.1	2.4	2.1	2.0	1.7	1.7	1.9	3.5	7.9	8.4	4.7	2.8	4.1	5.2	4.5	3.4
4	3.9	3.4	2.7	3.8	3.0	2.9	2.3	3.0	1.8	1.8	1.4	2.2	1.8	3.8	4.2	3.5	1.8	2.3	1.3	1.0	2.0	2.8	3.2	3.7	2.6
5	3.0	3.2	2.5	2.5	1.9	1.4	2.6	2.4	2.1	1.5	1.6	1.2	1.7	2.5	2.4	2.7	2.9	4.8	5.2	4.1	4.7	5.3	2.2	2.1	2.8
6	3.5	3.8	3.6	3.4	3.5	5.6	7.3	5.4	3.4	4.2	7.4	6.1	4.7	3.3	2.2	3.1	3.6	3.8	5.3	5.6	6.2	6.6	9.7	6.2	4.9
7	6.1	8.3	6.8	7.2	7.7	8.5	7.8	8.2	6.3	5.2	5.5	4.7	3.3	2.3	2.0	2.0	4.0	5.1	4.1	5.3	5.3	4.4	6.6	4.6	5.5
8	3.6	4.0	3.7	3.0	2.9	2.8	3.3	4.0	4.7	5.6	3.7	2.7	1.5	2.1	2.3	2.5	2.3	1.7	1.8	3.4	3.6	2.5	4.0	3.8	3.1
9	3.9	3.0	2.8	3.2	3.1	2.8	1.6	1.5	2.0	1.5	2.0	2.9	4.4	5.3	6.4	7.0	9.1	8.7	7.6	6.3	4.6	3.2	1.5	2.1	4.0
10	1.8	2.6	3.0	2.9	2.9	3.7	3.0	2.3	2.3	1.3	2.1	2.7	4.1	4.4	6.4	6.9	7.3	6.7	5.8	3.2	1.8	1.5	2.2	2.3	3.5
11	3.1	3.8	3.3	3.4	3.2	2.5	2.9	2.4	1.5	0.8	1.3	1.2	2.3	3.2	4.9	6.3	5.6	5.8	4.2	2.2	1.5	2.8	2.7	2.2	3.0
12	2.3	2.0	3.5	2.7	3.7	3.5	3.8	2.5	2.0	1.2	1.7	1.8	2.5	5.7	6.7	6.4	7.4	7.5	5.9	4.1	2.5	1.7	2.7	3.0	3.6
13	1.8	2.5	2.2	3.0	2.3	2.4	2.7	2.5	2.7	1.7	1.4	1.5	2.1	4.2	4.9	5.4	5.4	5.9	5.5	3.3	2.0	0.9	1.9	2.4	3.0
14	3.0	2.0	3.0	2.7	3.0	2.7	2.7	3.0	2.7	1.5	2.0	2.1	1.9	3.0	2.6	3.5	3.0	2.0	6.9	5.8	4.9	2.6	1.4	2.6	2.9
15	3.6	4.1	3.8	2.6	2.0	3.7	4.2	3.9	3.1	2.0	1.9	1.8	1.6	2.2	4.0	1.7	3.2	2.9	2.6	3.7	3.9	2.6	2.2	5.0	3.0
16	3.6	1.8	1.8	1.0	0.9	1.6	2.3	2.1	1.8	1.3	1.2	1.4	1.9	1.8	2.2	3.2	5.3	7.1	7.2	6.1	5.3	4.5	2.4	2.8	2.9
17	2.4	2.3	3.3	2.5	2.3	2.3	3.0	2.8	2.0	1.0	1.5	2.3	2.5	3.8	5.4	5.7	7.4	7.6	6.7	5.6	5.1	4.1	2.2	2.4	3.6
18	2.8	3.3	3.0	2.7	2.8	2.4	1.6	0.9	0.6	2.3	4.1	4.3	5.0	5.3	6.3	6.7	8.5	8.8	8.2	6.8	5.7	3.6	3.2	2.4	4.2
19	1.1	2.5	5.0	3.7	4.2	3.3	3.4	4.2	4.1	3.9	5.6	6.8	5.5	7.8	8.5	7.0	3.1	1.5	2.2	3.5	3.2	1.7	2.2	1.9	4.0
20	1.8	2.3	1.3	1.0	1.5	1.5	1.1	1.3	1.0	0.9	2.9	5.5	6.2	5.7	5.9	6.6	7.3	7.6	6.7	3.3	0.7	1.9	2.3	2.5	3.3
21	2.7	2.9	3.3	2.4	2.8	3.0	2.1	2.2	1.6	1.0	1.1	2.1	2.8	2.6	2.5	2.1	4.1	5.1	5.4	4.8	4.6	2.0	3.0	3.5	2.9
22	3.5	4.0	3.5	4.9	3.3	3.5	3.8	8.8	10.1	9.8	9.0	7.6	6.6	6.4	6.2	7.7	6.9	5.3	4.8	4.4	2.8	4.5	5.8	5.0	5.8
23	3.2	4.6	3.3	2.7	3.3	2.8	3.2	3.6	3.2	3.6	5.7	5.0	6.6	5.6	4.0	3.4	2.7	2.9	2.2	1.8	4.1	6.4	4.0	4.5	3.8
24	2.5	3.0	3.4	2.2	2.7	4.5	3.2	2.7	2.2	1.9	2.2	1.8	1.7	2.5	1.7	1.9	3.8	6.5	4.5	3.2	2.5	1.4	2.2	2.7	2.8
25	5.2	3.0	1.2	1.3	1.7	2.1	2.6	2.8	2.7	1.9	1.5	2.2	3.9	4.1	4.5	5.1	5.4	6.0	5.2	4.4	4.3	2.5	2.2	2.8	3.3
26	2.4	2.9	3.1	1.5	2.6	2.7	2.6	2.2	2.3	1.1	1.0	1.3	2.4	2.3	3.0	1.8	4.2	5.4	5.6	5.1	6.0	4.7	2.5	2.4	3.0
27	3.7	2.9	3.4	3.2	3.3	3.0	3.5	3.0	2.7	2.4	1.5	1.6	2.0	2.6	2.6	2.3	4.2	5.7	4.7	4.6	4.5	2.0	2.3	2.7	3.1
28	3.5	3.9	3.0	2.8	2.6	2.6	2.8	2.3	2.3	1.6	1.4	1.7	3.9	5.9	5.4	5.7	5.5	5.9	5.1	3.9	1.5	2.0	1.9	2.7	3.3
29	2.9	3.0	2.6	2.1	2.5	3.2	3.0	2.7	2.3	0.9	1.1	1.2	2.0	2.8	3.9	6.1	6.2	7.0	5.5	3.6	1.8	1.3	1.8	2.3	3.0
30	2.2	3.1	1.6	2.3	1.7	2.2	2.5	2.8	2.2	0.9	1.6	1.5	2.1	2.0	1.9	6.4	8.7	8.1	10.4	11.0	9.5	2.5	1.6	2.5	3.8
HRAVE	3.2	3.5	3.1	2.9	2.9	3.1	3.1	3.1	2.8	2.4	2.8	2.8	3.2	3.7	4.1	4.4	5.1	5.5	5.3	4.6	4.0	3.3	3.1	3.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.4	4.1	3.4	2.6	2.8	4.9	5.5	3.1	4.0	3.5	3.0	3.6	3.0	2.9	3.0	2.9	3.6	4.2	4.0	3.3	2.9	5.8	3.8	2.8	3.3
MAX	8.9	9.4	8.4	4.2	5.3	9.7	8.5	5.6	9.1	7.3	6.3	7.5	5.9	6.9	5.0	7.2	7.6	8.8	8.5	7.6	5.4	10.1	6.6	6.5	6.0
MIN	1.4	1.6	1.7	1.0	1.2	2.2	2.0	1.5	1.5	1.3	0.8	1.2	0.9	1.4	1.6	0.9	1.0	0.6	1.1	0.7	1.0	2.8	1.8	1.4	1.2

DAY	26	27	28	29	30	31
AVE	3.0	3.1	3.3	3.0	3.8	***
MAX	6.0	5.7	5.9	7.0	11.0	***
MIN	1.0	1.5	1.4	0.9	0.9	***

MONTHLY AVERAGE = 3.6 MONTHLY MAXIMUM = 11.0 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
SEPTEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	98	257	270	285	289	297	200	116	107	353	312	306	274	296	296	261	61	50	48	47	63	53	58	72	321
2	43	38	63	66	109	121	130	116	138	87	144	129	134	141	156	186	146	207	217	124	68	100	105	76	93
3	169	133	146	115	99	133	108	118	128	140	156	161	149	177	217	302	277	357	33	89	113	74	67	81	173
4	86	132	109	90	113	100	109	106	123	154	127	252	212	172	182	151	149	317	167	88	143	101	107	85	228
5	119	124	111	105	151	105	105	128	134	146	144	113	192	220	217	353	291	282	283	306	308	293	201	141	163
6	123	107	103	80	94	92	81	104	139	113	86	83	75	55	138	43	1	349	58	75	75	79	68	58	130
7	61	68	67	67	74	74	71	69	72	63	74	80	97	143	196	285	71	46	51	53	47	54	49	88	89
8	108	96	95	101	99	103	104	88	103	102	115	69	201	91	95	237	227	265	197	302	308	224	123	112	251
9	107	116	107	98	148	120	126	116	128	151	273	272	270	289	294	295	285	283	283	293	307	291	174	131	163
10	127	119	118	117	123	125	114	125	139	154	276	271	273	283	275	283	279	287	286	296	289	166	117	101	215
11	106	114	108	113	127	116	111	120	125	239	150	285	268	263	285	294	282	278	290	315	139	122	97	322	204
12	162	113	88	97	95	101	98	109	116	131	102	127	160	239	252	271	278	281	292	299	294	163	126	110	202
13	112	98	101	95	103	87	99	107	122	127	147	124	258	302	322	299	294	287	295	306	292	323	122	94	155
14	115	119	102	125	112	119	106	110	130	127	150	128	96	64	188	295	311	272	291	301	299	312	107	122	189
15	97	106	126	112	114	108	109	117	134	139	159	159	152	166	117	297	89	61	342	315	299	213	131	313	282
16	261	257	223	156	162	130	110	132	140	236	257	266	288	298	280	272	293	280	288	295	304	299	283	154	38
17	132	118	117	119	106	119	114	106	133	201	274	273	277	271	282	303	281	281	287	299	304	300	192	145	132
18	118	121	115	107	107	98	319	99	159	288	299	286	277	292	273	281	279	280	283	288	295	299	304	284	48
19	204	281	315	300	305	308	297	306	303	284	282	294	296	289	300	287	301	51	126	120	105	167	175	103	150
20	355	307	286	156	141	133	134	135	143	235	265	298	299	293	270	286	277	281	281	285	213	131	112	101	31
21	103	116	100	132	128	105	127	116	155	202	263	275	271	253	219	289	266	291	307	302	306	140	104	90	283
22	86	101	111	91	129	119	116	97	82	95	109	121	104	89	87	111	113	121	128	120	112	102	62	87	230
23	111	118	110	123	111	113	104	98	137	140	80	74	67	71	81	132	159	136	103	103	63	55	73	88	58
24	113	83	90	74	100	93	89	96	120	117	97	102	262	269	263	291	285	285	295	307	311	266	135	214	288
25	311	299	250	151	142	120	122	108	117	139	213	253	291	308	302	291	290	285	290	307	311	269	144	121	228
26	112	117	122	123	114	119	110	95	121	129	148	146	209	227	246	247	279	294	295	305	314	302	144	107	268
27	114	110	101	114	111	121	121	101	131	130	138	155	231	266	245	292	285	299	301	298	294	329	151	116	312
28	108	115	124	123	115	118	102	116	132	127	119	259	289	304	289	281	280	284	295	314	268	142	116	111	62
29	120	101	9	136	135	104	126	124	142	118	148	286	264	273	308	313	301	291	311	308	287	132	120	100	126
30	108	94	83	98	127	111	119	117	136	171	135	241	228	282	235	285	285	287	280	294	312	228	145	166	334

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
SEPTEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	36	33	27	17	17	15	28	15	28	40	22	40	40	23	19	36	14	11	11	8	12	11	14	11	22
2	11	13	42	13	15	25	14	20	14	20	23	24	41	28	40	41	42	22	12	46	13	42	16	10	24
3	25	17	12	12	13	13	11	15	14	17	27	33	56	61	63	58	30	32	14	31	19	11	8	12	25
4	13	14	12	8	10	11	8	12	26	28	44	31	57	15	19	22	18	32	41	36	8	20	11	7	21
5	10	6	11	8	16	23	8	9	18	25	30	55	47	56	32	28	28	12	7	6	6	7	35	11	21
6	8	12	9	10	11	15	9	15	15	29	14	19	24	47	42	56	29	26	17	9	10	10	8	13	19
7	13	7	13	7	8	6	8	6	8	12	15	24	34	47	48	48	32	35	27	9	12	12	7	18	19
8	8	9	10	15	16	17	14	13	15	16	19	42	66	44	46	48	45	39	21	11	7	19	9	7	23
9	8	16	55	19	9	6	30	29	23	50	29	23	23	23	20	18	12	10	8	7	8	8	27	9	20
10	10	7	12	10	8	7	8	12	16	38	51	27	31	28	18	13	13	14	8	7	12	16	8	13	16
11	7	8	8	8	7	7	8	11	27	66	37	56	48	45	24	19	16	16	11	20	16	14	36	29	23
12	45	11	8	11	9	10	9	9	15	34	27	35	76	25	27	19	19	10	10	6	9	28	7	7	19
13	11	11	10	9	10	12	7	15	12	26	32	45	35	23	26	20	19	13	10	7	12	30	10	10	17
14	7	23	6	9	8	6	7	8	14	27	26	40	49	32	53	31	27	44	9	7	4	15	31	9	21
15	10	11	11	10	19	11	9	9	9	22	26	45	56	46	27	32	39	12	21	9	7	23	36	14	21
16	19	23	16	45	19	10	8	8	17	42	61	47	38	37	43	29	17	9	8	7	7	5	19	10	23
17	7	9	8	8	8	9	7	7	20	37	35	35	43	23	22	17	11	9	7	7	7	5	21	6	15
18	9	7	10	11	11	17	25	27	47	31	22	19	19	25	17	15	9	9	8	6	7	9	8	14	16
19	26	31	8	9	9	10	8	9	12	13	14	11	13	9	9	13	33	23	12	9	13	46	41	22	17
20	41	18	15	20	9	9	9	13	33	32	19	15	14	18	14	13	9	8	6	20	47	11	9	8	17
21	9	8	9	7	6	12	9	12	17	29	28	22	23	28	31	40	14	9	7	7	6	59	11	7	17
22	10	8	14	15	19	22	19	12	11	12	11	13	19	20	22	12	14	16	12	9	19	9	14	10	14
23	16	11	11	18	9	12	11	13	13	19	16	16	11	17	25	22	21	21	10	19	13	9	12	13	15
24	19	11	10	19	18	14	9	8	11	16	15	49	46	34	40	38	20	9	8	8	8	25	7	30	20
25	11	26	18	25	14	11	9	10	13	21	45	30	18	22	22	20	15	8	7	6	6	22	9	5	16
26	8	7	6	51	8	8	6	9	14	46	55	58	42	33	21	62	17	11	8	7	6	27	8	10	22
27	10	8	9	7	9	7	5	10	14	17	38	38	41	29	47	35	18	15	8	6	5	26	25	9	18
28	7	9	7	8	7	8	7	8	13	23	41	31	30	20	23	15	17	10	6	8	29	8	12	13	15
29	9	35	28	18	13	8	9	11	15	42	36	56	35	49	35	18	17	11	9	6	32	12	9	8	22
30	14	9	31	11	12	13	11	15	14	39	29	37	42	58	66	17	7	7	9	9	8	23	35	9	22
HRAVE	15	14	15	15	11	12	11	12	17	29	29	34	37	32	31	29	21	17	12	12	12	19	17	12	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	22	24	25	21	21	19	19	23	20	16	23	19	17	21	21	23	15	16	17	17	17	14	15	20	16
MAX	40	46	63	57	56	56	48	66	55	51	66	76	45	53	56	61	43	47	46	47	59	22	25	49	45
MIN	8	10	8	7	6	8	6	7	6	7	7	6	7	4	7	5	5	6	8	6	6	8	9	7	5

DAY	26	27	28	29	30	31
AVE	22	18	15	22	22	***
MAX	62	47	41	56	66	***
MIN	6	5	6	6	7	***

MONTHLY AVERAGE = 19.3 MONTHLY MAXIMUM = 76.4 MONTHLY MINIMUM = 4.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
SEPTEMBER - 2018

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	31.0	32.1	31.4	31.0	30.2	29.8	29.0	30.4	31.2	32.9	34.0	34.5	35.1	36.0	36.1	35.0	30.0	29.8	29.4	29.5	29.2	29.1	28.6	27.7	31.4
2	26.5	25.7	22.9	22.5	21.1	20.0	19.9	22.0	24.0	26.2	28.4	29.4	31.0	32.5	33.6	32.9	32.9	32.6	31.6	29.6	28.0	26.9	25.9	25.4	27.1
3	24.8	24.1	23.0	22.6	22.4	21.1	21.1	23.0	25.0	27.2	28.8	30.4	31.8	33.0	33.5	34.2	34.5	32.6	29.2	28.6	27.6	27.0	26.5	26.1	27.4
4	25.1	24.1	23.5	23.0	22.1	22.2	22.3	23.9	26.0	28.3	30.3	31.3	33.8	33.0	33.0	28.1	30.9	29.8	28.9	29.4	27.7	27.4	26.9	26.9	27.4
5	25.7	25.2	24.4	24.1	22.9	22.6	22.6	23.7	26.0	28.1	30.5	32.8	35.0	35.8	35.2	34.2	36.0	36.0	34.5	32.8	32.5	31.1	29.6	28.7	29.6
6	27.4	27.0	26.4	26.0	25.8	25.9	26.2	27.2	28.8	31.1	32.4	33.7	34.8	35.4	36.2	36.9	36.1	36.0	34.5	33.5	32.4	31.1	30.2	29.0	31.0
7	28.2	27.7	27.0	26.5	26.0	25.4	25.7	26.8	28.5	30.4	32.3	33.9	35.0	36.0	36.6	37.0	36.9	35.8	34.8	33.9	33.4	32.6	32.0	30.3	31.4
8	28.9	28.4	27.2	26.6	26.2	25.5	25.3	27.4	30.2	32.4	34.2	35.2	36.3	36.9	38.1	38.8	38.8	38.2	37.2	35.5	34.8	33.2	31.2	30.6	32.4
9	29.5	28.4	27.5	27.2	25.7	25.9	25.6	26.9	29.1	31.5	32.3	34.1	36.3	37.0	38.2	38.6	38.3	37.6	35.9	34.3	33.7	33.2	31.8	31.0	32.1
10	29.8	28.4	27.6	27.1	26.1	25.3	25.5	26.8	29.0	31.2	33.0	35.2	37.0	38.1	38.7	38.6	38.1	37.1	35.8	34.6	33.7	32.3	31.0	30.0	32.1
11	28.6	28.0	27.1	26.2	25.1	24.6	24.5	26.3	27.9	30.9	33.7	36.2	37.7	38.7	39.4	39.1	38.9	38.1	36.7	35.5	33.6	32.1	31.6	30.7	32.1
12	29.6	29.8	28.5	27.6	26.2	24.8	24.9	26.2	28.4	31.4	34.5	36.5	37.9	39.3	39.4	38.9	38.5	37.7	36.2	34.5	33.5	31.9	30.4	29.3	32.3
13	28.5	26.9	26.2	24.7	24.2	22.8	22.9	23.6	26.2	29.6	32.6	35.6	36.9	38.0	38.4	38.5	38.3	37.5	36.0	34.3	33.7	32.6	30.5	29.3	31.2
14	27.9	26.7	25.6	25.0	24.0	23.3	23.0	25.2	27.5	30.6	33.9	36.6	38.6	39.5	40.4	40.6	40.1	39.7	37.6	35.8	34.8	34.1	32.8	31.2	32.3
15	29.9	28.7	28.1	27.0	25.2	25.0	25.1	26.9	29.4	32.7	35.5	37.4	39.2	40.2	39.9	39.4	39.2	38.4	37.5	36.3	35.7	34.0	32.8	33.0	33.2
16	31.8	31.2	29.7	28.8	27.8	26.5	26.3	27.2	29.4	31.4	33.2	34.8	36.0	37.7	38.4	39.2	38.7	37.7	36.0	34.7	33.7	33.0	32.3	30.9	32.8
17	30.2	29.3	28.6	28.0	27.1	26.4	26.1	27.7	29.9	31.9	34.1	36.7	38.2	39.2	39.9	39.9	39.5	38.4	36.5	35.2	34.3	33.8	32.3	31.4	33.1
18	30.1	29.5	28.6	28.1	27.3	26.9	25.5	27.0	28.8	31.6	33.5	35.1	36.5	37.5	37.7	37.9	37.5	36.5	35.0	33.8	33.1	32.5	31.9	31.3	32.2
19	30.4	30.1	29.7	29.2	29.0	28.7	28.4	28.5	29.3	29.2	29.3	29.0	28.3	27.0	23.0	21.8	21.0	21.7	21.7	21.6	22.0	22.1	22.0	21.9	26.0
20	21.8	21.5	21.3	21.0	20.3	20.4	20.2	21.1	22.7	24.1	25.6	27.4	28.6	29.5	30.1	30.5	30.4	29.8	28.3	27.5	27.3	26.3	25.4	24.9	25.3
21	24.2	23.7	23.2	22.4	21.7	21.6	21.1	22.7	23.9	26.0	27.7	30.0	32.2	33.9	35.4	35.2	35.1	34.1	32.3	30.9	30.4	28.8	28.0	27.2	28.0
22	26.4	26.0	25.1	25.2	23.3	23.5	24.0	27.2	28.3	29.4	30.8	32.3	33.1	33.5	34.3	34.2	33.7	32.9	31.5	30.2	29.6	28.6	28.8	27.2	29.1
23	25.6	24.5	23.9	22.8	23.0	22.5	21.8	22.5	24.8	28.2	31.0	32.1	33.1	33.9	34.6	35.1	34.9	33.9	32.7	31.4	30.9	30.6	29.4	28.2	28.8
24	27.1	26.2	25.4	25.4	24.9	25.2	25.3	25.2	26.0	27.3	30.2	32.2	32.8	33.2	33.0	33.8	34.0	33.2	32.0	30.9	30.5	30.0	28.6	28.3	29.2
25	28.4	27.8	26.8	25.3	24.3	24.0	22.9	24.6	26.2	28.8	30.5	32.0	32.8	33.4	34.4	34.4	34.3	33.3	31.7	30.8	30.3	29.4	27.7	27.1	29.2
26	26.4	25.5	24.8	23.7	22.5	22.2	21.9	23.1	25.4	28.2	31.0	33.4	34.8	35.4	35.9	36.2	36.0	34.9	33.2	31.9	31.3	30.7	28.5	27.8	29.4
27	26.7	25.6	25.0	23.8	23.0	22.4	21.7	23.6	25.9	28.6	31.2	33.8	35.4	36.3	37.0	36.7	37.0	35.8	34.1	32.7	31.8	31.0	29.4	28.2	29.9
28	26.9	26.3	24.8	23.8	23.2	22.0	21.9	22.5	25.0	28.0	31.2	33.1	35.4	36.2	36.7	36.7	36.3	35.2	33.3	32.5	31.1	29.7	28.4	27.3	29.5
29	26.0	25.7	24.4	23.2	22.7	22.7	21.5	23.1	25.2	28.2	31.0	33.3	34.8	35.8	35.9	35.9	35.6	34.6	33.1	32.1	30.9	29.9	28.5	27.4	29.2
30	26.4	25.4	25.0	23.7	23.0	22.2	22.4	22.5	24.4	27.1	30.9	33.0	35.3	35.8	36.4	35.7	33.7	32.4	30.8	24.8	23.1	23.1	23.6	23.4	27.7
HRAVE	27.7	27.0	26.1	25.4	24.6	24.0	23.8	25.2	27.1	29.4	31.6	33.4	34.8	35.6	36.0	35.8	35.5	34.7	33.3	32.0	31.2	30.3	29.2	28.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	31.4	27.1	27.4	27.4	29.6	31.0	31.4	32.4	32.1	32.1	32.1	32.3	31.2	32.3	33.2	32.8	33.1	32.2	26.0	25.3	28.0	29.1	28.8	29.2	29.2
MAX	36.1	33.6	34.5	33.8	36.0	36.9	37.0	38.8	38.6	38.7	39.4	39.4	38.5	40.6	40.2	39.2	39.9	37.9	30.4	30.5	35.4	34.3	35.1	34.0	34.4
MIN	27.7	19.9	21.1	22.1	22.6	25.8	25.4	25.3	25.6	25.3	24.5	24.8	22.8	23.0	25.0	26.3	26.1	25.5	21.0	20.2	21.1	23.3	21.8	24.9	22.9

DAY	26	27	28	29	30	31
AVE	29.4	29.9	29.5	29.2	27.7	***
MAX	36.2	37.0	36.7	35.9	36.4	***
MIN	21.9	21.7	21.9	21.5	22.2	***

MONTHLY AVERAGE = 30.1 MONTHLY MAXIMUM = 40.6 MONTHLY MINIMUM = 19.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
SEPTEMBER - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.1	0.1	0.2	0.2	0.2	0.3	0.1	-0.6	-0.8	-1.0	-1.3	-1.0	-1.0	-1.1	-0.9	-0.9	-0.6	-0.4	-0.2	-0.1	0.0	-0.1	-0.1	-0.1	-0.4
2	-0.2	-0.1	0.1	0.0	0.2	0.2	0.5	-0.2	-1.0	-1.3	-1.7	-1.7	-1.5	-1.5	-1.3	-0.8	-0.6	-0.4	-0.2	0.0	-0.1	0.0	-0.1	-0.1	-0.5
3	0.0	0.0	0.0	0.2	0.3	0.2	-0.3	-1.0	-1.4	-1.8	-1.5	-1.4	-1.3	-1.2	-1.0	-1.0	-1.0	-0.6	-0.2	0.0	0.1	0.1	0.1	0.1	-0.5
4	0.1	0.2	0.2	0.2	0.4	0.2	-0.2	-1.0	-1.0	-1.2	-0.9	-1.0	-1.1	-1.4	-1.3	0.6	0.0	0.2	0.4	0.4	0.8	0.8	0.6	0.8	-0.1
5	0.6	0.3	0.4	0.3	0.4	0.5	0.2	-0.7	-1.0	-0.9	-1.0	-1.0	-1.1	-1.2	-0.8	-0.2	-0.6	-0.6	0.0	0.6	0.6	0.4	0.4	0.4	-0.2
6	0.3	0.3	0.3	0.4	0.3	0.3	0.0	-0.7	-1.4	-1.5	-1.7	-1.8	-1.7	-1.4	-1.2	-1.1	-0.5	-0.3	0.1	0.2	0.2	0.2	0.1	0.0	-0.4
7	0.1	0.1	0.1	0.1	0.1	0.1	-0.1	-0.6	-1.1	-1.3	-1.7	-1.8	-1.7	-1.3	-1.2	-0.9	-0.6	-0.3	0.0	0.2	0.2	0.2	0.1	0.2	-0.5
8	0.4	0.3	0.2	0.3	0.4	0.2	0.0	-0.7	-1.4	-1.8	-2.0	-1.6	-1.2	-1.3	-1.4	-1.1	-0.8	-0.5	-0.2	0.3	0.5	0.5	0.3	0.3	-0.4
9	0.2	0.4	0.5	0.5	0.5	0.3	0.2	-0.8	-1.2	-1.0	-0.9	-1.1	-1.4	-1.1	-1.4	-1.3	-1.0	-0.6	-0.2	0.1	0.3	0.4	0.5	0.5	-0.3
10	0.5	0.5	0.4	0.2	0.5	0.4	-0.1	-0.8	-1.3	-0.9	-0.9	-1.0	-1.3	-1.2	-1.3	-1.2	-0.9	-0.6	-0.1	0.3	0.5	0.6	0.7	0.5	-0.3
11	0.5	0.3	0.4	0.2	0.3	0.3	0.0	-1.1	-0.9	-0.8	-0.9	-0.9	-1.1	-1.1	-1.3	-1.2	-0.9	-0.6	-0.1	0.6	0.6	0.6	0.7	0.9	-0.2
12	0.7	0.8	1.0	0.7	0.5	0.4	0.1	-1.1	-1.1	-0.9	-1.4	-1.3	-1.2	-1.4	-1.4	-1.1	-0.9	-0.6	-0.1	0.4	0.6	0.4	0.5	0.4	-0.2
13	0.4	0.8	0.8	0.6	0.5	0.4	0.3	-0.6	-1.3	-1.2	-1.0	-1.2	-1.0	-1.4	-1.1	-1.1	-0.9	-0.6	-0.1	0.5	0.5	0.5	0.7	0.6	-0.2
14	0.8	0.7	0.6	0.5	0.4	0.5	0.0	-1.1	-1.4	-1.0	-1.4	-1.3	-1.2	-1.4	-1.3	-1.1	-0.8	-0.4	-0.1	0.2	0.4	0.5	0.6	0.7	-0.3
15	0.9	0.4	0.3	0.7	0.8	0.9	0.6	-0.8	-1.4	-1.3	-1.3	-1.1	-1.2	-1.3	-1.0	-0.6	-0.4	0.0	0.4	0.5	0.7	0.5	0.4	0.3	-0.1
16	0.4	0.3	0.4	0.2	0.3	0.3	0.2	-0.6	-0.8	-0.7	-0.8	-0.9	-1.1	-1.2	-1.0	-1.1	-1.0	-0.6	-0.2	0.1	0.2	0.3	0.4	0.3	-0.3
17	0.2	0.2	0.3	0.3	0.4	0.3	-0.1	-1.1	-1.2	-0.7	-0.8	-1.1	-1.2	-1.2	-1.3	-1.2	-0.9	-0.6	-0.1	0.2	0.3	0.4	0.6	0.4	-0.3
18	0.3	0.4	0.2	0.3	0.4	0.5	0.4	-0.3	-0.5	-0.7	-1.1	-1.3	-1.3	-1.4	-1.3	-1.2	-0.9	-0.6	-0.1	0.1	0.1	0.2	0.2	0.3	-0.3
19	0.3	0.1	0.0	0.0	0.0	0.0	0.0	-0.2	-0.5	-0.3	-0.4	-0.6	-0.4	-0.3	0.0	-0.1	0.0	-0.1	-0.1	-0.1	0.3	0.2	0.3	0.3	-0.1
20	0.3	0.3	0.2	0.3	0.3	0.2	0.2	-0.4	-0.5	-0.4	-0.6	-0.8	-0.9	-0.9	-0.9	-0.8	-0.6	-0.3	0.1	0.3	0.2	0.3	0.3	0.4	-0.2
21	0.4	0.3	0.3	0.3	0.3	0.3	0.2	-0.8	-0.7	-0.5	-0.5	-0.8	-0.9	-0.8	-1.1	-0.7	-0.7	-0.4	0.3	0.4	0.5	0.5	0.4	0.6	-0.1
22	0.6	0.5	0.5	0.5	1.0	0.6	0.6	-0.3	-0.7	-1.1	-1.5	-1.7	-1.6	-1.2	-1.0	-0.7	-0.2	0.2	0.4	0.5	0.3	0.5	0.3	0.3	-0.1
23	0.5	1.0	0.8	0.9	0.8	1.1	1.1	0.2	-1.0	-1.4	-1.5	-1.5	-1.2	-1.0	-1.0	-1.0	-0.5	0.2	0.8	0.7	0.6	0.2	0.3	0.4	0.0
24	0.4	0.6	0.4	0.2	0.2	0.2	0.3	0.1	-0.4	-0.6	-1.4	-1.2	-0.9	-0.8	-0.5	-0.7	-0.6	-0.3	0.1	0.3	0.4	0.3	0.2	0.3	-0.1
25	0.3	0.4	0.4	0.4	0.4	0.5	0.1	-0.9	-1.3	-1.2	-0.8	-1.1	-1.2	-1.1	-1.2	-1.0	-0.8	-0.4	0.1	0.3	0.4	0.5	0.3	0.4	-0.3
26	0.3	0.4	0.4	0.4	0.6	0.5	0.3	-0.4	-1.2	-0.9	-0.8	-1.1	-1.2	-1.1	-1.1	-0.8	-0.8	-0.4	0.1	0.3	0.4	0.4	0.4	0.5	-0.2
27	0.6	0.5	0.5	0.4	0.3	0.4	0.2	-0.9	-1.3	-1.3	-1.0	-1.2	-1.1	-0.9	-1.2	-0.8	-0.7	-0.2	0.3	0.5	0.6	0.6	0.6	0.5	-0.2
28	0.6	0.3	0.5	0.4	0.4	0.5	0.4	-0.7	-1.1	-1.1	-1.0	-0.9	-1.1	-1.0	-1.1	-1.0	-0.7	-0.3	0.2	0.6	1.1	0.7	0.6	0.7	-0.1
29	0.6	0.4	0.8	0.8	0.6	0.5	0.7	-0.7	-1.1	-0.6	-0.8	-0.9	-0.9	-1.1	-1.0	-0.8	-0.6	-0.3	0.2	0.5	0.7	0.5	0.6	0.7	-0.1
30	0.6	0.5	0.7	0.5	0.3	0.5	0.2	0.0	-0.8	-0.6	-1.3	-0.8	-1.1	-1.0	-0.9	-1.0	-0.3	-0.1	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-0.2
HRAVE	0.4	0.4	0.4	0.4	0.4	0.4	0.2	-0.6	-1.0	-1.0	-1.1	-1.2	-1.2	-1.1	-1.1	-0.9	-0.7	-0.4	0.1	0.3	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.4	-0.5	-0.5	-0.1	-0.2	-0.4	-0.5	-0.4	-0.3	-0.3	-0.2	-0.2	-0.2	-0.3	-0.1	-0.3	-0.3	-0.3	-0.1	-0.2	-0.1	-0.1	0.0	-0.1	-0.3
MAX	0.3	0.5	0.3	0.8	0.6	0.4	0.2	0.5	0.5	0.7	0.9	1.0	0.8	0.8	0.9	0.4	0.6	0.5	0.3	0.4	0.6	1.0	1.1	0.6	0.5
MIN	-1.3	-1.7	-1.8	-1.4	-1.2	-1.8	-1.8	-2.0	-1.4	-1.3	-1.3	-1.4	-1.4	-1.4	-1.4	-1.2	-1.3	-1.4	-0.6	-0.9	-1.1	-1.7	-1.5	-1.4	-1.3

DAY	26	27	28	29	30	31
AVE	-0.2	-0.2	-0.1	-0.1	-0.2	***
MAX	0.6	0.6	1.1	0.8	0.7	***
MIN	-1.2	-1.3	-1.1	-1.1	-1.3	***

MONTHLY AVERAGE = -0.2 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
SEPTEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	697	697	697	697	698	698	698	699	699	699	699	698	698	697	696	696	696	696	696	696	697	697	698	698	697
2	698	699	700	700	700	701	701	701	701	701	701	701	700	699	699	698	698	698	698	698	699	700	700	701	700
3	701	701	701	701	701	701	701	702	702	702	702	701	700	699	699	698	698	698	698	699	699	699	699	699	700
4	699	700	700	700	700	700	701	701	701	701	701	701	700	699	699	698	698	698	698	699	699	699	700	700	700
5	700	700	700	700	700	701	702	702	702	703	702	702	701	701	700	700	700	700	700	700	701	701	701	702	701
6	702	702	702	702	703	703	703	704	704	704	704	703	702	702	701	700	700	700	700	701	701	702	702	702	702
7	702	702	702	702	702	702	703	703	703	703	703	702	702	701	700	699	699	699	699	699	700	700	700	701	701
8	701	701	701	701	701	701	701	701	702	702	701	701	700	699	699	698	697	697	697	697	698	698	698	698	699
9	699	699	699	699	699	699	700	700	701	701	700	700	699	698	698	697	697	697	697	697	698	698	698	699	699
10	699	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	698	698
11	698	698	698	699	699	699	699	700	700	700	700	699	698	698	697	697	697	696	696	697	697	697	698	698	698
12	698	698	698	699	699	699	699	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	699	698
13	699	699	699	699	699	700	700	701	701	701	701	700	700	699	699	698	698	698	698	698	699	699	699	699	699
14	699	699	699	699	699	699	700	700	700	700	700	699	699	698	697	697	696	696	696	697	697	697	697	697	698
15	698	698	698	698	698	699	699	699	700	700	699	699	698	697	697	697	696	696	696	697	697	698	698	698	698
16	699	699	699	699	700	700	700	701	701	701	701	700	700	699	698	698	697	697	698	698	698	699	699	699	699
17	699	699	699	699	699	699	699	700	700	700	700	699	698	698	697	697	696	696	696	696	697	697	698	698	698
18	698	698	699	699	699	699	700	700	700	700	699	699	698	697	697	696	696	696	696	696	697	697	697	697	698
19	697	697	697	697	697	697	697	698	698	698	698	698	698	697	698	698	697	697	698	698	698	698	698	697	698
20	697	697	698	698	698	698	699	699	699	699	699	699	699	698	698	698	698	698	698	699	700	700	700	700	699
21	701	701	701	701	701	702	702	703	703	703	703	702	702	701	700	700	700	700	700	701	701	702	702	702	701
22	702	702	702	702	702	703	703	703	703	703	703	703	702	701	700	700	700	700	700	700	700	700	700	701	701
23	701	701	701	701	701	701	701	702	702	702	701	701	700	699	698	698	697	697	697	697	698	698	698	698	699
24	698	698	698	698	699	699	699	700	700	700	700	699	699	698	697	697	697	697	697	697	698	698	698	699	698
25	699	699	699	699	700	700	700	701	701	701	701	701	700	700	699	699	699	699	699	699	700	700	700	700	700
26	700	701	701	701	701	701	702	702	703	703	702	702	701	701	700	700	699	699	699	700	700	700	701	701	701
27	701	701	701	701	701	701	702	702	702	702	702	701	700	699	699	698	698	698	698	698	699	699	699	699	700
28	699	699	699	700	700	700	701	701	701	701	701	700	700	699	699	698	698	698	699	699	699	699	699	699	700
29	700	700	700	700	700	701	701	702	702	702	702	701	700	700	699	699	699	699	699	699	699	699	700	700	700
30	700	700	700	700	700	700	701	701	701	702	701	700	699	699	698	697	697	698	698	700	700	700	700	701	700
HRAVE	699	699	700	700	700	700	700	701	701	701	701	700	700	699	698	698	698	698	698	698	699	699	699	699	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	697	700	700	700	701	702	701	699	699	698	698	698	699	698	698	699	698	698	698	699	701	701	699	698	700
MAX	699	701	702	701	703	704	703	702	701	700	700	700	701	700	700	701	700	700	698	700	703	703	702	700	701
MIN	696	698	698	698	700	700	699	697	697	697	696	697	698	696	696	697	696	696	697	697	700	700	697	697	699

DAY	26	27	28	29	30	31
AVE	701	700	700	700	700	***
MAX	703	702	701	702	702	***
MIN	699	698	698	699	697	***

MONTHLY AVERAGE = 699.4 MONTHLY MAXIMUM = 704.0 MONTHLY MINIMUM = 695.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
SEPTEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	41	39	39	40	42	42	45	42	42	37	36	36	36	34	33	36	49	49	50	49	51	52	53	55	43
2	60	59	77	82	93	98	99	88	76	64	57	53	47	42	37	37	36	39	43	46	49	52	56	58	60
3	61	62	72	76	75	81	81	69	57	50	43	39	33	29	28	28	29	33	41	42	47	50	52	52	51
4	56	60	65	66	70	71	70	61	53	47	43	42	35	37	37	63	48	49	54	52	60	61	60	58	55
5	62	63	69	72	76	79	77	71	61	51	43	34	30	31	31	35	28	25	25	27	26	32	40	42	47
6	49	53	54	54	54	52	49	48	44	39	36	34	31	28	25	23	25	24	29	31	33	35	38	42	39
7	44	45	45	46	47	48	48	46	43	40	37	33	29	28	26	23	21	25	28	29	31	34	36	40	36
8	43	46	48	50	51	53	54	48	42	37	33	32	29	25	21	20	21	21	23	27	27	29	32	34	35
9	36	38	42	43	47	48	48	44	39	36	39	36	30	27	25	24	24	23	27	30	32	31	34	36	35
10	38	42	43	45	47	49	49	44	39	36	37	33	26	22	19	19	19	23	23	25	27	29	33	32	33
11	36	38	40	42	44	46	46	41	38	32	27	21	18	16	15	15	16	16	18	21	23	26	26	28	29
12	29	31	31	33	35	37	38	35	32	27	23	18	17	15	16	17	17	17	18	19	20	22	25	28	25
13	30	29	32	33	35	37	36	34	31	25	19	15	13	12	12	13	14	16	16	18	19	21	24	27	23
14	28	30	32	33	35	37	37	33	29	24	21	18	17	16	16	15	16	16	18	20	21	22	24	26	24
15	28	30	30	34	37	37	36	33	28	24	22	20	18	17	17	18	18	20	21	22	22	23	26	28	25
16	32	36	40	43	45	50	49	46	41	38	35	31	28	23	21	21	23	25	28	31	33	33	34	37	34
17	39	41	43	44	46	48	48	43	38	34	32	28	25	23	20	19	21	22	24	27	29	30	32	33	33
18	35	36	38	40	42	43	45	41	37	35	33	30	27	26	26	25	25	26	29	30	31	34	36	37	34
19	38	42	53	56	58	58	59	59	56	58	56	57	59	68	95	100	100	100	100	100	99	91	89	89	72
20	90	92	94	96	100	99	100	96	84	78	76	68	64	62	59	57	56	56	61	64	65	69	75	77	77
21	80	80	82	84	87	86	86	78	73	64	58	49	41	32	22	22	27	32	38	42	41	48	51	53	56
22	55	49	55	54	62	63	62	53	49	45	41	35	33	30	28	24	22	23	24	26	29	31	31	35	40
23	38	39	41	44	48	50	52	50	47	37	31	28	24	22	21	19	19	20	23	24	22	20	22	25	32
24	33	34	34	35	36	35	37	38	39	37	32	36	37	37	38	36	34	37	39	43	44	44	50	49	38
25	40	39	42	47	50	51	52	48	42	38	32	29	28	27	26	26	26	28	31	32	33	34	39	42	37
26	44	47	48	53	57	57	59	54	46	38	32	28	26	24	22	22	23	25	28	29	30	30	35	38	37
27	39	43	45	47	50	52	53	47	41	35	32	28	23	20	18	19	19	21	23	24	26	29	30	33	33
28	36	36	40	43	45	48	47	45	39	33	28	24	20	19	19	19	19	21	24	25	27	29	33	34	31
29	37	38	40	42	44	45	47	43	39	33	28	25	24	23	22	22	23	24	27	28	30	32	36	37	33
30	40	41	43	45	46	50	49	48	43	36	29	27	24	24	22	26	30	33	40	78	88	88	84	85	47
HRAVE	44	45	49	51	53	55	55	51	46	40	36	33	30	28	27	28	28	30	32	35	37	39	41	43	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	43	60	51	55	47	39	36	35	35	33	29	25	23	24	25	34	33	34	72	77	56	40	32	38	37
MAX	55	99	81	71	79	54	48	54	48	49	46	38	37	37	37	50	48	45	100	100	87	63	52	50	52
MIN	33	36	28	35	25	23	21	20	23	19	15	15	12	15	17	21	19	25	38	56	22	22	19	32	26

DAY	26	27	28	29	30	31
AVE	37	33	31	33	47	***
MAX	59	53	48	47	88	***
MIN	22	18	19	22	22	***

MONTHLY AVERAGE = 39.9 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 12.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
SEPTEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.15	0.29	0.52	0.76	0.50	0.42	0.57	0.35	0.25	0.14	0.14	0.03	0.00	0.00	0.00	0.00	0.00	4.16
2	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.45	0.64	0.78	0.88	0.91	0.89	0.81	0.35	0.30	0.04	0.01	0.00	0.00	0.00	0.00	0.00	6.24
3	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.45	0.64	0.79	0.89	0.93	0.90	0.81	0.66	0.40	0.28	0.06	0.00	0.00	0.00	0.00	0.00	7.10
4	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.45	0.65	0.72	0.83	0.86	0.24	0.40	0.36	0.15	0.09	0.03	0.00	0.00	0.00	0.00	0.00	5.07
5	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.21	0.43	0.64	0.80	0.89	0.93	0.81	0.32	0.49	0.39	0.18	0.05	0.00	0.00	0.00	0.00	0.00	6.19
6	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.45	0.64	0.78	0.88	0.92	0.89	0.81	0.69	0.29	0.17	0.04	0.00	0.00	0.00	0.00	0.00	6.85
7	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.44	0.63	0.78	0.88	0.92	0.88	0.79	0.64	0.42	0.17	0.04	0.00	0.00	0.00	0.00	0.00	6.87
8	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.44	0.63	0.78	0.88	0.91	0.89	0.80	0.64	0.42	0.19	0.04	0.00	0.00	0.00	0.00	0.00	6.90
9	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.44	0.63	0.78	0.90	0.90	0.63	0.79	0.64	0.44	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.63
10	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.44	0.63	0.78	0.88	0.91	0.88	0.79	0.62	0.41	0.16	0.03	0.00	0.00	0.00	0.00	0.00	6.80
11	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.45	0.65	0.80	0.90	0.93	0.90	0.80	0.63	0.42	0.15	0.03	0.00	0.00	0.00	0.00	0.00	6.95
12	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.46	0.65	0.80	0.89	0.92	0.88	0.78	0.62	0.41	0.13	0.03	0.00	0.00	0.00	0.00	0.00	6.86
13	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.16	0.41	0.65	0.80	0.90	0.93	0.90	0.79	0.62	0.41	0.16	0.02	0.00	0.00	0.00	0.00	0.00	6.79
14	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.45	0.63	0.78	0.88	0.91	0.87	0.78	0.61	0.41	0.16	0.02	0.00	0.00	0.00	0.00	0.00	6.77
15	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.20	0.46	0.61	0.75	0.65	0.87	0.67	0.33	0.24	0.25	0.09	0.01	0.00	0.00	0.00	0.00	0.00	5.17
16	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.42	0.62	0.75	0.83	0.83	0.86	0.75	0.59	0.38	0.14	0.02	0.00	0.00	0.00	0.00	0.00	6.44
17	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.42	0.61	0.75	0.85	0.88	0.85	0.75	0.59	0.38	0.14	0.02	0.00	0.00	0.00	0.00	0.00	6.49
18	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.41	0.60	0.75	0.84	0.87	0.83	0.73	0.57	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	6.37
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.20	0.11	0.28	0.17	0.09	0.06	0.03	0.01	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.11
20	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.21	0.41	0.60	0.74	0.84	0.86	0.82	0.72	0.56	0.36	0.12	0.01	0.00	0.00	0.00	0.00	0.00	6.26
21	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.42	0.61	0.76	0.86	0.90	0.86	0.75	0.58	0.38	0.13	0.01	0.00	0.00	0.00	0.00	0.00	6.50
22	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.41	0.60	0.75	0.85	0.88	0.84	0.74	0.59	0.39	0.14	0.01	0.00	0.00	0.00	0.00	0.00	6.43
23	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.43	0.62	0.77	0.87	0.90	0.86	0.75	0.58	0.37	0.12	0.01	0.00	0.00	0.00	0.00	0.00	6.53
24	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.20	0.23	0.72	0.83	0.88	0.40	0.25	0.42	0.28	0.09	0.01	0.00	0.00	0.00	0.00	0.00	4.41
25	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.21	0.41	0.61	0.74	0.78	0.80	0.73	0.71	0.55	0.35	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.03
26	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.14	0.41	0.60	0.74	0.84	0.87	0.82	0.72	0.55	0.34	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.18
27	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.41	0.60	0.74	0.84	0.87	0.82	0.71	0.54	0.34	0.12	0.00	0.00	0.00	0.00	0.00	0.00	6.22
28	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.41	0.60	0.75	0.85	0.87	0.82	0.71	0.55	0.34	0.12	0.00	0.00	0.00	0.00	0.00	0.00	6.25
29	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.59	0.74	0.83	0.85	0.81	0.70	0.54	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.00	6.13
30	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.28	0.54	0.73	0.82	0.82	0.74	0.66	0.44	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	5.24
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.20	0.41	0.59	0.75	0.82	0.84	0.76	0.66	0.52	0.33	0.13	0.02	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.16	6.24	7.10	5.07	6.19	6.85	6.87	6.90	6.63	6.80	6.95	6.86	6.79	6.77	5.17	6.44	6.49	6.37	1.11	6.26	6.50	6.43	6.53	4.41	6.03
MAX	0.76	0.91	0.93	0.86	0.93	0.92	0.92	0.91	0.90	0.91	0.93	0.92	0.93	0.91	0.87	0.86	0.88	0.87	0.28	0.86	0.90	0.88	0.90	0.88	0.80
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.18	6.22	6.25	6.13	5.24	***
MAX	0.87	0.87	0.87	0.85	0.82	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
SEPTEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.01	0.00	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.93	0.00	0.03	0.01	0.00	0.00	0.00	1.32
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.16	0.00	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.08	0.00	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 1.64 MONTHLY MAXIMUM = 0.93 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

OCTOBER 2018 THROUGH MARCH 2019

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

August 2019

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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Appendix B – Data Screening and Validation Results
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period October 2018 through March 2019. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the audit and calibration results. Appendix B presents the data screening results. Appendix C presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

There were no significant operational events during the reporting period, besides the audit and calibration that occurred on January 16, 2019.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A performance audit of all equipment was performed on January 16, 2019. Audit results are presented in Appendix A, and they indicate that the meteorological systems were operating within the acceptable DQO ranges. A calibration was performed immediately after the audit; those results are also presented in Appendix A and they also indicate acceptable instrument accuracy.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were -3.2, 0.0, and -4.0 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix B presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix B presents comments from the manual review.

The only data edits that were required were related to the precipitation sensor. During a site inspection on October 31, 2018, it was noted that insects had blocked the opening on the precipitation sensor bucket. A detailed comparison of the ST-10 precipitation data to other nearby ASARCO precipitation sensors was performed, which clearly indicated that the ST-10 sensor began to read low as of October 7, 2018. Therefore, all ST-10 precipitation data was invalidated from October 7, 2018, at 09:00 until October 31, 2018, at 11:00.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these data capture goals, except for the precipitation sensor for the 4th quarter 2018.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Oct-18	100	100	100	100	100	100	22.4
Nov-18	100	100	100	100	100	100	100
Dec-18	100	100	100	100	100	100	100
Jan-19	99.3	99.3	99.3	99.3	99.3	99.3	99.3
Feb-19	100	100	100	100	100	100	100
Mar-19	100	100	100	100	100	100	100
Apr-19							
May-19							
Jun-19							
Jul-19							
Aug-19							
Sep-19							
Quarter 1	100.0	100.0	100.0	100.0	100.0	100.0	73.3
Quarter 2	99.8	99.8	99.8	99.8	99.8	99.8	99.8
Quarter 3							
Quarter 4							
Total	99.9	99.9	99.9	99.9	99.9	99.9	86.6

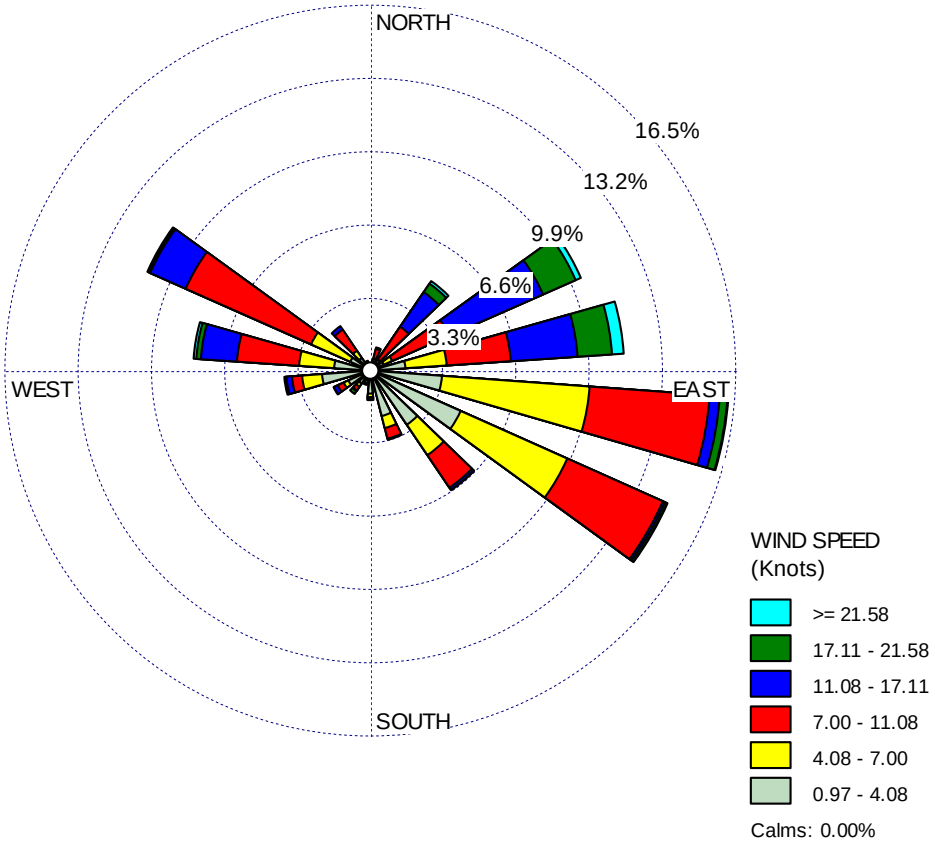
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix C presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly valid 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east-southeast (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours with higher wind speeds). This is similar to wind patterns previously observed at the monitoring site.

Figure 1 – 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Audit and Calibration Results

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 1/16/2019 Auditor: Sam Kaney

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 158704
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY81502
Wind Speed Audit Standard:	RM Young 18820 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Measurement Specialties 4600 SN 11I105727

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
300	3.4	3.4	0.0	-1.0%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.5 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	2	4	2
45	42	44	2
90	87	89	2
135	132	133	1
180	177	177	0
225	222	221	-1
270	267	266	-1
315	312	311	-1

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic) = 347

Vane alignment rod (true) = 357

Sensor Measured Alignment (magnetic) = 348

Sensor Measured Alignment (true) = 358

Alignment Difference (degrees) 1

Note - for fixture tests of combined linearity and orientation, the fixture index direction must be adjusted for:

Data logger offset of -4 degrees plus any alignment difference = -3 degrees

WD Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 11 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	-0.01	-0.1	-0.01	-0.1	0.00
14.7	14.68	0.0	14.68	0.0	0.03
47.8	47.94	0.1	47.93	0.1	0.02

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.48	0.47	-0.01	-1%

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

(Note - sensor mV readings are converted to kw/m2 by multiplying 0.1047) mVolt reading 4.6

104.7

Comments:

Audit started at 08:50, ended at 10:50

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 1/16/2019 By: Eli Fredrickson

RM Young Wind Monitor AQ Sensor SN :	SN 158704
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY81502
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Campbell CS215 SN E16175
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN CA04015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Streamline Pro SN CU06012, temp. probe T060102B
Relative Humidity Standard	Extech RH390 SN 130327978

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
300	3.44	3.4	0.0	-1.0%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.5 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	2	1
45	41	42	1
90	86	86	0
135	131	131	0
180	176	175	-1
225	221	221	0
270	266	266	0
315	311	311	0

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Magnetic Deviation (east is positive) =	10.3
Vane alignment rod (magnetic reading) =	348
Vane alignment rod (true reading) =	358
Sensor Measured Alignment (magnetic) =	348
Sensor Measured Alignment (true) =	358
Alignment Difference (degrees)	0

Note - for fixture tests of combined linearity and orientation, the fixture index direction must be adjusted for:

Data logger offset of -4 degrees plus any alignment difference = -4 degrees

WD Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 11 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.0	-0.01	0.0	-0.01	0.0	0.00
14.6	14.68	0.1	14.68	0.1	0.03
47.6	47.94	0.3	47.93	0.3	0.02

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
59.0	66.1	7.1

For RH the DQO limit is ± 7%

BAROMETRIC PRESSURE SENSOR

(mm Hg)	(mm Hg)	(mm Hg)
706.2	708.1	1.9

Acceptable tolerance is 2.3 mm Hg

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.20	0.20	0.00

Note: Input 100 ml for a target of 0.20 inches (20 tips).
The water must be input over at least 5 minutes.
Tested from 10:15 through 10:45

Comments:

Calibration start 08:50
Calibration end 10:55

APPENDIX B

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2018-March 2019 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
5	WS	18100123	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.18	Light to moderate winds in stable early morning period - WS is valid
5	WS	18100405	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.19	Light to moderate winds in stable early morning period - WS is valid
5	WS	18100923	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.2	Moderate winds in stable early morning period - WS is valid
5	WS	18101005	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.15	Moderate winds in stable early morning period - WS is valid
5	WS	18101709	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.19	Moderate to strong winds in stable early morning period - WS is valid
5	WS	18110206	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.12	Moderate winds in stable early morning period - WS is valid
5	WS	18111604	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.04	Moderate to strong winds in stable early morning period - WS is valid
5	WS	18112123	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.16	Moderate winds in stable early morning period - WS is valid
5	WS	18112312	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.17	Moderate winds in stable early morning period - WS is valid
5	WS	18112402	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.19	Moderate winds in stable early morning period - WS is valid
5	WS	18112508	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.14	Moderate winds in stable early morning period - WS is valid
5	WS	18112718	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.19	Moderate winds in stable early evening period - WS is valid
5	WS	18112809	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.14	Moderate winds in stable early morning period - WS is valid
5	WS	18112810	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.05	Moderate winds in stable early morning period - WS is valid
5	WS	18120111	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.01	Moderate winds in stable early morning period - WS is valid
5	WS	18120607	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.16	Moderate winds in stable early morning period - WS is valid
5	WS	18120718	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.2	Moderate winds in stable early evening period - WS is valid
5	WS	18121007	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.2	Moderate to strong winds in stable early morning period - WS is valid
5	WS	18121902	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.18	Moderate winds in stable early morning period - WS is valid
5	WS	18122708	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.22	Moderate winds in stable early morning period - WS is valid
5	WS	18123101	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.1	Moderate winds in stable early morning period - WS is valid
5	WS	19010216	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.22	Moderate winds in stable early evening period - WS is valid
5	WS	19010315	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.18	Moderate winds - WS is valid
5	WS	19010320	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.11	Moderate winds in stable early evening period - WS is valid
5	WS	19010605	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.19	Moderate winds in stable early morning period - WS is valid
5	WS	19011205	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.17	Moderate winds in stable early morning period - WS is valid
5	WS	19011307	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.1	Moderate winds in stable early morning period - WS is valid
5	WS	19011404	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.18	Moderate winds in stable early morning period - WS is valid
5	WS	19011814	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.22	Moderate winds - WS is valid
5	WS	19012223	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.07	Moderate winds in stable early morning period - WS is valid
5	WS	19020505	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.03	Moderate winds in stable early morning period - WS is valid
5	WS	19021210	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.19	Moderate winds - WS is valid
5	WS	19021704	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.05	Moderate winds in stable early morning period - WS is valid
5	WS	19021900	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.02	Moderate winds in stable early morning period - WS is valid
5	WS	19021919	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.09	Moderate winds in stable early evening period - WS is valid
5	WS	19022011	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.13	Moderate winds - WS is valid
5	WS	19022504	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.19	Moderate winds in stable early morning period - WS is valid
5	WS	19022516	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.12	Moderate winds in stable early morning period - WS is valid
5	WS	19030407	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.06	Moderate winds in stable early morning period - WS is valid
5	WS	19030610	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.21	Moderate winds in stable early morning period - WS is valid
5	WS	19030821	st10 WS varying < (.1ms) .223 mph for 3 hrs	0.16	Moderate winds in stable early evening period - WS is valid
12	WD	18101618	st10 WD varying < 1 deg for 3 hrs	0.24	Moderate to high steady wind speeds - WD is valid
12	WD	18101619	st10 WD varying < 1 deg for 3 hrs	0.33	Moderate to high steady wind speeds - WD is valid
12	WD	18101908	st10 WD varying < 1 deg for 3 hrs	0.7	Moderate to high steady wind speeds - WD is valid
12	WD	18101909	st10 WD varying < 1 deg for 3 hrs	0.6	Moderate to high steady wind speeds - WD is valid
12	WD	18102202	st10 WD varying < 1 deg for 3 hrs	0.88	Moderate to high steady wind speeds - WD is valid
12	WD	18110921	st10 WD varying < 1 deg for 3 hrs	0.91	Moderate to high steady wind speeds - WD is valid
12	WD	18111004	st10 WD varying < 1 deg for 3 hrs	0.52	Moderate to high steady wind speeds - WD is valid
12	WD	18111005	st10 WD varying < 1 deg for 3 hrs	0.48	Moderate to high steady wind speeds - WD is valid
12	WD	18111006	st10 WD varying < 1 deg for 3 hrs	0.4	Moderate to high steady wind speeds - WD is valid
12	WD	18111402	st10 WD varying < 1 deg for 3 hrs	0.79	Moderate to high steady wind speeds - WD is valid
12	WD	18111500	st10 WD varying < 1 deg for 3 hrs	0.39	Moderate to high steady wind speeds - WD is valid
12	WD	18120509	st10 WD varying < 1 deg for 3 hrs	0.92	Moderate to high steady wind speeds - WD is valid
12	WD	18120903	st10 WD varying < 1 deg for 3 hrs	0.7	Moderate to high steady wind speeds - WD is valid
12	WD	18120904	st10 WD varying < 1 deg for 3 hrs	0.7	Moderate to high steady wind speeds - WD is valid
12	WD	18120915	st10 WD varying < 1 deg for 3 hrs	0.67	Moderate to high steady wind speeds - WD is valid
12	WD	18121021	st10 WD varying < 1 deg for 3 hrs	0.28	Moderate to high steady wind speeds - WD is valid
12	WD	18121101	st10 WD varying < 1 deg for 3 hrs	0.19	Moderate to high steady wind speeds - WD is valid
12	WD	18121110	st10 WD varying < 1 deg for 3 hrs	0.96	Moderate to high steady wind speeds - WD is valid
12	WD	18121422	st10 WD varying < 1 deg for 3 hrs	0.35	Moderate to high steady wind speeds - WD is valid
12	WD	18121912	st10 WD varying < 1 deg for 3 hrs	0.5	Light wind speeds - WD is valid
12	WD	18122500	st10 WD varying < 1 deg for 3 hrs	0.8	Moderate to high steady wind speeds - WD is valid
12	WD	19010608	st10 WD varying < 1 deg for 3 hrs	0.7	Moderate to high steady wind speeds - WD is valid
12	WD	19010823	st10 WD varying < 1 deg for 3 hrs	0.58	Moderate to high steady wind speeds - WD is valid
12	WD	19010904	st10 WD varying < 1 deg for 3 hrs	0.73	Moderate to high steady wind speeds - WD is valid
12	WD	19012703	st10 WD varying < 1 deg for 3 hrs	0.5	Moderate to high steady wind speeds - WD is valid
12	WD	19012921	st10 WD varying < 1 deg for 3 hrs	0.85	Moderate to high steady wind speeds - WD is valid
12	WD	19030100	st10 WD varying < 1 deg for 3 hrs	0.7	Moderate to high steady wind speeds - WD is valid
12	WD	19031404	st10 WD varying < 1 deg for 3 hrs	0.7	Moderate to high steady wind speeds - WD is valid
12	WD	19031522	st10 WD varying < 1 deg for 3 hrs	0.34	Moderate to high steady wind speeds - WD is valid
13	WD	18121021	st10 WD varying < 10 deg for 18 hrs	7.86	Moderate to high steady wind speeds - WD is valid
13	WD	19010820	st10 WD varying < 10 deg for 18 hrs	7.73	Moderate to high steady wind speeds - WD is valid
22	DT	18101210	day delta T >0.1C	0.12	Wind Shift, after rain event - data is valid
22	DT	18102310	day delta T >0.1C	0.78	Wind Shift, variable high winds, likely frontal passage - data is valid
22	DT	18102311	day delta T >0.1C	0.45	Wind Shift, variable high winds, likely frontal passage - data is valid
22	DT	18102313	day delta T >0.1C	0.29	Wind Shift, variable high winds, likely frontal passage - data is valid
22	DT	18102314	day delta T >0.1C	0.25	Wind Shift, variable high winds, likely frontal passage - data is valid
22	DT	18102315	day delta T >0.1C	0.21	Wind Shift, variable high winds, likely frontal passage - data is valid
22	DT	18120714	day delta T >0.1C	0.1	Wind Shift, after rain event - data is valid
22	DT	18120914	day delta T >0.1C	0.12	Wind Shift - data is valid
22	DT	18120915	day delta T >0.1C	0.22	Wind Shift - data is valid
22	DT	19010415	day delta T >0.1C	0.11	Slightly above QC threshold - data is reasonable and valid
22	DT	19010814	day delta T >0.1C	0.1	Slightly above QC threshold - data is reasonable and valid
22	DT	19010815	day delta T >0.1C	0.16	Slightly above QC threshold - data is reasonable and valid
22	DT	19020310	day delta T >0.1C	0.13	Wind Shift, after rain event - data is valid
23	DT	18113003	night delta T <-0.1C	-0.11	Slightly above QC threshold - data is reasonable and valid
23	DT	18113004	night delta T <-0.1C	-0.1	Slightly above QC threshold - data is reasonable and valid
23	DT	19010101	night delta T <-0.1C	-0.17	Slightly above QC threshold - wind shift - data is reasonable and valid

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ITYPE	PARM	DATE	CODE	Value	Comments
23	DT	19010102	night delta T <-0.1C	-0.1	Slightly above QC threshold - data is reasonable and valid
23	DT	19010103	night delta T <-0.1C	-0.11	Slightly above QC threshold - data is reasonable and valid
30	2T	19020809	2mT ROC> 5C	5.09	Morning transition from strong insolation - Temp is valid
30	2T	19033010	2mT ROC> 5C	5.37	Morning transition from strong insolation - Temp is valid
50	RH	18100102	RH out of range	95.3	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100103	RH out of range	97.1	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100104	RH out of range	96.2	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100106	RH out of range	99.6	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100107	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100108	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100109	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100110	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100111	RH out of range	98.3	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100112	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100113	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100114	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100115	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100116	RH out of range	95.5	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100118	RH out of range	96.8	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100119	RH out of range	98.2	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100120	RH out of range	99.7	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100121	RH out of range	98.2	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100122	RH out of range	96.5	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100123	RH out of range	95.3	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100200	RH out of range	95.9	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100201	RH out of range	96.6	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100202	RH out of range	96.8	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100203	RH out of range	99.7	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100204	RH out of range	97.7	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100205	RH out of range	99.3	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100206	RH out of range	96.9	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100219	RH out of range	96.9	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100220	RH out of range	99	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100221	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100222	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100223	RH out of range	99.5	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100300	RH out of range	97.9	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100301	RH out of range	99.7	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100302	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100303	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100304	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100305	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100306	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100307	RH out of range	100	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100308	RH out of range	98	After rain event - cooler morning/evening hours - data is reasonable and valid
50	RH	18100400	RH out of range	97.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	18100401	RH out of range	98.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18100402	RH out of range	95.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18100403	RH out of range	95.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18100404	RH out of range	95.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18100406	RH out of range	97.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18100407	RH out of range	99.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	18100710	RH out of range	95.8	After rain event - - data is reasonable and valid
50	RH	18101205	RH out of range	99.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101206	RH out of range	99.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101207	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101208	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101209	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101210	RH out of range	99.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101211	RH out of range	97.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101309	RH out of range	99.3	Cooler temperature - data is reasonable and valid
50	RH	18101311	RH out of range	98.9	Cooler temperature - data is reasonable and valid
50	RH	18101312	RH out of range	100	Cooler temperature - data is reasonable and valid
50	RH	18101313	RH out of range	99.3	Cooler temperature - data is reasonable and valid
50	RH	18101314	RH out of range	98.8	Cooler temperature - data is reasonable and valid
50	RH	18101315	RH out of range	100	Cooler temperature - data is reasonable and valid
50	RH	18101316	RH out of range	100	Cooler temperature - data is reasonable and valid
50	RH	18101317	RH out of range	100	Cooler temperature - data is reasonable and valid
50	RH	18101318	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101319	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101320	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101321	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101322	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101323	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101400	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101401	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101402	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101403	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101404	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101405	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101406	RH out of range	98.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101407	RH out of range	98.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101408	RH out of range	95.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101501	RH out of range	97.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101502	RH out of range	95.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101503	RH out of range	99.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101504	RH out of range	99.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	18101505	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid

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50	RH	18101506	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18102404	RH out of range	95.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	18102406	RH out of range	95.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	18102505	RH out of range	97.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	18102506	RH out of range	99.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	18113003	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18113004	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18113005	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18113006	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18113007	RH out of range	99.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	18113008	RH out of range	97.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120102	RH out of range	95.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120103	RH out of range	97.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120104	RH out of range	99.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120105	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120106	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120107	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120108	RH out of range	98.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120302	RH out of range	96.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120303	RH out of range	98	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120304	RH out of range	99.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120305	RH out of range	99.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120306	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120307	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120619	RH out of range	95.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120620	RH out of range	99.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120621	RH out of range	99.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120622	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120623	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120700	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120701	RH out of range	99.2	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120702	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	18120703	RH out of range	99.5	After rain event - - data is reasonable and valid
50	RH	18120704	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	18120705	RH out of range	99.4	After rain event - - data is reasonable and valid
50	RH	18120706	RH out of range	98.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120707	RH out of range	97.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120708	RH out of range	96.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120713	RH out of range	96.4	After rain event - - data is reasonable and valid
50	RH	18120714	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	18120715	RH out of range	98.2	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120716	RH out of range	96.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120717	RH out of range	96.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120718	RH out of range	95.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120719	RH out of range	97	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120720	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120721	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120722	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120723	RH out of range	99.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120800	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120801	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120802	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120803	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120804	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120805	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120806	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120807	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120808	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120809	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120810	RH out of range	97.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120822	RH out of range	98.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120823	RH out of range	99.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120900	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120901	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120902	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120903	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120904	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120905	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120906	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120907	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18120908	RH out of range	98.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122523	RH out of range	97.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122600	RH out of range	95.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122601	RH out of range	97.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122602	RH out of range	98.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122603	RH out of range	99.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122604	RH out of range	99.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122605	RH out of range	99.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122606	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122607	RH out of range	99.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122608	RH out of range	99.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122609	RH out of range	96.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122705	RH out of range	96.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122706	RH out of range	98.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122707	RH out of range	98.2	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122801	RH out of range	96	After rain event - - data is reasonable and valid
50	RH	18122802	RH out of range	98.7	After rain event - - data is reasonable and valid
50	RH	18122803	RH out of range	98.9	Cooler morning/evening hours - data is reasonable and valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2018-March 2019 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
50	RH	18122804	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122805	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122806	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122807	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	18122808	RH out of range	98.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	18123119	RH out of range	98	After rain event - - data is reasonable and valid
50	RH	18123120	RH out of range	99.7	After rain event - - data is reasonable and valid
50	RH	18123121	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	18123122	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	18123123	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010100	RH out of range	99.7	After rain event - - data is reasonable and valid
50	RH	19010101	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010102	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010103	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010104	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010105	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010106	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010107	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010108	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010109	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010110	RH out of range	97.2	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010301	RH out of range	96.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010302	RH out of range	95.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010303	RH out of range	96.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010304	RH out of range	96.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010305	RH out of range	96.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010306	RH out of range	97	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010307	RH out of range	97.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010601	RH out of range	95.7	After rain event - - data is reasonable and valid
50	RH	19010602	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010603	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010604	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010605	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010606	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010607	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010608	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010609	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19010610	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010611	RH out of range	98.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010616	RH out of range	96.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010617	RH out of range	95.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010618	RH out of range	99.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010619	RH out of range	99.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010620	RH out of range	99.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010621	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010622	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010623	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010700	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010701	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010702	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010703	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010704	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010705	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010706	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010707	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010708	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010709	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010710	RH out of range	95.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	19010803	RH out of range	95.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011101	RH out of range	95.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011102	RH out of range	96.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011103	RH out of range	98.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011104	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011105	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011106	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011107	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011108	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011200	RH out of range	95.2	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011201	RH out of range	95.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011202	RH out of range	97.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011203	RH out of range	96.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011204	RH out of range	95.2	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011205	RH out of range	96.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011206	RH out of range	96.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011207	RH out of range	97.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011301	RH out of range	96.7	After rain event - - data is reasonable and valid
50	RH	19011302	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19011303	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011304	RH out of range	99.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011305	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011306	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011307	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011308	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011309	RH out of range	98.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011401	RH out of range	96.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011402	RH out of range	96.6	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011403	RH out of range	96.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011404	RH out of range	97.6	Cooler morning/evening hours - data is reasonable and valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2018-March 2019 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
50	RH	19011405	RH out of range	98.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011406	RH out of range	98.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011407	RH out of range	98.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011408	RH out of range	97.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011604	RH out of range	98.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011605	RH out of range	99.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011606	RH out of range	99.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011607	RH out of range	100	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011608	RH out of range	97.2	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011702	RH out of range	97.5	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011703	RH out of range	99.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011704	RH out of range	99.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011705	RH out of range	97.9	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011706	RH out of range	97.4	Cooler morning/evening hours - data is reasonable and valid
50	RH	19011707	RH out of range	98.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19020105	RH out of range	97.1	Cooler morning/evening hours - data is reasonable and valid
50	RH	19020106	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020107	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020108	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020109	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020204	RH out of range	97.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	19020205	RH out of range	98.7	Cooler morning/evening hours - data is reasonable and valid
50	RH	19020206	RH out of range	98.3	Cooler morning/evening hours - data is reasonable and valid
50	RH	19020207	RH out of range	97.8	Cooler morning/evening hours - data is reasonable and valid
50	RH	19020307	RH out of range	99.4	After rain event - - data is reasonable and valid
50	RH	19020308	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020309	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020310	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020311	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020312	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020313	RH out of range	99.9	After rain event - - data is reasonable and valid
50	RH	19020314	RH out of range	96.6	After rain event - - data is reasonable and valid
50	RH	19020316	RH out of range	99	After rain event - - data is reasonable and valid
50	RH	19020317	RH out of range	98.6	After rain event - - data is reasonable and valid
50	RH	19020318	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020319	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020320	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020321	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020322	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020323	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020400	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020401	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020402	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020403	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020404	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020405	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020406	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020407	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020408	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020409	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19020410	RH out of range	99	After rain event - - data is reasonable and valid
50	RH	19020411	RH out of range	95.6	After rain event - - data is reasonable and valid
50	RH	19020412	RH out of range	97.4	After rain event - - data is reasonable and valid
50	RH	19020415	RH out of range	98.8	After rain event - - data is reasonable and valid
50	RH	19020604	RH out of range	97.5	After rain event - - data is reasonable and valid
50	RH	19020605	RH out of range	97.3	After rain event - - data is reasonable and valid
50	RH	19020606	RH out of range	96	After rain event - - data is reasonable and valid
50	RH	19020607	RH out of range	95.8	After rain event - - data is reasonable and valid
50	RH	19020608	RH out of range	99.4	After rain event - - data is reasonable and valid
50	RH	19021416	RH out of range	97.2	After rain event - - data is reasonable and valid
50	RH	19021417	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021418	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021419	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021420	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021421	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021422	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021423	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021500	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021501	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021502	RH out of range	99.9	After rain event - - data is reasonable and valid
50	RH	19021503	RH out of range	96.4	After rain event - - data is reasonable and valid
50	RH	19021504	RH out of range	99.1	After rain event - - data is reasonable and valid
50	RH	19021505	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021506	RH out of range	99.9	After rain event - - data is reasonable and valid
50	RH	19021507	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021508	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021509	RH out of range	99.6	After rain event - - data is reasonable and valid
50	RH	19021812	RH out of range	95.4	Cooler temperature - data is reasonable and valid
50	RH	19021818	RH out of range	95.4	After rain event - - data is reasonable and valid
50	RH	19021819	RH out of range	98.2	After rain event - - data is reasonable and valid
50	RH	19021820	RH out of range	99	After rain event - - data is reasonable and valid
50	RH	19021821	RH out of range	99.8	After rain event - - data is reasonable and valid
50	RH	19021822	RH out of range	98.5	After rain event - - data is reasonable and valid
50	RH	19021823	RH out of range	99.8	After rain event - - data is reasonable and valid
50	RH	19021900	RH out of range	99.6	After rain event - - data is reasonable and valid
50	RH	19021901	RH out of range	99.8	After rain event - - data is reasonable and valid
50	RH	19021902	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021903	RH out of range	100	After rain event - - data is reasonable and valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2018-March 2019 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
50	RH	19021904	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021905	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021906	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021907	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19021908	RH out of range	99.3	After rain event - - data is reasonable and valid
50	RH	19022118	RH out of range	98.8	After rain event - - data is reasonable and valid
50	RH	19022119	RH out of range	99.9	After rain event - - data is reasonable and valid
50	RH	19022120	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022121	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022122	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022123	RH out of range	99.7	After rain event - - data is reasonable and valid
50	RH	19022200	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022201	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022202	RH out of range	99.6	After rain event - - data is reasonable and valid
50	RH	19022203	RH out of range	99.1	After rain event - - data is reasonable and valid
50	RH	19022204	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022205	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022206	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022207	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022208	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022209	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022210	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022211	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022212	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022213	RH out of range	99.8	After rain event - - data is reasonable and valid
50	RH	19022214	RH out of range	96.4	After rain event - - data is reasonable and valid
50	RH	19022218	RH out of range	95.4	After rain event - - data is reasonable and valid
50	RH	19022219	RH out of range	99.6	After rain event - - data is reasonable and valid
50	RH	19022220	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022221	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022222	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022223	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022300	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022301	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022302	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022303	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022304	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022305	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022306	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022307	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022308	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19022504	RH out of range	98.6	Cooler temperature - data is reasonable and valid
50	RH	19022505	RH out of range	98.1	Cooler temperature - data is reasonable and valid
50	RH	19022506	RH out of range	99.9	Cooler temperature - data is reasonable and valid
50	RH	19022507	RH out of range	99.6	Cooler temperature - data is reasonable and valid
50	RH	19031202	RH out of range	96.6	After rain event - - data is reasonable and valid
50	RH	19031203	RH out of range	98.4	After rain event - - data is reasonable and valid
50	RH	19031204	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19031205	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19031206	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19031207	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19031208	RH out of range	100	After rain event - - data is reasonable and valid
50	RH	19031209	RH out of range	97.9	After rain event - - data is reasonable and valid
61	SR	19012512	solarad more than 5% above 0.66	0.7	Slightly above QC threshold - data is reasonable and valid
61	SR	19012612	solarad more than 5% above 0.66	0.7	Slightly above QC threshold - data is reasonable and valid
61	SR	19022312	solarad more than 5% above 0.79	0.85	Slightly above QC threshold - data is reasonable and valid
61	SR	19022612	solarad more than 5% above 0.79	0.84	Slightly above QC threshold - data is reasonable and valid
61	SR	19022812	solarad more than 5% above 0.79	0.84	Slightly above QC threshold - data is reasonable and valid
70	PC	18100112	High HR precipt > 0.2"	0.27	Rain at nearby station - data is reasonable and valid
70	PC	18103109	High HR precipt > 0.2"	0.4	Rain at nearby station previous day - data is reasonable and valid
70	PC	19021420	High HR precipt > 0.2"	0.24	Rain at nearby station - data is reasonable and valid
70	PC	19021421	High HR precipt > 0.2"	0.33	Rain at nearby station - data is reasonable and valid

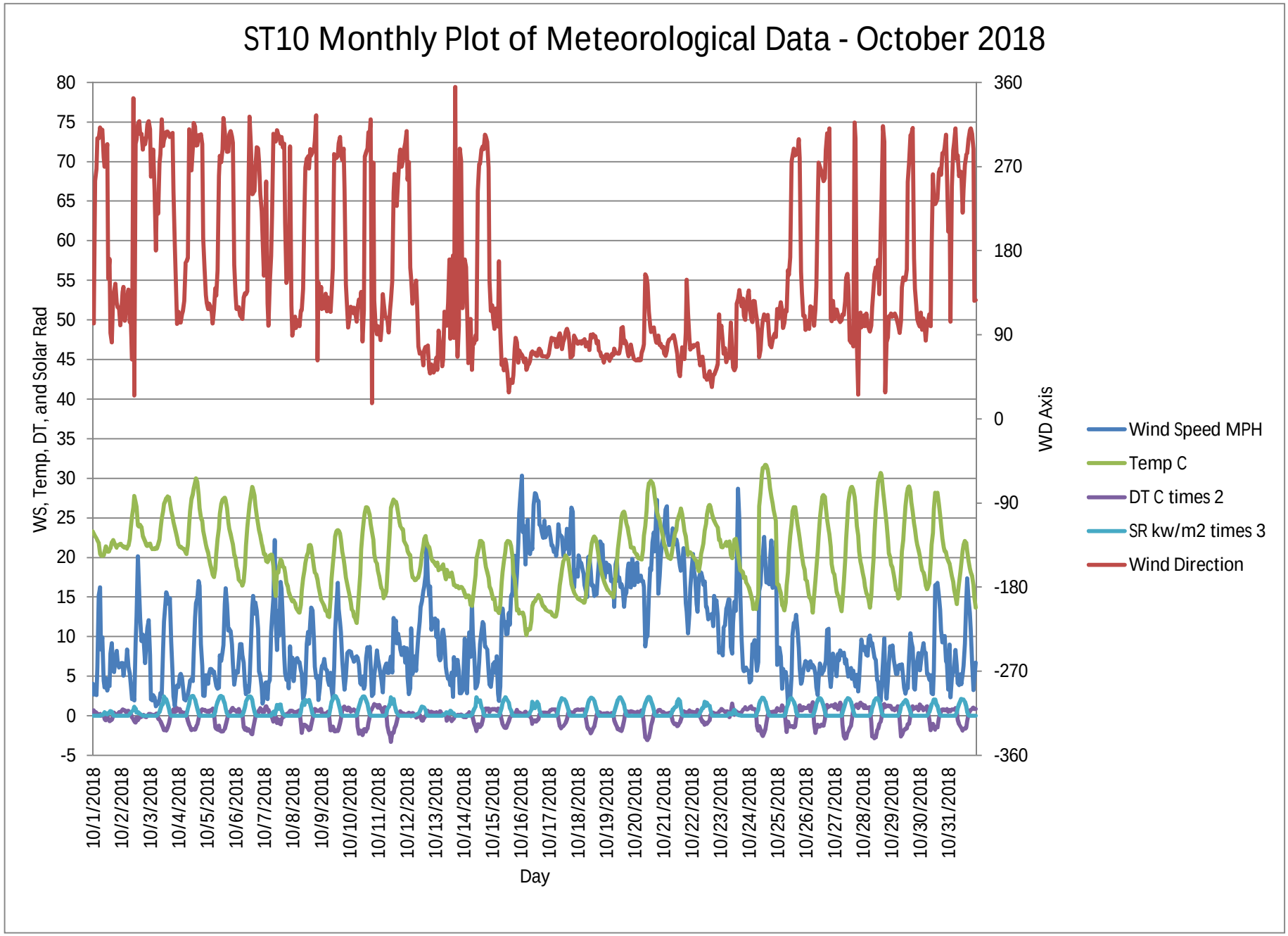
AZMET and ST10 Reported Precipitation Totals

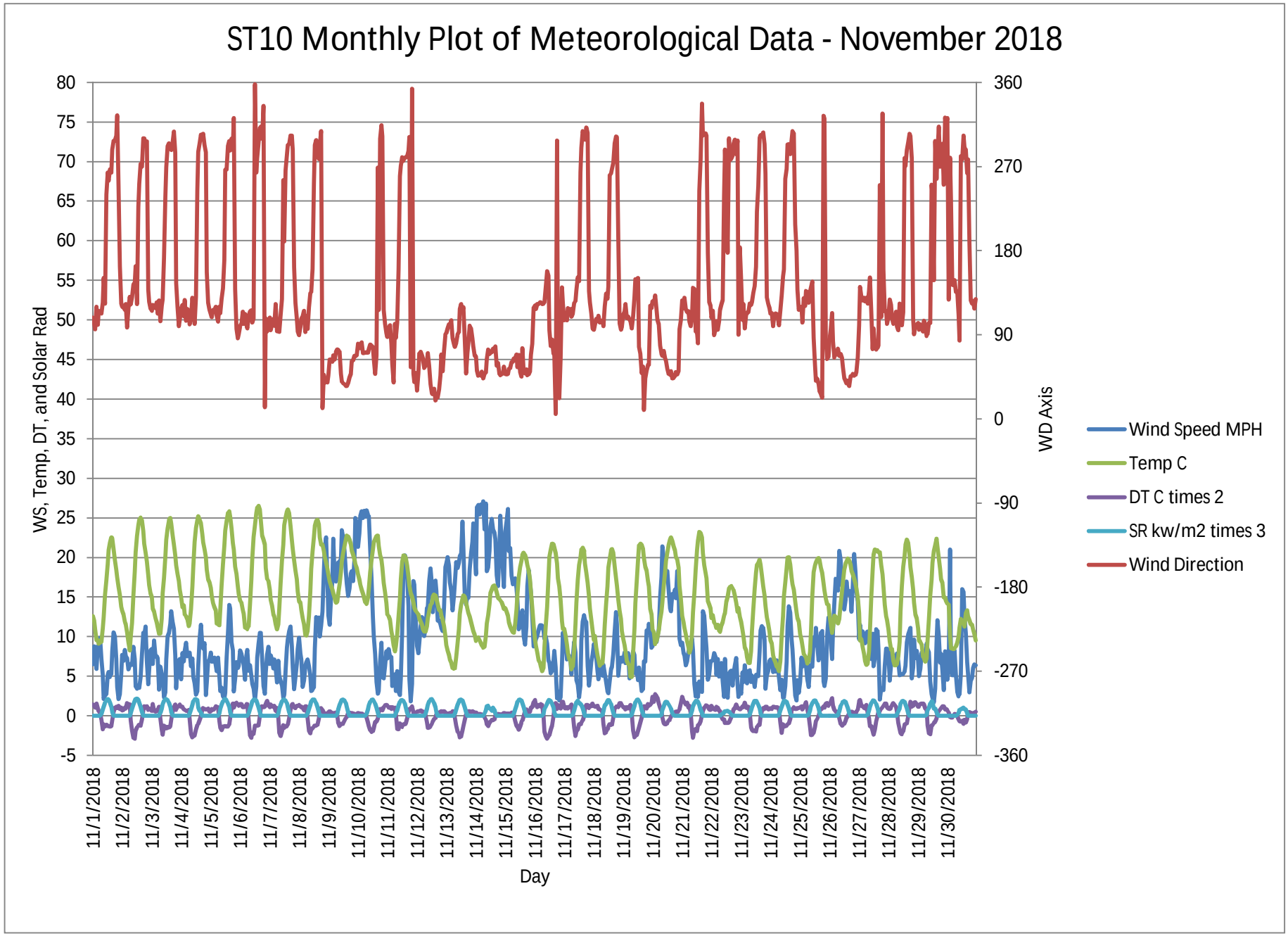
(inches/month)

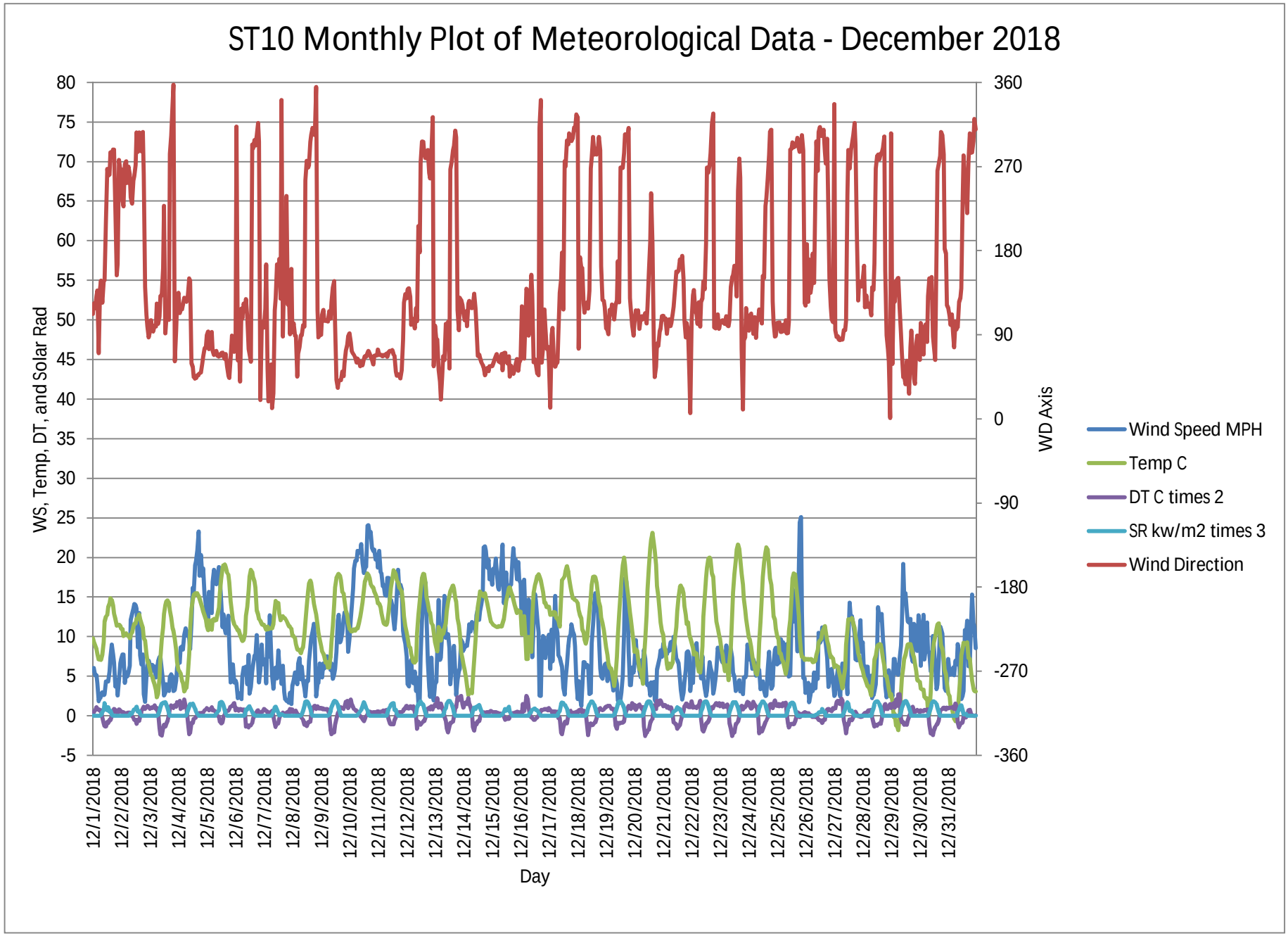
Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Oct-18	1.33	1.80	1.57	N/A
Nov-18	0.14	0.35	0.25	
Dec-18	0.74	0.49	0.62	0.89
Jan-19	0.63	0.54	0.59	0.99
Feb-19	2.79	0.80	1.80	3.55
Mar-19	0.43	0.87	0.65	0.53
Apr-19				
May-19				
Jun-19				
Jul-19				
Aug-19				
Sep-19				
Totals	6.06	4.85	5.46	7.66

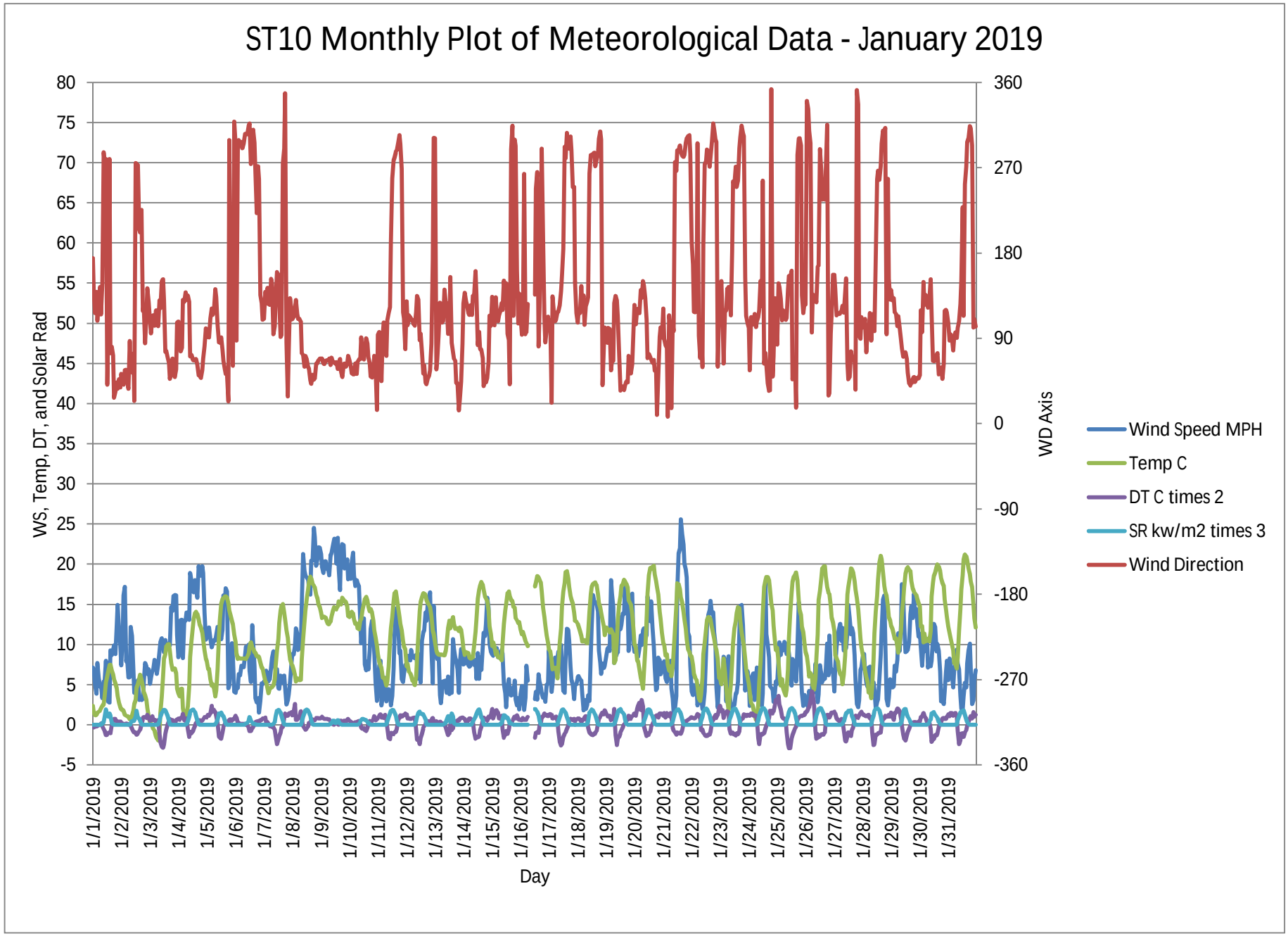
APPENDIX C

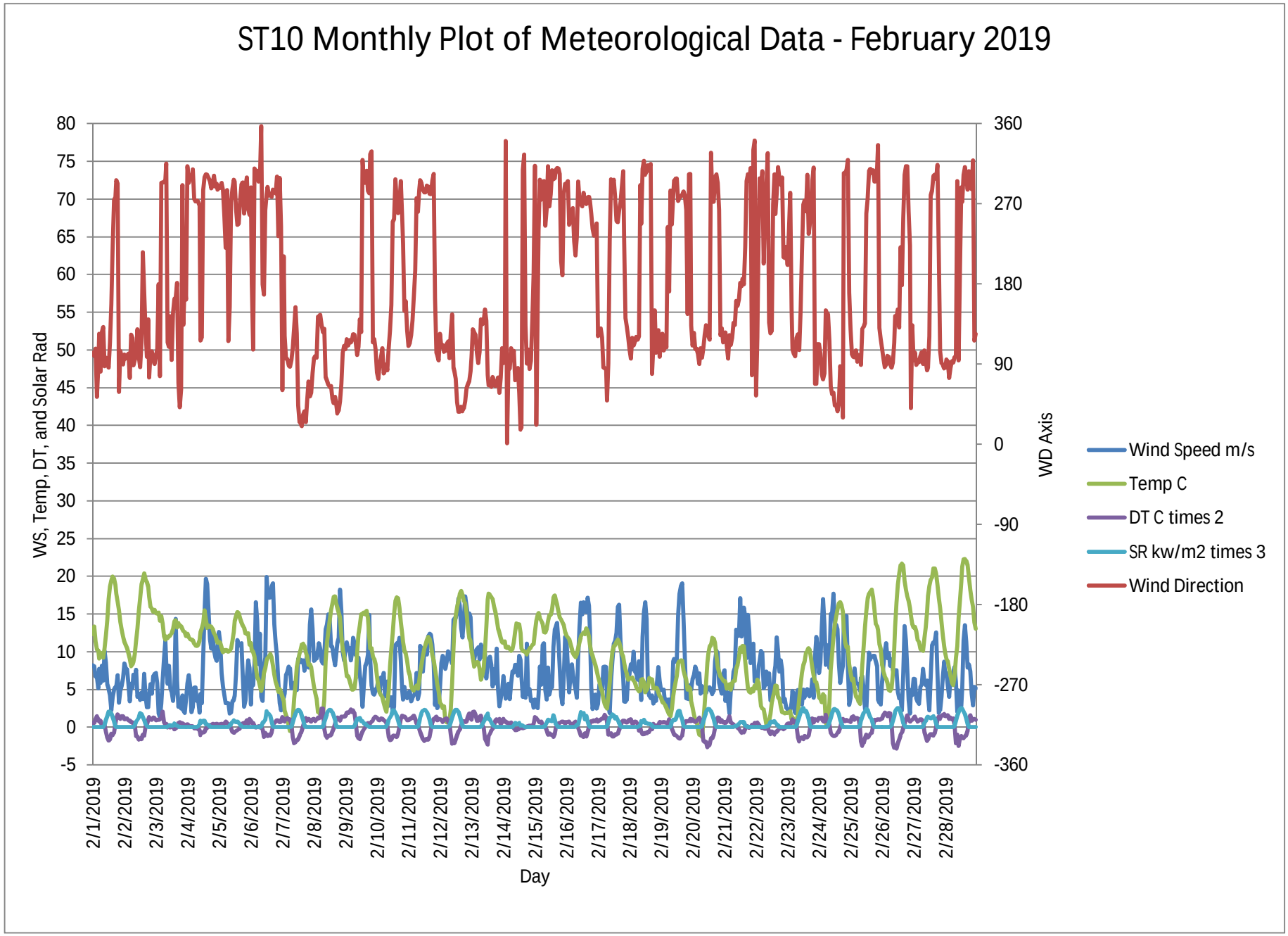
Monthly Data Plots and Tables

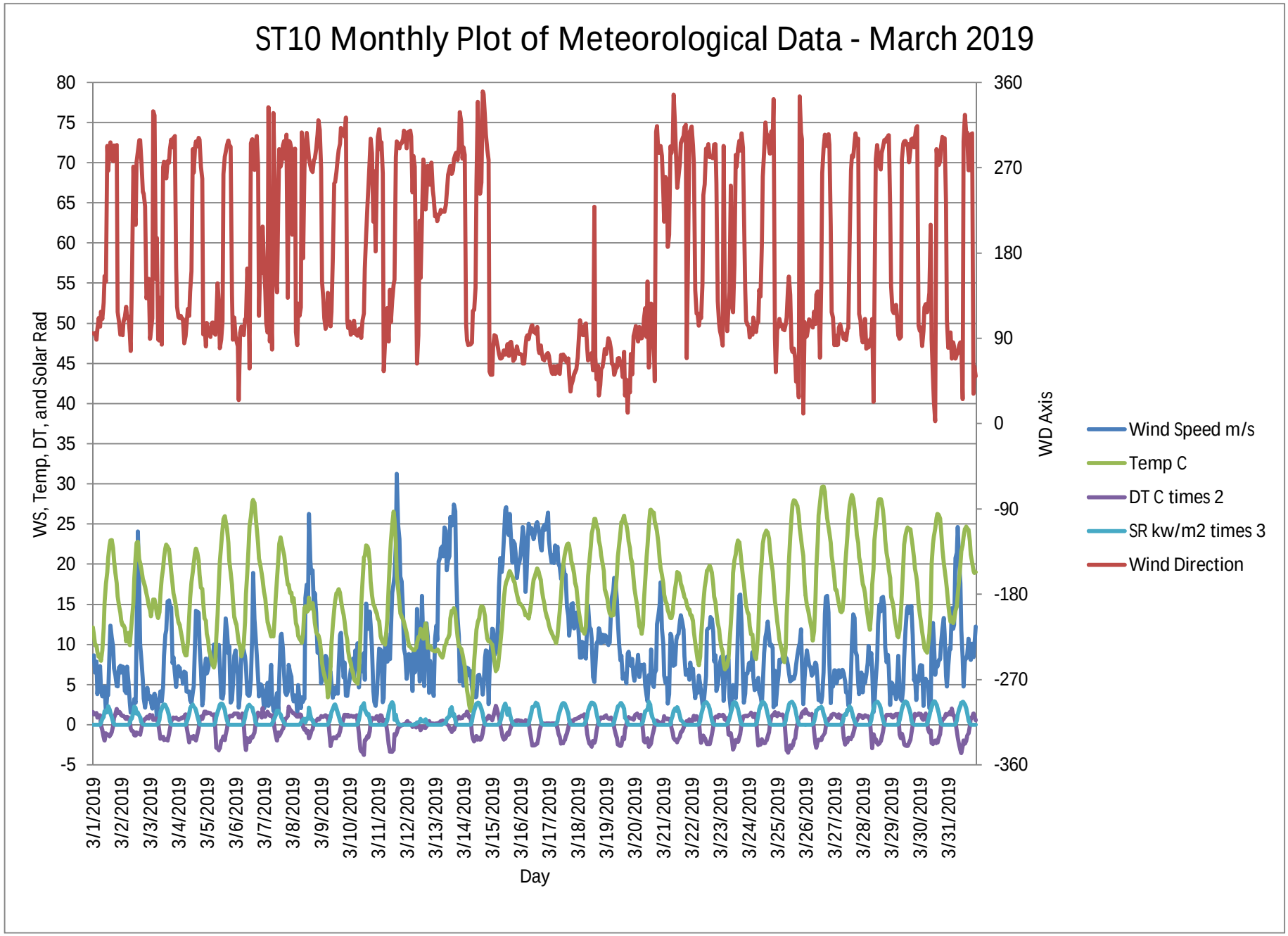

ST10 Monthly Plot of Meteorological Data - October 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
10/1/2018
10/2/2018
10/3/2018
10/4/2018
10/5/2018
10/6/2018
10/7/2018
10/8/2018
10/9/2018
10/10/2018
10/11/2018
10/12/2018
10/13/2018
10/14/2018
10/15/2018
10/16/2018
10/17/2018
10/18/2018
10/19/2018
10/20/2018
10/21/2018
10/22/2018
10/23/2018
10/24/2018
10/25/2018
10/26/2018
10/27/2018
10/28/2018
10/29/2018
10/30/2018
10/31/2018


ST10 Monthly Plot of Meteorological Data - November 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
11/1/2018
11/2/2018
11/3/2018
11/4/2018
11/5/2018
11/6/2018
11/7/2018
11/8/2018
11/9/2018
11/10/2018
11/11/2018
11/12/2018
11/13/2018
11/14/2018
11/15/2018
11/16/2018
11/17/2018
11/18/2018
11/19/2018
11/20/2018
11/21/2018
11/22/2018
11/23/2018
11/24/2018
11/25/2018
11/26/2018
11/27/2018
11/28/2018
11/29/2018
11/30/2018
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - December 2018
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
12/1/2018
12/2/2018
12/3/2018
12/4/2018
12/5/2018
12/6/2018
12/7/2018
12/8/2018
12/9/2018
12/10/2018
12/11/2018
12/12/2018
12/13/2018
12/14/2018
12/15/2018
12/16/2018
12/17/2018
12/18/2018
12/19/2018
12/20/2018
12/21/2018
12/22/2018
12/23/2018
12/24/2018
12/25/2018
12/26/2018
12/27/2018
12/28/2018
12/29/2018
12/30/2018
12/31/2018


ST10 Monthly Plot of Meteorological Data - January 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
1/1/2019
1/2/2019
1/3/2019
1/4/2019
1/5/2019
1/6/2019
1/7/2019
1/8/2019
1/9/2019
1/10/2019
1/11/2019
1/12/2019
1/13/2019
1/14/2019
1/15/2019
1/16/2019
1/17/2019
1/18/2019
1/19/2019
1/20/2019
1/21/2019
1/22/2019
1/23/2019
1/24/2019
1/25/2019
1/26/2019
1/27/2019
1/28/2019
1/29/2019
1/30/2019
1/31/2019


ST10 Monthly Plot of Meteorological Data - February 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
2/1/2019
2/2/2019
2/3/2019
2/4/2019
2/5/2019
2/6/2019
2/7/2019
2/8/2019
2/9/2019
2/10/2019
2/11/2019
2/12/2019
2/13/2019
2/14/2019
2/15/2019
2/16/2019
2/17/2019
2/18/2019
2/19/2019
2/20/2019
2/21/2019
2/22/2019
2/23/2019
2/24/2019
2/25/2019
2/26/2019
2/27/2019
2/28/2019
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - March 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
3/1/2019
3/2/2019
3/3/2019
3/4/2019
3/5/2019
3/6/2019
3/7/2019
3/8/2019
3/9/2019
3/10/2019
3/11/2019
3/12/2019
3/13/2019
3/14/2019
3/15/2019
3/16/2019
3/17/2019
3/18/2019
3/19/2019
3/20/2019
3/21/2019
3/22/2019
3/23/2019
3/24/2019
3/25/2019
3/26/2019
3/27/2019
3/28/2019
3/29/2019
3/30/2019
3/31/2019

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
OCTOBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	4.1	2.7	3.6	2.6	6.1	15.2	16.2	8.4	9.9	4.4	3.6	4.7	3.2	4.0	3.7	7.8	9.1	5.9	5.5	7.0	8.2	6.8	6.1	6.5	6.5
2	6.7	6.7	5.1	6.6	6.6	8.4	6.2	5.4	4.1	2.1	2.3	2.0	9.3	12.6	20.1	15.4	12.4	9.4	10.3	9.4	6.6	9.6	11.1	12.1	8.3
3	7.6	2.1	1.9	2.6	2.3	1.2	1.6	1.5	2.0	2.8	2.7	8.5	11.9	14.1	15.6	15.0	14.1	14.9	9.3	5.4	2.5	1.2	3.2	3.8	6.2
4	3.7	5.0	5.3	4.8	3.7	2.1	2.0	2.2	2.8	3.6	4.4	4.7	4.4	7.9	12.4	14.2	14.8	17.0	16.4	9.1	6.3	2.6	2.5	5.1	6.5
5	4.9	4.0	5.3	5.9	5.9	5.4	5.6	4.4	3.8	3.4	3.5	7.6	7.0	8.1	8.9	14.1	16.1	14.0	10.8	11.0	10.7	9.0	6.6	3.9	7.5
6	5.2	5.6	5.5	6.9	9.1	9.1	7.7	6.7	3.8	2.7	3.7	3.0	4.4	8.9	13.6	15.1	12.9	14.3	13.2	11.0	5.6	5.0	3.5	1.5	7.4
7	2.4	4.1	4.2	2.1	4.1	4.6	10.6	12.4	14.8	22.2	12.0	8.3	13.2	10.1	16.9	16.0	12.1	7.5	5.3	4.5	4.9	3.5	8.8	4.9	8.7
8	7.3	4.4	6.4	6.9	7.3	6.8	6.8	5.7	5.3	2.1	2.8	4.1	9.1	10.6	9.1	12.0	13.6	13.2	9.6	6.2	4.8	5.0	2.0	3.5	6.9
9	5.7	6.3	6.6	7.2	5.9	5.8	4.5	3.9	5.4	3.5	2.2	6.2	10.6	13.9	16.8	13.5	11.9	10.5	7.0	4.6	3.3	5.0	7.8	8.0	7.3
10	8.2	8.1	7.6	7.2	6.8	7.4	7.5	7.4	6.5	4.1	3.9	4.9	3.4	3.9	7.3	8.6	8.1	8.7	6.3	2.5	2.7	5.1	6.5	8.2	6.3
11	7.2	6.3	5.2	4.5	3.0	5.5	6.2	6.6	5.5	5.4	6.9	7.5	5.5	12.3	11.2	12.0	9.1	10.3	9.4	8.3	7.7	8.4	8.6	6.7	7.5
12	8.5	4.9	2.8	3.5	11.0	5.3	6.0	7.5	5.7	7.7	10.2	11.9	13.7	14.4	15.8	16.3	17.8	21.9	17.3	15.2	16.3	10.9	12.2	11.7	11.2
13	12.3	10.0	12.1	7.7	7.0	7.3	10.5	10.9	9.6	6.1	5.4	4.7	4.5	3.9	5.5	2.4	7.4	5.1	5.7	7.1	5.7	2.8	2.8	3.1	6.6
14	5.0	9.8	3.8	2.8	7.8	10.5	7.5	14.5	10.3	7.9	3.5	3.7	4.3	6.8	9.1	10.6	11.8	11.6	8.7	8.7	8.4	5.6	3.9	3.6	7.5
15	5.2	6.5	6.8	5.4	7.5	2.8	1.9	3.7	11.9	13.5	11.7	11.9	10.3	10.4	13.0	11.5	15.1	15.6	19.2	20.2	15.2	17.9	21.9	25.6	11.9
16	28.2	30.3	23.2	23.9	19.1	23.0	24.7	20.6	20.4	21.7	21.0	26.6	28.1	28.0	27.3	27.1	24.1	23.9	23.2	22.5	24.7	22.5	23.1	23.7	24.2
17	23.9	22.8	21.5	21.5	20.7	21.0	20.2	21.6	24.2	22.8	22.8	22.6	20.3	21.8	21.1	23.6	21.5	20.4	24.4	26.3	25.7	16.2	18.4	18.2	21.8
18	17.6	20.2	19.4	19.2	18.7	17.9	16.5	15.7	15.0	20.0	20.1	18.3	16.4	16.5	15.2	15.5	15.4	18.1	19.5	22.0	21.6	21.6	17.6	17.4	18.1
19	19.4	18.2	19.1	18.9	17.0	17.2	16.8	13.8	19.1	19.8	17.1	17.5	16.3	16.6	15.9	13.8	15.1	15.6	18.5	19.2	16.4	16.2	19.8	18.9	17.3
20	16.5	18.8	19.3	16.9	17.1	17.7	17.0	17.0	16.3	8.8	10.2	10.1	15.1	18.7	18.4	21.9	23.2	20.8	25.3	27.2	15.4	17.6	19.7	21.8	17.9
21	22.7	23.6	26.0	26.5	22.6	21.6	21.7	22.2	23.7	23.1	21.7	22.2	21.8	20.2	18.9	18.3	19.1	21.1	18.6	14.2	13.1	10.4	12.9	16.1	20.1
22	18.5	20.4	18.4	17.3	14.1	13.1	17.2	18.0	18.1	17.4	16.6	17.0	13.8	13.6	12.2	12.4	12.5	12.9	11.4	15.1	13.8	14.5	12.7	8.0	15.0
23	8.5	8.4	7.6	11.1	11.4	13.5	13.8	14.7	14.7	8.7	7.9	11.8	14.4	13.3	18.0	28.7	24.8	15.7	9.6	6.0	5.7	5.8	6.1	5.8	11.9
24	5.6	4.2	4.5	9.0	9.0	9.6	7.2	5.7	6.8	15.8	16.6	20.0	20.2	22.6	19.1	16.8	16.8	16.6	19.6	22.1	16.2	17.6	19.0	22.0	14.3
25	6.4	7.9	8.6	7.5	3.4	5.9	5.3	5.5	4.6	1.5	2.1	2.2	5.0	10.2	11.8	11.9	12.8	10.9	8.6	6.0	4.0	4.4	5.7	6.5	6.6
26	6.9	6.8	5.8	6.4	6.9	6.1	6.4	6.2	5.2	3.6	2.6	4.6	6.6	5.7	5.3	5.6	6.4	6.8	10.9	11.0	5.3	3.7	5.0	7.8	6.2
27	7.1	6.7	5.0	7.8	7.0	8.3	7.6	7.7	8.0	6.6	7.1	5.8	5.0	5.9	6.0	4.7	5.7	4.3	3.7	5.2	3.1	4.6	7.7	9.6	6.3
28	8.5	8.2	8.7	7.7	7.6	9.7	10.1	8.9	9.2	8.1	7.4	7.1	4.5	4.3	2.3	1.9	3.8	6.7	9.8	4.4	2.2	4.5	6.5	8.8	6.7
29	7.7	8.9	7.1	6.4	5.3	5.3	6.3	6.4	5.9	6.5	4.8	3.5	2.8	3.7	3.5	7.4	10.4	9.4	8.6	3.5	3.3	6.0	6.9	7.9	6.1
30	5.8	6.7	8.1	9.1	8.1	8.0	5.3	5.3	4.6	5.1	2.9	2.8	5.8	16.5	16.6	16.8	15.2	13.4	10.8	9.3	9.7	10.1	7.0	6.6	8.7
31	3.3	9.0	2.3	4.8	5.5	6.1	8.3	6.2	4.1	3.9	5.2	4.0	5.2	6.3	9.1	14.5	17.3	14.8	12.9	10.8	6.7	3.3	4.7	6.7	7.3
HRAVE	9.7	9.9	9.2	9.4	9.3	9.7	9.9	9.6	9.7	9.2	8.5	9.3	10.2	11.8	12.9	13.7	13.9	13.3	12.6	11.5	9.5	8.9	9.7	10.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.5	8.3	6.2	6.5	7.5	7.4	8.7	6.9	7.3	6.3	7.5	11.2	6.6	7.5	11.9	24.2	21.8	18.1	17.3	17.9	20.1	15.0	11.9	14.3	6.6
MAX	16.2	20.1	15.6	17.0	16.1	15.1	22.2	13.6	16.8	8.7	12.3	21.9	12.3	14.5	25.6	30.3	26.3	22.0	19.8	27.2	26.5	20.4	28.7	22.6	12.8
MIN	2.6	2.0	1.2	2.0	3.4	1.5	2.1	2.0	2.2	2.5	3.0	2.8	2.4	2.8	1.9	19.1	16.2	15.0	13.8	8.8	10.4	8.0	5.7	4.2	1.5

DAY	26	27	28	29	30	31
AVE	6.2	6.3	6.7	6.1	8.7	7.3
MAX	11.0	9.6	10.1	10.4	16.8	17.3
MIN	2.6	3.1	1.9	2.8	2.8	2.3

MONTHLY AVERAGE = 10.5 MONTHLY MAXIMUM = 30.3 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
OCTOBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	145	102	255	268	300	300	312	307	310	280	270	280	294	150	171	92	82	130	136	145	124	120	119	100	105
2	113	136	141	105	121	129	138	104	109	64	343	25	294	299	315	319	305	305	288	300	294	303	315	318	50
3	310	259	264	288	246	180	240	220	274	283	320	292	299	302	307	308	306	302	303	306	244	186	135	101	159
4	115	104	103	112	116	126	166	168	173	310	276	266	290	317	312	293	293	303	300	305	294	194	162	132	7
5	124	117	123	120	114	102	117	140	132	159	260	282	275	288	322	307	294	286	286	304	308	302	295	165	188
6	133	118	118	120	111	109	107	129	134	134	137	258	323	293	240	242	244	269	291	289	276	240	223	193	97
7	153	214	254	124	100	146	175	217	305	300	297	309	303	302	294	302	291	295	210	146	155	151	291	122	246
8	89	100	109	97	106	103	99	115	117	139	224	269	278	281	268	289	282	285	288	297	325	62	146	122	40
9	141	117	120	118	134	115	130	123	115	132	162	283	281	279	281	295	301	285	277	289	246	144	116	98	123
10	108	120	116	113	119	113	104	119	128	124	136	83	116	281	285	289	307	305	320	17	274	126	100	90	112
11	99	95	84	96	133	124	111	108	107	93	116	127	148	242	262	235	228	256	281	288	270	277	288	295	158
12	308	256	274	162	150	123	136	139	148	126	78	70	71	70	57	73	77	72	78	53	49	58	55	49	54
13	56	66	52	94	78	78	56	63	114	109	100	124	171	86	163	175	87	355	112	66	100	289	276	118	134
14	144	171	163	123	60	63	107	52	77	80	89	85	244	272	273	288	292	288	304	302	296	268	148	116	356
15	121	108	96	118	104	99	169	94	58	63	52	64	59	49	28	37	42	38	47	75	87	81	60	73	113
16	70	68	66	60	64	53	57	58	62	71	72	70	71	68	67	73	75	73	67	67	67	67	66	67	53
17	70	79	87	84	86	85	77	77	87	91	85	75	83	87	93	96	91	85	65	66	68	89	87	84	358
18	80	82	83	80	83	84	85	78	82	81	74	90	87	90	89	89	81	83	73	71	67	67	60	65	299
19	69	69	64	62	65	70	68	75	70	70	70	70	77	98	98	81	84	80	71	67	70	79	72	65	233
20	64	63	63	64	62	63	71	75	80	155	152	144	115	99	93	97	98	90	83	82	89	79	80	76	194
21	77	70	67	73	81	85	86	86	89	89	83	75	69	51	46	58	77	70	64	92	149	113	86	74	195
22	78	77	79	79	78	81	68	57	65	67	59	45	46	42	47	51	41	34	47	47	51	53	59	112	341
23	89	100	83	70	76	61	68	65	71	103	72	55	52	56	123	128	138	130	120	129	111	106	117	130	28
24	137	119	108	104	126	126	113	107	91	66	73	96	105	112	110	106	111	88	79	77	85	88	92	88	106
25	117	108	116	125	116	97	103	117	115	159	154	173	275	281	289	282	285	284	299	279	158	135	110	110	3
26	96	105	105	96	120	108	119	100	117	142	227	274	269	265	261	254	258	287	305	295	311	108	105	126	114
27	107	117	117	112	106	104	106	112	111	126	150	155	143	84	81	85	78	317	300	80	26	94	114	98	81
28	100	111	99	113	102	97	93	100	120	139	154	162	151	170	133	202	239	313	296	28	83	88	110	109	187
29	113	110	111	113	109	104	100	92	104	141	151	148	149	160	253	274	302	305	311	172	139	121	108	102	345
30	99	114	95	108	102	84	103	105	112	99	181	261	234	230	233	235	263	268	261	284	284	290	304	265	293
31	201	225	104	249	287	295	311	278	282	260	264	264	221	246	272	282	284	299	309	311	304	289	126	127	212

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
OCTOBER - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	20	18	17	33	13	8	8	9	7	12	17	27	29	52	15	13	7	21	12	19	7	8	8	13	16
2	11	5	12	15	18	13	21	25	29	47	40	50	9	10	11	13	10	16	11	9	9	8	12	9	17
3	14	53	11	9	24	13	21	21	20	23	32	19	15	15	12	14	14	10	7	7	22	11	31	10	18
4	12	12	19	12	15	37	17	23	19	34	39	47	37	26	18	17	13	9	9	8	8	21	16	5	20
5	9	13	9	7	10	10	9	11	19	27	27	19	22	24	25	16	11	9	7	8	7	6	15	20	14
6	6	9	7	6	10	8	9	11	19	28	34	55	67	33	20	16	15	10	6	6	10	10	31	25	19
7	39	20	28	17	30	58	13	27	10	8	9	55	14	18	13	14	12	9	22	48	9	34	34	29	24
8	13	16	11	10	11	10	11	10	20	44	47	29	21	22	26	16	12	8	7	3	30	31	51	17	20
9	12	12	10	10	8	11	8	14	18	36	48	23	18	17	14	17	15	10	5	15	23	30	8	8	16
10	7	6	8	10	8	7	7	7	13	25	31	26	47	60	29	21	23	11	10	44	33	15	12	8	19
11	11	8	14	17	18	16	12	11	18	18	18	19	47	29	20	13	17	9	7	10	11	10	7	10	15
12	9	18	23	32	10	14	16	10	8	11	8	9	9	9	14	14	11	9	11	14	10	14	13	10	13
13	9	11	11	14	13	30	11	14	11	12	17	17	38	45	13	45	14	40	18	26	25	37	56	29	23
14	17	19	51	42	11	20	22	12	13	7	24	25	35	20	18	15	13	10	7	6	4	12	7	12	18
15	8	11	11	13	10	32	32	40	16	20	22	17	24	27	18	27	17	12	15	12	11	12	10	8	18
16	8	7	10	10	12	14	14	12	13	10	10	8	8	8	9	8	9	9	8	9	8	10	9	9	10
17	8	9	9	8	7	8	8	10	9	12	14	12	15	13	14	13	11	12	10	8	8	13	9	8	10
18	6	7	8	6	6	5	6	6	11	12	10	13	15	13	15	16	17	11	8	8	9	10	14	12	10
19	10	9	10	13	13	9	8	7	8	9	14	14	13	14	15	13	13	10	8	9	10	11	7	10	11
20	11	11	10	10	11	12	9	9	19	10	18	18	16	17	18	11	12	11	10	10	11	8	8	9	12
21	8	9	7	8	9	9	8	9	11	13	10	9	11	15	16	15	9	10	13	14	17	13	10	7	11
22	8	6	6	6	7	13	8	12	10	9	12	14	16	14	16	19	13	12	12	8	10	11	11	12	11
23	15	15	15	13	11	12	9	9	8	41	23	12	14	16	15	9	11	12	15	15	16	12	12	13	14
24	14	14	12	15	5	6	9	12	9	15	15	15	14	10	11	13	13	9	8	9	11	11	8	7	11
25	10	9	9	10	13	7	10	9	16	50	38	51	23	17	14	13	13	6	5	30	7	5	10	8	16
26	8	9	12	8	8	8	8	10	13	23	33	17	13	18	25	21	18	6	7	5	18	27	27	11	15
27	10	8	9	8	9	8	9	9	8	13	13	21	37	15	12	15	16	32	26	27	43	14	13	8	16
28	8	8	6	8	8	6	6	8	7	10	11	14	30	27	40	48	19	8	6	25	32	18	9	8	15
29	7	8	9	7	10	8	7	7	11	14	16	21	32	29	25	15	10	8	6	21	18	8	9	10	13
30	10	10	6	11	8	10	11	14	15	18	32	28	61	15	13	15	13	9	9	6	6	8	9	12	14
31	42	11	35	42	21	21	9	19	24	18	24	31	39	38	27	16	9	8	6	6	11	35	14	19	22
HRAVE	12	12	13	14	12	14	11	13	14	20	23	24	25	22	18	17	13	12	10	14	15	15	16	12	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16	17	18	20	14	19	24	20	16	19	15	13	23	18	18	10	10	10	11	12	11	11	14	11	16
MAX	52	50	53	47	27	67	58	51	48	60	47	32	56	51	40	14	15	17	15	19	17	19	41	15	51
MIN	7	5	7	5	6	6	8	3	5	6	7	8	9	4	8	7	7	5	7	8	7	6	8	5	5

DAY	26	27	28	29	30	31
AVE	15	16	15	13	14	22
MAX	33	43	48	32	61	42
MIN	5	8	6	6	6	6

MONTHLY AVERAGE = 15.5 MONTHLY MAXIMUM = 67.4 MONTHLY MINIMUM = 3.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
OCTOBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	23.3	23.1	22.7	22.4	22.2	21.9	20.5	20.3	20.2	20.3	20.7	21.4	20.8	20.7	20.9	21.1	21.9	22.2	21.9	21.6	21.2	21.5	21.6	21.8	21.5
2	21.6	21.4	21.4	21.2	21.4	21.1	21.4	22.3	23.6	25.2	26.4	27.8	27.0	26.4	24.1	23.9	24.1	23.9	22.7	22.4	22.0	21.5	21.5	21.7	23.2
3	21.8	21.4	21.1	21.1	21.1	21.2	21.1	21.6	22.3	23.5	24.9	25.8	26.7	27.2	27.5	27.7	27.6	27.0	25.9	25.1	24.4	23.7	23.0	22.5	24.0
4	21.6	21.4	21.4	21.2	21.1	21.1	20.7	20.4	21.6	24.3	25.9	27.4	28.0	28.7	29.4	30.0	29.5	27.9	26.2	25.0	24.6	23.4	22.5	21.6	24.4
5	21.1	20.6	19.9	19.1	18.5	17.9	17.5	18.5	20.4	22.4	23.7	25.5	26.7	27.2	27.4	27.5	27.2	26.2	24.4	23.6	22.9	22.1	21.6	20.4	22.6
6	19.9	18.9	18.2	17.2	16.9	16.9	16.5	17.0	19.0	21.5	23.8	25.6	26.7	27.8	28.9	28.5	27.7	26.6	25.2	24.2	23.4	22.8	21.8	21.3	22.3
7	20.4	20.4	19.5	19.4	19.7	20.3	20.4	20.2	18.9	16.1	15.1	18.2	18.1	19.0	19.8	19.6	18.9	18.7	18.1	16.8	16.3	15.6	15.2	14.8	18.3
8	14.5	14.6	14.2	13.7	13.4	13.2	13.1	14.0	15.8	17.3	18.4	19.3	20.1	20.6	21.5	21.6	21.2	20.1	18.8	18.1	17.9	17.2	16.4	15.5	17.1
9	14.7	14.5	14.1	13.8	13.2	13.2	12.6	12.5	14.8	17.2	19.2	21.0	22.6	23.3	23.5	23.4	23.0	22.2	20.7	19.8	18.9	17.5	16.6	16.0	17.8
10	15.3	14.3	13.4	13.2	12.5	12.2	11.7	13.0	15.5	17.9	21.1	23.1	24.8	25.7	26.3	26.3	25.9	25.3	24.3	23.2	22.3	20.4	19.5	19.2	19.4
11	18.3	17.6	16.6	16.1	15.8	14.8	15.2	15.8	17.9	20.8	23.8	26.2	26.8	27.3	27.1	27.0	26.6	25.6	24.5	24.0	23.6	23.5	22.2	21.8	21.6
12	21.5	20.8	20.5	20.2	18.5	17.5	17.4	17.1	17.2	17.4	17.5	18.3	18.9	20.5	21.4	22.3	22.7	22.0	21.4	21.3	20.8	19.9	19.5	19.5	19.8
13	19.2	18.9	19.4	18.4	18.6	18.6	18.9	19.1	18.0	17.3	18.4	17.9	17.6	17.7	18.1	17.2	16.5	16.5	16.3	16.4	16.1	16.2	16.3	16.1	17.7
14	15.9	15.4	15.0	15.1	15.2	15.1	14.0	13.9	14.8	16.2	17.8	19.8	20.5	21.4	22.1	22.1	21.9	20.9	19.6	18.8	18.2	17.4	16.3	15.9	17.6
15	15.2	14.7	14.8	13.4	13.6	13.2	13.0	14.0	16.9	18.2	19.5	20.7	21.8	22.1	22.0	22.0	21.4	20.1	18.0	17.2	16.0	13.3	13.4	12.9	17.0
16	13.1	12.9	13.1	12.4	10.8	10.2	10.9	10.8	10.9	11.9	13.8	14.4	14.5	14.8	14.9	15.2	15.1	14.7	14.3	13.8	13.8	13.5	13.3	13.2	13.2
17	13.1	13.1	13.0	12.7	12.6	12.5	12.6	13.5	14.6	16.5	17.6	18.5	19.5	19.8	20.2	20.0	19.7	18.9	17.6	16.7	16.1	15.6	15.4	15.1	16.0
18	14.8	14.8	14.6	14.5	14.5	14.3	14.3	15.1	17.0	18.3	19.3	20.8	21.8	22.3	22.7	22.5	21.9	20.7	19.8	19.1	18.3	17.6	17.1	16.7	18.0
19	16.3	16.0	15.8	15.6	15.4	15.3	15.0	15.8	17.7	19.3	21.0	22.5	23.9	25.0	25.6	25.8	25.3	24.3	23.7	23.0	22.2	21.3	21.2	21.2	20.3
20	20.7	20.5	20.3	19.9	19.9	19.8	19.8	20.9	22.8	24.0	25.9	28.1	29.4	29.6	29.6	29.4	28.7	27.7	26.5	25.7	25.1	24.7	24.0	23.3	24.4
21	22.4	21.7	21.2	20.6	20.1	19.9	19.8	20.2	21.3	22.0	23.1	23.5	24.6	25.1	25.6	26.2	25.5	24.2	23.3	22.6	21.7	20.3	20.6	20.7	22.3
22	20.4	20.1	20.0	19.7	19.6	18.8	18.3	19.3	20.4	21.2	21.8	23.4	24.2	25.4	26.3	26.6	26.4	25.6	24.9	24.6	24.3	24.1	23.8	22.2	22.6
23	22.2	21.4	21.3	21.5	21.5	22.0	21.4	21.6	22.0	20.4	19.9	21.0	22.2	22.4	21.6	20.4	19.3	18.4	18.3	18.1	17.4	17.5	16.8	16.6	20.2
24	16.2	15.8	15.2	14.4	13.5	13.6	13.5	14.4	15.4	26.4	28.2	30.4	31.3	31.4	31.7	31.6	31.0	29.9	28.8	27.7	26.8	26.0	25.2	24.6	23.5
25	16.6	16.5	16.0	15.5	14.0	13.9	13.3	14.3	16.5	18.2	20.6	22.7	24.3	25.8	26.3	26.3	25.6	24.2	23.1	22.3	21.0	20.2	19.1	18.4	19.8
26	17.2	17.0	15.7	15.0	14.8	14.2	13.0	15.2	17.1	18.6	20.7	22.6	25.0	26.6	27.5	27.9	27.6	26.4	24.8	23.6	22.9	21.3	19.2	18.2	20.5
27	17.9	17.0	15.7	15.1	15.0	14.0	13.2	14.5	16.8	19.5	22.2	25.0	27.0	28.1	28.8	28.9	28.5	27.7	26.5	24.0	22.8	20.8	19.4	18.9	21.1
28	18.0	17.3	16.4	15.5	15.1	14.6	13.7	15.2	17.3	19.7	22.8	25.9	28.0	29.5	30.0	30.7	30.3	28.5	27.0	25.9	24.3	22.2	20.5	20.0	22.0
29	19.1	18.7	17.8	17.1	15.9	15.8	14.8	15.1	18.2	20.8	22.2	24.1	26.5	28.0	28.6	29.0	28.2	27.0	25.8	24.3	23.6	22.2	21.6	21.0	21.9
30	20.2	19.2	18.4	18.1	17.7	16.5	16.0	16.3	16.8	19.4	21.6	23.1	26.1	28.2	27.9	28.1	26.9	25.3	24.1	22.4	21.3	20.8	20.6	20.0	21.5
31	19.6	19.2	18.6	17.7	16.9	16.0	15.1	14.1	15.3	16.8	18.1	19.2	20.9	21.6	22.1	21.9	20.8	19.5	18.6	18.1	17.6	16.5	15.0	13.7	18.0
HRAVE	18.5	18.0	17.6	17.1	16.7	16.4	16.1	16.6	18.0	19.6	21.1	22.7	23.8	24.5	24.8	24.9	24.4	23.5	22.4	21.6	20.9	20.0	19.4	18.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	21.5	23.2	24.0	24.4	22.6	22.3	18.3	17.1	17.8	19.4	21.6	19.8	17.7	17.6	17.0	13.2	16.0	18.0	20.3	24.4	22.3	22.6	20.2	23.5	19.8
MAX	23.3	27.8	27.7	30.0	27.5	28.9	20.4	21.6	23.5	26.3	27.3	22.7	19.4	22.1	22.1	15.2	20.2	22.7	25.8	29.6	26.2	26.6	22.4	31.7	26.3
MIN	20.2	21.1	21.1	20.4	17.5	16.5	14.8	13.1	12.5	11.7	14.8	17.1	16.1	13.9	12.9	10.2	12.5	14.3	15.0	19.8	19.8	18.3	16.6	13.5	13.3

DAY	26	27	28	29	30	31
AVE	20.5	21.1	22.0	21.9	21.5	18.0
MAX	27.9	28.9	30.7	29.0	28.2	22.1
MIN	13.0	13.2	13.7	14.8	16.0	13.7

MONTHLY AVERAGE = 20.3 MONTHLY MAXIMUM = 31.7 MONTHLY MINIMUM = 10.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
OCTOBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.0	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	-0.2	-0.3	0.0	-0.2	-0.3	-0.3	-0.2	0.0	0.2	0.1	0.0	0.1	0.2	0.2	0.0
2	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.1	-0.1	-0.2	-0.3	-0.4	-0.1	-0.3	-0.2	-0.1	0.0	0.0	0.1	-0.1	-0.1	0.0	0.1	0.0
3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	-0.2	-0.2	-0.3	-0.6	-0.7	-0.9	-0.9	-0.9	-0.8	-0.5	-0.2	0.2	0.3	0.4	0.2	0.3	0.5	-0.2
4	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.0	-0.3	-0.6	-0.7	-0.9	-0.8	-0.8	-0.9	-0.7	-0.6	-0.2	0.1	0.2	0.4	0.4	0.4	0.3	-0.1
5	0.2	0.3	0.2	0.3	0.4	0.4	0.2	-0.7	-0.8	-0.9	-0.6	-0.9	-1.0	-1.0	-0.9	-0.8	-0.6	-0.2	0.1	0.2	0.2	0.4	0.5	0.3	-0.2
6	0.3	0.3	0.3	0.4	0.2	0.2	0.2	-0.7	-0.9	-0.8	-0.9	-0.9	-0.9	-1.1	-1.1	-0.8	-0.4	-0.1	0.1	0.2	0.3	0.5	0.4	0.2	-0.2
7	0.2	0.5	0.6	0.4	0.4	0.1	0.1	-0.1	-0.4	-0.1	0.0	-0.4	-0.2	-0.5	-0.6	-0.3	-0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.0
8	0.3	0.3	0.2	0.2	0.2	0.3	0.3	-0.5	-1.1	-0.6	-0.6	-0.6	-0.7	-0.8	-0.9	-0.8	-0.6	-0.2	0.2	0.4	0.3	0.3	0.3	0.3	-0.1
9	0.4	0.2	0.1	0.1	0.2	0.2	0.3	-0.1	-0.9	-0.9	-0.7	-0.9	-1.0	-0.9	-1.0	-0.8	-0.5	-0.2	0.4	0.6	0.6	0.4	0.3	0.5	-0.2
10	0.5	0.3	0.3	0.3	0.4	0.3	0.3	-0.7	-1.1	-0.9	-1.1	-1.2	-0.9	-0.8	-1.0	-0.8	-0.4	-0.1	0.3	0.4	0.6	0.8	0.7	0.6	-0.1
11	0.5	0.7	0.4	0.4	0.2	0.5	0.5	0.1	-0.6	-1.0	-1.2	-1.7	-1.1	-1.1	-0.8	-0.6	-0.4	0.0	0.1	0.3	0.2	0.1	0.2	0.1	-0.2
12	0.1	0.1	0.2	0.2	0.0	0.2	0.2	0.0	-0.1	-0.1	0.1	0.1	-0.1	-0.3	-0.3	-0.2	0.0	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.1
13	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.0	0.1	0.1	-0.3	-0.1	-0.1	-0.2	-0.3	-0.2	-0.2	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0
14	-0.1	-0.1	-0.1	0.1	0.2	0.2	0.2	0.1	-0.1	-0.5	-0.7	-1.0	-0.6	-0.6	-0.7	-0.6	-0.2	0.1	0.4	0.4	0.4	0.5	0.2	0.4	-0.1
15	0.4	0.4	0.4	0.4	0.3	0.5	0.3	0.1	-0.3	-0.5	-0.7	-0.8	-0.8	-0.6	-0.3	-0.1	0.0	0.1	0.1	0.1	0.2	0.4	0.2	0.2	0.0
16	0.2	0.1	0.1	0.1	0.3	0.1	0.1	0.0	-0.1	-0.2	-0.5	-0.3	-0.3	-0.4	-0.3	-0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
17	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.1	-0.2	-0.6	-0.8	-0.7	-0.7	-0.5	-0.4	-0.2	0.1	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.0
18	0.4	0.4	0.4	0.4	0.4	0.4	0.4	-0.2	-0.6	-0.8	-0.9	-1.1	-1.0	-0.9	-0.7	-0.4	0.0	0.2	0.2	0.2	0.1	0.1	0.1	0.2	-0.1
19	0.2	0.2	0.1	0.1	0.1	0.2	0.2	-0.3	-0.5	-0.7	-0.8	-0.9	-0.9	-1.0	-0.7	-0.3	0.1	0.3	0.3	0.2	0.2	0.3	0.3	0.2	-0.1
20	0.2	0.2	0.2	0.3	0.2	0.2	0.3	-0.1	-0.5	-1.4	-1.5	-1.5	-1.4	-1.0	-0.6	-0.3	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.2	-0.2
21	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.0	-0.3	-0.4	-0.5	-0.5	-0.7	-0.6	-0.4	-0.3	0.0	0.3	0.2	0.2	0.1	0.2	0.3	0.3	0.0
22	0.2	0.2	0.2	0.2	0.2	0.4	0.2	-0.1	-0.2	-0.4	-0.4	-0.6	-0.4	-0.5	-0.4	-0.3	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.0
23	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.1	-0.1	0.2	0.8	0.4	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.6	0.4	0.4	0.3
24	0.5	0.5	0.6	0.4	0.4	0.4	0.3	-0.6	-0.9	-0.6	-0.9	-1.1	-1.3	-1.1	-0.8	-0.4	0.0	0.2	0.2	0.2	0.2	0.2	0.3	0.2	-0.1
25	0.5	0.4	0.3	0.3	0.6	0.5	0.4	-0.5	-1.0	-0.4	-0.6	-0.7	-0.6	-0.6	-0.7	-0.6	-0.2	0.2	0.5	0.7	0.3	0.3	0.5	0.5	0.0
26	0.5	0.5	0.5	0.7	0.3	0.4	0.9	-0.5	-1.1	-0.8	-0.6	-0.7	-0.7	-0.6	-0.6	-0.6	-0.2	0.4	0.7	0.5	0.6	0.6	0.7	0.7	0.1
27	0.5	0.7	0.6	0.4	0.5	0.8	0.5	-0.6	-1.3	-1.5	-1.4	-1.1	-1.0	-0.8	-0.6	-0.2	0.4	0.6	0.6	0.7	0.5	0.6	0.8	0.7	0.0
28	0.7	0.5	0.7	0.5	0.5	0.5	0.5	-0.4	-1.3	-1.3	-1.4	-1.4	-1.0	-0.9	-0.5	-0.4	-0.1	0.7	0.8	0.5	0.6	0.7	0.6	0.6	0.0
29	0.6	0.4	0.5	0.3	0.5	0.6	0.6	-0.2	-1.3	-1.2	-1.0	-0.9	-0.8	-0.8	-0.5	-0.5	0.0	0.3	0.6	0.4	0.5	0.6	0.5	0.3	0.0
30	0.7	0.5	0.6	0.3	0.4	0.4	0.6	0.2	-0.2	-0.9	-0.6	-0.5	-0.7	-0.9	-0.7	-0.7	-0.2	0.1	0.2	0.4	0.4	0.3	0.3	0.4	0.0
31	0.3	0.4	0.3	0.4	0.4	0.4	0.5	0.3	-0.2	-0.5	-0.7	-0.8	-0.9	-0.8	-0.8	-0.7	-0.3	0.1	0.3	0.4	0.4	0.5	0.4	0.4	0.0
HRAVE	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-0.2	-0.5	-0.6	-0.6	-0.7	-0.7	-0.7	-0.6	-0.5	-0.2	0.1	0.3	0.3	0.3	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.0	0.0	-0.2	-0.1	-0.2	-0.2	0.0	-0.1	-0.2	-0.1	-0.2	0.1	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.2	0.0	0.0	0.3	-0.1	0.0
MAX	0.3	0.4	0.5	0.4	0.5	0.5	0.6	0.4	0.6	0.8	0.7	0.3	0.3	0.5	0.5	0.3	0.4	0.4	0.3	0.4	0.3	0.4	0.8	0.6	0.7
MIN	-0.3	-0.4	-0.9	-0.9	-1.0	-1.1	-0.6	-1.1	-1.0	-1.2	-1.7	-0.3	-0.3	-1.0	-0.8	-0.5	-0.8	-1.1	-1.0	-1.5	-0.7	-0.6	-0.1	-1.3	-1.0

DAY	26	27	28	29	30	31
AVE	0.1	0.0	0.0	0.0	0.0	0.0
MAX	0.9	0.8	0.8	0.6	0.7	0.5
MIN	-1.1	-1.5	-1.4	-1.3	-0.9	-0.9

MONTHLY AVERAGE = 0.0 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = -1.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
OCTOBER - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	701	701	701	701	701	701	702	702	703	703	703	703	703	702	702	701	701	700	700	700	701	701	700	700	701
2	700	700	700	700	699	700	700	700	700	701	701	700	700	699	699	700	700	700	700	701	701	701	701	701	700
3	701	701	701	701	701	701	701	701	702	702	702	701	701	700	700	699	699	699	700	700	700	700	701	701	701
4	701	701	701	700	701	701	701	702	702	702	702	701	701	700	700	699	699	699	699	699	700	700	700	700	700
5	700	700	700	700	700	700	700	701	701	701	701	700	699	699	698	698	698	698	698	698	698	699	699	699	699
6	699	699	698	698	698	698	698	699	699	699	698	698	697	696	696	695	695	695	695	695	695	695	695	695	697
7	695	695	694	694	694	694	694	694	695	695	696	695	695	695	695	695	695	695	696	696	696	697	697	697	695
8	696	697	696	696	696	697	697	698	698	698	698	698	697	697	696	696	696	696	697	697	697	698	698	698	697
9	698	698	698	698	698	698	699	699	699	699	699	699	698	697	697	697	697	697	697	698	698	698	699	699	698
10	699	699	699	699	699	700	700	700	701	701	700	700	699	698	698	698	697	697	697	698	698	698	699	699	699
11	699	699	699	699	699	699	699	700	700	700	700	699	698	698	698	698	698	698	698	698	698	699	699	699	699
12	699	699	699	699	700	700	700	700	700	701	701	700	699	698	697	697	697	697	697	698	698	698	699	698	699
13	698	699	698	698	698	698	698	699	699	699	699	699	698	698	698	698	698	698	698	698	698	698	699	698	698
14	698	699	699	699	699	699	700	700	700	701	701	701	700	700	699	699	699	699	700	700	701	701	701	701	700
15	701	701	701	701	701	702	702	702	702	702	702	702	701	701	700	700	700	700	700	701	701	702	702	702	701
16	702	702	702	702	703	702	702	702	703	703	703	703	703	703	702	703	703	703	703	704	704	704	704	704	703
17	704	705	705	704	704	705	705	705	705	705	705	705	704	703	703	703	703	703	703	704	704	704	705	705	704
18	705	705	704	704	704	704	705	705	705	705	705	704	704	703	702	702	702	702	703	703	703	704	704	704	704
19	704	704	704	704	704	704	704	705	705	705	704	704	703	702	702	701	701	702	702	702	702	703	703	703	703
20	703	703	703	703	703	703	704	704	704	704	704	703	702	702	701	701	701	701	701	701	702	703	703	703	703
21	703	703	703	703	703	703	703	704	704	704	703	703	702	701	701	700	700	700	700	701	701	701	701	701	702
22	701	701	701	701	701	701	701	701	702	702	701	701	700	700	699	699	699	698	699	699	699	699	699	699	700
23	699	700	700	699	699	699	699	699	700	701	701	700	699	699	699	699	700	699	700	700	700	700	700	700	700
24	700	700	701	701	700	700	701	701	702	707	707	706	706	705	704	704	704	704	704	705	705	706	706	706	703
25	702	702	702	702	702	703	703	703	704	704	704	703	702	701	701	701	701	701	701	702	702	702	702	702	702
26	702	703	703	703	703	703	703	704	705	705	704	704	703	702	702	702	701	702	702	702	703	703	703	703	703
27	703	703	703	703	704	704	704	705	705	705	705	704	703	703	702	702	702	702	702	702	703	703	704	704	703
28	704	704	704	704	704	704	705	705	705	705	705	704	704	703	702	702	702	702	702	703	703	703	703	703	704
29	703	703	703	703	703	704	704	704	704	704	704	704	703	702	701	701	701	701	701	701	701	701	701	701	702
30	701	701	701	700	700	700	700	700	701	701	700	700	699	698	698	697	697	697	698	698	698	699	699	699	699
31	699	699	699	699	699	700	700	701	701	702	702	702	701	700	700	700	701	701	702	702	703	703	703	703	701
HRAVE	701	701	701	701	701	701	701	701	702	702	702	701	701	700	700	700	700	700	700	700	700	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	700	701	700	699	697	695	697	698	699	699	699	698	700	701	703	704	704	703	703	702	700	700	703	702
MAX	703	701	702	702	701	699	697	698	699	701	700	701	699	701	702	704	705	705	705	704	704	702	701	707	704
MIN	700	699	699	699	698	695	694	696	697	697	698	697	698	698	700	702	703	702	701	701	700	698	699	700	701

DAY	26	27	28	29	30	31
AVE	703	703	704	702	699	701
MAX	705	705	705	704	701	703
MIN	701	702	702	701	697	699

MONTHLY AVERAGE = 700.7 MONTHLY MAXIMUM = 707.0 MONTHLY MINIMUM = 693.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
OCTOBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	89	93	95	97	96	94	100	100	100	100	100	98	100	100	100	100	96	95	97	98	100	98	97	95	97
2	96	97	97	100	98	99	97	92	86	74	70	64	76	77	89	87	85	87	94	97	99	100	100	100	90
3	98	100	100	100	100	100	100	100	98	92	81	78	73	70	68	65	64	66	71	76	80	86	90	93	85
4	97	99	96	96	96	95	98	99	91	75	65	52	47	43	38	36	38	43	49	55	57	63	67	71	69
5	74	77	79	83	86	90	88	79	70	58	57	52	46	42	41	39	37	38	43	50	53	55	56	61	61
6	64	68	70	76	74	73	74	67	59	52	46	42	38	36	30	31	33	36	39	42	45	48	52	54	52
7	56	59	65	71	65	57	61	64	75	94	96	80	68	61	60	59	59	65	67	77	81	87	80	77	70
8	82	81	82	84	85	86	86	82	70	61	56	51	46	44	41	41	42	45	52	55	58	61	66	70	64
9	72	74	74	73	76	77	79	79	67	56	48	45	36	31	30	29	30	33	37	39	42	46	49	52	53
10	54	55	59	60	64	64	71	64	52	44	37	34	31	29	29	30	30	32	37	41	43	48	51	51	46
11	54	58	62	64	64	70	70	67	59	51	44	39	39	40	41	39	41	43	47	49	52	55	59	62	53
12	67	70	72	73	87	100	100	100	100	100	100	98	94	82	74	67	61	63	65	66	70	74	75	75	80
13	77	79	76	82	82	83	81	81	90	99	93	99	100	99	99	100	100	100	100	100	100	100	100	100	92
14	100	100	100	100	100	100	99	99	96	90	81	71	64	63	60	59	59	62	70	73	75	78	87	91	82
15	95	98	95	99	100	100	100	92	57	50	48	45	45	47	48	50	56	62	67	69	74	91	84	83	73
16	78	74	72	76	90	93	83	85	83	78	70	65	64	63	63	61	61	62	63	64	64	66	68	66	71
17	65	64	64	65	66	66	66	64	61	56	54	52	50	48	47	47	47	50	54	58	60	63	64	66	58
18	68	68	70	71	72	74	75	71	64	60	57	53	50	49	48	49	51	54	57	59	63	66	69	70	62
19	72	73	74	75	76	77	79	76	69	63	59	55	52	48	47	47	49	53	55	57	60	63	63	64	63
20	66	67	67	69	70	70	71	67	61	57	51	46	40	38	37	35	37	40	41	43	44	43	44	45	52
21	46	48	48	49	51	53	54	54	52	50	48	49	47	48	46	45	46	52	54	59	64	70	66	63	53
22	63	66	67	69	70	79	81	75	71	68	67	61	59	56	54	53	54	57	59	59	60	61	63	71	64
23	71	75	75	73	72	69	71	70	69	84	90	78	69	65	69	68	74	79	78	78	82	83	85	83	75
24	84	87	91	93	95	95	96	90	84	18	19	18	17	17	16	17	18	19	21	22	22	23	24	24	46
25	87	84	85	86	95	97	99	92	77	69	60	54	50	43	39	40	43	47	51	53	59	62	68	70	67
26	76	77	82	87	84	88	93	82	70	63	57	56	47	41	35	33	32	34	40	43	46	52	59	62	60
27	62	65	71	72	72	76	79	72	61	51	44	39	33	29	27	25	26	31	36	40	46	50	54	56	51
28	59	62	64	68	70	72	76	70	62	54	47	40	34	31	27	24	26	33	35	39	44	49	53	54	50
29	57	57	60	63	68	69	73	72	59	50	47	41	34	33	31	34	34	37	39	43	46	51	53	54	50
30	57	59	62	62	64	69	73	72	69	59	51	48	39	34	34	31	30	34	37	45	53	48	50	53	51
31	57	58	64	64	50	41	41	42	37	32	31	33	33	33	30	29	31	34	38	40	41	44	49	51	42
HRAVE	72	74	75	77	79	80	81	78	71	65	60	56	52	50	48	47	48	51	55	58	61	64	66	67	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	97	90	85	69	61	52	70	64	53	46	53	80	92	82	73	71	58	62	63	52	53	64	75	46	67
MAX	100	100	100	99	90	76	96	86	79	71	70	100	100	100	100	93	66	75	79	71	70	81	90	96	99
MIN	89	64	64	36	37	30	56	41	29	29	39	61	76	59	45	61	47	48	47	35	45	53	65	16	39

DAY	26	27	28	29	30	31
AVE	60	51	50	50	51	42
MAX	93	79	76	73	73	64
MIN	32	25	24	31	30	29

MONTHLY AVERAGE = 64.0 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 16.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
OCTOBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06	0.16	0.12	0.05	0.11	0.12	0.20	0.18	0.04	0.00	0.00	0.00	0.00	0.00	0.00	1.10
2	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.12	0.19	0.23	0.38	0.30	0.13	0.15	0.09	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.78
3	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.16	0.29	0.46	0.52	0.81	0.73	0.68	0.51	0.31	0.10	0.00	0.00	0.00	0.00	0.00	0.00	4.66
4	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.31	0.52	0.74	0.82	0.84	0.79	0.68	0.52	0.31	0.10	0.00	0.00	0.00	0.00	0.00	0.00	5.68
5	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.40	0.58	0.73	0.81	0.83	0.79	0.67	0.51	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.93
6	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.39	0.57	0.69	0.81	0.81	0.79	0.67	0.42	0.20	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.60
7	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.17	0.05	0.17	0.45	0.28	0.46	0.47	0.24	0.08	0.04	0.00	0.00	0.00	0.00	0.00	0.00	2.52
8	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.42	0.58	0.46	0.66	0.58	0.59	0.66	0.47	0.30	0.07	0.00	0.00	0.00	0.00	0.00	0.00	4.98
9	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.36	0.57	0.71	0.81	0.83	0.78	0.67	0.50	0.29	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.66
10	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.38	0.57	0.71	0.80	0.81	0.77	0.65	0.49	0.28	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.72
11	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.28	0.37	0.52	0.78	0.52	0.71	0.47	0.24	0.13	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.13
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.05	0.10	0.17	0.26	0.39	0.37	0.34	0.24	0.05	0.00	0.00	0.00	0.00	0.00	0.00	2.05
13	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.03	0.12	0.16	0.12	0.10	0.21	0.15	0.07	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.12
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.15	0.28	0.39	0.78	0.59	0.62	0.65	0.39	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.20
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.35	0.54	0.69	0.77	0.74	0.65	0.55	0.34	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.04
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.11	0.22	0.58	0.38	0.33	0.50	0.58	0.49	0.24	0.05	0.00	0.00	0.00	0.00	0.00	0.00	3.54
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.29	0.53	0.67	0.74	0.70	0.69	0.63	0.46	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.11
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.53	0.68	0.76	0.76	0.73	0.63	0.46	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.37
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.53	0.67	0.76	0.77	0.72	0.61	0.45	0.25	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.31
20	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.33	0.51	0.65	0.74	0.79	0.75	0.60	0.45	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.25
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.24	0.37	0.38	0.60	0.71	0.62	0.33	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.64
22	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.21	0.32	0.32	0.59	0.42	0.56	0.46	0.42	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.67
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.12	0.06	0.05	0.13	0.25	0.08	0.06	0.04	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.91
24	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.26	0.50	0.65	0.74	0.76	0.70	0.59	0.42	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.32	0.50	0.63	0.72	0.75	0.69	0.58	0.41	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.96
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.32	0.50	0.64	0.72	0.74	0.69	0.58	0.41	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.95
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.32	0.51	0.65	0.73	0.75	0.70	0.59	0.42	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.03
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.32	0.49	0.65	0.73	0.75	0.70	0.59	0.35	0.15	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.87
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.38	0.46	0.51	0.59	0.67	0.60	0.47	0.34	0.15	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.30
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.15	0.35	0.47	0.57	0.69	0.68	0.46	0.41	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.04
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.32	0.49	0.63	0.71	0.69	0.69	0.58	0.40	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.83
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.26	0.39	0.51	0.61	0.61	0.60	0.52	0.37	0.20	0.04	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	1.10	1.78	4.66	5.68	5.93	5.60	2.52	4.98	5.66	5.72	4.13	2.05	1.12	4.20	5.04	3.54	5.11	5.37	5.31	5.25	3.64	3.67	0.91	5.00	4.96
MAX	0.20	0.38	0.81	0.84	0.83	0.81	0.47	0.66	0.83	0.81	0.78	0.39	0.21	0.78	0.77	0.58	0.74	0.76	0.77	0.79	0.71	0.59	0.25	0.76	0.75
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.95	5.03	4.87	4.30	4.04	4.83
MAX	0.74	0.75	0.75	0.67	0.69	0.71
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
OCTOBER - 2018

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.02	0.00	0.01	0.00	0.00	0.02	0.04	0.02	0.04	0.04	0.02	0.04	0.27	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57
2	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.05
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.00
8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
10	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
11	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
12	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
13	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
14	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
15	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
16	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
17	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
18	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
19	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
20	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
22	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
23	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
24	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
25	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
26	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
27	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
28	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
29	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
30	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
31	***	***	***	***	***	***	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.57	0.05	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
MAX	0.27	0.03	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***

DAY	26	27	28	29	30	31
TOT	***	***	***	***	***	0.00
MAX	***	***	***	***	***	0.00
MIN	***	***	***	***	***	0.00

MONTHLY TOTAL = 0.62 MONTHLY MAXIMUM = 0.27 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 22.4% OPERATIONAL RECOVERY RATE = 22.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
NOVEMBER - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	6.5	8.8	8.1	5.9	8.8	7.7	9.8	7.2	5.2	2.1	2.4	2.7	5.1	5.5	4.9	5.2	8.1	10.5	10.0	7.2	3.6	2.1	2.8	5.3	6.1
2	7.7	6.9	8.3	7.6	7.3	5.9	6.4	6.5	6.4	8.7	7.2	3.7	3.4	3.8	3.5	4.9	7.7	10.5	10.1	11.3	6.8	4.0	5.8	8.2	6.8
3	8.4	6.5	9.5	7.5	7.5	7.2	3.3	6.2	5.4	4.9	2.3	3.0	7.1	10.0	10.5	11.6	13.2	11.9	11.0	7.7	3.5	6.6	6.9	7.2	7.5
4	4.6	7.9	6.9	8.2	9.2	7.5	7.8	8.0	6.3	7.2	5.0	4.1	2.7	3.1	6.2	9.6	11.5	9.0	8.5	9.2	2.6	4.1	6.9	7.1	6.8
5	8.0	6.8	6.9	7.3	6.3	5.6	7.3	4.9	3.1	3.5	2.5	2.2	2.9	7.3	10.3	14.0	13.5	9.3	8.2	3.1	4.7	6.8	6.1	6.4	6.5
6	8.2	7.8	7.0	6.4	4.6	7.6	8.3	5.7	6.3	5.0	4.1	3.5	1.9	3.7	7.4	9.1	10.5	10.5	7.2	3.8	2.8	5.5	7.7	8.7	6.4
7	6.6	7.6	7.0	6.0	7.1	6.0	4.2	6.9	5.0	4.4	3.9	2.3	2.7	5.7	8.6	9.7	10.7	11.2	8.8	6.1	3.3	4.9	6.5	8.4	6.4
8	9.9	7.8	7.1	3.6	4.5	6.3	6.7	7.1	6.3	5.1	3.1	3.3	3.6	8.5	12.5	12.1	12.4	10.0	11.4	13.2	18.1	21.0	22.5	17.2	9.7
9	12.7	11.5	14.9	17.0	22.4	17.5	16.9	17.8	19.4	19.4	19.8	23.5	22.5	20.8	18.1	16.7	15.1	16.1	17.9	18.2	17.0	19.8	25.0	24.3	18.5
10	21.4	23.0	25.2	25.8	25.0	25.9	25.2	26.0	25.4	25.2	21.0	17.3	12.5	10.0	7.8	4.3	2.8	3.2	6.8	9.2	4.8	4.7	6.3	8.1	15.3
11	7.2	8.4	7.4	7.4	3.8	4.4	5.3	3.1	5.7	3.1	2.6	4.7	10.6	19.2	20.3	19.8	17.9	13.9	4.7	1.8	4.1	17.0	16.5	12.3	9.2
12	8.9	7.9	9.2	11.3	12.4	12.1	10.1	11.0	13.6	13.8	17.0	18.6	16.6	13.1	16.6	17.1	15.7	12.0	12.1	11.6	11.1	10.7	13.7	18.7	13.1
13	19.2	20.0	19.0	16.9	15.8	13.3	15.1	16.7	19.4	18.6	19.4	20.1	20.4	24.5	21.2	15.3	14.1	15.2	14.9	18.5	20.5	22.0	24.3	20.8	18.5
14	17.9	26.3	26.6	25.4	26.7	26.0	27.1	23.6	26.8	18.2	18.8	20.8	23.9	24.9	23.5	23.1	22.3	17.8	16.4	21.2	25.2	21.8	18.1	16.3	22.4
15	23.3	24.6	26.1	20.8	21.2	17.7	16.6	16.9	17.4	16.1	14.6	10.9	11.5	12.4	13.3	10.0	9.0	11.3	16.4	18.4	16.7	15.6	12.5	8.8	15.9
16	8.9	9.7	10.1	10.8	11.4	11.4	11.4	10.7	9.7	10.0	9.1	7.0	6.7	5.4	5.6	6.8	8.2	6.1	2.2	3.1	2.0	2.4	6.6	10.5	7.7
17	8.9	9.1	7.1	7.4	7.6	6.8	5.2	7.3	9.4	7.9	4.5	4.0	2.3	3.8	9.5	11.9	12.7	12.1	11.9	6.3	3.8	4.8	6.8	7.7	7.5
18	9.1	8.4	7.4	5.6	4.6	6.2	6.8	5.1	6.4	5.3	4.2	3.1	2.9	4.4	5.9	6.2	7.8	10.7	13.1	11.5	5.1	6.8	7.3	6.8	6.7
19	7.0	7.9	6.6	7.6	7.9	4.7	5.9	7.1	8.1	7.6	5.3	5.7	4.5	6.1	4.8	3.1	3.4	6.9	6.8	10.8	10.6	11.6	10.8	8.6	7.1
20	8.7	10.3	9.7	9.4	9.9	10.9	15.0	17.5	21.4	19.9	18.7	18.2	18.2	15.8	13.7	13.2	15.4	15.2	15.9	14.9	18.2	16.1	9.8	8.9	14.4
21	9.2	7.9	7.6	6.3	6.9	8.1	8.5	8.7	9.8	8.3	4.1	2.5	4.0	2.4	4.3	3.2	3.0	13.2	12.6	10.0	8.5	4.6	5.2	6.9	6.9
22	6.9	7.0	7.9	7.4	5.2	7.2	4.9	5.8	6.7	4.3	2.4	7.2	3.6	2.3	5.2	5.5	5.7	3.8	5.3	6.4	7.3	4.0	2.4	3.3	5.3
23	2.8	5.4	4.2	6.4	4.8	4.1	5.6	5.7	4.3	5.1	4.7	3.6	5.1	5.2	5.0	8.1	10.7	11.3	11.1	9.6	3.4	5.1	5.7	6.9	6.0
24	7.1	6.8	5.5	5.7	5.6	7.0	6.0	4.8	3.3	4.6	2.3	2.3	3.8	6.8	11.3	13.9	13.1	9.7	8.4	5.3	2.6	2.0	4.5	2.9	6.0
25	4.3	7.3	6.2	7.0	7.3	6.3	4.5	3.7	6.3	6.4	6.2	9.9	8.9	11.1	9.0	7.0	8.4	10.5	10.7	4.3	3.8	4.7	10.2	12.4	7.4
26	11.2	9.2	7.2	10.8	14.3	17.3	17.2	15.8	20.8	19.7	16.5	16.2	13.4	14.6	17.0	15.4	15.8	15.3	13.2	16.5	20.4	18.1	15.7	14.4	15.2
27	9.7	11.5	9.9	10.6	9.9	9.1	10.3	10.6	9.2	8.3	7.2	10.4	6.2	7.3	10.9	10.7	8.4	2.0	3.4	3.4	3.3	6.3	8.5	8.5	8.2
28	8.0	4.4	6.5	8.1	7.2	7.5	7.2	7.8	6.9	5.1	5.2	5.2	5.3	5.6	6.3	9.3	10.2	10.8	11.1	4.7	6.1	9.6	7.3	8.2	7.2
29	7.0	5.0	5.9	8.0	7.5	7.2	7.1	9.1	8.4	8.0	4.3	2.8	2.2	1.7	3.4	9.3	12.1	10.1	6.7	7.8	5.8	3.2	8.1	8.0	6.6
30	4.5	6.0	21.0	6.9	5.1	5.1	8.3	5.2	3.1	2.5	2.7	5.3	16.0	15.6	12.4	10.5	6.8	5.2	3.0	4.4	4.9	6.0	6.5	6.4	7.2
HRAVE	9.5	9.9	10.4	9.8	9.9	9.7	9.8	9.8	10.2	9.3	8.0	8.1	8.4	9.3	10.3	10.6	10.9	10.5	10.0	9.3	8.4	9.1	9.9	9.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.1	6.8	7.5	6.8	6.5	6.4	6.4	9.7	18.5	15.3	9.2	13.1	18.5	22.4	15.9	7.7	7.5	6.7	7.1	14.4	6.9	5.3	6.0	6.0	7.4
MAX	10.5	11.3	13.2	11.5	14.0	10.5	11.2	22.5	25.0	26.0	20.3	18.7	24.5	27.1	26.1	11.4	12.7	13.1	11.6	21.4	13.2	7.9	11.3	13.9	12.4
MIN	2.1	3.4	2.3	2.6	2.2	1.9	2.3	3.1	11.5	2.8	1.8	7.9	13.3	16.3	8.8	2.0	2.3	2.9	3.1	8.7	2.4	2.3	2.8	2.0	3.7

DAY	26	27	28	29	30	31
AVE	15.2	8.2	7.2	6.6	7.2	***
MAX	20.8	11.5	11.1	12.1	21.0	***
MIN	7.2	2.0	4.4	1.7	2.5	***

MONTHLY AVERAGE = 9.6 MONTHLY MAXIMUM = 27.1 MONTHLY MINIMUM = 1.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
NOVEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	108	101	96	120	101	116	115	113	124	151	123	240	264	255	267	264	288	297	298	303	325	249	163	124	201
2	120	119	116	123	98	119	130	122	130	144	145	163	123	227	252	273	270	300	300	295	297	138	125	118	133
3	116	122	120	119	125	113	127	105	121	128	172	238	270	291	295	289	288	295	308	285	145	120	99	106	176
4	117	122	110	127	105	117	113	101	109	130	116	102	130	245	286	294	304	300	305	293	285	157	124	117	24
5	112	109	117	115	120	110	104	120	113	128	140	170	266	267	292	298	287	300	293	322	139	96	86	91	318
6	99	102	114	102	112	101	97	110	114	116	103	108	358	264	279	295	311	313	300	335	12	108	93	96	239
7	109	95	101	107	100	123	94	93	93	111	128	255	190	266	282	293	294	303	303	288	162	124	107	94	147
8	90	98	106	110	116	93	110	96	120	134	136	160	252	293	298	290	278	293	308	11	47	38	41	39	324
9	46	64	63	61	68	64	71	74	74	72	48	40	38	37	35	35	39	44	48	61	63	67	67	68	116
10	80	76	77	82	70	71	71	71	71	74	79	78	77	64	48	68	269	116	300	314	302	117	102	92	230
11	88	96	100	81	59	39	102	87	103	160	260	271	280	276	279	280	280	286	301	55	353	48	39	49	328
12	30	49	70	72	68	64	54	57	62	70	56	37	27	26	32	20	24	23	31	46	69	51	73	90	186
13	91	97	101	99	106	86	80	77	81	90	92	117	123	115	119	86	49	71	81	100	97	86	78	68	73
14	67	52	46	47	46	51	43	49	50	64	74	70	72	71	75	76	78	57	60	48	47	48	49	56	280
15	48	48	48	53	55	61	61	64	64	69	56	68	50	45	76	50	48	53	47	48	51	69	80	119	103
16	121	118	123	123	125	125	123	123	125	141	158	153	95	78	85	70	68	5	298	60	22	65	141	123	5
17	106	113	105	119	116	118	109	113	124	126	138	152	147	263	290	308	304	299	312	306	137	125	113	97	120
18	96	100	107	105	111	103	105	105	99	121	134	129	141	261	263	267	274	295	302	301	195	102	95	99	57
19	111	115	123	108	110	106	104	97	110	131	149	148	151	77	70	49	56	10	43	52	57	58	121	119	215
20	126	124	132	117	106	101	78	70	67	73	65	62	53	48	47	51	43	44	46	50	47	52	96	106	142
21	127	118	130	117	114	115	105	99	111	140	139	94	92	81	244	278	338	303	306	305	303	178	125	121	80
22	108	115	90	96	104	96	104	117	123	127	238	288	244	178	300	277	278	282	294	299	283	298	90	183	284
23	148	106	123	97	112	114	114	123	122	125	135	142	163	222	249	300	304	303	306	294	262	130	123	118	60
24	113	113	99	109	113	112	107	100	116	132	152	160	257	267	294	294	283	298	308	306	208	180	138	117	142
25	119	120	103	129	121	137	136	124	136	140	147	87	58	41	43	38	30	27	23	324	321	87	64	66	53
26	84	96	113	83	65	69	70	75	68	70	65	55	44	41	38	41	35	45	46	48	46	47	51	66	261
27	100	141	130	127	129	126	130	124	137	151	115	75	97	80	74	76	79	250	109	327	160	115	115	102	53
28	108	128	122	108	102	105	115	99	95	123	117	100	114	279	271	288	296	305	302	279	107	91	101	99	249
29	103	95	101	98	93	105	100	89	91	103	103	250	238	148	297	257	284	313	270	288	294	251	322	314	162
30	322	128	279	236	144	143	149	136	136	112	84	281	278	303	290	288	263	278	189	127	123	126	118	128	338

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
NOVEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	17	11	6	10	9	8	7	8	15	37	33	42	20	22	21	22	17	8	5	9	29	28	20	8	17
2	9	9	6	10	8	11	17	6	9	10	17	29	41	41	36	36	11	6	6	5	23	20	7	8	16
3	10	12	9	9	9	12	22	10	11	18	40	44	20	21	14	13	8	7	6	27	28	8	10	20	16
4	17	8	13	8	8	9	9	8	10	12	16	24	51	42	29	12	10	7	7	6	28	28	5	8	16
5	8	11	7	8	6	9	7	12	15	18	33	52	37	21	18	14	10	7	6	15	21	8	8	9	15
6	6	7	9	8	14	6	7	12	9	17	17	27	50	59	19	17	13	8	6	24	29	7	7	7	16
7	11	8	10	9	8	8	7	7	8	15	25	35	47	23	17	18	13	8	6	20	13	9	8	6	14
8	6	7	8	13	9	7	8	6	11	16	28	30	35	19	15	15	10	7	6	21	16	13	12	14	14
9	21	19	14	14	10	14	11	10	11	12	18	14	13	13	14	16	15	11	13	13	14	10	8	8	13
10	9	8	8	10	8	7	9	8	9	7	12	11	14	21	27	32	47	41	15	9	22	17	8	6	15
11	5	7	8	9	24	18	15	13	10	36	26	23	14	11	11	10	9	8	20	66	36	10	13	16	17
12	23	26	28	17	14	16	21	23	18	17	18	23	22	28	20	21	22	26	21	22	17	19	10	10	20
13	10	9	9	10	7	7	5	6	10	11	14	14	12	9	10	18	15	10	11	9	9	7	6	7	10
14	7	7	6	8	9	13	9	12	8	10	11	10	9	9	11	11	9	13	12	10	6	8	10	10	10
15	8	9	7	11	9	12	12	9	9	10	17	21	21	21	12	21	18	11	9	8	11	10	9	14	12
16	7	6	5	5	6	5	5	6	7	8	7	16	18	20	16	16	12	16	25	30	44	20	11	5	13
17	7	6	7	8	8	6	8	7	6	11	21	25	46	24	15	14	9	6	5	19	26	8	8	7	13
18	7	7	8	9	9	7	8	10	7	18	19	31	39	24	17	17	8	6	7	5	23	6	6	8	13
19	7	7	9	7	8	10	7	8	8	12	19	18	33	36	49	33	43	8	20	11	14	12	13	9	17
20	12	6	7	17	16	17	11	7	6	8	13	16	15	16	19	16	12	11	10	11	7	10	21	11	12
21	13	7	8	7	8	7	9	6	7	12	25	34	21	47	34	34	47	9	5	5	7	27	8	5	16
22	8	7	6	11	9	7	9	10	7	11	35	8	19	38	9	8	8	8	9	6	5	24	45	41	15
23	32	11	12	9	12	12	9	11	15	22	22	31	27	32	33	17	12	8	6	4	25	9	6	7	16
24	8	8	8	10	9	7	8	10	17	14	41	59	35	18	16	14	9	8	7	8	28	37	15	14	17
25	13	6	16	10	10	23	14	16	7	13	16	19	28	19	23	21	16	15	9	40	21	14	9	11	16
26	9	14	21	11	11	8	7	8	8	8	15	19	20	18	13	13	14	11	10	8	7	8	11	8	12
27	12	4	5	5	6	6	6	5	15	13	27	10	17	21	6	6	19	22	31	45	44	11	7	7	15
28	9	10	6	7	6	7	6	7	7	12	21	24	35	30	15	16	10	6	4	25	9	6	6	8	12
29	12	10	8	6	7	11	11	5	9	10	25	30	45	36	46	20	10	16	9	7	9	38	25	15	17
30	51	45	20	21	15	18	11	10	16	19	33	26	9	12	12	12	13	12	19	15	12	7	9	10	18
HRAVE	12	10	10	10	10	10	10	9	10	15	22	26	27	25	20	18	16	11	11	17	19	15	11	11	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	17	16	16	16	15	16	14	14	13	15	17	20	10	10	12	13	13	13	17	12	16	15	16	17	16
MAX	42	41	44	51	52	59	47	35	21	47	66	28	18	13	21	44	46	39	49	21	47	45	33	59	40
MIN	5	5	6	5	6	6	6	6	8	6	5	10	5	6	7	5	5	5	7	6	5	5	4	7	6

DAY	26	27	28	29	30	31
AVE	12	15	12	17	18	***
MAX	21	45	35	46	51	***
MIN	7	4	4	5	7	***

MONTHLY AVERAGE = 14.8 MONTHLY MAXIMUM = 66.1 MONTHLY MINIMUM = 3.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
NOVEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	12.6	12.0	10.9	9.6	9.5	9.1	9.2	9.3	11.0	12.4	15.3	17.1	19.2	21.0	21.9	22.5	22.4	21.1	19.6	18.5	17.5	16.3	15.3	13.8	15.3
2	13.2	12.8	11.9	11.5	10.6	9.3	8.3	9.9	11.7	15.2	18.2	20.6	22.7	24.1	24.8	25.0	24.7	23.3	21.8	20.6	19.5	17.8	16.5	15.4	17.1
3	14.9	13.5	13.1	12.4	11.8	11.2	10.4	10.4	12.3	15.5	17.4	20.1	22.3	23.7	24.6	25.0	24.3	22.9	21.6	20.3	19.0	17.9	17.0	15.9	17.4
4	15.0	13.7	13.9	12.8	12.6	12.2	11.3	11.7	13.5	16.3	18.8	22.0	23.8	24.7	25.2	24.7	24.3	23.0	21.9	21.1	20.0	18.4	17.2	16.8	18.1
5	16.1	15.1	14.2	13.7	13.3	11.6	11.6	11.4	13.4	16.5	19.2	21.5	23.4	24.6	25.6	25.8	25.2	23.6	21.8	21.0	18.8	17.9	16.4	15.3	18.2
6	14.6	14.3	13.4	12.9	11.2	11.1	10.9	11.3	14.1	17.1	19.8	22.6	24.0	25.6	26.3	26.5	26.0	24.7	22.8	22.2	21.6	18.7	17.3	17.0	18.6
7	15.9	14.6	13.9	12.8	12.5	11.6	10.9	11.6	13.5	16.7	19.6	21.6	24.1	25.0	25.8	26.1	25.6	24.0	22.2	21.1	19.6	18.3	17.2	15.7	18.3
8	14.5	14.3	13.4	12.4	11.6	10.2	10.1	10.8	12.6	15.7	18.5	20.8	22.6	24.0	24.6	24.7	24.1	22.6	21.6	21.6	20.8	20.1	19.4	18.6	17.9
9	17.9	16.9	16.4	15.9	15.5	14.9	14.3	14.4	15.4	16.6	18.2	19.5	20.6	21.4	22.3	22.7	22.7	22.2	21.7	20.9	20.4	19.8	19.2	18.6	18.7
10	17.9	17.2	16.6	15.9	15.4	14.8	14.3	14.1	14.9	16.1	18.1	19.7	21.0	21.9	22.3	22.7	22.8	21.5	20.3	19.7	18.7	16.8	15.6	14.2	18.0
11	12.8	12.6	12.1	10.7	10.1	8.9	8.1	8.8	10.3	12.6	14.8	17.2	19.4	20.3	20.2	20.0	19.0	17.6	16.4	15.5	15.0	14.3	13.6	13.2	14.3
12	13.0	12.8	12.3	11.9	11.5	11.0	10.7	10.6	11.4	12.3	13.2	14.0	14.2	14.9	15.3	15.2	14.8	14.1	13.4	13.3	12.7	12.1	11.4	10.1	12.8
13	8.9	8.2	7.7	7.1	6.7	6.1	5.9	6.0	7.4	9.1	10.9	12.8	14.0	14.7	15.2	15.0	14.3	13.5	12.9	12.5	11.8	11.1	10.7	10.2	10.5
14	9.5	9.7	9.9	9.6	9.2	8.9	8.6	8.7	10.1	11.6	12.7	14.1	15.5	15.9	16.4	16.5	16.2	15.6	14.9	14.7	14.6	14.3	13.9	13.5	12.7
15	13.6	13.2	12.6	11.9	11.2	10.9	10.5	10.5	11.6	13.4	15.4	17.5	18.8	19.6	20.3	20.6	20.3	19.7	19.1	18.3	17.2	15.7	13.6	11.5	15.3
16	9.7	8.9	8.0	7.1	6.7	6.2	5.6	6.1	8.6	11.4	13.8	17.5	20.1	21.0	21.7	21.7	21.2	20.5	19.2	17.4	16.3	14.6	11.9	11.0	13.6
17	11.0	10.1	9.0	8.0	7.2	6.9	5.8	6.2	8.2	11.6	14.3	17.1	19.1	20.0	21.0	21.2	20.8	19.2	18.1	16.8	15.1	13.5	12.2	10.7	13.5
18	9.6	10.1	8.7	7.7	7.1	6.3	6.6	6.7	8.2	11.5	14.1	16.3	18.7	19.8	20.8	21.1	20.5	18.9	17.4	16.5	14.7	13.3	12.3	10.7	13.2
19	9.8	8.9	8.2	7.0	6.5	6.3	5.0	4.9	8.0	11.0	14.2	17.0	19.7	21.5	21.8	21.6	21.1	19.9	18.9	18.3	17.0	16.4	13.5	12.8	13.7
20	10.9	10.6	9.1	9.4	9.9	10.8	12.1	13.1	14.3	16.4	18.1	19.6	20.6	21.6	22.3	22.5	22.1	21.4	20.9	20.1	19.8	18.7	16.4	14.8	16.5
21	12.6	11.9	11.1	10.3	9.4	8.6	7.9	8.5	10.6	13.1	15.5	18.5	20.9	22.1	23.2	23.0	22.5	20.5	19.0	18.0	17.3	14.5	14.1	13.6	15.3
22	12.3	12.7	11.8	11.5	11.1	11.5	10.8	10.6	11.4	11.8	12.6	13.0	14.4	15.0	16.1	16.3	16.4	16.1	15.9	15.1	14.3	13.1	13.6	12.5	13.3
23	11.9	10.8	10.1	8.7	8.2	7.4	6.7	6.6	8.2	10.7	13.5	16.1	18.1	19.0	19.3	19.7	19.1	17.7	16.3	15.2	13.9	12.5	11.6	10.6	13.0
24	9.6	9.1	7.6	7.2	6.8	6.2	5.9	5.6	6.9	10.1	12.6	15.1	16.8	18.7	20.0	20.0	19.1	17.5	16.6	15.9	14.5	13.1	12.3	11.9	12.5
25	10.3	9.6	8.9	7.8	7.6	7.3	6.6	6.9	8.1	10.6	15.1	18.1	19.0	19.4	19.8	19.9	19.7	18.7	18.0	16.7	15.8	14.8	14.1	14.0	13.6
26	12.8	11.6	10.5	11.2	12.6	12.5	12.0	11.7	12.3	14.1	15.7	16.8	18.5	19.1	19.4	19.9	19.6	19.0	18.3	17.9	17.3	16.7	16.1	15.0	15.4
27	12.9	9.5	9.7	8.7	7.8	7.0	6.4	6.6	8.2	10.7	15.0	18.3	20.3	21.0	20.8	20.9	20.7	20.7	19.0	17.8	16.4	14.0	12.6	12.1	14.1
28	11.0	9.4	8.4	8.4	7.0	6.4	6.4	6.6	7.5	9.3	13.2	16.4	18.8	20.2	21.6	22.2	21.8	20.4	18.8	17.5	15.9	14.3	12.8	12.3	13.6
29	11.1	9.5	9.3	9.0	7.4	7.3	6.8	7.3	9.5	12.2	15.2	17.2	19.4	20.8	21.5	22.4	21.3	19.9	18.5	17.3	16.8	15.0	14.9	14.5	14.3
30	14.2	14.0	10.1	8.5	8.5	8.4	8.5	8.8	9.2	9.9	11.2	12.3	12.0	11.9	11.3	12.9	13.3	12.5	12.1	11.5	11.5	10.9	10.3	9.5	11.0
HRAVE	12.7	11.9	11.1	10.4	9.9	9.4	9.0	9.2	10.7	13.1	15.5	17.7	19.4	20.4	21.0	21.3	20.9	19.7	18.6	17.8	16.8	15.5	14.4	13.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15.3	17.1	17.4	18.1	18.2	18.6	18.3	17.9	18.7	18.0	14.3	12.8	10.5	12.7	15.3	13.6	13.5	13.2	13.7	16.5	15.3	13.3	13.0	12.5	13.6
MAX	22.5	25.0	25.0	25.2	25.8	26.5	26.1	24.7	22.7	22.8	20.3	15.3	15.2	16.5	20.6	21.7	21.2	21.1	21.8	22.5	23.2	16.4	19.7	20.0	19.9
MIN	9.1	8.3	10.4	11.3	11.4	10.9	10.9	10.1	14.3	14.1	8.1	10.1	5.9	8.6	10.5	5.6	5.8	6.3	4.9	9.1	7.9	10.6	6.6	5.6	6.6

DAY	26	27	28	29	30	31
AVE	15.4	14.1	13.6	14.3	11.0	***
MAX	19.9	21.0	22.2	22.4	14.2	***
MIN	10.5	6.4	6.4	6.8	8.4	***

MONTHLY AVERAGE = 15.0 MONTHLY MAXIMUM = 26.5 MONTHLY MINIMUM = 4.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
NOVEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.7	0.6	0.5	0.8	0.4	0.3	0.2	-0.3	-0.8	-0.5	-0.7	-0.6	-0.6	-0.6	-0.7	-0.7	-0.3	0.2	0.5	0.6	0.5	0.6	0.4	0.5	0.0
2	0.3	0.4	0.5	0.5	0.8	0.7	0.7	-0.3	-0.9	-1.4	-1.4	-0.9	-0.7	-0.6	-0.6	-0.6	-0.2	0.3	0.6	0.5	0.6	0.4	0.5	0.4	0.0
3	0.3	0.7	0.3	0.3	0.3	0.3	0.6	-0.2	-0.9	-1.2	-0.6	-0.7	-0.8	-0.7	-0.7	-0.7	-0.2	0.2	0.5	0.7	0.4	0.5	0.6	0.7	0.0
4	0.6	0.6	0.4	0.4	0.3	0.3	0.4	-0.2	-1.1	-1.4	-1.3	-1.2	-0.9	-0.6	-0.5	-0.3	0.0	0.4	0.5	0.4	0.4	0.4	0.5	0.3	-0.1
5	0.3	0.4	0.4	0.4	0.6	0.6	0.5	-0.3	-0.7	-0.9	-0.7	-0.7	-0.6	-0.7	-0.7	-0.5	-0.2	0.4	0.8	0.5	0.8	0.8	0.7	0.6	0.1
6	0.8	0.7	0.5	0.5	0.6	0.7	0.8	-0.3	-1.2	-1.4	-1.1	-1.1	-0.6	-0.6	-0.6	-0.6	0.0	0.4	0.6	0.6	0.6	0.8	0.9	0.6	0.1
7	0.5	0.7	0.6	0.6	0.6	0.3	0.5	-0.2	-1.0	-1.3	-1.0	-0.6	-0.8	-0.6	-0.7	-0.6	-0.2	0.4	0.7	0.8	0.6	0.5	0.6	0.6	0.0
8	0.7	0.6	0.6	0.5	0.3	0.6	0.6	-0.2	-0.9	-1.1	-0.8	-0.8	-0.7	-0.6	-0.6	-0.6	-0.2	0.3	0.5	0.4	0.2	0.1	0.1	0.2	0.0
9	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.0	-0.4	-0.6	-0.6	-0.5	-0.5	-0.3	-0.2	-0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0
10	0.2	0.1	0.1	0.1	0.1	0.1	0.1	-0.1	-0.4	-0.7	-0.9	-1.0	-1.0	-0.8	-0.4	-0.4	-0.2	0.2	0.4	0.4	0.3	0.5	0.7	0.7	-0.1
11	0.7	0.5	0.6	0.4	0.5	0.4	0.5	0.1	-0.8	-0.9	-0.5	-0.6	-0.7	-0.6	-0.5	-0.5	-0.2	0.2	0.4	0.5	0.6	0.2	0.2	0.2	0.0
12	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.0	-0.4	-0.8	-0.7	-0.6	-0.5	-0.4	-0.2	-0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.0
13	0.2	0.1	0.1	0.2	0.2	0.3	0.3	-0.1	-0.6	-1.0	-1.1	-1.4	-1.3	-0.9	-0.7	-0.3	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.2	-0.2
14	0.2	0.2	0.1	0.1	0.1	0.1	0.0	-0.1	-0.3	-0.5	-0.6	-0.4	-0.4	-0.2	-0.3	-0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	-0.1
15	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.0	-0.3	-0.6	-0.7	-0.9	-0.7	-0.4	-0.3	0.0	0.3	0.4	0.3	0.2	0.3	0.5	0.5	0.9	0.0
16	1.0	0.7	0.5	0.7	0.6	0.7	0.7	0.0	-1.0	-1.3	-1.4	-1.3	-1.2	-0.9	-0.6	-0.1	0.4	0.8	0.4	0.7	0.6	0.5	0.9	0.9	0.1
17	0.6	0.5	0.5	0.4	0.6	0.6	0.7	0.1	-0.7	-1.3	-1.0	-0.9	-0.6	-0.5	-0.5	-0.3	0.0	0.4	0.7	0.7	0.5	0.6	0.6	0.8	0.1
18	0.6	0.6	0.6	0.6	0.4	0.4	0.3	0.2	-0.5	-1.1	-1.0	-0.9	-0.7	-0.5	-0.6	-0.6	-0.1	0.5	0.6	0.6	0.5	0.8	0.8	0.7	0.1
19	0.6	0.5	0.4	0.6	0.5	0.5	0.7	0.1	-0.9	-1.4	-1.3	-1.2	-0.9	-0.7	-0.4	-0.1	0.3	0.6	0.6	0.4	0.7	0.6	0.7	0.8	0.1
20	1.2	0.9	1.4	1.3	1.1	0.8	0.5	0.3	-0.1	-0.4	-0.5	-0.6	-0.5	-0.3	-0.2	-0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.8	0.3
21	1.2	0.9	0.9	0.7	0.8	0.5	0.6	0.1	-1.0	-1.4	-0.9	-0.8	-1.0	-0.6	-0.6	-0.3	0.0	0.3	0.5	0.6	0.7	0.6	0.4	0.4	0.1
22	0.6	0.4	0.5	0.4	0.6	0.5	0.3	0.3	-0.1	-0.2	-0.2	-0.4	-0.5	-0.4	-0.4	-0.3	-0.1	0.2	0.4	0.5	0.7	0.5	0.4	0.4	0.2
23	0.5	0.6	0.5	0.8	0.5	0.5	0.6	0.2	-0.7	-0.9	-1.0	-0.9	-1.0	-0.7	-0.6	-0.6	-0.1	0.3	0.5	0.4	0.6	0.6	0.4	0.4	0.0
24	0.5	0.4	0.6	0.6	0.5	0.5	0.5	0.4	-0.4	-1.1	-0.6	-0.7	-0.7	-0.6	-0.6	-0.5	-0.2	0.3	0.4	0.5	0.4	0.4	0.5	0.5	0.1
25	0.5	0.6	0.4	0.6	0.7	0.9	0.4	0.0	-0.7	-1.2	-1.2	-1.1	-0.7	-0.3	-0.2	0.0	0.2	0.4	0.5	0.6	0.5	0.8	0.8	0.6	0.1
26	0.7	0.9	1.1	0.6	0.4	0.2	0.3	0.2	-0.2	-0.5	-0.6	-0.6	-0.5	-0.3	-0.1	0.0	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.1
27	0.9	1.0	0.6	0.6	0.5	0.4	0.7	0.2	-0.2	-0.6	-0.6	-0.9	-1.2	-0.9	-0.3	0.0	0.2	0.3	0.4	0.5	0.6	0.8	0.8	0.5	0.2
28	0.5	0.4	0.5	0.6	0.8	0.7	0.6	0.3	-0.4	-0.8	-1.1	-1.1	-1.0	-0.6	-0.6	-0.5	0.0	0.6	0.9	0.6	0.6	0.8	0.9	0.7	0.1
29	0.6	0.6	0.8	0.8	0.8	0.7	0.5	0.4	-0.6	-1.1	-1.1	-0.6	-0.6	-0.4	-0.4	-0.2	0.1	0.3	0.4	0.5	0.6	0.6	0.4	0.4	0.1
30	0.3	0.2	-0.1	-0.1	-0.1	0.0	0.1	0.1	0.0	-0.2	-0.3	-0.4	-0.3	-0.5	-0.2	-0.4	-0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.0
HRAVE	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.0	-0.6	-0.9	-0.9	-0.8	-0.7	-0.6	-0.5	-0.3	0.0	0.3	0.5	0.5	0.5	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.0	0.0	0.0	-0.1	0.1	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	-0.2	-0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.1	0.2	0.0	0.1	0.1
MAX	0.8	0.8	0.7	0.6	0.8	0.9	0.8	0.7	0.3	0.7	0.7	0.3	0.3	0.2	0.9	1.0	0.8	0.8	0.8	1.4	1.2	0.7	0.8	0.6	0.9
MIN	-0.8	-1.4	-1.2	-1.4	-0.9	-1.4	-1.3	-1.1	-0.6	-1.0	-0.9	-0.8	-1.4	-0.6	-0.9	-1.4	-1.3	-1.1	-1.4	-0.6	-1.4	-0.5	-1.0	-1.1	-1.2

DAY	26	27	28	29	30	31
AVE	0.1	0.2	0.1	0.1	0.0	***
MAX	1.1	1.0	0.9	0.8	0.3	***
MIN	-0.6	-1.2	-1.1	-1.1	-0.5	***

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = -1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
NOVEMBER - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	703	703	703	703	703	703	704	705	705	705	704	704	703	702	702	702	702	703	703	704	704	704	704	703
2	704	705	705	705	705	705	705	706	706	706	706	705	704	703	702	702	702	702	702	702	702	702	702	702	704
3	702	702	702	702	702	702	702	703	703	703	703	702	702	701	700	700	701	701	701	701	702	702	702	702	702
4	702	702	702	702	702	702	702	703	703	703	703	702	701	701	700	700	699	700	700	700	700	700	700	700	701
5	700	700	700	700	700	700	700	701	701	701	701	701	700	699	699	699	699	699	699	700	700	700	700	701	700
6	701	701	701	701	701	701	701	702	702	702	702	702	701	700	700	700	700	700	700	700	700	701	701	702	701
7	702	702	702	702	702	702	702	702	703	703	703	702	701	700	700	700	700	700	700	700	701	701	701	701	701
8	701	701	701	701	701	701	701	702	702	702	702	701	701	700	700	700	700	700	701	702	702	702	702	703	701
9	703	703	703	703	703	703	704	704	704	704	704	704	703	702	702	702	701	701	702	702	702	703	702	703	703
10	703	703	702	702	702	702	702	703	703	703	703	702	702	701	700	700	700	700	700	700	700	701	701	701	701
11	701	701	701	701	701	702	702	702	703	703	703	703	702	701	701	701	702	702	703	703	704	704	705	705	702
12	706	706	706	706	706	707	707	708	708	708	708	708	708	708	707	707	708	708	709	710	710	711	711	712	708
13	712	712	713	713	713	713	713	714	714	714	714	713	712	711	711	710	710	710	711	711	711	711	711	712	712
14	712	711	711	711	711	711	711	711	711	712	711	710	709	708	708	707	707	707	707	707	706	706	706	706	709
15	706	706	706	706	706	705	706	706	706	706	706	705	704	704	703	703	703	703	703	703	704	704	704	704	705
16	704	704	704	704	704	704	704	704	705	705	705	704	703	702	702	701	701	701	702	702	702	702	702	702	703
17	703	703	703	703	703	703	703	704	704	705	704	704	703	702	702	702	702	702	702	702	702	703	703	703	704	703
18	704	704	704	704	704	704	705	705	705	706	705	705	704	703	702	702	702	702	703	703	704	704	704	704	704
19	704	704	704	704	704	705	705	705	706	706	706	705	705	704	703	703	703	703	703	703	704	704	704	704	704
20	704	704	704	704	703	703	703	704	704	704	704	703	702	702	701	701	701	701	702	702	702	703	703	704	703
21	704	704	704	704	704	705	705	706	706	706	706	706	705	704	703	703	703	703	704	704	705	705	705	706	705
22	705	705	705	704	704	704	704	704	705	705	705	705	705	704	704	704	704	704	704	705	705	705	706	706	705
23	706	705	705	705	705	706	706	706	706	706	706	706	705	704	703	702	702	702	702	702	702	702	702	702	704
24	702	701	701	701	701	701	701	701	701	701	701	700	699	699	698	698	699	699	699	699	700	700	701	701	700
25	701	701	701	701	701	701	702	703	703	704	703	703	702	702	701	701	701	702	702	703	703	704	704	704	702
26	704	704	704	704	704	704	705	706	706	706	706	706	705	705	704	704	704	704	704	704	704	705	705	705	705
27	705	705	705	705	705	705	706	706	706	706	706	705	704	703	702	702	702	702	702	702	703	703	703	702	704
28	702	702	702	702	702	702	702	702	703	703	702	701	700	699	699	699	699	699	700	700	700	700	700	700	701
29	700	700	700	699	699	699	700	700	700	700	700	700	698	698	697	696	696	696	696	696	696	696	696	696	698
30	696	696	696	697	697	697	698	698	699	699	700	699	699	699	699	699	699	700	700	700	700	701	701	701	699
HRAVE	703	703	703	703	703	703	704	704	704	705	704	704	703	702	702	702	702	702	702	702	703	703	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	703	704	702	701	700	701	701	701	703	701	702	708	712	709	705	703	703	704	704	703	705	705	704	700	702
MAX	705	706	703	703	701	702	703	703	704	703	705	712	714	712	706	705	705	706	706	704	706	706	706	702	704
MIN	702	702	700	699	699	700	700	700	701	700	701	706	710	706	703	701	702	702	703	701	703	704	702	698	701

DAY	26	27	28	29	30	31
AVE	705	704	701	698	699	***
MAX	706	706	703	700	701	***
MIN	704	702	699	696	696	***

MONTHLY AVERAGE = 703.0 MONTHLY MAXIMUM = 714.1 MONTHLY MINIMUM = 695.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
NOVEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	52	53	55	63	61	64	63	62	55	51	42	37	28	25	22	22	26	28	30	34	38	40	42	48	43
2	48	49	52	53	58	64	67	62	56	45	38	34	30	26	22	22	24	27	32	34	37	42	45	47	42
3	48	53	54	56	59	62	66	68	58	47	42	39	35	32	30	30	30	33	36	39	44	47	49	51	46
4	56	57	56	59	60	61	66	65	57	47	39	32	27	25	25	28	27	29	32	33	37	40	44	45	44
5	47	50	53	56	59	65	66	66	57	47	40	35	32	31	28	26	25	26	30	35	38	39	44	46	43
6	49	50	53	55	61	62	62	62	52	44	38	33	31	29	29	27	27	29	32	35	37	43	46	47	43
7	50	53	56	60	61	65	69	65	56	47	41	38	32	30	29	27	27	29	32	35	39	44	46	49	45
8	52	53	56	61	64	69	70	67	57	47	40	34	31	31	29	28	30	34	38	31	24	22	21	20	42
9	20	20	18	17	17	17	18	19	19	20	21	21	22	23	24	25	26	27	32	37	41	42	43	45	26
10	46	47	48	48	50	51	52	53	51	47	43	41	38	37	37	35	36	40	43	40	42	51	54	59	46
11	64	63	64	69	73	76	82	80	68	54	47	43	34	24	22	23	25	26	29	31	33	24	19	19	45
12	20	21	22	23	24	25	26	27	26	25	24	20	19	17	16	15	15	15	16	18	20	21	21	30	21
13	37	40	40	39	39	40	39	39	34	31	27	24	22	19	18	19	22	24	24	23	24	24	24	26	29
14	28	27	26	27	28	28	29	30	27	27	25	25	24	24	24	24	23	25	26	25	24	25	27	28	26
15	27	28	29	31	32	33	34	34	31	28	26	23	21	20	18	18	17	18	18	18	20	22	25	29	25
16	33	34	35	37	38	39	41	40	35	30	28	24	20	19	18	18	17	21	23	25	27	32	31	33	29
17	35	36	39	42	45	46	51	49	42	33	30	27	24	23	23	23	22	24	26	29	32	36	39	41	34
18	43	43	47	50	52	54	53	53	49	40	34	30	26	24	23	22	21	23	27	28	31	35	36	40	37
19	43	46	47	51	53	54	59	59	46	37	32	28	24	18	16	16	19	22	22	22	25	25	29	32	34
20	35	36	39	38	37	35	32	30	29	26	25	23	22	22	21	21	21	21	22	22	22	24	29	32	28
21	36	39	41	45	46	50	52	51	45	39	35	31	28	27	28	29	31	32	33	35	36	42	45	47	38
22	51	50	53	54	56	55	58	60	57	56	55	55	50	48	46	47	48	49	49	52	54	61	59	62	54
23	65	70	71	77	80	83	84	84	73	64	56	51	42	38	34	32	37	44	50	54	58	62	65	66	60
24	68	68	74	76	77	76	77	80	67	54	48	41	40	38	35	35	38	43	47	50	52	56	59	63	57
25	67	69	71	74	76	76	79	78	68	58	41	22	19	20	22	24	26	29	30	32	33	35	35	34	47
26	35	39	44	38	33	31	31	31	30	28	26	25	25	24	24	24	25	25	27	27	28	29	29	31	30
27	35	44	45	49	52	55	57	56	51	45	35	28	25	24	25	25	25	26	29	33	34	38	42	44	38
28	46	50	53	53	57	58	58	57	54	48	38	33	29	28	26	26	26	27	29	32	37	38	42	43	41
29	45	50	50	51	55	57	58	57	50	43	36	33	30	27	27	24	27	29	33	35	36	40	48	61	42
30	65	65	92	100	100	100	100	100	97	93	88	82	85	87	92	81	78	81	86	90	89	90	92	94	89
HRAVE	45	47	49	52	53	55	57	56	50	43	38	34	30	29	28	27	28	30	33	34	36	39	41	44	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	43	42	46	44	43	43	45	42	26	46	45	21	29	26	25	29	34	37	34	28	38	54	60	57	47
MAX	64	67	68	66	66	62	69	70	45	59	82	30	40	30	34	41	51	54	59	39	52	62	84	80	79
MIN	22	22	30	25	25	27	27	20	17	35	19	15	18	23	17	17	22	21	16	21	27	46	32	35	19

DAY	26	27	28	29	30	31
AVE	30	38	41	42	89	***
MAX	44	57	58	61	100	***
MIN	24	24	26	24	65	***

MONTHLY AVERAGE = 40.8 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 15.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
NOVEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.38	0.56	0.64	0.71	0.68	0.56	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.44
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.31	0.48	0.62	0.71	0.72	0.67	0.56	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.75
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.30	0.48	0.62	0.70	0.71	0.66	0.55	0.39	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.72
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.27	0.46	0.60	0.69	0.71	0.67	0.37	0.21	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.21
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.47	0.61	0.69	0.70	0.65	0.54	0.38	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.59
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.46	0.60	0.68	0.69	0.64	0.53	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.52
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.46	0.60	0.68	0.69	0.64	0.53	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.50
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.46	0.60	0.68	0.68	0.64	0.53	0.36	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.48
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.45	0.59	0.67	0.69	0.64	0.53	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.45
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.44	0.58	0.66	0.68	0.62	0.51	0.35	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.33
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.22	0.43	0.58	0.65	0.67	0.63	0.51	0.35	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.26
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.46	0.61	0.69	0.71	0.65	0.54	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.56
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.45	0.59	0.67	0.69	0.64	0.54	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.46
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.23	0.40	0.41	0.31	0.28	0.21	0.35	0.24	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.62
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.44	0.59	0.67	0.69	0.64	0.53	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.44
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.39	0.51	0.64	0.67	0.63	0.52	0.36	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.23
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.22	0.43	0.57	0.65	0.55	0.50	0.45	0.32	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.90
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.44	0.50	0.63	0.67	0.61	0.49	0.33	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.03
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.24	0.42	0.57	0.66	0.68	0.63	0.52	0.25	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.14
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.40	0.55	0.58	0.57	0.48	0.39	0.30	0.12	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.69
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.40	0.54	0.63	0.62	0.59	0.45	0.25	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.87
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.10	0.12	0.19	0.19	0.21	0.18	0.13	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.37	0.51	0.62	0.62	0.59	0.47	0.32	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.91
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.39	0.53	0.62	0.63	0.58	0.48	0.32	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.95
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.40	0.54	0.63	0.65	0.60	0.49	0.33	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.06
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.41	0.52	0.58	0.63	0.59	0.48	0.33	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.90
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.39	0.54	0.62	0.64	0.59	0.49	0.33	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.02
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.31	0.52	0.61	0.63	0.58	0.47	0.32	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.75
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.32	0.51	0.60	0.58	0.31	0.31	0.15	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.09
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.12	0.24	0.28	0.29	0.35	0.29	0.27	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.02
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.40	0.53	0.61	0.62	0.57	0.47	0.32	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.44	4.75	4.72	4.21	4.59	4.52	4.50	4.48	4.45	4.33	4.26	4.56	4.46	2.62	4.44	4.23	3.90	4.03	4.14	3.69	3.87	1.23	3.91	3.95	4.06
MAX	0.71	0.72	0.71	0.71	0.70	0.69	0.69	0.68	0.69	0.68	0.67	0.71	0.69	0.41	0.69	0.67	0.65	0.67	0.68	0.58	0.63	0.21	0.62	0.63	0.65
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	3.90	4.02	3.75	3.09	2.02	***
MAX	0.63	0.64	0.63	0.60	0.35	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
NOVEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.11	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.25	***
MAX	0.00	0.00	0.00	0.00	0.12	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.25 MONTHLY MAXIMUM = 0.12 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
DECEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	5.8	6.1	5.1	5.2	4.1	1.8	2.2	2.6	3.0	2.6	2.8	4.3	4.3	4.3	5.6	7.4	9.0	7.7	6.7	3.7	4.5	2.5	4.5	6.7	4.7
2	7.2	7.7	7.8	4.2	5.4	5.0	5.5	6.3	12.1	12.8	13.5	14.1	13.9	13.5	8.6	13.0	7.6	6.5	7.7	2.7	1.8	5.0	6.3	7.0	8.1
3	6.3	5.5	6.4	6.1	6.2	4.8	5.7	6.9	7.4	7.4	5.8	4.3	2.5	3.0	4.0	3.7	3.1	5.0	5.2	5.0	3.1	3.3	4.4	6.0	5.1
4	7.0	6.7	8.7	8.8	8.4	10.3	11.0	10.1	10.7	9.7	8.4	11.7	16.1	15.5	19.0	19.5	20.9	23.2	17.7	20.3	17.7	18.6	15.3	14.0	13.7
5	12.1	11.4	15.6	14.2	12.9	16.9	18.5	17.0	16.6	17.9	18.8	17.4	14.5	11.2	12.8	10.9	10.4	11.5	12.6	8.8	4.2	5.1	6.5	4.2	12.6
6	4.5	4.1	2.2	2.9	2.4	2.1	5.0	6.1	6.0	6.2	4.0	7.7	2.8	3.6	5.6	6.5	7.6	7.5	10.2	6.7	4.2	5.7	9.0	6.5	5.4
7	7.1	7.1	4.1	10.5	7.5	12.7	7.9	5.1	3.4	5.3	6.1	4.8	8.3	6.5	6.1	4.1	6.3	3.0	2.1	1.9	2.0	1.6	2.9	1.5	5.3
8	3.8	4.4	5.5	5.5	4.0	6.6	7.3	4.6	6.2	4.4	3.4	2.5	4.5	4.4	6.9	8.6	9.8	10.6	11.6	9.3	2.5	4.0	4.2	6.6	5.9
9	5.8	4.9	6.6	6.0	6.7	7.5	6.9	6.8	5.8	6.6	4.7	5.3	5.9	8.1	12.0	12.8	9.3	9.6	10.5	12.2	13.0	12.3	12.0	8.1	8.3
10	9.8	12.3	13.7	16.0	18.6	19.6	19.6	20.8	20.6	20.6	21.7	19.3	18.0	18.5	18.8	23.9	24.1	23.0	23.2	21.2	20.8	21.0	19.7	20.4	19.4
11	18.7	20.8	18.2	18.0	16.4	16.5	15.2	15.1	17.4	17.4	13.6	14.6	13.9	11.9	10.9	12.9	15.2	18.4	15.5	16.6	15.9	10.8	9.9	9.1	15.1
12	7.5	4.0	3.7	6.5	7.1	4.4	4.1	5.6	3.1	4.8	1.6	2.0	7.5	12.0	15.2	16.6	16.8	12.7	6.9	3.7	2.4	7.3	3.0	1.9	6.7
13	4.0	4.3	8.3	14.6	7.1	7.4	10.6	11.4	15.1	9.9	9.9	10.3	8.6	4.0	6.2	7.2	8.8	5.5	2.6	4.5	5.7	6.0	9.6	9.3	7.9
14	8.2	8.5	8.9	8.8	10.1	11.6	10.6	11.9	11.2	11.7	10.5	12.7	13.6	12.1	13.2	14.1	15.3	21.2	21.4	20.8	18.7	19.7	17.2	17.7	13.7
15	16.6	18.6	18.0	19.9	18.2	16.2	15.9	17.3	19.7	21.6	14.2	16.4	18.1	15.1	15.2	16.4	16.5	19.7	21.2	18.9	19.7	17.2	19.4	17.2	17.8
16	16.8	10.8	12.1	17.2	12.2	9.8	10.6	14.7	10.3	10.6	7.4	11.6	15.3	14.5	12.3	10.5	2.6	2.5	8.0	10.1	9.8	7.3	9.2	8.7	10.6
17	10.3	5.9	10.9	6.9	10.7	15.2	11.5	10.4	7.7	7.3	6.6	6.2	3.6	2.7	4.6	6.5	8.8	9.8	10.2	11.6	10.7	10.2	8.8	4.3	8.4
18	2.1	4.4	2.3	1.3	3.5	6.8	6.8	6.2	6.4	6.3	2.7	2.8	9.2	11.5	14.4	15.5	15.0	13.0	10.0	6.0	5.0	4.7	6.0	6.5	7.0
19	6.6	4.4	5.5	5.7	5.5	4.4	3.2	5.3	5.0	4.0	2.0	1.6	2.1	3.0	5.0	10.6	17.3	17.0	13.8	8.2	3.9	3.9	6.1	5.5	6.2
20	6.6	9.6	6.9	6.9	5.7	4.8	7.0	6.6	8.3	7.2	4.1	3.9	4.0	2.6	4.2	2.9	4.3	2.0	1.7	5.8	6.6	7.3	8.3	7.4	5.6
21	9.1	8.0	7.7	7.8	8.2	8.2	9.2	9.3	8.3	10.0	8.8	7.2	7.1	6.6	4.7	3.2	2.1	2.9	4.3	5.8	8.0	8.2	7.4	3.1	6.9
22	4.9	4.2	7.8	8.3	9.2	7.1	6.4	6.8	4.7	7.5	4.8	3.5	2.5	3.2	5.1	6.8	6.1	5.4	2.8	3.4	4.7	5.9	8.6	8.0	5.7
23	8.6	7.1	6.7	7.3	6.7	8.9	7.7	5.2	7.5	8.4	7.4	5.4	4.9	3.2	3.8	3.9	4.5	3.1	3.8	2.7	4.8	4.8	5.1	9.0	5.9
24	7.1	8.0	7.2	5.9	7.1	6.5	5.1	6.6	6.0	5.8	3.4	4.3	4.3	3.1	2.5	2.6	5.9	8.1	5.3	3.4	3.8	6.7	8.3	8.6	5.6
25	6.5	7.1	6.7	9.6	9.0	9.3	6.8	7.5	9.1	6.1	5.0	5.1	12.6	16.1	11.9	15.2	12.6	8.1	18.3	24.4	25.1	12.9	4.8	4.7	10.6
26	2.9	3.5	4.2	1.7	2.6	3.9	3.1	5.4	3.5	5.5	4.7	10.5	9.2	9.6	11.1	11.1	9.8	9.0	7.4	3.6	4.3	5.4	5.9	4.5	5.9
27	2.5	2.8	4.7	5.9	4.5	2.5	5.8	6.6	5.8	5.6	5.6	2.7	9.3	14.3	12.0	12.6	11.6	10.3	7.1	7.0	8.5	9.8	12.0	8.1	7.4
28	9.3	5.0	5.2	6.2	6.2	3.7	3.7	5.1	2.2	2.6	3.1	4.0	8.4	13.7	12.5	12.1	12.9	9.7	7.2	3.8	2.3	3.9	5.8	3.5	6.3
29	3.1	2.5	7.2	7.2	5.3	6.4	5.2	7.2	8.8	11.6	19.2	15.4	15.5	13.1	11.9	11.8	12.2	7.7	6.8	11.6	11.0	8.9	8.2	12.7	9.6
30	10.7	6.3	10.0	12.8	7.1	8.5	11.8	8.2	7.9	5.6	5.8	10.1	8.8	6.4	3.4	3.9	7.0	11.3	10.9	10.3	6.2	3.5	3.2	3.8	7.6
31	7.2	5.3	5.2	5.3	6.1	5.2	6.9	6.5	9.0	8.0	3.0	2.1	2.6	3.2	10.8	10.6	12.0	6.2	6.8	10.6	15.3	11.6	11.3	8.5	7.5
HRAVE	7.7	7.1	7.8	8.5	7.9	8.2	8.3	8.6	8.7	8.7	7.5	7.9	8.8	8.7	9.4	10.2	10.5	10.0	9.7	9.2	8.6	8.2	8.5	7.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	4.7	8.1	5.1	13.7	12.6	5.4	5.3	5.9	8.3	19.4	15.1	6.7	7.9	13.7	17.8	10.6	8.4	7.0	6.2	5.6	6.9	5.7	5.9	5.6	10.6
MAX	9.0	14.1	7.4	23.2	18.8	10.2	12.7	11.6	13.0	24.1	20.8	16.8	15.1	21.4	21.6	17.2	15.2	15.5	17.3	9.6	10.0	9.2	9.0	8.6	25.1
MIN	1.8	1.8	2.5	6.7	4.2	2.1	1.5	2.5	4.7	9.8	9.1	1.6	2.6	8.2	14.2	2.5	2.7	1.3	1.6	1.7	2.1	2.5	2.7	2.5	4.7

DAY	26	27	28	29	30	31
AVE	5.9	7.4	6.3	9.6	7.6	7.5
MAX	11.1	14.3	13.7	19.2	12.8	15.3
MIN	1.7	2.5	2.2	2.5	3.2	2.1

MONTHLY AVERAGE = 8.6 MONTHLY MAXIMUM = 25.1 MONTHLY MINIMUM = 1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
DECEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	112	123	119	132	137	70	140	148	125	147	148	211	268	260	261	285	283	288	288	223	154	166	277	266	23
2	267	233	227	272	276	252	270	262	237	230	255	260	272	307	286	307	290	286	307	262	141	112	99	87	70
3	94	105	97	94	100	99	123	101	109	131	133	161	228	92	105	118	106	283	303	337	357	62	95	124	121
4	135	113	119	117	122	130	128	125	132	150	148	60	56	45	43	43	47	47	49	49	59	66	75	77	88
5	89	94	75	89	93	73	68	71	73	67	67	67	70	71	67	64	69	56	46	44	65	89	85	72	204
6	85	313	63	87	40	118	108	123	115	128	109	75	69	61	294	290	298	292	303	316	296	20	97	104	319
7	98	118	165	54	19	45	58	12	27	116	129	165	150	171	129	341	88	157	153	238	122	140	91	160	304
8	93	102	89	89	45	70	76	89	89	100	99	255	276	269	272	296	304	311	304	304	355	116	87	89	258
9	90	111	117	105	105	104	104	115	107	125	141	148	101	42	33	41	41	41	50	46	60	73	79	88	13
10	92	82	72	70	69	66	60	64	62	56	61	57	64	67	67	70	73	70	67	64	58	68	68	68	95
11	74	68	68	69	67	68	68	70	67	71	73	73	74	69	67	50	46	48	45	43	52	84	124	133	109
12	129	138	140	131	101	105	107	97	118	105	206	178	274	297	296	284	279	283	288	263	257	286	323	56	145
13	100	84	85	52	40	21	46	67	63	102	97	104	54	267	275	288	291	308	301	117	95	129	127	121	330
14	113	105	115	99	123	126	120	119	121	134	118	99	67	69	65	61	58	55	46	51	54	51	56	56	150
15	56	59	63	67	70	65	61	60	69	52	70	71	61	59	67	45	57	50	48	54	58	64	52	60	276
16	63	120	90	65	108	139	136	89	121	154	133	60	63	58	48	47	311	341	60	76	117	99	75	77	282
17	60	12	90	97	61	56	59	60	91	135	149	178	117	276	270	298	294	306	298	297	301	312	309	326	35
18	323	75	173	162	161	124	114	124	125	118	137	268	280	302	283	289	283	290	302	287	164	127	126	119	147
19	97	95	91	117	113	122	111	107	122	126	169	125	269	269	268	285	305	304	303	311	129	117	100	89	19
20	103	116	113	116	96	109	110	107	108	113	102	120	157	190	242	188	79	45	56	81	78	93	97	110	274
21	110	106	108	91	100	106	99	103	113	120	138	158	156	159	171	165	174	149	105	87	102	95	46	6	184
22	106	133	138	116	112	102	125	99	125	129	147	139	187	269	264	272	284	315	327	98	97	104	112	96	140
23	102	104	106	103	101	110	101	99	106	141	151	154	164	150	131	244	279	258	75	10	84	88	119	96	162
24	94	111	113	102	91	109	87	104	108	117	110	102	153	151	228	236	257	282	307	310	126	103	88	89	259
25	102	102	103	93	93	101	94	105	92	92	104	288	289	296	290	292	293	301	289	286	292	304	287	124	57
26	121	187	125	170	135	145	177	146	245	297	266	307	312	303	303	309	286	273	300	212	151	120	107	103	241
27	337	95	88	88	85	84	86	85	95	95	105	239	287	268	288	294	303	317	292	197	127	147	143	142	27
28	149	164	120	132	120	123	122	111	141	138	166	268	282	283	278	284	284	290	302	159	90	75	61	1	220
29	305	59	142	125	148	149	151	118	91	70	45	46	37	62	52	27	76	95	66	43	38	81	89	66	224
30	63	103	95	69	95	101	82	131	150	130	152	88	78	63	181	266	273	282	307	303	283	182	177	122	195
31	119	110	101	112	90	77	104	96	98	125	130	140	235	282	254	240	220	277	306	285	285	297	321	310	277

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
DECEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	15	11	10	12	11	47	44	15	14	19	34	20	14	21	19	15	11	5	5	26	20	42	9	9	19
2	8	10	10	27	21	22	11	13	11	10	13	13	12	16	19	14	17	14	6	36	32	16	10	11	15
3	14	26	16	8	10	27	17	8	10	10	17	23	49	27	35	36	41	18	14	33	57	37	13	14	23
4	9	6	6	7	10	7	5	5	5	10	24	20	17	13	10	10	10	7	11	10	13	10	7	10	10
5	14	12	10	11	14	8	8	9	8	8	8	6	11	15	14	14	11	11	9	29	21	11	10	22	12
6	27	9	47	13	18	19	12	6	8	11	25	16	39	34	16	10	8	8	17	14	38	30	17	13	19
7	9	12	28	16	37	16	37	25	55	42	22	20	11	22	22	42	17	58	38	39	34	11	10	22	27
8	11	9	7	7	17	7	12	16	19	18	19	45	17	17	12	14	11	6	5	6	36	9	8	5	14
9	10	7	9	7	9	6	7	7	8	12	18	17	30	25	17	15	23	15	7	10	10	6	5	17	12
10	11	6	9	8	8	9	12	9	11	13	12	14	14	16	12	8	9	8	8	11	13	9	9	8	10
11	9	7	9	8	9	8	8	10	8	8	12	10	10	13	10	13	10	8	10	10	9	11	6	8	9
12	8	23	23	7	7	13	8	8	27	32	49	53	20	13	12	8	7	5	16	30	39	16	48	35	21
13	44	35	15	9	44	36	20	15	20	31	32	18	53	42	22	19	10	16	33	20	17	15	10	6	24
14	8	13	8	9	8	5	7	7	7	9	20	13	7	6	8	10	9	7	7	9	12	10	11	9	9
15	10	9	9	8	8	11	12	15	10	10	17	15	14	17	14	14	13	12	10	11	11	10	10	12	12
16	10	20	9	12	15	13	12	14	15	7	21	13	12	11	9	9	25	30	25	14	13	9	10	19	14
17	14	30	22	23	9	10	15	12	20	15	26	23	38	47	28	22	10	10	6	7	7	7	9	24	18
18	22	21	45	31	15	9	12	11	11	12	28	58	16	18	13	10	8	7	7	17	12	9	6	7	17
19	8	10	12	11	11	10	11	10	9	12	46	57	49	24	16	10	8	7	6	10	27	10	7	10	16
20	13	7	10	10	12	9	8	9	6	12	22	23	27	40	42	38	14	37	20	10	10	9	8	8	17
21	7	8	7	7	7	8	7	6	7	6	8	8	10	10	11	11	11	7	21	15	9	10	44	24	11
22	14	11	6	8	8	9	7	9	16	7	14	31	40	23	16	8	8	12	31	25	11	14	7	8	14
23	8	10	8	10	9	8	8	14	7	7	10	17	16	38	29	49	15	33	41	27	10	13	10	6	17
24	10	9	7	9	6	9	16	9	8	10	25	22	26	28	29	41	12	5	11	43	19	7	7	9	16
25	8	7	9	6	6	8	9	11	8	20	45	14	17	16	14	16	14	14	9	8	8	12	20	18	13
26	18	51	24	34	10	9	27	12	15	9	22	11	14	12	12	12	16	9	8	39	11	7	10	12	17
27	35	49	10	7	17	29	15	6	7	8	14	44	18	13	17	13	10	10	8	32	13	10	11	14	17
28	16	28	33	11	12	19	19	14	29	53	36	30	24	16	14	17	10	7	5	28	40	16	36	35	23
29	24	39	9	5	12	6	18	15	17	19	14	19	17	21	25	21	10	9	14	14	13	18	12	11	16
30	14	22	21	8	18	17	7	17	13	13	22	17	18	27	57	23	13	6	7	8	28	17	18	15	18
31	8	11	13	13	8	15	8	11	9	13	44	64	25	51	25	21	18	19	10	11	8	10	12	11	18
HRAVE	14	17	15	12	13	14	13	11	13	15	23	24	22	22	19	18	13	14	14	19	19	14	13	14	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19	15	23	10	12	19	27	14	12	10	9	21	24	9	12	14	18	17	16	17	11	14	17	16	13
MAX	47	36	57	24	29	47	58	45	30	16	13	53	53	20	17	30	47	58	57	42	44	40	49	43	45
MIN	5	6	8	5	6	6	9	5	5	6	6	5	6	5	8	7	6	6	6	6	6	6	6	5	6

DAY	26	27	28	29	30	31
AVE	17	17	23	16	18	18
MAX	51	49	53	39	57	64
MIN	7	6	5	5	6	8

MONTHLY AVERAGE = 16.1 MONTHLY MAXIMUM = 63.8 MONTHLY MINIMUM = 4.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
DECEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	9.8	9.4	8.9	8.4	7.8	7.1	7.2	7.1	7.7	9.2	11.9	12.5	12.7	13.7	14.2	14.8	14.6	13.9	12.9	12.2	11.4	11.5	11.5	11.3	10.9
2	11.0	10.9	10.1	10.3	10.4	10.3	10.1	9.8	10.1	10.4	11.2	11.6	11.7	12.3	12.4	12.8	12.2	11.6	11.1	9.8	9.5	7.8	7.0	6.5	10.5
3	5.7	5.2	4.9	4.5	4.0	3.2	2.3	2.9	4.8	7.3	9.6	11.1	12.9	14.0	14.4	14.6	14.3	13.3	12.4	11.1	10.7	9.7	8.3	6.8	8.7
4	5.8	5.6	5.3	4.5	4.2	3.1	3.5	3.5	5.3	7.8	10.9	13.5	14.6	15.2	15.4	15.5	15.5	15.2	14.8	14.2	13.6	13.2	12.7	12.2	10.2
5	11.4	10.8	12.1	11.5	10.9	12.1	12.3	12.0	12.1	12.9	13.6	15.5	17.3	18.6	19.0	19.1	18.8	18.1	17.8	16.8	14.4	13.0	12.1	11.6	14.3
6	11.3	11.1	10.8	10.8	10.2	9.8	9.4	9.6	10.4	12.6	13.8	15.8	17.6	18.4	18.1	17.5	17.0	16.2	13.3	12.8	12.3	12.0	11.6	11.5	13.1
7	11.5	11.1	10.9	11.3	10.9	11.1	11.1	11.1	11.6	13.5	14.5	14.3	14.2	12.9	12.1	12.4	12.6	12.3	12.3	12.0	11.7	11.4	11.2	11.0	12.0
8	10.2	10.0	9.8	9.1	8.4	8.3	8.3	7.9	8.3	8.7	10.3	11.8	13.8	15.7	16.7	17.1	16.7	15.6	14.2	13.6	12.8	11.5	10.5	9.6	11.6
9	8.8	8.2	7.9	7.5	6.7	6.8	6.1	6.1	7.4	9.3	11.4	14.0	16.2	17.3	17.7	17.9	17.7	17.1	15.7	15.4	14.5	13.2	12.7	11.8	12.0
10	11.0	10.8	10.6	10.8	10.9	10.8	11.0	11.0	11.7	12.5	13.2	14.4	15.9	16.9	17.4	18.0	17.8	17.3	16.7	16.3	16.2	15.7	15.3	14.9	14.0
11	14.2	14.2	13.7	13.0	12.2	11.7	11.6	11.5	11.8	13.2	14.9	16.2	17.2	18.4	18.2	17.8	17.2	16.8	16.2	16.0	15.7	14.2	12.6	11.3	14.6
12	10.6	9.9	8.8	8.6	7.9	7.1	6.8	6.7	6.9	10.4	12.7	14.5	15.7	17.4	17.9	17.9	16.7	15.0	14.2	13.2	13.0	11.7	11.4	10.6	11.9
13	9.2	8.6	8.2	11.2	10.4	9.5	10.7	10.3	11.1	11.8	13.2	14.4	15.2	15.7	16.1	16.4	16.1	14.9	14.4	12.3	11.4	10.4	8.0	7.2	11.9
14	6.6	5.8	4.7	3.8	2.6	3.1	3.2	2.8	4.7	7.1	9.6	11.5	13.8	14.9	15.7	15.4	15.4	15.1	15.5	14.9	14.2	13.3	12.7	11.9	9.9
15	11.7	11.5	11.4	11.3	11.2	11.2	11.3	11.3	11.3	11.6	12.2	13.6	14.4	15.2	16.1	16.2	15.6	15.1	14.7	13.9	13.6	13.0	13.3	13.2	13.1
16	13.2	10.3	11.1	12.6	9.7	7.2	7.2	10.0	8.7	8.1	12.4	15.5	16.5	16.9	17.6	17.9	17.6	17.0	16.5	15.6	14.3	14.3	13.7	13.8	13.2
17	13.8	12.8	13.0	12.7	13.1	13.1	12.4	12.2	12.0	11.3	14.8	17.1	17.3	17.7	18.4	18.9	18.2	17.3	16.2	15.6	14.9	14.8	14.6	14.5	14.9
18	14.2	13.4	12.7	12.3	10.9	10.5	9.6	9.1	9.9	11.3	13.2	15.0	16.6	17.5	17.6	17.5	16.7	15.3	14.4	13.7	12.4	11.7	10.8	9.9	13.2
19	8.6	7.7	6.6	6.0	5.9	5.5	4.6	3.8	5.0	7.4	10.0	12.9	15.4	17.1	19.0	20.0	19.0	17.0	15.6	14.7	13.1	12.2	10.7	9.4	11.1
20	8.1	8.4	8.2	7.2	5.8	5.6	5.0	4.0	7.1	9.6	12.7	15.9	18.8	21.2	22.2	23.1	21.8	20.9	19.1	16.4	15.1	13.2	11.8	10.7	13.0
21	10.2	8.9	8.2	6.5	5.9	6.6	6.1	6.4	6.8	8.3	9.8	11.2	13.2	15.0	16.2	16.4	16.1	15.4	13.8	12.8	11.6	11.8	10.2	9.9	10.7
22	9.2	8.6	7.8	8.0	7.8	6.4	5.6	5.5	6.4	8.8	12.5	14.9	17.4	18.7	19.8	20.0	19.7	18.0	17.5	15.5	13.3	11.9	11.1	10.2	12.3
23	9.6	8.5	7.7	6.7	5.6	6.3	6.4	4.5	6.9	8.5	12.8	15.6	17.9	19.6	20.9	21.6	21.0	19.8	18.0	16.6	14.8	13.4	12.2	11.0	12.7
24	9.9	9.6	8.7	7.4	6.9	6.1	5.4	5.2	6.2	9.2	11.9	15.1	17.5	19.4	20.7	21.3	21.0	18.8	17.3	16.5	14.4	12.6	12.1	11.0	12.7
25	10.1	9.6	7.9	7.8	7.0	6.9	6.1	5.3	5.9	7.2	10.7	12.1	15.0	17.3	18.0	17.9	16.5	14.7	12.7	10.1	8.0	7.5	7.4	7.0	10.4
26	7.2	7.1	7.2	7.1	7.2	7.1	6.8	6.8	7.0	7.7	8.3	9.1	9.5	9.8	10.6	10.9	11.3	10.6	9.5	8.8	8.1	7.4	7.4	7.2	8.3
27	6.2	6.4	6.3	6.2	5.7	4.9	4.0	3.5	4.8	6.0	9.0	10.8	12.2	12.2	12.2	12.3	11.7	11.0	10.1	9.1	7.9	7.5	6.7	6.2	8.0
28	5.7	4.9	4.7	4.2	3.7	3.8	3.2	2.6	3.7	5.2	7.1	7.6	8.7	8.9	9.0	9.0	8.4	7.2	6.3	5.1	5.0	4.0	3.4	2.4	5.6
29	2.7	1.9	-0.2	0.2	-1.2	-1.3	-1.8	-0.3	2.9	4.8	6.0	7.2	7.7	8.6	9.0	9.1	9.1	8.6	7.8	7.3	6.6	5.6	4.6	4.4	4.5
30	4.3	3.4	3.3	3.3	2.4	2.2	2.2	0.6	0.2	3.0	5.8	8.2	9.2	10.0	11.0	11.5	11.6	10.1	8.9	8.4	7.2	5.8	5.2	4.1	5.9
31	2.9	2.5	1.2	0.9	0.2	-0.4	-0.7	-0.6	0.5	2.8	5.2	7.6	8.5	9.2	9.2	9.1	9.2	7.3	7.2	5.9	4.4	3.5	3.2	3.0	4.2
HRAVE	9.2	8.6	8.1	7.9	7.3	7.0	6.7	6.5	7.4	9.0	11.1	12.9	14.3	15.3	15.9	16.1	15.7	14.7	13.8	12.8	11.8	10.9	10.2	9.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	10.9	10.5	8.7	10.2	14.3	13.1	12.0	11.6	12.0	14.0	14.6	11.9	11.9	9.9	13.1	13.2	14.9	13.2	11.1	13.0	10.7	12.3	12.7	12.7	10.4
MAX	14.8	12.8	14.6	15.5	19.1	18.4	14.5	17.1	17.9	18.0	18.4	17.9	16.4	15.7	16.2	17.9	18.9	17.6	20.0	23.1	16.4	20.0	21.6	21.3	18.0
MIN	7.1	6.5	2.3	3.1	10.8	9.4	10.9	7.9	6.1	10.6	11.3	6.7	7.2	2.6	11.2	7.2	11.3	9.1	3.8	4.0	5.9	5.5	4.5	5.2	5.3

DAY	26	27	28	29	30	31
AVE	8.3	8.0	5.6	4.5	5.9	4.2
MAX	11.3	12.3	9.0	9.1	11.6	9.2
MIN	6.8	3.5	2.4	-1.8	0.2	-0.7

MONTHLY AVERAGE = 11.0 MONTHLY MAXIMUM = 23.1 MONTHLY MINIMUM = -1.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
DECEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.2	0.2	0.3	0.5	0.4	0.4	0.3	0.3	-0.1	-0.5	-0.7	-0.7	-0.4	-0.4	-0.3	-0.3	0.0	0.3	0.4	0.3	0.2	0.2	0.4	0.3	0.1
2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.0	0.0	-0.1	-0.2	-0.2	-0.5	-0.3	-0.3	-0.1	0.2	0.4	0.6	0.4	0.6	0.6	0.6	0.1
3	0.4	0.5	0.5	0.5	0.7	0.4	0.5	0.2	-0.8	-1.2	-1.2	-0.8	-0.6	-0.7	-0.5	-0.3	0.1	0.4	0.7	0.5	0.5	0.6	0.6	0.9	0.1
4	0.8	0.9	0.4	0.8	0.5	1.0	0.6	0.6	-0.4	-1.1	-1.1	-0.4	-0.4	-0.2	-0.1	-0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.1
5	0.5	0.4	0.3	0.4	0.6	0.3	0.3	0.3	0.2	0.0	-0.1	-0.4	-0.5	-0.4	-0.1	0.1	0.3	0.3	0.3	0.4	0.6	0.6	0.6	0.8	0.2
6	0.3	0.5	0.4	0.3	0.4	0.4	0.3	0.4	0.1	-0.7	-0.6	-0.7	-0.6	-0.6	-0.4	-0.2	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.0
7	0.4	0.3	0.3	0.2	0.1	0.2	0.2	0.3	-0.1	-0.5	-0.7	-0.6	-0.4	-0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.1	0.4	0.2	0.1
8	0.4	0.2	0.3	0.3	0.1	0.1	0.0	0.0	-0.1	-0.3	-0.6	-0.4	-0.6	-0.4	-0.4	-0.4	0.1	0.5	0.6	0.6	0.4	0.6	0.5	0.5	0.1
9	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.2	-0.9	-1.1	-0.9	-1.0	-0.6	-0.2	0.1	0.2	0.4	0.5	0.5	0.4	0.6	0.9	0.9	0.5	0.1
10	0.7	1.0	0.7	0.5	0.4	0.4	0.3	0.3	0.1	0.0	-0.1	-0.2	-0.3	-0.2	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
11	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.1	-0.2	-0.5	-0.5	-0.5	-0.6	-0.3	-0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.1
12	0.6	0.5	0.4	0.6	0.6	0.5	0.6	0.2	-0.1	-0.8	-0.4	-0.5	-0.6	-0.4	-0.3	-0.3	-0.1	0.3	0.5	0.5	0.4	0.6	0.4	0.5	0.2
13	0.7	0.6	1.1	0.5	0.6	0.8	0.5	0.4	-0.1	-0.3	-0.8	-1.1	-0.7	-0.4	-0.4	-0.4	-0.1	0.5	0.5	1.2	1.0	1.1	1.2	0.7	0.3
14	0.5	0.8	0.9	0.7	1.1	0.8	0.5	0.2	-0.7	-0.9	-0.5	-0.5	-0.3	-0.3	-0.2	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2
15	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	-0.2	-0.2	-0.2	-0.2	-0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.1
16	0.2	0.2	0.7	0.3	0.7	1.2	1.0	0.5	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3
17	0.5	0.4	0.3	0.2	0.3	0.2	0.3	0.3	-0.1	-0.1	-1.0	-1.2	-0.7	-0.4	-0.4	-0.5	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.0
18	0.2	0.3	0.4	0.4	0.2	0.1	0.3	0.1	-0.7	-1.2	-0.7	-0.5	-0.6	-0.6	-0.5	-0.4	-0.2	0.2	0.4	0.5	0.4	0.3	0.4	0.5	0.0
19	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.4	-0.6	-0.8	-0.4	-0.5	-0.5	-0.5	-0.4	-0.3	0.1	0.3	0.5	0.6	0.6	0.4	0.8	0.5	0.2
20	0.7	0.4	0.5	0.6	0.7	0.6	0.4	0.5	-0.7	-1.3	-1.1	-0.9	-0.9	-0.5	-0.3	-0.2	0.6	0.5	0.4	0.9	0.7	0.9	1.0	0.7	0.2
21	0.6	0.7	0.7	0.5	0.6	0.5	0.6	0.5	0.0	-0.4	-0.5	-0.6	-0.8	-0.7	-0.6	-0.3	0.0	0.3	0.6	0.7	0.8	0.6	0.5	0.5	0.2
22	0.9	0.5	0.6	0.6	0.5	0.6	0.6	0.9	-0.2	-0.9	-1.0	-0.8	-0.5	-0.4	-0.4	-0.1	0.3	0.5	0.5	0.6	0.7	0.8	0.7	0.8	0.2
23	0.6	0.7	0.8	0.6	0.6	0.6	0.7	0.4	-0.4	-0.8	-1.3	-1.0	-1.0	-0.6	-0.5	-0.4	0.0	0.5	0.6	0.4	0.6	0.5	0.6	0.9	0.1
24	0.8	0.6	0.5	0.5	0.9	0.7	0.6	0.5	-0.1	-1.1	-0.8	-1.0	-0.9	-0.6	-0.4	-0.3	-0.1	0.5	0.7	0.7	0.5	0.7	1.0	0.7	0.2
25	0.6	0.8	0.6	0.7	0.6	0.8	0.7	0.8	0.2	-0.5	-0.7	-0.5	-0.5	-0.5	-0.6	-0.3	-0.2	0.2	0.2	-0.1	0.0	0.1	0.2	0.2	0.1
26	0.2	0.1	0.2	0.1	0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.4	-0.2	-0.2	0.2	0.4	0.4	0.4	0.3	0.3	0.5	0.0
27	0.4	0.4	0.9	0.9	0.8	0.7	1.1	1.0	-0.3	-0.7	-1.1	-0.5	-0.6	-0.2	-0.2	-0.3	-0.1	0.1	0.2	0.1	0.0	0.0	-0.1	0.0	0.1
28	-0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	-0.1	-0.5	-0.7	-0.6	-0.6	-0.6	-0.5	-0.5	-0.2	0.3	0.6	0.8	0.4	0.4	0.6	0.7	0.1
29	0.5	0.6	0.8	0.5	1.0	0.6	1.4	1.4	-0.2	-0.4	-0.4	-0.6	-0.5	-0.6	-0.3	-0.1	0.1	0.4	0.6	0.2	0.2	0.3	0.4	0.3	0.3
30	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.4	-0.6	-1.1	-1.0	-1.2	-0.9	-0.7	-0.6	-0.5	-0.3	0.2	0.4	0.4	0.5	0.5	0.4	0.5	-0.1
31	0.5	0.5	0.5	0.5	0.6	0.4	0.8	0.5	-0.4	-0.8	-0.6	-0.5	-0.4	0.0	-0.1	-0.1	0.0	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.1
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.2	-0.6	-0.6	-0.6	-0.5	-0.4	-0.3	-0.2	0.0	0.3	0.4	0.4	0.4	0.4	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.2	0.1	0.3	0.0	0.0	0.2	0.2	0.2	0.2	0.1	0.2	0.1
MAX	0.5	0.6	0.9	1.0	0.8	0.5	0.4	0.6	0.9	1.0	0.5	0.6	1.2	1.1	0.3	1.2	0.5	0.5	0.8	1.0	0.8	0.9	0.9	1.0	0.8
MIN	-0.7	-0.5	-1.2	-1.1	-0.5	-0.7	-0.7	-0.6	-1.1	-0.3	-0.6	-0.8	-1.1	-0.9	-0.2	-0.2	-1.2	-1.2	-0.8	-1.3	-0.8	-1.0	-1.3	-1.1	-0.7

DAY	26	27	28	29	30	31
AVE	0.0	0.1	0.1	0.3	-0.1	0.1
MAX	0.5	1.1	0.8	1.4	0.5	0.8
MIN	-0.4	-1.1	-0.7	-0.6	-1.2	-0.8

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = -1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
DECEMBER - 2018

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	701	701	701	700	700	700	701	701	701	701	701	701	700	699	699	698	698	698	698	698	698	698	698	698	699
2	698	698	698	699	699	699	699	699	700	701	701	701	701	700	701	701	701	702	702	703	703	703	704	704	701
3	704	704	704	704	704	705	705	706	706	706	707	706	706	705	704	704	704	704	705	705	705	705	706	705	705
4	705	705	705	705	705	705	706	706	706	707	707	706	705	704	704	703	703	703	703	704	704	704	704	704	705
5	704	703	703	703	702	702	702	703	703	703	703	702	702	701	700	700	700	700	700	700	701	701	702	702	702
6	702	702	702	702	702	703	703	704	704	704	704	704	703	702	702	702	702	702	703	703	704	704	704	704	703
7	703	703	704	703	703	703	703	703	704	703	703	703	703	702	702	702	702	703	704	704	704	705	705	705	703
8	706	706	706	706	706	707	707	708	708	709	709	709	708	707	707	707	707	707	708	708	708	708	709	709	707
9	709	709	709	709	708	709	709	709	710	710	710	709	708	708	707	707	707	707	707	708	707	708	708	708	708
10	707	707	707	707	706	706	707	707	707	707	707	707	706	705	704	704	704	704	704	704	704	704	705	705	706
11	705	704	704	704	704	704	704	704	704	705	705	704	703	702	702	702	702	702	702	702	702	703	703	703	703
12	703	703	703	703	702	702	703	703	704	704	704	703	703	702	702	702	702	702	703	703	704	704	705	705	703
13	705	706	706	706	706	707	708	708	708	709	709	709	708	708	707	707	707	707	708	708	708	708	708	709	707
14	709	709	709	709	709	709	709	710	710	710	710	709	708	708	707	707	707	706	706	707	707	707	707	706	708
15	706	706	706	706	705	705	706	706	706	706	706	706	705	704	704	704	704	705	705	706	706	706	706	706	705
16	706	706	706	706	706	706	706	706	707	707	708	707	706	706	706	706	706	706	706	706	706	707	707	707	706
17	706	706	706	706	706	705	706	706	706	707	707	706	705	705	704	704	704	704	705	705	705	705	705	705	705
18	705	705	705	704	704	704	705	705	706	706	706	705	705	704	704	704	704	704	704	704	705	705	705	705	705
19	705	705	705	705	705	705	705	706	707	707	707	706	705	704	704	704	704	704	705	705	706	706	706	707	705
20	706	706	706	706	706	706	706	707	707	708	708	707	706	705	705	704	704	704	704	704	704	704	704	704	706
21	704	704	704	704	703	703	703	704	704	704	704	704	703	702	702	702	702	702	702	702	702	701	702	702	703
22	702	702	702	702	702	703	703	703	704	705	705	704	704	703	703	703	703	703	704	704	704	705	705	705	703
23	705	705	706	706	706	705	706	706	707	707	707	706	705	705	704	704	704	704	704	704	704	704	704	704	705
24	704	704	704	704	704	703	704	704	704	704	704	703	702	701	701	700	700	700	700	700	700	700	700	699	702
25	699	699	699	699	698	698	698	698	698	698	698	697	696	695	694	694	694	694	695	696	696	696	696	696	697
26	696	696	697	697	697	697	697	698	699	699	699	699	699	699	699	699	699	699	700	700	700	700	700	700	698
27	700	700	700	699	699	699	699	699	700	700	699	698	697	697	697	697	697	697	697	697	697	697	697	697	698
28	697	697	697	698	698	698	698	699	700	701	701	701	700	700	701	701	702	702	702	703	703	703	704	704	700
29	704	704	704	704	704	704	705	706	706	707	707	706	705	705	704	704	704	704	705	705	705	705	705	705	705
30	705	705	704	704	703	703	703	703	704	704	704	702	701	700	700	700	700	700	700	700	700	700	700	700	702
31	700	700	700	699	699	699	699	700	700	700	700	699	698	697	697	697	697	697	697	697	698	698	698	699	698
HRAVE	704	704	704	703	703	703	704	704	704	705	705	704	703	703	702	702	702	702	703	703	703	703	703	704	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	699	701	705	705	702	703	703	707	708	706	703	703	707	708	705	706	705	705	705	706	703	703	705	702	697
MAX	701	704	707	707	704	704	705	709	710	707	705	705	709	710	706	708	707	706	707	708	704	705	707	704	699
MIN	698	698	704	703	700	702	702	706	707	704	702	702	705	706	704	706	704	704	704	704	701	702	704	699	694

DAY	26	27	28	29	30	31
AVE	698	698	700	705	702	698
MAX	700	700	704	707	705	700
MIN	696	697	697	704	700	697

MONTHLY AVERAGE = 703.4 MONTHLY MAXIMUM = 710.2 MONTHLY MINIMUM = 693.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
DECEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	92	92	96	97	100	100	100	100	99	91	79	80	80	75	73	64	65	71	78	82	85	84	85	88	86
2	88	83	82	77	76	77	77	77	74	73	69	67	66	66	64	60	62	63	64	71	74	85	89	91	74
3	94	95	96	98	100	100	100	100	93	77	65	59	52	43	39	36	38	41	41	49	55	61	67	72	70
4	75	80	80	85	85	88	88	87	78	69	55	42	38	38	38	37	36	37	38	40	44	45	46	48	58
5	52	55	49	51	56	48	47	46	46	43	41	36	33	31	31	31	32	34	34	36	44	48	51	55	43
6	56	61	62	61	68	69	71	72	69	60	56	50	47	46	50	53	56	61	89	96	99	100	100	100	69
7	100	99	100	100	100	99	98	97	96	87	83	88	89	96	100	98	97	97	96	97	100	100	100	100	97
8	100	100	100	100	100	100	100	100	100	100	98	87	81	67	65	60	62	70	80	81	87	94	99	100	89
9	100	100	100	100	100	100	100	100	99	85	75	67	52	42	40	36	35	36	48	50	52	57	60	61	71
10	62	62	61	59	59	59	57	56	54	52	50	48	44	41	39	38	38	38	38	40	40	42	43	45	48
11	47	46	47	50	53	55	55	55	53	49	45	42	41	39	41	42	43	43	44	45	46	52	60	67	48
12	72	76	83	84	87	91	95	92	90	74	61	57	57	50	45	44	48	54	56	61	62	66	70	75	69
13	79	83	77	29	30	40	22	23	22	23	20	19	19	20	20	20	22	24	25	31	30	31	39	42	33
14	46	49	53	58	61	57	56	58	51	44	36	32	26	26	24	25	24	24	22	22	24	25	27	29	37
15	30	30	30	30	30	30	29	29	29	27	28	25	24	24	23	22	23	24	24	25	25	27	26	26	27
16	27	38	35	28	38	49	49	36	44	49	37	26	25	25	25	25	29	29	27	29	33	36	36	36	34
17	36	41	39	41	40	48	59	63	61	63	53	47	47	46	41	39	43	47	51	53	55	54	53	53	49
18	54	60	62	65	69	70	74	77	72	63	56	52	47	42	41	41	42	46	49	51	56	59	62	65	57
19	71	77	81	83	83	84	90	93	83	69	60	52	45	41	36	35	39	43	46	49	54	59	64	70	63
20	75	72	73	77	83	86	84	90	74	60	48	40	34	30	28	24	25	30	34	37	41	46	50	54	54
21	54	58	60	66	69	64	67	65	63	56	50	48	43	39	38	38	39	39	49	53	55	54	60	61	54
22	65	66	67	66	65	71	75	77	68	56	42	37	33	30	28	29	30	34	34	40	47	50	51	53	51
23	54	58	63	66	72	65	65	75	65	54	41	35	32	30	27	26	27	30	35	38	42	48	49	53	48
24	56	57	60	65	67	71	74	75	68	54	45	39	35	29	26	24	27	32	36	39	45	48	50	53	49
25	55	56	64	64	67	68	71	75	70	64	52	50	43	39	36	36	37	40	53	73	91	94	94	97	62
26	96	98	98	99	99	100	100	100	100	97	95	88	85	84	79	76	71	72	79	82	84	88	88	89	89
27	94	93	92	92	92	97	99	98	92	82	67	58	50	46	49	50	55	59	61	69	81	81	84	85	76
28	87	96	99	99	100	100	100	100	99	89	69	58	48	40	36	37	37	40	45	51	55	60	63	69	70
29	64	74	77	77	83	84	86	77	59	50	46	47	46	43	39	37	35	39	42	39	40	42	46	46	55
30	45	48	47	48	52	53	54	64	73	60	49	40	38	36	33	34	34	38	39	39	43	53	58	60	47
31	67	69	72	74	76	79	80	80	73	67	59	51	49	48	54	60	64	85	91	98	100	100	100	100	75
HRAVE	68	70	71	71	73	74	75	75	72	64	56	51	47	44	42	41	42	46	50	54	58	61	63	66	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	86	74	70	58	43	69	97	89	71	48	48	69	33	37	27	34	49	57	63	54	54	51	48	49	62
MAX	100	91	100	88	56	100	100	100	100	62	67	95	83	61	30	49	63	77	93	90	69	77	75	75	97
MIN	64	60	36	36	31	46	83	60	35	38	39	44	19	22	22	25	36	41	35	24	38	28	26	24	36

DAY	26	27	28	29	30	31
AVE	89	76	70	55	47	75
MAX	100	99	100	86	73	100
MIN	71	46	36	35	33	48

MONTHLY AVERAGE = 59.7 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 19.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
DECEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.23	0.53	0.27	0.23	0.37	0.17	0.21	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.26
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.08	0.19	0.27	0.26	0.38	0.18	0.20	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.37	0.52	0.55	0.56	0.57	0.47	0.32	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.74
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.23	0.39	0.49	0.48	0.52	0.41	0.31	0.20	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.15
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.16	0.22	0.56	0.59	0.54	0.43	0.22	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.91
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.27	0.25	0.37	0.40	0.29	0.18	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.35	0.38	0.24	0.14	0.02	0.03	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.21	0.42	0.58	0.60	0.56	0.46	0.31	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.36	0.50	0.60	0.62	0.58	0.48	0.33	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.85
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.11	0.19	0.25	0.40	0.57	0.47	0.33	0.23	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.29	0.39	0.45	0.51	0.53	0.25	0.25	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.84
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.34	0.50	0.49	0.60	0.51	0.45	0.31	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.44
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.31	0.51	0.60	0.63	0.59	0.49	0.33	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.81
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.34	0.28	0.39	0.42	0.46	0.34	0.20	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.72
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.08	0.17	0.29	0.21	0.29	0.38	0.17	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.72
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.18	0.25	0.29	0.30	0.25	0.23	0.13	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.19	0.47	0.56	0.53	0.45	0.41	0.31	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.11
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.33	0.48	0.57	0.60	0.56	0.46	0.32	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.63
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.48	0.58	0.61	0.57	0.47	0.32	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.70
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.49	0.59	0.61	0.58	0.48	0.32	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.73
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.18	0.21	0.24	0.37	0.33	0.28	0.20	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.99
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.33	0.48	0.58	0.60	0.57	0.42	0.20	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.43
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.33	0.48	0.57	0.57	0.57	0.50	0.34	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.66
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.33	0.48	0.57	0.60	0.55	0.48	0.33	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.63
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.26	0.34	0.51	0.55	0.56	0.49	0.27	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.17
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.07	0.14	0.15	0.15	0.28	0.16	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.17
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.29	0.47	0.57	0.51	0.21	0.19	0.21	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.69
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.32	0.48	0.59	0.60	0.59	0.49	0.35	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.75
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.33	0.48	0.58	0.62	0.57	0.49	0.34	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.75
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.33	0.48	0.58	0.61	0.57	0.49	0.35	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.74
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.24	0.41	0.43	0.22	0.06	0.07	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.27	0.39	0.47	0.48	0.44	0.36	0.25	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	2.26	1.74	3.74	3.15	2.91	1.93	1.42	3.33	3.85	2.64	2.84	3.44	3.81	2.72	1.72	1.82	3.11	3.63	3.70	3.73	1.99	3.43	3.66	3.63	3.17
MAX	0.53	0.38	0.57	0.52	0.59	0.40	0.38	0.60	0.62	0.57	0.53	0.60	0.63	0.46	0.38	0.30	0.56	0.60	0.61	0.61	0.37	0.60	0.57	0.60	0.56
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	1.17	2.69	3.75	3.75	3.74	1.67
MAX	0.28	0.57	0.60	0.62	0.61	0.43
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
DECEMBER - 2018

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.10	0.09	0.05	0.00	0.00	0.29
7	0.00	0.00	0.07	0.03	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
8	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.05
26	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.06	0.03	0.02	0.01	0.21
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
MAX	0.00	0.00	0.00	0.00	0.00	0.10	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.01	0.00	0.03	0.00	0.00	0.21
MAX	0.01	0.00	0.02	0.00	0.00	0.06
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.89 MONTHLY MAXIMUM = 0.10 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
JANUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	7.1	6.8	4.9	3.9	7.7	5.8	4.8	5.0	3.3	5.4	5.3	8.0	3.7	2.9	2.7	9.3	8.7	9.3	9.9	8.8	12.3	14.9	11.6	9.9	7.2
2	7.4	10.9	16.1	17.2	7.9	8.3	5.9	6.0	12.2	11.0	6.8	4.0	4.3	5.3	5.5	3.1	3.3	3.1	3.2	5.2	7.7	7.2	6.4	6.9	7.3
3	5.1	5.8	6.7	6.9	8.1	7.4	6.3	7.5	9.1	10.3	10.8	9.8	9.0	10.5	9.7	10.1	10.0	9.9	14.6	14.2	16.0	16.1	16.1	11.2	10.1
4	8.4	10.2	13.0	13.1	8.3	12.8	13.0	13.9	14.0	13.1	18.9	17.9	16.8	16.5	18.0	17.6	15.8	19.8	19.0	18.5	19.8	18.9	14.0	10.6	15.1
5	11.0	11.3	12.1	10.7	9.6	10.1	10.5	10.5	11.1	12.2	12.0	11.4	10.6	11.9	16.1	15.2	17.0	16.5	4.6	5.0	8.0	10.1	8.3	4.1	10.8
6	4.0	4.6	4.6	6.3	6.2	7.4	7.4	7.2	8.6	9.7	9.2	10.0	6.7	5.3	12.4	10.2	7.4	3.3	2.8	3.3	1.5	3.0	5.2	5.1	6.3
7	5.4	5.4	6.7	6.4	5.4	5.7	7.2	8.4	9.2	7.3	6.7	6.9	4.6	4.5	6.1	5.7	5.2	6.1	4.7	2.5	3.1	3.7	5.3	7.6	5.8
8	8.8	8.7	9.9	12.0	11.2	9.3	9.6	9.6	15.0	21.3	19.2	18.6	18.3	18.2	17.1	16.2	20.4	20.5	24.5	23.3	19.8	20.7	22.1	22.1	16.5
9	21.3	19.6	18.9	20.3	20.3	19.4	19.5	18.6	21.1	21.4	22.3	23.1	23.1	20.1	23.3	19.5	16.8	21.3	22.5	22.4	19.5	19.8	20.6	18.1	20.5
10	18.5	18.2	20.2	21.4	18.6	17.3	18.0	17.6	17.2	12.9	10.1	12.6	13.3	7.5	6.8	7.8	6.9	9.3	12.0	13.0	11.6	9.1	5.2	3.0	12.8
11	4.4	7.3	7.9	2.4	3.6	4.5	5.8	2.9	4.2	4.4	4.1	2.4	3.6	7.0	11.1	14.5	14.1	12.5	8.9	9.2	5.7	5.3	6.3	7.4	6.7
12	7.6	8.6	8.5	8.0	9.3	8.4	8.4	8.3	8.7	7.7	5.7	8.8	5.2	10.5	11.5	11.8	13.9	12.9	15.1	15.3	16.5	9.4	5.2	14.8	10.0
13	11.2	8.7	8.2	8.8	3.7	2.7	4.4	5.4	5.4	5.5	4.0	6.0	3.8	4.7	4.0	10.6	9.5	8.4	8.0	6.9	4.0	7.7	9.4	9.0	6.7
14	7.5	7.7	8.9	8.5	7.4	7.2	7.4	8.5	8.2	7.5	8.1	5.7	8.9	5.7	8.3	6.9	9.7	11.4	11.1	12.4	15.8	14.5	10.1	9.1	9.0
15	8.8	8.6	9.4	8.9	9.6	8.4	9.0	8.3	9.3	8.8	5.0	3.9	2.2	4.8	5.7	4.1	3.7	4.6	3.7	5.5	3.1	2.4	3.3	1.9	6.0
16	3.8	4.8	3.6	1.9	3.3	7.4	5.5	CAL	CAL	CAL	CAL	CAL	3.2	4.1	3.2	6.3	5.4	4.7	3.9	3.4	3.7	2.9	5.0	5.1	4.3
17	9.3	6.2	4.1	5.1	7.5	8.4	7.4	8.4	9.1	8.8	9.9	7.0	4.2	4.0	8.2	11.9	11.8	10.5	7.2	5.6	5.0	3.2	4.9	5.1	7.2
18	5.8	6.0	5.7	5.5	3.9	1.8	3.1	2.0	2.5	3.6	3.0	8.8	12.3	16.1	15.3	15.2	15.1	14.1	9.2	7.7	6.3	7.7	7.0	7.4	7.7
19	8.4	9.4	9.6	9.2	18.0	16.3	14.6	7.7	8.6	8.7	9.0	13.4	11.9	12.5	13.9	13.8	17.7	17.0	14.6	9.2	11.7	16.1	16.3	9.8	12.4
20	9.1	9.1	9.3	8.5	9.5	11.1	9.9	11.7	12.0	10.7	11.2	16.0	14.3	12.9	15.4	12.2	9.7	7.2	4.3	4.5	8.3	8.1	6.3	6.8	9.9
21	7.8	7.9	5.8	5.3	6.6	7.8	8.0	4.5	3.2	1.5	2.0	3.6	16.5	21.3	21.9	25.6	23.7	22.4	20.0	19.3	18.3	11.4	11.0	7.4	11.8
22	4.2	3.7	4.9	3.9	4.5	2.4	4.8	4.1	3.5	2.0	2.5	4.1	8.9	12.1	13.6	14.3	15.4	13.9	13.9	11.5	10.0	4.7	2.1	5.8	7.1
23	5.7	5.7	6.3	8.5	8.0	2.9	6.2	8.5	4.0	2.4	2.0	2.5	2.5	3.9	4.0	5.4	11.5	14.8	14.9	12.4	9.2	4.2	5.6	6.7	6.6
24	5.5	2.3	5.8	6.1	6.4	3.1	6.0	7.2	5.7	4.9	2.6	2.3	3.9	13.4	17.6	11.3	10.0	8.4	4.8	4.6	4.3	2.9	4.0	5.4	6.2
25	5.1	8.2	10.3	8.7	9.9	9.3	10.3	10.1	8.8	9.8	8.9	7.5	4.9	8.2	7.7	6.9	5.4	9.6	15.2	11.9	6.2	3.9	2.4	3.7	8.0
26	2.8	2.5	2.2	4.2	3.4	4.3	5.8	4.1	7.6	5.0	2.8	3.8	7.4	6.4	5.3	5.6	5.7	6.8	10.1	6.2	11.1	6.6	6.9	6.5	5.5
27	4.2	7.3	9.8	11.2	11.9	12.6	10.4	12.1	9.3	9.8	9.5	11.4	14.9	13.3	11.2	12.1	11.3	8.6	5.5	2.7	2.2	3.0	6.8	7.1	9.1
28	8.4	8.8	6.6	5.2	4.7	7.2	7.3	5.0	4.7	5.3	4.3	2.0	2.8	3.2	5.7	8.6	11.7	15.5	16.1	10.8	3.2	2.4	3.4	5.7	6.6
29	5.3	4.7	4.8	7.3	6.6	8.1	11.4	9.2	12.3	17.5	16.1	12.6	9.0	9.1	9.3	10.3	13.8	14.7	13.3	16.3	13.6	14.4	12.8	11.0	11.0
30	11.3	9.6	7.4	10.1	9.1	10.1	10.6	7.1	8.0	7.3	8.0	10.8	12.6	12.1	9.1	10.0	9.2	6.6	2.9	3.3	2.6	4.1	6.6	8.0	8.2
31	5.5	8.3	7.6	6.3	4.6	6.7	7.7	9.4	7.6	6.8	3.6	2.0	1.9	3.5	5.2	4.7	7.7	9.3	10.1	6.9	2.6	3.1	5.7	6.8	6.0
HRAVE	7.7	8.0	8.4	8.4	8.2	8.2	8.6	8.3	8.8	8.8	8.1	8.6	8.6	9.4	10.5	10.9	11.2	11.4	10.7	9.7	9.1	8.4	8.3	8.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.2	7.3	10.1	15.1	10.8	6.3	5.8	16.5	20.5	12.8	6.7	10.0	6.7	9.0	6.0	4.3	7.2	7.7	12.4	9.9	11.8	7.1	6.6	6.2	8.0
MAX	14.9	17.2	16.1	19.8	17.0	12.4	9.2	24.5	23.3	21.4	14.5	16.5	11.2	15.8	9.6	7.4	11.9	16.1	18.0	16.0	25.6	15.4	14.9	17.6	15.2
MIN	2.7	3.1	5.1	8.3	4.1	1.5	2.5	8.7	16.8	3.0	2.4	5.2	2.7	5.7	1.9	1.9	3.2	1.8	7.7	4.3	1.5	2.0	2.0	2.3	2.4

DAY	26	27	28	29	30	31
AVE	5.5	9.1	6.6	11.0	8.2	6.0
MAX	11.1	14.9	16.1	17.5	12.6	10.1
MIN	2.2	2.2	2.0	4.7	2.6	1.9

MONTHLY AVERAGE = 9.0 MONTHLY MAXIMUM = 25.6 MONTHLY MINIMUM = 1.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JANUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	175	138	116	139	108	130	144	115	147	286	275	279	41	97	279	75	81	72	27	34	43	37	47	38	17
2	53	45	41	56	57	45	37	87	57	54	74	24	275	274	273	205	202	225	119	124	85	116	143	128	90
3	108	95	110	114	103	119	120	103	130	122	149	152	130	76	77	70	64	47	56	69	53	49	57	106	235
4	107	97	76	80	130	129	139	131	135	129	71	72	68	67	67	68	62	51	51	48	56	68	82	101	125
5	92	99	91	111	121	115	120	142	134	105	86	85	91	78	66	58	52	52	23	299	78	95	61	319	360
6	295	88	288	299	297	297	290	296	305	306	306	314	317	274	303	310	296	266	222	271	258	136	127	110	280
7	111	139	127	143	126	125	153	148	94	103	132	160	158	130	92	94	274	290	349	86	29	76	132	120	206
8	110	113	122	130	116	111	110	108	74	73	60	72	67	60	58	46	42	52	46	48	63	64	67	69	14
9	68	69	64	63	66	67	67	69	62	70	65	65	64	65	57	62	68	55	49	61	64	60	64	72	166
10	66	60	53	52	52	64	52	65	68	68	91	71	68	77	90	84	69	64	50	49	56	71	58	15	298
11	93	97	91	45	95	107	98	71	109	116	123	192	259	278	281	287	288	296	304	295	269	118	111	79	26
12	129	104	114	112	109	110	105	103	118	135	130	88	95	75	53	61	43	42	48	51	56	85	173	302	51
13	301	57	68	94	128	119	107	108	141	127	127	95	95	155	85	75	69	66	44	42	14	25	44	84	197
14	127	138	129	125	117	115	125	115	135	137	161	136	83	97	79	78	69	40	49	43	49	65	114	104	344
15	134	106	104	134	116	108	114	119	127	120	151	132	148	95	88	42	289	314	114	300	293	161	106	137	186
16	113	94	100	264	94	96	126	CAL	CAL	CAL	CAL	CAL	136	248	265	82	116	204	290	196	111	86	100	113	183
17	100	109	22	134	117	108	111	117	118	125	140	157	185	292	280	307	291	290	303	289	250	250	150	116	41
18	107	119	117	145	126	135	105	124	129	134	264	284	283	285	286	272	279	285	301	308	300	41	81	101	214
19	88	85	101	100	56	67	66	127	135	130	112	73	35	36	39	35	40	44	43	71	63	53	62	101	93
20	125	105	121	118	117	141	133	150	146	132	109	69	73	70	68	65	67	56	56	9	52	92	101	91	165
21	121	89	83	80	7	114	100	16	107	98	276	267	288	288	293	287	283	282	284	296	301	303	304	284	210
22	192	168	118	118	122	296	93	69	109	60	189	273	277	289	284	271	282	297	317	311	299	297	60	122	329
23	131	151	105	63	118	120	143	144	140	114	182	256	252	271	250	256	291	302	314	307	303	154	114	106	172
24	101	56	112	112	105	116	102	109	113	120	150	124	256	64	74	62	43	34	35	353	49	71	132	117	145
25	83	148	144	132	109	119	112	110	112	141	156	154	162	47	53	56	17	283	300	301	293	135	117	128	51
26	126	340	332	309	296	96	136	132	135	128	165	166	290	266	236	240	236	267	315	30	33	95	116	157	269
27	157	142	114	116	116	116	119	124	117	138	153	64	47	49	76	70	67	69	36	352	337	94	90	113	141
28	101	102	111	75	100	94	117	88	108	116	98	176	258	267	257	271	295	309	304	312	94	258	153	131	212
29	141	130	132	118	116	103	113	101	89	79	70	72	75	68	54	42	40	42	46	49	44	47	48	48	39
30	51	120	97	150	125	136	133	122	131	152	116	66	66	67	72	74	52	53	59	47	63	119	120	117	336
31	106	88	94	91	77	90	96	90	101	108	126	150	228	114	253	271	297	301	314	311	293	101	110	103	242

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JANUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	28	11	19	49	11	13	12	11	27	9	11	16	41	50	25	45	11	10	9	14	12	14	16	23	20
2	24	19	14	12	17	19	21	15	18	19	17	27	23	18	21	26	31	15	22	16	16	12	7	10	18
3	16	10	11	10	10	11	9	8	8	9	10	13	15	13	15	12	12	14	8	14	12	9	12	13	11
4	14	15	9	16	17	10	7	6	7	12	10	8	10	9	10	10	11	7	7	10	11	8	12	15	10
5	14	15	11	17	14	16	18	15	13	19	16	13	10	8	9	12	8	8	67	22	29	18	29	44	18
6	15	51	24	7	9	11	8	9	9	8	9	11	16	19	10	11	10	18	39	12	38	39	10	10	17
7	11	8	8	10	8	7	8	8	11	14	20	17	19	26	16	11	30	6	34	30	27	32	12	10	16
8	6	7	11	5	7	7	6	14	9	7	15	10	13	16	15	14	10	13	9	9	11	10	8	7	10
9	7	8	11	11	10	10	9	9	11	8	9	12	13	11	12	12	10	11	12	11	12	13	9	7	10
10	8	13	11	10	10	11	12	11	13	13	10	10	9	11	9	7	11	11	9	7	10	11	32	41	13
11	18	8	6	36	35	11	6	12	23	10	25	35	22	20	17	12	8	7	8	5	16	11	10	9	15
12	13	7	8	8	7	7	8	7	7	7	22	9	17	9	16	16	12	12	10	13	11	15	45	11	12
13	10	14	21	15	39	45	20	16	13	10	15	13	34	51	19	8	15	13	15	18	45	18	16	17	21
14	10	6	5	5	7	7	9	6	9	9	7	13	13	27	11	20	10	12	10	12	8	11	11	10	10
15	8	7	8	7	6	9	7	10	10	7	14	16	27	14	9	46	29	28	41	15	43	36	12	11	18
16	14	11	17	59	30	14	15	CAL	CAL	CAL	CAL	CAL	39	33	59	20	22	11	20	41	26	21	12	13	25
17	8	8	29	24	8	10	11	10	9	10	10	13	25	29	16	12	11	8	9	13	11	17	7	8	13
18	14	15	15	20	9	22	21	37	31	15	28	20	14	14	14	13	10	7	8	7	31	42	14	16	18
19	19	19	25	19	11	14	22	17	7	11	18	11	18	16	13	12	10	10	11	14	11	10	9	11	14
20	13	14	18	19	19	10	15	7	8	19	18	8	11	11	9	11	12	27	29	27	40	28	13	37	18
21	13	13	23	43	23	12	10	51	23	47	55	25	14	12	12	11	10	8	8	9	8	10	9	15	19
22	23	18	11	12	11	23	15	23	24	43	32	26	16	14	13	12	11	9	7	10	8	36	58	19	20
23	19	24	34	31	17	43	14	10	32	32	47	29	54	28	45	37	19	9	7	7	6	30	8	11	25
24	12	34	11	7	8	22	8	8	9	16	33	45	19	28	12	20	22	16	15	20	21	35	22	28	20
25	26	9	7	7	8	7	7	7	8	7	8	11	30	29	29	24	35	6	6	5	36	17	31	25	16
26	30	45	49	43	43	22	36	37	12	17	49	32	15	20	45	28	21	10	32	51	24	42	47	25	32
27	23	12	10	6	7	6	7	6	6	9	18	18	14	14	11	7	9	8	29	43	32	14	11	7	14
28	7	9	9	15	11	8	9	10	11	9	22	47	30	24	19	12	9	7	7	8	36	37	24	8	16
29	7	27	13	6	6	9	12	19	13	8	10	16	20	18	23	16	14	10	10	7	11	10	11	11	13
30	14	16	17	8	13	10	7	10	13	18	17	20	12	10	10	8	14	12	25	25	22	13	6	7	14
31	11	7	8	8	11	6	6	7	10	11	23	27	41	36	20	19	9	7	5	11	35	22	9	10	15
HRAVE	15	15	15	18	14	14	12	14	13	14	20	19	21	21	18	17	15	11	17	16	21	21	17	16	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20	18	11	10	18	17	16	10	10	13	15	12	21	10	18	25	13	18	14	18	19	20	25	20	16
MAX	50	31	16	17	67	51	34	16	13	41	36	45	51	27	46	59	29	42	25	40	55	58	54	45	36
MIN	9	7	8	6	8	7	6	5	7	7	5	7	8	5	6	11	7	7	7	7	8	7	6	7	5

DAY	26	27	28	29	30	31
AVE	32	14	16	13	14	15
MAX	51	43	47	27	25	41
MIN	10	6	7	6	6	5

MONTHLY AVERAGE = 16.5 MONTHLY MAXIMUM = 66.8 MONTHLY MINIMUM = 4.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JANUARY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	2.4	1.5	1.1	1.2	1.5	1.6	1.7	2.0	2.3	2.5	3.5	5.3	6.0	6.6	7.4	7.5	6.7	6.2	5.6	5.2	4.6	3.6	2.7	2.2	3.8
2	1.9	1.9	1.7	1.2	1.1	1.0	1.0	0.7	0.7	1.1	1.8	2.6	3.1	4.6	5.1	5.7	6.2	5.6	4.8	4.1	3.6	3.0	2.1	1.0	2.7
3	0.3	0.2	-0.2	-0.5	-0.7	-1.4	-1.7	-2.0	-0.8	1.5	3.5	6.1	8.2	8.8	9.8	10.0	10.1	9.2	7.7	6.8	7.0	7.0	6.4	4.6	4.2
4	3.9	3.5	4.4	4.5	2.0	1.2	1.0	1.4	2.3	4.8	8.4	10.4	12.1	13.2	13.9	14.1	13.8	13.1	12.5	12.1	11.5	10.6	9.3	8.2	8.0
5	7.9	6.9	6.9	5.6	4.9	5.1	4.5	3.5	4.2	6.9	10.9	13.0	15.0	15.6	15.8	16.0	16.0	15.8	15.1	14.3	13.6	12.9	12.5	11.2	10.6
6	10.3	8.9	8.2	8.4	8.3	8.2	8.2	8.2	8.2	8.2	8.4	8.8	9.7	10.2	9.6	9.5	9.0	8.9	8.5	8.5	8.4	7.7	7.1	7.0	8.6
7	6.2	5.4	5.3	4.5	3.9	4.5	4.7	4.6	4.9	5.6	7.4	9.2	10.7	12.7	14.3	14.8	15.0	13.9	13.1	11.8	10.8	9.5	8.2	7.7	8.7
8	7.4	6.8	6.1	5.4	5.8	5.6	5.6	5.6	8.2	10.6	12.8	14.2	15.7	16.9	17.8	18.5	18.2	17.5	17.3	17.1	16.2	15.7	15.0	14.6	12.3
9	13.9	13.3	13.4	13.5	13.3	12.9	12.6	12.5	12.8	13.5	14.1	14.6	14.4	14.3	14.7	15.4	15.2	15.0	15.8	15.6	15.4	15.2	14.8	13.5	14.2
10	13.4	13.9	14.1	13.9	13.1	12.6	12.6	12.0	11.9	13.0	13.1	14.3	15.1	15.6	15.9	15.4	14.7	14.2	14.4	14.0	12.9	11.8	10.9	9.8	13.4
11	8.8	7.9	7.4	7.1	5.9	5.9	5.6	4.9	5.4	7.2	10.4	12.0	13.4	15.4	16.4	16.6	15.9	14.6	13.4	12.5	11.8	10.4	9.7	9.4	10.3
12	7.3	7.6	6.6	6.4	6.1	5.5	5.4	4.9	5.9	8.2	11.2	14.1	15.2	15.9	16.4	16.3	16.1	15.5	15.1	14.9	14.7	13.5	11.7	11.3	11.1
13	10.3	9.2	8.9	8.7	8.7	8.8	8.7	8.7	8.6	9.3	10.2	12.1	12.9	12.0	12.7	13.4	12.6	12.0	11.9	12.0	11.6	12.1	11.8	10.6	10.7
14	9.5	8.7	9.0	9.0	8.9	8.4	8.3	8.3	8.3	9.9	11.6	13.1	15.7	16.8	17.2	17.8	17.4	16.9	16.0	15.7	15.4	14.2	12.3	11.3	12.5
15	9.8	10.3	9.7	8.8	9.1	8.4	8.3	8.4	8.0	10.1	12.6	14.2	15.0	16.4	16.6	16.1	15.5	15.4	14.7	14.6	13.3	13.0	12.6	12.8	12.2
16	11.9	11.3	11.5	11.0	10.4	10.2	9.8	CAL	CAL	CAL	CAL	CAL	17.2	17.6	18.5	18.4	18.1	17.7	16.6	14.6	13.4	12.4	11.1	10.2	13.8
17	9.4	9.1	8.0	6.9	7.0	7.1	7.0	5.8	7.4	10.2	12.0	14.8	16.6	17.6	19.0	19.1	18.2	17.2	16.0	15.6	15.1	13.9	13.0	12.9	12.5
18	12.5	12.2	11.7	11.1	10.4	10.4	10.6	10.3	10.1	11.4	14.1	16.3	17.2	17.5	17.6	17.7	17.4	16.3	15.2	14.6	14.0	13.1	12.2	11.2	13.5
19	12.1	11.9	11.8	11.5	11.9	11.7	11.2	7.7	8.1	10.6	13.0	15.0	16.0	17.2	17.5	18.1	17.9	17.6	17.0	15.6	15.2	15.0	13.8	11.7	13.7
20	10.1	9.6	8.0	7.9	6.9	5.8	5.4	4.5	6.5	9.4	13.2	16.3	18.6	19.5	19.4	19.7	19.8	18.8	17.9	17.2	16.2	14.1	13.2	11.4	12.9
21	10.2	10.0	8.6	8.7	7.5	6.7	7.3	6.1	7.2	9.1	11.9	14.8	17.6	17.5	16.8	15.9	15.2	14.0	13.1	11.9	10.6	9.4	9.1	8.6	11.2
22	8.5	7.4	6.3	5.8	5.5	4.7	3.3	3.0	3.8	5.9	8.8	10.2	11.9	13.0	13.4	13.3	13.1	12.1	11.2	10.7	9.7	9.3	8.2	5.8	8.5
23	5.8	5.1	6.8	8.3	6.6	4.4	3.1	1.9	3.1	4.9	7.8	10.2	12.0	12.9	13.9	14.6	14.5	13.0	11.5	10.5	9.9	8.2	7.0	6.0	8.4
24	5.1	4.1	2.7	2.5	2.0	1.2	0.6	0.4	2.6	5.2	7.8	11.0	13.8	17.1	18.0	18.4	18.4	18.0	16.9	15.1	14.2	12.4	10.4	9.3	9.5
25	9.6	7.8	6.3	4.9	5.7	4.6	4.1	3.7	4.4	6.9	10.8	13.9	16.4	17.8	18.5	18.7	19.0	18.0	15.4	14.2	13.6	12.2	11.5	10.0	11.2
26	9.1	8.6	7.2	6.0	6.4	6.2	4.9	4.3	5.7	8.3	11.2	15.5	16.7	18.2	19.4	19.7	19.7	18.4	17.1	16.5	16.3	14.8	13.3	12.7	12.4
27	11.7	8.7	8.2	7.9	6.9	6.3	6.2	5.1	6.3	8.6	11.6	16.2	17.2	18.2	19.4	19.3	18.9	17.9	16.8	15.8	14.4	12.9	10.7	9.7	12.3
28	8.7	7.7	6.8	5.9	5.3	4.1	4.2	3.3	4.7	8.0	11.4	14.1	16.0	18.1	20.2	21.0	20.6	19.0	17.2	16.6	16.0	14.7	13.4	13.0	12.1
29	12.4	12.0	11.3	10.7	10.8	9.7	9.0	10.1	11.7	13.8	15.5	17.1	18.8	19.5	19.6	19.4	19.1	17.9	17.0	16.6	16.4	16.2	15.7	15.1	14.8
30	14.7	12.2	12.3	10.3	11.4	10.4	10.5	10.7	10.4	11.7	16.0	17.6	18.5	19.0	19.6	20.0	19.7	19.1	18.3	17.6	17.2	15.6	14.3	13.4	15.0
31	12.2	11.4	10.8	10.0	9.3	7.7	7.6	7.0	8.4	11.7	14.4	16.8	18.6	20.5	21.2	21.0	20.5	19.5	18.8	17.9	17.1	14.9	13.3	12.1	14.3
HRAVE	8.9	8.2	7.8	7.3	7.0	6.4	6.2	5.6	6.4	8.3	10.6	12.8	14.4	15.4	16.0	16.2	15.9	15.1	14.3	13.5	12.9	11.9	10.9	9.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	3.8	2.7	4.2	8.0	10.6	8.6	8.7	12.3	14.2	13.4	10.3	11.1	10.7	12.5	12.2	13.8	12.5	13.5	13.7	12.9	11.2	8.5	8.4	9.5	11.2
MAX	7.5	6.2	10.1	14.1	16.0	10.3	15.0	18.5	15.8	15.9	16.6	16.4	13.4	17.8	16.6	18.5	19.1	17.7	18.1	19.8	17.6	13.4	14.6	18.4	19.0
MIN	1.1	0.7	-2.0	1.0	3.5	7.0	3.9	5.4	12.5	9.8	4.9	4.9	8.6	8.3	8.0	9.8	5.8	10.1	7.7	4.5	6.1	3.0	1.9	0.4	3.7

DAY	26	27	28	29	30	31
AVE	12.4	12.3	12.1	14.8	15.0	14.3
MAX	19.7	19.4	21.0	19.6	20.0	21.2
MIN	4.3	5.1	3.3	9.0	10.3	7.0

MONTHLY AVERAGE = 10.9 MONTHLY MAXIMUM = 21.2 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JANUARY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	-0.1	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.1	-0.1	-0.2	-0.4	-0.6	-0.6	-0.5	-0.5	-0.5	0.0	0.3	0.3	0.4	0.2	0.2	0.2	0.2	-0.1
2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	-0.3	-0.4	-0.5	-0.5	-0.6	-0.5	-0.4	-0.3	0.0	0.4	0.5	0.5	0.4	0.6	0.4	0.0
3	0.2	0.4	0.5	0.3	0.3	0.2	0.3	0.3	-0.6	-1.1	-1.4	-1.4	-1.2	-0.6	-0.3	0.0	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.3	-0.1
4	0.4	0.3	0.4	0.4	0.7	0.3	0.3	0.4	-0.3	-0.8	-0.4	-0.5	-0.4	-0.2	-0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.5	0.5	0.1
5	0.4	0.6	0.6	0.7	1.2	0.8	0.9	0.8	0.5	0.1	-0.7	-0.8	-0.9	-0.5	-0.2	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2
6	0.6	0.4	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	-0.2	-0.4	-0.4	-0.2	-0.1	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.1
7	0.4	0.4	0.2	0.2	0.1	-0.1	-0.1	-0.1	-0.1	-0.3	-0.7	-1.2	-0.9	-0.7	-0.5	-0.2	-0.2	0.4	0.7	0.6	0.6	0.7	0.7	0.8	0.0
8	0.6	0.8	1.3	0.3	0.3	0.4	0.5	0.8	0.3	-0.1	-0.2	-0.3	-0.2	-0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3
9	0.4	0.5	0.4	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.2
10	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.2	0.1	0.2	0.2	0.2	0.3	0.5	0.3	0.4	0.1
11	0.4	0.6	0.6	0.5	0.5	0.4	0.6	0.3	-0.2	-0.9	-0.9	-0.5	-0.5	-0.6	-0.5	-0.5	-0.3	0.2	0.4	0.6	0.5	0.6	0.6	0.7	0.1
12	0.6	0.4	0.4	0.3	0.4	0.4	0.4	0.4	-0.3	-0.9	-0.9	-1.2	-0.8	-0.6	-0.2	-0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.0
13	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.0	-0.2	-0.4	-0.7	-0.5	0.0	-0.3	-0.2	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.0
14	0.4	0.4	0.2	0.2	0.2	0.4	0.4	0.3	0.2	-0.5	-0.9	-0.8	-0.8	-0.7	-0.4	-0.1	0.2	0.5	0.4	0.3	0.3	0.5	0.5	0.6	0.1
15	1.0	0.4	0.7	0.9	0.9	0.8	0.4	0.4	0.6	-0.3	-0.8	-0.6	-0.4	-0.6	-0.3	0.1	0.1	0.2	0.3	0.5	0.4	0.6	0.4	0.3	0.2
16	0.3	0.3	0.4	0.3	0.3	0.3	0.5	CAL	CAL	CAL	CAL	CAL	-0.8	-0.5	-0.4	-0.5	-0.1	0.1	0.5	0.5	0.7	0.6	0.6	0.5	0.2
17	0.6	0.7	0.6	0.4	0.4	0.4	0.5	0.2	-0.4	-1.0	-1.3	-1.2	-0.8	-0.6	-0.5	-0.2	-0.1	0.3	0.4	0.3	0.3	0.4	0.2	0.3	0.0
18	0.4	0.4	0.3	0.2	0.3	0.3	0.5	0.5	0.3	-0.2	-0.5	-0.6	-0.6	-0.6	-0.5	-0.6	-0.4	0.1	0.3	0.5	0.6	0.8	0.6	0.9	0.1
19	0.7	0.6	0.5	0.6	0.3	0.3	0.4	1.0	-0.7	-1.2	-0.9	-0.8	-0.5	-0.4	-0.2	0.0	0.1	0.2	0.3	0.6	0.5	0.4	0.5	0.6	0.1
20	0.7	0.6	1.0	1.2	1.4	0.9	1.5	1.1	-0.1	-0.4	-0.7	-0.5	-0.6	-0.4	-0.2	0.0	0.2	0.5	0.5	0.6	0.4	0.7	0.7	0.7	0.4
21	0.6	0.7	0.5	0.7	0.6	0.5	0.7	0.5	-0.2	-0.4	-0.5	-0.6	-0.5	-0.5	-0.5	-0.6	-0.3	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.1
22	0.5	0.4	0.4	0.4	0.5	0.7	0.6	0.4	-0.3	-0.3	-0.5	-0.6	-0.7	-0.7	-0.6	-0.6	-0.4	0.1	0.3	0.5	0.6	0.4	0.6	1.0	0.1
23	1.2	0.8	0.9	0.4	0.7	0.7	0.8	0.8	-0.2	-0.6	-0.5	-0.5	-0.6	-0.7	-0.5	-0.6	-0.4	0.2	0.3	0.4	0.6	0.6	0.5	0.6	0.2
24	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.3	-0.8	-1.2	-0.6	-0.6	-0.6	-0.5	-0.2	-0.1	0.2	0.4	0.9	0.9	0.7	0.8	1.2	1.5	0.3
25	1.5	1.8	1.2	1.0	0.5	0.4	0.4	0.3	-0.5	-1.2	-1.5	-1.5	-0.9	-0.6	-0.4	-0.2	-0.1	0.3	0.4	0.5	0.6	0.5	0.6	0.6	0.1
26	0.8	0.8	1.0	1.1	1.5	2.1	1.9	1.2	-0.4	-0.9	-0.6	-0.8	-0.7	-0.6	-0.6	-0.6	-0.5	0.2	0.6	0.6	0.4	0.6	0.8	0.8	0.4
27	0.8	0.7	0.4	0.3	0.2	0.2	0.4	0.3	-0.3	-1.0	-1.0	-0.7	-0.5	-0.5	-0.7	-0.3	-0.1	0.4	0.6	0.5	0.4	0.5	0.7	0.8	0.1
28	0.7	0.6	0.6	0.5	0.6	0.6	0.4	0.5	-0.5	-1.3	-1.2	-0.6	-0.6	-0.5	-0.5	-0.5	0.0	0.4	0.4	0.6	0.5	0.5	0.6	0.5	0.1
29	0.8	0.6	0.3	0.7	0.8	1.0	1.0	0.9	0.4	-0.1	-0.6	-0.9	-1.0	-0.7	-0.5	-0.2	-0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.1
30	0.2	0.5	0.5	0.7	0.6	0.4	0.2	0.2	0.2	-0.2	-1.1	-0.9	-0.9	-0.7	-0.7	-0.5	-0.1	0.1	0.2	0.4	0.4	0.3	0.3	0.5	0.0
31	0.6	0.5	0.7	0.7	0.6	0.6	0.7	0.5	-0.4	-1.2	-1.0	-0.6	-0.5	-0.8	-0.5	-0.3	-0.1	0.2	0.4	0.5	0.4	0.8	0.5	0.6	0.1
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.1	-0.5	-0.7	-0.7	-0.6	-0.5	-0.4	-0.3	0.0	0.2	0.4	0.4	0.4	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	0.0	-0.1	0.1	0.2	0.1	0.0	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.0	0.1	0.1	0.4	0.1	0.1	0.2	0.3	0.1
MAX	0.4	0.6	0.5	0.7	1.2	0.6	0.8	1.3	0.5	0.5	0.7	0.6	0.5	0.6	1.0	0.7	0.7	0.9	1.0	1.5	0.7	1.0	1.2	1.5	1.8
MIN	-0.6	-0.6	-1.4	-0.8	-0.9	-0.4	-1.2	-0.3	0.0	-0.4	-0.9	-1.2	-0.7	-0.9	-0.8	-0.8	-1.3	-0.6	-1.2	-0.7	-0.6	-0.7	-0.7	-1.2	-1.5

DAY	26	27	28	29	30	31
AVE	0.4	0.1	0.1	0.1	0.0	0.1
MAX	2.1	0.8	0.7	1.0	0.7	0.8
MIN	-0.9	-1.0	-1.3	-1.0	-1.1	-1.2

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 2.1 MONTHLY MINIMUM = -1.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JANUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	699	700	700	700	700	700	701	702	702	703	703	703	702	702	702	702	702	702	702	702	702	702	702	702	701
2	702	702	702	701	701	701	701	702	702	703	704	704	704	704	704	704	705	705	705	705	706	706	706	707	703
3	707	708	708	708	708	707	708	708	708	708	708	707	706	705	705	705	705	705	705	705	705	705	705	706	706
4	706	706	706	705	705	705	705	705	705	706	705	705	704	703	703	703	703	702	703	703	703	704	704	703	704
5	703	703	704	704	703	703	703	703	704	704	704	704	703	702	702	701	701	701	701	702	703	702	702	702	703
6	702	702	702	702	702	702	702	702	703	704	704	704	703	703	703	704	704	704	705	706	706	706	707	707	704
7	707	707	708	707	708	708	708	708	708	709	709	708	708	707	706	706	706	706	706	706	706	707	707	707	707
8	707	707	707	706	706	706	706	706	707	707	707	707	705	705	704	704	704	704	705	705	705	706	706	706	706
9	706	706	706	706	706	706	706	706	706	707	707	707	705	705	704	704	705	704	704	704	704	704	705	705	705
10	704	704	704	704	704	704	704	704	704	705	705	704	704	703	703	703	703	703	704	703	704	704	704	704	704
11	704	704	704	704	704	704	704	704	704	705	705	705	704	703	702	703	703	703	704	704	704	704	704	704	704
12	704	704	704	704	704	704	704	704	705	705	705	704	703	702	702	702	702	701	701	702	701	701	702	702	703
13	703	703	703	703	703	703	703	703	703	704	704	704	704	703	703	703	704	704	704	704	704	705	705	705	704
14	705	705	705	705	705	705	705	705	706	706	706	706	705	704	704	704	703	703	704	704	703	704	704	704	704
15	704	704	704	704	704	704	705	705	705	706	706	705	704	704	703	703	703	703	704	704	705	705	706	706	704
16	706	706	706	706	706	706	707	CAL	CAL	CAL	CAL	CAL	707	706	706	706	706	706	706	707	707	707	707	707	706
17	707	706	706	707	706	706	706	706	707	707	707	707	706	705	705	705	705	705	705	705	706	706	706	706	706
18	705	705	705	704	704	704	704	704	705	705	705	705	705	704	704	704	704	705	705	706	706	707	707	708	705
19	708	708	708	708	708	708	708	709	710	710	710	709	709	708	707	707	706	706	706	707	707	707	707	707	708
20	707	707	707	706	706	706	706	706	706	706	706	705	704	703	702	701	701	701	701	701	701	701	701	702	704
21	701	701	701	700	700	700	700	700	700	700	700	699	698	698	697	697	697	697	697	698	698	698	699	699	699
22	699	700	700	700	700	700	701	701	702	703	704	704	704	703	703	704	704	705	705	706	706	707	708	708	703
23	708	708	708	708	708	708	708	708	709	709	710	709	708	707	706	705	705	705	705	705	706	706	705	705	707
24	705	705	705	705	705	705	705	705	706	707	707	706	705	704	703	703	704	704	704	705	705	705	705	705	705
25	705	705	705	705	705	705	705	706	706	706	706	706	705	704	703	702	702	702	702	702	703	703	704	704	704
26	704	704	704	704	704	704	705	705	706	707	707	707	706	706	705	705	705	705	705	705	706	706	707	707	705
27	707	707	707	707	707	707	707	707	707	707	707	706	705	704	703	703	702	702	702	702	702	702	702	702	705
28	702	702	702	702	701	701	702	702	703	703	703	703	702	701	700	700	700	700	701	701	702	702	702	702	702
29	701	701	701	701	701	701	701	701	701	701	701	701	701	701	700	699	699	699	699	699	699	699	699	699	700
30	700	700	700	700	700	699	700	700	701	701	701	701	700	700	699	699	699	699	699	699	700	700	700	700	700
31	701	701	701	701	701	701	702	702	703	703	703	702	702	701	700	700	700	700	700	700	700	701	701	701	701
HRAVE	704	704	704	704	704	704	704	704	705	705	705	705	704	703	703	703	703	703	703	703	704	704	704	704	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	703	706	704	703	704	707	706	705	704	704	703	704	704	704	706	706	705	708	704	699	703	707	705	704
MAX	703	707	708	706	704	707	709	707	707	705	705	705	705	706	706	707	707	708	710	707	701	708	710	707	706
MIN	699	701	705	702	701	702	706	704	704	703	702	701	703	703	703	706	705	704	706	701	697	699	705	703	702

DAY	26	27	28	29	30	31
AVE	705	705	702	700	700	701
MAX	707	707	703	701	701	703
MIN	704	702	700	699	699	700

MONTHLY AVERAGE = 703.9 MONTHLY MAXIMUM = 709.9 MONTHLY MINIMUM = 697.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JANUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	100	100	100	100	100	100	100	100	100	100	97	85	79	70	59	60	65	66	69	68	64	58	58	57	81
2	58	56	55	59	61	62	65	76	74	77	77	73	71	66	66	63	64	68	73	76	71	71	78	88	69
3	95	97	95	96	97	97	97	98	93	79	72	62	52	43	40	40	43	46	53	58	58	57	58	68	71
4	73	75	70	68	83	91	91	89	85	73	54	47	44	42	41	41	41	43	45	46	49	53	58	64	61
5	64	68	69	74	78	77	78	82	79	70	53	47	42	42	43	43	43	43	46	49	51	57	63	73	60
6	82	96	100	100	100	100	100	100	100	100	100	99	93	90	94	93	96	96	99	99	99	100	100	100	97
7	100	100	100	100	100	100	100	100	100	100	96	87	81	69	55	49	54	59	62	69	73	78	84	87	83
8	89	90	93	96	95	95	93	90	81	69	60	54	51	48	45	43	44	46	46	46	49	50	52	53	66
9	55	56	54	53	52	53	54	53	52	49	48	46	48	52	52	49	53	54	49	48	48	49	52	56	52
10	56	56	55	55	57	60	59	63	66	61	61	58	57	56	55	58	62	65	64	67	72	76	81	88	63
11	91	95	97	99	100	100	100	100	100	94	80	75	72	64	60	55	58	64	70	74	78	85	89	89	83
12	95	95	98	97	95	96	97	97	92	78	62	48	46	45	44	44	44	48	49	50	51	55	69	75	69
13	86	97	100	100	100	100	100	100	100	99	94	82	77	88	84	79	86	90	85	80	84	79	79	86	90
14	93	97	97	97	98	99	99	99	97	91	85	77	65	59	57	56	58	60	62	61	61	66	76	82	79
15	87	86	88	90	90	92	91	89	87	79	67	60	53	53	54	58	59	61	66	65	76	80	84	81	75
16	89	95	91	94	98	100	100	CAL	CAL	CAL	CAL	CAL	61	59	55	55	57	59	65	74	81	86	89	93	79
17	94	94	98	100	100	98	97	99	94	79	70	62	56	53	50	50	51	54	60	62	64	70	75	76	75
18	77	79	79	79	84	84	84	86	86	78	68	65	62	59	57	57	57	61	67	71	74	79	83	78	73
19	51	44	41	41	39	40	41	58	65	53	42	33	32	28	28	26	27	27	27	31	31	30	32	40	38
20	48	48	54	53	57	58	59	62	55	49	38	30	27	27	28	27	27	30	32	35	34	42	46	52	42
21	57	58	66	65	70	74	72	77	72	64	56	47	36	38	46	50	48	45	43	33	32	37	39	41	53
22	42	46	51	54	56	59	69	74	70	60	47	45	40	36	38	39	40	41	45	45	46	49	56	64	50
23	61	63	47	36	41	53	57	61	58	51	42	32	28	25	23	23	26	29	31	33	34	40	46	51	41
24	56	61	66	68	71	74	77	78	65	53	45	38	35	26	23	23	23	24	28	30	33	37	40	43	47
25	41	45	50	56	54	55	58	59	57	49	39	34	29	24	24	22	22	24	31	32	33	39	44	46	40
26	49	54	59	60	57	55	56	57	50	43	39	29	26	22	19	19	20	22	27	26	23	26	30	30	37
27	33	40	42	42	45	46	46	49	47	41	37	26	26	24	22	22	24	26	29	33	35	39	44	47	36
28	50	53	58	62	65	69	65	71	66	51	40	34	31	28	26	26	26	31	35	36	39	42	45	47	46
29	48	50	52	55	53	56	55	50	44	38	36	33	30	30	30	31	32	33	34	34	34	34	35	37	40
30	38	46	46	53	50	54	54	54	56	53	39	34	33	32	31	31	32	34	36	38	40	41	46	49	42
31	55	59	62	64	67	73	74	75	68	54	44	38	35	31	30	32	35	37	39	42	45	52	56	60	51
HRAVE	68	71	72	73	75	76	77	78	75	68	60	53	49	46	44	44	46	48	51	52	54	57	61	65	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	81	69	71	61	60	97	83	66	52	63	83	69	90	79	75	79	75	73	38	42	53	50	41	47	40
MAX	100	88	98	91	82	100	100	96	56	88	100	98	100	99	92	100	100	86	65	62	77	74	63	78	59
MIN	57	55	40	41	42	82	49	43	46	55	55	44	77	56	53	55	50	57	26	27	32	36	23	23	22

DAY	26	27	28	29	30	31
AVE	37	36	46	40	42	51
MAX	60	49	71	56	56	75
MIN	19	22	26	30	31	30

MONTHLY AVERAGE = 60.8 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 19.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JANUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.12	0.32	0.63	0.35	0.33	0.47	0.37	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.72
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.14	0.14	0.19	0.33	0.57	0.29	0.27	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.15
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.33	0.48	0.58	0.62	0.60	0.51	0.37	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.83
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.33	0.48	0.59	0.63	0.60	0.52	0.37	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.87
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.21	0.47	0.46	0.50	0.38	0.36	0.19	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.71
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.07	0.17	0.31	0.17	0.09	0.04	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.94
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.35	0.58	0.62	0.59	0.51	0.37	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.36
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.33	0.48	0.59	0.63	0.60	0.52	0.38	0.19	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.85
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.07	0.17	0.17	0.07	0.08	0.18	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.95
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.11	0.18	0.24	0.23	0.21	0.19	0.11	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.38
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.31	0.47	0.57	0.62	0.60	0.52	0.38	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.83
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.31	0.49	0.55	0.46	0.44	0.43	0.36	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.44
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.10	0.20	0.36	0.33	0.11	0.46	0.33	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.99
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.20	0.34	0.45	0.57	0.63	0.52	0.29	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.33
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.20	0.39	0.38	0.28	0.30	0.16	0.05	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.91
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CAL	CAL	CAL	CAL	CAL	0.65	0.62	0.55	0.40	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.43
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.31	0.49	0.61	0.63	0.56	0.51	0.32	0.16	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.78
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.51	0.58	0.64	0.59	0.49	0.42	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.65
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.35	0.51	0.62	0.65	0.55	0.51	0.43	0.23	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.05
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.29	0.46	0.61	0.64	0.57	0.45	0.36	0.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.78
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.29	0.50	0.57	0.61	0.63	0.55	0.44	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.98
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.34	0.51	0.62	0.67	0.65	0.53	0.41	0.23	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.16
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.36	0.53	0.64	0.68	0.66	0.57	0.43	0.25	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.34
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.37	0.53	0.65	0.69	0.67	0.59	0.45	0.26	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.44
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.36	0.53	0.65	0.70	0.68	0.59	0.45	0.26	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.44
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.37	0.54	0.65	0.70	0.68	0.59	0.45	0.26	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.48
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.33	0.47	0.52	0.58	0.54	0.59	0.37	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	3.82
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.37	0.54	0.66	0.67	0.68	0.59	0.37	0.15	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.26
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.19	0.50	0.64	0.65	0.43	0.34	0.25	0.12	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.23
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.21	0.46	0.48	0.53	0.42	0.34	0.28	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	2.98
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.51	0.55	0.56	0.59	0.41	0.23	0.12	0.03	0.00	0.00	0.00	0.00	0.00	3.55
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.25	0.42	0.52	0.54	0.51	0.45	0.33	0.16	0.02	0.00	0.00	0.00	0.00	0.00	0.00

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	2.72	2.15	3.83	3.87	2.71	0.94	3.36	3.85	0.95	1.38	3.83	3.44	1.99	3.33	1.91	2.43	3.78	3.65	4.05	3.78	3.98	4.16	4.34	4.44	4.44
MAX	0.63	0.57	0.62	0.63	0.50	0.31	0.62	0.63	0.18	0.24	0.62	0.55	0.46	0.63	0.39	0.65	0.63	0.64	0.65	0.64	0.63	0.67	0.68	0.69	0.70
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.48	3.82	4.26	3.23	2.98	3.55
MAX	0.70	0.59	0.68	0.65	0.53	0.59
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JANUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.02	0.04	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.02	0.05	0.10	0.11	0.11	0.11	0.09	0.02	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67
7	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.01	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CAL	CAL	CAL	CAL	CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.11	0.00	0.00	0.00	0.00	0.67	0.01	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.04	0.00	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.99 MONTHLY MAXIMUM = 0.11 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.3% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
FEBRUARY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	8.2	8.1	6.7	6.6	5.2	7.7	5.9	8.1	6.2	10.1	8.6	5.7	5.1	4.2	2.2	4.0	4.9	5.3	5.4	6.9	3.2	4.8	5.5	6.5	6.0
2	8.4	7.8	7.7	5.7	3.4	5.8	5.2	6.9	6.5	7.6	4.1	4.4	3.6	4.6	3.7	7.1	4.1	2.6	2.6	4.3	5.7	4.4	6.7	7.0	5.4
3	7.2	5.8	1.9	1.4	3.1	6.3	9.1	11.5	8.5	5.7	8.1	5.2	4.7	3.5	5.3	14.3	6.2	2.7	3.7	2.4	4.2	2.2	1.9	3.7	5.4
4	5.8	6.9	5.4	2.0	2.7	5.2	5.3	3.5	3.6	2.0	4.4	3.2	9.2	15.2	19.6	18.9	15.3	11.6	10.4	12.6	10.1	9.3	8.8	10.4	8.4
5	12.6	11.1	7.1	5.4	4.2	3.2	3.2	3.2	1.8	1.9	3.4	3.6	4.1	7.0	11.5	10.8	10.8	11.1	6.7	2.7	3.5	6.6	8.8	7.9	6.4
6	3.0	6.0	5.6	8.4	16.6	14.1	8.4	12.4	4.1	3.5	8.0	9.2	19.9	18.0	17.1	17.2	18.6	19.1	13.6	11.2	9.4	5.9	3.2	2.2	10.6
7	3.9	3.9	4.4	6.9	7.3	8.0	7.8	5.1	5.2	5.9	4.9	4.9	9.0	9.0	8.6	8.8	8.9	7.5	8.6	9.4	7.9	13.6	15.6	13.0	7.8
8	8.8	9.0	9.1	10.2	11.1	10.3	8.8	8.4	9.6	12.9	13.6	14.9	14.4	10.8	10.6	9.2	8.2	9.3	11.1	11.8	18.2	15.4	9.9	8.8	11.0
9	10.1	11.2	10.4	10.5	8.9	9.9	11.9	11.0	9.6	9.4	9.2	7.0	5.3	2.7	5.6	8.1	8.6	9.6	14.9	9.1	5.5	4.5	4.3	5.0	8.4
10	5.2	6.4	4.6	6.6	6.1	7.2	4.1	4.1	6.1	2.8	3.9	4.0	1.9	2.7	10.9	11.1	11.0	11.9	8.8	4.9	3.7	5.3	4.1	3.9	5.9
11	4.4	4.7	3.4	3.9	4.2	4.6	7.2	3.7	4.6	10.8	10.3	7.4	9.8	10.4	9.6	12.1	12.4	12.2	11.0	8.4	3.0	5.6	2.5	3.0	7.0
12	5.1	8.5	9.5	9.0	7.7	8.6	10.1	9.5	9.0	8.4	14.2	14.4	14.4	15.4	17.0	16.1	13.1	11.9	14.4	17.4	16.1	14.7	15.1	14.5	12.3
13	11.5	9.3	8.9	9.9	10.3	10.6	8.9	11.0	9.4	9.4	9.8	6.4	8.4	8.9	9.3	8.2	5.4	7.7	5.8	10.4	5.0	2.8	3.8	4.8	8.2
14	6.8	5.0	3.8	5.5	5.8	3.7	5.8	7.4	7.2	8.3	8.2	6.8	9.4	8.9	6.7	4.0	5.2	3.9	11.0	4.4	5.1	3.5	3.6	2.6	5.9
15	3.7	2.9	2.5	4.3	8.0	5.6	10.8	11.1	4.9	3.7	7.9	4.3	5.2	5.3	10.7	12.9	13.2	13.8	11.5	7.9	4.2	3.0	6.7	11.9	7.3
16	11.5	8.1	4.6	7.0	8.3	7.2	5.9	5.0	3.9	9.3	13.4	16.5	14.9	16.6	15.5	15.2	17.2	16.1	13.0	5.3	2.4	3.9	4.3	2.5	9.5
17	3.1	5.6	6.0	4.6	8.0	8.0	7.9	3.6	2.8	1.9	6.2	8.8	11.0	11.4	12.5	15.8	16.2	11.4	8.9	6.5	3.4	3.3	3.6	6.6	7.4
18	7.1	8.3	7.7	10.0	7.4	7.1	6.3	8.7	6.1	3.6	12.0	15.3	16.5	14.3	4.9	4.2	3.9	4.2	3.1	3.8	3.5	5.9	8.0	6.1	7.4
19	4.9	4.9	4.9	3.1	3.6	2.2	3.7	2.8	3.3	8.7	9.1	8.7	9.0	14.9	17.7	18.6	19.0	14.4	9.1	3.8	3.8	3.8	5.6	5.0	7.7
20	6.3	6.9	8.0	7.4	5.8	7.2	4.4	5.5	5.2	4.6	4.6	5.2	5.2	5.3	4.9	4.4	4.8	8.7	10.2	9.8	5.9	5.1	4.4	6.9	6.1
21	7.6	3.5	4.7	3.4	1.8	4.8	5.2	7.3	7.9	12.9	12.1	12.1	17.1	12.0	14.4	15.9	14.7	9.1	14.9	12.8	8.5	9.8	11.1	6.1	9.6
22	6.2	5.7	8.2	8.8	10.1	9.9	5.1	5.6	7.4	5.7	7.1	3.6	3.4	4.6	7.3	8.1	11.9	10.0	7.4	8.9	7.6	3.4	3.7	2.6	6.8
23	2.4	2.0	2.2	3.3	4.8	3.0	1.9	4.4	4.9	4.5	3.6	3.0	4.9	3.9	4.3	5.1	4.5	4.1	4.4	6.3	3.9	9.3	11.9	10.5	4.7
24	7.2	8.5	13.3	17.0	13.5	8.2	10.9	10.6	7.8	14.9	15.1	17.7	13.8	13.6	12.9	8.5	5.9	7.1	8.1	13.9	14.8	14.7	7.9	3.0	11.2
25	3.8	6.4	6.8	7.8	5.8	5.7	5.6	4.8	6.5	6.8	5.1	2.5	2.1	6.7	9.9	9.0	9.4	9.4	9.5	8.7	8.1	3.7	3.2	3.0	6.3
26	6.0	8.2	10.1	11.1	9.1	9.8	8.1	9.0	7.6	7.6	7.1	7.6	4.7	3.8	4.0	2.2	7.1	13.4	11.5	7.6	3.6	1.8	4.9	4.3	7.1
27	6.4	6.3	3.9	3.4	3.1	5.2	5.6	7.7	5.9	5.6	6.2	4.1	2.2	6.6	10.8	11.2	11.4	12.5	7.2	1.9	2.2	4.0	6.7	8.7	6.2
28	7.1	7.2	5.4	4.0	6.4	6.9	7.2	8.0	6.0	2.0	4.8	2.6	2.8	5.1	11.5	13.5	11.3	7.9	8.3	7.4	4.4	2.9	5.3	5.2	6.4
HRAVE	6.6	6.7	6.3	6.7	6.9	7.0	6.8	7.1	6.1	6.8	8.0	7.5	8.3	8.8	10.0	10.5	10.1	9.6	9.1	7.9	6.3	6.2	6.5	6.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.0	5.4	5.4	8.4	6.4	10.6	7.8	11.0	8.4	5.9	7.0	12.3	8.2	5.9	7.3	9.5	7.4	7.4	7.7	6.1	9.6	6.8	4.7	11.2	6.3
MAX	10.1	8.4	14.3	19.6	12.6	19.9	15.6	18.2	14.9	11.9	12.4	17.4	11.5	11.0	13.8	17.2	16.2	16.5	19.0	10.2	17.1	11.9	11.9	17.7	9.9
MIN	2.2	2.6	1.4	2.0	1.8	2.2	3.9	8.2	2.7	1.9	2.5	5.1	2.8	2.6	2.5	2.4	1.9	3.1	2.2	4.4	1.8	2.6	1.9	3.0	2.1

DAY	26	27	28	29	30	31
AVE	7.1	6.2	6.4	***	***	***
MAX	13.4	12.5	13.5	***	***	***
MIN	1.8	1.9	2.0	***	***	***

MONTHLY AVERAGE = 7.6 MONTHLY MAXIMUM = 19.9 MONTHLY MINIMUM = 1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
FEBRUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	103	99	108	53	86	124	82	125	132	88	97	92	86	114	157	223	274	277	296	292	59	105	98	89	71
2	101	96	97	102	74	123	119	88	95	100	129	98	87	114	216	170	128	98	140	75	103	105	96	90	261
3	99	108	180	76	293	294	295	297	315	115	109	144	95	147	163	165	181	69	41	62	291	134	182	162	165
4	312	293	301	299	309	276	273	274	272	268	116	120	286	299	303	302	300	296	288	292	301	290	292	286	37
5	290	288	293	286	257	221	285	116	154	272	287	297	295	264	246	248	274	291	294	259	290	300	264	257	261
6	288	181	106	310	305	307	295	297	357	180	168	263	281	289	279	280	278	286	284	282	301	234	299	244	106
7	61	211	121	97	95	89	87	94	109	130	154	124	44	25	23	21	33	37	25	49	71	54	58	80	167
8	96	99	97	143	142	146	134	126	130	75	71	67	64	66	52	46	53	48	35	37	48	68	103	111	355
9	107	118	111	117	114	118	124	123	114	101	110	140	126	319	293	294	307	285	282	325	329	114	118	106	123
10	81	74	90	98	108	80	83	90	83	108	128	157	249	253	297	272	259	271	295	256	225	150	160	128	288
11	110	114	122	139	166	195	276	261	286	297	293	285	283	283	290	289	281	281	296	304	164	103	100	94	242
12	124	110	112	104	105	113	116	97	125	146	86	82	74	47	37	36	42	37	40	48	63	67	71	82	75
13	97	129	126	123	103	91	104	140	135	138	151	139	78	66	68	65	76	69	65	68	75	58	75	108	268
14	91	106	340	1	88	85	108	98	105	72	74	85	58	16	18	308	325	133	90	106	85	94	138	192	94
15	313	22	150	241	297	275	294	296	246	264	312	267	281	308	297	298	308	310	310	303	206	190	282	293	194
16	292	296	247	253	263	265	228	212	234	295	274	270	267	282	272	270	277	278	273	259	242	234	237	248	267
17	121	126	130	120	86	85	85	49	91	229	298	291	297	278	251	249	263	272	289	307	231	142	132	121	301
18	106	96	120	111	115	121	117	122	291	247	309	318	303	306	313	311	315	79	111	150	103	107	128	98	323
19	117	124	105	116	109	244	172	285	247	279	296	298	299	273	277	279	279	284	279	263	146	303	304	133	307
20	111	125	107	108	102	90	108	97	108	123	134	122	122	118	327	273	272	301	303	294	263	122	130	115	290
21	115	126	111	96	123	111	120	136	134	161	155	162	181	178	186	180	221	295	303	296	310	78	330	341	342
22	55	120	245	299	288	307	203	261	288	327	137	124	127	269	303	259	282	311	298	291	299	210	209	222	240
23	202	238	282	152	107	102	99	119	124	106	149	215	269	274	262	303	236	245	260	296	310	68	68	112	148
24	113	102	79	73	80	150	148	146	116	65	56	58	44	44	37	46	87	81	30	305	304	308	319	170	165
25	129	101	98	98	105	93	100	99	89	129	132	136	259	276	306	309	305	308	295	295	311	336	131	118	98
26	107	96	87	89	99	98	90	86	92	114	144	143	151	131	221	179	254	302	312	312	261	223	40	134	25
27	94	103	89	93	92	99	104	90	105	92	83	87	121	279	285	301	302	298	314	213	104	91	89	85	344
28	86	95	93	75	86	93	92	98	100	295	94	195	288	272	302	311	299	286	307	297	287	319	117	124	83

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
FEBRUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	8	9	40	57	56	17	15	18	16	18	22	18	15	28	62	36	17	7	10	10	30	20	9	6	23
2	8	6	7	36	33	10	11	5	6	9	16	18	27	36	42	25	25	21	19	19	23	21	8	11	18
3	8	12	35	35	40	13	12	10	10	43	15	18	21	27	22	9	19	29	51	30	17	63	62	21	26
4	16	7	10	50	46	8	12	37	21	36	42	40	14	10	8	8	7	8	8	7	8	7	7	12	18
5	8	9	7	10	19	32	12	25	33	21	13	24	21	16	14	13	12	9	8	42	16	7	11	24	17
6	41	20	19	31	12	11	16	13	31	56	20	28	13	14	15	15	11	11	8	5	7	25	22	38	20
7	13	25	12	7	6	7	7	13	12	13	19	44	31	31	27	23	19	18	11	11	13	9	11	8	16
8	15	17	19	13	7	9	16	18	18	9	14	14	13	19	21	21	18	14	11	11	8	9	9	11	14
9	10	9	9	11	11	10	5	8	14	11	12	15	25	30	29	12	20	10	9	26	29	19	12	12	15
10	14	15	19	10	9	10	14	18	16	19	19	22	56	61	16	16	14	12	7	13	36	13	11	10	19
11	17	25	37	18	22	25	13	27	22	15	18	27	19	16	23	18	12	10	7	6	31	11	25	14	19
12	21	7	10	8	8	8	7	8	8	14	17	11	12	16	13	13	12	15	11	8	12	9	5	9	11
13	14	11	13	10	16	13	15	8	6	5	6	16	13	12	9	10	23	11	12	9	18	20	31	10	13
14	5	14	39	30	51	33	13	10	9	8	14	19	12	19	21	37	38	36	11	31	13	46	46	42	25
15	28	62	27	24	9	12	7	7	33	33	17	20	18	21	13	11	10	9	8	7	34	43	12	7	20
16	5	7	11	12	10	11	15	14	44	15	14	12	15	15	10	12	10	9	7	18	54	21	49	36	18
17	28	7	10	16	8	7	6	39	32	44	25	16	19	16	18	19	13	9	7	7	17	10	10	9	16
18	11	24	15	10	12	14	11	8	44	22	13	13	9	11	19	20	42	23	32	11	40	13	8	10	18
19	11	6	11	10	21	38	37	37	27	12	12	20	21	16	15	12	11	8	5	36	14	34	21	20	19
20	9	10	8	9	9	6	15	12	11	16	21	33	32	44	44	31	27	17	9	5	40	9	11	11	18
21	13	18	21	33	39	16	16	15	14	14	17	14	16	19	16	15	34	22	11	12	36	15	40	52	22
22	35	35	32	23	11	13	43	14	9	35	12	31	27	21	12	13	17	10	10	11	14	21	9	11	20
23	8	9	9	22	13	25	28	13	11	19	26	39	28	47	53	40	37	26	11	4	42	12	12	7	23
24	13	13	11	7	12	16	8	13	23	13	17	16	20	18	14	20	17	10	13	14	5	5	13	32	14
25	10	8	7	7	11	9	11	17	8	17	20	33	51	20	17	18	16	12	6	9	9	32	27	25	17
26	10	8	4	5	6	6	6	8	7	14	18	16	33	36	43	58	16	8	6	5	42	40	26	11	18
27	8	7	22	14	19	12	11	7	9	11	8	20	31	13	10	13	16	10	11	41	25	11	7	6	14
28	9	8	10	19	7	7	6	6	12	48	22	62	45	26	18	14	16	11	6	5	8	36	14	14	18
HRAVE	14	15	17	19	19	14	14	15	18	21	17	23	23	23	22	20	19	14	12	15	23	21	19	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	23	18	26	18	17	20	16	14	15	19	19	11	13	25	20	18	16	18	19	18	22	20	23	14	17
MAX	62	42	63	50	42	56	44	21	30	61	37	21	31	51	62	54	44	44	38	44	52	43	53	32	51
MIN	6	5	8	7	7	5	6	7	5	7	6	5	5	5	7	5	6	8	5	5	11	9	4	5	6

DAY	26	27	28	29	30	31
AVE	18	14	18	***	***	***
MAX	58	41	62	***	***	***
MIN	4	6	5	***	***	***

MONTHLY AVERAGE = 18.1 MONTHLY MAXIMUM = 63.0 MONTHLY MINIMUM = 4.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
FEBRUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	12.3	13.3	11.3	10.3	10.2	9.1	9.9	9.4	9.2	10.5	12.2	14.1	17.0	18.6	19.4	20.0	19.7	18.9	17.7	16.6	15.5	13.9	12.9	12.0	13.9
2	11.3	10.9	10.4	9.8	9.1	8.1	8.3	8.7	9.6	11.4	13.1	15.4	17.1	18.9	19.5	20.4	19.6	19.2	18.6	17.3	16.0	15.7	15.3	15.6	14.1
3	15.1	15.1	15.2	14.1	14.7	13.7	12.1	11.6	12.1	11.8	12.0	12.2	12.4	13.0	14.0	14.2	13.2	13.8	13.5	13.4	13.0	12.7	12.6	12.1	13.2
4	12.4	11.9	11.6	11.6	11.5	11.1	10.8	10.8	10.9	11.5	12.6	13.1	13.8	15.5	14.3	13.2	13.4	13.3	13.3	13.1	12.4	12.2	11.6	11.2	12.4
5	11.3	11.1	10.5	9.9	10.1	10.2	10.2	10.0	10.1	10.4	11.4	12.6	14.0	14.7	15.3	15.0	14.4	13.9	13.4	13.2	12.4	12.3	12.4	11.0	12.1
6	11.1	10.2	10.0	9.4	7.9	6.6	6.2	5.4	4.8	5.6	7.2	7.8	8.9	9.2	9.4	9.7	9.2	8.1	6.9	6.0	5.4	4.7	5.0	4.6	7.5
7	4.0	3.5	2.2	1.6	1.1	0.2	-0.5	-0.5	1.1	3.8	5.6	8.0	8.9	9.7	10.4	11.0	11.1	10.8	9.9	9.3	8.2	8.3	7.9	6.6	5.9
8	5.4	4.5	3.7	2.0	1.9	1.6	1.3	1.7	3.7	8.7	11.2	12.7	14.1	15.5	16.4	17.2	17.4	16.5	15.8	15.2	14.5	12.1	10.4	9.5	9.7
9	8.2	6.8	6.7	6.2	5.6	5.0	5.0	5.1	6.6	9.9	12.3	13.5	14.9	15.0	15.2	14.9	15.4	14.5	11.9	10.4	10.5	9.4	9.0	8.3	10.0
10	6.8	5.4	4.6	4.3	4.0	3.2	2.6	2.1	3.1	4.7	8.1	10.4	12.4	14.9	16.7	17.2	17.1	15.8	13.9	12.4	11.3	10.2	9.8	8.8	9.2
11	7.5	6.9	5.5	5.1	4.9	5.2	5.5	5.1	6.2	7.2	8.3	9.4	10.4	11.0	11.6	12.0	11.7	10.9	9.6	8.8	7.7	6.5	5.7	4.7	7.8
12	3.3	3.0	2.5	2.8	0.8	0.6	1.0	0.8	2.4	5.8	10.4	13.1	14.8	15.9	16.7	17.6	18.0	17.5	16.8	16.4	15.2	13.2	11.9	11.3	9.7
13	10.3	9.1	8.1	8.3	8.6	8.5	7.7	6.3	6.9	7.8	10.2	13.4	16.9	17.7	17.5	17.3	17.0	16.0	15.3	14.3	13.1	12.5	11.8	11.2	11.9
14	11.2	11.3	10.6	10.5	10.6	10.3	10.1	10.3	11.2	12.7	13.8	13.6	13.6	12.5	10.5	10.1	10.1	10.0	9.6	10.0	10.4	10.6	10.9	11.0	11.1
15	12.7	14.1	14.8	15.1	14.4	14.1	13.7	12.6	12.5	13.0	14.1	14.8	14.9	15.6	17.1	17.5	16.9	16.2	15.3	14.5	14.3	13.9	13.5	12.6	14.5
16	12.1	11.9	11.6	11.0	10.3	9.9	9.5	9.3	9.7	10.5	11.3	12.0	12.3	12.5	12.3	13.1	12.7	12.0	10.9	9.9	9.5	8.8	8.3	7.6	10.8
17	6.7	6.1	5.2	4.8	3.7	3.1	2.7	2.5	4.1	6.0	8.3	10.0	10.7	10.9	11.3	11.6	11.2	10.6	9.8	9.4	8.5	7.6	7.1	6.3	7.4
18	6.5	6.5	6.6	6.2	5.9	5.3	5.0	4.7	4.9	6.3	6.3	6.0	4.6	4.9	5.4	6.5	6.3	6.4	5.2	5.1	5.2	5.1	4.6	4.1	5.6
19	3.9	3.4	3.2	3.0	2.5	2.1	1.7	1.5	2.3	4.1	4.9	5.9	6.8	8.4	8.8	8.9	8.8	7.5	6.8	6.3	5.0	5.3	5.1	3.4	5.0
20	2.6	1.7	0.9	0.9	-0.3	-1.0	-1.1	-1.3	0.7	3.1	5.8	8.5	9.7	10.7	10.9	11.9	11.7	11.1	9.5	8.0	7.3	6.7	6.4	6.2	5.4
21	6.1	6.0	5.1	5.3	5.7	4.9	5.8	6.1	6.2	7.7	8.3	9.3	10.5	10.0	10.8	10.7	8.7	6.9	5.2	4.7	4.6	5.1	4.7	5.5	6.8
22	5.2	6.3	5.8	4.6	2.8	2.5	2.3	1.4	0.3	0.1	0.8	1.7	3.2	4.1	4.8	5.5	5.5	4.0	3.8	2.7	2.0	1.9	1.8	1.9	3.1
23	1.9	2.0	2.1	1.0	1.3	1.1	0.4	0.6	1.9	3.8	5.7	7.2	8.2	8.7	9.9	10.1	10.5	10.3	9.2	7.9	6.8	6.1	5.9	5.1	5.3
24	4.0	3.8	3.3	4.4	4.1	0.7	0.3	0.9	3.2	7.6	9.7	12.0	13.6	14.7	15.6	16.4	16.5	16.2	15.3	12.9	11.2	10.6	10.6	8.3	9.0
25	7.2	6.2	6.4	5.2	4.1	3.9	3.4	3.1	5.2	8.2	10.6	13.2	15.4	17.0	17.7	18.0	18.3	17.3	15.6	13.7	13.4	12.8	11.1	10.4	10.7
26	8.3	7.4	6.7	6.4	5.9	4.9	4.8	5.1	7.1	10.4	13.3	16.5	18.9	20.3	21.4	21.7	21.5	19.4	18.3	17.3	16.7	15.8	14.8	13.7	13.2
27	13.2	13.3	12.7	11.6	11.3	10.4	10.2	10.1	11.8	13.2	15.3	17.4	18.7	19.5	19.8	21.0	21.0	20.3	18.9	17.2	15.8	13.9	12.1	10.7	15.0
28	9.9	9.0	8.8	7.7	6.8	5.9	5.6	6.8	9.2	10.7	14.5	16.8	19.2	21.3	22.2	22.3	22.1	21.4	19.8	18.2	16.9	16.0	13.9	13.0	14.1
HRAVE	8.2	7.9	7.4	6.9	6.4	5.8	5.5	5.4	6.3	8.1	9.9	11.5	12.7	13.6	14.1	14.5	14.2	13.5	12.5	11.6	10.8	10.1	9.5	8.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	13.9	14.1	13.2	12.4	12.1	7.5	5.9	9.7	10.0	9.2	7.8	9.7	11.9	11.1	14.5	10.8	7.4	5.6	5.0	5.4	6.8	3.1	5.3	9.0	10.7
MAX	20.0	20.4	15.2	15.5	15.3	11.1	11.1	17.4	15.4	17.2	12.0	18.0	17.7	13.8	17.5	13.1	11.6	6.6	8.9	11.9	10.8	6.3	10.5	16.5	18.3
MIN	9.1	8.1	11.6	10.8	9.9	4.6	-0.5	1.3	5.0	2.1	4.7	0.6	6.3	9.6	12.5	7.6	2.5	4.1	1.5	-1.3	4.6	0.1	0.4	0.3	3.1

DAY	26	27	28	29	30	31
AVE	13.2	15.0	14.1	***	***	***
MAX	21.7	21.0	22.3	***	***	***
MIN	4.8	10.1	5.6	***	***	***

MONTHLY AVERAGE = 9.8 MONTHLY MAXIMUM = 22.3 MONTHLY MINIMUM = -1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
FEBRUARY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.3	0.3	0.5	0.7	0.6	0.4	0.4	0.1	0.1	0.2	-0.3	-0.7	-0.9	-0.8	-0.4	-0.5	-0.4	0.2	0.6	0.9	0.6	0.5	0.7	0.7	0.2
2	0.5	0.6	0.6	0.4	0.4	0.3	0.3	0.2	0.2	-0.6	-0.6	-0.8	-0.8	-0.8	-0.5	-0.6	0.0	0.2	0.5	0.7	0.5	0.5	0.6	0.6	0.1
3	0.4	0.5	0.5	0.5	0.6	1.0	0.3	0.2	0.2	0.0	0.1	0.0	0.1	0.0	-0.1	-0.1	0.0	0.3	0.3	0.3	0.2	0.2	0.2	0.0	0.2
4	0.2	0.1	0.0	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.5	-0.3	-0.3	-0.3	-0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.0
5	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.2	0.1	-0.1	-0.3	-0.4	-0.3	-0.2	-0.2	-0.1	0.0	0.1	0.2	0.3	0.3	0.4	0.2	0.6	0.1
6	0.4	0.3	0.3	0.1	0.0	0.0	0.1	0.0	0.0	-0.2	-0.6	-0.4	-0.5	-0.6	-0.5	-0.6	-0.3	0.1	0.2	0.4	0.4	0.4	0.3	0.4	0.0
7	0.7	0.5	0.4	0.6	0.6	0.5	0.5	0.2	-0.7	-1.0	-1.0	-0.9	-0.8	-0.6	-0.4	-0.2	0.1	0.4	0.6	0.4	0.6	0.4	0.4	0.5	0.1
8	0.6	0.4	0.5	0.6	0.6	0.6	1.2	1.2	-0.1	-0.6	-0.7	-0.6	-0.6	-0.5	-0.3	-0.1	0.2	0.5	0.6	0.6	0.4	0.7	0.7	0.7	0.3
9	0.7	1.0	0.9	1.0	1.2	1.0	1.1	0.9	0.3	-0.6	-0.7	-0.8	-0.5	-0.3	-0.1	0.0	0.2	0.3	0.2	0.2	0.4	0.4	0.6	0.7	0.3
10	0.6	0.5	0.4	0.6	0.6	0.5	0.4	0.3	0.1	-0.6	-0.9	-0.8	-0.6	-0.6	-0.6	-0.6	-0.4	0.1	0.6	0.8	0.7	0.7	0.6	0.4	0.1
11	0.5	0.6	0.6	0.7	0.8	0.6	0.2	0.3	-0.2	-0.3	-0.6	-0.8	-0.9	-0.9	-0.8	-0.8	-0.6	-0.1	0.3	0.6	0.5	0.7	0.4	0.6	0.1
12	0.5	0.5	0.3	0.5	0.6	0.6	0.4	0.3	-0.5	-1.1	-1.0	-1.1	-0.8	-0.5	-0.3	-0.2	0.1	0.4	0.4	0.3	0.4	0.7	0.9	0.6	0.1
13	0.5	1.0	1.0	0.8	0.4	0.4	0.7	0.8	0.2	0.0	-0.8	-0.9	-1.1	-0.6	-0.4	-0.2	-0.1	0.1	0.4	0.5	0.4	0.5	0.2	0.3	0.2
14	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.1	-0.1	-0.2	-0.2	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1
15	0.7	0.6	0.5	0.4	0.3	0.4	0.2	0.1	0.0	-0.2	-0.5	-0.4	-0.5	-0.5	-0.6	-0.4	-0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.2	0.1
16	0.3	0.3	0.4	0.2	0.2	0.2	0.3	0.4	0.1	-0.1	-0.3	-0.6	-0.6	-0.6	-0.4	-0.6	-0.3	0.0	0.2	0.4	0.4	0.5	0.4	0.5	0.1
17	0.4	0.4	0.5	0.6	0.6	0.8	0.7	0.3	-0.5	-0.5	-0.4	-0.6	-0.6	-0.5	-0.5	-0.4	-0.2	0.1	0.3	0.4	0.4	0.3	0.3	0.4	0.1
18	0.5	0.5	0.3	0.2	0.4	0.3	0.2	-0.2	-0.1	-0.3	-0.5	-0.5	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.0
19	0.3	0.3	0.3	0.3	0.3	0.2	0.5	0.3	-0.1	-0.3	-0.5	-0.5	-0.6	-0.7	-0.8	-0.7	-0.6	0.0	0.3	0.4	0.4	0.4	0.6	0.4	0.0
20	0.5	0.4	0.3	0.4	0.5	0.6	0.5	0.0	-0.9	-1.0	-1.0	-1.3	-1.2	-1.2	-0.7	-0.7	-0.5	0.0	0.4	0.6	0.6	0.3	0.5	0.3	-0.1
21	0.3	0.3	0.4	0.5	0.7	0.3	0.2	0.2	0.1	0.1	0.0	-0.1	-0.3	-0.4	-0.3	-0.3	-0.1	0.1	0.0	-0.1	0.0	0.2	0.0	0.3	0.1
22	0.2	0.3	0.2	0.1	0.0	-0.1	0.0	-0.1	-0.1	0.0	-0.3	-0.5	-0.3	-0.4	-0.5	-0.4	-0.3	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.1
23	0.2	0.2	0.2	0.3	0.5	0.4	0.4	0.1	-0.6	-0.9	-0.8	-0.7	-0.8	-0.6	-0.7	-0.7	-0.6	-0.2	0.2	0.6	0.3	0.5	0.5	0.4	-0.1
24	0.6	0.6	0.6	0.4	0.4	0.8	0.5	0.3	0.2	-0.4	-0.5	-0.6	-0.6	-0.5	-0.4	-0.3	0.0	0.3	0.5	0.4	0.4	0.5	0.4	0.4	0.2
25	0.3	0.7	0.7	0.5	0.6	0.6	0.5	-0.1	-0.9	-1.2	-1.0	-0.7	-0.5	-0.7	-0.6	-0.4	-0.4	0.1	0.5	0.4	0.5	0.5	0.5	0.5	0.0
26	0.6	0.8	1.0	0.9	0.7	0.9	0.9	0.2	-1.0	-1.4	-1.4	-1.4	-1.0	-0.8	-0.6	-0.4	-0.1	0.2	0.5	0.8	0.5	0.4	0.4	0.5	0.1
27	0.6	0.7	0.5	0.4	0.4	0.5	0.5	0.4	-0.3	-0.6	-0.9	-0.8	-0.6	-0.5	-0.5	-0.6	-0.4	0.0	0.5	0.7	0.5	0.7	0.8	0.9	0.1
28	0.7	0.8	0.8	0.6	0.6	0.5	0.6	0.1	-1.1	-0.5	-1.2	-0.8	-0.6	-0.7	-0.7	-0.6	-0.5	-0.2	0.6	0.8	0.4	0.5	0.5	0.5	0.0
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.2	-0.2	-0.4	-0.6	-0.7	-0.6	-0.5	-0.4	-0.4	-0.2	0.1	0.3	0.4	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.2	0.1	0.2	0.0	0.1	0.0	0.1	0.3	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	-0.1	0.1	-0.1	-0.1	0.2	0.0
MAX	0.9	0.7	1.0	0.2	0.6	0.4	0.7	1.2	1.2	0.8	0.8	0.9	1.0	0.5	0.7	0.5	0.8	0.5	0.6	0.6	0.7	0.3	0.6	0.8	0.7
MIN	-0.9	-0.8	-0.1	-0.5	-0.4	-0.6	-1.0	-0.7	-0.8	-0.9	-0.9	-1.1	-1.1	-0.2	-0.6	-0.6	-0.6	-0.5	-0.8	-1.3	-0.4	-0.5	-0.9	-0.6	-1.2

DAY	26	27	28	29	30	31
AVE	0.1	0.1	0.0	***	***	***
MAX	1.0	0.9	0.8	***	***	***
MIN	-1.4	-0.9	-1.2	***	***	***

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = -1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
FEBRUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	701	701	701	701	701	702	702	703	703	703	703	703	702	701	701	701	701	701	701	701	702	702	702	702	702
2	702	702	702	703	702	702	702	703	703	704	704	703	702	701	701	700	700	700	700	699	700	700	700	700	701
3	700	700	700	699	699	699	699	700	700	700	700	700	700	699	699	698	699	699	699	699	699	699	699	700	699
4	699	699	699	699	699	699	699	699	699	700	700	699	699	698	698	698	698	698	698	699	699	699	699	700	699
5	700	700	700	700	699	699	699	699	700	700	700	700	700	699	698	698	698	698	698	698	698	698	699	699	699
6	699	698	698	698	698	698	699	699	700	701	701	701	701	701	701	700	701	701	702	702	703	704	704	705	700
7	705	706	706	706	707	707	707	708	708	709	709	708	708	707	706	706	706	705	705	706	706	706	706	706	707
8	706	705	705	705	705	705	705	705	705	706	705	705	704	703	702	702	702	702	702	702	702	702	702	702	704
9	702	702	702	701	701	701	701	701	702	702	702	702	701	700	700	700	700	701	701	702	702	702	702	702	701
10	702	701	701	701	701	701	701	701	702	702	702	702	701	700	700	699	699	699	699	699	699	700	700	700	700
11	700	700	700	700	700	700	701	701	703	703	704	704	704	704	704	704	704	704	705	705	705	705	706	706	703
12	707	707	707	706	706	706	707	707	707	708	707	707	706	705	704	704	704	704	704	704	704	704	704	704	705
13	704	703	703	703	703	703	703	703	703	703	703	703	702	701	701	701	701	701	701	701	701	702	703	703	702
14	703	703	703	702	702	702	702	702	702	702	702	703	702	701	701	700	700	700	700	700	700	700	700	700	701
15	700	700	700	700	700	700	700	701	702	702	703	702	702	702	701	701	701	701	701	701	701	701	701	700	701
16	700	700	700	700	700	700	701	701	701	702	702	701	701	700	700	699	699	699	699	700	700	700	701	700	700
17	701	701	700	700	700	700	700	701	702	702	702	702	701	701	700	700	700	700	700	700	701	701	701	701	701
18	701	701	700	700	700	700	700	700	701	701	701	701	701	701	700	700	700	699	699	700	700	700	700	700	700
19	700	699	699	699	699	699	699	700	700	701	701	702	701	701	701	701	701	701	701	701	702	702	703	703	701
20	702	702	702	702	701	701	702	702	702	702	702	701	700	699	698	697	697	696	696	696	696	696	696	696	699
21	695	695	695	695	695	695	695	694	695	695	695	694	694	694	693	693	693	693	694	694	695	695	695	695	694
22	695	694	695	695	695	695	696	696	697	698	698	698	698	698	698	698	699	699	700	701	702	702	703	704	704	698
23	704	705	705	706	706	706	707	708	708	709	709	709	709	708	708	708	707	707	707	707	707	707	707	707	707
24	707	707	706	706	705	706	706	705	706	706	705	705	704	703	702	702	702	702	701	702	702	702	702	703	704
25	703	703	703	702	703	703	703	704	704	704	704	704	703	703	702	702	702	702	702	703	703	703	704	704	703
26	704	704	704	704	704	704	705	705	706	706	705	705	704	703	703	703	703	703	703	703	703	703	704	704	704
27	704	704	704	704	704	704	704	704	705	705	705	705	704	704	703	703	703	703	703	703	703	704	704	704	704
28	703	703	704	704	704	704	704	704	705	705	704	704	703	703	702	702	702	701	701	702	702	703	703	703	703
HRAVE	702	702	702	701	701	701	702	702	703	703	703	703	702	701	701	701	701	701	701	701	701	702	702	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	702	701	699	699	699	700	707	704	701	700	703	705	702	701	701	700	701	700	701	699	694	698	707	704	703
MAX	703	704	700	700	700	705	709	706	702	702	706	708	704	703	703	702	702	701	703	702	695	704	709	707	704
MIN	701	699	698	698	698	698	705	702	700	699	700	704	701	700	700	699	700	699	699	696	693	694	704	701	702

DAY	26	27	28	29	30	31
AVE	704	704	703	***	***	***
MAX	706	705	705	***	***	***
MIN	703	703	701	***	***	***

MONTHLY AVERAGE = 701.6 MONTHLY MAXIMUM = 709.0 MONTHLY MINIMUM = 692.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
FEBRUARY - 2019

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	58	53	67	88	89	97	100	100	100	100	93	82	68	54	49	49	52	55	60	64	73	80	86	90	75
2	91	92	95	93	97	99	98	98	93	84	76	66	58	53	49	41	42	45	48	55	63	64	67	65	72
3	66	65	65	73	71	77	92	99	100	100	100	100	100	100	97	92	99	99	100	100	100	100	100	100	91
4	100	100	100	100	100	100	100	100	100	100	99	96	97	89	94	99	93	89	87	79	81	79	83	85	94
5	83	81	85	89	88	86	87	89	89	88	82	78	73	70	63	64	67	69	69	70	77	77	75	88	79
6	89	91	92	95	98	97	96	96	99	93	82	71	56	56	51	51	51	52	54	58	61	65	62	63	74
7	65	58	68	76	80	88	92	93	84	67	57	49	37	36	36	36	34	33	36	39	46	42	42	48	56
8	56	60	65	78	78	79	80	76	67	43	36	33	31	29	28	27	28	30	31	30	30	39	47	51	48
9	56	64	62	63	64	66	66	64	58	50	43	43	40	42	43	48	39	41	48	44	43	48	50	54	52
10	64	75	79	78	80	83	87	89	83	72	59	52	43	36	33	31	31	35	40	45	50	52	50	53	58
11	57	58	66	65	65	67	70	75	71	61	54	51	46	42	37	34	35	36	40	42	46	55	62	69	54
12	72	73	72	72	84	84	77	80	69	55	38	32	29	27	25	24	23	24	23	22	26	31	34	35	47
13	38	44	48	46	44	44	46	52	51	52	45	37	27	27	29	31	33	35	37	39	43	47	50	53	41
14	53	53	61	61	60	64	64	63	58	53	49	57	60	71	93	95	97	100	100	100	100	100	100	100	76
15	100	100	100	96	99	100	100	100	100	100	93	85	85	83	76	73	75	79	82	87	89	91	92	88	91
16	85	81	77	71	71	76	77	76	76	71	68	66	65	63	61	56	52	54	57	58	60	64	63	63	67
17	65	65	71	74	81	86	88	90	82	74	64	57	53	51	48	46	44	47	52	55	60	67	70	73	65
18	70	69	66	67	66	68	68	69	70	71	79	86	95	94	89	83	88	88	95	98	99	100	99	100	82
19	100	100	100	100	100	100	100	100	99	86	79	73	68	54	52	50	49	53	57	59	65	60	55	63	76
20	68	73	78	77	85	91	90	94	81	67	54	43	37	34	33	32	32	35	39	47	51	57	56	59	59
21	59	58	67	69	67	67	59	61	56	56	58	52	57	67	63	68	82	95	99	100	100	100	100	100	73
22	100	100	100	99	100	100	100	100	100	100	100	100	100	100	96	89	86	94	95	100	100	100	100	100	98
23	100	100	100	100	100	100	100	100	100	91	77	64	64	58	54	53	51	53	59	64	71	75	74	78	79
24	83	83	83	76	76	92	94	91	81	63	56	50	45	43	42	41	41	42	46	60	69	70	67	78	66
25	86	93	93	95	99	98	100	100	89	77	65	54	50	47	44	41	38	42	49	58	59	60	70	74	70
26	80	80	78	75	75	78	79	78	68	60	52	46	39	34	31	29	31	41	44	48	51	56	62	67	58
27	70	71	74	81	82	84	84	84	74	67	58	49	44	45	46	40	37	35	38	45	52	59	65	71	60
28	74	79	80	86	88	91	92	86	74	67	52	48	39	34	35	35	36	37	43	48	53	59	68	71	61
HRAVE	75	76	78	80	82	84	85	86	81	74	67	61	57	55	53	52	52	55	58	61	65	68	70	73	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	75	72	91	94	79	74	56	48	52	58	54	47	41	76	91	67	65	82	76	59	73	98	79	66	70
MAX	100	99	100	100	89	99	93	80	66	89	75	84	53	100	100	85	90	100	100	94	100	100	100	94	100
MIN	49	41	65	79	63	51	33	27	39	31	34	22	27	49	73	52	44	66	49	32	52	86	51	41	38

DAY	26	27	28	29	30	31
AVE	58	60	61	***	***	***
MAX	80	84	92	***	***	***
MIN	29	35	34	***	***	***

MONTHLY AVERAGE = 68.7 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 22.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
FEBRUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.32	0.48	0.69	0.68	0.60	0.45	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	3.64
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.24	0.32	0.43	0.62	0.58	0.44	0.33	0.14	0.04	0.00	0.00	0.00	0.00	0.00	0.00	3.24
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.07	0.08	0.06	0.07	0.16	0.08	0.07	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.66
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.13	0.28	0.21	0.28	0.28	0.13	0.12	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.58
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.11	0.23	0.30	0.24	0.22	0.25	0.19	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	1.77
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.25	0.32	0.71	0.63	0.59	0.50	0.26	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.50
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.42	0.59	0.70	0.76	0.74	0.65	0.51	0.32	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.41	0.58	0.71	0.76	0.74	0.66	0.51	0.32	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.18	0.36	0.34	0.41	0.27	0.27	0.16	0.14	0.08	0.05	0.00	0.00	0.00	0.00	0.00	0.00	2.30
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.33	0.42	0.53	0.74	0.74	0.64	0.51	0.31	0.08	0.00	0.00	0.00	0.00	0.00	0.00	4.43
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.23	0.43	0.60	0.72	0.77	0.75	0.66	0.52	0.32	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.10
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.43	0.60	0.71	0.77	0.77	0.68	0.51	0.28	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.09
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.20	0.35	0.51	0.61	0.37	0.34	0.23	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	2.85
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.18	0.12	0.14	0.19	0.07	0.09	0.06	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.98
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.17	0.33	0.30	0.28	0.26	0.52	0.32	0.15	0.06	0.00	0.00	0.00	0.00	0.00	0.00	2.46
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.11	0.39	0.67	0.58	0.62	0.35	0.50	0.24	0.07	0.00	0.00	0.00	0.00	0.00	0.00	3.65
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.42	0.46	0.57	0.52	0.39	0.45	0.32	0.18	0.04	0.00	0.00	0.00	0.00	0.00	0.00	3.62
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.26	0.23	0.32	0.19	0.19	0.15	0.14	0.12	0.07	0.00	0.00	0.00	0.00	0.00	1.78
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.24	0.32	0.31	0.33	0.48	0.71	0.73	0.50	0.35	0.04	0.00	0.00	0.00	0.00	0.00	4.03
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27	0.47	0.64	0.76	0.81	0.79	0.70	0.55	0.36	0.10	0.00	0.00	0.00	0.00	0.00	0.00	5.51
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.05	0.09	0.14	0.22	0.22	0.21	0.22	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.28
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.05	0.09	0.23	0.24	0.20	0.26	0.20	0.13	0.06	0.00	0.00	0.00	0.00	0.00	0.00	1.49
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.47	0.65	0.78	0.85	0.69	0.73	0.56	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	5.60
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.22	0.41	0.62	0.78	0.80	0.76	0.70	0.57	0.30	0.15	0.00	0.00	0.00	0.00	0.00	0.00	5.38
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.47	0.62	0.71	0.81	0.77	0.57	0.43	0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00	5.20
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.49	0.67	0.79	0.84	0.82	0.65	0.44	0.19	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.33
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.26	0.43	0.46	0.43	0.39	0.45	0.48	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	3.66
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.50	0.67	0.79	0.84	0.82	0.71	0.59	0.38	0.15	0.01	0.00	0.00	0.00	0.00	0.00	5.81
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.29	0.40	0.50	0.55	0.52	0.47	0.37	0.22	0.07	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.64	3.24	0.66	1.58	1.77	3.50	5.00	5.00	2.30	4.43	5.10	5.09	2.85	0.98	2.46	3.65	3.62	1.78	4.03	5.51	1.28	1.49	5.60	5.38	5.20
MAX	0.69	0.62	0.16	0.28	0.30	0.71	0.76	0.76	0.41	0.74	0.77	0.77	0.61	0.19	0.52	0.67	0.57	0.32	0.73	0.81	0.22	0.26	0.85	0.80	0.81
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.33	3.66	5.81	***	***	***
MAX	0.84	0.48	0.84	***	***	***
MIN	0.00	0.00	0.00	***	***	***

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
FEBRUARY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.02	0.06	0.02	0.06	0.06	0.03	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.07	0.16	0.06	0.03	0.01	0.02	0.00	0.00	0.03	0.01	0.00	0.00	0.04	0.07	0.01	0.00	0.58
4	0.01	0.04	0.01	0.08	0.05	0.05	0.02	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04
6	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.01	0.03	0.09	0.10	0.08	0.24	0.33	0.10	0.05	1.07
15	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.08
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.06	0.04	0.03	0.03	0.01	0.06	0.26
22	0.02	0.00	0.08	0.01	0.03	0.05	0.06	0.06	0.02	0.04	0.07	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.08	0.02	0.00	0.01	0.00	0.57
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.00	0.01	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.40	0.00	0.58	0.41	0.04	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07	0.06	0.00	0.00	0.08	0.00	0.00	0.26	0.57	0.00	0.00	0.00
MAX	0.14	0.00	0.16	0.08	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.05	0.00	0.00	0.02	0.00	0.00	0.06	0.08	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	***	***	***
MAX	0.00	0.00	0.00	***	***	***
MIN	0.00	0.00	0.00	***	***	***

MONTHLY TOTAL = 3.55 MONTHLY MAXIMUM = 0.33 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 672 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
MARCH - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	8.4	8.6	6.5	7.9	3.8	6.1	7.3	4.5	3.5	4.6	4.8	1.5	3.8	3.7	9.1	12.3	10.9	9.7	7.0	6.2	4.8	4.8	7.1	7.3	6.4
2	6.5	7.2	7.1	4.2	4.0	7.2	5.3	2.8	1.5	1.8	2.1	3.2	2.7	10.8	24.1	16.9	10.0	8.0	5.6	3.2	2.1	3.5	4.6	3.3	6.2
3	3.6	2.8	2.0	3.3	3.9	2.8	0.9	2.5	3.4	4.1	2.9	4.7	8.6	11.2	11.8	15.4	15.5	14.9	14.7	7.7	8.4	6.5	4.7	6.3	6.8
4	7.3	7.1	6.0	6.2	5.1	6.6	6.5	4.2	4.1	4.1	3.1	2.7	4.0	4.8	10.4	14.2	14.1	13.9	9.9	6.8	2.4	3.2	6.9	8.2	6.7
5	6.4	7.0	7.6	8.6	7.9	7.8	10.0	9.6	9.1	9.8	9.9	7.3	3.4	3.2	3.9	10.5	13.2	11.6	8.9	9.7	2.8	3.1	4.9	8.5	7.7
6	9.2	7.8	6.2	2.2	3.8	8.9	9.8	9.2	8.5	7.3	3.8	3.6	3.7	5.6	11.4	18.9	13.1	11.5	8.8	5.8	3.5	5.0	4.9	4.3	7.4
7	2.0	2.6	4.0	5.2	2.4	4.5	7.5	3.5	1.7	1.5	2.9	4.0	1.7	5.9	10.9	11.3	9.6	6.1	4.1	3.7	4.2	7.4	6.6	6.0	5.0
8	3.7	2.9	3.6	3.5	1.6	4.9	3.1	2.0	3.4	2.9	3.2	15.8	17.5	15.2	26.2	20.5	18.9	19.2	14.6	16.4	13.9	9.1	8.9	8.9	10.0
9	5.2	6.1	6.1	7.7	8.6	8.1	5.3	5.0	6.6	5.1	3.4	4.6	3.8	4.7	3.8	7.2	11.1	11.4	8.3	5.9	7.7	3.6	3.6	4.5	6.1
10	5.6	6.9	7.0	8.3	5.9	9.2	8.0	10.2	4.7	7.3	7.1	6.7	8.9	5.6	15.1	13.3	11.9	14.1	12.5	9.4	4.2	2.9	2.4	3.9	8.0
11	6.3	9.5	9.4	9.2	2.8	3.3	10.0	11.4	7.9	8.4	8.2	11.8	16.4	17.6	18.5	22.6	31.3	24.9	23.1	18.4	17.8	13.9	9.5	8.6	13.4
12	5.7	6.4	8.8	7.7	8.6	4.2	8.9	6.5	7.1	14.4	9.4	5.4	7.2	16.0	10.0	4.8	12.0	12.6	11.0	4.0	8.0	5.2	4.8	3.6	8.0
13	10.7	12.3	10.5	20.3	20.8	22.0	22.2	21.0	24.6	24.1	19.2	20.5	21.1	25.8	24.8	25.4	27.4	26.6	18.9	13.4	11.0	5.4	8.6	6.4	18.5
14	4.9	5.0	5.6	7.1	7.0	6.2	6.7	4.8	3.7	4.2	3.4	3.5	6.1	6.2	5.7	5.5	3.8	4.9	8.4	9.3	9.1	2.6	6.4	9.4	5.8
15	11.9	11.9	8.7	9.2	9.9	12.7	17.1	20.8	19.0	20.0	23.2	26.7	27.1	24.0	23.6	26.2	23.0	20.2	22.9	22.5	21.4	18.3	19.9	20.1	19.2
16	21.1	23.2	24.6	23.2	16.5	18.2	22.7	25.0	23.8	24.5	24.0	23.1	23.9	24.9	25.2	24.4	23.8	22.1	21.7	24.5	24.9	24.3	25.1	26.4	23.4
17	23.0	21.3	20.2	21.1	20.1	22.3	20.6	22.1	20.2	19.7	18.2	18.9	19.8	18.7	18.7	14.7	13.6	11.1	13.1	15.0	15.1	12.0	13.8	13.9	17.8
18	13.1	11.4	8.3	8.4	10.3	10.2	8.6	8.3	12.4	14.9	12.2	11.9	10.7	6.0	5.3	7.2	10.1	10.5	12.0	11.3	10.1	11.2	10.3	11.1	10.2
19	11.0	10.1	9.9	10.2	14.3	15.9	16.7	18.3	17.7	15.5	12.9	10.0	8.0	8.6	5.7	6.2	6.3	5.2	8.8	9.1	7.7	7.3	8.2	6.1	10.4
20	5.5	6.7	7.3	8.7	5.9	7.2	7.5	7.1	7.5	4.8	3.6	2.9	6.2	5.6	9.4	5.2	4.7	6.4	6.8	12.5	13.6	15.0	17.7	11.9	7.9
21	10.1	6.1	5.2	5.8	2.6	3.8	11.3	11.1	8.9	7.3	7.5	10.5	11.1	11.3	12.9	13.6	12.8	11.8	8.5	6.2	6.9	6.6	5.6	7.7	8.6
22	6.4	6.9	5.0	3.3	4.8	4.0	6.1	5.0	4.1	2.7	2.2	4.1	6.1	11.6	12.0	12.1	13.4	13.2	11.5	7.9	8.6	4.2	4.9	6.4	6.9
23	7.7	8.5	6.9	3.0	5.8	7.9	8.5	8.1	3.5	1.9	3.6	4.9	4.4	3.3	5.5	12.2	16.0	16.2	12.5	5.8	2.7	3.8	6.3	6.4	6.9
24	7.5	7.7	6.8	9.0	6.0	4.3	5.4	4.5	5.8	4.1	3.6	2.5	5.0	8.9	10.9	11.5	12.9	11.1	9.9	10.0	9.5	2.2	6.7	2.4	7.0
25	4.7	6.2	8.1	7.8	8.1	8.6	9.3	8.1	8.2	7.4	6.5	5.4	5.9	5.6	5.7	6.4	7.4	8.7	9.7	10.1	11.9	7.5	2.6	5.9	7.3
26	7.6	9.3	8.1	7.4	7.2	6.1	6.3	7.1	7.7	7.5	5.2	3.1	3.0	2.8	3.6	6.5	13.8	15.9	16.0	14.0	7.5	2.7	5.2	4.8	7.4
27	6.8	6.7	5.2	5.9	6.8	5.9	6.5	6.8	6.3	5.4	4.0	4.0	2.4	2.8	6.4	10.3	13.8	13.2	9.1	8.6	5.1	3.8	4.9	6.5	6.6
28	4.0	6.2	5.2	6.2	7.7	9.8	7.6	8.9	6.8	1.6	2.3	5.7	8.0	12.5	14.9	14.1	15.8	15.9	14.6	9.6	7.8	8.7	7.0	2.5	8.5
29	5.3	5.1	3.9	4.1	3.2	6.1	8.6	3.8	3.1	3.0	4.5	8.3	11.8	14.2	14.7	14.0	13.9	14.8	11.2	5.6	6.2	3.1	5.4	5.4	7.5
30	7.2	7.4	7.3	2.4	5.3	5.7	5.0	5.3	2.0	1.8	10.5	12.7	10.6	6.2	7.8	7.2	8.0	8.2	10.1	11.9	13.3	11.3	6.1	4.8	7.4
31	7.3	9.5	9.4	14.5	11.9	12.4	20.7	21.4	24.6	20.5	17.6	11.8	8.3	4.8	8.0	8.2	8.6	10.7	8.5	8.1	10.1	8.4	9.8	12.2	12.0
HRAVE	7.9	8.3	7.8	8.1	7.5	8.5	9.7	9.3	8.8	8.5	7.9	8.4	9.1	9.9	12.1	12.9	13.6	13.1	11.7	10.1	9.1	7.3	7.8	7.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.4	6.2	6.8	6.7	7.7	7.4	5.0	10.0	6.1	8.0	13.4	8.0	18.5	5.8	19.2	23.4	17.8	10.2	10.4	7.9	8.6	6.9	6.9	7.0	7.3
MAX	12.3	24.1	15.5	14.2	13.2	18.9	11.3	26.2	11.4	15.1	31.3	16.0	27.4	9.4	27.1	26.4	23.0	14.9	18.3	17.7	13.6	13.4	16.2	12.9	11.9
MIN	1.5	1.5	0.9	2.4	2.8	2.2	1.5	1.6	3.4	2.4	2.8	3.6	5.4	2.6	8.7	16.5	11.1	5.3	5.2	2.9	2.6	2.2	1.9	2.2	2.6

DAY	26	27	28	29	30	31
AVE	7.4	6.6	8.5	7.5	7.4	12.0
MAX	16.0	13.8	15.9	14.8	13.3	24.6
MIN	2.7	2.4	1.6	3.0	1.8	4.8

MONTHLY AVERAGE = 9.4 MONTHLY MAXIMUM = 31.3 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MARCH - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	95	95	96	88	100	111	103	118	111	127	155	150	293	267	290	297	284	277	293	292	294	118	108	94	186
2	95	93	108	112	123	112	113	95	77	159	271	230	210	276	287	298	299	275	245	242	229	133	138	153	140
3	90	98	112	330	325	153	196	89	88	133	83	270	276	275	259	277	275	289	300	292	301	304	165	124	224
4	113	112	114	111	110	85	92	104	121	114	139	161	290	265	292	298	293	301	299	271	258	94	106	82	186
5	106	97	98	91	106	107	96	94	110	148	125	79	89	108	263	281	286	294	299	293	292	136	89	112	65
6	92	88	82	25	96	102	98	93	110	108	164	125	58	295	300	271	268	294	303	272	114	174	159	208	224
7	171	141	106	96	334	87	114	78	328	253	156	139	235	290	271	275	293	298	280	305	133	298	297	290	267
8	199	275	290	96	83	126	114	123	307	174	270	295	307	292	280	272	268	265	278	280	290	305	320	309	265
9	269	150	131	112	100	106	138	119	103	118	175	253	255	265	281	289	295	312	307	304	303	323	109	101	150
10	107	94	102	96	109	95	94	93	99	101	90	109	116	163	199	231	250	279	301	286	213	266	182	270	169
11	302	310	290	297	264	56	87	94	122	87	141	107	130	147	152	281	298	293	291	295	296	300	309	305	188
12	290	305	308	309	303	244	283	271	145	64	93	214	154	215	279	271	226	243	272	257	252	276	247	238	212
13	219	221	214	220	221	225	224	225	223	231	243	262	268	272	264	268	279	283	286	278	293	328	319	280	43
14	291	283	105	89	83	84	83	85	119	120	143	253	340	278	242	255	351	347	323	305	290	278	55	51	252
15	52	81	93	93	87	80	73	68	69	72	77	73	74	84	71	85	86	77	66	68	74	82	74	73	80
16	74	73	64	63	82	90	93	89	97	102	104	97	96	95	102	78	75	83	75	68	67	68	73	75	231
17	71	61	55	53	61	53	60	61	54	52	73	67	73	71	67	64	69	51	34	41	46	52	54	58	356
18	70	86	109	100	94	94	102	106	79	67	72	70	74	56	229	70	47	61	29	40	57	59	69	79	66
19	73	82	90	86	78	63	62	52	57	59	69	69	62	63	49	76	30	46	12	38	33	73	52	92	168
20	96	103	92	87	102	90	90	95	110	122	92	150	59	88	127	114	83	45	308	314	286	286	293	283	281
21	244	213	260	257	187	200	293	285	294	347	316	274	249	261	275	296	300	304	313	315	69	176	307	309	120
22	313	293	274	141	116	116	103	114	111	147	241	252	290	286	295	281	282	281	280	294	295	254	130	106	39
23	98	92	82	293	119	115	98	124	138	251	124	118	168	284	271	290	298	288	306	291	228	142	109	104	51
24	102	91	100	94	112	105	97	105	107	141	134	189	260	287	318	306	305	290	285	308	300	342	90	55	6
25	100	103	110	103	104	100	98	105	112	142	155	136	79	76	79	69	44	49	28	345	307	300	11	107	78
26	92	93	102	110	104	104	101	118	105	136	139	131	70	152	264	290	305	297	293	305	294	209	118	111	78
27	83	93	83	83	101	105	98	95	89	95	88	99	100	193	267	282	281	297	306	297	301	116	109	94	189
28	86	97	110	79	87	80	88	91	111	23	127	279	294	285	272	268	285	291	299	297	301	303	304	228	353
29	145	120	116	117	125	110	94	90	92	279	295	298	298	294	295	276	290	300	301	291	302	312	314	104	134
30	98	101	82	98	123	126	118	124	138	210	89	49	24	3	290	278	273	277	293	302	301	301	233	109	213
31	80	92	96	69	86	81	69	73	74	82	86	82	26	298	326	305	307	267	268	305	306	31	60	50	94

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MARCH - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	6	6	12	7	14	8	9	19	19	11	18	51	24	30	18	14	13	7	6	11	22	17	9	11	15
2	11	6	7	14	14	9	14	46	36	50	37	34	48	21	11	12	13	10	21	13	23	44	15	37	23
3	31	56	60	39	24	49	42	19	11	19	48	34	23	21	23	14	12	10	8	8	6	9	18	9	25
4	9	10	10	15	10	10	8	13	13	18	31	39	49	35	26	15	14	12	9	12	48	46	14	12	20
5	17	7	10	6	8	8	6	7	8	10	18	15	35	45	37	14	11	11	8	8	43	37	21	12	17
6	6	12	15	18	16	8	8	8	13	17	39	48	45	28	16	12	16	10	12	13	46	38	15	18	20
7	34	26	12	15	26	25	9	24	30	29	27	34	49	21	16	13	11	11	8	13	31	17	37	19	22
8	21	16	40	29	51	9	37	22	40	49	28	13	11	16	9	14	12	12	10	7	8	9	13	11	20
9	34	22	10	9	7	9	12	14	13	22	29	29	55	36	53	20	14	14	10	9	4	32	9	14	20
10	12	8	9	6	10	7	6	9	16	14	17	20	22	54	23	28	21	14	8	5	40	30	35	18	18
11	14	11	10	9	45	50	47	26	30	17	19	18	20	17	14	19	9	9	9	10	9	10	10	9	18
12	15	17	13	17	20	24	9	15	40	13	23	26	18	15	22	26	14	12	11	30	12	20	18	32	19
13	19	15	16	14	13	12	11	12	12	10	14	12	13	11	12	12	11	10	9	5	7	17	11	12	12
14	18	38	9	7	12	15	13	15	28	21	32	43	37	49	43	47	62	32	19	9	8	36	24	22	27
15	14	11	11	13	13	9	8	7	11	9	11	11	9	14	9	12	12	10	8	7	9	11	9	9	10
16	9	9	11	13	8	9	9	9	9	10	11	12	11	10	10	12	11	12	10	9	8	8	10	9	10
17	8	12	14	12	13	12	13	13	15	13	12	11	11	11	9	14	10	15	13	11	9	11	10	11	12
18	11	14	11	16	14	14	17	19	14	12	15	15	17	63	43	40	19	18	13	12	13	13	14	10	19
19	9	13	14	13	8	9	11	12	14	15	16	21	32	25	58	35	37	41	10	14	14	31	24	18	21
20	24	18	9	6	13	8	6	10	12	20	35	31	21	50	24	18	23	28	28	13	10	8	9	11	18
21	11	16	26	23	38	41	8	10	16	21	26	20	22	20	14	13	17	10	10	17	31	31	12	7	19
22	12	7	19	10	10	10	8	11	19	36	45	39	54	20	22	19	13	12	8	5	9	21	10	9	18
23	12	8	26	33	11	9	8	10	32	40	32	41	39	42	40	33	15	12	9	12	14	7	6	8	21
24	8	6	9	7	13	10	8	9	10	21	33	49	43	29	27	19	15	12	6	7	5	41	10	25	18
25	25	12	7	7	8	7	7	8	11	14	17	42	34	46	55	33	23	18	10	14	7	6	49	13	20
26	6	6	8	9	8	7	9	9	10	13	20	58	38	64	40	39	12	8	6	7	11	31	17	8	18
27	18	10	12	15	8	8	7	8	8	15	17	26	43	58	33	22	14	10	11	10	12	38	10	15	18
28	49	8	19	16	10	6	8	7	11	41	64	24	28	20	17	18	15	13	8	4	6	6	10	42	19
29	9	10	13	15	25	8	6	15	46	23	30	26	19	17	21	17	19	12	10	6	11	61	33	29	20
30	10	11	12	25	11	8	11	8	29	46	22	20	22	43	24	24	20	22	8	8	6	6	17	12	18
31	8	11	10	6	13	12	9	8	8	12	13	17	35	56	39	34	31	16	9	6	7	21	15	18	17
HRAVE	16	14	15	14	16	14	12	14	19	21	26	28	30	32	26	21	17	14	11	10	16	23	17	16	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15	23	25	20	17	20	22	20	20	18	18	19	12	27	10	10	12	19	21	18	19	18	21	18	20
MAX	51	50	60	49	45	48	49	51	55	54	50	40	19	62	14	13	15	63	58	50	41	54	42	49	55
MIN	6	6	6	8	6	6	8	7	4	5	9	9	5	7	7	8	8	10	8	6	7	5	6	5	6

DAY	26	27	28	29	30	31
AVE	18	18	19	20	18	17
MAX	64	58	64	61	46	56
MIN	6	7	4	6	6	6

MONTHLY AVERAGE = 18.4 MONTHLY MAXIMUM = 63.8 MONTHLY MINIMUM = 4.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MARCH - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	12.1	11.3	9.9	9.9	9.1	8.5	8.4	8.0	9.2	12.0	15.2	17.5	19.0	20.8	22.3	22.9	23.0	22.0	20.5	18.9	17.6	16.0	14.9	13.9	15.1
2	13.0	12.4	12.4	12.0	10.4	11.0	11.4	9.9	11.3	13.3	15.2	18.2	21.0	22.6	22.8	20.5	20.1	19.3	18.2	17.8	17.1	16.3	15.8	14.9	15.7
3	14.3	13.5	14.8	15.6	15.6	14.7	13.9	13.3	14.0	16.2	18.3	19.4	20.8	22.0	22.5	22.2	21.9	20.9	19.1	17.5	16.4	15.6	14.6	13.7	17.1
4	12.8	12.4	11.7	10.8	10.1	9.1	8.6	8.7	10.3	13.6	15.8	17.8	19.1	20.1	21.5	21.9	21.4	20.5	18.7	17.0	17.0	15.3	13.2	12.9	15.0
5	11.3	10.6	9.3	8.7	7.9	7.5	7.1	7.9	10.7	13.7	17.8	20.3	22.4	24.3	25.6	26.0	25.4	24.4	22.7	20.4	19.0	17.4	15.6	13.5	16.2
6	12.8	12.5	11.1	10.3	9.7	8.5	9.0	10.0	12.8	16.3	19.0	22.2	24.8	25.9	27.6	28.0	27.7	26.3	24.4	22.6	20.7	19.8	18.8	18.1	18.3
7	16.6	15.7	14.5	12.9	12.4	11.7	11.0	11.3	11.0	13.4	15.6	18.1	20.7	22.6	23.3	22.8	21.9	21.1	20.1	18.7	17.5	17.5	16.5	16.4	16.8
8	15.3	15.8	13.9	12.7	12.1	11.1	10.7	10.4	10.2	11.3	14.6	14.8	14.1	14.2	15.8	14.4	14.6	15.2	13.9	12.7	11.6	11.2	11.1	10.4	13.0
9	9.0	7.7	6.7	6.2	5.5	5.1	3.4	4.4	7.3	10.2	12.4	14.3	15.4	16.4	16.6	16.9	16.4	15.5	14.5	13.7	12.9	11.4	10.5	9.2	10.9
10	8.2	7.6	6.9	6.5	5.7	5.4	5.6	5.1	6.7	10.6	14.9	17.9	20.7	21.0	22.3	22.2	21.8	20.3	17.9	16.1	15.0	14.8	14.2	13.8	13.4
11	13.2	12.9	11.1	10.7	10.3	10.2	10.0	11.7	13.2	17.2	21.0	22.9	25.0	26.5	25.5	22.6	18.6	17.0	15.1	13.9	13.4	13.1	12.7	12.1	15.8
12	11.4	10.8	9.9	9.7	9.5	9.4	9.3	9.3	9.6	10.2	10.9	11.1	12.0	11.4	10.7	11.5	12.6	12.2	9.6	9.7	9.8	9.4	9.2	9.2	10.3
13	9.1	9.2	9.4	9.2	8.9	8.6	8.3	8.7	9.7	10.0	10.4	10.8	11.3	13.2	14.2	14.0	14.5	14.0	12.6	11.0	9.7	9.7	9.5	8.8	10.6
14	8.2	7.3	5.4	4.3	3.3	2.4	1.7	2.7	4.7	7.9	10.3	11.8	12.8	13.2	14.2	14.8	14.7	14.4	13.5	12.0	10.8	10.4	10.4	10.2	9.2
15	10.0	9.3	7.9	6.7	6.8	7.3	8.4	10.1	11.8	13.4	15.8	17.2	17.7	18.2	18.8	19.1	18.7	18.5	18.1	17.6	17.0	16.2	15.6	15.1	14.0
16	15.0	14.8	14.6	14.3	13.6	13.7	13.5	13.2	14.1	15.4	16.8	18.1	18.5	18.9	19.5	19.1	18.6	18.0	16.9	15.8	15.0	14.2	13.5	13.0	15.8
17	12.4	11.8	11.4	11.2	10.8	10.5	10.1	11.0	12.3	14.1	16.3	18.1	20.0	21.1	21.7	22.4	22.5	22.2	21.2	20.3	19.7	18.8	17.7	17.1	16.5
18	15.4	14.2	13.2	12.1	11.7	11.7	11.3	12.2	15.9	18.5	20.4	22.2	23.8	24.5	25.6	25.6	24.8	24.2	23.0	22.1	21.1	20.2	19.1	16.9	18.8
19	16.3	15.6	14.7	13.8	13.6	13.7	13.6	15.3	16.8	18.8	20.9	22.4	24.1	25.2	25.5	26.0	25.3	24.9	23.9	22.8	22.0	20.7	20.1	18.2	19.8
20	16.9	15.8	14.8	13.7	12.3	12.0	11.3	12.4	15.5	18.0	20.9	22.4	24.8	26.7	26.8	26.5	26.4	25.3	24.7	24.0	22.7	20.6	19.5	18.7	19.7
21	17.6	16.2	15.4	15.0	14.3	13.8	13.3	13.3	14.0	15.4	16.9	17.9	19.0	18.9	18.4	17.6	17.0	16.4	15.9	15.6	15.0	14.4	14.4	13.8	15.8
22	13.6	12.9	11.6	10.2	9.0	8.2	7.4	8.5	11.0	13.3	15.2	17.1	18.2	19.2	19.4	19.8	19.5	18.9	17.4	15.9	15.2	14.0	12.7	11.9	14.2
23	10.7	9.7	9.1	7.7	6.9	7.1	7.4	8.3	10.2	12.6	15.4	18.9	20.5	21.2	22.2	23.0	22.7	21.8	20.0	18.5	17.7	15.9	14.9	14.1	14.9
24	13.7	12.3	11.3	11.2	9.8	8.6	8.2	9.3	11.7	15.1	18.4	20.7	22.5	23.5	23.9	24.2	24.0	23.1	21.8	20.2	19.1	17.7	15.4	14.6	16.7
25	12.9	11.6	10.6	9.8	9.2	8.3	7.8	9.5	13.6	17.3	20.2	23.4	26.0	27.4	27.9	27.9	27.7	27.2	26.1	24.5	23.2	22.2	21.0	17.5	18.9
26	16.2	14.9	14.2	13.6	12.7	11.8	10.5	11.7	15.6	19.5	22.8	26.1	27.6	29.2	29.6	29.7	28.9	27.3	25.8	24.6	23.9	22.6	21.0	19.9	20.8
27	18.3	16.9	16.7	15.6	15.1	14.2	14.0	14.2	16.0	19.8	21.3	23.5	25.5	27.3	28.2	28.6	28.1	26.8	25.7	23.6	22.7	20.9	20.0	18.8	20.9
28	17.6	17.0	16.4	14.7	13.6	12.7	11.8	14.0	17.4	19.4	23.0	24.7	26.2	27.6	28.1	28.1	27.8	26.7	25.0	23.0	21.4	20.4	19.3	18.3	20.6
29	16.0	15.3	14.4	13.1	12.2	11.0	10.9	11.9	14.1	16.3	19.8	22.4	23.6	24.3	24.6	24.4	24.3	23.5	22.2	20.8	19.5	18.5	17.7	15.1	18.2
30	13.7	12.9	11.6	10.5	9.6	9.2	9.0	9.8	11.4	14.6	20.0	22.5	23.4	24.4	25.7	26.3	26.1	25.6	24.3	21.9	20.2	19.3	18.0	16.9	17.8
31	15.0	13.5	12.9	13.3	12.7	13.1	14.2	14.7	16.2	18.0	20.0	21.6	22.4	23.4	24.4	24.7	24.5	24.3	22.9	21.2	20.2	19.2	18.9	19.0	18.8
HRAVE	13.5	12.7	11.9	11.2	10.5	10.0	9.7	10.3	12.2	14.7	17.3	19.2	20.7	21.8	22.4	22.4	22.0	21.2	19.8	18.5	17.5	16.6	15.7	14.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15.1	15.7	17.1	15.0	16.2	18.3	16.8	13.0	10.9	13.4	15.8	10.3	10.6	9.2	14.0	15.8	16.5	18.8	19.8	19.7	15.8	14.2	14.9	16.7	18.9
MAX	23.0	22.8	22.5	21.9	26.0	28.0	23.3	15.8	16.9	22.3	26.5	12.6	14.5	14.8	19.1	19.5	22.5	25.6	26.0	26.8	19.0	19.8	23.0	24.2	27.9
MIN	8.0	9.9	13.3	8.6	7.1	8.5	11.0	10.2	3.4	5.1	10.0	9.2	8.3	1.7	6.7	13.0	10.1	11.3	13.6	11.3	13.3	7.4	6.9	8.2	7.8

DAY	26	27	28	29	30	31
AVE	20.8	20.9	20.6	18.2	17.8	18.8
MAX	29.7	28.6	28.1	24.6	26.3	24.7
MIN	10.5	14.0	11.8	10.9	9.0	12.7

MONTHLY AVERAGE = 16.1 MONTHLY MAXIMUM = 29.7 MONTHLY MINIMUM = 1.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MARCH - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.8	0.6	0.6	0.7	0.4	0.6	0.6	0.0	-0.3	-0.8	-1.0	-0.5	-0.6	-0.6	-0.7	-0.6	-0.4	-0.1	0.5	0.6	1.0	0.7	0.8	0.7	0.1
2	0.6	0.6	0.6	0.5	0.4	0.5	0.4	0.2	-0.2	-0.4	-0.4	-0.6	-0.7	-0.5	-0.5	-0.6	-0.6	-0.2	0.2	0.2	0.4	0.4	0.5	0.4	0.0
3	0.6	0.5	0.6	0.3	0.3	0.4	0.3	0.1	-0.5	-0.9	-0.8	-0.8	-0.9	-0.9	-0.9	-1.0	-0.6	-0.3	0.2	0.3	0.4	0.4	0.4	0.4	-0.1
4	0.3	0.3	0.4	0.5	0.5	0.5	0.6	-0.1	-0.6	-1.1	-0.8	-0.8	-0.9	-0.7	-0.8	-1.0	-0.6	-0.2	0.3	0.5	0.4	0.5	0.8	0.8	-0.1
5	0.7	0.8	0.7	0.7	0.6	0.6	0.6	-0.2	-1.4	-1.5	-1.6	-1.5	-1.0	-0.9	-0.7	-1.0	-0.6	-0.2	0.4	0.5	0.6	0.5	0.6	0.7	-0.1
6	0.7	0.7	0.7	0.4	0.5	0.5	0.7	0.1	-1.2	-1.6	-0.9	-0.9	-1.1	-0.8	-0.8	-0.7	-0.5	0.0	0.4	0.8	0.6	0.7	0.5	1.0	0.0
7	0.5	0.5	0.7	0.8	0.7	0.6	0.6	0.6	0.3	-0.3	-0.6	-1.0	-0.5	-0.7	-0.6	-0.4	-0.3	0.0	0.4	0.4	0.5	1.1	0.9	0.9	0.2
8	0.8	0.7	0.6	0.6	0.5	0.5	0.6	0.6	0.4	-0.2	-0.3	-0.2	-0.5	-0.4	-0.9	-0.6	-0.4	-0.3	0.1	0.2	0.2	0.4	0.3	0.4	0.1
9	0.5	0.5	0.5	0.5	0.6	0.5	0.5	-0.4	-1.3	-1.1	-0.8	-0.8	-0.8	-0.8	-0.7	-0.7	-0.4	-0.2	0.1	0.4	0.6	0.6	0.5	0.6	-0.1
10	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.2	-0.6	-1.5	-1.6	-1.7	-1.9	-1.0	-0.9	-0.7	-0.8	-0.4	0.2	0.4	0.4	0.4	0.4	0.5	-0.2
11	0.4	0.2	0.6	0.6	0.2	0.3	0.3	-0.1	-0.4	-1.2	-1.7	-1.6	-1.7	-1.6	-0.6	-0.6	-0.5	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.1	-0.3
12	0.2	0.2	0.1	0.1	0.0	-0.1	0.0	0.0	-0.2	0.2	0.0	-0.2	-0.3	-0.1	-0.1	-0.2	-0.2	-0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0
13	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.0	-0.2	-0.3	-0.4	-0.2	-0.3	-0.1	0.2	0.4	0.5	0.4	0.4	0.4	0.1
14	0.5	0.6	0.6	0.8	0.6	0.4	0.5	-0.6	-0.8	-1.0	-0.9	-0.7	-0.9	-0.8	-0.9	-0.9	-0.5	-0.1	0.2	0.4	0.4	0.6	0.5	0.4	-0.1
15	0.3	0.5	0.8	1.2	1.0	0.7	0.5	0.0	-0.4	-0.7	-0.9	-0.9	-0.7	-0.5	-0.6	-0.4	-0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.0
16	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.1	-0.4	-0.9	-1.3	-1.3	-1.3	-1.2	-1.2	-0.8	-0.4	-0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.3
17	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.2	-0.5	-0.8	-1.2	-1.1	-1.1	-1.0	-0.8	-0.5	-0.2	0.1	0.2	0.3	0.2	0.3	0.3	0.4	-0.2
18	0.4	0.4	0.5	0.6	0.5	0.6	0.6	0.2	-0.6	-0.9	-1.2	-1.3	-1.4	-1.0	-1.1	-0.9	-0.4	0.1	0.3	0.3	0.4	0.4	0.4	0.5	-0.1
19	0.6	0.4	0.4	0.4	0.5	0.3	0.3	-0.2	-0.6	-0.8	-1.2	-1.3	-1.3	-1.3	-0.8	-0.9	-0.3	0.0	0.4	0.5	0.4	0.4	0.4	0.3	-0.1
20	0.5	0.6	0.7	0.6	0.4	0.6	0.4	-0.4	-1.0	-1.1	-1.0	-0.9	-1.4	-1.3	-1.1	-0.6	-0.3	0.0	0.3	0.3	0.2	0.1	0.1	0.1	-0.2
21	0.2	0.5	0.4	0.4	0.3	0.3	0.2	-0.2	-0.5	-0.9	-1.0	-0.9	-1.1	-0.9	-0.7	-0.5	-0.4	-0.2	0.0	0.1	0.2	0.2	0.3	0.3	-0.2
22	0.2	0.4	0.6	0.3	0.5	0.4	0.3	-0.8	-1.1	-0.8	-0.7	-0.8	-1.0	-1.2	-1.2	-1.2	-1.0	-0.6	-0.1	0.3	0.5	0.5	0.4	0.6	-0.2
23	0.6	0.6	0.6	0.6	0.3	0.4	0.4	-0.6	-0.6	-0.5	-1.0	-1.5	-1.3	-0.9	-0.9	-1.1	-0.8	-0.6	0.1	0.4	0.5	0.5	0.6	0.5	-0.2
24	0.6	0.6	0.8	0.6	0.5	0.7	0.6	-0.4	-1.3	-1.0	-1.2	-0.9	-1.0	-1.1	-1.1	-1.0	-0.7	-0.4	0.1	0.5	0.6	0.6	0.8	0.6	-0.1
25	0.5	0.7	0.6	0.6	0.6	0.6	0.3	-0.8	-1.6	-1.8	-1.6	-1.3	-1.5	-1.3	-1.0	-0.9	-0.4	0.1	0.4	0.4	0.5	0.7	0.8	0.7	-0.2
26	0.9	0.7	0.7	0.6	0.6	0.7	0.5	-0.4	-1.2	-1.4	-1.1	-0.9	-0.9	-1.0	-0.8	-0.7	-0.5	-0.1	0.2	0.3	0.4	0.4	0.6	0.7	-0.1
27	0.6	0.6	0.5	0.4	0.6	0.4	0.6	0.0	-0.9	-1.2	-0.9	-1.1	-0.8	-0.9	-0.9	-0.8	-0.5	-0.2	0.1	0.3	0.4	0.6	0.5	0.6	-0.1
28	0.4	0.5	0.6	0.5	0.5	0.5	0.3	-0.8	-1.5	-0.6	-0.8	-0.9	-1.1	-1.2	-1.2	-1.0	-0.8	-0.5	0.1	0.5	0.6	0.6	0.6	0.6	-0.2
29	0.6	0.4	0.5	0.6	0.7	0.6	0.7	-0.6	-0.8	-0.6	-0.8	-1.2	-1.3	-1.3	-1.3	-1.1	-0.9	-0.6	0.0	0.5	0.7	0.6	0.6	0.7	-0.1
30	0.6	0.7	0.4	0.3	0.6	0.7	0.3	-0.2	-0.5	-0.4	-1.1	-1.2	-1.0	-1.0	-1.2	-1.1	-0.8	-0.6	-0.1	0.3	0.4	0.5	0.7	0.6	-0.1
31	0.6	0.8	0.6	1.0	0.6	0.6	0.2	-0.4	-0.8	-1.2	-1.6	-1.8	-1.3	-1.0	-1.2	-1.0	-0.7	-0.6	-0.1	0.4	0.4	0.7	0.5	0.3	-0.2
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.2	-0.7	-0.9	-1.0	-1.0	-1.0	-0.9	-0.9	-0.8	-0.5	-0.2	0.2	0.4	0.4	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.0	-0.1	-0.1	-0.1	0.0	0.2	0.1	-0.1	-0.2	-0.3	0.0	0.1	-0.1	0.0	-0.3	-0.2	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2
MAX	1.0	0.6	0.6	0.8	0.8	1.0	1.1	0.8	0.6	0.6	0.6	0.2	0.5	0.8	1.2	0.3	0.4	0.6	0.6	0.7	0.5	0.6	0.6	0.8	0.8
MIN	-1.0	-0.7	-1.0	-1.1	-1.6	-1.6	-1.0	-0.9	-1.3	-1.9	-1.7	-0.3	-0.4	-1.0	-0.9	-1.3	-1.2	-1.4	-1.3	-1.4	-1.1	-1.2	-1.5	-1.3	-1.8

DAY	26	27	28	29	30	31
AVE	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2
MAX	0.9	0.6	0.6	0.7	0.7	1.0
MIN	-1.4	-1.2	-1.5	-1.3	-1.2	-1.8

MONTHLY AVERAGE = -0.1 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = -1.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MARCH - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	703	703	702	703	703	703	703	704	704	704	703	703	702	701	701	701	701	701	702	702	702	702	702	702
2	702	702	702	702	702	702	702	702	703	703	703	702	701	701	701	701	701	701	701	702	702	702	702	702	702
3	702	702	702	702	702	702	702	702	703	703	703	702	702	701	700	700	700	700	700	700	700	701	701	701	701
4	701	701	701	701	701	701	701	702	702	702	702	702	702	701	701	700	701	701	701	702	702	702	703	703	701
5	703	703	703	703	703	703	703	704	704	704	704	703	703	702	701	701	701	701	701	702	702	702	703	703	703
6	702	702	702	703	703	703	703	703	703	703	702	702	702	701	700	700	700	700	701	701	701	702	702	702	702
7	702	702	702	701	701	702	702	702	702	703	703	702	702	701	701	700	700	700	700	700	700	700	700	700	701
8	700	700	699	699	698	698	699	699	699	699	699	699	699	698	697	698	698	698	699	699	700	701	701	701	699
9	701	701	701	701	701	702	702	702	702	702	702	702	701	700	700	700	700	699	699	699	699	700	700	700	701
10	700	700	699	699	699	699	699	699	700	700	700	700	699	698	698	697	697	698	698	698	699	699	700	700	699
11	700	700	700	700	700	700	700	700	700	700	699	698	697	696	695	695	695	696	697	698	699	699	699	699	699
12	698	698	697	697	697	697	696	697	697	696	696	696	696	695	695	695	695	695	695	696	696	696	696	696	696
13	696	696	696	696	695	696	696	697	697	697	698	698	698	698	697	698	698	699	700	700	701	702	703	703	698
14	703	703	703	703	703	703	704	704	705	705	705	705	705	705	704	704	704	704	704	705	705	705	705	705	704
15	704	704	704	704	704	704	704	704	704	704	704	703	703	702	701	701	701	701	701	701	702	702	703	703	703
16	703	703	702	702	702	703	703	704	704	705	705	705	704	704	703	703	703	703	703	703	704	704	704	705	703
17	705	705	705	704	704	705	705	705	705	705	705	705	704	703	702	702	701	701	702	702	702	702	703	703	704
18	703	703	703	702	702	703	703	703	704	704	704	703	703	702	701	701	701	700	701	701	701	702	702	702	702
19	702	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	700	700	700	700	701	701	701	701	702
20	702	702	702	701	702	702	702	703	703	703	703	703	702	701	700	700	699	699	699	699	700	701	701	702	701
21	702	702	702	702	702	703	703	703	704	704	704	704	704	703	703	702	702	702	702	703	702	702	703	703	703
22	703	703	703	702	702	703	703	704	704	704	704	704	704	703	703	702	702	703	703	703	704	704	704	704	703
23	704	704	704	704	704	704	704	704	705	705	705	704	704	703	702	702	702	702	702	703	703	703	703	703	703
24	703	704	704	704	704	704	705	705	706	706	706	706	705	705	704	704	704	704	704	705	705	706	706	706	705
25	706	706	705	705	705	705	706	706	706	706	706	705	704	703	703	702	702	702	702	702	702	703	703	703	704
26	703	702	702	702	702	702	702	702	703	703	702	702	701	701	700	700	700	700	700	700	701	701	701	701	701
27	701	701	701	701	701	702	702	703	703	703	703	703	702	701	701	701	701	701	701	702	702	703	703	703	702
28	703	703	703	703	703	703	704	704	704	704	704	704	703	702	702	702	702	702	702	702	703	703	703	703	703
29	703	703	703	703	703	703	703	704	704	704	704	703	703	702	702	701	701	701	701	702	702	703	702	702	703
30	702	702	702	702	702	702	703	703	704	704	703	702	702	701	700	700	700	700	700	700	701	701	701	702	702
31	702	702	701	701	701	702	702	702	703	703	703	702	702	701	700	700	700	700	700	701	701	702	703	703	701
HRAVE	702	702	702	702	702	702	702	703	703	703	703	702	702	701	701	700	700	700	701	701	701	702	702	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	702	702	701	701	703	702	701	699	701	699	699	696	698	704	703	703	704	702	702	701	703	703	703	705	704
MAX	704	703	703	703	704	703	703	701	702	700	700	698	703	705	704	705	705	704	703	703	704	704	705	706	706
MIN	701	701	700	700	701	700	700	697	699	697	695	695	695	703	701	702	701	700	700	699	702	702	702	703	702

DAY	26	27	28	29	30	31
AVE	701	702	703	703	702	701
MAX	703	703	704	704	704	703
MIN	700	701	702	701	700	700

MONTHLY AVERAGE = 701.7 MONTHLY MAXIMUM = 706.1 MONTHLY MINIMUM = 694.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MARCH - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	76	79	85	85	88	91	90	87	83	69	60	50	48	44	43	40	36	38	42	48	54	61	65	69	64
2	73	76	74	77	82	80	75	86	78	67	62	53	43	38	36	45	45	51	58	60	63	67	67	71	64
3	75	81	73	65	65	70	74	78	74	65	54	51	47	40	37	36	37	42	48	54	59	61	64	69	59
4	73	74	77	81	86	91	93	91	80	65	55	48	44	42	37	34	36	37	41	46	46	53	60	61	60
5	66	70	75	75	77	78	79	74	61	52	42	36	30	24	23	24	28	29	31	37	42	46	53	58	50
6	57	57	63	72	72	74	73	68	57	47	42	35	29	27	23	20	20	23	28	32	35	35	34	34	44
7	41	41	48	54	56	59	61	62	62	57	51	39	32	29	27	28	33	36	40	46	51	50	50	46	46
8	49	44	55	61	65	64	68	65	69	65	59	64	61	61	56	51	43	38	39	40	42	44	47	49	54
9	53	59	62	65	70	70	76	74	61	49	44	39	33	30	30	32	33	36	38	41	44	51	57	63	50
10	66	67	68	69	73	73	72	73	66	51	39	33	25	27	30	30	29	30	34	38	43	44	45	46	49
11	49	51	60	63	67	67	69	63	61	50	42	38	32	28	28	40	48	50	59	64	65	65	64	66	54
12	76	86	97	98	100	100	100	100	100	98	92	91	80	80	84	73	69	71	88	90	84	84	87	88	88
13	85	85	83	83	86	90	93	91	84	83	83	81	78	63	55	50	40	38	39	43	47	48	48	48	68
14	51	56	70	77	83	87	90	86	74	58	46	35	34	34	34	32	30	31	38	46	50	53	52	51	54
15	52	55	61	67	64	62	56	49	44	42	37	33	32	32	30	29	30	32	32	34	35	37	38	39	43
16	39	39	39	40	42	41	40	39	38	35	36	39	41	41	40	43	44	45	49	51	53	56	58	59	44
17	62	64	65	65	67	68	70	66	62	56	50	45	39	36	35	33	32	34	38	38	39	41	44	46	50
18	52	57	61	65	66	66	66	63	51	43	39	35	32	30	27	25	26	27	30	30	33	35	37	44	43
19	46	48	52	55	55	55	55	49	45	41	37	34	30	28	25	25	27	27	30	32	34	38	38	45	40
20	51	53	58	62	68	70	72	68	55	47	38	36	32	28	27	27	27	32	28	21	21	25	26	32	42
21	39	45	50	53	57	59	62	62	58	52	48	43	35	34	34	36	39	39	39	41	44	45	45	46	46
22	48	50	56	60	68	72	76	67	57	46	40	36	34	32	32	30	30	32	35	41	42	47	53	57	48
23	60	65	67	72	76	75	74	67	59	51	42	36	32	28	27	30	29	28	31	36	38	44	47	50	48
24	52	57	62	61	66	74	77	70	59	47	38	32	29	26	26	24	23	23	25	29	31	37	42	48	44
25	51	54	59	61	63	67	69	61	47	37	33	28	23	21	20	19	19	20	23	26	28	30	34	41	39
26	45	49	50	52	55	59	64	59	47	36	30	25	22	20	20	22	24	25	26	28	29	33	37	41	37
27	44	49	50	54	56	59	60	60	54	41	37	32	28	25	24	22	20	24	24	29	33	37	39	42	39
28	47	48	50	58	62	64	68	57	44	38	30	27	25	20	17	17	16	18	20	22	25	26	27	29	36
29	34	37	40	45	48	52	52	50	44	39	33	28	25	22	22	23	24	23	24	26	28	30	30	39	34
30	43	45	48	52	53	52	50	47	44	38	25	19	17	17	15	15	15	15	17	21	22	23	25	29	31
31	35	38	41	40	40	40	38	38	35	32	29	25	25	22	21	20	19	18	20	24	26	29	25	20	29
HRAVE	54	57	61	64	67	69	70	67	60	52	45	40	36	33	32	31	31	33	36	39	41	44	46	49	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	64	64	59	60	50	44	46	54	50	49	54	88	68	54	43	44	50	43	40	42	46	48	48	44	39
MAX	91	86	81	93	79	74	62	69	76	73	69	100	93	90	67	59	70	66	55	72	62	76	76	77	69
MIN	36	36	36	34	23	20	27	38	30	25	28	69	38	30	29	35	32	25	25	21	34	30	27	23	19

DAY	26	27	28	29	30	31
AVE	37	39	36	34	31	29
MAX	64	60	68	52	53	41
MIN	20	20	16	22	15	18

MONTHLY AVERAGE = 48.3 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 14.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MARCH - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.20	0.33	0.56	0.60	0.52	0.77	0.64	0.48	0.32	0.12	0.01	0.00	0.00	0.00	0.00	0.00	4.64
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.22	0.28	0.52	0.74	0.70	0.47	0.50	0.39	0.32	0.09	0.01	0.00	0.00	0.00	0.00	0.00	4.31
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.51	0.68	0.80	0.85	0.83	0.74	0.59	0.39	0.16	0.01	0.00	0.00	0.00	0.00	0.00	5.83
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.26	0.47	0.66	0.76	0.85	0.77	0.70	0.59	0.37	0.17	0.01	0.00	0.00	0.00	0.00	0.00	5.71
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.53	0.70	0.83	0.88	0.86	0.77	0.61	0.39	0.18	0.01	0.00	0.00	0.00	0.00	0.00	6.18
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.52	0.69	0.80	0.83	0.75	0.71	0.55	0.38	0.13	0.01	0.00	0.00	0.00	0.00	0.00	5.77
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.16	0.29	0.40	0.57	0.58	0.51	0.43	0.30	0.18	0.08	0.01	0.00	0.00	0.00	0.00	0.00	3.55
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.13	0.22	0.24	0.10	0.27	0.24	0.71	0.41	0.25	0.18	0.01	0.00	0.00	0.00	0.00	0.00	2.81
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.52	0.65	0.81	0.84	0.68	0.49	0.37	0.17	0.08	0.01	0.00	0.00	0.00	0.00	0.00	5.08
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.51	0.73	0.80	0.89	0.63	0.50	0.39	0.44	0.20	0.01	0.00	0.00	0.00	0.00	0.00	5.36
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.20	0.51	0.74	0.82	0.93	0.80	0.21	0.41	0.19	0.06	0.00	0.00	0.00	0.00	0.00	0.00	4.97
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.08	0.12	0.11	0.24	0.14	0.13	0.11	0.23	0.12	0.01	0.00	0.00	0.00	0.00	0.00	1.33
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.08	0.24	0.29	0.35	0.66	0.72	0.37	0.44	0.20	0.02	0.00	0.00	0.00	0.00	0.00	3.45
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.38	0.59	0.76	0.88	0.92	0.90	0.80	0.65	0.44	0.21	0.02	0.00	0.00	0.00	0.00	0.00	6.70
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.56	0.75	0.87	0.72	0.42	0.68	0.47	0.22	0.07	0.01	0.00	0.00	0.00	0.00	0.00	5.27
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.28	0.51	0.73	0.75	0.78	0.91	0.88	0.71	0.47	0.21	0.03	0.00	0.00	0.00	0.00	0.00	6.32
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.56	0.73	0.85	0.90	0.88	0.79	0.64	0.44	0.19	0.02	0.00	0.00	0.00	0.00	0.00	6.51
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.58	0.75	0.87	0.92	0.90	0.85	0.74	0.44	0.19	0.02	0.00	0.00	0.00	0.00	0.00	6.79
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.58	0.75	0.80	0.90	0.90	0.81	0.65	0.28	0.20	0.03	0.00	0.00	0.00	0.00	0.00	6.43
20	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.33	0.56	0.59	0.64	0.95	0.85	0.50	0.29	0.21	0.06	0.01	0.00	0.00	0.00	0.00	0.00	5.14
21	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.21	0.40	0.58	0.67	0.58	0.72	0.58	0.34	0.18	0.15	0.05	0.01	0.00	0.00	0.00	0.00	0.00	4.49
22	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.41	0.62	0.78	0.90	0.94	0.91	0.82	0.66	0.46	0.19	0.03	0.00	0.00	0.00	0.00	0.00	6.91
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.28	0.50	0.69	0.90	0.94	0.92	0.80	0.65	0.40	0.18	0.02	0.00	0.00	0.00	0.00	0.00	6.46
24	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.40	0.62	0.79	0.91	0.95	0.92	0.83	0.67	0.42	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.84
25	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.42	0.63	0.80	0.91	0.95	0.93	0.84	0.67	0.46	0.19	0.04	0.00	0.00	0.00	0.00	0.00	7.04
26	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.37	0.60	0.64	0.69	0.71	0.74	0.69	0.44	0.29	0.09	0.01	0.00	0.00	0.00	0.00	0.00	5.44
27	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.31	0.43	0.41	0.61	0.60	0.76	0.70	0.53	0.32	0.14	0.05	0.00	0.00	0.00	0.00	0.00	4.97
28	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.43	0.64	0.81	0.92	0.96	0.93	0.84	0.68	0.47	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.14
29	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.44	0.65	0.82	0.93	0.97	0.94	0.85	0.67	0.47	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.22
30	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.37	0.61	0.72	0.92	0.97	0.95	0.85	0.69	0.48	0.16	0.05	0.00	0.00	0.00	0.00	0.00	6.95
31	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.42	0.63	0.79	0.91	0.96	0.93	0.84	0.68	0.48	0.19	0.05	0.00	0.00	0.00	0.00	0.00	7.09
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.30	0.49	0.64	0.74	0.79	0.75	0.68	0.52	0.35	0.15	0.02	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.64	4.31	5.83	5.71	6.18	5.77	3.55	2.81	5.08	5.36	4.97	1.33	3.45	6.70	5.27	6.32	6.51	6.79	6.43	5.14	4.49	6.91	6.46	6.84	7.04
MAX	0.77	0.74	0.85	0.85	0.88	0.83	0.58	0.71	0.84	0.89	0.93	0.24	0.72	0.92	0.87	0.91	0.90	0.92	0.90	0.95	0.72	0.94	0.94	0.95	0.95
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.44	4.97	7.14	7.22	6.95	7.09
MAX	0.74	0.76	0.96	0.97	0.97	0.96
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MARCH - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.03	0.01	0.08	0.08	0.06	0.02	0.03	0.04	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.37
13	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.05	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.53 MONTHLY MAXIMUM = 0.08 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

APRIL THROUGH SEPTEMBER 2019

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

November 2019

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period April through September 2019. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the audit and calibration results. Appendix B presents the data screening results. Appendix C presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

With the exception of precipitation data, no data was collected from the station on May 22, 2019 between 9am and 11pm; the cause of the data gap is unknown. No data was collected from the station on July 30, 2019 between 10am and 12pm, when replacement of the anemometer was attempted (as discussed in Section 3.1 below). A power failure occurred at the site on September 1, 2019. The data logger battery backup kept the logger collecting data until 1:00 am on September 4, 2019 (except for relative humidity and barometric pressure, as those sensors require AC power). AC power was restored at noon on September 4, 2019. There were no other significant operational events during the reporting period besides an audit conducted on July 10, 2019, and calibrations performed on the precipitation gauge on August 14, 2019 and September 19, 2019.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A performance audit of all equipment was performed on July 10, 2019. Audit results are presented in Appendix A, and they indicate that the meteorological systems were operating within the acceptable DQO ranges, with one exception. The wind direction sensor starting torque threshold was slightly higher than the DQO. A calibration was performed immediately after the audit; those results are also presented in Appendix A and they also indicate acceptable instrument accuracy, again with the exception of the wind direction sensor starting torque. A replacement of the wind direction sensor was attempted on July 30, 2019, however the replacement was not completed due to the inability to calibrate the new instrument properly, and the existing anemometer was reinstalled. Replacement of the anemometer is still scheduled when parts are received. The precipitation sensor was also calibrated on August 14 and September 19, 2019.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were -1.7, -2.8, and -5.0 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix B presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix B presents comments from the manual review.

No data edits were required during the data processing.

In the digital data file that accompanies this data validation report, each hourly data point has been assigned a QC code as listed in Table 8-3 of EPA's Met Monitoring Guidance. The QC codes used were:

Code 0 - valid data,

Code 2 - valid data with corrections (i.e., data with readily identifiable offsets and simple corrections),

Code 7 – suspect data (i.e., lack of calibration documentation, and/or inconsistencies between Level 2 intercomparisons),

Code 8 - invalid data (inconsistent readings between "as-left" and "as-found" calibrations that make developing a correction factor impossible).

Note that all invalid data also has a value of 999.0 in the data file.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these data capture goals for the April through September 2019 period.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Oct-18	100	100	100	100	100	100	22
Nov-18	100	100	100	100	100	100	100
Dec-18	100	100	100	100	100	100	100
Jan-19	99.3	99.3	99.3	99.3	99.3	99.3	99.3
Feb-19	100	100	100	100	100	100	100
Mar-19	100	100	100	100	100	100	100
Apr-19	100.0	100.0	100.0	100.0	100.0	100.0	100.0
May-19	98.0	98.0	98.0	98.0	98	98	100.0
Jun-19	100	100	100	100	100	100	100
Jul-19	98.9	98.9	98.9	98.9	98.9	98.9	98.9
Aug-19	100	100	100	100	100	100	100
Sep-19	98.3	98.3	98.3	98.3	89.4	89.4	98.1
Quarter 1	100.0	100.0	100.0	100.0	100.0	100.0	73.3
Quarter 2	99.8	99.8	99.8	99.8	99.8	99.8	99.8
Quarter 3	99.3	99.3	99.3	99.3	99.3	99.3	100.0
Quarter 4	99.1	99.1	99.1	99.1	96.1	96.1	99.0
Total	99.5	99.5	99.5	99.5	98.8	98.8	93.1

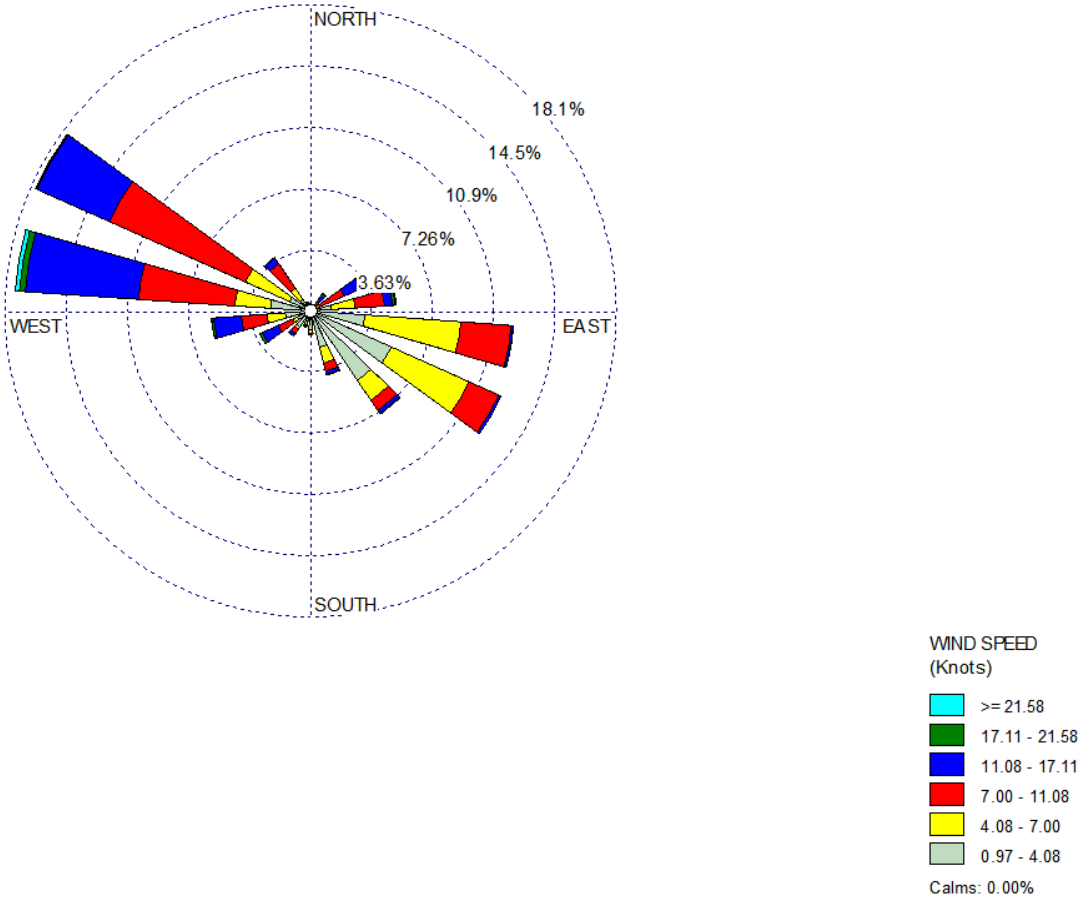
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix C presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly valid 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east-southeast (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours with higher wind speeds). This is similar to wind patterns previously observed at the monitoring site.

Figure 1 – 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Audit and Calibration Results

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 7/10/2019 Auditor: Sam Kaney

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 158704
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY81502
Wind Speed Audit Standard:	RM Young 18820 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton SN 86818

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
308	3.5	3.4	-0.1	-2.7%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.7 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	3	6	3
45	43	46	3
90	88	90	2
135	133	135	2
180	178	179	1
225	223	224	1
270	268	269	1
315	313	315	2

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic) = 346

Vane alignment rod (true) = 356

Sensor Measured Alignment (true) = 358 Logger reading

Alignment Difference (degrees) 2

Note - for fixture tests of combined linearity and orientation, the fixture index direction must be adjusted for:

Data logger offset of -4 degrees plus any alignment difference = -2 degrees

WD Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 13 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	-0.03	-0.1	0.03	0.0	0.06
20.8	20.72	-0.1	20.76	0.0	0.03
41.1	41.19	0.1	41.19	0.1	0.00

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.96	0.93	-0.03	-2%

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

(Note - sensor mV readings are converted to kw/m2 by multiplying 0.1047) mVolt reading 9.2

Comments:

Audit started at 08:35, ended at 10:50

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 7/10/2019 By:Sarah Cooper

RM Young Wind Monitor AQ Sensor SN :	SN 158704
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY81502
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Campbell CS215 SN E16175
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN CA04015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Streamline Pro SN CU06012, temp. probe T060102B
Relative Humidity Standard	Testo 635 S/N 80510054/803

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.7 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	3	6	3
45	43	46	3
90	88	90	2
135	133	135	2
180	178	179	1
225	223	224	1
270	268	269	1
315	313	315	2

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic reading) = 346

Vane alignment rod (true reading) = 356

Sensor Measured Alignment (true) = 358 Logger reading

Alignment Difference (degrees) 2

Note - for fixture tests of combined linearity and orientation, the fixture index direction must be adjusted for:

Data logger offset of -4 degrees plus any alignment difference = -2 degrees

WD Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 13 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	-0.03	-0.1	0.03	-0.1	0.06
20.6	20.72	0.1	20.76	0.2	0.01
41.0	41.19	0.2	41.19	0.2	0.00

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
16.9	16.6	-0.3

For RH the DQO limit is ± 7%

BAROMETRIC PRESSURE SENSOR

(mm Hg)	(mm Hg)	(mm Hg)
701.7	703.7	2.0

Acceptable tolerance is 2.3 mm Hg

Comments:

Calibration start 08:35

Calibration end 11:01

APPENDIX B

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for April-Sept 2019 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	19040202	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable evening period - WS is valid
4	WS	19040203	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable evening period - WS is valid
4	WS	19041902	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable evening period - WS is valid
4	WS	19041903	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable evening period - WS is valid
4	WS	19042505	WIND SPD TOO CONSTANT 3 HR	0.04	Light to moderate winds in stable evening period - WS is valid
4	WS	19043004	WIND SPD TOO CONSTANT 3 HR	0.13	Light to moderate winds in stable evening period - WS is valid
4	WS	19051310	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
4	WS	19052715	WIND SPD TOO CONSTANT 3 HR	0.11	Moderate to high steady winds - data is valid
4	WS	19060823	WIND SPD TOO CONSTANT 3 HR	0.07	Light to moderate winds in stable evening period - WS is valid
4	WS	19061506	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate to high steady winds - data is valid
4	WS	19062303	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate to high steady winds - data is valid
4	WS	19062410	WIND SPD TOO CONSTANT 3 HR	0.18	Light yet steady winds - morning stable - data is valid
4	WS	19072016	WIND SPD TOO CONSTANT 3 HR	0.13	Moderate to high steady winds - data is valid
4	WS	19081601	WIND SPD TOO CONSTANT 3 HR	0.07	Light to moderate winds in stable evening period - WS is valid
4	WS	19082602	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable evening period - WS is valid
4	WS	19090112	WIND SPD TOO CONSTANT 3 HR	0.07	Light yet steady winds - morning stable - data is valid
4	WS	19090515	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
4	WS	19090607	WIND SPD TOO CONSTANT 3 HR	0.07	Light to moderate winds in stable evening period - WS is valid
4	WS	19091116	WIND SPD TOO CONSTANT 3 HR	0.13	Moderate to high steady winds - data is valid
4	WS	19091314	WIND SPD TOO CONSTANT 3 HR	0.16	Moderate to high steady winds - data is valid
4	WS	19092506	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable evening period - WS is valid
4	WS	19092704	WIND SPD TOO CONSTANT 3 HR	0.11	Light to moderate winds in stable evening period - WS is valid
7	WD	19042405	WIND DIR TOO CONSTANT 3 HR	0.7	Light to moderate winds in stable evening period - WD is valid
7	WD	19042818	WIND DIR TOO CONSTANT 3 HR	0.7	Moderate to high steady winds - data is valid
7	WD	19050304	WIND DIR TOO CONSTANT 3 HR	0.3	Light to moderate winds in stable evening period - WD is valid
7	WD	19070407	WIND DIR TOO CONSTANT 3 HR	0.6	Light to moderate winds in stable morning period - WD is valid
7	WD	19071719	WIND DIR TOO CONSTANT 3 HR	0.7	Moderate to high steady winds - data is valid
7	WD	19072605	WIND DIR TOO CONSTANT 3 HR	0.7	Light to moderate winds in stable morning period - WD is valid
7	WD	19082613	WIND DIR TOO CONSTANT 3 HR	0.3	Moderate to high steady winds - data is valid
11	TP	19050817	HIGH RATE OF C CHANGE	5	Transition - early morning or early evening - Temp OK
11	TP	19051217	HIGH RATE OF C CHANGE	5.75	Transition - early morning or early evening - Temp OK
11	TP	19072218	HIGH RATE OF C CHANGE	5.55	Transition - early morning or early evening - Temp OK
11	TP	19072219	HIGH RATE OF C CHANGE	7.39	Transition - early morning or early evening - Temp OK
11	TP	19072420	HIGH RATE OF C CHANGE	6.31	Transition - early morning or early evening - Temp OK
11	TP	19080517	HIGH RATE OF C CHANGE	13.55	Transition - early morning or early evening - Temp OK
11	TP	19080620	HIGH RATE OF C CHANGE	5.06	Transition - early morning or early evening - Temp OK
11	TP	19081015	HIGH RATE OF C CHANGE	6.28	Transition - early morning or early evening - Temp OK
11	TP	19082817	HIGH RATE OF C CHANGE	5.77	Transition - early morning or early evening - Temp OK
11	TP	19083017	HIGH RATE OF C CHANGE	5.03	Transition - early morning or early evening - Temp OK
11	TP	19090117	HIGH RATE OF C CHANGE	10.09	Transition - early morning or early evening - Temp OK
11	TP	19091616	HIGH RATE OF C CHANGE	7.63	Transition - early morning or early evening - Temp OK
15	D1	19050611	DT LARGE READING	-2.22	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19051512	DT LARGE READING	-2.07	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19052511	DT LARGE READING	-2.15	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19053113	DT LARGE READING	-2.29	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19060111	DT LARGE READING	-2.22	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19060311	DT LARGE READING	-2.22	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19060312	DT LARGE READING	-2.04	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19061711	DT LARGE READING	-2.17	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19062711	DT LARGE READING	-2.15	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19062812	DT LARGE READING	-2.22	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19063014	DT LARGE READING	-2.04	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19070710	DT LARGE READING	-2.05	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19070711	DT LARGE READING	-2.03	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19090210	DT LARGE READING	-2.01	Slightly above QC threshold - near solar max - data is reasonable and valid
15	D1	19090810	DT LARGE READING	-2.04	Slightly above QC threshold - near solar max - data is reasonable and valid
17	D1	19070522	DT - During Nighttime	-0.13	Still transitioning from daytime high temperatures - data is valid
17	D1	19071322	DT - During Nighttime	-0.12	Still transitioning from daytime high temperatures - data is valid
17	D1	19071323	DT - During Nighttime	-0.17	Still transitioning from daytime high temperatures - data is valid
17	D1	19071400	DT - During Nighttime	-0.21	Still transitioning from daytime high temperatures - data is valid
17	D1	19072422	DT - During Nighttime	-0.21	Still transitioning from daytime high temperatures - data is valid
17	D1	19072423	DT - During Nighttime	-0.19	Still transitioning from daytime high temperatures - data is valid
17	D1	19072922	DT - During Nighttime	-0.17	Still transitioning from daytime high temperatures - data is valid
17	D1	19072923	DT - During Nighttime	-0.17	Still transitioning from daytime high temperatures - data is valid
17	D1	19073000	DT - During Nighttime	-0.15	Still transitioning from daytime high temperatures - data is valid
17	D1	19081022	DT - During Nighttime	-0.13	Still transitioning from daytime high temperatures - data is valid
17	D1	19081023	DT - During Nighttime	-0.15	Still transitioning from daytime high temperatures - data is valid
17	D1	19081100	DT - During Nighttime	-0.11	Still transitioning from daytime high temperatures - data is valid
17	D1	19082222	DT - During Nighttime	-0.15	Still transitioning from daytime high temperatures - data is valid
17	D1	19082322	DT - During Nighttime	-0.18	Still transitioning from daytime high temperatures - data is valid
17	D1	19082323	DT - During Nighttime	-0.15	Still transitioning from daytime high temperatures - data is valid
17	D1	19082400	DT - During Nighttime	-0.16	Still transitioning from daytime high temperatures - data is valid
17	D1	19090722	DT - During Nighttime	-0.18	Still transitioning from daytime high temperatures - data is valid
17	D1	19090723	DT - During Nighttime	-0.12	Still transitioning from daytime high temperatures - data is valid
17	D1	19091104	DT - During Nighttime	-0.11	Still transitioning from daytime high temperatures - data is valid
19	RH	19041705	OUT OF LIMITS	95.9	After rain event - data is reasonable and valid
19	RH	19041706	OUT OF LIMITS	99.3	After rain event - data is reasonable and valid
19	RH	19041707	OUT OF LIMITS	97.2	After rain event - data is reasonable and valid
19	RH	19072221	OUT OF LIMITS	95.7	After rain event - data is reasonable and valid
19	RH	19073023	OUT OF LIMITS	97.7	Cooler temperature for date - data is reasonable and valid
19	RH	19081103	OUT OF LIMITS	100	Cooler temperature for date - data is reasonable and valid
19	RH	19081104	OUT OF LIMITS	100	Cooler temperature for date - data is reasonable and valid
19	RH	19081105	OUT OF LIMITS	98.1	Cooler temperature for date - data is reasonable and valid
19	RH	19081106	OUT OF LIMITS	100	Cooler temperature for date - data is reasonable and valid
19	RH	19081107	OUT OF LIMITS	98	Cooler temperature for date - data is reasonable and valid
19	RH	19092409	OUT OF LIMITS	97.4	Cooler temperature for date - data is reasonable and valid
19	RH	19092410	OUT OF LIMITS	96	Cooler temperature for date - data is reasonable and valid
19	RH	19092505	OUT OF LIMITS	96.2	Cooler temperature for date - data is reasonable and valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for April-Sept 2019 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	19092701	OUT OF LIMITS	97.5	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092702	OUT OF LIMITS	97	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092703	OUT OF LIMITS	97	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092704	OUT OF LIMITS	99.9	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092705	OUT OF LIMITS	99.6	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092706	OUT OF LIMITS	99.9	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092707	OUT OF LIMITS	98.7	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092708	OUT OF LIMITS	98.5	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092709	OUT OF LIMITS	100	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092710	OUT OF LIMITS	99.8	Cloudy, cooler temperature for date - data is reasonable and valid
19	RH	19092805	OUT OF LIMITS	96.9	Cooler temperature for date - data is reasonable and valid
19	RH	19092806	OUT OF LIMITS	97.5	Cooler temperature for date - data is reasonable and valid
20	SR	19053112	SR OUT OF MAX/MIN	1.09	Slightly above QC threshold - data is reasonable and valid
20	SR	19090113	SR OUT OF MAX/MIN	1.01	Slightly above QC threshold - data is reasonable and valid

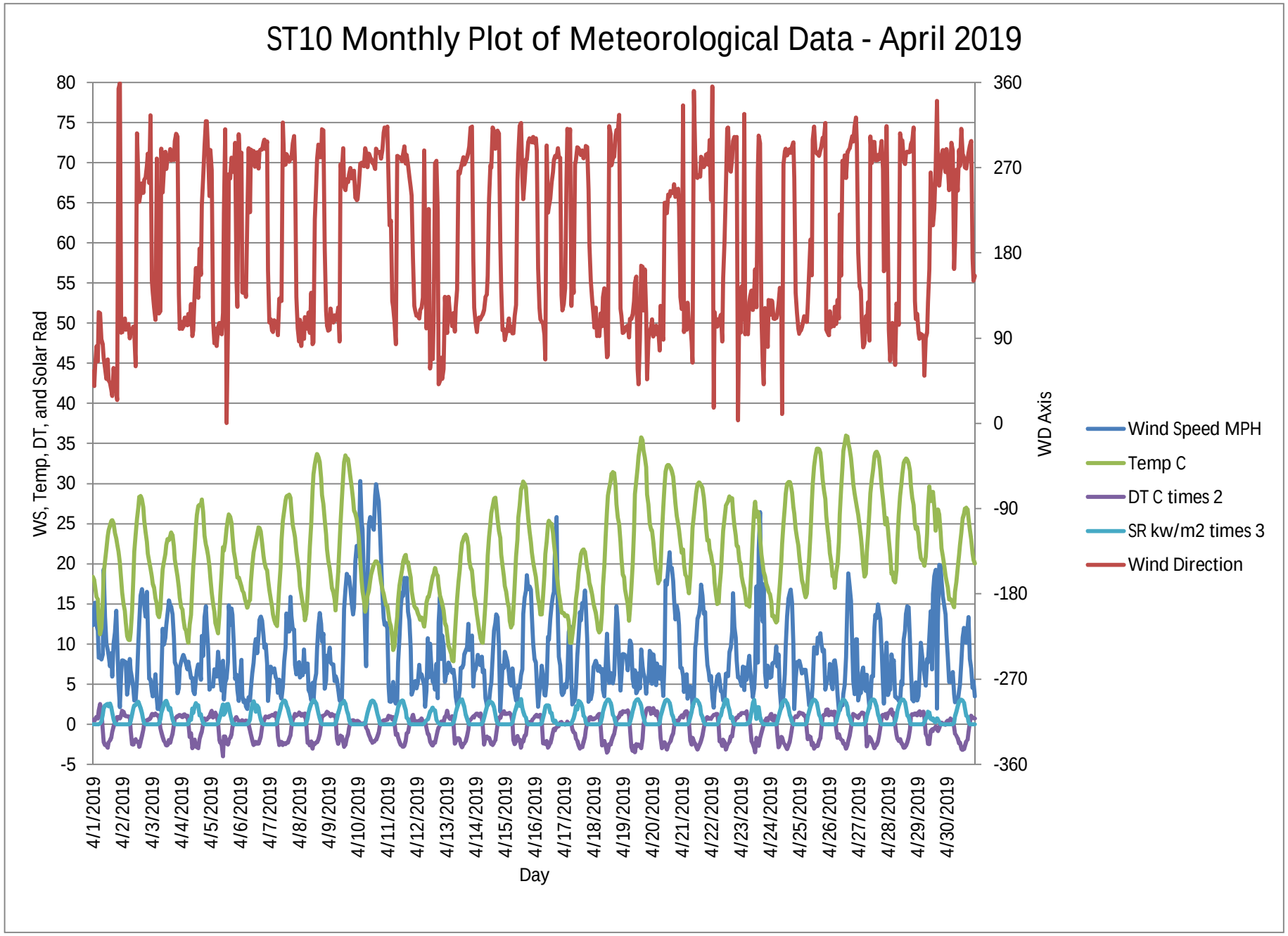
AZMET and ST10 Reported Precipitation Totals

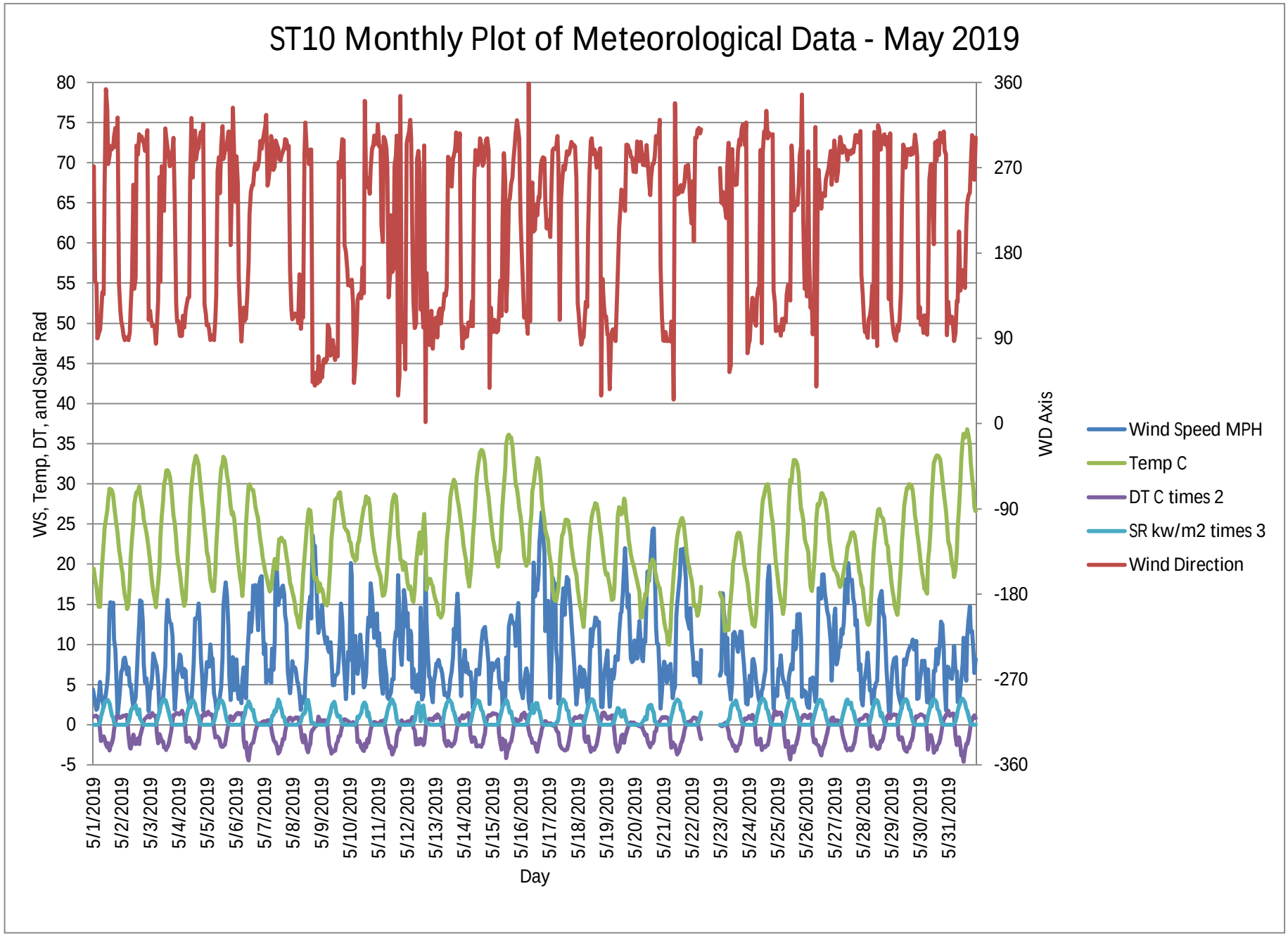
(inches/month)

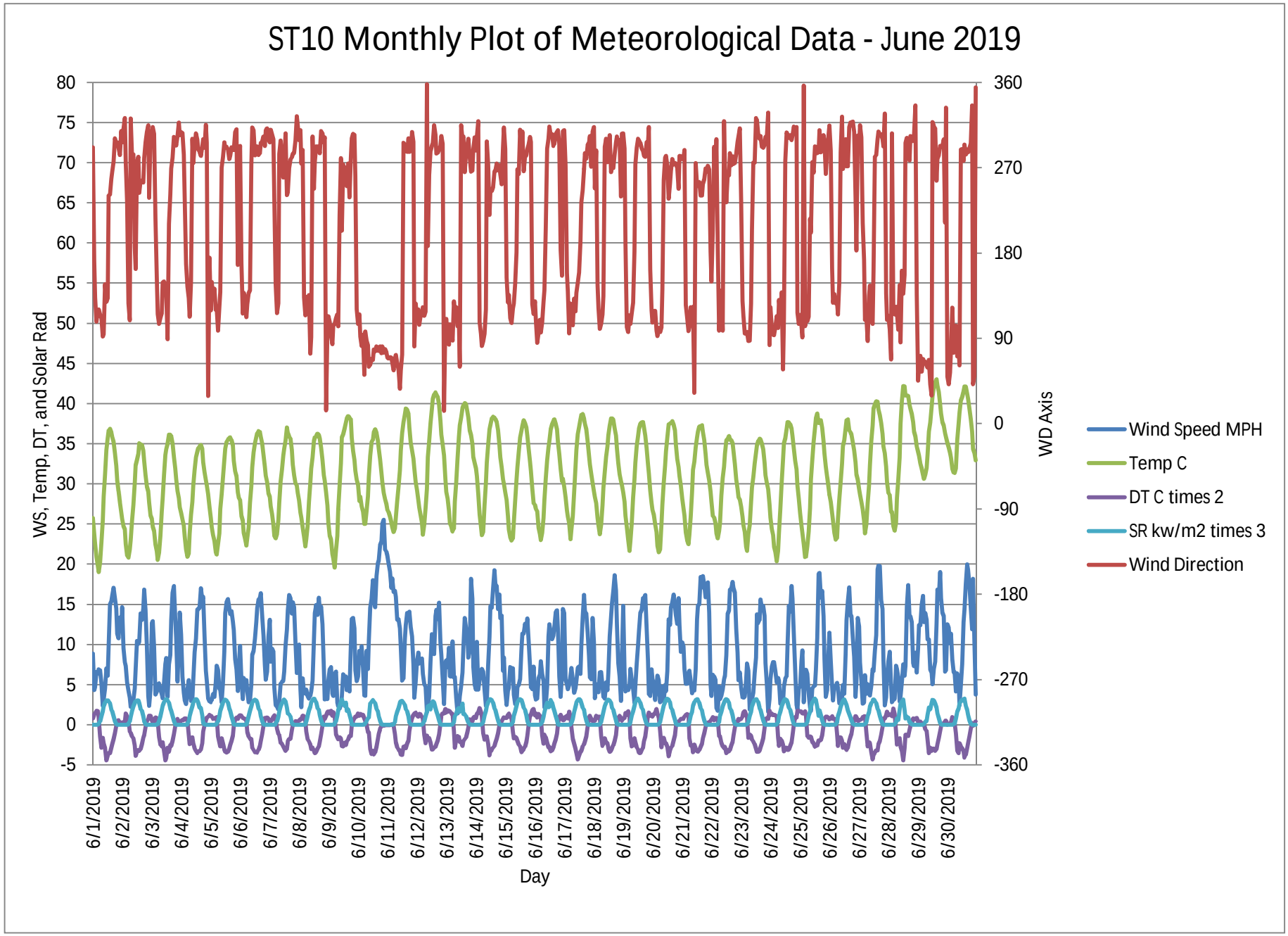
Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Oct-18	1.33	1.80	1.57	N/A
Nov-18	0.14	0.35	0.25	0.25
Dec-18	0.74	0.49	0.62	0.89
Jan-19	0.63	0.54	0.59	0.99
Feb-19	2.79	0.80	1.80	3.55
Mar-19	0.43	0.87	0.65	0.53
Apr-19	0.17	0.22	0.20	0.08
May-19	0.04	0.01	0.03	0.17
Jun-19	0.00	0.00	0.00	0.00
Jul-19	0.59	0.48	0.54	0.21
Aug-19	0.13	0.48	0.31	0.01
Sep-19	0.33	0.60	0.47	0.00
Totals Nov-Sept	5.99	4.84	5.42	6.68

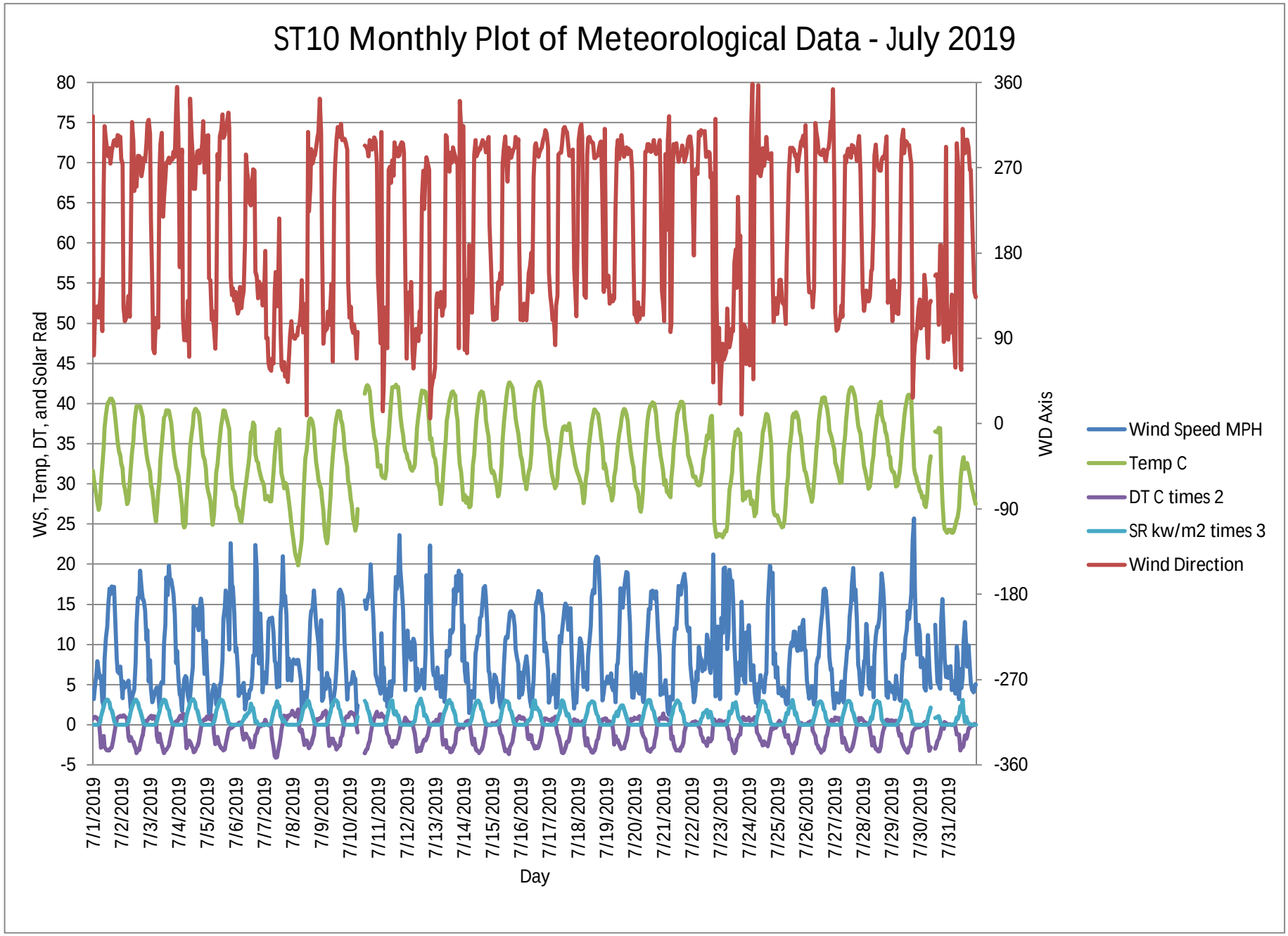
APPENDIX C

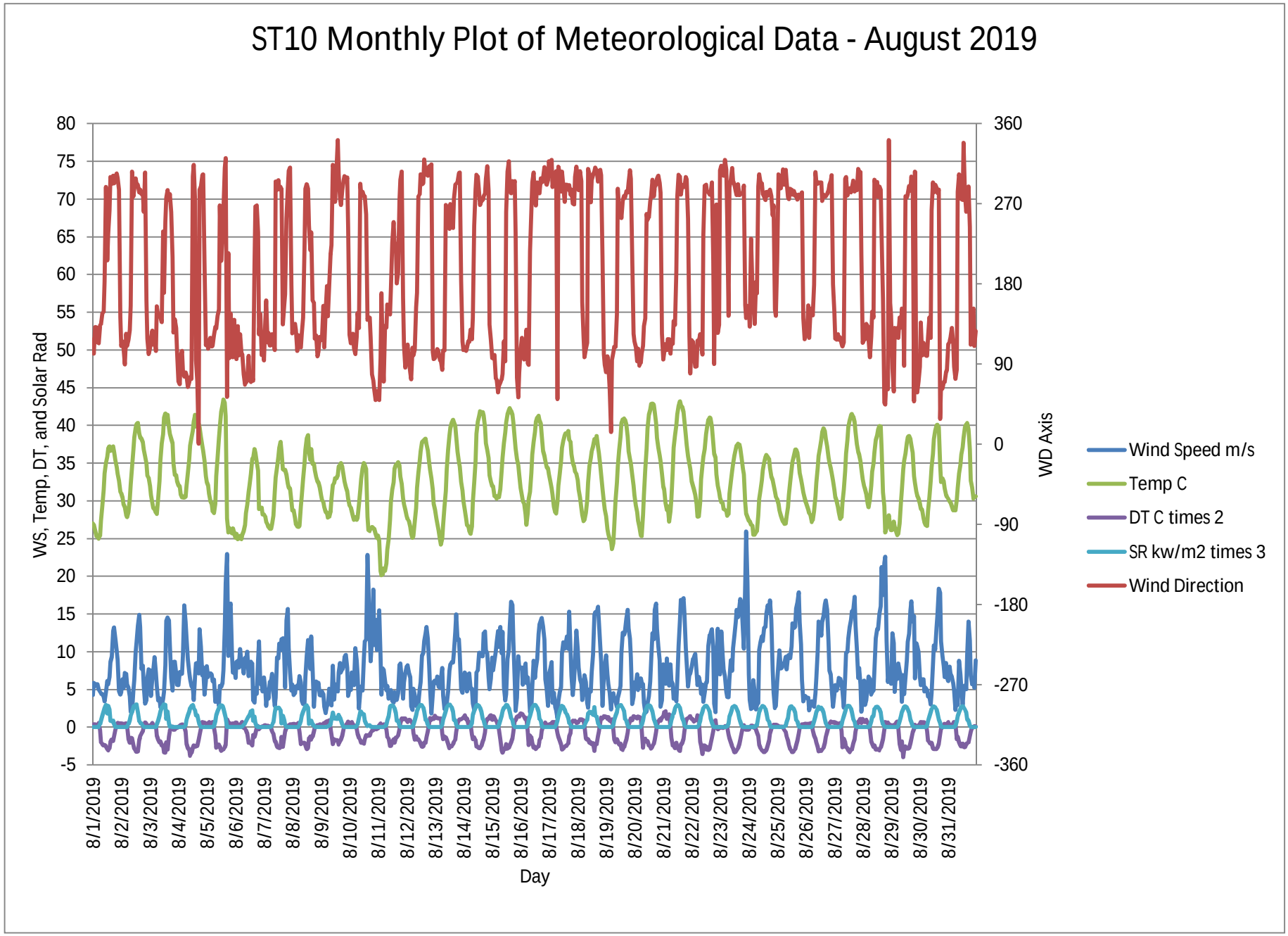
Monthly Data Plots and Tables

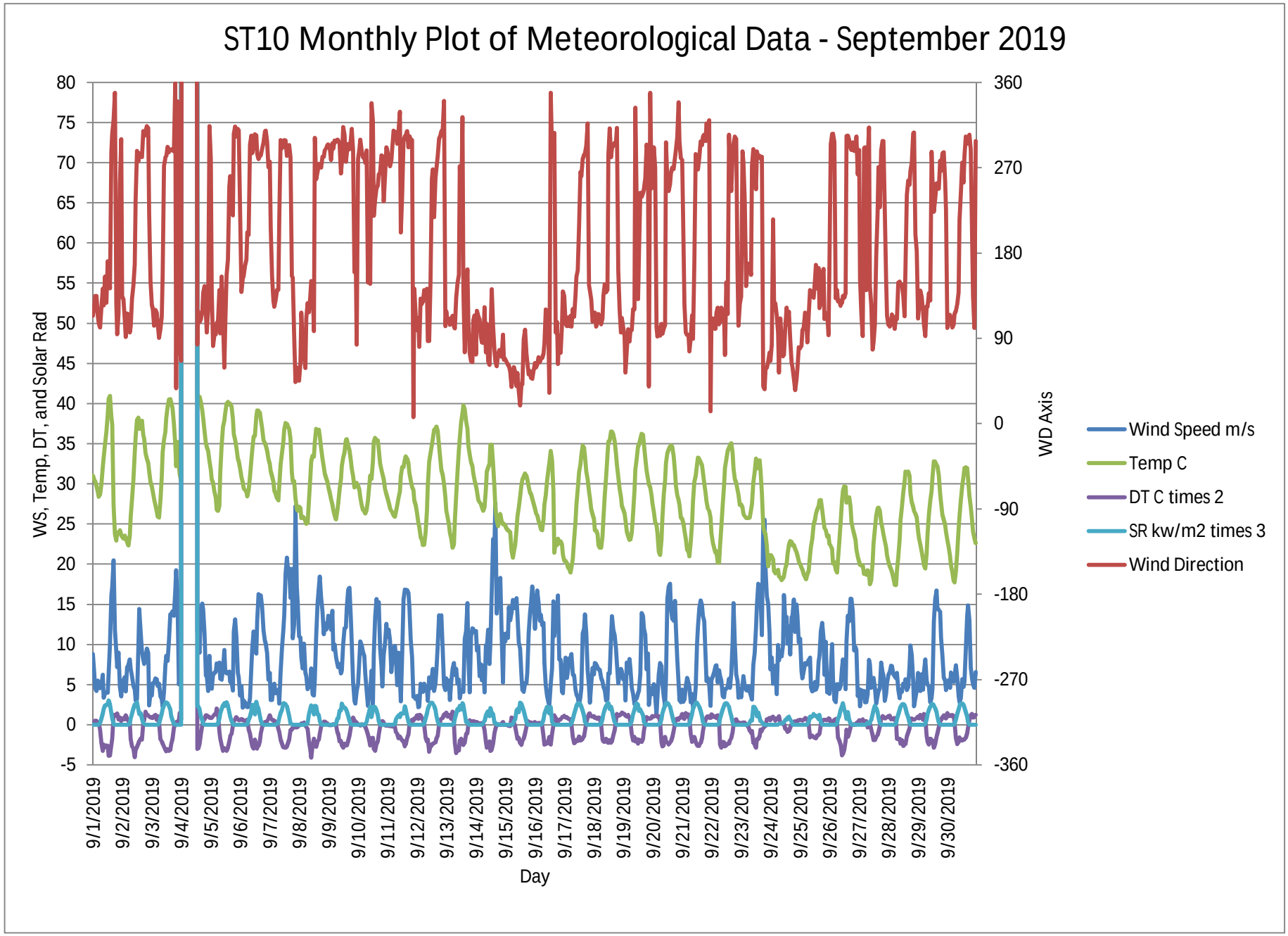

ST10 Monthly Plot of Meteorological Data - April 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
4/1/2019
4/2/2019
4/3/2019
4/4/2019
4/5/2019
4/6/2019
4/7/2019
4/8/2019
4/9/2019
4/10/2019
4/11/2019
4/12/2019
4/13/2019
4/14/2019
4/15/2019
4/16/2019
4/17/2019
4/18/2019
4/19/2019
4/20/2019
4/21/2019
4/22/2019
4/23/2019
4/24/2019
4/25/2019
4/26/2019
4/27/2019
4/28/2019
4/29/2019
4/30/2019


ST10 Monthly Plot of Meteorological Data - May 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
5/1/2019
5/2/2019
5/3/2019
5/4/2019
5/5/2019
5/6/2019
5/7/2019
5/8/2019
5/9/2019
5/10/2019
5/11/2019
5/12/2019
5/13/2019
5/14/2019
5/15/2019
5/16/2019
5/17/2019
5/18/2019
5/19/2019
5/20/2019
5/21/2019
5/22/2019
5/23/2019
5/24/2019
5/25/2019
5/26/2019
5/27/2019
5/28/2019
5/29/2019
5/30/2019
5/31/2019


ST10 Monthly Plot of Meteorological Data - June 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
6/1/2019
6/2/2019
6/3/2019
6/4/2019
6/5/2019
6/6/2019
6/7/2019
6/8/2019
6/9/2019
6/10/2019
6/11/2019
6/12/2019
6/13/2019
6/14/2019
6/15/2019
6/16/2019
6/17/2019
6/18/2019
6/19/2019
6/20/2019
6/21/2019
6/22/2019
6/23/2019
6/24/2019
6/25/2019
6/26/2019
6/27/2019
6/28/2019
6/29/2019
6/30/2019


ST10 Monthly Plot of Meteorological Data - July 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
7/1/2019
7/2/2019
7/3/2019
7/4/2019
7/5/2019
7/6/2019
7/7/2019
7/8/2019
7/9/2019
7/10/2019
7/11/2019
7/12/2019
7/13/2019
7/14/2019
7/15/2019
7/16/2019
7/17/2019
7/18/2019
7/19/2019
7/20/2019
7/21/2019
7/22/2019
7/23/2019
7/24/2019
7/25/2019
7/26/2019
7/27/2019
7/28/2019
7/29/2019
7/30/2019
7/31/2019


ST10 Monthly Plot of Meteorological Data - August 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
8/1/2019
8/2/2019
8/3/2019
8/4/2019
8/5/2019
8/6/2019
8/7/2019
8/8/2019
8/9/2019
8/10/2019
8/11/2019
8/12/2019
8/13/2019
8/14/2019
8/15/2019
8/16/2019
8/17/2019
8/18/2019
8/19/2019
8/20/2019
8/21/2019
8/22/2019
8/23/2019
8/24/2019
8/25/2019
8/26/2019
8/27/2019
8/28/2019
8/29/2019
8/30/2019
8/31/2019


ST10 Monthly Plot of Meteorological Data - September 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
9/1/2019
9/2/2019
9/3/2019
9/4/2019
9/5/2019
9/6/2019
9/7/2019
9/8/2019
9/9/2019
9/10/2019
9/11/2019
9/12/2019
9/13/2019
9/14/2019
9/15/2019
9/16/2019
9/17/2019
9/18/2019
9/19/2019
9/20/2019
9/21/2019
9/22/2019
9/23/2019
9/24/2019
9/25/2019
9/26/2019
9/27/2019
9/28/2019
9/29/2019
9/30/2019

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
APRIL - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	12.4	14.5	15.1	12.4	11.7	8.3	8.3	8.1	8.7	19.3	13.4	10.1	9.3	8.6	7.2	8.9	5.9	10.1	11.5	14.1	10.5	4.9	2.1	6.5	10.1
2	7.9	7.9	7.8	7.8	3.7	5.1	8.1	6.7	5.7	4.4	3.0	3.0	5.6	10.2	12.7	16.0	16.8	15.6	15.0	13.4	16.5	12.3	5.7	5.6	9.0
3	4.1	3.5	4.6	6.2	3.1	1.9	2.3	1.8	5.5	11.9	9.9	10.8	12.3	13.9	15.4	14.7	14.6	13.7	10.8	7.8	7.3	3.9	4.6	7.0	8.0
4	7.8	8.3	8.6	8.1	7.6	6.9	7.8	6.8	5.8	5.8	4.2	3.8	5.7	6.8	7.5	7.1	5.5	11.0	8.5	13.4	14.7	12.3	9.4	4.3	7.8
5	4.6	4.9	4.7	6.8	6.5	6.0	9.1	7.0	5.6	4.2	7.9	3.1	5.2	5.8	7.7	14.8	12.4	14.4	13.6	10.1	5.7	6.2	4.3	2.9	7.2
6	5.9	8.0	3.6	2.8	3.0	2.2	1.9	3.4	3.0	4.4	6.3	7.7	10.0	10.6	8.9	11.0	12.9	13.4	12.8	11.0	9.5	9.9	7.6	2.9	7.2
7	5.0	7.2	6.5	6.8	7.0	5.9	5.6	3.9	5.6	3.6	3.2	4.7	7.9	9.6	13.8	11.6	11.6	15.9	13.5	11.8	11.8	7.4	6.2	7.2	8.0
8	7.7	5.9	6.3	6.1	9.3	6.5	7.2	7.6	4.3	4.0	3.0	5.2	2.8	5.4	6.3	9.4	12.2	13.9	12.5	10.3	11.3	4.4	5.5	8.5	7.3
9	8.4	9.5	7.7	7.5	7.5	5.4	6.0	5.5	4.3	3.0	2.8	3.1	8.8	14.4	16.8	18.7	18.2	18.4	17.0	15.0	13.7	14.6	20.3	22.2	11.2
10	21.0	22.4	30.3	25.2	24.3	17.5	10.5	7.2	17.8	24.9	25.8	25.0	24.7	24.2	28.5	29.9	28.8	27.8	25.3	20.7	16.2	13.2	12.4	12.6	21.5
11	11.9	4.7	2.9	2.8	4.3	5.3	3.0	2.6	2.9	7.7	10.7	14.6	16.4	16.0	18.2	17.0	18.2	14.0	13.0	9.4	3.7	4.3	5.1	5.4	8.9
12	4.5	5.2	7.4	5.9	6.2	5.5	4.9	2.2	4.2	10.7	5.9	10.1	7.1	5.3	5.3	4.3	7.5	3.2	12.7	15.9	8.1	11.1	9.8	5.3	7.0
13	6.3	6.3	7.7	7.2	6.7	6.4	6.8	5.3	3.4	2.4	3.1	4.3	7.0	7.0	7.5	8.7	9.2	9.6	12.5	9.2	10.5	11.0	4.7	6.5	7.1
14	6.9	7.7	8.6	7.7	7.4	8.4	6.5	6.7	3.2	2.4	2.4	2.8	4.5	5.1	8.4	11.7	12.6	13.7	13.3	9.7	1.6	4.0	7.3	7.0	7.1
15	9.1	8.4	7.8	6.4	5.1	4.8	7.0	5.4	3.9	3.0	2.8	4.8	4.5	6.1	6.8	13.7	15.8	16.7	18.6	16.9	17.2	16.8	13.6	10.0	9.4
16	8.2	7.7	5.2	2.2	4.1	5.0	7.3	6.1	3.7	3.6	5.2	10.9	10.6	13.1	14.9	16.1	16.5	22.9	25.8	12.8	8.4	7.3	4.0	3.7	9.4
17	3.9	5.0	4.6	5.9	11.5	12.1	5.0	2.5	2.7	3.1	4.6	8.5	11.0	14.0	12.9	15.1	14.9	16.6	14.7	10.6	2.8	3.5	3.1	4.0	8.0
18	7.1	7.4	7.9	7.4	6.7	7.2	6.5	6.9	4.2	3.5	7.2	11.3	8.1	5.1	6.4	5.4	5.1	6.2	11.6	14.7	12.5	7.6	4.2	5.9	7.3
19	8.8	8.7	8.6	8.5	6.8	8.9	10.4	9.9	5.7	4.7	6.7	3.8	4.3	6.3	4.5	9.3	7.2	6.4	5.7	3.8	5.6	5.3	9.2	8.8	7.0
20	5.0	8.7	7.2	4.9	7.6	6.8	5.6	7.2	6.2	3.5	8.1	17.9	17.4	19.5	21.4	19.3	19.5	17.8	15.6	13.1	14.8	13.9	12.4	7.1	11.7
21	7.0	6.1	4.1	5.2	6.2	3.2	4.5	4.7	4.2	2.0	3.1	9.6	10.4	13.1	13.6	14.9	17.4	16.0	13.8	14.0	9.9	7.4	6.4	5.4	8.4
22	6.0	3.4	2.1	4.1	4.8	6.0	6.2	5.5	4.1	4.0	3.0	3.2	6.3	6.3	6.0	9.0	9.6	11.5	16.4	12.1	10.8	8.0	5.8	5.8	6.7
23	5.3	4.8	7.2	4.3	7.1	5.6	7.1	8.5	6.8	5.1	3.4	4.5	6.7	17.2	7.7	21.9	26.4	14.6	12.8	17.5	6.4	4.6	7.3	6.2	9.1
24	5.8	5.9	7.5	7.7	7.8	9.7	7.2	8.7	4.2	2.0	2.2	3.7	6.3	9.8	13.5	15.6	16.4	16.8	15.1	9.9	1.9	5.6	7.8	7.4	8.3
25	7.9	7.2	6.3	6.7	6.8	6.8	5.3	4.2	2.4	2.5	3.4	5.1	9.6	9.3	8.8	10.8	10.5	11.3	10.1	9.1	9.3	4.3	4.9	5.8	7.0
26	5.8	7.5	5.1	4.4	7.7	7.9	6.7	3.7	1.7	1.8	2.4	2.4	3.8	5.0	8.3	15.4	18.8	17.2	15.4	9.3	5.4	3.8	10.6	10.6	7.5
27	3.0	3.9	4.0	6.3	7.1	4.6	4.2	6.2	3.7	2.0	2.7	6.0	6.0	12.1	13.6	13.2	14.9	14.0	13.1	9.4	4.9	2.6	7.1	10.2	7.3
28	3.6	4.1	4.3	8.7	7.5	8.0	3.5	3.3	3.2	2.9	2.9	5.4	5.0	10.5	11.6	13.7	14.7	14.6	10.4	6.9	3.1	2.9	4.5	5.2	6.7
29	3.0	3.6	5.8	10.2	8.5	7.1	6.2	4.8	8.1	7.8	10.9	14.1	6.8	16.2	18.5	19.2	2.0	12.8	19.9	19.7	18.0	15.9	14.8	13.7	11.1
30	11.1	8.4	5.3	5.4	5.3	6.5	3.8	2.8	3.0	2.7	4.2	4.9	7.7	10.9	12.0	11.4	10.2	12.1	13.3	8.2	7.0	4.5	5.4	3.5	7.1
HRAVE	7.2	7.2	7.2	7.1	7.3	6.7	6.1	5.5	4.9	5.4	5.8	7.5	8.4	10.6	11.5	13.6	13.5	14.1	14.1	12.0	9.3	7.8	7.5	7.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	10.1	9.0	8.0	7.8	7.2	7.2	8.0	7.3	11.2	21.5	8.9	7.0	7.1	7.1	9.4	9.4	8.0	7.3	7.0	11.7	8.4	6.7	9.1	8.3	7.0
MAX	19.3	16.8	15.4	14.7	14.8	13.4	15.9	13.9	22.2	30.3	18.2	15.9	12.5	13.7	18.6	25.8	16.6	14.7	10.4	21.4	17.4	16.4	26.4	16.8	11.3
MIN	2.1	3.0	1.8	3.8	2.9	1.9	3.2	2.8	2.8	7.2	2.6	2.2	2.4	1.6	2.8	2.2	2.5	3.5	3.8	3.5	2.0	2.1	3.4	1.9	2.4

DAY	26	27	28	29	30	31
AVE	7.5	7.3	6.7	11.1	7.1	***
MAX	18.8	14.9	14.7	19.9	13.3	***
MIN	1.7	2.0	2.9	2.0	2.7	***

MONTHLY AVERAGE = 8.6 MONTHLY MAXIMUM = 30.3 MONTHLY MINIMUM = 1.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
APRIL - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	55	39	60	81	65	117	116	89	83	69	58	47	67	45	43	35	29	59	38	34	25	353	359	96	290
2	96	107	111	99	104	105	90	96	97	102	96	60	306	257	234	244	254	243	256	259	272	285	254	325	354
3	151	138	122	109	280	165	116	118	290	244	270	287	268	280	281	289	278	285	278	298	306	302	136	100	39
4	108	100	102	112	111	104	115	104	126	92	98	137	164	139	132	185	157	230	260	292	319	319	285	240	105
5	289	267	109	85	100	82	101	106	100	94	117	222	310	0	99	263	259	281	277	265	296	151	123	305	170
6	271	286	138	138	146	134	216	290	223	289	287	288	271	279	286	269	286	289	289	297	300	290	298	162	238
7	107	110	98	97	109	105	105	93	132	133	130	318	273	274	284	281	276	281	280	296	303	274	134	100	27
8	87	109	82	105	89	112	106	100	117	95	138	84	86	215	252	279	294	281	281	311	310	185	119	104	117
9	98	99	121	109	106	114	109	111	122	87	273	266	290	251	246	258	255	263	270	259	265	267	238	236	297
10	237	253	275	276	275	272	291	286	271	285	281	280	275	274	269	290	286	286	287	280	288	307	313	306	51
11	314	252	209	214	129	123	108	84	282	282	281	280	277	284	293	274	283	273	260	249	241	174	124	119	43
12	113	114	111	119	122	133	288	201	100	157	226	58	75	68	114	275	277	224	41	45	70	47	58	133	196
13	101	96	134	116	110	103	116	97	122	141	266	264	269	275	281	273	277	280	286	293	312	314	174	122	3
14	106	97	107	112	110	113	115	120	133	136	156	237	272	270	312	308	290	300	309	306	191	143	98	99	133
15	88	95	100	111	98	102	95	95	114	125	256	284	314	317	261	237	255	279	279	297	301	297	297	302	234
16	296	301	288	164	122	110	107	105	94	67	293	223	229	237	254	266	278	283	281	291	281	281	136	119	103
17	126	143	257	311	283	311	124	161	138	273	278	292	290	287	283	288	280	283	293	292	247	188	151	131	108
18	115	101	122	92	96	92	116	103	133	143	100	70	72	314	306	272	280	281	304	310	308	326	121	113	286
19	96	97	100	102	103	91	110	110	115	129	148	155	57	41	88	166	165	119	162	116	46	88	97	102	320
20	110	92	98	103	94	99	77	124	95	88	233	233	222	242	240	245	243	244	252	239	243	248	229	134	255
21	121	336	97	112	99	128	105	106	86	64	351	282	262	259	262	260	282	277	271	273	284	285	273	299	355
22	236	356	17	117	103	102	110	109	115	87	153	192	247	310	312	269	266	280	298	302	301	303	3	133	340
23	96	144	110	327	94	112	94	128	135	140	120	140	163	123	266	304	296	114	61	42	122	101	81	130	233
24	114	130	129	111	110	111	115	126	143	131	10	274	287	290	283	287	290	286	292	297	259	138	116	100	18
25	95	98	102	108	113	108	107	126	160	194	156	300	313	287	285	286	282	289	292	302	301	317	100	96	170
26	93	118	102	108	103	123	105	130	111	221	156	277	259	283	259	286	287	290	298	303	298	314	323	295	237
27	180	145	140	107	80	85	113	97	128	88	303	275	297	297	278	278	283	279	286	298	269	161	165	314	287
28	190	99	66	92	106	100	62	127	121	104	306	297	299	279	274	284	287	286	287	294	298	312	130	110	36
29	115	96	89	95	93	90	51	90	96	128	163	265	224	209	226	271	340	272	251	267	282	289	273	265	244
30	290	271	246	275	296	288	163	190	268	246	289	272	311	284	280	270	269	279	286	293	298	175	151	156	166

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
APRIL - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	18	17	22	10	13	22	24	20	19	10	14	28	25	42	45	25	35	18	13	9	7	30	49	11	22
2	7	6	7	7	21	10	5	8	15	26	44	39	40	28	26	18	15	18	11	9	9	11	29	53	19
3	44	32	17	50	28	32	31	37	23	19	26	20	21	20	15	17	13	16	10	6	6	30	15	14	23
4	6	9	7	7	6	8	8	10	10	16	30	42	34	33	40	34	32	28	11	8	9	11	18	30	19
5	16	21	9	14	15	23	10	12	15	26	18	32	32	42	39	16	21	13	10	13	23	7	11	32	20
6	23	18	38	40	16	26	34	20	30	24	30	31	20	28	34	21	19	14	10	6	5	3	11	31	22
7	9	9	7	8	9	6	8	13	17	31	34	46	23	22	24	22	14	10	8	7	6	22	8	10	16
8	9	15	20	8	7	8	8	9	19	27	59	27	63	45	32	26	13	11	8	7	6	19	8	7	19
9	7	7	7	9	8	8	7	11	17	49	33	32	21	20	23	18	17	12	9	10	10	10	10	9	15
10	8	12	9	10	10	14	18	17	13	13	14	14	15	13	15	12	13	12	12	8	9	10	10	9	12
11	10	22	29	23	8	15	25	28	36	19	18	21	19	17	14	20	15	13	13	10	15	20	10	13	18
12	13	17	10	17	33	48	36	19	50	22	32	27	32	44	44	55	27	24	46	8	30	10	19	16	28
13	10	15	6	7	8	10	11	16	25	37	44	50	30	37	45	32	22	24	10	6	8	6	26	13	21
14	7	8	9	13	12	8	8	9	30	37	44	52	52	59	32	23	17	13	9	7	25	11	11	8	21
15	7	10	8	8	8	11	6	9	16	31	47	26	32	49	49	21	19	13	10	8	10	9	8	7	18
16	10	10	17	10	7	8	12	10	20	37	40	29	31	19	21	15	18	10	8	12	9	27	35	13	18
17	14	10	27	10	14	10	33	21	23	35	34	23	24	17	19	14	15	12	9	9	35	32	20	11	20
18	6	10	10	10	10	7	9	10	22	23	41	23	25	50	45	40	33	21	9	6	6	9	42	8	20
19	7	7	9	6	8	6	7	8	17	26	22	38	59	44	39	23	28	38	18	14	28	33	10	13	21
20	21	8	11	19	9	12	15	9	18	46	58	18	22	21	18	16	14	14	12	9	8	11	11	22	18
21	13	31	54	29	27	21	14	15	21	59	56	32	24	24	27	21	14	17	11	8	8	9	15	48	25
22	26	45	24	14	11	9	11	14	18	20	49	50	56	42	53	37	22	18	10	8	7	8	22	21	25
23	17	11	11	40	10	9	12	12	6	15	37	57	22	21	36	14	10	39	14	11	25	21	14	18	20
24	15	10	8	9	7	6	9	11	21	59	44	59	28	24	19	17	16	12	11	8	39	11	7	8	19
25	7	9	14	9	10	10	11	16	50	61	47	35	22	28	38	21	20	13	12	6	5	30	11	10	21
26	11	11	39	13	8	9	9	15	32	54	37	54	46	67	49	18	12	15	10	6	6	23	10	25	24
27	42	21	22	8	25	25	12	10	22	40	47	36	55	33	18	24	18	13	10	6	36	29	40	16	25
28	22	12	28	18	10	7	24	16	25	37	55	35	64	28	26	19	17	16	11	5	16	23	17	21	23
29	19	32	12	15	9	12	38	46	20	22	26	16	40	18	20	26	28	22	15	10	8	10	10	19	20
30	9	7	18	11	27	9	19	21	42	68	58	49	32	28	20	23	19	18	10	9	5	13	10	42	24
HRAVE	14	15	17	15	13	14	16	16	23	33	38	35	34	32	31	23	19	17	12	8	14	17	17	19	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	22	19	23	19	20	22	16	19	15	12	18	28	21	21	18	18	20	20	21	18	25	25	20	19	21
MAX	49	53	50	42	42	40	46	63	49	18	36	55	50	59	49	40	35	50	59	58	59	56	57	59	61
MIN	7	5	6	6	7	3	6	6	7	8	8	8	6	7	6	7	9	6	6	8	8	7	6	6	5

DAY	26	27	28	29	30	31
AVE	24	25	23	20	24	***
MAX	67	55	64	46	68	***
MIN	6	6	5	8	5	***

MONTHLY AVERAGE = 20.5 MONTHLY MAXIMUM = 67.8 MONTHLY MINIMUM = 2.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
APRIL - 2019

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	18.4	18.0	17.1	15.9	15.6	13.1	11.2	12.0	15.2	18.8	20.3	21.8	23.5	24.2	24.7	25.3	25.4	25.0	23.8	23.1	22.4	21.5	20.1	17.9	19.8
2	16.4	15.0	14.1	12.7	11.1	10.5	10.5	11.5	14.1	18.4	21.5	23.6	25.6	27.0	28.3	28.4	28.0	27.1	25.5	24.0	22.7	21.3	20.3	19.4	19.9
3	18.4	17.5	17.0	15.7	15.0	13.8	13.4	14.4	16.7	19.3	20.3	21.2	22.4	23.1	23.0	23.5	23.9	23.6	22.1	20.6	19.5	18.4	17.0	15.8	19.0
4	14.7	14.3	13.1	12.0	11.7	10.6	10.1	12.4	13.6	17.5	19.6	21.9	24.7	26.1	27.2	27.3	27.3	27.3	28.0	26.4	23.5	22.4	21.9	21.0	19.6	19.5
5	18.2	16.4	15.1	14.0	12.7	12.1	11.3	13.6	16.0	18.9	22.0	21.7	22.6	24.4	25.6	26.1	25.9	25.1	23.5	21.6	20.6	19.3	18.3	18.3	19.3
6	17.7	17.1	16.7	16.4	15.6	15.2	14.6	15.1	15.5	17.8	19.8	21.5	22.3	22.8	23.7	24.5	24.5	24.0	22.5	21.0	20.2	19.5	19.2	18.1	19.4
7	16.7	15.6	14.7	13.7	13.0	12.5	12.2	14.1	17.1	19.6	22.9	25.4	26.6	27.9	28.4	28.5	28.6	28.1	26.7	24.8	24.0	23.3	21.5	20.3	21.1
8	18.9	17.1	16.1	15.1	14.1	13.0	13.8	16.2	18.5	22.2	25.0	29.1	31.1	32.4	33.3	33.7	33.3	32.6	30.7	28.6	27.5	25.5	23.7	21.8	23.9
9	20.4	19.4	18.5	17.0	16.5	15.5	14.2	16.5	19.0	22.6	24.9	28.0	30.9	32.6	33.5	33.2	33.0	32.2	30.8	29.5	28.0	26.7	26.3	25.6	24.8
10	24.6	23.1	20.3	17.8	16.6	15.5	14.0	14.6	16.0	16.7	17.9	18.6	19.3	19.9	20.2	20.3	20.1	19.8	18.8	17.7	16.9	16.2	15.7	14.9	18.2
11	14.7	13.6	12.8	12.2	10.8	9.3	9.8	11.8	13.4	15.5	17.3	18.3	19.3	20.2	20.8	21.1	20.2	20.2	19.2	18.3	16.7	15.6	14.8	14.5	15.8
12	14.4	13.8	13.4	13.0	13.3	12.9	12.2	13.1	15.2	15.9	15.9	16.7	17.6	18.4	18.7	19.5	18.8	18.5	17.3	16.0	15.4	15.0	14.2	12.6	15.5
13	12.2	11.2	9.8	9.3	8.8	8.0	7.9	11.0	13.0	15.6	17.7	19.2	21.0	22.5	23.0	23.4	23.6	23.2	22.2	20.4	19.5	19.2	17.3	16.0	16.5
14	15.2	13.7	12.9	11.7	10.8	10.3	10.1	12.5	15.1	18.1	21.0	23.4	25.0	26.3	27.2	28.1	28.3	27.1	25.5	24.1	23.2	21.1	19.8	18.4	19.5
15	17.2	16.5	15.3	14.5	12.8	12.1	12.4	14.2	17.5	20.9	23.0	25.8	27.2	29.2	29.8	30.3	30.0	29.4	27.7	25.6	24.0	22.7	21.5	20.2	21.7
16	19.2	18.3	17.2	15.7	14.8	13.7	13.7	16.0	18.6	21.2	22.8	24.9	25.4	25.1	25.0	23.8	22.6	21.0	18.8	17.3	16.3	15.3	13.9	13.9	18.9
17	13.9	13.5	13.6	13.5	12.8	10.1	10.1	11.1	12.3	13.8	15.6	16.9	18.9	20.1	21.1	21.6	21.8	21.5	20.7	19.4	18.6	17.6	16.9	16.1	16.3
18	15.1	14.6	13.9	12.8	11.8	11.5	11.7	14.0	17.2	19.6	23.4	26.6	28.5	29.5	30.3	31.2	31.4	31.3	29.7	27.4	25.7	24.9	22.7	20.7	21.9
19	18.7	18.3	16.8	15.9	15.0	12.9	14.2	16.9	19.9	24.1	28.7	30.3	32.0	33.4	34.6	35.8	35.4	34.2	33.3	32.1	28.6	27.4	25.0	24.2	25.3
20	24.1	22.7	20.8	19.2	18.7	17.6	17.9	19.7	23.8	27.1	29.9	31.4	32.2	32.3	32.2	32.0	31.5	30.8	29.5	27.5	25.9	25.0	24.2	22.7	25.8
21	21.4	21.8	20.0	18.6	18.4	17.4	16.3	18.5	21.8	24.5	26.0	27.6	28.8	29.9	30.1	30.0	29.8	29.4	28.3	26.5	24.5	22.9	23.0	21.8	24.1
22	21.1	20.1	19.8	17.7	16.2	15.0	15.1	17.1	19.0	22.1	24.1	25.7	27.1	27.5	27.8	28.4	28.1	28.2	26.4	24.8	23.5	22.3	22.1	20.4	22.5
23	19.9	18.5	17.6	16.9	16.1	14.9	14.9	14.6	16.5	19.9	23.8	26.8	27.7	25.9	26.5	26.1	23.2	21.1	19.9	19.0	18.4	17.4	17.0	16.5	20.0
24	16.2	15.3	13.4	13.6	13.0	12.7	12.8	15.4	17.5	20.1	22.5	25.0	27.1	28.8	30.0	30.2	30.2	29.9	28.9	27.1	26.3	24.3	23.2	22.3	21.9
25	21.0	19.5	18.0	17.4	16.6	15.9	16.4	18.4	20.7	23.7	27.7	30.0	32.2	33.4	34.3	34.4	34.3	33.8	32.7	30.5	29.1	28.1	26.0	24.3	25.7
26	22.8	21.4	20.2	18.4	18.5	17.0	18.9	20.0	22.7	26.2	29.3	32.0	34.1	35.0	36.0	35.8	35.1	34.3	33.2	31.4	30.0	28.7	27.7	27.1	27.3
27	26.1	24.8	23.3	22.1	19.9	18.4	18.8	21.4	23.7	26.7	28.8	30.4	31.7	33.3	33.8	34.0	33.6	33.2	31.8	29.6	28.1	26.9	24.9	25.7	27.1
28	24.4	23.0	21.2	18.8	19.0	17.9	17.7	19.2	22.8	26.1	28.4	30.0	31.2	32.5	33.0	33.1	33.0	32.5	31.6	29.8	28.3	27.3	24.9	24.4	26.2
29	24.6	23.5	22.0	20.8	20.4	20.2	19.8	20.9	23.7	27.0	29.6	27.9	27.9	29.0	27.1	24.1	25.3	26.8	26.1	23.9	21.9	20.9	19.8	18.5	23.8
30	17.9	17.1	15.6	15.6	15.4	15.0	14.6	16.5	17.7	19.5	21.1	22.3	23.9	25.7	26.2	26.9	27.0	26.8	25.7	24.3	23.0	21.3	20.6	20.0	20.8
HRAVE	18.8	17.8	16.7	15.6	14.8	13.8	13.7	15.4	17.8	20.6	23.0	24.8	26.3	27.3	27.8	28.0	27.8	27.3	26.0	24.3	23.0	21.9	20.7	19.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19.8	19.9	19.0	19.5	19.3	19.4	21.1	23.9	24.8	18.2	15.8	15.5	16.5	19.5	21.7	18.9	16.3	21.9	25.3	25.8	24.1	22.5	20.0	21.9	25.7
MAX	25.4	28.4	23.9	28.0	26.1	24.5	28.6	33.7	33.5	24.6	21.1	19.5	23.6	28.3	30.3	25.4	21.8	31.4	35.8	32.3	30.1	28.4	27.7	30.2	34.4
MIN	11.2	10.5	13.4	10.1	11.3	14.6	12.2	13.0	14.2	14.0	9.3	12.2	7.9	10.1	12.1	13.7	10.1	11.5	12.9	17.6	16.3	15.0	14.6	12.7	15.9

DAY	26	27	28	29	30	31
AVE	27.3	27.1	26.2	23.8	20.8	***
MAX	36.0	34.0	33.1	29.6	27.0	***
MIN	17.0	18.4	17.7	18.5	14.6	***

MONTHLY AVERAGE = 21.4 MONTHLY MAXIMUM = 36.0 MONTHLY MINIMUM = 7.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
APRIL - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.3	0.2	0.3	0.5	0.4	0.9	1.3	0.9	-0.4	-1.1	-1.3	-1.3	-1.5	-1.1	-1.0	-0.8	-0.5	-0.2	0.2	0.2	0.4	0.4	0.3	0.6	-0.1
2	0.8	0.8	0.5	0.5	0.5	0.5	0.5	-0.4	-1.2	-1.3	-1.0	-0.9	-1.1	-1.1	-1.4	-1.1	-0.7	-0.3	0.1	0.2	0.2	0.3	0.3	0.4	-0.2
3	0.6	0.6	0.6	0.7	0.6	0.6	0.5	-0.3	-0.5	-0.8	-1.0	-1.2	-1.3	-1.3	-1.0	-1.2	-0.9	-0.6	0.0	0.3	0.4	0.5	0.5	0.6	-0.1
4	0.5	0.5	0.6	0.6	0.5	0.5	0.1	-0.8	-0.6	-1.5	-1.1	-1.0	-1.4	-1.4	-1.5	-0.9	-0.6	-0.5	0.0	0.4	0.2	0.3	0.4	0.4	-0.3
5	0.6	0.9	0.4	0.6	0.7	0.6	0.1	-1.0	-1.1	-1.3	-2.0	-0.8	-0.8	-1.2	-1.3	-1.0	-0.9	-0.6	-0.2	0.1	0.3	0.4	0.3	0.2	-0.3
6	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.0	-0.4	-0.7	-1.0	-1.3	-1.2	-1.1	-1.2	-1.2	-1.0	-0.8	-0.2	0.2	0.3	0.5	0.4	0.4	-0.3
7	0.5	0.5	0.6	0.6	0.5	0.7	0.2	-0.8	-1.3	-1.1	-1.1	-1.3	-1.2	-1.2	-1.2	-1.1	-0.9	-0.7	-0.2	0.3	0.5	0.6	0.5	0.6	-0.2
8	0.7	0.7	0.5	0.6	0.5	0.7	0.0	-1.2	-1.1	-1.3	-1.1	-1.5	-1.2	-1.2	-1.1	-1.1	-0.9	-0.6	0.0	0.5	0.5	0.6	0.6	0.8	-0.2
9	0.7	0.6	0.5	0.6	0.5	0.6	0.5	-0.9	-1.2	-0.9	-0.7	-0.8	-1.1	-1.4	-1.3	-0.9	-0.6	-0.2	0.1	0.2	0.2	0.2	0.2	0.2	-0.2
10	0.2	0.2	0.1	0.0	0.0	0.1	0.0	-0.2	-0.4	-0.7	-0.9	-1.0	-1.2	-1.1	-1.0	-1.0	-0.8	-0.5	-0.1	0.1	0.2	0.2	0.2	0.3	-0.3
11	0.3	0.5	0.5	0.5	0.3	0.4	0.1	-0.7	-0.6	-0.8	-1.1	-1.3	-1.3	-1.4	-1.3	-1.0	-0.6	-0.5	-0.1	0.1	0.3	0.6	0.2	0.1	-0.3
12	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.2	-0.2	-0.6	-0.6	-1.1	-1.2	-1.3	-1.1	-1.1	-0.8	-0.4	-0.2	-0.1	0.2	0.1	0.1	0.5	-0.3
13	0.6	0.8	0.5	0.3	0.4	0.5	0.0	-1.2	-1.1	-0.9	-0.9	-0.9	-1.2	-1.4	-1.2	-1.2	-1.1	-0.8	-0.3	0.2	0.3	0.4	0.5	0.4	-0.3
14	0.6	0.7	0.6	0.5	0.7	0.4	-0.1	-1.3	-0.9	-0.8	-0.9	-0.8	-1.1	-1.2	-1.3	-1.2	-1.0	-0.6	0.0	0.4	0.4	0.6	0.7	0.8	-0.2
15	0.6	0.6	0.7	0.7	0.7	0.6	0.1	-1.0	-1.2	-1.0	-0.7	-1.0	-0.9	-1.5	-1.0	-1.1	-0.7	-0.6	-0.2	0.1	0.1	0.1	0.2	0.3	-0.3
16	0.4	0.5	0.6	0.5	0.5	0.6	0.2	-1.2	-1.2	-1.2	-1.0	-1.5	-1.4	-1.2	-0.9	-0.5	-0.3	-0.4	-0.2	-0.2	-0.1	0.1	0.2	0.0	-0.3
17	0.0	0.0	0.0	0.2	0.0	0.0	0.0	-0.3	-0.5	-0.6	-0.9	-1.0	-1.3	-1.5	-1.4	-1.4	-1.1	-0.8	-0.3	0.1	0.2	0.4	0.4	0.3	-0.4
18	0.3	0.4	0.4	0.5	0.6	0.6	-0.2	-1.3	-1.2	-1.0	-1.3	-1.8	-1.7	-1.2	-1.3	-1.0	-0.8	-0.6	-0.1	0.3	0.4	0.5	0.7	0.6	-0.3
19	0.8	0.8	0.8	0.8	0.9	0.6	-0.2	-1.4	-1.7	-1.4	-1.8	-1.2	-1.3	-1.3	-1.3	-1.5	-0.9	-0.1	0.4	0.8	1.0	1.0	1.0	0.6	-0.2
20	0.7	1.0	0.8	0.6	0.8	0.5	0.1	-0.8	-1.5	-1.2	-1.1	-1.3	-1.6	-1.3	-1.1	-1.1	-0.8	-0.6	-0.1	0.2	0.2	0.2	0.3	0.5	-0.3
21	0.6	0.4	0.6	0.8	0.8	0.7	0.2	-1.0	-1.3	-0.9	-1.1	-1.2	-1.4	-1.6	-1.4	-1.2	-1.0	-0.7	-0.2	0.2	0.3	0.4	0.3	0.4	-0.3
22	0.3	0.5	0.6	0.6	0.6	0.6	-0.1	-1.1	-1.0	-1.4	-1.0	-1.1	-1.6	-1.3	-1.2	-1.1	-0.8	-0.8	-0.3	0.2	0.3	0.4	0.4	0.6	-0.3
23	0.6	0.7	0.7	0.7	0.7	0.8	0.2	0.2	-0.1	-1.0	-1.2	-1.5	-1.7	-0.9	-1.3	-1.4	-0.9	-0.5	-0.2	0.0	0.2	0.3	0.2	0.4	-0.2
24	0.5	0.6	0.3	0.2	0.5	0.3	-0.6	-1.4	-1.2	-0.8	-0.9	-1.1	-1.3	-1.4	-1.5	-1.3	-1.1	-0.8	-0.2	0.3	0.4	0.5	0.5	0.6	-0.4
25	0.7	0.7	0.7	0.6	0.5	0.5	-0.4	-0.9	-0.7	-0.8	-1.3	-1.2	-1.5	-1.4	-1.3	-1.3	-1.0	-0.8	-0.3	0.4	0.6	0.6	0.9	0.9	-0.2
26	0.6	0.6	0.8	0.6	0.8	0.8	-0.3	-0.8	-0.6	-0.8	-1.0	-1.0	-1.2	-1.2	-1.5	-1.3	-1.0	-0.7	-0.2	0.4	0.6	0.6	0.5	0.4	-0.2
27	0.4	0.6	0.6	0.7	0.7	0.6	-0.1	-1.4	-1.1	-0.8	-0.9	-1.1	-1.2	-1.5	-1.4	-1.3	-1.0	-0.8	-0.2	0.4	0.6	0.5	0.6	0.4	-0.3
28	0.7	0.7	0.8	0.9	0.6	0.7	0.0	-0.6	-0.9	-1.0	-0.9	-1.2	-1.2	-1.5	-1.4	-1.3	-1.1	-0.8	-0.3	0.5	0.6	0.6	0.7	0.6	-0.2
29	0.6	0.7	0.8	0.6	0.7	0.8	0.4	-0.6	-0.8	-1.2	-1.2	-0.4	-0.3	-0.4	-0.2	-0.2	-0.3	-0.4	-0.2	0.1	0.1	0.1	0.0	0.0	-0.1
30	0.1	0.2	0.2	0.4	0.3	0.3	-0.2	-0.6	-0.7	-0.9	-1.2	-1.2	-1.5	-1.6	-1.5	-1.3	-1.1	-1.0	-0.5	0.1	0.5	0.4	0.4	0.3	-0.4
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.1	-0.7	-0.9	-1.0	-1.1	-1.1	-1.3	-1.3	-1.2	-1.1	-0.8	-0.6	-0.1	0.2	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	-0.2	-0.1	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.4	-0.3	-0.2	-0.3	-0.3	-0.3	-0.2	-0.4	-0.2
MAX	1.3	0.8	0.7	0.6	0.9	0.5	0.7	0.8	0.7	0.3	0.6	0.5	0.8	0.8	0.7	0.6	0.4	0.7	1.0	1.0	0.8	0.6	0.8	0.6	0.9
MIN	-1.5	-1.4	-1.3	-1.5	-2.0	-1.3	-1.3	-1.5	-1.4	-1.2	-1.4	-1.3	-1.4	-1.3	-1.5	-1.5	-1.5	-1.8	-1.8	-1.6	-1.6	-1.6	-1.7	-1.5	-1.5

DAY	26	27	28	29	30	31
AVE	-0.2	-0.3	-0.2	-0.1	-0.4	***
MAX	0.8	0.7	0.9	0.8	0.5	***
MIN	-1.5	-1.5	-1.5	-1.2	-1.6	***

MONTHLY AVERAGE = -0.3 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
APRIL - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	700	700	699	700	700	700	700	701	701	702
2	700	700	701	701	701	701	701	702	702	702	701	701	700	699	699	698	698	698	698	698	699	699	700	700	700
3	700	700	700	700	700	700	701	701	702	702	702	702	702	701	701	701	701	701	701	702	702	703	703	703	701
4	704	704	704	704	704	704	704	705	705	705	704	704	703	702	701	701	700	700	700	700	700	701	701	702	703
5	702	701	701	701	701	701	701	701	701	701	701	701	700	700	699	699	698	698	699	699	700	700	700	700	700
6	701	701	700	700	700	700	701	702	702	702	702	702	701	701	701	700	700	701	701	702	702	703	703	704	701
7	704	704	704	704	704	705	706	706	706	706	705	705	704	704	703	703	702	702	703	703	704	704	704	704	704
8	705	705	704	704	705	705	705	706	706	705	705	705	704	703	703	702	702	702	702	702	702	703	703	702	704
9	702	702	702	702	702	702	702	702	703	702	702	701	700	699	698	697	697	696	696	696	696	696	696	695	699
10	695	695	695	696	696	697	699	699	699	699	699	699	699	698	698	698	698	698	698	699	699	700	700	700	698
11	700	700	699	699	699	699	700	701	701	701	701	701	700	699	699	698	698	697	697	697	697	697	697	697	699
12	697	696	696	696	695	695	696	696	696	696	696	696	695	695	695	694	695	695	695	696	697	697	697	698	696
13	698	698	698	698	699	699	700	701	701	701	701	701	701	701	700	700	700	700	700	700	701	701	702	702	700
14	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	699	699	699	699	699	699	699	699	699	701
15	699	699	699	699	699	699	700	700	700	700	700	699	698	698	697	696	696	696	696	697	698	699	699	700	698
16	700	700	700	700	700	700	700	701	701	701	700	700	699	699	698	698	698	698	698	699	699	700	700	700	701	700
17	701	701	701	700	701	701	702	702	703	703	703	703	703	703	702	702	702	702	702	703	703	704	704	704	702
18	704	704	704	704	704	705	705	706	706	706	706	705	704	704	703	702	702	702	702	702	703	703	703	704	704
19	704	704	704	703	703	703	704	704	704	704	703	702	701	701	700	699	699	698	698	698	698	699	699	699	701
20	700	699	699	699	699	699	700	700	700	700	699	699	698	698	698	697	697	697	697	698	698	699	699	699	699
21	700	700	700	700	700	700	700	701	701	701	700	700	699	699	698	698	698	698	698	698	699	699	700	700	699
22	700	700	700	700	700	700	700	701	701	701	700	700	699	699	698	698	697	697	697	698	698	699	699	700	699
23	700	699	699	699	700	700	700	701	701	701	700	700	699	699	699	699	700	701	701	701	701	701	701	702	700
24	701	701	701	701	701	702	702	703	703	703	702	702	701	700	700	699	699	699	699	700	700	701	701	701	701
25	701	701	701	701	702	702	702	703	703	703	703	702	702	701	700	700	700	700	700	700	701	701	701	701	701
26	701	701	702	702	702	702	702	702	702	702	702	701	701	700	699	699	698	698	698	699	699	700	700	700	700
27	700	700	700	701	701	701	701	702	702	701	701	701	700	699	698	698	697	697	697	697	698	698	699	699	700
28	699	699	699	699	699	699	700	700	700	700	700	699	698	698	697	697	696	696	696	696	697	697	698	698	698
29	698	698	698	698	698	697	698	698	698	698	697	698	697	696	696	696	696	695	696	696	697	698	698	699	697
30	699	699	699	700	700	700	701	701	701	701	701	701	700	700	699	699	699	699	699	699	699	699	700	700	700
HRAVE	701	701	700	700	701	701	701	702	702	702	701	701	700	700	699	699	699	699	699	699	700	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	702	700	701	703	700	701	704	704	699	698	699	696	700	701	698	700	702	704	701	699	699	699	700	701	701
MAX	704	702	703	705	702	704	706	706	703	700	701	698	702	703	700	701	704	706	704	700	701	701	702	703	703
MIN	699	698	700	700	698	700	702	702	695	695	697	694	698	699	696	698	700	702	698	697	698	697	699	699	700

DAY	26	27	28	29	30	31
AVE	700	700	698	697	700	***
MAX	702	702	700	699	701	***
MIN	698	697	696	695	699	***

MONTHLY AVERAGE = 700.3 MONTHLY MAXIMUM = 706.2 MONTHLY MINIMUM = 694.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
APRIL - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	20	21	21	24	24	30	35	35	32	28	28	26	22	22	21	21	20	21	24	24	26	28	32	36	26
2	39	43	45	49	54	59	59	55	47	36	28	23	21	18	17	17	18	18	19	20	21	24	25	28	33
3	29	32	33	36	38	41	45	41	36	34	34	31	29	27	26	26	25	24	27	31	33	36	39	43	33
4	46	46	51	53	54	59	62	51	46	38	33	30	23	18	17	16	15	15	17	22	23	25	22	25	34
5	28	32	36	39	43	46	49	43	37	29	24	24	24	22	20	19	19	21	27	34	38	41	44	45	33
6	46	50	53	54	58	62	67	61	62	55	47	41	40	38	35	34	34	33	37	41	43	44	45	49	47
7	54	57	61	64	68	71	71	61	51	44	37	33	31	27	27	27	27	26	28	30	31	30	35	38	43
8	41	45	50	53	55	61	58	48	41	34	29	23	17	15	14	16	16	17	19	21	21	23	29	31	32
9	34	35	36	41	41	45	50	41	34	29	26	22	20	17	16	15	15	14	16	17	20	20	21	23	27
10	24	25	20	27	28	30	32	32	31	29	26	22	20	19	17	15	15	15	17	19	20	22	24	24	23
11	25	27	28	29	33	36	37	34	31	30	28	26	25	22	20	20	19	18	19	20	23	24	26	26	26
12	26	27	29	30	30	31	35	34	35	35	37	36	33	31	30	28	31	31	38	44	46	48	51	55	35
13	59	62	63	65	67	73	71	57	49	43	38	35	32	29	27	26	26	27	28	31	32	32	35	38	44
14	41	45	47	49	54	54	56	47	39	33	28	23	22	22	21	19	18	19	21	22	24	27	30	33	33
15	35	36	40	42	47	50	48	43	34	28	25	21	21	20	19	19	18	20	21	21	24	28	31	34	30
16	35	37	39	42	46	50	49	43	36	31	31	30	30	31	31	33	36	39	44	49	57	68	85	87	44
17	86	89	85	81	83	96	99	97	88	76	70	65	57	50	47	45	45	46	48	52	56	60	63	67	69
18	71	73	76	82	87	89	85	73	60	50	38	26	22	21	21	20	19	18	23	28	32	34	39	44	47
19	47	47	51	54	57	61	60	49	40	31	23	20	18	17	14	9	10	11	12	14	19	20	23	24	31
20	24	26	29	33	33	36	37	35	27	23	20	15	14	14	13	13	14	15	16	19	21	23	24	26	23
21	29	30	33	35	37	39	43	38	32	27	25	22	20	20	20	19	18	18	18	20	23	26	28	31	27
22	31	34	34	38	43	46	44	41	36	31	25	20	20	20	21	19	19	19	22	24	26	27	28	30	29
23	32	33	37	39	42	46	47	46	43	37	30	23	22	24	23	27	36	43	48	48	50	55	58	59	39
24	60	62	71	70	71	74	70	58	50	42	36	30	28	27	26	25	23	22	23	26	28	31	33	36	43
25	38	41	45	47	49	52	49	42	37	32	25	22	19	19	17	17	17	16	18	20	22	24	27	30	30
26	32	35	37	42	40	45	40	37	33	28	22	19	16	16	16	16	16	16	17	19	20	23	24	23	26
27	25	26	29	32	35	39	38	33	28	23	20	18	17	16	15	13	13	13	13	15	16	17	20	21	22
28	23	26	28	31	32	33	36	33	28	23	19	18	17	15	14	15	14	14	15	17	20	22	23	26	23
29	25	26	28	29	31	32	34	33	29	24	19	18	19	19	25	35	31	30	29	28	30	33	41	49	29
30	53	57	63	64	67	70	71	62	58	51	46	42	38	32	30	29	28	27	29	32	34	38	39	41	46
HRAVE	39	41	43	46	48	52	52	47	41	35	31	27	25	23	22	22	22	22	24	27	29	32	35	37	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	26	33	33	34	33	47	43	32	27	23	26	35	44	33	30	44	69	47	31	23	27	29	39	43	30
MAX	36	59	45	62	49	67	71	61	50	32	37	55	73	56	50	87	99	89	61	37	43	46	59	74	52
MIN	20	17	24	15	19	33	26	14	14	15	18	26	26	18	18	30	45	18	9	13	18	19	22	22	16

DAY	26	27	28	29	30	31
AVE	26	22	23	29	46	***
MAX	45	39	36	49	71	***
MIN	16	13	14	18	27	***

MONTHLY AVERAGE = 34.2 MONTHLY MAXIMUM = 99.3 MONTHLY MINIMUM = 9.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
APRIL - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.12	0.40	0.65	0.79	0.83	0.85	0.75	0.86	0.70	0.48	0.21	0.03	0.00	0.00	0.00	0.00	0.00	6.70
2	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.39	0.67	0.79	0.80	0.90	0.94	0.83	0.68	0.47	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.84
3	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.46	0.66	0.82	0.93	0.97	0.83	0.60	0.68	0.47	0.21	0.04	0.00	0.00	0.00	0.00	0.00	6.94
4	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.20	0.18	0.65	0.47	0.73	0.88	0.81	0.78	0.37	0.41	0.22	0.05	0.00	0.00	0.00	0.00	0.00	5.79
5	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.25	0.35	0.60	0.82	0.39	0.49	0.83	0.84	0.71	0.43	0.19	0.05	0.00	0.00	0.00	0.00	0.00	5.99
6	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.20	0.51	0.82	0.95	0.77	0.52	0.79	0.70	0.43	0.20	0.03	0.00	0.00	0.00	0.00	0.00	6.01
7	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.47	0.67	0.84	0.94	0.99	0.94	0.79	0.66	0.42	0.23	0.05	0.00	0.00	0.00	0.00	0.00	7.29
8	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.48	0.69	0.86	0.96	1.01	0.98	0.88	0.71	0.44	0.24	0.05	0.00	0.00	0.00	0.00	0.00	7.62
9	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.47	0.66	0.84	0.86	0.92	0.97	0.86	0.58	0.41	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.08
10	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.47	0.68	0.84	0.95	0.99	0.95	0.85	0.70	0.43	0.24	0.06	0.00	0.00	0.00	0.00	0.00	7.43
11	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27	0.50	0.71	0.86	0.96	0.99	0.97	0.76	0.57	0.26	0.23	0.03	0.00	0.00	0.00	0.00	0.00	7.17
12	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.16	0.20	0.31	0.53	0.57	0.69	0.62	0.57	0.21	0.10	0.03	0.00	0.00	0.00	0.00	0.00	4.11
13	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.49	0.70	0.86	0.96	1.01	1.03	0.84	0.72	0.41	0.25	0.07	0.00	0.00	0.00	0.00	0.00	7.68
14	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.51	0.71	0.87	0.96	0.93	0.92	0.86	0.71	0.41	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.47
15	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.24	0.51	0.67	0.87	0.85	0.77	1.05	0.67	0.53	0.36	0.28	0.07	0.00	0.00	0.00	0.00	0.00	6.95
16	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27	0.51	0.72	0.78	0.79	0.76	0.49	0.46	0.14	0.09	0.14	0.02	0.00	0.00	0.00	0.00	0.00	5.23
17	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.13	0.26	0.48	0.74	0.61	0.98	0.94	0.87	0.71	0.35	0.28	0.07	0.00	0.00	0.00	0.00	0.00	6.46
18	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.30	0.52	0.73	0.89	0.99	1.03	1.00	0.90	0.74	0.40	0.29	0.07	0.00	0.00	0.00	0.00	0.00	7.94
19	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.54	0.75	0.91	1.00	1.04	1.00	0.91	0.76	0.42	0.30	0.07	0.00	0.00	0.00	0.00	0.00	8.09
20	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.32	0.53	0.73	0.89	0.99	1.02	0.99	0.90	0.73	0.43	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.97
21	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.53	0.73	0.89	0.99	1.02	0.99	0.89	0.72	0.43	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.97
22	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.27	0.35	0.61	0.69	0.92	1.02	1.01	0.79	0.58	0.26	0.30	0.09	0.00	0.00	0.00	0.00	0.00	6.99
23	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.08	0.20	0.55	0.87	1.01	0.68	0.23	0.71	0.71	0.30	0.12	0.04	0.00	0.00	0.00	0.00	0.00	5.56
24	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.53	0.73	0.88	0.98	1.01	0.98	0.88	0.69	0.40	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.88
25	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.54	0.74	0.89	0.99	1.02	0.99	0.89	0.71	0.41	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.99
26	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.52	0.74	0.89	0.99	1.02	0.99	0.90	0.71	0.41	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.98
27	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.33	0.55	0.76	0.91	1.00	1.03	1.00	0.90	0.72	0.41	0.32	0.09	0.00	0.00	0.00	0.00	0.00	8.13
28	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.33	0.56	0.76	0.91	1.00	1.03	1.00	0.91	0.71	0.38	0.32	0.09	0.00	0.00	0.00	0.00	0.00	8.11
29	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.24	0.30	0.53	0.48	0.23	0.18	0.24	0.12	0.10	0.25	0.21	0.11	0.00	0.00	0.00	0.00	0.00	3.06
30	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.33	0.53	0.75	0.93	0.97	1.02	0.99	0.89	0.68	0.36	0.31	0.10	0.00	0.00	0.00	0.00	0.00	7.94
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.24	0.43	0.66	0.81	0.87	0.90	0.87	0.79	0.63	0.38	0.24	0.06	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.70	6.84	6.94	5.79	5.99	6.01	7.29	7.62	7.08	7.43	7.17	4.11	7.68	7.47	6.95	5.23	6.46	7.94	8.09	7.97	7.97	6.99	5.56	7.88	7.99
MAX	0.86	0.94	0.97	0.88	0.84	0.95	0.99	1.01	0.97	0.99	0.99	0.69	1.03	0.96	1.05	0.79	0.98	1.03	1.04	1.02	1.02	1.02	1.01	1.01	1.02
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	7.98	8.13	8.11	3.06	7.94	***
MAX	1.02	1.03	1.03	0.53	1.02	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
APRIL - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02
17	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.08 MONTHLY MAXIMUM = 0.06 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
MAY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.4	3.8	2.7	1.9	2.0	3.3	5.3	3.8	3.1	2.2	2.7	3.9	5.2	6.8	14.3	15.3	13.5	15.2	10.7	9.4	4.7	1.1	2.8	4.9	6.0
2	6.6	6.9	8.0	8.4	7.5	6.3	7.1	4.8	5.0	3.4	2.1	2.7	3.4	5.5	9.4	12.7	15.5	15.4	12.7	7.6	5.3	5.8	4.5	1.7	7.0
3	4.4	4.5	6.3	8.9	8.2	7.6	7.2	5.4	1.6	2.4	3.2	3.2	4.9	7.3	12.7	15.5	13.2	12.8	12.6	11.0	5.9	1.9	4.3	6.2	7.1
4	7.1	8.7	8.6	6.4	6.0	6.9	6.8	4.3	3.2	2.3	2.2	3.1	5.5	7.7	13.2	13.2	13.5	15.1	13.3	8.3	5.8	1.8	3.9	5.8	7.2
5	7.8	7.7	7.2	10.0	8.0	8.2	3.9	3.1	1.9	1.9	2.8	3.4	4.7	8.4	14.8	16.6	17.7	16.0	12.2	6.2	3.1	5.9	8.4	4.3	7.7
6	5.8	8.1	3.9	3.2	4.7	2.7	5.6	7.2	4.6	3.3	8.7	11.3	13.9	11.5	13.4	17.3	16.4	17.4	15.2	11.8	17.4	18.1	18.5	13.5	10.6
7	8.8	10.0	5.2	6.2	5.7	6.8	5.2	9.4	6.8	10.3	20.4	19.0	14.9	15.8	15.9	16.9	17.4	16.3	13.7	12.6	6.6	5.5	3.9	5.8	10.8
8	7.9	6.8	7.1	6.6	5.4	5.1	3.8	1.9	3.5	3.4	2.7	5.7	8.3	13.5	14.8	16.0	13.2	23.6	21.9	22.3	18.2	13.5	11.4	12.4	10.4
9	13.9	14.9	12.1	11.2	10.1	10.9	9.5	9.0	10.2	8.2	4.9	4.9	6.1	6.2	6.4	7.8	11.0	15.1	13.0	8.1	6.5	3.2	6.0	9.1	9.1
10	8.1	20.1	18.6	3.9	10.7	11.0	6.9	6.4	7.6	11.2	9.8	7.6	4.7	4.9	6.3	11.4	13.3	12.2	17.6	16.1	12.8	10.8	13.2	13.8	10.8
11	9.9	11.4	6.5	5.1	3.9	9.3	7.5	6.2	3.5	3.2	3.8	4.0	5.7	5.7	10.1	11.6	11.1	18.6	13.6	9.3	7.5	11.4	16.8	15.3	8.8
12	12.2	13.9	8.1	11.7	11.2	4.6	7.0	5.5	4.1	5.3	6.3	4.1	14.6	3.2	3.7	6.2	19.8	13.0	9.0	5.9	5.9	3.9	2.8	5.2	7.8
13	6.2	7.6	7.6	8.1	7.2	7.1	6.3	5.4	3.7	3.8	3.9	3.3	4.4	5.7	6.6	8.4	12.0	10.6	13.9	16.3	13.1	7.9	3.6	7.9	7.5
14	7.3	9.3	6.6	7.7	6.5	6.3	6.6	4.5	2.1	2.5	5.5	6.8	6.4	6.3	8.0	10.2	11.6	11.9	12.2	10.9	9.6	7.5	2.6	5.6	7.3
15	7.7	6.8	7.5	7.3	7.9	8.1	5.8	4.5	5.2	2.3	3.8	3.5	8.3	5.5	12.1	12.9	13.6	12.8	12.7	12.4	9.8	12.7	15.1	12.1	8.8
16	4.5	3.9	3.3	5.2	6.6	7.0	6.2	3.0	1.9	3.0	8.4	20.2	16.0	17.5	16.7	18.6	22.8	25.1	26.5	23.5	21.5	11.6	13.9	15.4	12.6
17	9.2	3.4	8.4	18.3	17.7	17.6	9.4	7.7	2.6	3.4	8.4	14.6	17.0	13.7	16.3	18.4	18.1	16.7	14.6	12.7	10.3	7.6	5.6	2.5	11.4
18	4.2	5.4	7.2	7.0	4.7	6.9	6.4	5.0	3.0	2.2	6.6	11.9	9.8	11.8	12.3	13.3	13.2	12.3	12.8	7.2	2.3	2.2	5.6	6.9	7.5
19	8.0	9.3	5.5	2.3	4.4	6.8	5.7	6.3	8.6	8.1	8.1	11.5	13.7	13.9	16.2	19.5	22.0	18.6	14.6	16.2	11.2	8.2	7.8	8.0	10.6
20	10.5	9.1	8.2	10.6	12.9	10.1	8.5	7.9	10.6	10.3	16.2	19.1	17.9	19.7	21.5	24.1	24.5	19.7	12.1	10.1	10.0	6.1	2.0	4.1	12.7
21	6.9	7.8	7.1	5.3	6.0	7.3	7.6	5.7	3.3	4.2	4.8	13.6	15.1	16.9	18.7	21.8	21.3	21.9	20.4	18.3	13.5	12.7	12.0	14.5	11.9
22	10.4	8.6	6.2	6.4	7.8	6.0	6.4	5.2	9.3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	7.4
23	6.1	6.7	16.4	14.3	12.8	6.3	10.9	5.2	4.7	3.1	5.1	11.3	11.6	10.9	9.9	9.1	10.2	11.6	11.6	8.9	7.6	5.1	2.6	2.5	8.5
24	4.3	6.1	3.6	8.0	8.2	7.4	5.5	4.7	3.5	3.0	2.7	4.3	4.6	5.8	6.8	11.1	18.0	19.7	17.9	13.8	5.4	2.0	4.3	4.5	7.3
25	3.6	6.9	6.5	8.6	6.3	5.6	5.2	4.7	4.1	3.3	5.9	6.8	7.6	6.9	11.7	9.4	9.7	13.8	11.6	13.8	10.8	3.5	4.3	4.2	7.3
26	4.1	2.6	2.1	2.1	5.7	5.2	5.9	4.3	2.9	3.7	10.4	17.0	16.0	15.7	18.7	18.7	16.3	15.6	14.2	13.5	12.2	10.2	5.5	9.1	9.7
27	13.6	14.4	7.5	8.3	9.6	9.7	11.9	11.3	12.7	17.1	18.1	15.1	20.2	18.0	18.0	18.0	15.7	14.9	12.4	13.0	9.2	6.8	7.5	3.2	12.8
28	2.4	5.4	5.8	7.1	8.9	7.2	4.3	4.3	2.6	2.7	4.3	5.1	5.4	8.9	15.5	16.2	16.7	14.0	13.3	10.8	6.7	4.2	1.7	1.5	7.3
29	4.4	7.1	8.0	8.3	8.4	5.1	3.9	3.1	2.6	2.1	5.6	8.1	7.4	8.3	8.9	9.4	9.8	9.8	10.6	9.4	9.3	10.4	3.2	3.3	6.9
30	5.6	6.3	8.0	7.8	8.0	5.9	2.8	6.9	3.0	2.4	2.3	3.2	6.7	6.7	9.4	7.5	8.8	10.6	12.9	12.5	9.4	4.7	1.8	7.2	6.7
31	7.2	6.4	5.9	5.7	7.4	9.8	6.8	6.7	2.8	2.8	4.6	5.7	7.6	10.8	7.1	5.5	10.9	13.1	14.8	11.6	11.7	9.0	6.5	8.2	7.9
HRAVE	7.2	8.1	7.3	7.5	7.8	7.4	6.5	5.6	4.7	4.6	6.5	8.5	9.6	10.0	12.3	13.8	15.0	15.4	14.2	12.1	9.4	7.2	6.7	7.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.0	7.0	7.1	7.2	7.7	10.6	10.8	10.4	9.1	10.8	8.8	7.8	7.5	7.3	8.8	12.6	11.4	7.5	10.6	12.7	11.9	7.4	8.5	7.3	7.3
MAX	15.3	15.5	15.5	15.1	17.7	18.5	20.4	23.6	15.1	20.1	18.6	19.8	16.3	12.2	15.1	26.5	18.4	13.3	22.0	24.5	21.9	10.4	16.4	19.7	13.8
MIN	1.1	1.7	1.6	1.8	1.9	2.7	3.9	1.9	3.2	3.9	3.2	2.8	3.3	2.1	2.3	1.9	2.5	2.2	2.3	2.0	3.3	5.2	2.5	2.0	3.3

DAY	26	27	28	29	30	31
AVE	9.7	12.8	7.3	6.9	6.7	7.9
MAX	18.7	20.2	16.7	10.6	12.9	14.8
MIN	2.1	3.2	1.5	2.1	1.8	2.8

MONTHLY AVERAGE = 8.9 MONTHLY MAXIMUM = 26.5 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MAY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	184	271	150	148	90	95	100	112	138	137	249	353	331	274	282	293	289	291	303	312	292	323	148	120	90
2	109	101	93	88	91	91	88	96	123	153	252	142	154	294	284	306	301	303	298	296	288	301	310	110	323
3	119	110	103	103	103	84	99	130	260	149	272	237	225	312	301	291	281	272	282	288	301	228	127	108	327
4	108	93	92	93	114	101	119	125	133	134	255	323	260	307	309	279	288	290	302	308	299	316	126	115	218
5	104	105	100	88	91	94	88	110	135	267	281	243	292	314	279	287	288	295	308	308	188	255	333	280	86
6	234	282	252	155	116	87	105	122	109	110	135	170	221	245	251	252	269	275	268	273	278	298	290	297	306
7	306	314	326	251	257	270	304	294	268	271	299	294	289	279	278	283	287	291	300	298	289	293	162	120	112
8	110	112	116	115	116	106	157	100	113	112	284	318	288	288	274	289	289	44	46	40	54	43	71	44	142
9	56	49	67	68	64	67	104	100	72	76	88	76	67	79	71	276	260	279	300	299	188	181	164	146	112
10	150	145	152	127	43	63	97	130	136	138	132	165	137	340	250	249	259	243	269	290	294	304	295	300	158
11	316	293	293	209	192	302	299	291	271	134	157	220	160	164	272	282	304	29	50	346	86	116	112	57	250
12	295	301	307	321	301	183	129	101	106	279	288	267	120	133	102	293	2	159	99	84	83	119	79	97	197
13	110	112	91	117	121	106	120	121	137	135	144	282	278	261	250	280	283	291	307	288	291	306	111	80	68
14	103	90	93	92	107	106	103	129	103	257	289	275	273	280	301	293	272	274	286	298	301	288	38	122	51
15	96	97	109	97	96	98	115	151	114	214	285	256	118	157	235	237	253	260	277	293	306	320	309	301	275
16	217	176	151	112	121	111	95	359	108	247	255	203	205	230	220	239	238	273	277	281	280	234	206	215	228
17	211	197	256	287	290	290	292	304	276	109	237	254	272	268	274	287	284	285	292	297	293	294	293	258	356
18	127	116	97	84	88	91	107	129	123	203	263	298	301	284	289	285	270	273	284	290	29	153	126	114	273
19	113	94	94	36	87	97	99	93	87	130	159	206	229	247	245	233	224	294	294	291	288	282	281	266	119
20	267	265	298	285	277	297	287	273	283	273	294	278	259	241	260	273	275	282	304	297	297	321	166	113	299
21	88	87	97	87	87	89	87	108	97	26	338	241	241	243	249	252	244	250	254	272	269	273	253	227	175
22	211	256	192	302	302	310	312	306	310	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	47
23	269	233	244	231	228	217	269	296	54	61	290	260	255	252	252	288	299	294	310	316	307	293	318	74	102
24	84	88	114	133	112	109	103	133	143	139	289	85	286	308	308	330	301	307	305	304	305	140	128	98	301
25	101	99	102	93	110	99	111	107	136	146	146	130	293	274	225	230	234	231	251	283	293	347	213	142	71
26	167	134	287	174	122	127	94	117	313	39	230	268	241	227	242	243	240	257	263	269	276	288	252	273	41
27	299	287	256	266	285	302	295	286	293	288	289	278	288	286	285	289	287	296	304	304	297	300	309	157	12
28	137	106	97	97	91	109	114	125	146	91	308	272	82	315	310	289	303	300	305	294	303	289	131	306	211
29	125	106	95	90	88	103	97	110	140	226	295	291	270	285	289	289	283	290	284	294	305	294	281	111	200
30	123	104	111	96	114	112	94	120	257	272	274	225	189	297	278	299	284	307	304	297	308	288	284	94	210
31	129	109	106	113	101	87	95	129	129	203	140	151	162	157	143	207	233	241	244	272	304	296	257	302	208

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MAY - 2019

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	27	22	39	41	16	20	11	14	37	65	52	55	56	53	22	20	20	13	13	7	10	27	20	7	28
2	7	7	7	6	7	10	8	12	18	31	56	47	49	33	23	18	13	11	10	9	7	8	23	38	19
3	8	8	7	7	7	7	7	12	37	37	33	45	42	38	21	16	17	13	9	6	7	29	10	10	18
4	10	6	6	6	8	9	8	13	26	42	43	55	48	40	25	24	22	14	12	9	9	27	8	7	20
5	7	15	7	6	7	7	17	15	38	47	46	49	59	30	26	19	13	12	9	13	35	25	16	26	23
6	28	19	34	23	9	31	10	8	20	32	20	25	20	21	23	16	17	13	10	9	8	9	7	11	18
7	11	14	26	21	39	19	18	14	29	16	12	12	17	22	19	17	13	14	15	9	9	28	13	9	17
8	9	9	21	14	9	12	29	37	23	25	40	27	32	20	20	17	18	15	13	10	10	18	32	17	20
9	15	7	15	12	12	16	13	12	10	13	26	37	52	48	22	45	18	14	9	9	30	21	16	19	20
10	17	10	15	44	14	13	17	18	14	16	20	41	65	61	55	20	23	17	12	8	8	7	6	9	22
11	10	8	5	18	19	8	11	17	33	54	51	57	63	60	48	16	27	19	21	20	27	15	14	13	26
12	38	7	12	9	8	40	12	15	33	35	34	52	20	41	52	45	20	37	14	14	17	32	47	18	27
13	12	10	11	12	13	8	10	7	18	26	34	59	57	37	34	21	20	16	12	10	13	9	20	8	20
14	12	10	9	7	9	8	11	17	50	33	28	29	48	42	33	26	17	15	9	7	6	18	40	9	21
15	8	7	13	7	8	9	11	13	21	40	35	36	24	49	25	22	20	18	11	7	7	11	9	9	18
16	20	13	13	32	10	9	11	46	58	30	44	17	23	18	17	19	16	12	10	8	8	12	12	14	20
17	14	24	16	7	8	9	14	15	49	39	40	22	17	24	18	13	14	12	12	9	6	6	5	20	17
18	12	8	7	7	14	8	12	15	40	45	42	18	33	28	22	17	26	13	11	7	26	13	13	9	19
19	9	10	12	45	21	11	10	11	13	17	22	26	20	18	16	16	16	12	11	9	7	5	8	9	15
20	11	10	11	10	11	14	10	10	13	15	13	17	19	23	15	16	13	17	13	12	11	15	49	35	16
21	7	8	14	13	8	7	7	14	37	49	52	21	23	22	20	18	18	16	14	10	10	9	13	11	17
22	10	10	35	8	5	9	11	17	21	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	14
23	35	44	12	17	13	16	13	25	42	49	45	23	27	35	34	29	25	20	13	9	10	13	44	26	26
24	10	12	18	7	9	8	8	12	23	44	58	57	52	50	31	24	16	13	12	8	12	26	8	14	22
25	11	8	8	5	10	8	9	12	22	29	31	51	40	46	25	37	34	20	19	9	6	48	27	50	23
26	35	41	26	30	8	10	23	35	42	36	40	18	22	26	16	17	17	20	14	9	7	5	13	9	22
27	6	11	19	15	18	8	11	10	16	15	14	22	16	18	18	13	17	16	14	10	7	6	7	27	14
28	19	12	8	7	6	12	12	14	31	48	42	47	81	35	15	13	15	18	12	7	5	9	28	17	21
29	10	9	9	7	8	11	14	18	46	52	29	22	47	59	35	34	39	27	13	8	6	4	20	32	23
30	10	7	9	8	7	12	39	12	33	33	48	58	60	58	42	47	39	25	13	8	9	17	31	19	27
31	20	32	10	7	6	6	11	13	32	40	39	34	49	28	58	63	22	25	13	12	8	13	15	11	24
HRAVE	15	14	15	15	11	12	13	16	30	35	36	36	39	36	28	24	20	17	12	9	11	16	19	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	28	19	18	20	23	18	17	20	20	22	26	27	20	21	18	20	17	19	15	16	17	14	26	22	23
MAX	65	56	45	55	59	34	39	40	52	65	63	52	59	50	49	58	49	45	45	49	52	35	49	58	51
MIN	7	6	6	6	6	7	9	9	7	6	5	7	7	6	7	8	5	7	5	10	7	5	9	7	5

DAY	26	27	28	29	30	31
AVE	22	14	21	23	27	24
MAX	42	27	81	59	60	63
MIN	5	6	5	4	7	6

MONTHLY AVERAGE = 20.7 MONTHLY MAXIMUM = 80.7 MONTHLY MINIMUM = 4.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MAY - 2019

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	19.5	19.4	18.1	17.1	16.0	14.7	14.7	17.4	20.3	22.7	24.4	25.6	26.7	28.0	29.4	29.4	29.2	28.6	27.4	26.0	24.7	23.8	21.9	20.8	22.7
2	19.8	18.9	17.4	16.1	15.4	14.4	14.9	17.8	20.8	23.3	25.2	27.5	28.5	28.9	28.9	29.7	28.7	27.8	26.8	25.6	24.8	23.9	23.2	21.9	22.9
3	20.4	19.0	17.5	16.7	15.8	14.6	15.9	17.6	19.8	23.4	26.0	27.9	29.9	30.6	31.6	31.7	31.3	30.8	29.7	27.5	26.1	25.1	23.1	21.5	23.9
4	20.0	19.0	18.0	16.6	15.8	14.8	15.5	17.7	21.0	24.3	27.2	29.8	31.2	32.3	33.1	33.5	33.0	32.3	31.0	29.3	27.6	26.8	24.5	23.1	24.9
5	21.5	20.9	19.8	17.9	17.2	16.6	16.7	19.2	22.2	25.0	28.0	29.9	31.8	32.5	33.3	33.1	32.4	31.0	30.1	29.0	27.2	26.2	26.5	25.6	25.6
6	23.8	22.5	20.9	19.8	18.3	17.3	16.0	18.4	21.9	24.8	27.5	29.8	29.9	29.4	29.3	29.2	28.2	27.2	26.4	25.6	24.4	23.0	21.9	20.9	24.0
7	20.0	19.0	18.5	17.8	17.2	16.6	16.9	18.1	19.6	20.6	20.2	19.4	22.0	23.1	23.2	23.3	22.8	22.9	22.2	21.0	19.9	19.2	17.7	17.1	19.9
8	16.5	15.9	15.0	14.0	13.4	12.7	12.1	13.6	15.6	18.6	20.8	22.2	24.5	26.2	26.8	26.7	25.6	20.6	18.7	18.1	18.3	17.8	16.5	17.6	18.7
9	16.9	16.9	16.1	15.4	15.0	14.9	15.1	17.8	20.4	23.1	25.0	26.7	28.0	28.2	28.2	28.8	28.9	27.8	26.6	25.6	24.6	24.3	24.1	23.8	22.6
10	22.9	22.6	21.6	21.0	20.8	20.4	20.6	22.4	22.9	24.1	25.1	26.1	27.1	27.3	28.4	27.6	28.2	27.4	25.6	23.7	22.5	21.6	20.8	19.9	23.8
11	19.5	19.0	18.4	17.3	16.1	16.1	16.7	18.1	19.8	22.2	24.2	25.7	27.6	28.3	28.7	28.5	27.3	23.6	22.2	20.6	20.4	19.3	20.3	20.1	21.7
12	18.6	17.7	16.9	17.2	16.5	15.5	15.3	16.9	20.1	21.2	22.8	24.0	21.3	22.2	25.0	26.2	22.5	16.8	17.6	18.1	18.1	17.6	17.3	16.5	19.3
13	15.7	15.2	15.0	13.7	13.8	13.4	13.8	14.2	17.8	20.7	22.9	24.5	26.5	28.3	29.4	30.0	30.5	30.2	29.3	28.0	27.1	26.3	25.0	23.7	22.3
14	22.4	21.4	20.5	18.9	17.9	17.2	18.9	20.8	23.3	25.4	28.2	30.5	32.1	33.1	34.0	34.2	34.0	33.6	32.6	30.9	29.5	28.3	27.2	25.5	26.7
15	24.0	23.1	22.2	21.1	20.5	19.7	21.3	21.8	25.5	27.5	29.8	31.9	34.9	35.8	36.1	35.8	35.8	34.7	33.4	31.5	30.0	29.4	28.1	27.0	28.4
16	26.0	24.3	23.3	20.9	20.2	19.8	20.5	20.3	24.4	26.2	29.0	30.0	31.3	32.1	33.2	33.1	32.3	30.5	28.1	26.6	25.4	24.2	23.5	23.0	26.2
17	21.6	20.5	19.4	17.0	15.8	15.4	15.4	16.4	17.1	20.0	22.2	23.5	23.9	25.0	25.5	25.5	25.3	24.6	23.5	22.2	21.0	19.9	19.4	18.7	20.8
18	16.9	16.1	14.8	14.1	13.2	12.2	13.8	16.2	19.1	21.0	23.3	25.0	25.9	26.6	27.1	27.6	27.5	26.6	25.7	24.2	23.5	22.0	20.5	19.5	20.9
19	18.7	18.8	18.2	17.4	16.3	15.5	15.6	16.8	20.4	23.5	26.1	27.1	26.5	26.2	26.5	28.2	27.8	25.7	24.5	23.1	22.0	21.2	20.4	19.9	21.9
20	19.4	18.6	17.8	17.3	16.5	13.4	13.4	14.7	15.1	16.3	16.1	17.2	18.6	20.0	20.0	20.6	20.4	19.3	18.6	17.9	17.4	17.1	16.2	15.0	17.4
21	13.8	12.9	12.0	11.4	10.1	10.0	11.9	14.7	17.0	18.8	20.5	22.3	23.4	24.3	25.0	25.4	25.7	25.2	24.2	22.6	21.4	20.1	19.5	18.8	18.8
22	18.0	16.7	14.8	15.0	14.2	13.6	14.2	15.6	17.1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	15.5
23	16.4	15.9	15.5	13.5	11.7	12.1	11.8	11.8	14.1	15.8	17.7	20.1	21.1	22.5	23.4	23.9	23.9	23.5	22.6	21.4	20.2	19.2	18.6	17.7	18.1
24	16.2	14.8	13.9	12.6	12.4	12.2	13.6	15.5	18.6	21.4	23.9	26.7	28.0	28.6	29.4	29.8	30.0	29.0	27.9	26.3	25.2	23.9	21.6	20.2	21.7
25	19.0	17.3	16.5	15.5	14.7	13.8	14.9	18.1	21.3	24.3	27.8	30.5	30.3	31.8	33.0	32.9	32.8	32.3	31.2	28.9	26.9	26.5	25.5	23.3	24.5
26	22.7	22.2	21.5	19.5	17.3	16.7	17.6	20.0	22.6	25.6	27.5	27.2	27.7	28.8	28.9	28.4	28.1	27.4	26.3	24.6	23.0	21.9	20.9	19.9	23.6
27	19.3	19.1	18.9	18.3	17.6	17.2	17.4	18.1	19.2	20.1	20.5	22.1	22.4	22.9	23.7	23.9	23.9	23.6	22.9	21.6	20.3	19.2	18.6	17.5	20.3
28	17.0	15.4	14.4	13.3	12.6	12.5	13.1	16.1	18.2	21.5	22.7	24.4	25.9	26.7	26.9	26.1	25.9	25.7	24.9	23.9	22.6	22.2	20.4	19.6	20.5
29	18.1	16.8	15.8	14.9	14.3	13.7	14.7	17.5	19.9	22.7	25.1	27.1	28.4	29.5	29.4	30.0	29.9	29.8	29.2	27.6	26.1	25.0	23.9	22.7	23.0
30	21.2	20.0	18.9	18.0	17.0	16.7	16.3	20.4	22.0	24.7	28.0	30.9	32.6	33.1	33.5	33.5	33.4	33.1	32.2	30.6	28.9	28.0	26.6	25.2	26.0
31	22.8	22.3	21.7	20.1	19.5	18.4	19.3	21.5	24.5	27.1	30.2	33.1	35.4	36.2	35.8	36.1	36.8	36.0	34.8	32.6	30.7	29.3	27.2	26.6	28.2
HRAVE	19.6	18.8	17.8	16.7	15.9	15.2	15.7	17.6	20.0	22.5	24.6	26.3	27.4	28.3	28.9	29.1	28.7	27.6	26.5	25.2	24.0	23.1	22.0	21.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	22.7	22.9	23.9	24.9	25.6	24.0	19.9	18.7	22.6	23.8	21.7	19.3	22.3	26.7	28.4	26.2	20.8	20.9	21.9	17.4	18.8	15.5	18.1	21.7	24.5
MAX	29.4	29.7	31.7	33.5	33.3	29.9	23.3	26.8	28.9	28.4	28.7	26.2	30.5	34.2	36.1	33.2	25.5	27.6	28.2	20.6	25.7	18.0	23.9	30.0	33.0
MIN	14.7	14.4	14.6	14.8	16.6	16.0	16.6	12.1	14.9	19.9	16.1	15.3	13.4	17.2	19.7	19.8	15.4	12.2	15.5	13.4	10.0	13.6	11.7	12.2	13.8

DAY	26	27	28	29	30	31
AVE	23.6	20.3	20.5	23.0	26.0	28.2
MAX	28.9	23.9	26.9	30.0	33.5	36.8
MIN	16.7	17.2	12.5	13.7	16.3	18.4

MONTHLY AVERAGE = 22.6 MONTHLY MAXIMUM = 36.8 MONTHLY MINIMUM = 10.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MAY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.5	0.5	0.6	0.6	0.5	0.4	-0.3	-1.0	-0.8	-0.7	-0.9	-1.2	-1.4	-1.1	-1.6	-1.4	-1.1	-0.8	-0.3	0.2	0.5	0.5	0.5	0.4	-0.3
2	0.5	0.5	0.6	0.6	0.6	0.6	-0.6	-1.3	-1.5	-1.1	-0.6	-1.0	-1.2	-1.1	-0.8	-1.2	-0.7	-0.4	-0.1	0.3	0.4	0.5	0.5	0.6	-0.3
3	0.4	0.5	0.7	0.6	0.5	0.6	-0.5	-1.2	-0.6	-0.8	-1.0	-1.0	-1.4	-1.4	-1.6	-1.4	-1.1	-0.8	-0.4	0.2	0.6	0.6	0.7	0.7	-0.3
4	0.7	0.6	0.8	0.9	0.7	0.6	-0.4	-1.1	-1.0	-0.8	-0.9	-1.1	-1.3	-1.4	-1.5	-1.3	-1.1	-0.8	-0.3	0.3	0.6	0.6	0.8	0.6	-0.2
5	0.7	0.8	0.7	0.6	0.6	0.6	-0.2	-0.8	-0.7	-0.7	-0.8	-1.0	-1.4	-1.4	-1.3	-1.2	-0.9	-0.4	0.0	0.4	0.5	0.5	0.3	0.4	-0.2
6	0.6	0.6	0.7	0.7	0.6	0.7	0.7	-1.0	-1.4	-1.1	-1.9	-2.2	-1.8	-1.3	-1.2	-1.1	-0.7	-0.4	-0.1	0.1	0.1	0.1	0.1	0.2	-0.4
7	0.2	0.2	0.2	0.3	0.3	0.3	-0.2	-0.5	-0.9	-1.1	-1.1	-1.4	-1.8	-1.7	-1.4	-1.3	-0.9	-0.9	-0.5	0.0	0.3	0.4	0.5	0.3	-0.5
8	0.2	0.4	0.4	0.4	0.4	0.4	0.1	-0.3	-0.8	-1.1	-0.7	-0.9	-1.5	-1.7	-1.4	-1.2	-0.5	-0.3	-0.2	-0.1	-0.1	0.1	0.5	0.3	-0.3
9	0.3	0.2	0.3	0.3	0.2	0.2	-0.4	-1.3	-1.5	-1.8	-1.7	-1.6	-1.6	-1.2	-1.0	-0.7	-0.7	-0.4	-0.1	0.3	0.3	0.3	0.2	0.2	-0.5
10	0.2	0.1	0.0	0.2	0.1	0.1	-0.2	-1.1	-1.0	-1.2	-1.4	-1.5	-1.6	-1.2	-1.4	-0.9	-1.1	-0.7	-0.3	0.0	0.1	0.2	0.2	0.1	-0.5
11	0.0	0.0	0.2	0.2	0.2	0.3	-0.1	-0.6	-0.8	-1.2	-1.5	-1.3	-1.9	-1.6	-1.5	-1.3	-0.7	-0.4	-0.3	0.2	0.3	0.2	0.1	0.0	-0.5
12	0.2	0.2	0.2	0.1	0.3	0.5	-0.2	-0.3	-1.2	-0.9	-1.2	-1.1	-0.9	-0.9	-1.3	-1.1	-0.4	0.3	0.2	0.4	0.3	0.4	0.3	0.4	-0.2
13	0.5	0.4	0.6	0.6	0.4	0.3	-0.1	0.1	-0.9	-1.2	-1.3	-1.0	-1.1	-1.3	-1.4	-1.2	-1.2	-0.9	-0.5	-0.1	0.1	0.4	0.4	0.6	-0.3
14	0.4	0.4	0.6	0.6	0.7	0.4	-0.7	-1.1	-0.8	-0.8	-1.0	-1.3	-1.4	-1.3	-1.3	-1.4	-1.2	-0.9	-0.5	0.1	0.4	0.6	0.6	0.6	-0.3
15	0.7	0.7	0.7	0.7	0.6	0.6	-0.5	-1.1	-1.5	-0.9	-1.0	-1.0	-2.1	-1.6	-1.4	-1.2	-1.1	-0.6	-0.2	0.2	0.4	0.2	0.2	0.3	-0.4
16	0.3	0.6	0.6	0.8	0.4	0.6	0.0	-0.3	-0.7	-0.8	-1.1	-1.1	-1.1	-1.4	-1.7	-1.2	-0.9	-0.6	-0.3	0.0	0.1	0.2	0.2	0.1	-0.3
17	0.1	0.1	0.1	-0.1	0.0	-0.1	-0.3	-0.5	-0.5	-1.2	-1.4	-1.5	-1.5	-1.6	-1.6	-1.5	-1.2	-0.9	-0.4	0.0	0.2	0.4	0.5	0.4	-0.5
18	0.4	0.4	0.6	0.4	0.5	0.3	-0.8	-1.1	-1.1	-0.7	-1.3	-1.7	-1.4	-1.5	-1.6	-1.5	-1.2	-0.8	-0.5	0.2	0.4	0.7	0.8	0.7	-0.4
19	0.5	0.3	0.4	0.5	0.4	0.6	0.3	-0.3	-1.2	-1.5	-1.7	-1.5	-1.1	-0.7	-0.6	-1.1	-0.8	-0.5	-0.2	-0.1	0.0	0.1	0.1	0.1	-0.3
20	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.3	-0.4	-0.7	-0.6	-1.0	-1.2	-1.4	-1.1	-1.2	-1.0	-0.5	-0.4	-0.1	0.1	0.2	0.3	0.4	-0.4
21	0.5	0.4	0.5	0.4	0.4	0.3	-0.9	-1.4	-1.1	-1.3	-1.3	-1.7	-1.9	-1.7	-1.5	-1.2	-1.0	-0.7	-0.4	0.0	0.1	0.2	0.2	0.2	-0.5
22	0.3	0.4	0.4	0.4	0.4	0.2	-0.3	-0.7	-0.9	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	0.0
23	0.0	-0.1	-0.1	0.1	0.1	0.1	-0.1	-0.4	-0.8	-0.9	-1.1	-1.4	-1.3	-1.6	-1.6	-1.4	-1.2	-1.1	-0.6	-0.1	0.2	0.4	0.3	0.4	-0.5
24	0.5	0.5	0.4	0.6	0.4	0.2	-1.0	-1.2	-1.2	-1.0	-0.9	-1.6	-1.4	-1.3	-1.4	-1.3	-1.3	-0.9	-0.5	0.0	0.4	0.6	0.9	0.7	-0.4
25	0.6	0.8	0.7	0.8	0.6	0.4	-0.7	-1.4	-1.3	-1.0	-1.8	-2.2	-1.4	-1.3	-1.7	-1.3	-1.2	-0.9	-0.5	0.0	0.4	0.4	0.6	0.6	-0.5
26	0.6	0.5	0.4	0.6	0.6	0.4	-0.6	-1.1	-0.9	-1.2	-1.3	-1.3	-1.7	-1.9	-1.6	-1.3	-1.1	-0.9	-0.5	-0.1	0.1	0.2	0.4	0.4	-0.5
27	0.2	0.2	0.3	0.3	0.2	0.2	-0.2	-0.6	-1.0	-1.2	-1.5	-1.6	-1.6	-1.5	-1.6	-1.6	-1.3	-1.1	-0.7	-0.2	0.2	0.3	0.4	0.3	-0.5
28	0.4	0.5	0.6	0.6	0.5	0.3	-0.5	-1.3	-0.7	-1.1	-1.1	-1.3	-1.5	-1.5	-1.5	-1.0	-1.1	-0.9	-0.4	-0.1	0.4	0.6	0.6	0.4	-0.4
29	0.6	0.6	0.6	0.6	0.6	0.6	-0.6	-0.9	-0.9	-0.8	-1.2	-1.5	-1.6	-1.7	-1.4	-1.5	-1.1	-1.0	-0.8	-0.1	0.3	0.5	0.5	0.6	-0.4
30	0.6	0.6	0.6	0.6	0.5	0.3	-0.6	-1.5	-0.8	-0.6	-0.8	-1.2	-1.7	-1.5	-1.5	-1.3	-1.2	-0.9	-0.6	-0.1	0.3	0.4	0.6	0.6	-0.4
31	0.9	0.6	0.6	0.7	0.7	0.5	-0.7	-1.3	-0.9	-0.8	-1.3	-1.9	-2.0	-2.3	-1.7	-1.2	-1.2	-0.9	-0.4	0.0	0.3	0.5	0.6	0.4	-0.4
HRAVE	0.4	0.4	0.4	0.5	0.4	0.4	-0.4	-0.9	-1.0	-1.0	-1.2	-1.4	-1.5	-1.4	-1.4	-1.3	-1.0	-0.7	-0.4	0.1	0.3	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.3	-0.3	-0.3	-0.2	-0.2	-0.4	-0.5	-0.3	-0.5	-0.5	-0.5	-0.2	-0.3	-0.3	-0.4	-0.3	-0.5	-0.4	-0.3	-0.4	-0.5	0.0	-0.5	-0.4	-0.5
MAX	0.6	0.6	0.7	0.9	0.8	0.7	0.5	0.5	0.3	0.2	0.3	0.5	0.6	0.7	0.7	0.8	0.5	0.8	0.6	0.4	0.5	0.4	0.4	0.9	0.8
MIN	-1.6	-1.5	-1.6	-1.5	-1.4	-2.2	-1.8	-1.7	-1.8	-1.6	-1.9	-1.3	-1.4	-1.4	-2.1	-1.7	-1.6	-1.7	-1.7	-1.4	-1.9	-0.9	-1.6	-1.6	-2.2

DAY	26	27	28	29	30	31
AVE	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4
MAX	0.6	0.4	0.6	0.6	0.6	0.9
MIN	-1.9	-1.6	-1.5	-1.7	-1.7	-2.3

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = -2.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MAY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	700	700	700	700	700	701	701	701	701	701	701	701	700	700	699	699	699	699	699	699	700	700	701	701	700
2	701	701	701	702	702	702	702	702	702	702	702	701	701	700	700	699	699	699	699	699	700	700	700	700	701
3	700	700	700	700	700	700	701	701	701	701	701	701	700	699	699	699	698	698	698	698	699	699	699	699	700
4	699	699	699	700	700	700	700	700	700	700	700	699	699	698	697	697	696	696	696	697	697	697	698	698	698
5	698	698	698	698	698	698	699	699	699	699	698	698	697	697	696	696	696	696	696	696	696	697	697	697	697
6	698	698	698	698	698	698	699	699	700	699	699	699	699	698	698	698	698	698	698	698	698	699	699	700	698
7	700	699	700	700	700	701	701	701	701	701	701	702	701	701	701	700	700	700	700	701	701	701	701	701	701
8	701	701	701	701	701	701	701	701	701	701	700	700	699	698	698	697	697	698	698	699	699	700	700	700	700
9	700	700	699	699	699	699	699	699	699	699	698	698	697	696	696	695	695	695	695	695	696	696	697	697	697
10	697	697	697	697	697	697	698	698	698	698	698	698	697	697	697	696	697	697	697	698	699	699	700	700	698
11	700	700	700	700	700	701	701	701	701	701	700	700	699	698	698	697	697	698	698	699	699	700	700	700	700
12	701	700	700	700	700	701	701	702	701	701	701	701	701	700	700	699	699	701	701	701	701	702	702	702	701
13	702	702	702	702	702	703	703	703	703	703	703	702	701	701	700	700	699	699	700	700	700	701	701	701	701
14	702	701	701	702	702	702	703	703	703	703	703	702	701	701	700	700	699	699	699	699	700	700	700	700	701
15	700	700	700	701	701	701	701	702	702	701	701	700	699	699	698	698	698	697	697	698	698	699	699	699	700
16	699	699	699	699	699	699	699	700	700	700	699	699	698	698	697	697	696	696	697	697	697	698	698	698	698
17	699	699	698	699	699	699	700	701	701	700	700	700	700	699	699	699	698	698	698	699	699	699	700	700	699
18	700	700	700	700	700	700	700	701	701	701	701	700	700	700	699	699	699	699	699	699	699	699	699	699	700
19	699	699	699	699	699	699	699	700	700	699	699	698	698	698	697	696	696	696	696	696	697	697	697	697	698
20	697	697	696	696	696	697	697	697	698	698	698	698	698	697	697	697	697	698	698	699	699	699	700	700	698
21	700	699	699	700	699	700	700	700	700	699	698	698	697	697	696	695	694	694	694	694	694	695	695	696	697
22	696	695	695	695	695	695	695	695	696	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	695
23	697	697	697	698	699	699	701	701	702	702	702	702	702	702	702	701	701	701	701	701	701	702	702	702	701
24	702	702	701	701	701	702	702	702	702	702	702	701	701	700	699	699	698	698	698	698	699	699	699	699	700
25	699	699	699	699	700	700	700	700	700	700	700	699	699	698	698	698	697	697	697	697	697	698	698	698	699
26	698	698	698	698	698	698	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	700	700	700	699
27	700	699	699	699	699	700	700	700	700	700	700	700	700	700	700	700	699	699	699	700	700	700	700	700	700
28	700	700	700	700	700	700	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	699	699
29	699	698	698	698	698	699	699	700	700	700	700	700	699	699	698	698	698	698	698	698	699	699	699	699	699
30	699	699	700	700	700	700	701	701	701	701	701	700	700	699	699	698	698	698	698	698	699	699	700	700	699
31	700	700	700	701	701	701	701	701	701	701	701	700	699	699	698	697	697	697	697	697	698	699	699	699	699
HRAVE	699	699	699	699	699	700	700	700	700	700	700	700	699	699	698	698	698	698	698	698	699	699	699	699	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	701	700	698	697	698	701	700	697	698	700	701	701	701	700	698	699	700	698	698	697	695	701	700	699
MAX	701	702	701	700	699	700	702	701	700	700	701	702	703	703	702	700	701	701	700	700	700	696	702	702	700
MIN	699	699	698	696	696	698	699	697	695	696	697	699	699	699	697	696	698	699	696	696	694	695	697	698	697

DAY	26	27	28	29	30	31
AVE	699	700	699	699	699	699
MAX	700	700	700	700	701	701
MIN	698	699	697	698	698	697

MONTHLY AVERAGE = 699.2 MONTHLY MAXIMUM = 703.4 MONTHLY MINIMUM = 693.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MAY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	43	46	49	52	58	61	58	50	43	34	30	28	27	23	19	19	20	20	23	25	27	32	32	36	36
2	36	37	39	42	45	48	47	40	33	29	26	22	20	20	20	18	18	19	19	21	24	26	27	31	29
3	34	35	37	38	40	43	39	35	33	25	21	17	14	14	15	14	13	13	15	17	18	19	22	25	25
4	26	27	28	31	34	35	34	30	25	21	18	16	15	16	14	13	14	15	16	18	20	22	24	27	22
5	27	28	29	32	34	35	36	30	26	23	19	17	16	15	13	13	13	14	14	16	18	19	18	18	22
6	19	19	22	25	25	30	31	26	22	19	16	14	13	14	16	17	18	20	21	22	26	28	26	29	22
7	33	37	40	40	43	46	47	46	43	40	44	49	40	36	34	33	32	33	34	37	40	42	45	47	40
8	49	50	52	55	56	59	59	54	50	41	39	39	34	31	29	29	31	49	55	57	55	62	73	62	49
9	68	65	68	72	73	73	72	60	49	42	36	32	30	29	30	25	23	24	24	25	27	27	27	27	43
10	31	31	33	36	37	38	38	32	29	26	23	22	20	20	19	21	21	22	25	30	34	38	42	46	30
11	50	52	55	58	61	63	60	55	50	42	37	32	28	26	25	28	31	39	44	56	52	58	50	51	46
12	63	68	72	69	70	76	77	72	54	49	44	38	51	49	35	33	50	86	76	72	73	76	80	85	63
13	87	88	89	92	88	91	86	85	68	52	43	39	36	33	29	28	28	28	30	33	31	33	39	44	54
14	50	52	54	59	62	64	57	48	42	37	33	29	26	23	22	22	22	22	23	26	27	28	32	36	37
15	39	40	42	45	46	49	43	41	34	30	26	23	20	19	15	17	17	18	19	21	23	23	23	24	29
16	24	28	31	36	37	39	37	38	32	28	23	19	16	17	17	16	16	18	18	17	16	17	22	27	25
17	30	33	40	48	45	43	41	41	39	33	33	31	28	24	20	20	20	21	22	23	24	26	28	30	31
18	34	35	37	39	42	44	40	34	29	25	21	20	18	17	15	15	14	15	17	18	20	22	24	26	26
19	26	27	32	35	33	35	34	33	29	23	19	18	20	20	22	19	18	20	23	28	32	33	37	39	27
20	42	47	50	47	49	74	68	49	44	40	43	40	37	31	32	27	25	27	32	34	35	36	39	43	41
21	48	52	55	57	62	62	55	48	44	40	36	29	28	26	24	23	23	24	26	26	27	29	29	31	38
22	34	37	40	41	44	48	48	46	44	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	42
23	44	46	48	66	76	75	76	81	65	56	47	36	33	30	26	26	26	26	26	29	31	33	35	37	45
24	41	44	47	48	49	50	45	40	34	30	27	19	18	18	17	16	14	15	15	17	19	22	23	25	29
25	30	29	30	32	34	36	33	29	24	19	17	15	16	13	10	12	12	12	14	16	18	20	17	20	21
26	21	22	24	26	30	32	30	27	25	23	23	25	24	23	20	18	19	21	22	25	28	30	32	35	25
27	35	34	35	37	39	42	46	47	44	43	43	39	38	35	33	31	28	27	28	28	28	29	30	32	35
28	33	37	39	41	43	43	41	34	29	25	24	23	21	19	19	19	19	19	20	22	24	24	27	29	28
29	31	32	33	35	37	39	35	31	26	23	22	22	20	19	18	18	18	18	19	21	23	24	27	29	26
30	31	33	34	35	37	38	37	29	27	24	21	17	15	14	15	16	16	16	16	17	18	19	22	23	24
31	25	27	28	32	33	32	31	28	23	22	19	15	11	11	12	12	11	11	11	12	14	15	17	18	20
HRAVE	38	40	42	45	47	50	48	43	37	32	29	26	24	23	21	21	21	24	25	27	28	30	32	34	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	36	29	25	22	22	22	40	49	43	30	46	63	54	37	29	25	31	26	27	41	38	42	45	29	21
MAX	61	48	43	35	36	31	49	73	73	46	63	86	92	64	49	39	48	44	39	74	62	48	81	50	36
MIN	19	18	13	13	13	13	32	29	23	19	25	33	28	22	15	16	20	14	18	25	23	34	26	14	10

DAY	26	27	28	29	30	31
AVE	25	35	28	26	24	20
MAX	35	47	43	39	38	33
MIN	18	27	19	18	14	11

MONTHLY AVERAGE = 33.0 MONTHLY MAXIMUM = 91.9 MONTHLY MINIMUM = 9.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MAY - 2019

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.55	0.76	0.90	0.99	1.02	1.00	0.90	0.69	0.41	0.29	0.09	0.00	0.00	0.00	0.00	0.00	8.06
2	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.55	0.70	0.69	0.73	0.83	0.64	0.43	0.64	0.24	0.15	0.04	0.00	0.00	0.00	0.00	0.00	6.10
3	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.55	0.76	0.92	1.02	1.06	1.02	0.91	0.71	0.46	0.33	0.11	0.00	0.00	0.00	0.00	0.00	8.32
4	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.34	0.57	0.76	0.91	1.01	1.01	0.98	0.88	0.67	0.47	0.32	0.10	0.00	0.00	0.00	0.00	0.00	8.16
5	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.55	0.76	0.92	1.00	1.01	0.96	0.86	0.62	0.41	0.15	0.05	0.00	0.00	0.00	0.00	0.00	7.78
6	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.30	0.48	0.73	0.78	0.98	0.89	0.70	0.59	0.62	0.30	0.16	0.07	0.01	0.00	0.00	0.00	0.00	6.68
7	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.35	0.41	0.59	0.54	0.77	1.05	0.97	0.73	0.64	0.33	0.32	0.11	0.00	0.00	0.00	0.00	0.00	6.92
8	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.13	0.32	0.44	0.46	0.56	1.01	1.02	0.83	0.49	0.12	0.09	0.05	0.00	0.00	0.00	0.00	0.00	5.58
9	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.34	0.55	0.73	0.87	0.95	0.82	0.51	0.34	0.38	0.35	0.16	0.05	0.00	0.00	0.00	0.00	0.00	6.18
10	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.33	0.28	0.40	0.47	0.77	0.89	0.91	0.83	0.36	0.53	0.25	0.09	0.00	0.00	0.00	0.00	0.00	6.22
11	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.33	0.54	0.75	0.90	1.00	1.04	0.87	0.84	0.49	0.23	0.06	0.02	0.00	0.00	0.00	0.00	0.00	7.17
12	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.16	0.53	0.75	0.91	0.67	0.14	0.73	0.81	0.51	0.11	0.05	0.08	0.01	0.00	0.00	0.00	0.00	5.52
13	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.18	0.57	0.75	0.90	0.99	1.02	0.99	0.90	0.62	0.55	0.34	0.14	0.01	0.00	0.00	0.00	0.00	8.04
14	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.34	0.54	0.75	0.90	1.00	1.01	0.98	0.83	0.62	0.55	0.33	0.12	0.01	0.00	0.00	0.00	0.00	8.09
15	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.57	0.77	0.84	0.91	1.05	0.96	0.67	0.51	0.55	0.27	0.11	0.01	0.00	0.00	0.00	0.00	7.70
16	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.28	0.47	0.56	0.85	0.49	0.69	0.89	0.90	0.61	0.56	0.28	0.10	0.01	0.00	0.00	0.00	0.00	6.78
17	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.13	0.24	0.68	0.92	0.97	1.04	0.97	0.90	0.62	0.57	0.29	0.10	0.01	0.00	0.00	0.00	0.00	7.53
18	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.59	0.79	0.94	1.03	1.06	1.02	0.85	0.62	0.56	0.26	0.13	0.00	0.00	0.00	0.00	0.00	8.38
19	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.17	0.40	0.55	0.69	0.63	0.45	0.33	0.39	0.60	0.39	0.17	0.05	0.00	0.00	0.00	0.00	0.00	4.89
20	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.16	0.32	0.22	0.60	0.78	0.80	0.82	0.61	0.48	0.15	0.09	0.01	0.00	0.00	0.00	0.00	5.23
21	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.56	0.74	0.92	0.99	1.05	1.01	0.92	0.62	0.57	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.39
22	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.51	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	1.00
23	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.20	0.25	0.66	0.85	0.90	0.85	1.00	0.90	0.66	0.58	0.36	0.15	0.01	0.00	0.00	0.00	0.00	7.42
24	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.60	0.80	0.95	1.04	1.08	1.02	0.94	0.68	0.60	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.78
25	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.61	0.80	0.95	1.03	1.07	1.03	0.95	0.67	0.59	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.77
26	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.36	0.58	0.72	0.87	1.01	1.05	1.01	0.91	0.66	0.59	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.46
27	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.34	0.56	0.76	0.93	1.04	0.86	0.86	0.91	0.66	0.58	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.20
28	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.60	0.78	0.92	1.03	1.00	0.95	0.69	0.35	0.48	0.28	0.12	0.02	0.00	0.00	0.00	0.00	7.75
29	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.37	0.59	0.78	0.93	1.02	1.06	1.01	0.92	0.66	0.59	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.62
30	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.59	0.78	0.93	1.03	1.07	1.02	0.93	0.66	0.58	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.64
31	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.58	0.78	0.94	1.03	1.09	1.03	0.94	0.66	0.59	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.72
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.30	0.50	0.70	0.82	0.91	0.94	0.91	0.81	0.60	0.46	0.27	0.11	0.01	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	8.06	6.10	8.32	8.16	7.78	6.68	6.92	5.58	6.18	6.22	7.17	5.52	8.04	8.09	7.70	6.78	7.53	8.38	4.89	5.23	8.39	1.00	7.42	8.78	8.77
MAX	1.02	0.83	1.06	1.01	1.01	0.98	1.05	1.02	0.95	0.91	1.04	0.91	1.02	1.01	1.05	0.90	1.04	1.06	0.69	0.82	1.05	0.51	1.00	1.08	1.07
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	8.46	8.20	7.75	8.62	8.64	8.72
MAX	1.05	1.04	1.03	1.06	1.07	1.09
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.0% OPERATIONAL RECOVERY RATE = 98.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MAY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.04
9	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.11
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.17 MONTHLY MAXIMUM = 0.05 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
JUNE - 2019

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	8.9	4.3	4.8	6.6	6.4	6.9	6.8	5.2	2.3	3.1	4.5	7.0	6.1	9.8	15.0	15.4	16.1	17.1	15.7	14.5	11.4	10.8	13.3	11.7	9.3
2	14.6	9.6	7.8	7.3	5.3	4.3	3.4	2.3	3.0	3.1	4.5	6.9	10.4	10.1	10.4	13.9	13.1	14.5	16.8	14.3	9.7	3.6	2.3	4.3	8.1
3	12.6	12.9	9.7	3.8	4.1	4.7	5.1	4.4	3.9	3.3	5.2	7.6	8.3	3.5	7.5	8.7	13.1	16.4	17.3	13.2	10.8	5.4	10.0	14.0	8.5
4	11.2	6.0	4.0	3.1	2.6	4.4	5.5	4.2	3.0	3.3	5.5	9.0	10.7	14.3	14.4	14.6	17.0	15.6	15.9	11.1	6.8	5.5	3.3	2.9	8.1
5	2.8	3.0	3.8	3.5	5.2	7.4	6.8	4.5	4.3	2.8	5.3	9.1	13.9	15.2	15.7	14.5	13.8	14.1	12.9	11.8	8.2	6.9	4.2	7.2	8.2
6	9.8	5.5	3.2	5.8	5.0	5.6	4.1	2.8	3.0	5.0	8.7	9.2	10.7	12.8	14.5	15.6	15.8	16.4	13.6	11.1	7.5	5.6	6.6	10.9	8.7
7	13.1	7.9	9.5	9.1	4.7	2.5	2.3	1.9	2.8	5.1	5.3	5.5	6.6	9.9	11.9	14.2	16.2	15.7	13.9	15.2	14.6	10.3	6.5	9.5	8.9
8	10.0	4.4	2.2	5.8	4.0	3.8	4.3	3.6	3.2	3.6	4.2	5.5	10.6	13.9	14.9	13.7	15.8	14.3	14.7	12.5	7.1	3.2	3.2	3.2	7.6
9	5.5	6.9	7.2	4.0	3.6	6.2	6.6	2.8	2.3	2.0	2.5	3.5	6.3	5.9	6.0	4.3	5.2	4.2	9.8	13.1	13.3	12.0	6.8	5.4	6.1
10	6.1	9.2	7.7	9.7	7.1	3.6	3.6	9.2	6.9	10.5	14.6	15.6	18.0	16.0	14.6	18.5	20.1	20.5	22.4	22.8	25.0	25.5	21.8	21.5	14.6
11	21.1	20.0	19.0	17.0	18.2	16.5	16.7	15.9	13.1	13.1	12.0	9.6	5.5	5.8	10.6	12.4	13.9	13.4	14.1	12.2	11.0	7.5	3.4	5.3	12.8
12	8.0	9.0	7.6	7.9	8.2	6.3	5.1	4.7	1.6	2.1	3.5	7.8	11.3	9.2	8.8	13.5	14.3	13.2	15.2	10.3	8.7	5.7	2.6	7.6	8.0
13	8.0	7.2	9.6	6.1	6.0	10.4	5.9	6.0	3.4	1.4	2.1	3.5	4.8	6.5	9.6	13.3	12.0	11.0	8.3	9.4	18.2	15.7	7.3	5.0	7.9
14	4.4	10.3	4.4	5.6	6.7	7.0	6.6	4.3	2.3	2.9	7.4	10.9	14.7	14.6	17.0	19.2	17.5	17.3	14.4	16.2	13.3	13.6	6.7	8.4	10.2
15	4.3	2.5	4.3	4.6	7.2	7.0	7.0	3.8	2.6	2.7	4.7	5.0	5.7	9.4	11.3	11.4	12.6	11.8	13.2	10.4	7.3	4.6	4.4	7.2	6.9
16	3.6	3.2	3.3	5.8	6.2	7.9	6.3	5.4	2.2	2.5	4.8	11.0	12.5	11.5	10.6	11.2	12.2	13.9	14.2	11.9	6.0	3.5	6.3	14.4	7.9
17	13.8	5.6	5.1	4.4	5.0	6.2	7.1	5.6	4.0	4.6	5.4	7.1	7.2	6.3	9.9	13.4	16.2	14.1	13.9	11.5	8.6	5.9	5.7	13.3	8.3
18	10.2	3.3	5.1	4.3	4.1	6.5	6.6	4.8	3.5	3.2	5.3	4.3	6.5	11.0	13.5	15.1	16.7	18.6	16.7	12.5	7.7	6.0	3.0	8.1	8.2
19	14.8	6.6	4.1	4.6	4.3	4.8	7.0	5.6	4.5	2.7	4.9	7.6	9.9	11.7	13.9	14.3	15.8	15.7	16.1	12.1	8.0	3.8	3.6	6.9	8.5
20	5.7	5.0	3.1	4.8	6.1	5.5	2.8	4.8	3.0	2.9	5.0	4.2	6.7	13.1	12.4	14.6	15.2	16.2	14.8	13.6	12.6	15.7	12.4	9.1	8.7
21	10.2	9.7	6.9	5.1	5.1	6.4	6.7	5.4	3.9	5.1	4.2	6.9	13.1	14.9	15.0	18.4	17.1	18.5	17.5	15.9	16.3	17.7	14.0	5.0	10.8
22	3.6	6.2	6.0	5.6	2.1	1.7	4.8	3.2	3.6	4.4	5.7	6.1	8.6	13.8	14.3	16.8	17.0	17.8	17.0	16.4	11.9	9.0	5.5	6.5	8.6
23	4.6	3.4	3.3	3.5	5.6	7.6	6.7	1.9	1.9	3.1	4.0	6.4	8.4	13.8	12.6	13.0	15.6	14.6	14.8	13.6	7.7	5.1	1.6	3.2	7.3
24	5.7	7.2	7.8	7.8	6.7	5.3	5.8	5.4	2.7	2.8	2.8	4.8	5.7	6.0	9.9	14.8	14.1	17.3	15.7	11.2	6.8	2.4	1.9	4.5	7.3
25	4.8	8.0	9.2	2.8	6.4	6.8	6.3	3.8	2.2	1.7	4.5	4.8	4.9	6.8	10.8	18.7	18.9	15.9	16.7	13.5	8.3	3.5	4.3	8.9	8.0
26	11.5	8.0	4.8	3.0	4.8	4.6	5.2	4.6	2.7	2.6	3.2	4.9	3.8	8.8	13.0	15.4	17.1	13.6	13.5	10.8	8.5	3.5	5.3	13.3	7.8
27	12.2	7.7	5.5	2.6	2.8	6.2	3.9	5.1	3.9	3.6	4.8	6.9	6.7	9.2	11.1	19.3	19.8	19.8	15.5	14.4	8.1	2.4	3.4	5.9	8.4
28	7.9	9.1	4.8	2.8	3.1	3.3	7.4	6.9	5.9	2.9	3.5	5.3	7.5	6.1	7.4	14.7	17.4	13.4	13.5	12.8	7.7	7.3	9.0	6.5	7.8
29	9.5	12.4	12.4	15.0	16.1	12.8	13.9	13.1	10.6	10.6	6.9	6.5	5.0	6.9	7.8	12.6	16.8	15.8	19.0	15.8	14.0	13.5	6.6	6.8	11.7
30	12.5	12.1	10.2	11.3	8.1	6.6	6.6	4.1	6.4	5.5	2.4	5.0	7.6	12.8	14.3	17.6	20.0	19.3	17.5	14.6	11.9	18.2	10.5	3.7	10.8
HRAVE	9.0	7.5	6.5	6.1	6.0	6.3	6.2	5.2	4.0	4.1	5.2	6.9	8.6	10.3	12.0	14.4	15.5	15.3	15.2	13.3	10.6	8.4	6.5	8.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.3	8.1	8.5	8.1	8.2	8.7	8.9	7.6	6.1	14.6	12.8	8.0	7.9	10.2	6.9	7.9	8.3	8.2	8.5	8.7	10.8	8.6	7.3	7.3	8.0
MAX	17.1	16.8	17.3	17.0	15.7	16.4	16.2	15.8	13.3	25.5	21.1	15.2	18.2	19.2	13.2	14.4	16.2	18.6	16.1	16.2	18.5	17.8	15.6	17.3	18.9
MIN	2.3	2.3	3.3	2.6	2.8	2.8	1.9	2.2	2.0	3.6	3.4	1.6	1.4	2.3	2.5	2.2	4.0	3.0	2.7	2.8	3.9	1.7	1.6	1.9	1.7

DAY	26	27	28	29	30	31
AVE	7.8	8.4	7.8	11.7	10.8	***
MAX	17.1	19.8	17.4	19.0	20.0	***
MIN	2.6	2.4	2.8	5.0	2.4	***

MONTHLY AVERAGE = 8.8 MONTHLY MAXIMUM = 25.5 MONTHLY MINIMUM = 1.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JUNE - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	291	172	133	108	119	120	115	111	92	95	147	128	133	241	242	258	266	276	301	294	297	292	284	309	257
2	297	311	323	276	234	127	109	322	282	284	186	163	276	281	243	257	256	254	280	297	308	315	238	303	213
3	306	313	306	217	154	116	105	111	117	149	150	147	136	89	211	242	269	281	302	301	293	304	318	304	41
4	308	307	284	238	169	145	133	113	150	301	275	294	306	299	289	287	283	292	300	291	315	296	29	175	128
5	120	150	135	143	120	122	98	123	139	270	281	297	291	292	289	279	283	292	291	289	307	310	167	276	282
6	293	169	116	138	133	112	126	138	141	274	312	309	283	284	292	283	285	296	297	303	293	309	312	301	232
7	297	310	305	300	238	147	117	127	285	299	282	260	274	306	241	245	270	279	281	284	286	298	324	315	352
8	299	310	274	289	133	114	134	122	136	74	92	303	248	276	293	293	291	285	308	306	297	302	14	99	309
9	113	107	93	84	104	105	111	115	103	219	280	204	273	263	270	251	275	239	280	300	306	305	261	121	54
10	105	115	92	82	94	52	97	88	82	60	62	68	67	78	76	81	78	77	82	74	82	75	79	75	152
11	70	69	70	70	64	56	68	72	64	57	37	56	73	296	293	290	287	301	287	288	308	297	82	127	178
12	114	120	104	114	115	123	114	119	358	188	263	288	293	296	315	305	285	286	289	293	303	295	14	107	207
13	110	93	83	105	101	88	129	119	123	103	108	60	315	300	303	265	286	295	300	282	266	267	290	302	230
14	288	303	319	107	95	82	87	95	120	298	274	220	246	245	250	266	267	275	267	272	263	253	291	313	211
15	289	154	128	136	112	106	121	126	148	181	268	263	310	284	308	266	282	283	290	294	303	297	126	116	227
16	129	109	85	96	109	96	107	129	141	207	290	301	313	304	306	293	295	306	308	310	295	183	156	308	233
17	309	272	159	140	95	127	107	104	132	118	138	149	159	191	233	246	269	285	280	294	296	304	271	308	254
18	313	248	288	147	122	100	106	115	135	292	301	276	282	304	265	274	270	285	297	303	296	299	240	306	256
19	306	290	190	102	97	114	105	116	128	182	273	291	301	299	296	291	288	283	281	297	296	313	163	120	222
20	107	119	119	98	93	101	97	102	142	257	280	282	273	237	254	267	279	273	275	275	270	248	283	282	76
21	279	280	289	125	112	98	102	123	116	124	33	275	251	253	255	241	241	253	258	269	266	272	268	182	313
22	150	205	292	254	300	186	98	120	140	98	319	272	234	262	262	286	273	282	274	275	285	297	303	311	16
23	235	130	114	95	95	97	87	88	127	205	276	275	323	320	305	301	303	292	291	295	302	303	328	83	228
24	123	101	94	94	102	113	101	130	115	138	57	111	277	307	305	302	304	299	304	313	308	313	117	105	158
25	115	103	91	357	103	110	108	113	216	202	276	265	292	291	285	286	310	286	290	305	298	263	289	305	306
26	314	288	164	127	137	127	128	115	149	286	324	269	295	300	272	271	313	318	317	319	308	240	183	304	152
27	291	315	302	212	173	110	114	87	135	146	113	105	161	282	284	300	308	304	306	300	292	327	137	109	116
28	114	99	68	306	119	115	123	117	99	146	86	161	137	157	296	302	285	278	303	298	298	305	336	137	53
29	45	61	71	55	68	64	65	61	59	67	41	30	318	314	311	256	280	283	293	292	293	300	212	333	57
30	50	42	54	77	122	75	82	103	71	79	61	289	290	277	294	284	289	286	290	296	336	42	50	355	244

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JUNE - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	24	15	8	15	10	8	8	11	37	33	33	34	67	37	27	22	18	19	14	9	8	8	10	9	20
2	9	9	14	8	24	9	19	32	30	33	64	45	27	26	28	26	22	16	10	9	8	15	29	29	23
3	6	8	14	21	8	11	13	17	27	32	28	33	49	64	41	40	19	14	12	9	7	13	10	9	21
4	9	16	30	19	15	6	8	16	36	41	33	23	24	20	22	14	15	15	11	7	9	18	33	32	20
5	40	48	25	21	10	11	10	15	21	45	30	26	21	18	21	17	17	14	14	7	7	7	31	27	21
6	7	21	12	6	9	10	9	17	37	32	20	24	25	22	20	15	17	16	13	10	6	9	6	22	16
7	10	12	9	7	17	20	20	48	28	32	33	51	49	37	47	19	14	13	12	7	7	8	18	11	22
8	8	37	28	35	17	10	13	15	27	45	53	41	26	20	24	20	19	15	12	9	6	18	23	21	23
9	11	8	7	29	17	11	13	19	36	44	47	74	42	29	32	49	51	54	18	8	6	6	22	12	27
10	12	12	15	13	29	57	45	12	26	11	17	16	13	22	20	14	16	14	12	11	10	10	10	9	18
11	8	7	6	8	12	13	9	10	20	21	21	23	43	37	34	19	17	16	9	7	6	9	65	8	18
12	8	9	10	8	9	9	7	17	37	64	31	19	20	22	25	19	15	14	12	7	6	7	30	8	17
13	20	15	8	14	9	7	10	9	21	45	39	58	40	29	24	18	17	14	15	12	10	9	17	18	20
14	39	12	42	46	12	18	20	21	46	52	28	26	17	24	18	20	18	16	14	8	10	13	34	11	23
15	39	32	19	9	8	9	7	18	27	50	38	40	47	35	24	27	16	20	11	9	5	14	26	16	23
16	56	13	41	6	8	9	7	13	39	44	34	20	18	27	28	24	21	20	14	10	8	31	30	18	22
17	8	21	14	13	17	17	8	11	24	26	35	36	57	58	56	22	19	16	11	9	5	12	33	9	22
18	9	24	15	19	15	8	10	16	37	39	32	45	60	25	28	16	21	13	13	9	6	8	48	22	22
19	8	19	23	10	22	11	7	13	19	45	31	32	27	21	21	18	13	14	10	9	7	9	24	7	17
20	14	11	25	7	7	9	19	13	28	44	31	50	39	23	24	20	19	19	12	8	10	12	11	16	20
21	11	11	39	19	11	11	10	12	34	46	50	42	28	23	23	16	20	19	15	10	9	8	10	35	21
22	23	21	16	15	47	34	12	18	25	40	44	54	37	24	22	17	20	13	13	8	6	10	29	18	24
23	30	14	12	10	9	9	9	36	43	38	42	42	37	24	23	23	18	16	13	8	9	14	26	33	22
24	7	6	6	8	8	16	7	12	32	38	46	56	51	50	33	24	18	13	12	10	11	14	9	12	21
25	10	7	8	63	10	9	10	15	33	61	31	34	56	43	31	13	14	15	11	9	9	40	44	7	24
26	8	13	14	14	13	8	9	12	25	39	44	53	66	45	30	27	14	16	14	12	9	27	28	8	23
27	7	11	10	31	36	11	11	9	25	29	37	27	56	37	24	13	14	12	12	9	7	48	19	10	21
28	10	9	24	19	19	26	9	9	12	37	44	53	36	49	46	18	14	19	12	8	10	9	29	18	22
29	16	12	11	13	9	12	11	11	10	16	24	27	43	53	44	26	15	11	9	9	7	9	26	27	19
30	16	11	14	10	17	14	12	28	20	23	65	59	40	26	20	16	11	12	11	9	16	9	9	28	21
HRAVE	16	16	17	17	15	14	12	17	29	38	37	39	39	32	29	21	18	17	12	9	8	14	25	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20	23	21	20	21	16	22	23	27	18	18	17	20	23	23	22	22	22	17	20	21	24	22	21	24
MAX	67	64	64	41	48	37	51	53	74	57	65	64	58	52	50	56	58	60	45	50	50	54	43	56	63
MIN	8	8	6	6	7	6	7	6	6	9	6	6	7	8	5	6	5	6	7	7	8	6	8	6	7

DAY	26	27	28	29	30	31
AVE	23	21	22	19	21	***
MAX	66	56	53	53	65	***
MIN	8	7	8	7	9	***

MONTHLY AVERAGE = 21.1 MONTHLY MAXIMUM = 73.9 MONTHLY MINIMUM = 5.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JUNE - 2019

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	25.8	23.8	22.5	20.9	19.8	19.0	20.2	22.7	25.4	28.5	31.1	34.2	35.7	36.6	36.9	36.4	35.8	35.2	33.8	32.3	30.5	29.1	27.7	26.5	28.8
2	25.6	24.7	24.3	22.5	21.1	20.8	21.8	23.0	25.4	27.4	30.1	32.3	33.0	33.7	35.0	34.9	34.8	34.1	32.8	31.1	29.7	29.0	27.6	26.1	28.4
3	25.6	24.7	24.1	22.4	21.6	20.5	21.4	23.5	26.5	28.2	31.0	33.6	34.3	35.0	36.1	36.2	35.9	35.1	33.4	31.9	30.6	29.1	28.2	27.1	29.0
4	26.3	25.6	24.8	23.5	21.8	20.9	21.4	23.9	26.1	27.8	29.8	31.7	33.3	34.0	34.4	34.6	34.8	34.3	32.7	31.4	30.4	29.8	28.7	27.2	28.7
5	25.8	24.6	23.6	22.9	21.5	21.2	22.5	23.9	26.9	28.6	30.8	33.0	34.4	35.2	35.5	35.7	35.8	35.5	34.8	32.9	31.6	31.0	28.9	28.3	29.4
6	28.0	26.0	25.4	23.9	23.2	22.3	23.3	24.6	27.6	29.7	32.1	34.0	35.0	35.9	36.3	36.5	36.5	35.8	35.1	33.6	32.1	31.0	30.2	28.8	30.3
7	28.4	27.2	26.3	24.9	23.6	23.2	23.8	25.5	27.6	30.3	31.8	33.5	34.4	35.4	37.0	36.3	35.9	35.6	34.2	32.4	31.1	30.0	29.8	28.9	30.3
8	27.9	26.4	25.8	24.5	23.4	22.2	23.1	24.7	27.8	30.1	31.9	33.3	35.3	35.8	35.9	36.2	36.1	35.6	34.5	33.0	31.1	30.4	28.9	27.3	30.1
9	25.2	23.6	23.1	21.2	20.7	19.6	21.7	23.5	26.8	29.8	32.6	35.8	36.2	36.8	37.7	38.1	38.4	38.2	38.0	35.7	34.1	33.0	31.6	30.5	30.5
10	29.9	27.9	28.4	27.2	26.6	25.0	25.0	26.6	28.4	31.0	33.5	35.1	35.5	36.4	36.8	36.3	35.4	34.4	33.0	31.3	30.2	28.9	28.1	27.5	30.8
11	26.8	26.5	25.9	25.2	24.6	24.0	24.5	25.8	27.9	29.7	31.7	34.2	36.3	37.7	38.6	39.3	39.2	38.7	37.0	35.1	34.2	33.2	31.9	30.2	31.6
12	29.2	27.9	27.0	26.1	25.1	23.7	24.9	27.0	29.4	33.3	35.3	37.6	39.3	40.5	41.1	41.4	41.2	40.9	39.8	37.9	36.2	34.9	33.5	30.6	33.5
13	29.0	28.2	26.6	25.1	24.7	24.1	24.4	27.8	30.1	33.1	35.9	37.3	38.3	39.4	39.8	40.0	39.9	38.9	38.3	36.7	36.1	35.0	33.3	32.6	33.1
14	31.9	31.0	28.8	26.2	24.7	23.6	24.0	27.4	30.1	32.7	34.8	36.8	37.3	38.1	38.3	38.2	38.1	37.7	36.7	34.8	33.3	32.1	30.5	30.0	32.4
15	29.0	28.0	26.0	24.3	23.4	22.9	23.2	25.2	27.9	30.5	32.1	34.0	35.8	36.6	37.2	37.9	37.5	37.0	36.0	34.3	32.7	31.6	29.4	27.6	30.8
16	27.4	26.9	26.6	24.5	23.7	23.0	23.9	25.7	28.1	30.7	33.0	34.5	35.3	36.8	37.4	37.8	38.0	37.5	36.7	35.2	33.7	31.9	30.4	30.6	31.2
17	29.6	28.3	26.7	25.9	25.1	23.1	24.4	26.0	29.0	32.1	34.2	36.2	37.1	38.0	38.6	38.7	38.1	37.5	36.8	35.3	33.5	32.4	31.2	30.1	32.0
18	29.0	28.4	27.6	25.7	24.9	23.7	24.9	27.3	29.5	31.5	33.4	34.7	36.0	37.2	38.1	38.1	38.0	36.9	36.0	34.4	32.6	31.2	30.3	29.8	31.6
19	29.0	27.7	26.0	24.6	23.0	21.6	22.9	25.1	28.3	30.6	32.6	34.7	36.0	36.8	37.5	37.6	37.7	37.1	36.0	34.5	32.5	31.3	29.1	27.6	30.8
20	26.7	26.1	25.0	24.0	22.3	21.5	21.9	25.0	27.4	30.1	32.3	34.1	35.8	37.4	37.5	37.6	37.8	37.4	36.6	34.9	33.1	32.1	31.0	29.8	30.7
21	28.2	26.9	26.1	24.0	23.0	22.5	23.7	26.0	29.0	31.7	32.8	34.6	35.8	36.5	37.1	37.2	37.3	36.5	35.4	33.7	32.3	31.3	30.4	29.1	30.9
22	27.7	26.0	25.8	25.0	23.9	23.2	24.1	25.1	28.6	30.8	32.2	33.8	35.4	35.5	35.9	35.5	35.5	35.0	34.1	32.5	30.6	29.4	28.4	28.1	30.1
23	27.1	25.9	24.8	24.0	22.1	21.7	23.8	24.9	27.7	29.6	30.9	32.5	33.9	34.8	35.3	35.6	35.5	35.0	34.2	32.7	31.1	30.1	29.3	27.5	29.6
24	25.8	24.4	23.6	22.2	21.5	20.4	21.6	23.9	26.9	30.2	33.0	35.0	35.7	36.8	37.7	37.7	37.4	36.8	36.0	34.4	32.9	31.8	29.8	28.2	30.2
25	26.3	24.8	23.9	22.5	20.9	20.9	22.3	24.1	27.0	30.6	33.0	35.3	37.0	38.2	38.8	37.6	37.6	37.9	36.9	35.3	33.8	32.1	30.8	29.6	30.7
26	28.7	27.8	26.4	25.4	23.9	23.1	23.3	25.7	28.1	30.2	32.5	34.6	35.4	36.9	37.9	38.0	36.7	36.4	36.1	35.2	34.2	32.7	31.2	30.5	31.3
27	29.4	28.7	27.8	26.8	25.4	23.8	24.9	27.6	29.8	32.3	35.3	37.2	39.4	39.9	40.3	40.2	39.3	38.5	37.6	36.2	34.6	33.8	32.1	30.2	33.0
28	28.9	28.6	26.5	26.5	24.8	24.2	25.1	28.2	30.6	33.3	37.5	40.3	42.2	42.1	41.0	41.0	40.9	39.8	39.3	38.7	37.7	36.5	35.9	34.6	34.3
29	34.0	33.5	32.5	31.9	31.1	30.6	31.2	32.0	33.6	36.5	37.7	39.5	40.9	42.0	42.6	43.0	42.2	41.5	39.9	38.8	37.7	37.2	36.3	35.8	36.8
30	35.1	34.5	33.9	33.3	31.9	31.4	31.3	32.0	35.5	37.5	38.9	40.4	40.8	41.5	42.1	42.2	41.2	40.6	39.4	38.1	36.5	34.4	33.9	32.9	36.6
HRAVE	28.3	27.2	26.2	24.9	23.8	22.9	23.8	25.8	28.4	30.9	33.1	35.1	36.4	37.3	37.8	37.9	37.6	37.0	36.0	34.5	33.0	31.9	30.6	29.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	28.8	28.4	29.0	28.7	29.4	30.3	30.3	30.1	30.5	30.8	31.6	33.5	33.1	32.4	30.8	31.2	32.0	31.6	30.8	30.7	30.9	30.1	29.6	30.2	30.7
MAX	36.9	35.0	36.2	34.8	35.8	36.5	37.0	36.2	38.4	36.8	39.3	41.4	40.0	38.3	37.9	38.0	38.7	38.1	37.7	37.8	37.3	35.9	35.6	37.7	38.8
MIN	19.0	20.8	20.5	20.9	21.2	22.3	23.2	22.2	19.6	25.0	24.0	23.7	24.1	23.6	22.9	23.0	23.1	23.7	21.6	21.5	22.5	23.2	21.7	20.4	20.9

DAY	26	27	28	29	30	31
AVE	31.3	33.0	34.3	36.8	36.6	***
MAX	38.0	40.3	42.2	43.0	42.2	***
MIN	23.1	23.8	24.2	30.6	31.3	***

MONTHLY AVERAGE = 31.2 MONTHLY MAXIMUM = 43.0 MONTHLY MINIMUM = 19.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JUNE - 2019

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.4	0.6	0.7	0.9	0.8	0.4	-0.7	-1.4	-0.8	-1.1	-1.5	-2.2	-1.9	-1.8	-1.8	-1.4	-1.2	-0.9	-0.5	-0.1	0.2	0.3	0.1	0.1	-0.5
2	0.1	0.2	0.2	0.7	0.5	0.3	-0.4	-0.5	-0.7	-0.8	-1.3	-1.9	-1.6	-1.6	-1.6	-1.5	-1.2	-0.8	-0.6	-0.1	0.2	0.3	0.6	0.6	-0.5
3	0.3	0.2	0.2	0.4	0.4	0.2	-0.8	-1.2	-1.3	-1.1	-1.6	-2.2	-2.0	-1.4	-1.7	-1.3	-1.3	-1.0	-0.6	-0.1	0.2	0.3	0.2	0.2	-0.6
4	0.3	0.3	0.3	0.4	0.4	0.2	-0.6	-1.2	-1.0	-0.8	-1.1	-1.5	-1.6	-1.8	-1.6	-1.6	-1.5	-1.1	-0.4	0.0	0.3	0.4	0.5	0.6	-0.5
5	0.6	0.5	0.4	0.4	0.4	0.5	-0.7	-1.1	-1.3	-0.8	-1.2	-1.5	-1.7	-1.7	-1.7	-1.7	-1.5	-1.3	-1.0	-0.7	-0.1	0.3	0.4	0.4	0.5	-0.5
6	0.6	0.6	0.4	0.4	0.3	0.2	-0.4	-0.7	-0.9	-0.9	-1.4	-1.6	-1.7	-1.7	-1.7	-1.6	-1.3	-1.0	-0.6	-0.1	0.4	0.4	0.4	0.4	-0.5
7	0.2	0.2	0.3	0.5	0.6	0.4	-0.3	-0.6	-0.6	-1.1	-1.2	-1.4	-1.5	-1.6	-1.5	-1.1	-0.9	-0.9	-0.3	0.0	0.1	0.2	0.2	0.2	-0.4
8	0.3	0.3	0.3	0.6	0.5	0.2	-0.4	-0.9	-1.0	-1.2	-1.5	-1.4	-1.6	-1.8	-1.7	-1.5	-1.4	-1.1	-0.6	-0.1	0.5	0.4	0.6	0.8	-0.5
9	0.8	0.7	0.9	0.6	0.8	0.6	-0.6	-0.8	-0.9	-0.8	-0.9	-1.3	-1.4	-1.1	-1.3	-1.0	-0.9	-0.7	-0.7	-0.1	0.2	0.4	0.5	0.5	-0.3
10	0.7	0.6	0.7	0.6	0.6	0.4	0.3	0.0	-0.4	-0.5	-1.5	-1.8	-1.6	-1.9	-1.7	-1.4	-0.9	-0.6	-0.3	-0.1	-0.1	-0.1	0.0	0.0	-0.4
11	0.0	0.0	0.0	0.0	0.0	-0.1	-0.6	-1.1	-1.4	-1.5	-1.6	-1.8	-1.9	-1.4	-1.3	-1.5	-1.2	-1.0	-0.4	0.1	0.4	0.6	0.7	0.8	-0.6
12	0.6	0.5	0.7	0.6	0.5	0.4	-0.6	-1.1	-0.7	-0.9	-0.9	-1.1	-1.5	-1.5	-1.4	-1.4	-1.2	-1.0	-0.6	0.1	0.5	0.7	0.7	1.0	-0.3
13	0.8	0.9	0.8	0.9	0.7	0.6	-0.4	-1.4	-1.0	-0.7	-0.8	-1.1	-1.1	-1.3	-1.0	-0.9	-0.8	-0.5	-0.2	0.3	0.2	0.2	0.4	0.5	-0.2
14	0.4	0.7	0.8	1.0	0.8	0.5	-0.5	-0.9	-0.8	-0.7	-1.2	-1.9	-1.6	-1.6	-1.4	-1.3	-1.1	-0.9	-0.5	0.0	0.2	0.2	0.3	0.4	-0.4
15	0.4	0.4	0.6	0.7	0.5	0.3	-0.4	-0.9	-0.8	-0.8	-1.0	-1.2	-1.4	-1.7	-1.6	-1.5	-1.4	-1.1	-0.7	0.0	0.6	0.6	0.9	1.0	-0.3
16	0.6	0.7	0.5	0.7	0.6	0.4	-0.7	-1.2	-0.6	-0.8	-1.1	-1.4	-1.4	-1.6	-1.6	-1.4	-1.2	-0.9	-0.6	0.0	0.5	0.6	0.4	0.3	-0.4
17	0.3	0.5	0.6	0.4	0.8	0.5	-0.2	-0.9	-1.2	-1.5	-1.8	-2.2	-1.9	-1.7	-1.6	-1.4	-1.2	-1.0	-0.7	-0.1	0.4	0.6	0.4	0.2	-0.5
18	0.3	0.3	0.6	0.4	0.5	0.5	-0.7	-1.3	-1.2	-0.8	-1.1	-1.2	-1.5	-1.7	-1.6	-1.5	-1.3	-1.0	-0.7	0.0	0.4	0.6	0.4	0.3	-0.5
19	0.3	0.4	0.7	0.6	0.8	0.5	-0.8	-1.4	-1.3	-0.8	-1.1	-1.4	-1.5	-1.7	-1.8	-1.6	-1.4	-1.0	-0.7	-0.1	0.6	0.8	0.6	0.6	-0.4
20	0.5	0.6	0.7	1.0	0.7	0.4	-0.4	-1.4	-0.9	-0.8	-1.1	-1.2	-1.4	-2.0	-1.6	-1.4	-1.3	-1.0	-0.6	-0.1	0.2	0.1	0.3	0.3	-0.4
21	0.4	0.4	0.5	0.6	0.7	0.6	-0.9	-1.3	-1.3	-1.7	-1.2	-1.5	-1.7	-1.7	-1.6	-1.4	-1.2	-0.8	-0.5	-0.1	0.1	0.1	0.2	0.2	-0.5
22	0.3	0.5	0.3	0.4	0.4	0.3	-0.7	-0.7	-1.1	-1.4	-1.5	-1.4	-1.8	-1.6	-1.6	-1.6	-1.3	-1.1	-0.7	-0.2	0.1	0.2	0.3	0.3	-0.6
23	0.3	0.5	0.8	0.9	0.6	0.5	-0.8	-0.6	-0.7	-0.9	-1.0	-1.2	-1.5	-1.7	-1.7	-1.6	-1.4	-1.1	-0.8	-0.2	0.4	0.4	0.4	0.9	-0.4
24	0.6	0.7	0.6	0.6	0.6	0.5	-0.8	-1.3	-0.9	-1.0	-1.3	-1.7	-1.4	-1.4	-1.6	-1.5	-1.3	-1.1	-0.7	0.0	0.5	0.4	0.9	0.8	-0.4
25	0.8	0.8	0.7	0.7	0.8	0.5	-0.7	-0.8	-0.7	-0.8	-1.1	-1.2	-1.4	-1.4	-1.3	-1.0	-1.0	-0.9	-0.6	0.0	0.4	0.5	0.5	0.4	-0.3
26	0.3	0.4	0.5	0.4	0.4	0.3	-0.6	-1.3	-0.8	-0.8	-1.0	-1.4	-1.2	-1.5	-1.6	-1.4	-1.0	-0.7	-0.6	0.0	0.3	0.5	0.5	0.2	-0.4
27	0.3	0.3	0.3	0.5	0.5	0.5	-0.5	-1.4	-1.1	-1.2	-1.7	-2.2	-1.9	-1.8	-1.6	-1.6	-1.2	-1.0	-0.6	-0.1	0.4	0.4	0.6	0.8	-0.5
28	0.6	0.6	0.6	0.5	1.0	0.6	-0.4	-1.2	-0.9	-0.8	-1.3	-1.6	-2.2	-1.5	-0.6	-0.6	-0.7	-0.3	-0.1	0.1	0.4	0.3	0.3	0.4	-0.3
29	0.2	0.2	0.2	0.1	0.1	0.1	-0.3	-0.4	-0.9	-1.8	-1.4	-1.6	-1.5	-1.5	-1.6	-1.5	-1.2	-0.8	-0.4	-0.1	0.1	0.1	0.2	0.3	-0.6
30	0.0	0.1	0.0	0.1	0.5	0.2	0.2	-0.5	-1.6	-1.8	-1.2	-1.4	-1.5	-1.7	-2.0	-1.9	-1.5	-1.1	-0.7	-0.2	0.1	-0.1	0.0	0.2	-0.7
HRAVE	0.4	0.5	0.5	0.6	0.6	0.4	-0.5	-1.0	-1.0	-1.0	-1.3	-1.5	-1.6	-1.6	-1.6	-1.4	-1.2	-0.9	-0.6	-0.1	0.3	0.4	0.4	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.5	-0.5	-0.6	-0.5	-0.5	-0.5	-0.4	-0.5	-0.3	-0.4	-0.6	-0.3	-0.2	-0.4	-0.3	-0.4	-0.5	-0.5	-0.4	-0.4	-0.5	-0.6	-0.4	-0.4	-0.3
MAX	0.9	0.7	0.4	0.6	0.6	0.6	0.6	0.8	0.9	0.7	0.8	1.0	0.9	1.0	1.0	0.7	0.8	0.6	0.8	1.0	0.7	0.5	0.9	0.9	0.8
MIN	-2.2	-1.9	-2.2	-1.8	-1.7	-1.7	-1.6	-1.8	-1.4	-1.9	-1.9	-1.5	-1.4	-1.9	-1.7	-1.6	-2.2	-1.7	-1.8	-2.0	-1.7	-1.8	-1.7	-1.7	-1.4

DAY	26	27	28	29	30	31
AVE	-0.4	-0.5	-0.3	-0.6	-0.7	***
MAX	0.5	0.8	1.0	0.3	0.5	***
MIN	-1.6	-2.2	-2.2	-1.8	-2.0	***

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = -2.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JUNE - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	699	699	699	699	699	700	700	700	700	700	700	699	698	697	697	696	696	696	696	696	697	698	698	699	698
2	699	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	697	698	698	698	698
3	699	699	699	699	699	700	700	700	700	700	700	699	699	698	698	697	697	696	697	697	697	698	698	699	698
4	699	699	699	700	700	700	700	701	701	701	700	700	699	699	698	698	698	698	698	698	699	700	700	700	699
5	700	700	700	701	701	701	701	702	702	702	702	701	701	700	700	700	699	699	699	699	700	700	701	701	700
6	701	701	701	701	701	702	702	702	702	702	702	702	701	701	700	700	700	699	699	699	699	700	700	700	701
7	701	701	701	701	701	701	701	701	701	701	700	700	699	699	698	698	698	698	698	698	698	699	699	700	700
8	700	700	700	700	700	701	701	701	702	701	701	701	701	701	701	700	700	700	700	700	701	701	702	702	701
9	702	702	702	702	703	703	704	704	704	704	704	704	703	703	702	702	701	701	701	701	702	702	703	703	703
10	703	703	703	704	704	704	705	705	706	706	706	705	705	704	704	704	703	703	703	704	704	705	706	706	704
11	706	706	706	706	706	706	706	706	706	706	705	705	704	703	702	702	702	701	701	701	702	702	702	702	704
12	702	702	702	702	702	702	703	703	703	703	702	702	701	701	700	700	699	699	699	699	699	700	700	700	701
13	700	700	700	700	701	701	701	702	702	701	701	701	700	700	699	699	698	698	697	697	698	698	699	699	700
14	700	699	699	700	700	700	700	701	701	701	700	700	700	699	699	698	698	698	698	698	698	699	699	699	699
15	700	700	700	700	700	701	701	701	702	701	701	701	700	700	699	699	698	698	698	699	699	699	699	699	700
16	700	699	699	700	700	700	701	701	701	701	700	700	699	699	698	697	697	697	697	697	697	698	698	699	699
17	699	699	699	700	699	700	700	700	701	701	700	700	699	698	698	698	697	697	697	698	698	699	699	700	699
18	700	700	700	701	701	701	701	702	702	702	702	701	701	700	700	700	699	699	699	700	700	701	701	701	701
19	702	702	702	702	702	703	703	703	703	703	703	702	702	701	700	700	700	699	699	700	700	700	701	701	701
20	701	701	701	701	701	701	702	702	702	702	701	701	700	700	699	698	698	697	697	697	697	698	698	698	700
21	699	699	699	699	699	699	700	700	700	699	699	699	698	698	697	697	697	697	697	697	697	698	698	698	698
22	699	699	699	699	699	700	700	700	700	700	700	700	699	699	699	698	698	698	698	699	699	700	700	701	699
23	701	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	700	700	700	700	700	701
24	700	700	700	700	701	701	701	702	702	701	701	701	700	700	699	698	698	698	698	698	698	699	699	699	700
25	699	699	699	699	700	700	700	701	701	701	701	700	700	699	699	698	698	698	698	698	699	700	700	700	699
26	700	701	701	701	702	702	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	702	702	701
27	702	702	703	703	703	704	704	704	704	704	704	703	703	702	702	701	701	701	701	701	701	702	702	702	702
28	702	702	702	702	703	703	703	704	704	703	703	702	702	701	700	700	700	699	699	700	700	701	701	702	702
29	702	702	702	702	702	702	702	703	703	702	702	702	701	701	700	699	699	699	699	700	700	701	702	702	701
30	702	702	702	702	702	702	702	702	702	702	702	702	701	700	700	699	699	699	700	700	701	701	701	701	701
HRAVE	700	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	699	699	699	699	699	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	698	698	698	699	700	701	700	701	703	704	704	701	700	699	700	699	699	701	701	700	698	699	701	700	699
MAX	700	700	700	701	702	702	701	702	704	706	706	703	702	701	702	701	701	702	703	702	700	701	702	702	701
MIN	696	697	696	698	699	699	698	700	701	703	701	699	697	698	698	697	697	699	699	697	697	698	699	698	698

DAY	26	27	28	29	30	31
AVE	701	702	702	701	701	***
MAX	703	704	704	703	702	***
MIN	700	701	699	699	699	***

MONTHLY AVERAGE = 700.3 MONTHLY MAXIMUM = 706.1 MONTHLY MINIMUM = 695.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JUNE - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	21	22	25	26	29	30	27	24	21	18	17	18	18	17	17	17	17	17	19	19	20	22	27	30	22
2	33	37	42	44	48	49	44	41	38	32	29	26	25	22	19	21	20	20	22	23	25	26	27	31	31
3	31	34	36	39	40	44	40	36	31	28	24	19	18	17	15	14	16	16	21	23	25	28	31	29	27
4	27	26	26	27	30	31	31	27	26	24	23	22	20	18	18	17	17	16	17	18	20	20	24	24	23
5	27	27	28	30	33	34	31	28	24	24	23	21	19	18	17	17	17	17	17	19	22	23	24	25	24
6	25	27	31	31	33	34	32	29	27	25	22	21	19	18	18	17	17	18	19	20	22	24	25	27	24
7	30	36	37	38	39	40	38	36	31	29	27	26	26	24	18	19	17	19	21	24	27	28	26	24	28
8	25	29	29	31	34	38	34	31	27	24	20	18	13	12	13	12	12	12	12	13	14	16	19	19	21
9	21	24	23	27	29	28	24	22	19	16	16	14	12	11	10	9	9	9	10	11	13	15	17	19	17
10	19	21	19	20	21	24	24	22	21	22	26	28	27	25	24	26	28	30	32	36	38	41	42	44	28
11	46	46	46	49	51	54	52	49	44	39	35	30	24	22	18	16	16	15	17	18	16	16	18	20	32
12	22	23	23	25	27	29	28	25	23	19	16	15	13	12	11	11	11	11	11	12	13	14	16	18	18
13	19	20	21	24	24	24	24	21	18	16	16	15	15	14	14	13	13	14	14	15	13	13	14	14	17
14	13	12	15	17	19	20	21	17	17	16	15	15	15	13	12	11	10	11	11	12	13	14	16	18	15
15	22	24	26	28	31	30	27	23	19	16	16	15	14	13	12	11	11	12	12	13	14	16	17	20	18
16	22	24	25	24	28	26	26	25	22	21	21	19	19	18	16	15	15	15	16	18	19	20	21	20	21
17	20	21	25	26	29	31	31	28	23	20	19	18	16	15	14	10	12	14	15	16	17	19	20	23	20
18	25	26	27	30	34	34	31	28	25	21	19	19	18	17	12	11	10	10	11	12	13	15	16	17	20
19	16	18	18	22	23	25	23	20	17	15	13	13	12	12	12	12	11	11	11	11	12	16	15	17	16
20	17	17	18	20	20	22	23	20	17	16	14	13	11	9	10	12	11	11	10	11	13	16	16	16	15
21	16	17	18	20	23	22	20	18	15	14	15	16	17	15	15	15	14	14	14	15	17	18	21	24	17
22	26	28	32	33	36	36	34	31	25	22	20	18	15	16	16	17	16	16	17	18	22	24	24	23	24
23	24	25	27	29	30	31	28	27	23	21	20	19	16	15	14	14	14	14	15	17	18	19	23	25	21
24	25	25	25	26	29	31	28	25	21	18	15	13	13	12	11	11	11	10	11	12	13	15	17	17	18
25	19	20	20	24	24	24	21	21	17	16	15	13	12	12	12	13	13	14	14	15	16	19	20	19	17
26	20	20	21	24	25	27	26	24	21	19	19	18	17	18	19	19	20	21	20	22	22	24	25	25	22
27	25	27	28	30	32	35	32	27	25	21	20	18	17	16	16	15	15	16	16	15	16	18	19	23	22
28	23	22	25	25	30	30	25	22	21	21	21	19	17	17	17	17	17	18	18	17	18	20	22	24	21
29	30	30	31	32	34	35	34	33	30	26	25	22	20	18	18	17	18	18	18	17	17	18	21	25	24
30	29	30	31	31	30	35	35	32	28	24	20	19	19	19	18	17	17	17	18	19	22	29	29	32	25
HRAVE	24	25	27	28	31	32	30	27	24	21	20	19	17	16	15	15	15	15	16	17	18	20	22	23	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	22	31	27	23	24	24	28	21	17	28	32	18	17	15	18	21	20	20	16	15	17	24	21	18	17
MAX	30	49	44	31	34	34	40	38	29	44	54	29	24	21	31	28	31	34	25	23	24	36	31	31	24
MIN	17	19	14	16	17	17	17	12	9	19	15	11	13	10	11	15	10	10	11	9	14	15	14	10	12

DAY	26	27	28	29	30	31
AVE	22	22	21	24	25	***
MAX	27	35	30	35	35	***
MIN	17	15	17	17	17	***

MONTHLY AVERAGE = 21.6 MONTHLY MAXIMUM = 53.8 MONTHLY MINIMUM = 8.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JUNE - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.56	0.76	0.91	1.00	1.01	0.97	0.90	0.64	0.56	0.36	0.15	0.01	0.00	0.00	0.00	0.00	8.32
2	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.32	0.56	0.76	0.90	0.98	1.00	1.00	0.90	0.65	0.57	0.36	0.15	0.01	0.00	0.00	0.00	0.00	8.30
3	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.59	0.78	0.93	1.02	1.06	1.00	0.92	0.67	0.58	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.60
4	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.58	0.77	0.92	1.01	1.06	1.01	0.92	0.71	0.69	0.40	0.08	0.01	0.00	0.00	0.00	0.00	8.66
5	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.58	0.75	0.91	1.00	1.05	1.00	0.91	0.67	0.58	0.36	0.16	0.02	0.00	0.00	0.00	0.00	8.48
6	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.57	0.76	0.91	1.00	1.04	1.00	0.91	0.67	0.58	0.36	0.16	0.02	0.00	0.00	0.00	0.00	8.48
7	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.34	0.54	0.76	0.90	0.98	1.04	0.98	0.71	0.47	0.43	0.33	0.08	0.01	0.00	0.00	0.00	0.00	7.71
8	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.59	0.75	0.93	1.03	1.09	1.04	0.94	0.69	0.61	0.39	0.18	0.02	0.00	0.00	0.00	0.00	8.79
9	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.37	0.59	0.79	0.94	1.04	0.87	0.78	0.91	0.58	0.64	0.43	0.22	0.02	0.00	0.00	0.00	0.00	8.32
10	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.13	0.24	0.30	0.88	0.96	1.02	0.98	0.89	0.67	0.56	0.36	0.16	0.01	0.00	0.00	0.00	0.00	7.23
11	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.55	0.69	0.89	0.97	0.99	0.92	0.82	0.65	0.56	0.36	0.09	0.01	0.00	0.00	0.00	0.00	7.98
12	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.54	0.77	0.81	0.64	0.92	0.97	0.92	0.69	0.56	0.39	0.18	0.02	0.00	0.00	0.00	0.00	7.90
13	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.44	0.64	0.69	0.55	0.62	0.88	0.45	0.43	0.35	0.19	0.10	0.01	0.00	0.00	0.00	0.00	5.83
14	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.38	0.58	0.77	0.93	1.02	1.07	1.02	0.91	0.70	0.61	0.40	0.18	0.02	0.00	0.00	0.00	0.00	8.72
15	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.37	0.56	0.78	0.93	1.03	1.07	1.03	0.92	0.71	0.61	0.40	0.16	0.02	0.00	0.00	0.00	0.00	8.72
16	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.34	0.52	0.74	0.91	0.73	0.77	1.02	0.91	0.69	0.57	0.38	0.18	0.02	0.00	0.00	0.00	0.00	7.90
17	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.24	0.53	0.75	0.90	1.01	1.06	1.01	0.90	0.71	0.61	0.39	0.18	0.02	0.00	0.00	0.00	0.00	8.39
18	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.36	0.53	0.76	0.91	1.01	1.05	1.01	0.91	0.71	0.61	0.40	0.19	0.03	0.00	0.00	0.00	0.00	8.60
19	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.38	0.56	0.78	0.93	1.03	1.08	1.03	0.92	0.71	0.61	0.40	0.20	0.03	0.00	0.00	0.00	0.00	8.79
20	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.38	0.55	0.79	0.94	1.03	1.09	1.05	0.93	0.71	0.62	0.40	0.20	0.03	0.00	0.00	0.00	0.00	8.84
21	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.37	0.55	0.78	0.93	1.02	1.06	1.02	0.91	0.69	0.60	0.40	0.19	0.03	0.00	0.00	0.00	0.00	8.67
22	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.37	0.55	0.77	0.91	1.01	1.06	1.02	0.92	0.70	0.60	0.40	0.19	0.03	0.00	0.00	0.00	0.00	8.65
23	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.36	0.55	0.76	0.92	1.02	1.07	1.03	0.93	0.70	0.62	0.40	0.19	0.03	0.00	0.00	0.00	0.00	8.70
24	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.36	0.54	0.76	0.92	1.01	1.07	1.03	0.93	0.71	0.62	0.40	0.20	0.03	0.00	0.00	0.00	0.00	8.70
25	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.37	0.54	0.77	0.93	1.03	1.08	1.03	0.73	0.38	0.59	0.39	0.18	0.02	0.00	0.00	0.00	0.00	8.16
26	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.36	0.53	0.75	0.90	0.99	1.04	0.92	0.82	0.60	0.44	0.30	0.19	0.03	0.00	0.00	0.00	0.00	7.98
27	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.35	0.52	0.74	0.89	0.98	1.04	0.99	0.90	0.67	0.59	0.38	0.18	0.03	0.00	0.00	0.00	0.00	8.37
28	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.27	0.20	0.62	0.88	0.97	1.05	0.61	0.27	0.33	0.29	0.11	0.07	0.01	0.00	0.00	0.00	0.00	5.79
29	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.16	0.42	0.71	0.64	0.90	1.02	1.00	0.88	0.71	0.46	0.28	0.08	0.02	0.00	0.00	0.00	0.00	7.41
30	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.27	0.54	0.68	0.88	0.98	1.03	1.00	1.08	0.79	0.61	0.42	0.18	0.03	0.00	0.00	0.00	8.53
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.34	0.52	0.73	0.89	0.97	1.02	0.98	0.86	0.65	0.56	0.36	0.16	0.02	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	8.32	8.30	8.60	8.66	8.48	8.48	7.71	8.79	8.32	7.23	7.98	7.90	5.83	8.72	8.72	7.90	8.39	8.60	8.79	8.84	8.67	8.65	8.70	8.70	8.16
MAX	1.01	1.00	1.06	1.06	1.05	1.04	1.04	1.09	1.04	1.02	0.99	0.97	0.88	1.07	1.07	1.02	1.06	1.05	1.08	1.09	1.06	1.06	1.07	1.07	1.08
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	7.98	8.37	5.79	7.41	8.53	***
MAX	1.04	1.04	1.05	1.02	1.08	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JUNE - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.00 MONTHLY MAXIMUM = 0.00 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
JULY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.4	3.2	5.0	6.4	7.9	6.7	5.8	6.1	2.9	2.3	8.2	10.8	12.3	14.7	17.0	16.2	17.2	16.4	17.2	12.6	8.2	6.6	6.4	7.3	9.2
2	5.6	3.3	5.4	4.6	5.0	4.8	5.5	3.5	2.1	3.4	4.0	4.4	7.8	12.6	15.8	15.8	19.2	17.0	15.6	15.5	14.2	10.6	11.8	5.4	8.9
3	8.0	4.5	2.8	3.2	3.9	4.4	4.7	3.9	2.1	4.8	5.3	5.2	10.1	12.5	18.4	16.2	19.8	18.1	18.0	17.1	16.3	13.7	7.7	9.2	9.6
4	5.8	3.7	3.7	1.8	3.7	5.6	6.1	5.9	3.6	2.8	3.5	5.6	7.1	14.8	12.3	13.7	14.4	11.8	14.5	15.7	14.6	10.3	6.3	10.4	8.2
5	7.4	3.7	1.3	1.6	3.4	4.3	5.0	4.7	2.5	3.3	3.4	4.8	5.4	8.1	13.2	14.5	16.7	14.8	12.5	9.3	22.6	17.4	17.1	14.1	8.8
6	9.1	9.6	6.9	3.6	4.8	4.0	4.5	5.2	1.9	2.6	3.8	3.3	4.3	4.4	5.9	8.7	8.6	22.4	19.3	9.7	7.6	13.8	8.8	4.1	7.4
7	6.5	5.3	5.2	8.4	12.8	13.3	12.9	13.3	11.6	8.0	7.7	4.6	5.5	4.7	14.0	15.4	21.0	14.9	16.0	13.6	5.6	8.2	6.2	5.5	10.0
8	7.6	8.1	7.9	7.6	8.1	8.1	6.9	5.6	1.8	2.1	4.1	2.9	3.4	5.3	8.7	13.0	14.2	14.5	16.7	15.1	12.6	11.2	10.1	6.9	8.4
9	13.0	3.0	3.3	5.7	4.4	6.4	5.8	5.6	3.6	2.5	2.4	3.7	4.6	7.1	10.8	16.5	16.8	16.5	16.0	14.3	10.2	7.0	3.2	4.7	7.8
10	5.1	5.1	5.4	6.6	6.0	5.7	1.3	2.4	CAL	CAL	CAL	CAL	CAL	15.5	14.4	15.6	16.1	16.6	20.0	16.4	13.5	10.3	6.3	5.7	9.9
11	5.1	4.7	3.9	11.4	5.6	7.1	3.1	4.4	2.2	3.7	5.4	3.5	5.4	5.3	12.6	18.4	16.9	17.6	23.6	19.3	17.1	14.3	9.3	4.3	9.3
12	9.4	11.7	8.5	10.3	8.1	10.2	10.7	10.0	4.2	7.0	4.6	5.2	5.1	6.9	5.2	4.5	9.1	18.6	16.7	15.3	22.4	11.8	6.8	6.2	9.5
13	6.3	4.5	7.1	5.5	4.8	3.5	6.1	4.9	2.9	5.4	9.2	8.5	8.8	11.8	11.4	11.9	16.9	15.0	18.5	16.7	19.2	18.1	18.6	8.0	10.1
14	12.4	6.8	5.3	7.7	4.9	1.5	2.5	4.2	4.1	3.3	8.9	9.5	11.0	11.2	13.3	13.5	15.6	17.0	17.3	15.8	12.4	6.7	6.4	4.2	9.0
15	2.8	3.3	6.2	5.9	5.2	5.0	3.4	2.3	2.0	3.4	7.4	10.5	10.9	10.8	12.7	13.8	14.1	13.9	13.6	12.3	9.4	8.4	7.6	3.3	7.8
16	6.5	3.7	4.4	6.8	7.8	8.5	7.0	4.8	3.0	2.2	3.3	5.7	10.9	15.0	15.6	16.7	15.3	16.3	14.8	13.7	9.1	10.2	9.1	6.9	9.0
17	2.7	3.8	3.8	4.8	6.2	4.9	2.1	2.6	5.5	11.0	10.2	11.6	13.1	14.7	15.1	14.8	11.8	14.0	14.5	9.8	4.6	2.0	3.2	2.8	7.9
18	6.3	8.0	10.8	10.2	8.7	4.7	6.5	5.6	4.3	8.6	10.4	12.3	15.9	16.8	16.4	20.3	20.9	20.8	19.4	15.0	9.2	3.0	4.1	5.2	11.0
19	5.1	6.0	5.8	5.2	6.4	4.7	4.3	5.5	2.8	7.4	7.7	11.1	17.0	15.6	14.6	17.0	17.9	19.0	18.9	15.9	12.6	7.5	3.4	3.3	9.8
20	5.3	6.5	6.2	4.3	3.9	6.3	5.0	2.9	2.8	6.5	9.9	11.5	14.4	14.4	16.6	16.7	16.6	15.7	16.6	14.4	10.8	8.6	3.7	4.5	9.3
21	3.9	4.7	5.5	3.2	1.7	1.2	3.5	3.4	3.1	9.4	12.0	11.9	13.9	17.3	17.1	16.2	17.6	18.4	18.8	17.2	12.6	11.7	12.1	7.5	10.2
22	5.8	4.4	2.8	3.7	6.6	5.5	9.7	8.5	8.2	6.7	7.9	6.9	8.4	11.2	10.2	7.0	6.4	8.4	21.2	13.6	3.5	3.8	12.2	9.8	8.0
23	3.2	13.3	11.5	19.4	19.5	16.6	9.4	11.9	19.3	17.7	17.9	15.8	9.9	6.6	3.9	4.2	7.8	6.2	15.3	8.8	5.6	5.2	11.5	10.0	11.3
24	12.4	10.0	5.5	5.9	7.4	4.1	2.7	5.1	2.2	4.6	6.2	4.7	5.0	4.0	6.0	6.5	14.6	18.0	19.8	18.0	18.9	7.6	8.9	5.9	8.5
25	7.2	4.0	4.7	4.0	3.6	4.7	4.2	2.9	2.5	2.7	6.9	9.4	10.2	9.8	11.6	11.6	9.9	9.2	9.4	12.1	9.3	12.2	13.1	9.3	7.7
26	9.2	5.5	4.2	3.2	4.1	4.8	3.6	2.5	3.4	7.4	8.3	8.4	11.0	13.0	13.9	16.8	16.9	16.7	14.4	11.4	8.4	6.8	6.9	3.7	8.5
27	2.0	3.3	3.9	3.1	2.8	3.5	5.4	4.2	2.8	6.5	7.6	9.8	9.5	13.5	15.2	17.6	19.5	15.6	16.8	13.1	7.5	6.9	4.4	3.7	8.2
28	5.2	7.9	7.8	12.6	10.4	5.0	4.5	4.5	7.2	3.4	8.6	11.0	12.2	12.1	13.2	16.2	18.9	17.3	14.4	8.8	3.6	3.3	5.2	4.7	9.1
29	4.9	4.1	4.8	3.2	6.1	4.5	4.4	3.1	3.0	6.2	8.8	8.2	10.8	11.9	14.1	13.2	15.0	16.3	23.0	25.7	16.7	10.8	8.7	12.4	10.0
30	11.3	7.2	8.3	8.1	4.6	4.3	7.5	11.1	7.1	4.6	CAL	CAL	CAL	12.4	7.7	5.2	5.0	4.5	12.7	15.7	11.3	8.2	5.9	7.2	8.1
31	5.8	6.9	7.3	4.3	5.5	5.2	3.9	9.8	8.8	3.2	6.9	4.6	5.9	10.3	12.8	9.7	7.2	9.9	7.1	5.3	4.3	4.0	4.5	5.0	6.6
HRAVE	6.6	5.8	5.6	6.2	6.3	5.8	5.4	5.5	4.5	5.4	7.3	7.8	9.3	11.1	12.6	13.5	14.8	15.2	16.5	14.1	11.4	9.0	8.1	6.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.2	8.9	9.6	8.2	8.8	7.4	10.0	8.4	7.8	9.9	9.3	9.5	10.1	9.0	7.8	9.0	7.9	11.0	9.8	9.3	10.2	8.0	11.3	8.5	7.7
MAX	17.2	19.2	19.8	15.7	22.6	22.4	21.0	16.7	16.8	20.0	23.6	22.4	19.2	17.3	14.1	16.7	15.1	20.9	19.0	16.7	18.8	21.2	19.5	19.8	13.1
MIN	2.3	2.1	2.1	1.8	1.3	1.9	4.6	1.8	2.4	1.3	2.2	4.2	2.9	1.5	2.0	2.2	2.0	3.0	2.8	2.8	1.2	2.8	3.2	2.2	2.5

DAY	26	27	28	29	30	31
AVE	8.5	8.2	9.1	10.0	8.1	6.6
MAX	16.9	19.5	18.9	25.7	15.7	12.8
MIN	2.5	2.0	3.3	3.0	4.3	3.2

MONTHLY AVERAGE = 8.9 MONTHLY MAXIMUM = 25.7 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JULY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	324	72	117	113	124	112	131	152	98	248	314	300	288	282	291	274	287	295	299	300	293	304	303	302	57
2	279	274	122	108	112	117	135	113	179	318	298	245	254	250	283	282	281	261	270	280	277	296	316	321	48
3	306	215	146	79	74	111	110	102	267	295	307	218	238	259	275	277	281	275	278	279	287	281	333	355	92
4	302	165	270	289	112	88	88	88	130	71	343	305	281	248	248	274	287	288	275	284	296	319	265	303	137
5	280	304	153	152	109	119	101	79	111	284	258	303	309	326	302	305	314	318	328	311	155	136	143	130	38
6	139	125	116	120	144	122	131	140	192	284	265	254	233	230	255	268	267	161	155	132	150	147	141	125	33
7	130	182	90	90	64	58	56	68	64	141	160	124	159	217	97	61	56	65	50	55	44	65	93	108	261
8	95	91	90	93	93	102	104	121	151	96	98	126	9	308	224	248	290	274	281	283	291	302	307	343	255
9	307	193	84	96	98	100	118	104	129	148	66	240	272	299	313	311	303	316	299	300	301	296	289	151	44
10	112	124	102	96	105	93	69	97	CAL	CAL	CAL	CAL	CAL	293	293	289	282	299	295	289	297	302	298	273	130
11	158	124	85	308	13	40	122	84	79	267	271	254	278	262	297	282	291	282	283	293	297	295	286	159	273
12	69	114	139	121	150	77	58	79	100	93	87	119	96	239	267	227	267	281	274	268	5	37	46	48	137
13	59	131	138	123	130	139	114	121	124	304	303	272	266	286	275	291	287	282	276	276	79	341	310	315	178
14	314	78	151	74	125	188	134	117	149	283	299	282	286	290	289	294	299	297	294	286	296	303	210	172	134
15	129	109	109	123	111	149	142	159	148	273	292	303	281	255	291	286	281	287	289	292	302	292	300	188	5
16	110	120	109	127	113	109	136	159	166	180	138	260	292	296	288	282	286	290	291	299	303	310	306	292	310
17	159	135	123	109	112	83	125	135	284	286	286	294	310	313	310	308	294	283	283	283	289	164	146	113	222
18	207	299	311	316	302	181	135	133	283	301	303	298	297	296	280	280	282	283	290	296	298	230	139	311	265
19	158	145	156	127	135	129	130	132	228	290	299	279	290	304	290	281	286	292	285	290	288	288	266	168	293
20	115	113	107	128	110	117	122	115	149	287	287	295	295	288	287	291	299	289	284	290	293	299	258	140	11
21	125	108	285	205	298	324	97	105	266	295	290	296	287	276	284	283	293	287	276	282	286	299	303	303	284
22	289	219	178	265	269	263	308	304	309	309	307	309	281	283	287	285	260	264	44	153	321	134	66	101	207
23	21	57	84	67	72	76	121	88	81	88	101	98	170	183	143	239	163	198	9	98	105	102	63	98	208
24	77	62	310	358	47	298	264	314	357	265	261	270	291	272	285	303	280	279	282	286	154	107	123	132	260
25	116	132	151	152	130	127	126	105	168	225	265	291	288	291	289	282	284	266	281	287	297	298	304	292	283
26	315	244	160	138	139	139	123	144	317	308	298	287	285	284	286	289	280	277	287	290	298	319	301	353	215
27	252	118	98	100	107	112	125	113	176	282	275	287	290	284	281	294	293	286	289	277	297	303	265	213	141
28	140	119	127	140	136	129	135	161	163	210	282	295	274	273	267	267	278	282	279	288	303	128	133	138	325
29	150	108	152	117	140	117	116	150	272	300	310	286	298	297	294	294	281	274	27	70	85	93	104	123	356
30	131	100	108	104	157	142	88	69	126	130	CAL	CAL	CAL	156	158	154	104	188	189	148	86	101	292	128	138
31	89	111	96	136	109	86	59	296	279	262	63	57	311	285	285	300	300	291	268	268	217	170	140	133	338

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JULY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	17	43	11	10	8	12	8	13	37	51	23	26	22	21	18	20	13	18	12	10	6	8	7	6	18
2	25	56	10	14	10	10	8	27	47	42	48	56	44	24	16	18	21	15	14	11	7	7	9	35	24
3	12	24	21	23	28	14	13	22	47	40	53	60	39	20	20	18	14	12	14	8	7	9	35	24	24
4	67	48	23	44	15	9	10	13	25	40	55	49	49	21	31	24	22	17	15	9	8	12	44	19	28
5	12	43	25	29	13	10	9	11	38	39	40	52	64	44	21	18	17	16	17	31	11	15	13	11	25
6	13	10	8	10	11	21	15	23	61	35	34	44	30	50	34	27	33	21	11	11	14	9	18	25	24
7	34	18	13	10	12	12	13	9	14	25	24	41	49	54	26	12	11	25	19	12	50	13	28	18	23
8	6	8	11	10	8	9	7	9	47	36	31	63	57	51	38	30	18	18	10	8	7	9	14	21	22
9	8	44	19	12	15	12	7	13	21	57	56	54	54	30	26	19	16	16	12	9	6	9	21	8	23
10	9	9	12	8	9	9	31	25	CAL	CAL	CAL	CAL	CAL	15	18	17	14	16	10	7	7	5	8	12	13
11	17	14	51	42	51	25	37	13	35	25	29	53	40	32	19	13	12	12	9	9	9	9	29	37	26
12	16	9	14	12	46	24	12	10	21	32	44	42	50	44	58	56	25	10	11	31	15	32	45	21	28
13	17	19	10	16	10	16	9	18	51	25	25	27	26	20	24	22	16	15	11	9	30	20	9	42	20
14	11	21	17	8	17	35	19	15	25	48	24	22	22	26	20	20	19	14	12	8	8	28	28	37	21
15	37	17	9	9	11	7	11	20	48	52	26	22	22	21	23	20	16	15	12	8	7	5	7	27	19
16	16	28	19	8	9	8	9	10	31	44	41	36	26	19	18	13	20	16	14	9	7	8	8	25	18
17	22	16	8	8	10	48	50	46	26	14	24	25	22	16	18	18	18	14	9	7	12	18	14	17	20
18	32	15	9	6	14	16	9	17	43	24	23	27	18	17	15	12	11	9	11	10	10	24	25	14	17
19	17	12	10	14	13	14	14	18	40	16	21	18	13	17	21	15	13	13	10	9	6	7	22	28	16
20	9	8	10	10	38	8	12	17	45	24	21	23	19	19	18	17	15	13	9	8	5	7	50	12	17
21	18	21	43	37	39	31	12	20	40	17	14	21	21	16	18	16	17	12	10	7	11	14	8	9	20
22	18	25	22	23	16	14	11	10	16	18	25	25	28	15	18	26	27	17	36	34	48	17	15	22	22
23	61	13	28	12	7	7	19	13	11	13	11	16	21	45	64	65	29	19	30	35	29	26	12	13	25
24	11	20	23	18	30	12	51	17	48	35	19	32	53	49	50	33	11	9	8	8	33	45	15	21	27
25	16	12	15	20	12	7	13	27	34	45	23	22	24	21	22	14	20	16	11	8	9	14	10	6	17
26	11	17	11	12	4	7	7	27	42	20	28	29	20	15	20	16	12	11	10	9	7	10	8	39	16
27	37	25	11	14	16	12	8	14	43	23	26	23	27	21	19	13	13	14	10	7	8	7	18	20	18
28	11	9	13	10	10	26	24	28	11	42	24	22	21	24	20	15	9	8	8	8	36	33	21	9	18
29	13	21	19	21	7	11	10	20	33	25	24	29	26	25	20	24	18	12	21	8	12	15	12	12	18
30	13	37	15	13	20	22	16	9	22	35	CAL	CAL	CAL	14	19	39	27	45	25	30	17	33	22	10	23
31	21	15	11	8	10	18	26	10	11	44	25	52	34	24	9	21	16	14	21	35	24	18	9	11	20
HRAVE	20	22	17	16	17	16	16	18	34	33	30	35	32	27	25	22	18	16	14	13	15	16	19	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	18	24	24	28	25	24	23	22	23	13	26	28	20	21	19	18	20	17	16	17	20	22	25	27	17
MAX	51	56	60	67	64	61	54	63	57	31	53	58	51	48	52	44	50	43	40	50	43	48	65	53	45
MIN	6	7	7	8	9	8	9	6	6	5	9	9	9	8	5	7	7	6	6	5	7	10	7	8	6

DAY	26	27	28	29	30	31
AVE	16	18	18	18	23	20
MAX	42	43	42	33	45	52
MIN	4	7	8	7	9	8

MONTHLY AVERAGE = 21.0 MONTHLY MAXIMUM = 67.0 MONTHLY MINIMUM = 3.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JULY - 2019

	HOUR																						DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	31.6	30.7	29.5	28.4	27.6	26.8	27.6	30.0	32.3	34.5	37.0	38.6	39.8	40.2	40.4	40.6	40.6	40.2	39.5	38.1	36.3	35.2	34.1	33.5	34.7
2	32.5	31.9	30.1	29.4	28.4	27.5	28.0	30.2	31.8	34.0	35.4	37.4	38.9	39.7	39.6	39.7	39.6	39.0	38.3	36.8	35.3	33.8	33.0	32.2	34.3
3	31.5	29.9	29.2	28.2	26.5	25.3	26.4	29.0	30.6	33.0	35.0	36.8	38.3	38.5	39.1	39.2	39.1	38.5	37.7	35.8	34.2	33.0	32.0	31.6	33.3
4	31.0	29.8	28.6	27.3	25.2	24.6	25.0	27.8	30.2	32.5	34.6	36.0	37.2	38.8	39.2	39.3	39.1	38.8	38.2	36.3	34.3	33.5	33.1	31.9	33.0
5	30.0	29.1	28.6	27.9	26.1	24.9	26.1	29.1	31.4	32.5	34.5	35.7	37.3	38.3	39.2	39.1	38.6	38.0	37.2	36.8	32.5	30.2	29.3	29.0	32.6
6	28.3	27.3	26.9	26.5	25.5	25.3	26.1	27.9	29.2	30.0	31.4	32.6	33.8	36.3	36.6	37.6	37.2	33.7	32.9	32.6	31.9	31.1	30.5	30.3	30.9
7	29.8	28.0	28.3	28.5	28.2	27.8	27.8	29.1	31.2	33.6	34.9	36.5	36.2	36.8	33.1	31.2	30.5	29.4	30.1	29.9	28.9	28.0	26.6	25.0	30.4
8	24.0	22.8	21.4	21.0	20.4	19.9	21.0	22.1	23.1	27.3	31.1	33.2	34.2	36.1	37.7	38.2	38.0	37.7	36.6	34.7	32.6	31.5	30.5	29.8	29.4
9	29.4	28.1	26.6	24.7	23.3	22.6	23.3	26.1	28.6	31.3	33.6	35.4	37.1	38.2	39.0	39.1	38.9	38.0	37.5	36.1	34.4	33.2	32.1	30.4	32.0
10	29.6	28.0	27.4	25.6	25.2	24.2	25.0	26.8	CAL	CAL	CAL	CAL	CAL	41.2	41.9	42.3	42.1	41.5	40.2	38.2	36.7	35.8	35.2	33.8	33.7
11	32.2	32.1	32.3	31.1	30.8	31.0	30.7	31.7	34.5	35.9	38.4	40.0	42.0	42.1	42.1	42.4	42.0	42.1	40.3	38.6	37.2	36.2	35.1	34.1	36.4
12	33.8	33.1	32.8	32.1	31.8	31.7	31.9	32.4	34.8	36.9	38.4	39.7	40.7	41.6	41.3	41.6	41.5	40.5	39.8	37.5	35.5	35.7	34.2	33.5	36.4
13	33.1	32.0	30.0	29.9	29.0	27.5	29.0	31.1	33.6	35.6	37.8	38.8	40.3	40.7	41.3	41.5	41.3	41.0	39.1	37.9	34.0	32.4	31.5	29.5	34.9
14	28.0	28.6	27.7	28.3	27.6	27.1	27.2	29.6	32.2	33.6	36.4	38.0	39.5	40.8	41.3	41.5	41.4	40.9	39.9	38.0	36.8	35.8	33.8	31.9	34.4
15	31.4	31.6	31.1	30.1	29.8	28.5	28.8	30.2	32.6	35.3	37.6	39.3	40.5	41.8	42.5	42.6	42.4	42.0	41.1	39.4	38.1	37.1	36.2	35.2	36.1
16	33.6	32.9	32.1	30.6	30.1	29.4	30.7	31.5	32.0	33.9	36.7	39.9	41.4	41.9	42.2	42.6	42.7	42.1	41.5	39.9	38.0	37.0	36.1	35.4	36.4
17	34.6	32.8	31.3	30.9	30.0	29.4	29.6	30.7	32.7	33.8	35.3	36.4	37.1	37.2	36.8	36.7	37.2	37.5	36.5	35.1	34.1	33.3	32.5	31.8	33.9
18	31.3	31.0	30.5	29.9	29.1	27.6	28.4	30.6	31.7	33.6	35.2	36.6	37.6	38.5	39.3	39.2	38.9	38.7	38.0	36.8	35.6	34.6	31.9	32.5	34.1
19	31.7	30.5	29.8	29.5	28.9	27.9	28.7	30.9	31.8	33.7	34.8	36.2	37.1	38.0	38.9	39.3	39.2	38.7	37.9	36.4	34.9	33.9	32.8	32.0	33.9
20	30.5	29.7	29.3	28.9	27.2	26.5	27.1	29.1	32.0	34.3	36.6	37.9	39.0	39.6	39.7	40.2	40.0	39.6	38.7	37.0	35.4	34.6	33.5	32.6	34.1
21	31.4	29.9	30.4	29.0	29.0	28.6	28.3	30.7	32.4	34.4	36.0	37.7	38.8	39.3	39.9	40.2	40.2	39.8	38.2	36.7	36.0	33.6	33.0	32.6	34.4
22	32.0	31.0	30.9	30.9	30.2	29.9	29.8	29.9	30.7	31.6	33.0	33.9	35.1	36.0	35.6	37.2	38.2	38.5	32.9	25.5	24.1	23.4	23.8	23.6	31.2
23	23.7	23.6	23.4	23.5	24.1	24.0	24.7	27.2	29.2	30.2	31.5	34.0	35.4	36.5	36.5	36.8	36.0	36.3	31.8	28.0	28.2	28.1	28.9	28.6	29.6
24	29.0	29.0	27.5	27.9	27.3	26.0	26.3	28.0	30.7	31.7	33.2	34.8	36.4	37.1	38.2	38.7	38.5	37.7	36.5	34.8	28.5	26.6	26.1	26.0	31.5
25	26.1	25.5	25.1	25.0	24.6	24.6	25.4	27.4	29.5	30.8	33.7	35.1	36.6	38.4	38.8	38.3	39.0	38.6	37.8	36.5	35.8	34.4	32.8	31.7	32.1
26	31.5	30.7	29.6	29.2	28.6	27.8	28.4	30.3	32.4	34.2	35.8	37.7	39.1	40.1	40.7	40.8	40.7	40.0	39.4	38.1	36.7	36.2	35.7	34.9	34.9
27	34.3	32.7	32.1	31.5	30.9	30.1	30.2	32.4	34.5	36.1	37.8	39.7	41.0	41.7	42.0	42.0	41.5	41.0	40.3	38.7	37.3	36.8	36.2	34.9	36.5
28	33.7	32.2	31.7	30.9	30.1	29.4	29.7	31.1	32.4	33.6	35.4	37.0	38.4	38.8	40.0	40.2	38.6	37.9	37.5	36.6	36.1	34.9	33.7	33.3	34.7
29	32.0	31.5	31.4	31.0	29.6	29.8	30.4	31.5	33.2	35.3	36.9	38.2	39.5	40.5	40.9	41.1	41.0	40.4	36.2	32.0	31.4	30.9	30.3	29.8	34.4
30	29.0	29.0	28.3	28.4	27.4	27.1	28.3	30.4	32.3	33.4	CAL	CAL	CAL	36.5	36.5	36.4	37.0	36.9	32.2	27.9	25.1	24.3	24.1	23.9	30.2
31	24.3	24.1	24.3	23.9	24.0	24.3	24.9	25.6	25.9	27.0	30.4	31.5	32.9	33.3	31.9	32.2	32.6	31.8	31.0	30.3	29.4	28.7	28.1	27.5	28.3
HRAVE	30.5	29.6	29.0	28.4	27.6	27.0	27.6	29.4	31.3	33.1	35.1	36.7	38.0	38.8	39.1	39.3	39.2	38.6	37.2	35.4	33.7	32.7	31.8	31.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	34.7	34.3	33.3	33.0	32.6	30.9	30.4	29.4	32.0	33.7	36.4	36.4	34.9	34.4	36.1	36.4	33.9	34.1	33.9	34.1	34.4	31.2	29.6	31.5	32.1
MAX	40.6	39.7	39.2	39.3	39.2	37.6	36.8	38.2	39.1	42.3	42.4	41.6	41.5	41.5	42.6	42.7	37.5	39.3	39.3	40.2	40.2	38.5	36.8	38.7	39.0
MIN	26.8	27.5	25.3	24.6	24.9	25.3	25.0	19.9	22.6	24.2	30.7	31.7	27.5	27.1	28.5	29.4	29.4	27.6	27.9	26.5	28.3	23.4	23.4	26.0	24.6

DAY	26	27	28	29	30	31
AVE	34.9	36.5	34.7	34.4	30.2	28.3
MAX	40.8	42.0	40.2	41.1	37.0	33.3
MIN	27.8	30.1	29.4	29.6	23.9	23.9

MONTHLY AVERAGE = 33.3 MONTHLY MAXIMUM = 42.7 MONTHLY MINIMUM = 19.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JULY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.4	0.4	0.5	0.4	0.3	0.4	-0.6	-1.4	-0.9	-0.7	-1.4	-1.5	-1.6	-1.6	-1.6	-1.5	-1.4	-1.0	-0.7	-0.1	0.3	0.4	0.5	0.6	-0.5
2	0.5	0.5	0.6	0.5	0.5	0.3	-0.7	-1.0	-0.8	-1.0	-1.1	-1.2	-1.5	-1.8	-1.6	-1.6	-1.3	-0.9	-0.6	-0.2	0.1	0.3	0.3	0.4	-0.5
3	0.5	0.6	0.3	0.5	0.5	0.5	-0.7	-1.1	-0.6	-0.9	-1.2	-1.5	-1.8	-1.6	-1.6	-1.4	-1.3	-1.0	-0.6	-0.2	0.0	0.1	0.2	0.2	-0.5
4	0.3	0.5	0.6	0.4	0.7	0.6	-0.6	-1.5	-1.2	-1.0	-1.1	-1.3	-1.5	-1.7	-1.6	-1.5	-1.4	-1.1	-0.7	-0.2	0.2	0.2	0.3	0.3	-0.5
5	0.5	0.4	0.4	0.3	0.6	0.6	-0.6	-1.2	-0.9	-0.8	-1.1	-1.3	-1.5	-1.5	-1.6	-1.5	-1.2	-0.8	-0.4	-0.2	-0.2	-0.2	-0.1	0.0	-0.5
6	0.0	0.0	0.0	0.1	0.1	0.0	-0.5	-0.9	-0.6	-0.6	-0.8	-0.8	-0.9	-1.4	-1.3	-1.4	-1.1	-0.6	-0.5	-0.2	-0.1	-0.1	0.0	0.1	-0.5
7	0.0	0.3	0.1	0.0	0.0	0.0	-0.2	-0.8	-1.3	-2.0	-2.0	-2.0	-1.5	-1.3	-0.8	-0.3	0.1	0.6	0.5	0.3	0.6	0.5	0.6	0.6	-0.3
8	0.9	0.6	0.5	0.7	0.8	0.9	-0.3	-0.4	-0.3	-0.8	-1.3	-1.0	-1.0	-1.3	-1.5	-1.3	-1.2	-0.9	-0.6	-0.1	0.3	0.4	0.3	0.4	-0.3
9	0.4	0.5	0.8	0.7	0.9	0.7	-0.4	-1.3	-1.1	-0.9	-0.9	-1.2	-1.1	-1.5	-1.4	-1.4	-1.3	-0.8	-0.7	-0.1	0.3	0.5	0.5	0.5	-0.4
10	0.7	0.8	0.8	0.7	0.7	0.5	-0.2	-0.5	CAL	CAL	CAL	CAL	CAL	-1.8	-1.6	-1.5	-1.2	-1.0	-0.6	-0.1	0.2	0.4	0.6	0.8	-0.1
11	0.5	0.5	0.5	0.7	0.6	0.5	0.4	-0.3	-0.6	-0.7	-1.1	-1.1	-1.4	-1.0	-1.0	-1.2	-1.0	-0.9	-0.5	-0.1	0.0	0.0	0.1	0.4	-0.3
12	0.3	0.2	0.1	0.1	0.1	0.1	-0.2	-0.5	-1.2	-1.7	-1.4	-1.6	-1.6	-1.3	-1.1	-0.9	-1.0	-0.9	-0.6	-0.2	-0.1	0.0	0.0	0.1	-0.5
13	0.1	0.3	0.2	0.2	0.6	0.6	-0.8	-1.2	-1.0	-1.0	-1.4	-1.4	-1.5	-1.7	-1.7	-1.5	-1.4	-1.1	-0.5	-0.2	-0.3	-0.1	-0.1	-0.2	-0.6
14	-0.2	0.0	0.2	0.2	0.2	0.2	-0.3	-1.0	-1.2	-0.9	-1.4	-1.6	-1.6	-1.8	-1.7	-1.6	-1.4	-1.0	-0.7	-0.2	0.0	0.0	0.0	0.0	-0.7
15	0.1	0.0	0.1	0.1	0.2	0.2	-0.1	-0.5	-0.7	-0.9	-1.3	-1.6	-1.5	-1.6	-1.8	-1.5	-1.3	-1.1	-0.7	-0.2	0.2	0.4	0.4	0.5	-0.5
16	0.4	0.4	0.4	0.4	0.2	0.1	-0.8	-0.9	-0.6	-0.7	-1.1	-1.3	-1.5	-1.4	-1.5	-1.4	-1.1	-0.9	-0.5	0.0	0.4	0.4	0.3	0.3	-0.4
17	0.3	0.3	0.2	0.4	0.4	0.5	-0.1	-0.6	-0.7	-1.0	-1.5	-1.7	-1.8	-1.6	-1.4	-1.1	-1.1	-0.9	-0.5	-0.1	0.2	0.3	0.3	0.2	-0.4
18	0.3	0.1	0.1	0.1	0.2	0.2	-0.7	-1.3	-0.8	-1.2	-1.4	-1.5	-1.7	-1.8	-1.6	-1.5	-1.1	-0.9	-0.6	-0.1	0.1	0.3	0.3	0.4	-0.6
19	0.4	0.1	0.2	0.2	0.1	0.1	-0.4	-1.2	-0.7	-1.0	-0.9	-1.2	-1.4	-1.5	-1.5	-1.5	-1.2	-1.0	-0.6	-0.1	0.2	0.4	0.3	0.3	-0.5
20	0.4	0.4	0.4	0.4	0.5	0.3	-0.4	-0.7	-0.8	-0.9	-1.4	-1.5	-1.6	-1.7	-1.5	-1.5	-1.4	-1.0	-0.6	-0.1	0.2	0.4	0.4	0.4	-0.5
21	0.7	0.4	0.4	0.3	0.3	0.3	0.0	-0.9	-0.7	-1.2	-1.4	-1.6	-1.6	-1.6	-1.6	-1.4	-1.3	-1.1	-0.4	-0.1	0.1	0.0	0.0	0.0	-0.5
22	0.1	0.2	0.2	0.2	0.2	0.1	-0.1	-0.3	-0.6	-0.8	-1.0	-1.1	-1.1	-1.3	-0.8	-1.0	-1.0	-0.9	0.1	0.3	0.2	0.1	0.2	0.3	-0.3
23	0.3	0.2	0.1	0.1	0.2	0.2	-0.2	-0.4	-0.9	-0.9	-1.2	-1.6	-1.8	-1.6	-0.9	-0.8	-0.6	-0.6	0.3	0.5	0.4	0.3	0.3	0.3	-0.3
24	0.4	0.3	0.3	0.3	0.3	0.5	0.1	-0.5	-0.6	-0.7	-1.0	-1.1	-1.3	-1.0	-1.2	-1.2	-1.3	-1.0	-0.7	-0.2	-0.3	-0.2	-0.2	-0.2	-0.4
25	-0.1	0.2	0.2	0.1	0.0	0.0	-0.5	-0.8	-0.7	-0.6	-1.1	-1.2	-1.4	-1.8	-1.5	-1.1	-1.2	-0.8	-0.4	-0.1	0.1	0.1	0.0	0.0	-0.5
26	0.0	0.0	0.1	0.2	0.2	0.1	-0.4	-0.5	-0.7	-1.2	-1.3	-1.5	-1.5	-1.7	-1.6	-1.6	-1.3	-0.8	-0.6	-0.1	0.1	0.2	0.3	0.2	-0.6
27	0.2	0.4	0.4	0.3	0.4	0.3	-0.5	-1.1	-0.8	-1.1	-1.3	-1.5	-1.5	-1.6	-1.6	-1.5	-1.2	-0.8	-0.5	-0.1	0.3	0.4	0.3	0.4	-0.5
28	0.3	0.2	0.1	0.1	0.1	0.1	-0.3	-0.9	-1.3	-0.8	-1.3	-1.5	-1.6	-1.6	-1.7	-1.4	-0.9	-0.4	-0.2	0.1	0.3	0.3	0.2	0.2	-0.5
29	0.3	0.2	0.2	0.2	0.2	0.2	-0.4	-0.7	-0.6	-1.1	-1.3	-1.4	-1.6	-1.7	-1.8	-1.4	-1.4	-0.9	-0.5	-0.3	-0.2	-0.2	-0.2	-0.2	-0.6
30	-0.2	0.0	-0.1	0.0	0.1	0.2	-0.4	-1.0	-1.6	-1.4	CAL	CAL	CAL	-1.5	-1.2	-1.0	-0.9	-0.6	-0.3	0.0	-0.2	0.2	0.1	0.0	-0.5
31	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.6	-0.6	-0.6	-1.6	-1.2	-1.4	-1.3	-0.7	-0.9	-0.7	-0.2	-0.2	-0.1	-0.1	0.0	0.1	0.0	-0.4
HRAVE	0.3	0.3	0.3	0.3	0.3	0.3	-0.4	-0.8	-0.8	-1.0	-1.3	-1.4	-1.5	-1.5	-1.4	-1.3	-1.1	-0.8	-0.4	-0.1	0.1	0.2	0.2	0.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.3	-0.3	-0.4	-0.1	-0.3	-0.5	-0.6	-0.7	-0.5	-0.4	-0.4	-0.6	-0.5	-0.5	-0.5	-0.3	-0.3	-0.4	-0.5
MAX	0.6	0.6	0.6	0.7	0.6	0.1	0.6	0.9	0.9	0.8	0.7	0.3	0.6	0.2	0.5	0.4	0.5	0.4	0.4	0.5	0.7	0.3	0.5	0.5	0.2
MIN	-1.6	-1.8	-1.8	-1.7	-1.6	-1.4	-2.0	-1.5	-1.5	-1.8	-1.4	-1.7	-1.7	-1.8	-1.8	-1.5	-1.8	-1.8	-1.5	-1.7	-1.6	-1.3	-1.8	-1.3	-1.8

DAY	26	27	28	29	30	31
AVE	-0.6	-0.5	-0.5	-0.6	-0.5	-0.4
MAX	0.3	0.4	0.3	0.3	0.2	0.1
MIN	-1.7	-1.6	-1.7	-1.8	-1.6	-1.6

MONTHLY AVERAGE = -0.5 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JULY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	701	701	701	701	701	702	702	702	702	702	702	701	701	701	700	699	699	698	699	699	699	700	700	701	701
2	701	701	701	701	701	702	702	702	702	702	702	701	701	700	699	699	698	698	698	698	698	699	700	700	700
3	700	700	700	700	700	700	701	701	701	701	701	700	700	700	699	698	698	698	698	698	698	699	699	700	700
4	700	700	700	701	701	701	701	702	702	702	701	701	701	700	700	699	699	699	699	699	700	701	701	702	700
5	702	702	702	702	703	703	704	704	704	704	704	704	703	702	702	701	701	701	701	701	702	704	704	705	703
6	705	705	704	704	704	705	705	705	705	705	705	705	704	703	702	702	701	701	701	701	702	702	702	703	703
7	703	703	703	703	703	703	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	702	702	702	702
8	702	702	702	702	702	703	703	704	704	704	703	703	703	702	701	701	701	700	700	700	701	701	702	702	702
9	703	703	703	703	703	704	704	704	704	704	704	704	703	703	702	702	701	701	701	701	702	702	703	703	703
10	703	703	703	703	703	704	704	704	CAL	CAL	CAL	CAL	CAL	702	702	701	701	700	700	701	701	702	702	702	702
11	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	699	699	699	699	700	700	700	701	701	701
12	701	701	702	701	701	701	702	702	702	702	701	701	700	699	699	698	698	697	698	699	699	699	700	700	700
13	700	700	700	700	701	701	702	702	702	702	702	701	701	700	700	699	699	699	699	700	701	703	703	703	701
14	702	702	702	702	703	703	704	704	704	704	703	703	702	701	701	700	700	700	700	700	701	702	703	703	702
15	703	702	702	702	702	702	702	703	702	702	702	701	701	700	699	699	698	698	698	699	699	699	699	699	700
16	700	700	699	700	700	700	701	701	701	701	701	701	700	699	699	698	698	698	698	698	699	699	700	700	700
17	700	700	700	701	701	702	703	703	703	704	704	703	703	702	702	701	701	700	700	701	701	702	702	702	702
18	702	702	702	702	703	703	703	703	703	703	702	702	701	701	700	699	699	699	699	699	700	700	700	700	701
19	700	701	701	701	701	701	701	702	702	701	701	701	701	700	699	699	698	698	698	699	699	700	700	700	700
20	700	700	700	700	701	701	701	702	702	702	701	701	701	700	700	699	699	698	698	699	699	700	700	700	700
21	701	701	701	701	701	702	702	703	703	703	702	702	702	701	701	700	700	699	700	700	700	701	701	702	701
22	702	702	702	702	703	704	704	704	705	705	705	704	704	703	702	702	701	701	702	705	707	706	706	707	704
23	707	706	706	705	705	705	706	706	706	705	705	705	704	704	703	702	702	702	702	703	703	703	704	704	704
24	704	704	704	704	704	705	705	705	705	705	705	704	703	703	702	701	700	700	701	701	703	703	703	703	703
25	703	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	700	700	700	701	701	702	702	702	702
26	703	703	703	703	703	704	704	704	704	704	704	703	703	702	701	701	701	701	701	701	702	702	702	703	703
27	703	703	703	703	703	703	704	704	704	704	703	703	702	702	701	701	700	700	700	701	701	701	702	702	702
28	702	702	702	703	703	703	704	704	704	704	704	703	703	702	701	701	700	700	700	700	701	701	701	701	702
29	701	701	701	701	701	702	702	702	702	702	702	702	701	701	700	699	699	699	700	702	703	702	702	703	701
30	703	703	702	702	702	703	703	703	703	703	CAL	CAL	CAL	702	701	700	700	700	701	702	704	704	703	704	702
31	704	703	703	703	704	704	705	705	705	705	705	704	704	703	703	703	703	702	702	703	703	704	704	703	704
HRAVE	702	702	702	702	702	703	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	702	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	700	700	700	703	703	702	702	703	702	701	700	701	702	700	700	702	701	700	700	701	704	704	703	702
MAX	702	702	701	702	705	705	703	704	704	704	703	702	703	704	703	701	704	703	702	702	703	707	707	705	704
MIN	698	698	698	699	701	701	700	700	701	700	699	697	699	700	698	698	700	699	698	698	699	701	702	700	700

DAY	26	27	28	29	30	31
AVE	703	702	702	701	702	704
MAX	704	704	704	703	704	705
MIN	701	700	700	699	700	702

MONTHLY AVERAGE = 701.6 MONTHLY MAXIMUM = 706.9 MONTHLY MINIMUM = 697.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JULY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	34	36	38	39	38	41	36	32	28	25	23	22	19	19	18	17	16	16	16	18	20	21	22	21	26
2	22	23	29	32	36	36	36	32	30	27	24	22	19	17	18	19	17	17	18	20	20	22	22	23	24
3	23	25	27	29	32	34	32	28	28	25	22	20	20	19	18	18	18	18	18	19	22	25	27	24	24
4	20	21	22	23	28	28	25	23	22	19	16	16	15	14	15	16	18	18	17	17	17	17	17	17	19
5	18	21	21	21	24	27	24	21	19	21	20	18	16	15	14	14	14	15	16	18	35	41	43	43	22
6	45	49	51	53	54	56	54	48	42	42	37	34	31	25	24	24	24	32	35	35	36	40	42	43	40
7	43	53	51	47	48	49	51	47	42	35	33	29	27	28	39	44	45	51	48	47	51	53	59	68	45
8	71	75	79	78	74	73	60	52	49	40	23	17	14	12	11	11	11	11	12	14	15	17	19	20	36
9	17	19	23	24	28	28	27	24	21	17	14	15	14	13	14	15	16	18	16	16	19	20	22	23	19
10	26	28	29	31	32	33	32	29	CAL	CAL	CAL	CAL	CAL	14	14	14	14	15	16	18	19	19	20	22	22
11	24	24	24	25	27	27	27	25	21	20	17	16	15	14	15	15	15	15	16	17	18	19	21	22	20
12	25	27	28	33	35	35	35	34	28	25	23	21	20	18	18	17	18	20	20	24	28	27	31	33	26
13	34	35	36	37	38	41	39	34	30	27	25	24	22	22	21	20	20	21	23	25	33	37	39	47	30
14	56	52	55	53	53	53	51	44	37	34	32	31	28	25	24	23	23	22	24	25	28	31	36	41	37
15	44	42	44	46	48	50	49	43	38	32	29	27	24	22	20	20	19	19	20	23	25	26	27	29	32
16	31	34	36	37	39	41	37	37	38	33	28	22	20	19	19	18	17	17	16	16	18	19	22	26	27
17	27	29	34	37	37	39	37	37	36	38	36	33	32	30	31	30	28	28	30	34	38	40	40	42	34
18	43	43	45	47	49	52	49	44	42	39	36	32	30	27	25	24	20	17	17	19	20	22	24	25	33
19	28	32	36	42	47	51	49	43	41	34	31	26	21	22	22	22	23	21	21	21	22	22	24	25	30
20	28	30	30	29	33	34	31	28	24	20	18	18	17	17	17	17	17	17	18	19	20	21	23	24	23
21	26	28	28	31	35	38	35	32	36	35	31	27	26	25	24	23	23	22	24	28	29	39	41	43	30
22	44	46	46	46	44	45	49	50	49	46	43	41	38	37	37	33	30	29	47	75	91	96	90	92	52
23	92	94	93	90	83	82	81	68	58	53	49	43	41	38	37	35	38	37	52	70	69	70	64	65	62
24	62	61	71	68	69	78	78	70	55	52	47	41	37	34	33	32	33	36	38	42	64	77	76	75	55
25	75	79	82	84	88	87	82	71	61	58	48	44	39	35	34	34	31	32	33	36	37	41	46	50	54
26	51	54	59	62	63	67	64	55	47	42	39	36	33	30	29	28	27	27	28	30	33	35	35	37	42
27	38	42	43	45	47	49	47	42	36	34	31	28	25	22	21	21	22	23	23	25	27	26	26	28	32
28	30	34	36	46	52	55	53	48	44	38	34	31	30	29	27	27	28	28	28	31	33	34	37	37	36
29	40	43	42	45	48	49	45	42	38	33	31	29	27	25	23	23	23	24	31	42	43	44	47	49	37
30	52	52	55	54	59	61	55	47	43	40	CAL	CAL	CAL	33	34	33	30	31	47	67	80	91	95	98	55
31	93	92	89	93	92	89	85	83	81	75	53	50	46	45	51	50	49	52	54	59	63	67	68	71	69
HRAVE	41	43	45	46	48	49	47	42	39	35	31	28	26	24	24	24	24	24	27	31	35	37	39	41	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	26	24	24	19	22	40	45	36	19	22	20	26	30	37	32	27	34	33	30	23	30	52	62	55	54
MAX	41	36	34	28	43	56	68	79	28	33	27	35	47	56	50	41	42	52	51	34	43	96	94	78	88
MIN	16	17	18	14	14	24	27	11	13	14	14	17	20	22	19	16	27	17	21	17	22	29	35	32	31

DAY	26	27	28	29	30	31
AVE	42	32	36	37	55	69
MAX	67	49	55	49	98	93
MIN	27	21	27	23	30	45

MONTHLY AVERAGE = 35.4 MONTHLY MAXIMUM = 97.7 MONTHLY MINIMUM = 10.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JULY - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.34	0.55	0.74	0.89	0.99	1.04	1.00	0.92	0.67	0.60	0.39	0.19	0.03	0.00	0.00	0.00	0.00	8.46
2	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.35	0.54	0.75	0.90	0.99	1.05	1.01	0.92	0.68	0.60	0.39	0.18	0.03	0.00	0.00	0.00	0.00	8.51
3	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.35	0.54	0.75	0.90	1.00	1.04	1.00	0.88	0.67	0.59	0.38	0.18	0.03	0.00	0.00	0.00	0.00	8.43
4	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.36	0.57	0.76	0.91	1.01	1.06	1.02	0.93	0.68	0.59	0.38	0.19	0.03	0.00	0.00	0.00	0.00	8.61
5	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.34	0.56	0.75	0.89	0.99	1.05	1.01	0.92	0.68	0.60	0.34	0.12	0.05	0.00	0.00	0.00	0.00	8.42
6	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.21	0.38	0.33	0.47	0.49	0.54	0.88	0.67	0.70	0.35	0.09	0.14	0.03	0.00	0.00	0.00	0.00	5.38
7	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.50	0.71	0.74	0.98	0.74	0.76	0.36	0.31	0.13	0.19	0.11	0.01	0.00	0.00	0.00	0.00	5.88
8	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.18	0.37	0.61	0.77	0.74	0.92	1.00	0.95	0.69	0.62	0.40	0.19	0.03	0.00	0.00	0.00	0.00	7.60
9	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.33	0.55	0.74	0.89	0.99	1.05	1.01	0.93	0.69	0.59	0.39	0.18	0.03	0.00	0.00	0.00	0.00	8.48
10	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.33	CAL	CAL	CAL	CAL	CAL	0.99	0.90	0.65	0.57	0.39	0.15	0.02	0.00	0.00	0.00	0.00	4.12
11	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.16	0.36	0.61	0.90	0.99	1.01	0.53	0.43	0.56	0.40	0.39	0.16	0.02	0.00	0.00	0.00	0.00	6.57
12	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.15	0.49	0.72	0.85	0.99	1.09	0.88	0.70	0.37	0.42	0.33	0.15	0.01	0.00	0.00	0.00	0.00	7.26
13	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.33	0.55	0.67	0.83	0.99	1.02	0.89	0.90	0.62	0.58	0.40	0.10	0.02	0.00	0.00	0.00	0.00	8.03
14	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.29	0.51	0.73	0.88	0.97	1.01	0.96	0.88	0.63	0.56	0.35	0.15	0.01	0.00	0.00	0.00	0.00	8.05
15	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.20	0.51	0.71	0.88	1.00	0.95	0.97	0.89	0.64	0.56	0.35	0.15	0.02	0.00	0.00	0.00	0.00	7.92
16	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.18	0.20	0.31	0.66	0.99	1.00	0.65	0.71	0.60	0.56	0.35	0.15	0.02	0.00	0.00	0.00	0.00	6.54
17	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.21	0.37	0.50	0.85	1.01	0.95	0.71	0.57	0.38	0.44	0.31	0.08	0.01	0.00	0.00	0.00	0.00	6.52
18	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.32	0.51	0.72	0.87	0.91	0.98	0.96	0.89	0.65	0.44	0.35	0.16	0.02	0.00	0.00	0.00	0.00	7.91
19	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.33	0.40	0.54	0.36	0.61	0.74	0.81	0.80	0.63	0.53	0.34	0.14	0.01	0.00	0.00	0.00	0.00	6.37
20	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.33	0.55	0.74	0.89	0.98	1.02	1.00	0.83	0.63	0.56	0.35	0.15	0.01	0.00	0.00	0.00	0.00	8.18
21	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.33	0.52	0.73	0.83	0.96	1.00	0.96	0.87	0.60	0.55	0.37	0.09	0.01	0.00	0.00	0.00	0.00	7.91
22	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.08	0.24	0.32	0.48	0.52	0.54	0.61	0.29	0.55	0.53	0.28	0.02	0.00	0.00	0.00	0.00	0.00	4.51
23	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.25	0.54	0.47	0.60	0.88	0.72	0.94	0.72	0.37	0.22	0.17	0.04	0.00	0.00	0.00	0.00	0.00	6.04
24	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.29	0.51	0.66	0.87	0.95	0.99	0.96	0.85	0.54	0.57	0.36	0.19	0.01	0.00	0.00	0.00	0.00	7.83
25	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.32	0.49	0.45	0.69	0.69	0.86	1.02	0.74	0.41	0.50	0.24	0.08	0.01	0.00	0.00	0.00	0.00	6.60
26	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.48	0.70	0.85	0.94	0.98	0.96	0.88	0.61	0.54	0.30	0.15	0.02	0.00	0.00	0.00	0.00	7.78
27	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.31	0.52	0.72	0.87	0.96	0.99	0.97	0.88	0.61	0.50	0.30	0.13	0.01	0.00	0.00	0.00	0.00	7.86
28	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.32	0.25	0.60	0.81	0.94	0.99	0.92	0.93	0.63	0.25	0.12	0.06	0.01	0.00	0.00	0.00	0.00	6.93
29	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.22	0.37	0.62	0.83	0.91	1.01	0.97	0.89	0.61	0.56	0.32	0.05	0.01	0.00	0.00	0.00	0.00	7.47
30	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.32	0.51	0.71	CAL	CAL	CAL	0.28	0.32	0.29	0.35	0.15	0.02	0.00	0.00	0.00	0.00	0.00	3.04
31	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.29	0.24	0.42	0.76	0.57	1.02	0.52	0.12	0.31	0.17	0.04	0.03	0.00	0.00	0.00	0.00	0.00	4.56
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.28	0.46	0.63	0.79	0.89	0.94	0.88	0.76	0.57	0.48	0.31	0.13	0.02	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	8.46	8.51	8.43	8.61	8.42	5.38	5.88	7.60	8.48	4.12	6.57	7.26	8.03	8.05	7.92	6.54	6.52	7.91	6.37	8.18	7.91	4.51	6.04	7.83	6.60
MAX	1.04	1.05	1.04	1.06	1.05	0.88	0.98	1.00	1.05	0.99	1.01	1.09	1.02	1.01	1.00	1.00	1.01	0.98	0.81	1.02	1.00	0.61	0.94	0.99	1.02
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	7.78	7.86	6.93	7.47	3.04	4.56
MAX	0.98	0.99	0.99	1.01	0.71	1.02
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JULY - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.01	0.11
8	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CAL	CAL	CAL	CAL	CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.03
23	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.04
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CAL	CAL	CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.01	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.01
MAX	0.00	0.00	0.00	0.00	0.00	0.01
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.21 MONTHLY MAXIMUM = 0.02 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 98.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
AUGUST - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.3	5.9	5.4	5.7	5.7	4.9	4.7	4.5	4.3	4.0	3.4	4.6	6.1	5.7	6.7	8.6	9.3	12.7	13.2	11.8	10.1	8.9	4.8	4.3	6.7
2	4.7	6.3	5.2	7.2	7.1	5.6	5.2	4.1	2.1	2.0	4.9	6.3	9.9	11.2	13.4	14.9	13.3	7.7	8.1	5.4	3.2	3.6	6.6	7.7	6.9
3	7.6	4.1	6.4	7.4	9.3	7.2	5.5	3.5	3.9	2.7	2.8	3.7	4.7	8.2	14.1	14.5	14.2	10.9	6.6	4.8	8.6	8.7	7.1	5.7	7.2
4	5.6	7.3	7.1	7.1	9.5	16.1	13.9	11.9	9.0	7.3	6.3	5.4	5.3	3.6	6.7	8.4	8.5	7.1	13.0	10.6	6.9	7.9	4.3	6.1	8.1
5	8.1	6.7	6.9	7.2	6.9	6.1	6.3	3.3	4.6	3.9	2.8	5.5	5.3	5.9	7.6	13.2	19.1	22.9	9.5	15.9	16.4	9.6	7.2	8.0	8.7
6	6.5	8.7	8.8	7.9	10.4	8.6	8.4	7.2	9.1	8.9	10.0	6.8	8.0	8.7	8.4	3.5	3.2	5.2	4.4	8.9	11.4	5.8	5.8	4.8	7.5
7	6.6	4.9	2.8	4.9	3.8	6.0	6.2	7.1	4.5	2.8	3.9	9.2	9.1	11.0	10.2	11.6	11.8	9.6	5.3	14.2	15.7	10.5	7.2	4.9	7.7
8	5.6	4.3	4.5	5.4	5.5	5.1	6.8	5.9	3.5	3.0	3.1	6.6	9.5	11.6	10.7	7.7	12.0	7.8	2.7	4.5	6.0	5.5	5.9	4.2	6.1
9	4.2	4.8	4.3	2.7	1.9	2.9	3.0	5.1	4.2	2.9	8.2	3.7	5.4	5.7	4.7	7.2	8.5	7.3	7.6	8.2	9.2	9.6	7.9	4.2	5.5
10	5.0	4.9	7.3	5.8	5.6	10.4	8.9	7.0	2.5	4.7	5.4	4.9	9.2	11.4	11.6	22.9	19.0	12.1	8.8	11.6	18.2	10.9	14.2	10.2	9.7
11	11.5	15.5	9.4	4.3	7.8	7.6	6.1	4.9	5.4	3.8	4.7	4.9	3.5	3.2	4.6	3.6	3.6	4.5	8.2	8.4	6.4	3.8	6.0	7.2	6.2
12	8.0	8.2	7.2	6.6	2.8	2.3	5.1	4.3	2.8	2.9	3.2	5.1	5.9	9.5	9.9	11.4	12.5	13.3	11.7	8.2	5.1	1.8	4.3	6.0	6.6
13	6.2	5.8	6.7	5.3	5.2	6.4	7.8	4.2	2.4	2.7	3.2	4.7	7.5	8.3	8.6	8.6	10.0	12.6	14.9	11.6	11.7	9.5	5.1	4.6	7.2
14	6.0	7.2	6.5	4.7	6.8	7.2	5.1	5.1	3.1	2.3	2.7	7.2	7.5	9.9	9.8	9.4	9.4	12.4	12.7	10.2	9.8	6.6	5.1	6.4	7.2
15	9.2	7.6	8.8	10.1	11.3	12.7	10.6	13.2	9.8	12.6	5.3	3.6	4.4	9.0	10.3	13.4	16.6	16.1	11.4	6.2	2.2	3.9	9.4	7.9	9.4
16	7.8	7.9	5.6	7.6	8.4	5.9	6.6	5.2	2.0	2.5	5.4	8.8	6.5	7.9	9.0	12.3	13.6	14.1	14.5	13.4	11.6	6.3	5.0	2.8	7.9
17	7.0	7.6	8.6	3.2	4.6	2.7	2.3	1.2	3.5	4.6	5.3	9.8	11.3	10.4	11.0	12.0	10.4	15.3	10.3	6.8	4.3	6.4	8.9	12.8	7.5
18	10.4	7.9	6.4	5.8	3.6	5.2	6.9	6.0	3.2	2.6	5.0	4.7	7.3	9.6	14.8	15.3	15.1	16.0	14.0	10.8	8.7	2.8	6.7	8.1	8.2
19	9.5	7.0	5.7	4.6	2.3	4.2	4.5	3.8	3.4	2.7	3.9	4.6	5.5	9.9	12.5	12.3	12.7	14.4	15.6	13.1	11.7	9.2	3.1	4.0	7.5
20	5.9	5.6	7.0	4.9	5.3	6.5	5.9	5.7	3.3	2.0	2.1	3.1	4.1	6.0	8.8	12.5	11.7	15.6	16.4	13.0	10.7	8.8	2.7	3.5	7.1
21	8.3	6.4	5.7	9.1	6.5	5.5	8.3	6.1	5.7	3.8	4.2	3.5	5.9	10.8	14.2	16.9	16.7	17.1	15.1	10.5	8.4	5.4	7.0	7.1	8.7
22	8.0	9.0	9.2	9.7	7.3	5.6	6.6	5.8	4.4	5.6	3.4	4.6	5.9	6.0	10.8	12.2	12.4	13.0	10.3	3.1	2.0	7.8	13.0	7.2	7.6
23	7.0	12.7	9.5	7.6	6.7	4.7	4.0	3.9	6.4	8.8	7.5	10.4	12.2	13.9	15.6	14.6	15.9	17.0	16.3	12.7	10.4	19.0	25.9	19.2	11.7
24	7.0	3.6	2.4	2.5	6.2	4.6	2.3	2.9	3.2	10.2	11.3	12.0	11.4	13.2	13.2	15.1	16.1	15.1	16.8	14.2	7.6	4.6	2.5	2.8	8.4
25	6.0	8.6	10.2	7.8	8.0	8.3	8.5	9.3	7.7	9.3	9.6	9.1	10.7	13.7	13.2	13.3	15.7	16.5	17.9	13.9	10.9	6.3	3.4	4.1	10.1
26	4.1	3.8	3.9	2.2	3.0	3.4	3.3	2.7	4.5	6.6	10.1	14.0	13.8	12.1	14.0	14.7	16.3	16.8	15.5	11.3	7.6	7.0	5.2	2.7	8.3
27	4.3	5.6	4.8	5.6	6.5	6.4	5.8	4.8	2.6	6.6	9.9	10.0	11.8	13.3	14.2	15.4	15.5	17.3	13.5	10.4	6.5	7.9	5.7	2.1	8.6
28	3.9	6.2	2.9	3.7	5.5	6.7	6.4	4.3	4.6	4.9	7.6	11.8	13.0	13.0	15.0	16.0	21.2	17.5	21.8	22.6	11.4	6.0	7.1	7.2	10.0
29	5.8	12.4	11.1	4.7	7.4	6.4	8.4	7.4	6.7	3.4	6.9	4.4	6.6	8.8	11.3	12.4	15.5	16.7	14.0	14.7	6.5	11.1	10.7	9.9	9.3
30	6.7	5.6	6.3	6.3	4.7	5.2	4.9	4.1	4.1	3.0	4.5	8.3	10.8	10.3	13.2	14.9	18.3	17.8	11.4	9.5	8.1	6.7	8.5	6.7	8.3
31	6.1	8.0	7.0	6.7	5.8	4.9	2.3	3.9	2.9	8.8	7.0	5.3	3.0	4.8	5.5	5.0	9.6	14.0	11.5	6.8	5.7	6.0	5.2	8.8	6.4
HRAVE	6.7	7.1	6.6	5.9	6.2	6.3	6.2	5.4	4.5	4.9	5.6	6.7	7.8	9.2	10.8	12.1	13.2	13.4	12.0	10.6	8.8	7.3	7.1	6.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.7	6.9	7.2	8.1	8.7	7.5	7.7	6.1	5.5	9.7	6.2	6.6	7.2	7.2	9.4	7.9	7.5	8.2	7.5	7.1	8.7	7.6	11.7	8.4	10.1
MAX	13.2	14.9	14.5	16.1	22.9	11.4	15.7	12.0	9.6	22.9	15.5	13.3	14.9	12.7	16.6	14.5	15.3	16.0	15.6	16.4	17.1	13.0	25.9	16.8	17.9
MIN	3.4	2.0	2.7	3.6	2.8	3.2	2.8	2.7	1.9	2.5	3.2	1.8	2.4	2.3	2.2	2.0	1.2	2.6	2.3	2.0	3.5	2.0	3.9	2.3	3.4

DAY	26	27	28	29	30	31
AVE	8.3	8.6	10.0	9.3	8.3	6.4
MAX	16.8	17.3	22.6	16.7	18.3	14.0
MIN	2.2	2.1	2.9	3.4	3.0	2.3

MONTHLY AVERAGE = 7.9 MONTHLY MAXIMUM = 25.9 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
AUGUST - 2019

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	118	102	132	131	114	114	133	135	147	149	183	289	207	236	263	300	292	301	293	299	304	299	286	143	82
2	110	116	109	90	124	111	117	128	156	306	278	287	299	292	291	283	286	281	282	261	305	161	119	102	17
3	108	118	127	112	121	105	155	145	145	143	137	239	170	250	277	286	275	281	260	210	126	140	131	104	128
4	71	67	99	105	83	76	81	77	64	70	76	74	301	314	273	94	71	0	286	290	301	303	202	111	196
5	117	107	113	119	110	111	123	132	130	145	151	268	206	235	263	310	321	53	215	97	147	118	98	140	66
6	101	96	133	100	124	103	100	78	67	69	74	99	72	70	75	72	201	267	268	238	123	146	100	123	114
7	94	138	161	115	125	111	111	123	116	106	295	286	297	287	289	287	135	156	169	254	288	307	311	179	78
8	125	133	135	128	105	123	111	109	124	142	218	286	292	286	245	218	238	162	159	119	122	99	104	121	37
9	117	120	155	109	149	178	144	179	213	224	314	310	272	307	341	303	276	269	286	297	301	295	299	244	136
10	123	114	124	124	108	102	121	147	131	293	280	284	278	278	258	140	142	142	120	79	71	61	50	60	331
11	53	50	96	170	97	70	133	131	157	151	146	174	226	249	226	224	181	193	274	297	306	165	111	86	124
12	103	112	94	81	73	109	100	107	154	170	278	281	303	292	294	320	303	310	301	312	304	314	104	96	197
13	97	102	107	103	95	94	84	105	105	269	265	249	242	270	263	243	276	291	292	295	304	305	183	115	71
14	106	109	105	109	115	115	129	118	142	245	286	303	301	282	269	274	274	278	281	298	312	284	134	117	21
15	97	96	100	74	72	58	66	69	72	79	116	93	261	306	318	288	282	295	288	295	237	75	53	81	67
16	105	120	103	95	100	129	91	89	217	263	294	305	274	268	294	284	282	299	294	299	311	296	291	297	35
17	318	310	319	289	300	297	307	51	311	305	284	306	290	272	291	291	286	291	280	286	270	269	300	312	13
18	299	285	307	296	160	119	98	107	114	309	303	272	297	303	306	311	308	295	303	308	302	210	102	89	241
19	81	99	89	62	14	95	103	109	110	146	287	259	266	254	274	279	277	284	283	294	308	298	211	124	295
20	115	109	93	107	88	91	102	110	133	141	259	252	255	273	279	297	278	288	291	298	302	293	282	125	273
21	95	103	112	106	118	118	102	117	113	138	134	195	278	303	300	281	291	289	289	300	297	253	122	79	178
22	117	115	102	87	88	117	116	123	113	101	235	291	292	284	283	280	281	294	206	90	248	269	125	134	54
23	307	313	307	302	319	308	255	144	288	297	310	295	292	284	280	292	280	281	282	281	290	157	142	155	107
24	155	132	231	176	158	135	182	169	289	303	294	293	281	278	274	283	280	284	286	279	257	268	152	144	155
25	207	303	301	287	298	309	291	308	294	278	275	287	286	281	284	279	280	275	280	279	278	283	142	118	27
26	131	123	156	120	148	153	145	179	305	294	292	294	294	294	273	280	279	278	281	285	291	296	302	180	42
27	149	119	118	123	118	120	113	110	115	297	300	279	284	288	283	287	296	284	290	286	309	306	306	213	97
28	114	118	118	135	133	118	98	121	149	142	297	291	294	278	289	285	232	164	47	45	79	62	341	159	292
29	144	85	59	131	120	131	120	142	131	153	148	88	278	277	281	290	285	301	296	48	306	63	58	70	182
30	87	137	100	114	104	100	99	120	142	119	263	294	283	292	288	282	286	28	66	62	69	70	80	83	128
31	112	115	120	131	114	87	73	84	284	303	294	275	274	338	282	261	273	289	244	112	149	152	110	127	110

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
AUGUST - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	11	9	12	4	8	10	9	16	22	34	55	39	27	50	31	26	24	17	11	9	6	6	20	12	20
2	10	9	8	8	8	9	8	17	57	59	43	40	29	25	22	12	12	20	9	12	17	18	11	10	20
3	11	13	9	9	9	12	10	19	24	55	61	54	50	52	18	18	11	10	11	15	11	14	53	15	23
4	14	12	21	15	8	12	10	11	16	25	34	32	40	71	47	38	15	46	11	7	6	6	35	8	22
5	8	9	8	10	15	20	14	20	24	23	41	32	54	43	35	29	35	18	41	16	40	28	16	10	25
6	14	44	13	12	13	11	13	26	18	19	7	15	11	14	12	51	52	14	8	22	29	44	47	47	23
7	15	11	14	10	16	11	12	14	23	37	59	22	24	21	25	29	13	13	12	21	6	10	13	21	19
8	12	11	10	8	10	10	12	17	31	36	53	28	30	22	39	33	24	13	29	8	8	8	9	15	20
9	14	13	23	24	26	32	8	19	23	36	17	47	36	40	44	21	22	20	14	9	7	5	7	21	22
10	14	7	10	10	12	12	10	11	51	29	39	48	33	13	31	12	13	11	12	21	10	17	19	13	19
11	14	10	21	35	16	25	12	17	14	18	23	24	59	57	39	38	34	48	20	8	6	30	7	8	24
12	11	9	10	8	46	26	12	13	23	34	32	43	33	31	23	24	16	15	11	8	9	45	26	11	22
13	9	13	21	11	9	8	7	19	30	25	33	29	36	26	28	22	20	12	9	7	6	7	17	10	17
14	8	6	9	19	10	9	8	13	28	34	41	24	34	27	25	27	21	15	8	6	7	37	10	9	18
15	16	16	16	10	17	12	15	6	12	19	54	62	49	29	25	26	17	12	10	9	23	40	15	17	22
16	19	7	13	9	18	11	8	15	63	46	36	21	34	34	35	20	18	18	12	9	7	16	26	45	22
17	16	16	32	35	14	40	18	51	44	36	41	28	20	26	19	20	22	14	11	10	25	19	12	15	24
18	9	18	17	9	25	10	8	10	23	30	36	32	27	22	15	16	15	9	8	6	6	33	10	7	17
19	6	34	16	23	31	10	12	13	21	43	43	26	33	26	19	24	19	14	8	7	6	4	17	11	19
20	7	9	7	10	9	6	8	7	25	58	47	43	45	30	33	23	20	13	10	8	6	5	31	13	20
21	7	14	25	9	14	19	11	15	22	34	38	50	42	30	19	23	14	15	9	6	5	31	15	10	20
22	12	16	11	9	14	17	17	7	25	35	53	52	48	42	28	21	18	17	30	57	15	51	25	22	27
23	24	9	10	9	9	9	22	16	36	20	38	28	20	22	18	19	13	13	8	7	7	30	9	9	17
24	17	12	22	21	10	17	27	36	29	20	18	22	20	19	21	15	12	13	10	8	10	12	39	11	18
25	20	25	9	8	9	11	14	11	16	17	22	30	28	16	18	19	13	9	7	6	5	22	20	10	15
26	13	9	11	21	21	7	11	23	25	25	21	16	18	21	17	21	12	10	8	6	6	8	16	17	15
27	11	7	12	8	7	6	8	12	43	26	19	21	24	17	17	15	16	11	11	6	9	8	21	37	16
28	11	7	37	36	7	12	11	17	18	29	24	23	26	21	19	17	27	18	18	12	16	29	47	12	21
29	25	18	14	32	14	6	10	13	19	32	23	47	32	27	27	18	18	11	13	16	29	21	10	16	20
30	23	13	12	15	14	12	12	20	30	43	36	23	21	25	22	21	16	38	11	12	12	9	10	7	19
31	12	15	17	17	10	20	49	23	45	22	32	35	48	55	34	35	30	13	30	16	13	9	14	9	25
HRAVE	13	14	15	15	14	14	13	17	28	32	36	33	33	31	26	24	20	17	14	12	12	20	20	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20	20	23	22	25	23	19	20	22	19	24	22	17	18	22	22	24	17	19	20	20	27	17	18	15
MAX	55	59	61	71	54	52	59	53	47	51	59	46	36	41	62	63	51	36	43	58	50	57	38	39	30
MIN	4	8	9	6	8	7	6	8	5	7	6	8	6	6	6	7	10	6	4	5	5	7	7	8	5

DAY	26	27	28	29	30	31
AVE	15	16	21	20	19	25
MAX	25	43	47	47	43	55
MIN	6	6	7	6	7	9

MONTHLY AVERAGE = 20.4 MONTHLY MAXIMUM = 71.2 MONTHLY MINIMUM = 4.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
AUGUST - 2019

	HOUR																						
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	27.0	26.8	26.1	25.3	25.4	25.0	25.3	27.4	29.3	31.4	33.6	35.0	35.8	36.9	37.2	36.6	36.8	37.2	36.5	35.3	34.5	33.6	32.7	31.2	31.7
2	31.0	30.4	29.6	29.2	28.1	27.9	28.5	30.2	32.2	34.4	36.7	38.4	39.7	40.1	40.3	38.9	38.4	38.2	37.8	36.8	35.9	35.0	33.4	33.0	34.3
3	32.0	30.8	29.7	29.1	28.9	28.4	28.3	30.3	32.6	35.4	37.6	38.8	41.0	41.6	40.4	41.4	39.7	38.9	38.3	37.6	35.0	33.4	33.4	32.6	34.8
4	32.1	31.9	30.9	30.5	30.6	30.4	30.5	32.0	33.7	35.5	37.3	38.4	39.3	40.5	41.4	39.8	40.1	40.2	39.7	38.4	37.3	36.6	35.3	33.3	35.7
5	32.5	32.0	31.0	30.0	29.6	28.6	28.4	29.6	33.3	35.7	38.3	39.8	41.8	42.7	43.4	42.9	41.2	27.6	25.8	26.4	26.1	25.7	26.3	25.7	32.7
6	25.1	25.7	24.9	25.3	25.4	24.9	25.5	26.0	26.8	28.4	29.5	31.2	32.1	33.6	35.5	35.6	36.8	36.3	35.1	34.0	28.9	29.1	29.1	28.2	29.7
7	28.2	27.9	27.2	26.9	26.5	26.3	26.3	26.9	28.0	31.2	33.1	34.4	35.8	37.0	37.8	36.5	34.2	34.0	34.1	33.5	32.2	31.8	31.6	29.9	31.3
8	28.7	28.7	27.7	26.9	26.6	26.5	26.7	29.3	30.6	32.9	34.9	36.7	38.2	38.7	36.5	35.4	36.8	34.9	35.0	34.0	33.1	32.6	32.4	31.8	32.3
9	30.7	30.1	29.8	29.2	28.5	28.4	27.8	27.9	28.6	30.3	32.1	32.4	33.0	33.0	33.4	34.5	34.7	35.0	34.5	33.3	32.6	31.8	31.3	30.3	31.4
10	29.4	29.1	28.6	27.9	27.5	27.9	27.5	27.8	29.5	31.5	32.9	34.3	35.0	34.7	34.2	27.9	26.1	26.0	26.3	26.5	26.4	26.3	25.6	25.1	28.9
11	25.4	24.7	20.7	20.1	20.2	21.1	20.7	21.7	23.5	24.9	27.5	29.9	31.5	32.4	34.2	34.8	34.7	35.1	34.6	33.2	32.2	30.3	29.6	28.8	28.0
12	28.0	27.6	27.3	26.5	25.7	25.1	25.4	27.2	29.0	31.7	33.7	35.3	36.6	37.8	37.9	38.1	38.2	37.5	36.7	35.1	34.1	33.0	31.5	29.6	32.0
13	28.8	27.7	27.0	26.0	24.9	24.2	25.0	26.8	29.2	31.3	34.2	36.8	38.6	39.7	40.3	40.8	40.4	39.9	38.5	36.5	35.2	34.5	32.5	31.4	32.9
14	30.0	28.9	27.7	26.8	26.6	26.0	25.6	26.6	29.9	32.4	35.2	38.9	40.5	41.2	41.9	41.8	41.8	41.2	39.8	37.7	36.8	35.7	33.4	32.6	34.1
15	32.0	31.9	30.7	30.6	30.3	30.6	30.5	31.5	34.0	35.8	37.7	39.1	40.4	41.5	42.0	42.3	41.9	41.4	40.4	38.3	36.9	35.6	34.7	33.5	36.0
16	31.7	30.7	30.0	29.6	28.2	26.8	28.4	30.2	31.2	33.7	36.1	37.8	39.1	40.4	41.0	41.3	40.7	40.2	38.7	36.6	36.0	35.3	34.5	34.3	34.7
17	33.5	32.6	31.7	30.8	29.2	28.5	28.3	29.9	32.0	33.6	35.3	37.0	38.0	38.6	38.9	38.9	39.2	38.1	37.8	36.2	35.0	34.5	33.9	33.6	34.4
18	32.7	31.5	30.5	29.0	28.2	27.3	27.5	28.4	30.1	32.4	34.7	35.7	36.5	37.2	38.2	37.7	38.6	37.1	36.3	34.7	33.5	31.6	29.9	28.9	32.8
19	28.0	26.2	25.6	24.9	24.7	23.6	24.4	26.6	30.1	32.4	34.6	36.8	38.5	40.2	40.8	40.9	40.7	40.1	38.5	36.5	35.6	34.9	33.5	32.0	32.9
20	30.7	29.4	28.5	27.3	26.5	25.4	25.3	28.1	30.8	34.2	36.9	39.6	41.4	42.1	42.8	42.9	42.7	41.8	40.3	38.4	37.0	36.0	35.2	33.6	34.9
21	31.9	31.5	29.7	28.8	29.2	27.2	28.6	30.3	33.9	37.0	38.6	40.0	41.5	42.6	43.2	42.7	42.5	41.7	40.6	38.7	37.4	35.9	34.9	34.2	35.9
22	32.6	32.0	31.5	30.7	29.6	27.9	28.0	29.8	32.9	34.7	35.8	36.8	38.8	39.6	40.8	41.0	40.9	39.8	37.7	36.3	35.7	33.5	32.0	31.2	34.6
23	30.4	29.8	29.7	28.9	28.8	28.7	28.0	28.3	30.9	32.5	34.0	34.9	36.0	36.9	37.3	37.6	37.5	36.9	35.7	34.2	33.5	29.8	28.3	27.9	32.4
24	27.3	27.3	26.8	26.7	25.5	25.5	25.8	26.0	28.1	30.3	31.4	32.8	34.0	35.0	35.8	36.1	35.9	35.5	34.3	33.2	32.7	32.1	31.2	30.6	30.8
25	30.2	29.5	28.7	28.1	27.5	27.2	27.0	27.0	27.9	29.2	30.8	32.6	34.2	35.2	35.9	36.8	36.8	36.3	35.0	33.7	32.9	32.2	31.1	30.4	31.5
26	29.9	29.4	28.9	28.4	28.1	27.2	27.5	28.7	30.6	32.4	34.3	36.0	37.0	38.1	39.0	39.6	39.2	38.2	37.2	35.8	35.1	34.3	33.7	32.7	33.4
27	31.5	30.5	30.0	29.2	28.5	27.6	27.8	29.7	31.5	34.0	36.2	38.0	39.8	40.7	41.3	41.5	41.2	40.4	39.2	37.5	36.5	36.1	35.2	34.3	34.9
28	32.8	31.9	31.6	30.9	29.7	29.2	30.3	32.0	33.9	35.0	36.4	38.0	38.7	39.4	39.9	39.9	36.9	31.1	29.3	25.8	26.5	27.2	28.1	26.6	32.5
29	26.1	26.2	27.2	26.5	26.0	25.5	25.6	27.0	29.9	31.5	34.2	35.3	36.3	37.7	38.4	38.6	38.2	37.4	36.4	33.3	32.4	31.3	30.7	30.3	31.7
30	29.7	29.0	28.8	27.7	27.2	26.8	26.6	28.6	30.4	32.6	34.5	36.2	38.2	39.3	40.0	40.1	39.8	34.8	32.5	33.0	32.5	31.6	30.8	30.5	32.5
31	30.3	30.0	29.8	29.3	28.7	28.8	28.7	30.2	31.8	33.7	34.8	36.2	37.1	38.4	39.7	40.2	40.3	39.5	36.8	32.7	31.8	30.3	30.5	30.6	33.3
HRAVE	30.0	29.4	28.6	28.0	27.4	26.9	27.1	28.5	30.5	32.6	34.6	36.2	37.6	38.5	39.0	38.8	38.5	37.2	36.1	34.6	33.6	32.6	31.8	30.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	31.7	34.3	34.8	35.7	32.7	29.7	31.3	32.3	31.4	28.9	28.0	32.0	32.9	34.1	36.0	34.7	34.4	32.8	32.9	34.9	35.9	34.6	32.4	30.8	31.5
MAX	37.2	40.3	41.6	41.4	43.4	36.8	37.8	38.7	35.0	35.0	35.1	38.2	40.8	41.9	42.3	41.3	39.2	38.6	40.9	42.9	43.2	41.0	37.6	36.1	36.8
MIN	25.0	27.9	28.3	30.4	25.7	24.9	26.3	26.5	27.8	25.1	20.1	25.1	24.2	25.6	30.3	26.8	28.3	27.3	23.6	25.3	27.2	27.9	27.9	25.5	27.0

DAY	26	27	28	29	30	31
AVE	33.4	34.9	32.5	31.7	32.5	33.3
MAX	39.6	41.5	39.9	38.6	40.1	40.3
MIN	27.2	27.6	25.8	25.5	26.6	28.7

MONTHLY AVERAGE = 32.9 MONTHLY MAXIMUM = 43.4 MONTHLY MINIMUM = 20.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
AUGUST - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.0	0.2	0.2	0.1	0.2	0.3	-0.2	-1.0	-1.1	-1.2	-1.2	-1.3	-1.5	-1.5	-1.4	-1.0	-0.8	-0.9	-0.6	-0.2	0.1	0.3	0.3	0.2	-0.5
2	0.3	0.2	0.2	0.2	0.2	0.1	-0.8	-1.0	-0.7	-0.7	-1.2	-1.4	-1.6	-1.6	-1.6	-0.9	-0.7	-0.5	-0.3	0.1	0.3	0.2	0.1	0.1	-0.5
3	0.1	0.2	0.3	0.0	0.1	0.1	-0.6	-0.8	-1.0	-0.9	-1.2	-1.2	-1.7	-1.7	-1.0	-1.5	-0.6	-0.2	-0.1	0.0	-0.2	-0.2	-0.1	-0.1	-0.5
4	0.0	0.1	0.1	0.2	0.1	0.0	-0.3	-1.1	-1.4	-1.5	-1.9	-1.7	-1.4	-1.2	-1.3	-1.2	-1.2	-0.9	-0.5	-0.1	0.3	0.3	0.3	0.2	-0.6
5	0.2	0.2	0.3	0.1	0.1	0.3	-0.1	-0.6	-1.4	-1.1	-1.2	-1.3	-1.6	-1.5	-1.5	-1.3	-1.1	0.5	0.3	0.3	0.2	0.1	0.2	0.2	-0.4
6	0.3	0.3	0.1	0.1	0.2	0.3	0.3	-0.1	-0.1	-0.2	-0.4	-1.0	-1.0	-1.1	-1.2	-0.5	-0.6	-0.4	0.0	0.1	-0.2	0.0	0.0	0.0	-0.2
7	0.1	0.1	0.0	0.1	0.1	0.1	-0.1	-0.3	-0.4	-0.9	-1.0	-1.3	-1.4	-1.4	-1.3	-0.7	-1.3	-0.7	-0.3	0.0	0.0	0.1	0.2	0.2	-0.4
8	0.1	0.2	0.2	0.2	0.2	0.3	-0.3	-1.1	-1.0	-1.0	-1.0	-1.2	-1.5	-1.4	-0.8	-0.6	-0.8	-0.7	-0.3	0.0	0.1	0.1	0.1	0.2	-0.4
9	0.2	0.1	0.2	0.3	0.3	0.4	0.2	0.4	-0.1	-0.5	-1.1	-0.8	-0.9	-0.9	-0.9	-1.2	-1.0	-0.8	-0.6	-0.1	0.0	0.1	0.2	0.4	-0.2
10	0.2	0.2	0.3	0.1	0.1	0.1	-0.1	-0.4	-0.7	-0.9	-1.0	-1.0	-1.1	-0.8	-0.5	-0.6	-0.5	-0.6	-0.4	-0.2	-0.2	-0.1	-0.1	-0.2	-0.3
11	-0.1	0.1	0.2	0.1	0.1	0.2	0.0	-0.1	-0.6	-0.8	-1.2	-1.2	-0.9	-0.8	-1.0	-0.7	-0.7	-0.6	-0.2	0.3	0.6	0.5	0.6	0.6	-0.2
12	0.4	0.3	0.5	0.5	0.4	0.2	-0.4	-0.8	-0.6	-0.8	-0.8	-0.9	-1.1	-1.3	-1.3	-1.0	-1.0	-0.7	-0.3	0.3	0.6	0.5	0.6	0.6	-0.3
13	0.8	0.6	0.6	0.6	0.6	0.6	-0.4	-0.8	-0.6	-0.7	-0.8	-1.1	-1.4	-1.3	-1.3	-1.1	-1.0	-0.8	-0.3	0.2	0.4	0.5	0.5	0.6	-0.2
14	0.6	0.8	0.5	0.6	0.2	0.3	0.2	-0.5	-0.8	-0.7	-0.9	-1.3	-1.3	-1.4	-1.4	-1.2	-0.9	-0.8	-0.3	0.3	0.6	0.5	0.7	0.8	-0.2
15	0.5	0.7	0.6	0.4	0.4	0.1	-0.2	-0.8	-1.5	-1.7	-1.4	-1.4	-1.1	-1.4	-1.4	-1.2	-1.0	-0.7	-0.3	0.4	0.5	0.7	0.8	0.7	-0.3
16	0.9	0.9	0.8	0.7	0.5	0.6	-0.3	-1.2	-0.6	-0.7	-1.0	-1.4	-1.3	-1.5	-1.3	-1.3	-0.9	-0.8	-0.2	0.1	0.2	0.3	0.2	0.1	-0.3
17	0.2	0.2	0.2	0.3	0.3	0.3	0.1	-0.4	-0.7	-0.9	-1.2	-1.5	-1.4	-1.3	-1.3	-1.2	-1.1	-0.6	-0.4	0.3	0.4	0.4	0.4	0.3	-0.3
18	0.3	0.4	0.5	0.5	0.5	0.4	0.1	-0.7	-0.8	-0.8	-1.0	-1.0	-1.1	-1.0	-1.6	-1.1	-1.1	-0.6	-0.3	0.3	0.6	0.6	0.7	0.7	-0.2
19	0.7	0.5	0.7	0.4	0.4	0.5	-0.2	-0.8	-1.0	-0.8	-0.9	-1.2	-1.1	-1.4	-1.5	-1.3	-1.1	-0.8	-0.3	0.2	0.4	0.6	0.5	0.7	-0.3
20	0.7	0.7	0.6	0.7	0.7	0.6	-0.2	-1.4	-0.8	-0.8	-0.9	-0.9	-1.2	-1.3	-1.4	-1.3	-1.1	-0.9	-0.3	0.2	0.4	0.5	0.4	0.6	-0.3
21	0.7	1.0	1.1	0.6	0.7	0.9	0.0	-0.7	-1.2	-1.2	-1.4	-1.0	-1.4	-1.5	-1.6	-1.2	-1.1	-0.8	-0.3	0.3	0.6	0.6	0.7	0.7	-0.2
22	0.5	0.5	0.4	0.4	0.5	0.8	0.5	-1.0	-1.2	-1.8	-1.2	-1.2	-1.5	-1.3	-1.5	-1.4	-1.1	-0.7	-0.3	0.1	0.4	0.0	-0.2	-0.1	-0.4
23	0.0	0.0	-0.1	0.0	0.1	0.1	0.0	-0.5	-0.8	-1.0	-1.3	-1.4	-1.7	-1.6	-1.5	-1.4	-1.1	-0.9	-0.4	0.0	0.1	-0.1	-0.2	-0.2	-0.6
24	-0.2	0.0	0.1	0.1	0.0	0.0	-0.2	-0.3	-0.6	-1.1	-1.4	-1.5	-1.6	-1.7	-1.6	-1.5	-1.2	-0.9	-0.4	-0.1	0.0	0.2	0.2	0.2	-0.6
25	0.1	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.6	-0.9	-1.2	-1.5	-1.6	-1.7	-1.6	-1.5	-1.2	-0.9	-0.4	0.0	0.1	0.2	0.2	0.2	-0.5
26	0.2	0.2	0.2	0.2	0.3	0.3	-0.2	-0.6	-0.8	-1.0	-1.3	-1.6	-1.5	-1.6	-1.5	-1.4	-1.0	-0.6	-0.3	0.1	0.2	0.4	0.3	0.3	-0.4
27	0.3	0.3	0.3	0.2	0.2	0.3	-0.3	-1.3	-0.8	-1.0	-1.3	-1.4	-1.5	-1.7	-1.5	-1.5	-1.1	-0.8	-0.3	0.1	0.3	0.4	0.5	0.3	-0.5
28	0.5	0.4	0.3	0.5	0.3	0.2	-0.1	-0.9	-1.1	-1.3	-1.2	-1.5	-1.5	-1.5	-1.5	-1.4	-1.1	-0.8	-0.2	0.3	0.3	0.3	0.2	0.2	-0.4
29	0.1	0.1	0.1	0.2	0.3	0.4	0.0	-1.1	-1.5	-0.9	-2.0	-1.5	-1.3	-1.4	-1.4	-1.4	-1.1	-0.8	-0.4	-0.1	0.2	0.0	0.1	0.1	-0.6
30	0.2	0.3	0.2	0.3	0.3	0.3	-0.3	-0.9	-1.0	-1.1	-1.0	-1.4	-1.4	-1.4	-1.4	-1.4	-1.1	-0.5	-0.1	0.0	0.1	0.2	0.2	0.2	-0.4
31	0.3	0.2	0.2	0.2	0.2	0.3	0.3	-0.8	-0.7	-1.0	-1.2	-1.3	-1.1	-1.3	-1.3	-1.1	-1.1	-1.0	-0.6	-0.3	0.0	0.0	0.1	0.0	-0.5
HRAVE	0.3	0.3	0.3	0.3	0.3	0.3	-0.1	-0.7	-0.9	-1.0	-1.2	-1.3	-1.3	-1.4	-1.3	-1.2	-1.0	-0.7	-0.3	0.1	0.2	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.5	-0.5	-0.5	-0.6	-0.4	-0.2	-0.4	-0.4	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.2	-0.4	-0.6	-0.6	-0.5
MAX	0.3	0.3	0.3	0.3	0.5	0.3	0.2	0.3	0.4	0.3	0.6	0.6	0.8	0.8	0.8	0.9	0.4	0.7	0.7	0.7	1.1	0.8	0.1	0.2	0.2
MIN	-1.5	-1.6	-1.7	-1.9	-1.6	-1.2	-1.4	-1.5	-1.2	-1.1	-1.2	-1.3	-1.4	-1.4	-1.7	-1.5	-1.5	-1.6	-1.5	-1.4	-1.6	-1.8	-1.7	-1.7	-1.7

DAY	26	27	28	29	30	31
AVE	-0.4	-0.5	-0.4	-0.6	-0.4	-0.5
MAX	0.4	0.5	0.5	0.4	0.3	0.3
MIN	-1.6	-1.7	-1.5	-2.0	-1.4	-1.3

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
AUGUST - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	703	703	703	704	704	704	704	705	705	704	704	704	703	703	702	701	701	701	701	701	702	702	702	702	703
2	702	702	702	702	702	703	703	703	703	703	703	702	702	701	701	700	700	700	700	701	701	701	701	702	702
3	702	702	702	702	702	702	702	703	703	702	702	702	701	700	700	699	699	700	700	700	701	702	702	703	701
4	702	702	703	703	702	703	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	701	701	702
5	701	701	701	701	702	702	702	702	702	702	702	701	701	700	699	699	698	701	702	702	702	703	704	704	701
6	703	702	702	702	703	703	704	704	704	703	703	703	703	702	701	701	700	700	700	701	702	703	703	703	702
7	702	702	703	703	703	703	703	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	701	701	702
8	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	700	699	699	699	700	700	701	701	701	701
9	701	701	701	701	701	702	702	703	703	704	703	703	703	702	701	701	700	700	700	700	701	701	701	701	701
10	701	701	700	701	701	701	702	702	702	702	702	701	701	700	700	701	701	701	701	702	703	703	703	703	701
11	703	703	703	703	704	704	704	704	704	705	704	704	703	702	702	701	701	701	701	701	701	702	702	702	703
12	702	703	703	703	703	704	704	704	704	704	704	704	703	703	702	702	701	701	701	701	702	702	702	702	703
13	702	702	702	703	703	703	704	704	704	704	704	703	703	702	701	701	701	700	700	701	701	702	702	702	702
14	702	702	702	702	703	703	703	704	704	704	703	703	702	702	701	701	700	700	700	701	701	702	702	702	702
15	702	702	702	703	703	703	703	704	704	704	703	703	702	701	701	700	700	700	700	700	700	701	701	701	702
16	701	701	702	701	702	702	703	703	703	703	703	702	702	701	700	699	699	699	699	699	699	700	700	701	701
17	701	701	700	700	700	701	701	702	702	702	701	701	700	700	699	699	698	698	698	698	699	699	699	700	700
18	700	700	700	700	701	701	701	702	702	702	702	702	701	701	700	700	700	700	700	700	700	701	701	701	701
19	701	701	702	702	702	702	703	703	703	703	703	702	702	701	700	700	700	700	699	700	700	701	701	701	701
20	701	701	701	701	701	702	702	702	702	702	702	701	701	700	699	699	699	698	699	699	699	699	700	700	700
21	700	700	700	700	700	701	701	701	701	701	701	700	699	699	698	697	697	697	697	697	698	698	699	699	699
22	699	699	699	699	700	700	701	701	701	700	700	700	699	699	698	697	697	697	697	697	697	699	699	700	699
23	700	700	700	700	700	701	701	702	702	702	702	702	701	700	700	699	699	699	699	700	700	701	702	703	701
24	703	703	703	703	703	704	704	704	704	704	704	703	703	702	702	702	701	701	701	702	702	703	703	703	703
25	703	703	703	703	704	704	704	705	705	705	704	704	703	702	702	701	701	700	700	701	701	701	701	701	703
26	701	701	701	701	701	701	702	702	702	702	702	701	701	700	699	698	698	698	698	699	699	699	700	700	700
27	700	700	700	700	700	700	700	701	701	701	700	700	700	699	698	698	698	698	698	699	699	700	700	700	699
28	700	701	701	701	701	702	703	703	703	704	704	703	702	702	701	700	700	701	702	703	703	704	705	705	702
29	705	704	704	704	704	704	704	705	705	705	704	704	703	702	701	701	700	701	701	702	702	702	703	703	703
30	703	703	703	702	703	703	703	704	704	703	703	702	702	701	700	699	699	699	699	700	700	701	701	701	701
31	701	701	702	702	703	703	703	703	703	703	703	702	702	701	700	699	699	699	699	700	700	701	701	701	701
HRAVE	702	701	702	702	702	702	703	703	703	703	703	702	702	701	700	700	700	700	700	700	701	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	703	702	701	702	701	702	702	701	701	701	703	703	702	702	702	701	700	701	701	700	699	699	701	703	703
MAX	705	703	703	703	704	704	703	702	704	703	705	704	704	704	704	703	702	702	703	702	701	701	703	704	705
MIN	701	700	699	700	698	700	700	699	700	700	701	701	700	700	700	699	698	700	699	698	697	697	699	701	700

DAY	26	27	28	29	30	31
AVE	700	699	702	703	701	701
MAX	702	701	705	705	704	703
MIN	698	698	700	700	699	699

MONTHLY AVERAGE = 701.4 MONTHLY MAXIMUM = 705.4 MONTHLY MINIMUM = 696.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
AUGUST - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	75	74	77	81	81	82	79	69	60	52	43	38	37	35	36	38	37	35	36	37	39	40	42	46	53
2	48	50	53	54	58	61	59	53	46	40	34	32	30	29	28	29	30	31	31	32	35	36	40	45	41
3	49	52	55	58	57	57	59	52	44	37	31	29	25	25	27	25	26	27	29	30	39	44	44	48	40
4	50	48	48	47	47	48	48	45	40	36	32	30	28	25	24	27	27	26	25	26	27	28	30	37	35
5	39	40	42	46	47	51	51	48	38	33	28	26	24	23	21	22	25	77	83	75	74	76	73	78	47
6	86	78	85	83	84	89	82	79	75	65	59	52	49	45	35	34	32	34	38	42	61	60	63	68	62
7	67	69	73	76	79	81	80	76	69	54	48	44	40	37	34	35	42	44	44	45	45	47	47	53	55
8	59	59	63	67	69	69	67	56	50	41	36	34	32	30	34	37	35	42	42	47	48	49	49	50	49
9	53	55	55	58	59	58	61	62	59	51	43	42	41	41	40	38	38	37	39	41	42	44	45	48	48
10	52	53	54	57	61	61	63	62	55	45	41	38	37	39	40	64	74	74	72	71	63	60	60	64	57
11	64	70	95	100	100	98	100	98	90	80	65	58	50	47	43	41	42	39	36	40	42	50	54	56	65
12	60	60	62	64	69	73	72	62	54	44	28	27	27	24	24	24	24	23	24	27	28	32	34	40	42
13	41	45	46	50	53	55	52	47	41	37	27	22	21	19	17	16	17	18	19	21	22	23	25	30	32
14	31	33	36	39	39	41	42	41	33	29	23	17	16	16	16	15	15	16	17	18	19	19	22	24	26
15	24	28	30	35	38	38	39	38	34	32	28	25	21	14	15	14	13	12	11	13	14	16	20	23	24
16	24	22	25	36	36	40	39	35	35	29	25	23	21	18	17	16	16	15	18	24	26	27	30	31	26
17	37	39	41	43	47	49	49	45	40	37	33	27	23	20	19	21	20	23	21	24	25	23	25	27	31
18	27	29	33	34	37	40	38	38	36	31	28	25	22	21	21	20	16	16	18	20	21	24	27	25	27
19	26	33	32	35	36	36	33	31	27	26	26	24	21	16	16	16	15	15	16	17	17	18	19	22	24
20	25	26	26	30	29	30	32	27	24	19	17	13	13	16	15	16	16	17	19	20	21	22	23	25	22
21	28	28	30	32	31	35	33	29	26	25	24	23	18	17	16	16	16	15	15	16	17	18	20	25	23
22	29	32	36	37	41	43	43	38	34	32	30	28	26	23	20	20	19	21	26	30	31	37	41	43	32
23	46	48	49	52	53	53	55	54	45	40	36	34	31	30	28	27	27	27	30	33	34	48	53	54	41
24	55	55	56	57	60	61	60	59	52	47	46	44	42	40	39	38	39	39	41	45	47	49	50	51	49
25	52	58	63	65	68	70	72	72	68	63	57	51	47	43	41	39	37	37	39	41	45	46	49	53	53
26	53	55	55	58	58	59	58	55	54	50	45	40	36	34	32	30	29	31	32	34	35	36	39	40	44
27	43	46	48	48	50	52	51	45	41	39	36	33	29	26	24	23	24	26	28	31	33	34	35	37	37
28	40	41	41	43	44	45	42	37	34	34	34	33	32	31	30	29	33	43	52	69	67	64	59	70	44
29	72	71	63	66	69	71	72	69	56	46	37	33	32	31	29	28	28	31	33	38	40	45	47	49	48
30	50	50	53	55	58	60	61	52	46	39	38	35	31	29	29	28	28	43	50	46	48	53	57	58	46
31	58	57	56	57	59	58	58	54	46	40	37	34	30	28	25	24	26	28	33	43	47	55	56	55	44
HRAVE	47	49	51	54	55	57	56	52	47	41	36	33	30	28	27	27	28	31	33	35	37	39	41	44	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	53	41	40	35	47	62	55	49	48	57	65	42	32	26	24	26	31	27	24	22	23	32	41	49	53
MAX	82	61	59	50	83	89	81	69	62	74	100	73	55	42	39	40	49	40	36	32	35	43	55	61	72
MIN	35	28	25	24	21	32	34	30	37	37	36	23	16	15	11	15	19	16	15	13	15	19	27	38	37

DAY	26	27	28	29	30	31
AVE	44	37	44	48	46	44
MAX	59	52	70	72	61	59
MIN	29	23	29	28	28	24

MONTHLY AVERAGE = 40.8 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 11.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
AUGUST - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.29	0.51	0.70	0.85	0.99	0.61	0.95	0.76	0.29	0.27	0.28	0.15	0.01	0.00	0.00	0.00	0.00	6.78
2	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.31	0.50	0.69	0.86	0.95	0.98	1.00	0.67	0.26	0.20	0.14	0.07	0.00	0.00	0.00	0.00	0.00	6.76
3	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.28	0.51	0.69	0.86	0.92	1.00	0.99	0.36	0.69	0.16	0.03	0.02	0.00	0.00	0.00	0.00	0.00	6.64
4	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.32	0.53	0.69	0.85	0.95	0.98	0.85	0.74	0.52	0.52	0.25	0.10	0.01	0.00	0.00	0.00	0.00	7.40
5	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.26	0.52	0.70	0.85	0.94	0.97	0.95	0.83	0.59	0.40	0.01	0.00	0.00	0.00	0.00	0.00	0.00	7.07
6	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.11	0.15	0.22	0.34	0.49	0.51	0.70	0.75	0.28	0.47	0.19	0.02	0.00	0.00	0.00	0.00	0.00	4.26
7	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.20	0.65	0.86	0.82	0.86	0.85	0.75	0.16	0.51	0.30	0.10	0.01	0.00	0.00	0.00	0.00	6.18
8	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.50	0.69	0.82	0.93	0.97	0.87	0.14	0.22	0.29	0.13	0.07	0.01	0.00	0.00	0.00	0.00	6.03
9	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.13	0.34	0.64	0.38	0.43	0.36	0.37	0.55	0.43	0.30	0.12	0.00	0.00	0.00	0.00	0.00	4.13
10	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.13	0.40	0.66	0.69	0.59	0.56	0.28	0.15	0.04	0.06	0.08	0.02	0.00	0.00	0.00	0.00	0.00	3.72
11	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.29	0.49	0.91	0.95	0.96	0.92	0.85	0.62	0.28	0.29	0.08	0.00	0.00	0.00	0.00	0.00	6.79
12	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.30	0.52	0.71	0.86	0.95	0.99	0.96	0.87	0.68	0.33	0.31	0.10	0.00	0.00	0.00	0.00	0.00	7.69
13	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.52	0.73	0.88	0.97	1.00	0.97	0.88	0.69	0.32	0.30	0.10	0.00	0.00	0.00	0.00	0.00	7.79
14	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.19	0.54	0.72	0.87	0.96	0.98	0.95	0.86	0.68	0.36	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.54
15	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.30	0.51	0.70	0.86	0.88	0.99	0.97	0.85	0.69	0.40	0.30	0.10	0.00	0.00	0.00	0.00	0.00	7.65
16	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.51	0.72	0.87	0.96	0.99	0.96	0.87	0.68	0.37	0.29	0.06	0.00	0.00	0.00	0.00	0.00	7.69
17	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.49	0.71	0.86	0.94	0.91	0.78	0.64	0.56	0.41	0.18	0.11	0.00	0.00	0.00	0.00	0.00	6.98
18	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.19	0.31	0.61	0.69	0.62	0.67	0.55	0.89	0.50	0.47	0.18	0.10	0.00	0.00	0.00	0.00	0.00	5.84
19	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.30	0.51	0.67	0.91	0.94	0.98	0.95	0.85	0.70	0.36	0.28	0.08	0.00	0.00	0.00	0.00	0.00	7.61
20	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.30	0.52	0.71	0.85	0.95	0.97	0.94	0.85	0.69	0.36	0.27	0.08	0.00	0.00	0.00	0.00	0.00	7.58
21	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.30	0.51	0.58	0.80	0.92	0.98	0.96	0.86	0.66	0.40	0.27	0.08	0.00	0.00	0.00	0.00	0.00	7.42
22	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.29	0.50	0.69	0.84	0.92	0.95	0.93	0.82	0.69	0.40	0.21	0.05	0.00	0.00	0.00	0.00	0.00	7.38
23	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.47	0.63	0.82	0.91	0.95	0.91	0.82	0.66	0.36	0.25	0.06	0.00	0.00	0.00	0.00	0.00	7.04
24	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.09	0.45	0.67	0.82	0.91	0.94	0.90	0.80	0.65	0.33	0.24	0.06	0.00	0.00	0.00	0.00	0.00	6.92
25	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.23	0.41	0.71	0.91	0.93	0.87	0.80	0.65	0.33	0.24	0.05	0.00	0.00	0.00	0.00	0.00	6.22
26	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.48	0.67	0.80	0.91	0.80	0.87	0.81	0.65	0.34	0.19	0.07	0.00	0.00	0.00	0.00	0.00	6.92
27	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.49	0.68	0.83	0.92	0.95	0.92	0.82	0.66	0.36	0.24	0.05	0.00	0.00	0.00	0.00	0.00	7.28
28	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.44	0.51	0.81	0.89	0.90	0.89	0.80	0.65	0.35	0.13	0.05	0.00	0.00	0.00	0.00	0.00	6.74
29	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27	0.48	0.67	0.81	0.90	0.93	0.89	0.80	0.64	0.33	0.23	0.05	0.00	0.00	0.00	0.00	0.00	7.06
30	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.47	0.66	0.80	0.89	0.92	0.89	0.79	0.63	0.35	0.18	0.03	0.00	0.00	0.00	0.00	0.00	6.94
31	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.48	0.67	0.81	0.90	0.93	0.89	0.79	0.64	0.34	0.28	0.07	0.00	0.00	0.00	0.00	0.00	7.12
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.23	0.44	0.63	0.81	0.87	0.89	0.86	0.74	0.56	0.35	0.22	0.07	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.78	6.76	6.64	7.40	7.07	4.26	6.18	6.03	4.13	3.72	6.79	7.69	7.79	7.54	7.65	7.69	6.98	5.84	7.61	7.58	7.42	7.38	7.04	6.92	6.22
MAX	0.99	1.00	1.00	0.98	0.97	0.75	0.86	0.97	0.64	0.69	0.96	0.99	1.00	0.98	0.99	0.99	0.94	0.89	0.98	0.97	0.98	0.95	0.95	0.94	0.93
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.92	7.28	6.74	7.06	6.94	7.12
MAX	0.91	0.95	0.90	0.93	0.92	0.93
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
AUGUST - 2019

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.01 MONTHLY MAXIMUM = 0.01 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.9% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
SEPTEMBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	8.8	6.4	4.6	4.2	5.5	5.3	4.5	5.0	6.2	3.3	4.0	4.0	4.0	6.3	10.1	16.1	17.1	20.5	11.8	9.1	7.2	9.0	4.7	3.5	7.6
2	4.9	5.5	6.0	4.2	7.2	7.5	8.1	6.9	6.0	4.9	4.4	3.0	3.2	9.5	14.4	11.7	9.1	8.1	7.6	8.5	9.5	8.8	2.4	4.0	6.9
3	3.6	5.1	5.1	5.8	5.7	4.8	5.1	3.6	3.2	2.2	4.1	7.3	8.6	8.0	10.5	13.7	13.7	14.1	13.6	16.6	19.2	15.5	5.0	5.3	8.3
4	10.5	***	***	***	***	***	***	***	***	***	***	***	***	11.8	9.7	9.0	14.4	15.1	14.3	11.4	6.2	6.1	4.2	8.6	10.1
5	4.8	4.5	6.3	6.5	6.6	7.6	7.5	7.7	5.7	5.6	6.9	9.3	6.8	6.4	6.5	6.6	5.3	5.4	4.3	11.6	13.1	10.8	6.5	5.9	7.0
6	3.7	4.8	2.1	3.0	2.8	2.2	2.2	2.2	3.3	7.1	9.6	11.6	10.4	8.9	13.0	16.2	15.9	16.1	14.6	11.8	10.5	10.1	8.9	5.6	8.2
7	6.5	3.1	3.1	4.7	5.1	3.9	4.2	4.4	2.6	6.6	9.5	11.7	13.6	18.8	20.8	19.5	19.5	15.8	19.4	10.8	12.5	27.2	17.2	15.1	11.5
8	11.0	10.9	8.4	7.0	10.1	6.5	6.0	4.4	4.8	5.2	7.0	3.8	3.6	5.7	11.0	15.0	17.2	18.4	15.8	14.1	11.3	12.6	11.8	12.4	9.8
9	13.6	13.2	11.8	14.2	9.4	10.0	8.5	7.6	7.2	7.6	6.4	6.8	10.0	12.0	12.1	14.6	16.7	17.0	13.3	10.2	5.3	3.0	2.7	4.2	9.9
10	5.0	8.2	10.4	9.9	9.1	8.6	6.4	4.3	2.3	3.5	4.2	6.7	2.5	8.8	13.4	15.7	14.7	15.2	9.6	7.3	4.8	8.7	10.2	12.6	8.4
11	11.0	11.9	10.5	6.6	7.8	9.5	9.8	8.5	4.9	9.0	5.8	2.9	8.7	15.6	16.9	16.7	16.8	16.4	14.8	10.6	8.5	3.5	3.5	3.2	9.7
12	3.6	2.2	2.3	5.1	4.4	4.1	5.1	4.3	4.4	3.0	5.9	4.5	6.1	6.9	4.2	5.1	6.8	9.9	13.6	13.2	13.6	9.5	4.9	4.3	6.1
13	5.8	5.0	5.5	3.1	5.3	7.0	7.7	6.2	6.9	5.1	5.6	3.3	4.2	4.3	4.1	10.7	11.6	15.2	8.6	4.1	11.0	12.0	11.9	11.5	7.3
14	11.7	9.3	9.8	6.1	7.5	5.6	7.4	4.0	9.9	9.6	11.8	7.6	10.2	16.6	23.1	22.4	27.6	13.8	17.9	15.9	18.3	11.2	5.3	11.3	12.2
15	10.4	11.4	10.8	14.6	13.0	14.0	15.5	14.5	14.5	15.8	13.8	10.3	9.5	6.1	4.3	4.1	5.2	5.2	6.6	11.4	13.9	15.0	17.2	15.2	11.3
16	12.0	14.0	16.7	15.1	13.0	13.7	12.4	12.7	7.7	4.9	3.5	2.8	2.5	5.0	7.0	15.4	11.0	13.1	13.8	16.1	8.1	8.1	4.1	3.9	9.9
17	6.8	8.3	5.8	6.6	8.2	8.3	8.8	6.3	6.1	4.4	3.8	3.4	2.5	3.5	4.5	11.3	11.9	13.7	11.4	6.8	4.8	2.8	5.1	7.1	6.8
18	6.3	7.7	7.5	7.1	6.9	6.8	5.8	5.4	4.7	4.3	3.0	3.2	6.4	6.4	10.9	13.5	11.9	11.1	9.4	7.7	5.2	6.2	6.9	6.6	7.1
19	5.6	5.8	3.0	7.7	6.5	8.2	7.0	4.6	3.8	2.6	3.1	3.3	3.9	4.3	6.3	13.9	13.5	12.0	11.2	6.9	8.9	2.5	4.0	4.6	6.4
20	3.8	5.0	3.5	1.2	3.4	6.3	7.7	7.4	5.1	3.5	2.3	5.8	15.7	17.1	17.5	14.4	13.2	13.0	15.4	12.1	8.2	5.2	3.0	2.8	8.0
21	4.4	2.9	3.1	4.8	5.8	5.2	4.7	2.8	3.8	2.2	2.5	4.7	10.1	12.2	14.6	15.5	14.9	13.6	12.9	8.4	5.5	5.8	5.0	2.3	7.0
22	5.6	6.0	6.5	7.3	7.4	5.3	6.8	6.1	5.4	3.6	3.4	4.4	4.5	4.7	5.7	4.6	6.3	10.3	15.1	10.0	6.3	5.4	3.3	4.5	6.2
23	3.4	4.9	6.0	4.8	4.4	4.2	4.8	4.2	3.6	3.1	7.5	8.9	12.1	14.9	17.5	17.1	16.0	11.2	24.9	25.5	19.6	16.0	15.0	11.4	10.9
24	6.9	8.4	5.1	6.4	7.4	3.8	9.9	8.0	9.1	8.5	9.9	16.2	13.1	13.4	10.1	12.2	8.7	13.4	13.6	15.6	11.6	15.0	13.6	10.2	10.4
25	10.7	6.7	5.8	6.7	7.6	7.7	7.5	8.1	8.3	4.7	4.2	4.3	5.3	4.4	4.9	7.8	8.6	11.6	12.7	10.7	6.2	10.3	4.1	5.1	7.3
26	3.9	6.6	10.0	5.7	3.1	2.8	5.0	5.1	4.4	4.9	7.0	8.1	7.0	4.4	10.4	13.6	12.9	15.7	15.6	14.1	9.3	9.6	9.3	3.6	8.0
27	4.4	2.3	4.3	4.2	4.2	2.8	2.8	3.8	8.1	7.5	4.6	5.6	5.8	4.6	2.6	3.6	4.2	4.6	7.7	6.6	6.1	3.0	3.8	5.2	4.7
28	6.2	6.6	7.3	7.3	6.3	6.0	5.8	6.5	4.4	3.3	4.3	4.1	5.1	4.9	5.7	4.3	4.7	7.3	9.9	8.6	5.6	2.3	3.3	4.3	5.6
29	6.5	5.0	4.2	6.3	4.4	6.6	8.1	5.6	5.0	4.8	2.8	3.3	4.6	12.8	15.6	16.7	14.5	14.3	14.1	10.8	8.6	5.9	5.5	4.3	7.9
30	5.5	5.6	4.6	6.5	5.6	5.3	6.1	7.4	5.8	3.6	2.8	3.4	5.6	4.7	5.4	9.4	13.6	14.9	13.0	7.1	5.7	5.1	4.6	6.6	6.6
HRAVE	6.9	6.8	6.6	6.6	6.7	6.5	6.9	6.1	5.8	5.3	5.6	6.0	7.1	8.8	10.4	12.3	12.6	12.9	12.9	11.1	9.5	8.9	6.9	6.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.6	6.9	8.3	10.1	7.0	8.2	11.5	9.8	9.9	8.4	9.7	6.1	7.3	12.2	11.3	9.9	6.8	7.1	6.4	8.0	7.0	6.2	10.9	10.4	7.3
MAX	20.5	14.4	19.2	15.1	13.1	16.2	27.2	18.4	17.0	15.7	16.9	13.6	15.2	27.6	17.2	16.7	13.7	13.5	13.9	17.5	15.5	15.1	25.5	16.2	12.7
MIN	3.3	2.4	2.2	4.2	4.3	2.1	2.6	3.6	2.7	2.3	2.9	2.2	3.1	4.0	4.1	2.5	2.5	3.0	2.5	1.2	2.2	3.3	3.1	3.8	4.1

DAY	26	27	28	29	30	31
AVE	8.0	4.7	5.6	7.9	6.6	***
MAX	15.7	8.1	9.9	16.7	14.9	***
MIN	2.8	2.3	2.3	2.8	2.8	***

MONTHLY AVERAGE = 8.2 MONTHLY MAXIMUM = 27.6 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
SEPTEMBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	114	123	135	135	113	106	101	123	142	125	155	128	172	161	143	286	306	321	349	127	95	116	254	300	21
2	134	131	108	92	116	115	96	103	132	146	168	237	288	277	285	282	281	309	303	308	314	312	222	150	219
3	125	121	103	120	117	105	90	100	113	156	272	280	282	292	286	289	288	290	287	359	37	340	113	81	149
4	66	***	***	***	***	***	***	***	***	***	***	***	***	84	118	107	111	118	138	145	117	96	120	314	154
5	279	139	82	94	94	106	108	141	95	155	110	59	103	157	173	250	261	236	220	306	313	303	311	310	7
6	225	139	153	156	166	173	202	199	294	304	285	292	305	304	285	279	283	283	290	296	307	309	298	271	282
7	276	208	155	129	124	130	141	141	215	299	291	294	299	299	283	293	294	281	156	154	94	44	59	47	56
8	45	64	117	85	72	59	111	127	117	135	151	149	98	301	258	265	274	272	270	282	282	288	291	294	66
9	294	292	278	296	290	299	297	300	299	296	264	276	313	305	276	285	295	290	300	311	288	160	214	84	219
10	279	290	300	288	281	280	275	288	149	236	147	338	319	219	236	248	252	263	265	283	282	235	262	292	86
11	288	278	272	278	291	309	305	308	296	309	329	202	241	298	303	304	308	291	303	300	299	7	142	114	267
12	99	111	81	132	126	128	141	132	142	87	87	151	258	268	218	259	269	282	301	304	308	309	341	103	155
13	118	108	111	104	110	114	103	100	133	148	157	271	223	324	139	75	132	163	108	74	66	65	109	114	246
14	73	119	113	110	92	86	85	123	75	105	66	62	90	142	102	77	66	61	73	78	74	70	94	67	35
15	68	65	62	61	55	39	50	60	54	40	54	34	19	41	42	89	99	74	65	52	56	48	47	56	55
16	64	59	63	70	65	69	69	74	84	120	99	88	33	349	284	291	307	96	107	63	93	75	105	139	211
17	134	106	103	112	103	114	102	121	113	135	155	162	209	266	261	279	283	285	294	317	146	140	131	108	303
18	113	117	103	109	116	107	105	111	135	147	139	141	283	311	281	291	293	296	297	312	162	121	96	112	354
19	101	92	54	78	100	87	98	99	121	120	333	230	132	179	244	239	243	247	259	294	284	39	349	248	23
20	258	292	270	102	92	101	93	105	95	101	104	297	256	245	253	265	270	269	280	289	302	339	297	280	180
21	278	188	126	96	94	94	76	91	114	90	169	285	271	268	280	298	294	302	305	298	317	312	320	13	230
22	110	111	101	100	117	123	105	107	122	116	113	72	149	116	305	272	245	283	295	303	301	158	103	126	358
23	134	287	276	235	145	161	169	166	157	272	290	263	247	287	281	283	280	281	39	36	56	59	65	75	101
24	66	84	215	129	127	114	96	54	111	86	71	73	102	122	105	118	89	64	60	48	35	47	58	81	342
25	79	82	98	101	117	115	86	114	141	139	135	133	152	168	143	164	122	128	157	163	110	115	117	93	309
26	164	295	306	306	297	132	141	129	130	124	127	135	133	138	303	304	299	291	289	297	288	288	303	263	242
27	289	153	115	93	290	292	141	281	312	145	125	78	85	105	177	222	271	228	288	298	298	226	151	114	298
28	104	102	107	115	109	100	113	111	149	150	146	146	135	113	166	241	256	252	267	276	305	307	200	182	127
29	111	123	140	134	118	105	92	124	123	138	130	287	256	224	237	253	248	248	277	267	285	286	257	226	44
30	101	109	115	110	101	105	116	119	126	138	215	243	275	254	282	303	299	295	305	289	196	135	101	298	241

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
SEPTEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	9	37	18	28	13	14	12	13	20	49	44	58	47	38	28	20	14	48	55	54	38	13	48	41	32
2	13	11	13	17	13	11	9	11	17	17	22	42	30	17	9	11	14	10	9	5	8	9	45	24	16
3	13	14	8	11	11	10	8	19	21	60	31	22	20	24	19	21	16	11	8	20	14	38	33	13	19
4	13	***	***	***	***	***	***	***	***	***	***	***	***	21	38	27	14	12	11	10	11	11	38	11	18
5	23	9	11	18	19	20	16	14	23	29	29	29	35	61	61	32	41	25	15	9	7	6	13	16	23
6	18	10	34	24	12	25	22	24	26	19	17	18	18	25	20	12	12	10	9	7	7	8	9	13	17
7	12	20	34	14	6	9	8	8	23	21	19	21	19	15	12	14	12	20	11	15	19	15	13	12	15
8	15	13	11	12	8	18	18	18	23	29	22	66	50	53	22	16	14	11	9	9	6	6	10	9	20
9	9	8	11	8	10	8	7	13	18	18	35	29	25	26	22	16	15	11	11	9	15	17	42	51	18
10	30	23	10	8	13	11	9	13	38	58	57	35	74	32	23	19	18	15	12	10	16	12	12	12	23
11	12	11	10	13	11	10	9	15	27	18	32	58	23	20	17	17	14	14	10	9	6	34	17	14	18
12	18	35	50	14	10	11	8	10	16	39	29	46	27	25	45	46	21	12	8	6	6	7	28	11	22
13	11	9	10	14	12	6	7	10	11	19	18	44	43	65	72	19	20	13	21	22	10	13	14	12	21
14	15	12	10	16	12	17	15	24	12	24	19	21	28	18	13	16	11	21	14	21	8	19	26	14	17
15	11	9	11	12	15	13	12	10	15	12	18	23	22	50	49	36	25	23	13	8	9	8	7	11	18
16	13	12	11	10	11	8	12	8	21	27	50	48	50	40	28	16	63	24	12	14	18	10	23	22	23
17	10	7	10	8	9	7	9	11	16	25	32	27	67	45	30	20	14	9	8	7	15	33	9	9	18
18	11	10	7	8	7	7	8	13	14	24	33	36	48	39	20	22	15	14	8	6	38	9	38	17	19
19	10	7	43	9	9	7	8	9	19	36	37	56	50	48	70	16	14	14	12	11	17	50	41	28	26
20	34	29	36	46	30	8	7	9	17	37	60	52	15	16	21	19	19	12	7	5	9	26	29	32	24
21	31	28	14	10	8	8	20	32	25	44	68	38	21	28	18	16	15	12	10	7	11	8	21	37	22
22	17	14	8	10	9	9	9	10	11	28	49	65	46	68	50	43	22	11	8	6	23	11	46	22	25
23	28	14	15	25	13	20	17	22	24	45	49	28	24	24	13	11	14	43	14	15	27	50	18	16	24
24	26	20	54	8	8	37	22	15	23	15	6	8	13	14	15	13	13	14	11	10	13	9	9	15	16
25	8	31	17	18	13	12	13	21	12	19	21	23	19	21	17	13	26	15	11	10	17	12	36	13	17
26	31	9	13	13	37	45	7	10	16	23	21	18	28	55	35	11	10	10	8	9	10	9	12	45	20
27	18	19	11	37	11	19	25	22	40	23	25	12	12	35	49	32	24	16	5	5	6	37	9	10	21
28	8	10	11	9	9	11	13	10	22	26	26	33	33	35	44	52	36	19	8	7	29	31	46	22	23
29	14	12	9	7	9	9	8	8	14	23	45	59	48	19	19	14	16	12	6	8	5	8	12	24	17
30	10	9	9	10	7	8	9	10	16	27	31	62	27	36	53	21	16	10	8	8	33	7	48	13	20
HRAVE	16	16	18	15	12	14	12	14	20	29	33	37	33	34	31	21	19	16	12	11	15	18	25	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	32	16	19	18	23	17	15	20	18	23	18	22	21	17	18	23	18	19	26	24	22	25	24	16	17
MAX	58	45	60	38	61	34	34	66	51	74	58	50	72	28	50	63	67	48	70	60	68	68	50	54	36
MIN	9	5	8	10	6	7	6	6	7	8	6	6	6	8	7	8	7	6	7	5	7	6	11	6	8

DAY	26	27	28	29	30	31
AVE	20	21	23	17	20	***
MAX	55	49	52	59	62	***
MIN	7	5	7	5	7	***

MONTHLY AVERAGE = 20.4 MONTHLY MAXIMUM = 74.4 MONTHLY MINIMUM = 4.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
SEPTEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	31.0	30.5	30.4	29.7	29.1	28.4	28.6	29.9	32.1	33.3	35.0	36.5	38.7	40.6	41.0	38.4	37.4	27.3	23.7	23.0	23.9	24.0	24.2	23.6	30.8
2	23.4	23.2	23.6	23.4	22.8	22.3	23.5	25.9	28.1	30.5	33.9	35.8	38.0	38.3	36.9	36.9	37.9	36.1	35.6	33.8	33.1	32.6	31.6	30.2	30.7
3	29.7	29.0	28.1	27.3	26.5	25.9	25.8	27.9	30.8	33.9	35.5	36.5	38.2	39.6	40.5	40.6	40.1	39.4	37.5	35.0	32.2	35.2	32.4	31.1	33.3
4	30.4	***	***	***	***	***	***	***	***	***	***	***	***	40.6	40.9	40.8	40.1	39.2	38.2	36.6	35.0	34.6	34.1	32.8	36.9
5	31.8	30.6	30.1	29.0	28.3	26.8	26.6	27.3	31.5	34.8	37.0	37.8	38.8	40.0	40.2	39.9	40.0	39.6	38.1	36.2	35.5	34.5	33.1	32.8	34.2
6	31.9	30.8	30.1	29.4	29.2	29.0	28.4	29.2	30.9	32.9	34.2	35.9	36.0	38.4	39.2	39.1	38.9	38.0	36.9	35.5	35.1	34.8	34.1	33.1	33.8
7	32.5	31.6	30.9	30.2	29.2	28.8	28.2	27.9	29.8	32.4	33.8	35.2	36.7	37.6	37.5	37.2	36.8	35.6	31.4	30.3	30.3	28.2	26.9	26.7	31.9
8	27.1	27.0	25.7	25.9	25.7	25.4	25.0	25.1	28.0	30.8	32.8	33.5	33.3	35.2	36.9	36.4	36.7	35.9	34.4	33.1	32.1	31.3	30.7	30.2	30.8
9	29.6	29.0	28.1	27.4	26.7	26.1	25.6	26.6	27.6	29.3	30.6	32.3	33.2	34.0	35.4	35.6	34.8	34.2	32.9	31.9	31.0	29.5	30.0	30.1	30.5
10	29.8	29.2	28.3	27.4	26.7	26.5	26.3	26.8	28.0	29.2	31.0	30.6	32.8	35.2	35.7	35.4	35.4	34.3	32.6	31.7	31.2	30.6	29.3	28.7	30.5
11	28.3	27.7	27.0	26.7	26.5	26.1	25.9	26.5	27.3	28.3	29.1	31.0	32.1	32.1	33.1	33.4	33.2	32.5	31.4	30.5	29.6	29.2	27.9	27.4	29.3
12	26.3	25.1	24.7	23.4	23.0	22.4	22.5	23.9	26.6	29.9	32.8	33.8	34.8	35.5	36.7	36.9	37.1	36.5	34.7	32.9	31.8	31.1	30.0	28.3	30.0
13	26.7	25.8	24.9	23.9	23.2	22.0	22.5	25.4	28.5	31.5	34.2	35.7	37.7	38.8	39.8	39.2	37.8	36.9	34.8	33.7	32.7	32.2	31.3	30.4	31.2
14	29.8	29.1	28.1	27.7	27.5	27.2	26.6	27.1	29.3	31.5	32.0	32.5	34.8	34.9	32.4	29.5	27.1	25.5	24.7	25.7	26.2	25.4	25.0	25.0	28.5
15	24.8	24.4	24.2	24.1	24.0	21.7	20.8	21.5	22.4	24.3	25.9	27.0	28.4	29.9	30.5	30.9	31.3	31.0	30.5	29.7	28.9	28.8	28.1	27.5	26.7
16	26.9	26.4	26.1	25.4	24.9	24.4	24.2	25.6	27.4	28.6	30.5	31.8	32.6	34.1	33.0	29.0	21.4	22.8	22.4	23.2	22.6	22.8	22.4	21.2	26.2
17	20.4	20.4	20.1	19.6	19.5	19.0	19.6	20.7	23.1	25.3	27.4	29.4	31.4	32.4	33.6	34.8	34.5	33.5	31.5	30.6	29.1	28.3	26.8	26.2	26.5
18	25.6	24.2	24.2	23.7	22.4	22.1	22.0	23.4	25.6	28.6	30.9	33.5	35.2	35.4	36.5	36.5	36.1	35.4	33.7	32.3	30.9	29.4	28.4	27.3	29.3
19	26.8	26.3	25.5	24.0	23.5	23.0	23.1	23.9	26.3	29.1	31.8	33.2	34.7	34.8	35.6	36.2	36.1	35.0	33.2	31.6	30.6	30.0	29.5	28.5	29.7
20	27.5	26.5	25.2	24.9	23.9	21.6	21.1	23.0	25.7	28.6	30.5	32.6	33.8	34.3	34.6	34.8	34.6	33.5	31.5	29.8	28.6	28.0	27.4	25.8	28.7
21	25.6	25.0	24.2	23.1	21.8	21.5	21.0	22.8	25.1	27.8	30.2	31.0	32.4	33.3	33.1	32.8	32.3	31.5	30.1	28.8	27.8	27.0	26.6	25.8	27.5
22	23.8	22.7	22.0	21.4	21.6	20.2	20.2	22.2	24.7	27.4	29.8	32.0	33.0	34.1	34.5	34.7	35.1	33.9	31.9	30.6	30.1	29.2	28.7	27.4	28.0
23	27.4	27.1	26.3	26.0	25.8	25.8	25.8	25.8	26.8	27.5	30.2	31.5	33.2	31.9	32.8	32.9	31.6	28.9	24.7	23.9	23.8	22.2	19.8	21.0	27.2
24	21.1	21.0	20.6	19.1	18.9	19.2	19.3	18.4	18.4	18.0	18.2	18.5	19.5	20.0	21.2	22.4	22.9	22.8	22.3	22.4	21.9	21.5	21.1	20.4	20.4
25	20.0	19.6	19.4	18.7	18.4	18.1	18.8	19.2	21.1	22.1	23.1	25.0	25.5	26.2	26.8	27.2	27.9	28.0	26.8	25.3	24.5	24.2	23.5	23.6	23.0
26	22.5	22.3	21.9	20.1	20.3	19.4	19.0	20.5	22.8	25.2	27.9	29.1	29.7	29.6	27.7	28.0	28.3	27.1	25.3	24.4	23.7	23.0	21.8	20.9	24.2
27	20.3	19.9	19.8	19.8	18.8	19.1	18.7	19.2	18.8	17.5	18.1	20.2	22.5	24.3	26.1	26.9	27.0	26.6	25.2	24.4	23.7	22.9	22.1	21.1	21.8
28	20.3	19.7	19.4	19.0	18.3	17.5	17.4	19.2	20.9	23.0	25.5	27.1	28.9	30.3	31.5	31.3	31.5	30.9	28.8	27.7	27.2	26.6	26.3	25.8	24.8
29	24.1	23.2	22.4	21.5	20.6	19.9	19.5	21.3	23.7	26.2	27.9	29.1	30.9	32.8	32.8	32.4	32.2	31.1	28.8	27.7	26.2	25.5	24.9	24.0	26.2
30	23.0	22.1	21.0	19.9	19.0	17.9	17.8	19.1	21.5	24.4	26.0	28.0	29.7	31.0	32.0	32.1	32.0	30.6	28.5	27.2	25.4	24.1	23.2	22.6	24.9
HRAVE	26.3	25.5	24.9	24.2	23.7	23.0	22.9	24.0	26.0	28.0	29.9	31.2	32.6	33.8	34.3	34.1	33.6	32.5	30.7	29.6	28.8	28.2	27.4	26.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	30.8	30.7	33.3	36.9	34.2	33.8	31.9	30.8	30.5	30.5	29.3	30.0	31.2	28.5	26.7	26.2	26.5	29.3	29.7	28.7	27.5	28.0	27.2	20.4	23.0
MAX	41.0	38.3	40.6	40.9	40.2	39.2	37.6	36.9	35.6	35.7	33.4	37.1	39.8	34.9	31.3	34.1	34.8	36.5	36.2	34.8	33.3	35.1	33.2	22.9	28.0
MIN	23.0	22.3	25.8	30.4	26.6	28.4	26.7	25.0	25.6	26.3	25.9	22.4	22.0	24.7	20.8	21.2	19.0	22.0	23.0	21.1	21.0	20.2	19.8	18.0	18.1

DAY	26	27	28	29	30	31
AVE	24.2	21.8	24.8	26.2	24.9	***
MAX	29.7	27.0	31.5	32.8	32.1	***
MIN	19.0	17.5	17.4	19.5	17.8	***

MONTHLY AVERAGE = 28.4 MONTHLY MAXIMUM = 41.0 MONTHLY MINIMUM = 17.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
SEPTEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.0	0.2	0.2	0.2	0.1	0.1	-0.3	-1.1	-1.6	-1.2	-1.4	-1.3	-1.3	-1.9	-1.9	-1.2	-0.9	0.6	0.6	0.6	0.7	0.3	0.4	0.2	-0.4
2	0.3	0.4	0.3	0.6	0.4	0.2	0.1	-0.9	-1.3	-1.5	-2.0	-1.6	-1.4	-1.2	-1.0	-0.9	-0.9	0.1	0.3	0.8	0.6	0.6	0.5	0.4	-0.3
3	0.5	0.4	0.6	0.6	0.3	0.5	0.1	-0.9	-1.0	-1.2	-1.4	-1.5	-1.7	-1.5	-1.6	-1.6	-1.2	-0.9	-0.2	0.1	0.2	0.2	0.2	0.7	-0.4
4	0.3	***	***	***	***	***	***	***	***	***	***	***	***	-1.5	-1.5	-1.2	-0.6	0.0	0.2	0.3	0.6	0.6	0.5	0.5	-0.1
5	0.4	0.4	0.5	0.6	0.6	1.0	0.7	-0.4	-0.9	-1.2	-1.6	-1.5	-1.6	-1.6	-1.4	-1.1	-0.8	-0.6	-0.1	0.3	0.3	0.5	0.4	0.3	-0.3
6	0.3	0.3	0.3	0.3	0.2	0.3	0.3	-0.3	-0.6	-1.1	-1.3	-1.5	-0.9	-1.4	-1.5	-1.3	-1.0	-0.5	-0.2	0.1	0.2	0.2	0.2	0.3	-0.4
7	0.6	0.4	0.3	0.3	0.2	0.2	0.1	-0.3	-0.4	-0.9	-1.2	-1.4	-1.4	-1.4	-1.3	-1.2	-0.9	-0.3	-0.3	-0.2	-0.1	-0.2	-0.2	-0.1	-0.4
8	0.0	0.0	0.1	0.1	0.1	0.0	-0.1	-0.2	-1.0	-1.6	-2.0	-1.3	-0.9	-1.2	-1.4	-1.0	-0.9	-0.6	-0.1	0.1	0.2	0.2	0.1	0.1	-0.5
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.6	-1.0	-1.0	-1.3	-1.4	-1.2	-1.3	-1.3	-1.0	-0.7	-0.2	0.1	0.5	0.2	0.2	0.1	-0.4
10	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.3	-0.6	-0.9	-1.3	-0.8	-0.8	-1.5	-1.6	-1.2	-1.0	-0.6	-0.1	0.1	0.2	0.1	0.0	-0.1	-0.4
11	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.2	-0.5	-0.6	-0.8	-0.7	-0.8	-1.0	-1.0	-1.3	-1.2	-0.8	-0.6	-0.1	0.2	0.3	0.3	0.4	0.4	-0.4
12	0.6	0.3	0.6	0.6	0.3	0.3	0.0	-0.8	-1.0	-0.9	-1.7	-1.3	-1.3	-1.2	-1.1	-1.1	-0.9	-0.7	0.0	0.2	0.3	0.4	0.6	0.6	-0.3
13	0.8	0.5	0.6	0.6	0.4	0.8	0.1	-1.1	-1.8	-1.4	-1.6	-1.0	-0.9	-1.1	-1.3	-1.1	-0.6	-0.5	0.0	0.3	0.2	0.1	0.2	0.2	-0.3
14	0.2	0.2	0.1	0.1	0.1	0.1	0.0	-0.3	-1.1	-1.4	-1.3	-1.0	-1.6	-1.5	-1.2	-0.5	-0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	-0.4
15	0.0	0.0	-0.1	-0.1	-0.1	0.4	0.4	0.1	-0.1	-0.6	-0.9	-0.8	-1.1	-1.3	-1.0	-0.9	-0.5	-0.1	0.2	0.2	0.1	0.1	0.1	0.1	-0.2
16	0.2	0.1	0.1	0.1	0.1	0.1	-0.1	-0.7	-1.2	-1.2	-1.2	-1.0	-0.8	-1.2	-0.6	0.0	0.6	0.4	0.2	0.2	0.3	0.3	0.4	0.5	-0.2
17	0.6	0.4	0.5	0.4	0.3	0.3	0.0	-0.8	-1.1	-1.1	-1.0	-1.0	-0.7	-1.0	-0.9	-0.9	-0.7	-0.4	0.2	0.4	0.7	0.7	0.5	0.5	-0.2
18	0.5	0.4	0.4	0.4	0.4	0.4	0.0	-0.9	-1.0	-1.1	-0.9	-1.1	-1.1	-0.9	-1.1	-1.0	-0.7	-0.3	0.3	0.7	0.6	0.6	0.7	0.8	-0.2
19	0.7	0.7	0.6	0.5	0.6	0.5	0.2	-0.6	-1.0	-0.8	-1.0	-0.9	-1.2	-0.9	-1.0	-1.1	-0.9	-0.4	0.1	0.5	0.4	0.4	0.3	0.4	-0.2
20	0.5	0.5	0.6	0.6	0.5	0.5	0.2	-1.1	-1.4	-1.2	-0.8	-1.0	-1.1	-1.2	-1.1	-1.0	-0.8	-0.4	0.1	0.3	0.4	0.3	0.4	0.4	-0.2
21	0.7	0.4	0.4	0.7	0.5	0.6	0.4	-0.6	-1.1	-0.8	-0.8	-1.1	-1.3	-1.3	-1.3	-1.1	-0.8	-0.4	0.1	0.3	0.5	0.5	0.4	0.4	-0.2
22	0.6	0.6	0.5	0.5	0.4	0.6	0.2	-1.2	-1.4	-1.1	-1.1	-1.4	-1.3	-1.2	-1.2	-1.0	-0.9	-0.5	0.0	0.2	0.3	0.1	0.1	0.1	-0.3
23	0.1	0.1	0.1	0.1	0.0	0.0	-0.1	-0.4	-0.5	-0.4	-1.1	-1.2	-1.4	-0.9	-0.9	-0.7	-0.3	-0.4	-0.2	-0.1	-0.1	0.3	0.3	0.4	-0.3
24	0.3	0.4	0.5	0.4	0.3	0.4	0.3	0.5	0.1	0.1	0.1	0.1	-0.2	-0.3	-0.4	-0.4	-0.2	0.0	0.2	0.1	0.2	0.2	0.2	0.3	0.1
25	0.3	0.3	0.2	0.3	0.4	0.4	0.3	0.0	-0.8	-0.7	-0.7	-0.8	-0.8	-0.8	-0.6	-0.6	-0.6	0.0	0.2	0.3	0.3	0.3	0.3	0.4	-0.1
26	0.4	0.2	0.1	0.1	0.3	0.4	0.1	-0.8	-1.0	-1.3	-1.9	-1.8	-1.5	-1.0	-0.3	-0.8	-0.5	-0.1	0.0	0.0	0.0	0.0	0.1	0.2	-0.4
27	0.3	0.2	0.3	0.3	0.2	0.2	0.2	-0.2	0.1	0.1	-0.3	-0.7	-0.9	-0.9	-0.8	-0.7	-0.4	-0.1	0.4	0.5	0.5	0.4	0.4	0.4	0.0
28	0.5	0.6	0.3	0.3	0.3	0.4	0.2	-0.9	-0.9	-0.9	-1.2	-1.0	-1.3	-1.2	-1.2	-0.7	-0.5	-0.2	0.2	0.4	0.3	0.3	0.3	0.4	-0.2
29	0.5	0.4	0.6	0.4	0.3	0.7	0.4	-0.7	-1.0	-1.2	-0.9	-0.9	-1.0	-1.4	-1.2	-0.8	-0.5	-0.2	0.2	0.3	0.5	0.6	0.5	0.4	-0.2
30	0.7	0.5	0.6	0.5	0.6	0.6	0.2	-0.8	-1.2	-1.1	-0.8	-1.0	-1.0	-0.9	-0.9	-0.8	-0.5	-0.2	0.3	0.6	0.7	0.4	0.5	0.6	-0.1
HRAVE	0.4	0.3	0.3	0.3	0.3	0.3	0.1	-0.6	-0.9	-1.0	-1.1	-1.1	-1.1	-1.2	-1.1	-0.9	-0.7	-0.3	0.1	0.3	0.3	0.3	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.4	-0.3	-0.4	-0.1	-0.3	-0.4	-0.4	-0.5	-0.4	-0.4	-0.4	-0.3	-0.3	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	0.1	-0.1
MAX	0.7	0.8	0.7	0.6	1.0	0.3	0.6	0.2	0.5	0.2	0.4	0.6	0.8	0.2	0.4	0.6	0.7	0.8	0.7	0.6	0.7	0.6	0.4	0.5	0.4
MIN	-1.9	-2.0	-1.7	-1.5	-1.6	-1.5	-1.4	-2.0	-1.4	-1.6	-1.3	-1.7	-1.8	-1.6	-1.3	-1.2	-1.1	-1.1	-1.2	-1.4	-1.3	-1.4	-1.4	-0.4	-0.8

DAY	26	27	28	29	30	31
AVE	-0.4	0.0	-0.2	-0.2	-0.1	***
MAX	0.4	0.5	0.6	0.7	0.7	***
MIN	-1.9	-0.9	-1.3	-1.4	-1.2	***

MONTHLY AVERAGE = -0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = -2.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
SEPTEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	702	702	702	703	703	703	704	704	704	704	704	703	702	702	701	700	700	***	***	***	***	***	***	***	702
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	700	701	701	700
5	701	701	701	701	701	702	702	702	703	703	702	702	702	701	700	700	699	699	700	700	701	701	701	702	701
6	702	702	702	702	702	702	703	703	703	703	703	702	702	701	700	700	699	699	699	700	700	700	700	701	701
7	701	700	700	700	700	701	701	701	701	701	701	700	700	699	698	698	698	698	698	699	699	700	701	700	700
8	700	699	699	699	699	699	700	700	700	700	699	699	698	697	697	696	696	696	696	696	697	697	698	698	698
9	698	698	698	699	699	699	700	700	700	700	700	700	699	698	698	697	697	697	697	697	697	698	698	698	698
10	698	698	698	699	699	699	699	700	700	700	700	699	699	698	697	697	697	697	697	698	698	699	699	699	699
11	700	700	700	700	701	701	701	702	702	702	702	702	701	700	700	699	699	699	699	700	700	701	701	701	701
12	702	702	702	702	702	702	702	703	703	703	702	702	702	701	700	700	699	699	699	700	700	701	701	701	701
13	701	701	701	701	701	701	702	702	702	702	702	701	701	700	699	698	699	699	699	700	700	701	702	702	701
14	702	702	702	702	703	703	703	703	703	703	703	702	702	701	702	702	702	703	703	702	702	702	702	703	702
15	703	702	702	701	702	702	702	702	702	702	702	702	701	701	700	699	699	699	699	699	700	700	700	701	701
16	701	701	701	701	701	701	701	702	702	702	702	701	701	700	699	699	700	700	701	701	701	702	702	701	701
17	701	701	701	701	701	702	702	702	702	703	702	702	701	700	699	699	699	699	699	699	699	699	700	700	700
18	700	700	700	700	700	700	701	701	701	701	701	700	700	699	698	698	698	698	698	698	698	698	698	698	699
19	699	699	699	699	699	699	699	699	699	699	699	698	697	697	696	696	695	695	695	696	696	696	696	697	697
20	697	697	697	697	698	698	698	699	699	699	699	698	698	698	697	697	697	697	697	697	698	698	699	699	698
21	699	699	699	700	700	700	700	701	701	701	701	700	700	699	698	698	698	698	698	699	699	700	700	700	699
22	700	700	700	701	701	701	702	702	703	703	702	702	701	700	700	699	699	699	699	700	700	701	701	701	701
23	701	701	701	701	701	701	702	702	702	702	702	701	700	700	699	699	699	700	700	700	701	702	702	702	701
24	701	701	701	701	701	701	701	702	702	703	703	702	701	700	700	699	699	699	699	699	700	700	700	700	701
25	700	700	700	699	700	700	700	700	701	701	701	701	700	699	699	699	698	698	699	699	700	700	701	701	700
26	701	701	701	701	702	702	702	702	703	703	702	702	701	700	700	699	699	699	699	700	700	700	700	700	701
27	700	700	699	699	699	699	699	699	700	700	700	700	699	698	697	697	697	697	697	697	697	697	697	697	698
28	697	697	697	697	697	697	698	698	698	698	697	697	696	696	695	695	695	695	695	695	695	696	696	696	696
29	696	697	696	696	697	697	697	698	698	698	698	697	697	696	696	695	695	695	696	696	697	697	697	697	697
30	697	698	698	698	698	698	698	698	698	698	698	697	697	696	695	695	695	695	695	695	696	696	696	696	697
HRAVE	700	700	700	700	700	700	701	701	701	701	701	700	700	699	698	698	698	698	698	698	699	699	699	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	702	***	***	700	701	701	700	698	698	699	701	701	701	702	701	701	700	699	697	698	699	701	701	701	700
MAX	704	***	***	701	703	703	701	700	700	700	702	703	702	703	703	702	703	701	699	699	701	703	702	703	701
MIN	700	***	***	700	699	699	698	696	697	697	699	699	698	701	699	699	699	698	695	697	698	699	699	699	698

DAY	26	27	28	29	30	31
AVE	701	698	696	697	697	***
MAX	703	700	698	698	698	***
MIN	699	697	695	695	695	***

MONTHLY AVERAGE = 699.6 MONTHLY MAXIMUM = 704.1 MONTHLY MINIMUM = 694.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 89.4% OPERATIONAL RECOVERY RATE = 89.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
SEPTEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	50	52	53	55	55	55	56	50	44	41	37	34	31	25	24	33	34	***	***	***	***	***	***	***	43
2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	26	26	33	28
5	39	36	41	40	40	45	43	42	33	28	24	23	21	19	19	19	20	20	22	25	25	26	30	34	30
6	36	38	41	43	45	47	48	47	46	42	40	36	34	29	28	28	27	28	29	30	31	32	34	36	36
7	38	40	42	44	46	49	49	50	46	44	43	39	35	31	31	32	31	35	42	45	45	56	60	59	43
8	57	57	63	62	63	65	68	69	56	48	44	42	42	37	31	33	30	28	32	35	39	40	44	47	47
9	52	57	60	62	61	64	68	65	65	58	51	44	40	37	31	31	34	34	36	38	39	43	43	43	48
10	47	53	61	67	71	71	71	69	61	57	51	52	43	36	35	33	31	33	38	40	40	44	55	59	51
11	60	63	66	66	66	68	69	66	61	58	53	44	43	44	41	38	37	38	38	38	39	41	43	47	51
12	49	53	54	57	58	61	57	52	45	38	32	28	27	24	22	21	20	19	22	24	25	26	28	31	36
13	33	36	37	40	41	44	41	35	30	23	21	19	19	21	21	21	23	26	30	33	34	34	38	40	31
14	41	43	46	47	48	49	51	48	44	38	37	37	31	32	37	43	47	57	58	55	51	56	57	57	46
15	58	59	61	62	64	83	90	86	79	69	64	59	55	49	46	43	42	44	46	49	52	51	54	56	59
16	58	61	63	66	68	71	71	65	57	52	46	43	40	37	39	53	90	83	80	73	77	76	78	85	64
17	89	88	88	91	90	91	86	83	72	63	55	47	41	39	36	29	30	30	36	41	45	48	53	55	59
18	56	62	61	62	66	67	67	60	53	43	37	32	29	27	23	22	23	24	26	27	30	35	35	38	42
19	40	41	43	43	45	46	47	44	41	36	30	27	25	25	24	22	22	23	24	27	28	31	31	30	33
20	32	35	38	41	42	46	47	42	36	30	22	21	23	22	22	21	21	22	24	26	27	27	27	30	30
21	30	29	33	34	37	37	39	35	33	29	24	24	23	22	21	21	22	24	27	28	29	29	28	30	29
22	33	35	37	38	40	42	42	39	37	36	34	29	27	26	26	25	24	26	30	32	32	35	44	53	34
23	54	60	65	67	68	70	70	69	64	61	52	47	41	45	42	39	42	48	57	53	53	67	79	67	58
24	66	66	67	77	80	79	79	90	89	97	96	95	93	89	81	74	70	71	73	72	74	76	78	82	80
25	84	86	87	91	92	96	95	92	81	75	71	63	62	60	59	62	55	50	49	53	57	58	63	63	71
26	68	70	73	85	85	90	91	82	70	59	51	42	41	41	51	50	46	51	61	66	67	71	80	89	66
27	94	98	97	97	100	100	100	99	99	100	100	90	75	62	54	54	52	55	61	64	66	71	75	83	81
28	87	90	90	90	93	97	98	87	78	66	58	51	45	41	38	38	38	39	44	48	51	55	55	55	64
29	64	67	71	75	80	85	86	74	62	53	44	40	35	29	26	27	28	29	36	38	41	42	42	45	51
30	51	54	58	63	65	71	72	64	53	45	40	34	31	29	26	24	23	24	27	29	34	38	42	42	43
HRAVE	54	57	59	62	63	66	67	63	57	51	47	42	39	36	34	35	36	37	40	42	44	46	49	52	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	43	***	***	28	30	36	43	47	48	51	51	36	31	46	59	64	59	42	33	30	29	34	58	80	71
MAX	56	***	***	33	45	48	60	69	68	71	69	61	44	58	90	90	91	67	47	47	39	53	79	97	96
MIN	24	***	***	26	19	27	31	28	31	31	37	19	19	31	42	37	29	22	22	21	21	24	39	66	49

DAY	26	27	28	29	30	31
AVE	66	81	64	51	43	***
MAX	91	100	98	86	72	***
MIN	41	52	38	26	23	***

MONTHLY AVERAGE = 49.1 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 18.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 89.4% OPERATIONAL RECOVERY RATE = 89.4%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
SEPTEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.47	0.66	0.80	0.85	0.82	1.01	0.84	0.49	0.26	0.01	0.00	0.00	0.00	0.00	0.00	0.00	6.54
2	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.47	0.68	0.84	0.85	0.93	0.64	0.45	0.48	0.27	0.07	0.03	0.00	0.00	0.00	0.00	0.00	6.03
3	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.47	0.65	0.80	0.90	0.93	0.89	0.79	0.63	0.36	0.19	0.04	0.00	0.00	0.00	0.00	0.00	6.97
4	0.00	***	***	***	***	***	***	***	***	***	***	***	***	0.78	0.77	0.63	0.33	0.19	0.03	0.00	0.00	0.00	0.00	0.00	2.73
5	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.47	0.66	0.81	0.90	0.79	0.94	0.78	0.53	0.34	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.74
6	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.33	0.56	0.83	0.82	0.43	0.95	0.78	0.65	0.36	0.16	0.03	0.00	0.00	0.00	0.00	0.00	6.12
7	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.10	0.28	0.49	0.61	0.88	0.90	0.86	0.76	0.59	0.35	0.06	0.01	0.00	0.00	0.00	0.00	0.00	5.92
8	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.44	0.66	0.80	0.69	0.43	0.79	0.77	0.45	0.40	0.17	0.02	0.00	0.00	0.00	0.00	0.00	5.71
9	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.24	0.27	0.57	0.60	0.87	0.73	0.71	0.66	0.56	0.38	0.16	0.02	0.00	0.00	0.00	0.00	0.00	5.80
10	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.38	0.49	0.74	0.32	0.62	0.74	0.72	0.60	0.39	0.15	0.01	0.00	0.00	0.00	0.00	0.00	5.29
11	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.30	0.40	0.32	0.47	0.46	0.46	0.77	0.62	0.36	0.13	0.02	0.00	0.00	0.00	0.00	0.00	4.53
12	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.47	0.66	0.80	0.90	0.92	0.87	0.79	0.61	0.38	0.13	0.02	0.00	0.00	0.00	0.00	0.00	6.87
13	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.46	0.66	0.60	0.78	0.63	0.89	0.80	0.47	0.11	0.13	0.02	0.00	0.00	0.00	0.00	0.00	5.85
14	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.38	0.44	0.56	0.35	0.69	0.48	0.44	0.09	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.70
15	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.20	0.60	0.65	0.53	0.91	0.86	0.74	0.57	0.36	0.13	0.01	0.00	0.00	0.00	0.00	0.00	5.67
16	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.44	0.59	0.75	0.56	0.46	0.72	0.12	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.95
17	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.44	0.63	0.77	0.87	0.89	0.84	0.74	0.57	0.37	0.12	0.01	0.00	0.00	0.00	0.00	0.00	6.53
18	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.45	0.64	0.79	0.88	0.90	0.66	0.75	0.59	0.32	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.39
19	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.17	0.44	0.61	0.77	0.88	0.82	0.57	0.64	0.52	0.40	0.11	0.01	0.00	0.00	0.00	0.00	0.00	5.98
20	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.47	0.66	0.80	0.89	0.90	0.85	0.74	0.57	0.36	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.66
21	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.25	0.46	0.66	0.80	0.89	0.91	0.86	0.74	0.57	0.36	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.66
22	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.45	0.64	0.78	0.88	0.90	0.85	0.74	0.56	0.35	0.10	0.01	0.00	0.00	0.00	0.00	0.00	6.54
23	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.07	0.18	0.17	0.74	0.72	0.64	0.35	0.50	0.28	0.14	0.12	0.01	0.00	0.00	0.00	0.00	0.00	3.95
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.06	0.06	0.12	0.20	0.20	0.30	0.33	0.23	0.13	0.01	0.00	0.00	0.00	0.00	0.00	1.71
25	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.34	0.30	0.35	0.44	0.37	0.38	0.32	0.22	0.41	0.12	0.00	0.00	0.00	0.00	0.00	0.00	3.38
26	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.38	0.61	0.77	0.89	0.64	0.44	0.25	0.53	0.21	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.06
27	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.04	0.07	0.19	0.43	0.59	0.78	0.69	0.52	0.29	0.07	0.00	0.00	0.00	0.00	0.00	0.00	3.78
28	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.43	0.61	0.75	0.84	0.86	0.80	0.69	0.46	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.12
29	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.43	0.61	0.75	0.84	0.86	0.80	0.69	0.52	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.15
30	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.63	0.77	0.87	0.88	0.82	0.71	0.53	0.33	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.33
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.19	0.37	0.54	0.68	0.73	0.72	0.73	0.65	0.49	0.30	0.11	0.01	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.54	6.03	6.97	2.73	6.74	6.12	5.92	5.71	5.80	5.29	4.53	6.87	5.85	3.70	5.67	3.95	6.53	6.39	5.98	6.66	6.66	6.54	3.95	1.71	3.38
MAX	1.01	0.93	0.93	0.78	0.94	0.95	0.90	0.80	0.87	0.74	0.77	0.92	0.89	0.69	0.91	0.75	0.89	0.90	0.88	0.90	0.91	0.90	0.74	0.33	0.44
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.06	3.78	6.12	6.15	6.33	***
MAX	0.89	0.78	0.86	0.86	0.88	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 98.3% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
SEPTEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	***	***	***	***	***	***	***	***	***	***	***	***	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CAL	CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.00 MONTHLY MAXIMUM = 0.00 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 98.1% OPERATIONAL RECOVERY RATE = 98.3%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

OCTOBER 2019 THROUGH MARCH 2020

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

October 2020

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period October 2019 through March 2020. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the audit and calibration results. Appendix B presents the data screening results. Appendix C presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

An audit and a calibration of the system was performed on January 23, 2020. There were no other significant operational events during the reporting period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A performance audit of all equipment was performed on January 23, 2020, and a calibration was performed immediately after the audit. Audit and calibration results are presented in Appendix A, and they indicate that the meteorological systems were operating within the acceptable DQO ranges, with two exceptions.

First, the wind direction sensor starting torque threshold was slightly higher than the DQO during both the audit and calibration. The readings indicate a wind direction starting threshold of 0.6 m/sec instead of the target 0.5 m/sec. This small difference did not warrant any adjustments or invalidation of the wind direction data. As part of the calibration, the wind direction sensor

was replaced, and an "as-left" calibration was performed. The results from the "as-left" wind direction calibration were within the acceptable DQO ranges.

Second, the calibration of the relative humidity sensor indicated that the accuracy was slightly outside of DQO limits, with the measured accuracy at +12.9% versus the DQO limit of 7% (note that an audit is not performed on the relative humidity sensor). The sensor accuracy was checked again during another calibration on June 30, 2020, and was found to be at +8.2% high. Therefore, the relative humidity sensor was replaced on July 9, 2020, and a calibration indicated the new sensor was within the DQO accuracy limit. The relative humidity data has been flagged with a validation code of 7 (i.e., suspect data) for the time period from the last acceptable calibration on July 10, 2019, through July 9, 2020, but the relative humidity data is still being reported rather than invalidated because the accuracy errors were only slightly greater than the DQO limit.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were -2.8, -3.5, and -4.5 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix B presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix B presents comments from the manual review.

No data edits were required during the data screening and validation process.

In the digital data file that accompanies this data validation report, each hourly data point has been assigned a QC code as listed in Table 8-3 of EPA's Met Monitoring Guidance. The QC codes used were:

Code 0 - valid data,

Code 2 - valid data with corrections (i.e., data with readily identifiable offsets and simple corrections),

Code 7 – suspect data (i.e., lack of calibration documentation, and/or inconsistencies between Level 2 intercomparisons),

Code 8 - invalid data (inconsistent readings between "as-left" and "as-found" calibrations that make developing a correction factor impossible).

Note that all invalid data also has a value of 999.0 in the data file.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these data capture goals for the reporting period.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Oct-19	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Nov-19	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dec-19	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Jan-20	99.6	99.6	99.6	99.6	99.6	99.6	99.6
Feb-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mar-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Apr-20							
May-20							
Jun-20							
Jul-20							
Aug-20							
Sep-20							
Quarter 1	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Quarter 2	99.9	99.9	99.9	99.9	99.9	99.9	99.9
Quarter 3							
Quarter 4							
Total	99.9	99.9	99.9	99.9	99.9	99.9	99.9

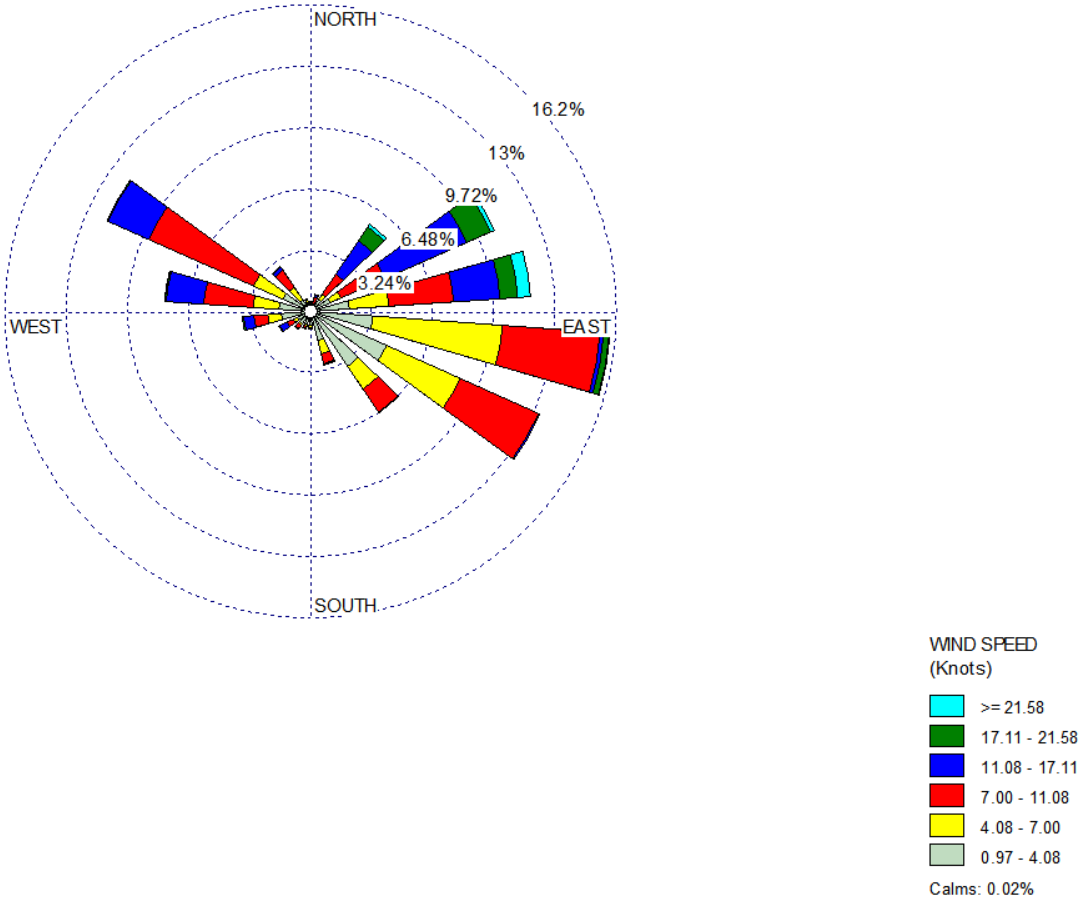
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix C presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly valid 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east-southeast (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours with higher wind speeds). This is similar to wind patterns previously observed at the monitoring site.

Figure 1 – 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Audit and Calibration Results

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 1/23/2020 Auditor: John Podrez

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor	SN 158704
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY81502
Wind Speed Audit Standard:	RM Young 18820 SN 12071
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton Thermometer SN 86818

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 1.4 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	3	3	0
45	43	44	1
90	88	89	1
135	133	133	0
180	178	178	0
225	223	222	-1
270	268	266	-2
315	313	312	-1

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic) = 346

Vane alignment rod (true) = 356

Sensor Measured Alignment (true) = 358 Logger reading

Alignment Difference (degrees) 2

Note - for fixture tests of combined linearity and orientation, the fixture index direction must be adjusted for:

Data logger offset of -4 degrees plus any alignment difference = -2 degrees

WD Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 15 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.3	0.10	-0.2	0.10	-0.2	0.03
18.8	18.90	0.1	18.90	0.1	0.06
43.4	43.10	-0.3	43.20	-0.2	0.10

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.50	0.54	0.04	2%

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

(Note - sensor mV readings are converted to kw/m2 by multiplying 0.1047) mVolt reading 4.8

Comments:

Audit started at 08:22 mst, ended at 10:50

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 1/23/2020 By: Kendra Ford

RM Young Wind Monitor AQ Sensor SN :	Existing SN 158704
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY81502
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Campbell CS215 SN E16175
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN CA04015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torgue Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Streamline Pro SN C191103, temp. probe T191103
Relative Humidity Standard	Testo 635 S/N 80510054/803

AS Found WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
300	3.4	3.4	0.0	-1.0%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 1.4 gr/cm

AS Left WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
300	3.4	3.4	0.0	-1.0%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Replaced wind monitor assembly

New Wind Monitor SN: wm154835

As Found WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	3	2
45	41	44	3
90	86	89	3
135	131	133	2
180	176	178	2
225	221	222	1
270	266	266	0
315	311	312	1

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic reading) = 348

Vane alignment rod (true reading) = 358

Sensor Measured Alignment (true) = 358 Logger reading

Alignment Difference (degrees) 0

Note - for fixture tests of combined linearity and orientation, the fixture index direction must be adjusted for:

Data logger offset of -4 degrees plus any alignment difference = -4 degrees

WD Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 15 gr/cm

As Left WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	1	2	1
45	41	43	2
90	86	88	2
135	131	132	1
180	176	177	1
225	221	221	0
270	266	267	1
315	311	312	1

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.1	0.10	0.0	0.10	0.0	0.03
18.8	18.80	0.0	18.90	0.1	0.06
42.6	42.90	0.3	43.00	0.4	0.10

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
64.1	76.9	12.8

For RH the DQO limit is ± 7%

BAROMETRIC PRESSURE SENSOR

(mm Hg)	(mm Hg)	(mm Hg)
704.7	706	1.3

Acceptable tolerance is 2.3 mm Hg

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.20	0.20	0.00

counted 20

Note: Input 100 ml for a target of 0.20 inches (20 tips).
The water must be input over at least 5 minutes.

Comments:

Calibration start 08:22 mst

Calibration end 10:50 mst

Replaced wind monitor assembly

New Wind Monitor SN: wm154835, prop is 08254 SN: 73527

APPENDIX B

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2019 thru March 2020 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	19100503	WIND SPD TOO CONSTANT 3 HR	0.09	Light to moderate winds in stable period - WS is valid
4	WS	19100605	WIND SPD TOO CONSTANT 3 HR	0.02	Light to moderate winds in stable period - WS is valid
4	WS	19101411	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable period - WS is valid
4	WS	19102602	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
4	WS	19110300	WIND SPD TOO CONSTANT 3 HR	0.07	Moderate to high steady winds - data is valid
4	WS	19110309	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate to high steady winds - data is valid
4	WS	19110610	WIND SPD TOO CONSTANT 3 HR	0.04	Moderate to high steady winds - data is valid
4	WS	19110611	WIND SPD TOO CONSTANT 3 HR	0.13	Moderate to high steady winds - data is valid
4	WS	19111210	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate to high steady winds - data is valid
4	WS	19121307	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable period - WS is valid
4	WS	19122300	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate to high steady winds - data is valid
4	WS	19122712	WIND SPD TOO CONSTANT 3 HR	0.11	Moderate to high steady winds - data is valid
4	WS	19123108	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
4	WS	20010702	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable period - WS is valid
4	WS	20010703	WIND SPD TOO CONSTANT 3 HR	0.09	Light to moderate winds in stable period - WS is valid
4	WS	20011208	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable period - WS is valid
4	WS	20011502	WIND SPD TOO CONSTANT 3 HR	0.13	Light to moderate winds in stable period - WS is valid
4	WS	20011515	WIND SPD TOO CONSTANT 3 HR	0.07	Moderate to high steady winds - data is valid
4	WS	20020901	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable period - WS is valid
4	WS	20021202	WIND SPD TOO CONSTANT 3 HR	0.09	Light to moderate winds in stable period - WS is valid
4	WS	20021408	WIND SPD TOO CONSTANT 3 HR	0.11	Light to moderate winds in stable period - WS is valid
4	WS	20030210	WIND SPD TOO CONSTANT 3 HR	0.02	Light to moderate winds in stable period - WS is valid
4	WS	20030910	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate steady winds - data is valid
4	WS	20031415	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate steady winds - data is valid
4	WS	20031506	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate steady winds - data is valid
4	WS	20031623	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable period - WS is valid
4	WS	20031700	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable period - WS is valid
4	WS	20032411	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable period - WS is valid
4	WS	20032907	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable period - WS is valid
4	WS	20032908	WIND SPD TOO CONSTANT 3 HR	0.09	Light to moderate winds in stable period - WS is valid
7	WD	19101120	WIND DIR TOO CONSTANT 3 HR	0.78	Light to moderate winds in stable period - WD is valid
7	WD	19102420	WIND DIR TOO CONSTANT 3 HR	0.49	Light to moderate winds in stable period - WD is valid
7	WD	19102700	WIND DIR TOO CONSTANT 3 HR	0.9	Light to moderate winds in stable period - WD is valid
7	WD	19102701	WIND DIR TOO CONSTANT 3 HR	0.8	Light to moderate winds in stable period - WD is valid
7	WD	19110913	WIND DIR TOO CONSTANT 3 HR	0.59	Moderate to high steady winds - data is valid
7	WD	19121821	WIND DIR TOO CONSTANT 3 HR	0.49	Light to moderate winds in stable period - WD is valid
7	WD	19122203	WIND DIR TOO CONSTANT 3 HR	0.85	Light to moderate winds in stable period - WD is valid
7	WD	19123110	WIND DIR TOO CONSTANT 3 HR	0.88	Moderate to high steady winds - data is valid
7	WD	20011404	WIND DIR TOO CONSTANT 3 HR	0.9	Light to moderate winds in stable period - WD is valid
7	WD	20011817	WIND DIR TOO CONSTANT 3 HR	0.96	Moderate to high steady winds - data is valid
7	WD	20012010	WIND DIR TOO CONSTANT 3 HR	0.85	Moderate to high steady winds - data is valid
7	WD	20012617	WIND DIR TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
7	WD	20030201	WIND DIR TOO CONSTANT 3 HR	0.9	Light to moderate winds in stable period - WD is valid
7	WD	20032204	WIND DIR TOO CONSTANT 3 HR	0.6	Light to moderate winds in stable period - WD is valid
11	TP	19101609	HIGH RATE OF C CHANGE	5.78	Transition - early morning or early evening - Temp data is valid
11	TP	19102408	HIGH RATE OF C CHANGE	5.25	Transition - early morning or early evening - Temp data is valid
11	TP	19121202	HIGH RATE OF C CHANGE	9.4	Transition - early morning or early evening - Temp data is valid
11	TP	20010610	HIGH RATE OF C CHANGE	5.94	Transition - early morning or early evening - Temp data is valid
11	TP	20012309	HIGH RATE OF C CHANGE	6.05	Transition - early morning or early evening - Temp data is valid
11	TP	20022810	HIGH RATE OF C CHANGE	5.39	Transition - early morning or early evening - Temp data is valid
15	D1	20012806	DT LARGE READING	2.33	Transition - early morning or early evening - Delta Temp data is valid
16	D1	19111914	DT + During Daytime	0.16	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	19122015	DT + During Daytime	0.13	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	19122315	DT + During Daytime	0.16	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	19122415	DT + During Daytime	0.19	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20010415	DT + During Daytime	0.17	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20010615	DT + During Daytime	0.18	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20011611	DT + During Daytime	0.41	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20011612	DT + During Daytime	0.15	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20011613	DT + During Daytime	0.25	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20011614	DT + During Daytime	0.11	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20011615	DT + During Daytime	0.12	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20011815	DT + During Daytime	0.13	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20011915	DT + During Daytime	0.11	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20012315	DT + During Daytime	0.11	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20022211	DT + During Daytime	0.19	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20022212	DT + During Daytime	0.21	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20022213	DT + During Daytime	0.18	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20022214	DT + During Daytime	0.22	Slightly above QC threshold - near solar max - data is reasonable and valid
16	D1	20022215	DT + During Daytime	0.11	Slightly above QC threshold - near solar max - data is reasonable and valid
19	RH	19111915	OUT OF LIMITS	96.4	Rain Event- RH is valid
19	RH	19111916	OUT OF LIMITS	98.8	Rain Event- RH is valid
19	RH	19111919	OUT OF LIMITS	98.9	Rain Event- RH is valid
19	RH	19111922	OUT OF LIMITS	95.5	Rain Event- RH is valid
19	RH	19111923	OUT OF LIMITS	95.8	Morning-evening hours, cooler temps - RH is valid
19	RH	19112000	OUT OF LIMITS	98.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19112001	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19112002	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112003	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112004	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112005	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112006	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112007	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112008	OUT OF LIMITS	99	Rain Event- RH is valid
19	RH	19112009	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112010	OUT OF LIMITS	99.2	Rain Event- RH is valid
19	RH	19112011	OUT OF LIMITS	96.7	Just after small precip event - data is valid
19	RH	19112021	OUT OF LIMITS	99.2	Rain Event- RH is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2019 thru March 2020 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	19112022	OUT OF LIMITS	99.7	Rain Event- RH is valid
19	RH	19112023	OUT OF LIMITS	97.2	Rain Event- RH is valid
19	RH	19112100	OUT OF LIMITS	99.6	Rain Event- RH is valid
19	RH	19112101	OUT OF LIMITS	99.9	Rain Event- RH is valid
19	RH	19112102	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112103	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112104	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112105	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112106	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112107	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112115	OUT OF LIMITS	95.6	Rain Event- RH is valid
19	RH	19112117	OUT OF LIMITS	99.3	Rain Event- RH is valid
19	RH	19112118	OUT OF LIMITS	99.8	Rain Event- RH is valid
19	RH	19112119	OUT OF LIMITS	97.8	Rain Event- RH is valid
19	RH	19112120	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112121	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112122	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112123	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112200	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112201	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112202	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112203	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112204	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112205	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112206	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112207	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19112208	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19112304	OUT OF LIMITS	96.8	Morning-evening hours, cooler temps - RH is valid
19	RH	19112305	OUT OF LIMITS	96.4	Morning-evening hours, cooler temps - RH is valid
19	RH	19112307	OUT OF LIMITS	97	Morning-evening hours, cooler temps - RH is valid
19	RH	19112506	OUT OF LIMITS	95.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19112507	OUT OF LIMITS	97	Morning-evening hours, cooler temps - RH is valid
19	RH	19112907	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112908	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112909	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112910	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19112911	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19113005	OUT OF LIMITS	97.1	Morning-evening hours, cooler temps - RH is valid
19	RH	19113006	OUT OF LIMITS	98.3	Morning-evening hours, cooler temps - RH is valid
19	RH	19113007	OUT OF LIMITS	99.3	Morning-evening hours, cooler temps - RH is valid
19	RH	19120506	OUT OF LIMITS	96.4	Morning-evening hours, cooler temps - RH is valid
19	RH	19120507	OUT OF LIMITS	99.8	Morning-evening hours, cooler temps - RH is valid
19	RH	19120508	OUT OF LIMITS	98.3	Morning-evening hours, cooler temps - RH is valid
19	RH	19120603	OUT OF LIMITS	97.9	Morning-evening hours, cooler temps - RH is valid
19	RH	19120604	OUT OF LIMITS	98	Morning-evening hours, cooler temps - RH is valid
19	RH	19120605	OUT OF LIMITS	97.3	Morning-evening hours, cooler temps - RH is valid
19	RH	19120606	OUT OF LIMITS	98.1	Morning-evening hours, cooler temps - RH is valid
19	RH	19120607	OUT OF LIMITS	95.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19120800	OUT OF LIMITS	97.1	Rain Event- RH is valid
19	RH	19120801	OUT OF LIMITS	98.2	Morning-evening hours, cooler temps - RH is valid
19	RH	19120802	OUT OF LIMITS	96.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19120803	OUT OF LIMITS	99.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19120804	OUT OF LIMITS	98.7	Morning-evening hours, cooler temps - RH is valid
19	RH	19120805	OUT OF LIMITS	98.9	Rain Event- RH is valid
19	RH	19120806	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19120807	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19120808	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19120809	OUT OF LIMITS	98.9	Morning-evening hours, cooler temps - RH is valid
19	RH	19120810	OUT OF LIMITS	96.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19120822	OUT OF LIMITS	96.8	Rain Event- RH is valid
19	RH	19120823	OUT OF LIMITS	98.9	Rain Event- RH is valid
19	RH	19120900	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19120901	OUT OF LIMITS	99.9	Rain Event- RH is valid
19	RH	19120902	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19120903	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19120904	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19120905	OUT OF LIMITS	99.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19120906	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19120907	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19120908	OUT OF LIMITS	99.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19120909	OUT OF LIMITS	99	Rain Event- RH is valid
19	RH	19120910	OUT OF LIMITS	98.1	Rain Event- RH is valid
19	RH	19120911	OUT OF LIMITS	99.8	Rain Event- RH is valid
19	RH	19120912	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19120913	OUT OF LIMITS	97.1	Rain Event- RH is valid
19	RH	19120921	OUT OF LIMITS	97.1	Morning-evening hours, cooler temps - RH is valid
19	RH	19120922	OUT OF LIMITS	98.7	Morning-evening hours, cooler temps - RH is valid
19	RH	19120923	OUT OF LIMITS	99.3	Morning-evening hours, cooler temps - RH is valid
19	RH	19121000	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121001	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121002	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121003	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121004	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121005	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121006	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121007	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121008	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121009	OUT OF LIMITS	95.7	Morning-evening hours, cooler temps - RH is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2019 thru March 2020 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
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ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	19121203	OUT OF LIMITS	96.2	Morning-evening hours, cooler temps - RH is valid
19	RH	19121204	OUT OF LIMITS	98.2	Morning-evening hours, cooler temps - RH is valid
19	RH	19121205	OUT OF LIMITS	99	Morning-evening hours, cooler temps - RH is valid
19	RH	19121206	OUT OF LIMITS	99.7	Morning-evening hours, cooler temps - RH is valid
19	RH	19121207	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121301	OUT OF LIMITS	96.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19121303	OUT OF LIMITS	97.4	Morning-evening hours, cooler temps - RH is valid
19	RH	19121304	OUT OF LIMITS	99.2	Morning-evening hours, cooler temps - RH is valid
19	RH	19121305	OUT OF LIMITS	99.9	Morning-evening hours, cooler temps - RH is valid
19	RH	19121306	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19121307	OUT OF LIMITS	99.8	Morning-evening hours, cooler temps - RH is valid
19	RH	19121405	OUT OF LIMITS	97.7	Morning-evening hours, cooler temps - RH is valid
19	RH	19121406	OUT OF LIMITS	96.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19121407	OUT OF LIMITS	95.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19121505	OUT OF LIMITS	96.5	Morning-evening hours, cooler temps - RH is valid
19	RH	19121506	OUT OF LIMITS	97.3	Morning-evening hours, cooler temps - RH is valid
19	RH	19121507	OUT OF LIMITS	96.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19122410	OUT OF LIMITS	95.7	Rain Event- RH is valid
19	RH	19122411	OUT OF LIMITS	96.9	Rain Event- RH is valid
19	RH	19122416	OUT OF LIMITS	99.4	Rain Event- RH is valid
19	RH	19122417	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19122418	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19122419	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19122420	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122421	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122422	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122423	OUT OF LIMITS	99.1	Morning-evening hours, cooler temps - RH is valid
19	RH	19122500	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122501	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122502	OUT OF LIMITS	98.8	Morning-evening hours, cooler temps - RH is valid
19	RH	19122503	OUT OF LIMITS	97.1	Morning-evening hours, cooler temps - RH is valid
19	RH	19122506	OUT OF LIMITS	99.8	Morning-evening hours, cooler temps - RH is valid
19	RH	19122507	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122508	OUT OF LIMITS	96.7	Morning-evening hours, cooler temps - RH is valid
19	RH	19122509	OUT OF LIMITS	99	Rain Event- RH is valid
19	RH	19122510	OUT OF LIMITS	97.9	Rain Event- RH is valid
19	RH	19122519	OUT OF LIMITS	96.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19122520	OUT OF LIMITS	98.4	Morning-evening hours, cooler temps - RH is valid
19	RH	19122521	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122522	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122523	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122600	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122601	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122602	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122603	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122604	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122605	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122606	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122607	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122608	OUT OF LIMITS	99.7	Morning-evening hours, cooler temps - RH is valid
19	RH	19122700	OUT OF LIMITS	98.5	Rain Event- RH is valid
19	RH	19122701	OUT OF LIMITS	98.6	Rain Event- RH is valid
19	RH	19122702	OUT OF LIMITS	99.3	Rain Event- RH is valid
19	RH	19122703	OUT OF LIMITS	98.3	Rain Event- RH is valid
19	RH	19122704	OUT OF LIMITS	97.1	Morning-evening hours, cooler temps - RH is valid
19	RH	19122705	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19122706	OUT OF LIMITS	96.7	Morning-evening hours, cooler temps - RH is valid
19	RH	19122707	OUT OF LIMITS	96.7	Morning-evening hours, cooler temps - RH is valid
19	RH	19122708	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	19122709	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19122710	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19122711	OUT OF LIMITS	96.7	Rain Event- RH is valid
19	RH	19122719	OUT OF LIMITS	96	Rain Event- RH is valid
19	RH	19122720	OUT OF LIMITS	99.9	Rain Event- RH is valid
19	RH	19122721	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122722	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122723	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19122800	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122801	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122802	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122803	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19122804	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122805	OUT OF LIMITS	99.9	Morning-evening hours, cooler temps - RH is valid
19	RH	19122806	OUT OF LIMITS	99.9	Morning-evening hours, cooler temps - RH is valid
19	RH	19122807	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	19122808	OUT OF LIMITS	99.3	Rain Event- RH is valid
19	RH	19122900	OUT OF LIMITS	99.9	Morning-evening hours, cooler temps - RH is valid
19	RH	19122901	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122902	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122903	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122904	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122905	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122906	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122907	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	19122908	OUT OF LIMITS	98.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20010201	OUT OF LIMITS	95.5	Morning-evening hours, cooler temps - RH is valid
19	RH	20010202	OUT OF LIMITS	95.9	Morning-evening hours, cooler temps - RH is valid
19	RH	20010205	OUT OF LIMITS	98.2	Morning-evening hours, cooler temps - RH is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2019 thru March 2020 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
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ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	20010206	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20010207	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20010208	OUT OF LIMITS	99.8	Morning-evening hours, cooler temps - RH is valid
19	RH	20010306	OUT OF LIMITS	98.2	Morning-evening hours, cooler temps - RH is valid
19	RH	20010307	OUT OF LIMITS	99.8	Morning-evening hours, cooler temps - RH is valid
19	RH	20010607	OUT OF LIMITS	95.9	Morning-evening hours, cooler temps - RH is valid
19	RH	20010920	OUT OF LIMITS	99.2	Rain Event- RH is valid
19	RH	20010921	OUT OF LIMITS	98.4	Rain Event- RH is valid
19	RH	20010922	OUT OF LIMITS	98.7	Morning-evening hours, cooler temps - RH is valid
19	RH	20010923	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011000	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011001	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011002	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011003	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011004	OUT OF LIMITS	99.9	Rain Event- RH is valid
19	RH	20011005	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011006	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011007	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011008	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011009	OUT OF LIMITS	95.5	Morning-evening hours, cooler temps - RH is valid
19	RH	20011103	OUT OF LIMITS	96.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20011104	OUT OF LIMITS	97.3	Morning-evening hours, cooler temps - RH is valid
19	RH	20011207	OUT OF LIMITS	95.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20011613	OUT OF LIMITS	97.9	Rain Event- RH is valid
19	RH	20011614	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011615	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011616	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011617	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011618	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011619	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20011620	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011621	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011622	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011623	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011700	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011701	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011702	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011703	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011704	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011705	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011706	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011707	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011708	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011709	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011710	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011711	OUT OF LIMITS	99.8	Morning-evening hours, cooler temps - RH is valid
19	RH	20011803	OUT OF LIMITS	97.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20011804	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20011805	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011806	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20011807	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012106	OUT OF LIMITS	99.8	Rain Event- RH is valid
19	RH	20012107	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012108	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012109	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012110	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012111	OUT OF LIMITS	98.7	Rain Event- RH is valid
19	RH	20012113	OUT OF LIMITS	96.2	Rain Event- RH is valid
19	RH	20012116	OUT OF LIMITS	99.3	Rain Event- RH is valid
19	RH	20012117	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012118	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012119	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012120	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012121	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012122	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012123	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012200	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012201	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012202	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012203	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012204	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012205	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012206	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012207	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012208	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012209	OUT OF LIMITS	99.2	Morning-evening hours, cooler temps - RH is valid
19	RH	20012222	OUT OF LIMITS	99	Morning-evening hours, cooler temps - RH is valid
19	RH	20012223	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012300	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012301	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012302	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012303	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012304	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012305	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012306	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20012307	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012308	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012503	OUT OF LIMITS	96.3	Morning-evening hours, cooler temps - RH is valid

ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2019 thru March 2020 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

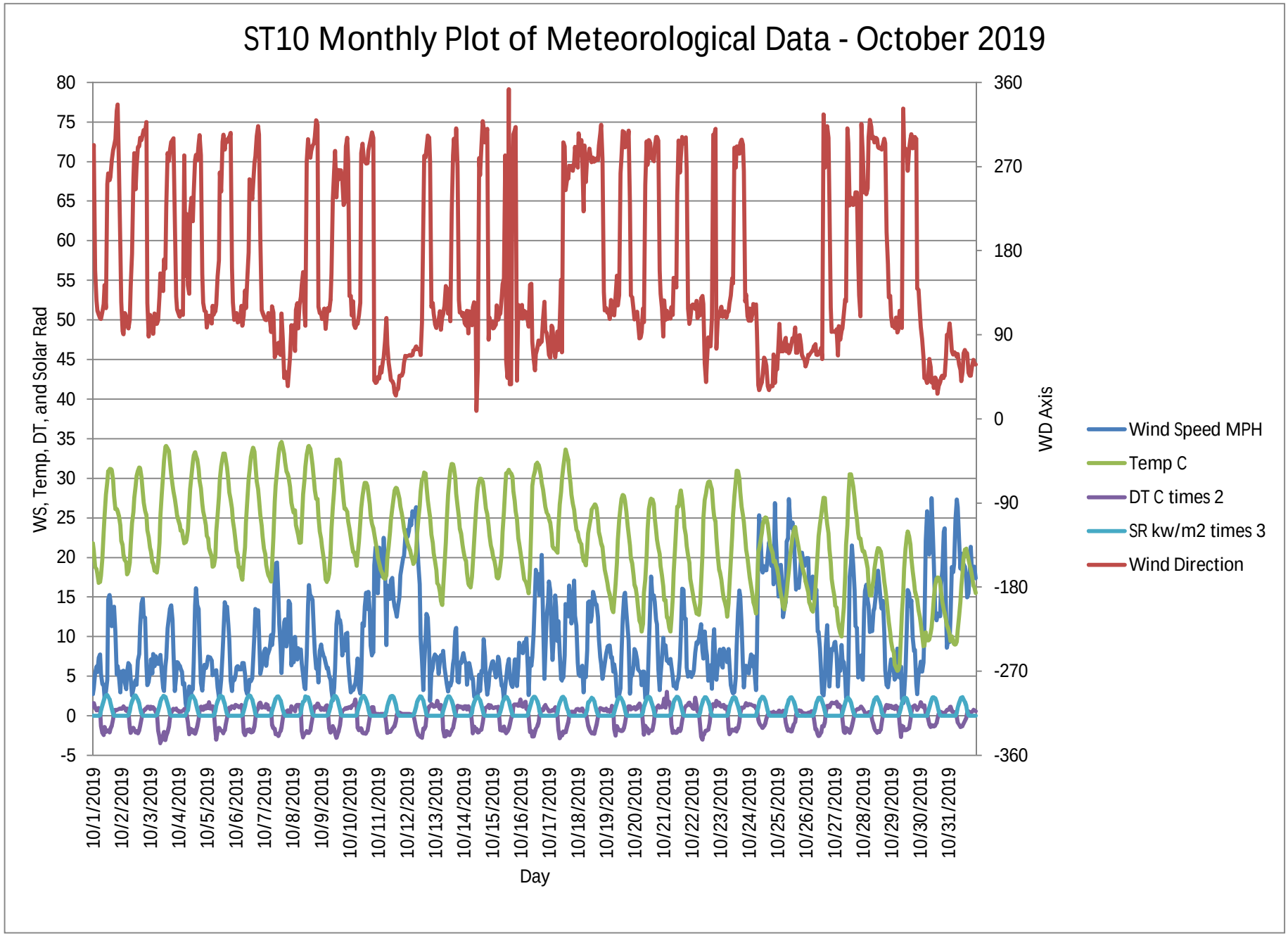
ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	20012504	OUT OF LIMITS	99.7	Morning-evening hours, cooler temps - RH is valid
19	RH	20012505	OUT OF LIMITS	99.5	Morning-evening hours, cooler temps - RH is valid
19	RH	20012506	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20012507	OUT OF LIMITS	99.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20012603	OUT OF LIMITS	96.5	Morning-evening hours, cooler temps - RH is valid
19	RH	20012604	OUT OF LIMITS	99.1	Morning-evening hours, cooler temps - RH is valid
19	RH	20012605	OUT OF LIMITS	99.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20012606	OUT OF LIMITS	99.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20012607	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20021018	OUT OF LIMITS	97.9	Rain Event- RH is valid
19	RH	20021019	OUT OF LIMITS	97	Rain Event- RH is valid
19	RH	20021020	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20021021	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20021022	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20021023	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20021100	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20021101	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20021102	OUT OF LIMITS	98.5	Morning-evening hours, cooler temps - RH is valid
19	RH	20021103	OUT OF LIMITS	96.9	Rain Event- RH is valid
19	RH	20021105	OUT OF LIMITS	98.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20021106	OUT OF LIMITS	97.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20021107	OUT OF LIMITS	97.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20021202	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20021203	OUT OF LIMITS	99.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20021204	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20021205	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20021206	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20021207	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20021208	OUT OF LIMITS	98.1	Morning-evening hours, cooler temps - RH is valid
19	RH	20021306	OUT OF LIMITS	95.7	Morning-evening hours, cooler temps - RH is valid
19	RH	20022205	OUT OF LIMITS	98.4	Rain Event- RH is valid
19	RH	20022206	OUT OF LIMITS	99.8	Rain Event- RH is valid
19	RH	20022207	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20022208	OUT OF LIMITS	99.1	Rain Event- RH is valid
19	RH	20022209	OUT OF LIMITS	98.3	Rain Event- RH is valid
19	RH	20022210	OUT OF LIMITS	99.1	Rain Event- RH is valid
19	RH	20022211	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20022212	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20022213	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20022214	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20022215	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20022216	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20022217	OUT OF LIMITS	99.3	Rain Event- RH is valid
19	RH	20022305	OUT OF LIMITS	95.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20022306	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022307	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022322	OUT OF LIMITS	95.7	Morning-evening hours, cooler temps - RH is valid
19	RH	20022323	OUT OF LIMITS	99.2	Morning-evening hours, cooler temps - RH is valid
19	RH	20022400	OUT OF LIMITS	99.7	Morning-evening hours, cooler temps - RH is valid
19	RH	20022401	OUT OF LIMITS	99.8	Morning-evening hours, cooler temps - RH is valid
19	RH	20022402	OUT OF LIMITS	99.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20022403	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022404	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022405	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022406	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022407	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022408	OUT OF LIMITS	97.7	Morning-evening hours, cooler temps - RH is valid
19	RH	20022501	OUT OF LIMITS	98.7	Morning-evening hours, cooler temps - RH is valid
19	RH	20022502	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022503	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022504	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022505	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022506	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20022507	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20030406	OUT OF LIMITS	97	Morning-evening hours, cooler temps - RH is valid
19	RH	20031022	OUT OF LIMITS	99.2	Rain Event- RH is valid
19	RH	20031023	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20031100	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20031101	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031102	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031103	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031104	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20031105	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20031106	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20031107	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031108	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031109	OUT OF LIMITS	96.3	Morning-evening hours, cooler temps - RH is valid
19	RH	20031200	OUT OF LIMITS	97.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20031201	OUT OF LIMITS	99.1	Morning-evening hours, cooler temps - RH is valid
19	RH	20031202	OUT OF LIMITS	99	Morning-evening hours, cooler temps - RH is valid
19	RH	20031203	OUT OF LIMITS	99.5	Morning-evening hours, cooler temps - RH is valid
19	RH	20031204	OUT OF LIMITS	99.7	Rain Event- RH is valid
19	RH	20031205	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031206	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031207	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031208	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031209	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20031210	OUT OF LIMITS	98.3	Rain Event- RH is valid

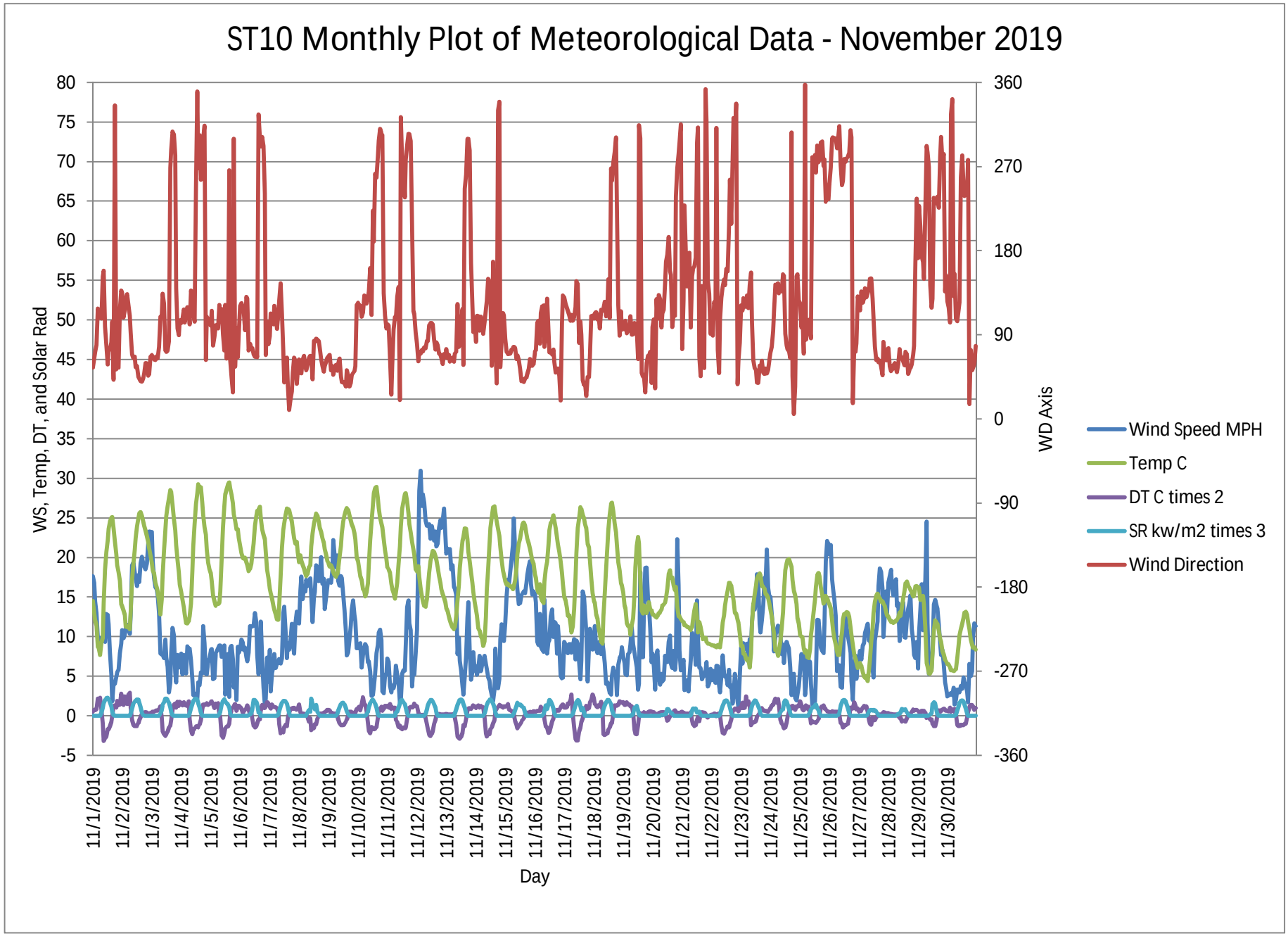
ASARCO ST-10 10-Meter Data - QA Screen Test Results for Oct 2019 thru March 2020 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

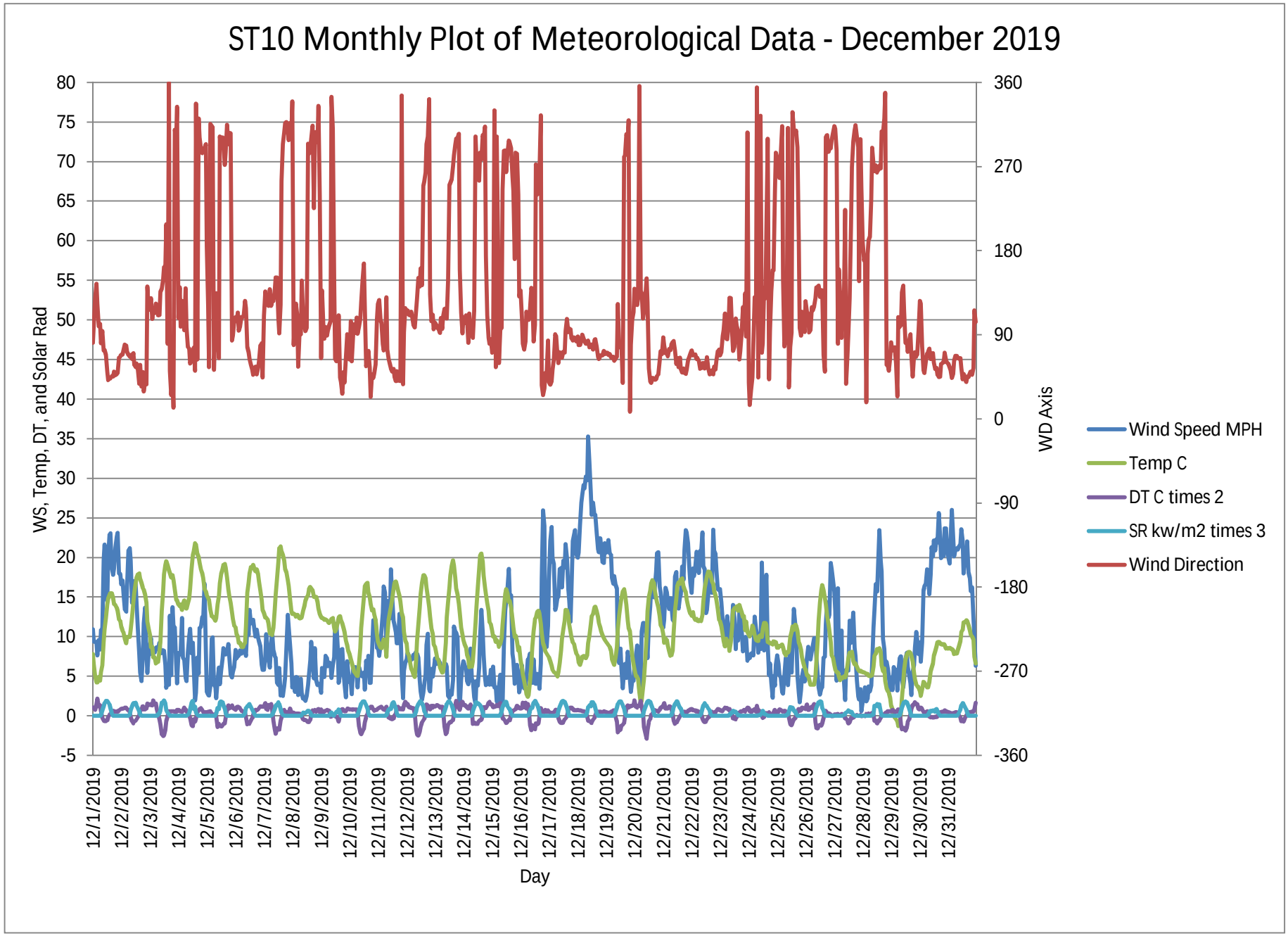
ITYPE	PARM	DATE	CODE	Value	Comments
19	RH	20031220	OUT OF LIMITS	97.2	Rain Event- RH is valid
19	RH	20031303	OUT OF LIMITS	98.4	Rain Event- RH is valid
19	RH	20031304	OUT OF LIMITS	100	Rain Event- RH is valid
19	RH	20031305	OUT OF LIMITS	98.4	Morning-evening hours, cooler temps - RH is valid
19	RH	20031319	OUT OF LIMITS	97.3	Morning-evening hours, cooler temps - RH is valid
19	RH	20031320	OUT OF LIMITS	97.3	Morning-evening hours, cooler temps - RH is valid
19	RH	20031321	OUT OF LIMITS	95.9	Morning-evening hours, cooler temps - RH is valid
19	RH	20031322	OUT OF LIMITS	96.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20031323	OUT OF LIMITS	99	Morning-evening hours, cooler temps - RH is valid
19	RH	20031400	OUT OF LIMITS	99.8	Morning-evening hours, cooler temps - RH is valid
19	RH	20031401	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031402	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031403	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031404	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031405	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031406	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20031407	OUT OF LIMITS	99	Morning-evening hours, cooler temps - RH is valid
19	RH	20031502	OUT OF LIMITS	95.9	Morning-evening hours, cooler temps - RH is valid
19	RH	20031503	OUT OF LIMITS	98.3	Morning-evening hours, cooler temps - RH is valid
19	RH	20031504	OUT OF LIMITS	99.2	Morning-evening hours, cooler temps - RH is valid
19	RH	20031505	OUT OF LIMITS	99.9	Morning-evening hours, cooler temps - RH is valid
19	RH	20031506	OUT OF LIMITS	99.9	Morning-evening hours, cooler temps - RH is valid
19	RH	20031507	OUT OF LIMITS	97.6	Morning-evening hours, cooler temps - RH is valid
19	RH	20031817	OUT OF LIMITS	96.4	Rain Event- RH is valid
19	RH	20031818	OUT OF LIMITS	99.5	Rain Event- RH is valid
19	RH	20031819	OUT OF LIMITS	99.7	Rain Event- RH is valid
19	RH	20031820	OUT OF LIMITS	98.9	Morning-evening hours, cooler temps - RH is valid
19	RH	20031822	OUT OF LIMITS	96.4	Rain Event- RH is valid
19	RH	20031823	OUT OF LIMITS	96.8	Morning-evening hours, cooler temps - RH is valid
19	RH	20031900	OUT OF LIMITS	99.9	Rain Event- RH is valid
19	RH	20031901	OUT OF LIMITS	99.5	Rain Event- RH is valid
19	RH	20031902	OUT OF LIMITS	99.6	Rain Event- RH is valid
19	RH	20031903	OUT OF LIMITS	99.6	Rain Event- RH is valid
19	RH	20031904	OUT OF LIMITS	99.8	Rain Event- RH is valid
19	RH	20031905	OUT OF LIMITS	98.5	Rain Event- RH is valid
19	RH	20031906	OUT OF LIMITS	96.2	Morning-evening hours, cooler temps - RH is valid
19	RH	20032004	OUT OF LIMITS	99.3	Morning-evening hours, cooler temps - RH is valid
19	RH	20032005	OUT OF LIMITS	100	Morning-evening hours, cooler temps - RH is valid
19	RH	20032006	OUT OF LIMITS	99.1	Morning-evening hours, cooler temps - RH is valid
19	RH	20032105	OUT OF LIMITS	95.8	Morning-evening hours, cooler temps - RH is valid
19	RH	20032106	OUT OF LIMITS	95.9	Morning-evening hours, cooler temps - RH is valid
20	SR	19110112	SR OUT OF MAX/MIN	0.76	Slightly above QC threshold - data is reasonable and valid
20	SR	20012812	SR OUT OF MAX/MIN	0.71	Slightly above QC threshold - data is reasonable and valid
20	SR	20012912	SR OUT OF MAX/MIN	0.72	Slightly above QC threshold - data is reasonable and valid
20	SR	20013112	SR OUT OF MAX/MIN	0.72	Slightly above QC threshold - data is reasonable and valid
20	SR	20013113	SR OUT OF MAX/MIN	0.7	Slightly above QC threshold - data is reasonable and valid
20	SR	20022512	SR OUT OF MAX/MIN	0.85	Slightly above QC threshold - data is reasonable and valid
20	SR	20022612	SR OUT OF MAX/MIN	0.85	Slightly above QC threshold - data is reasonable and valid
20	SR	20022613	SR OUT OF MAX/MIN	0.83	Slightly above QC threshold - data is reasonable and valid
20	SR	20022712	SR OUT OF MAX/MIN	0.86	Slightly above QC threshold - data is reasonable and valid
20	SR	20022912	SR OUT OF MAX/MIN	0.86	Slightly above QC threshold - data is reasonable and valid
20	SR	20022913	SR OUT OF MAX/MIN	0.85	Slightly above QC threshold - data is reasonable and valid
20	SR	20033012	SR OUT OF MAX/MIN	0.98	Slightly above QC threshold - data is reasonable and valid
21	PR	19111915	OUT OF LIMITS	0.25	Wind Shift, Temp falls, rain event - data is valid
21	PR	20031304	OUT OF LIMITS	0.27	Wind Shift, rain event - data is valid

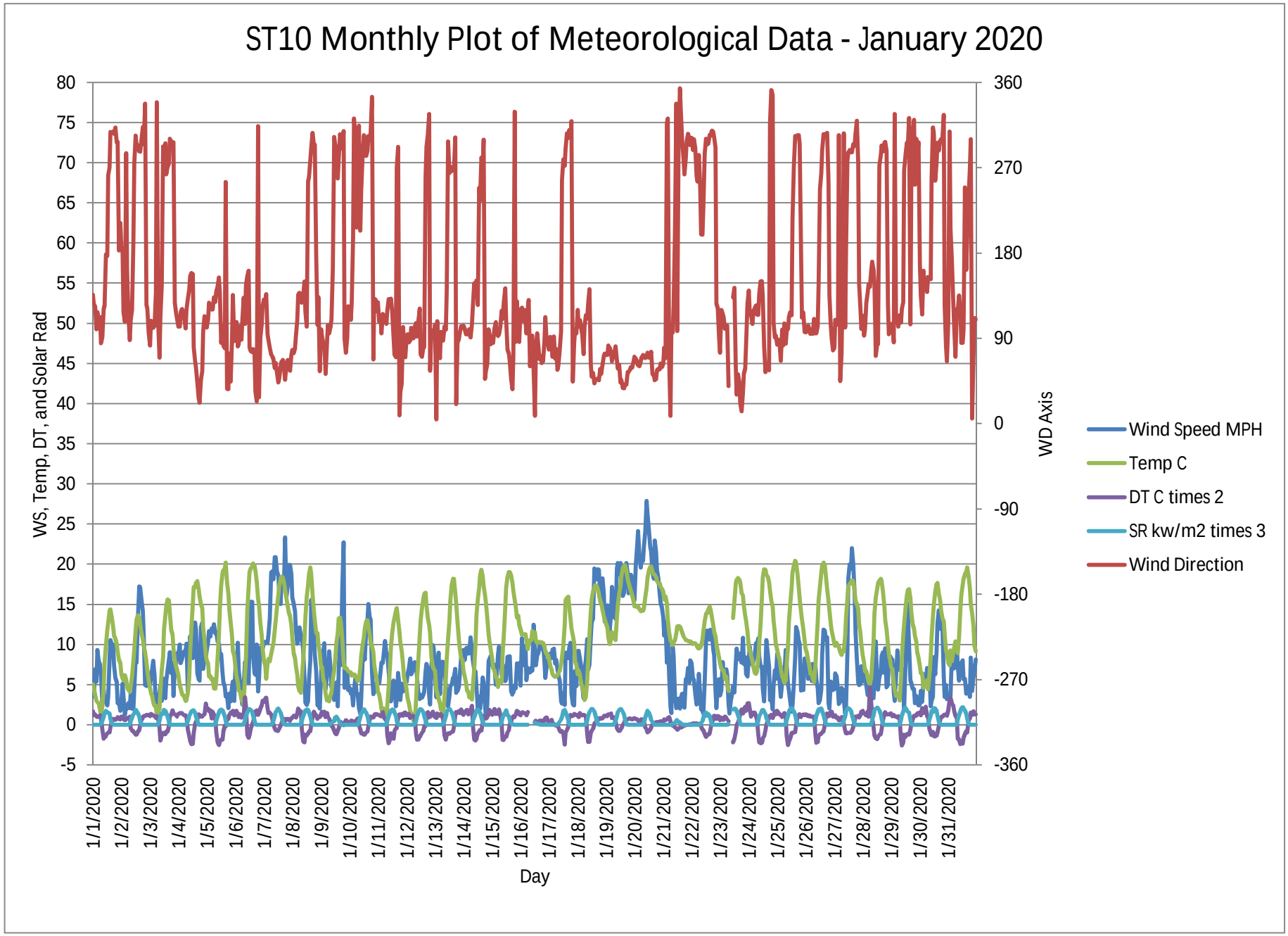
APPENDIX C

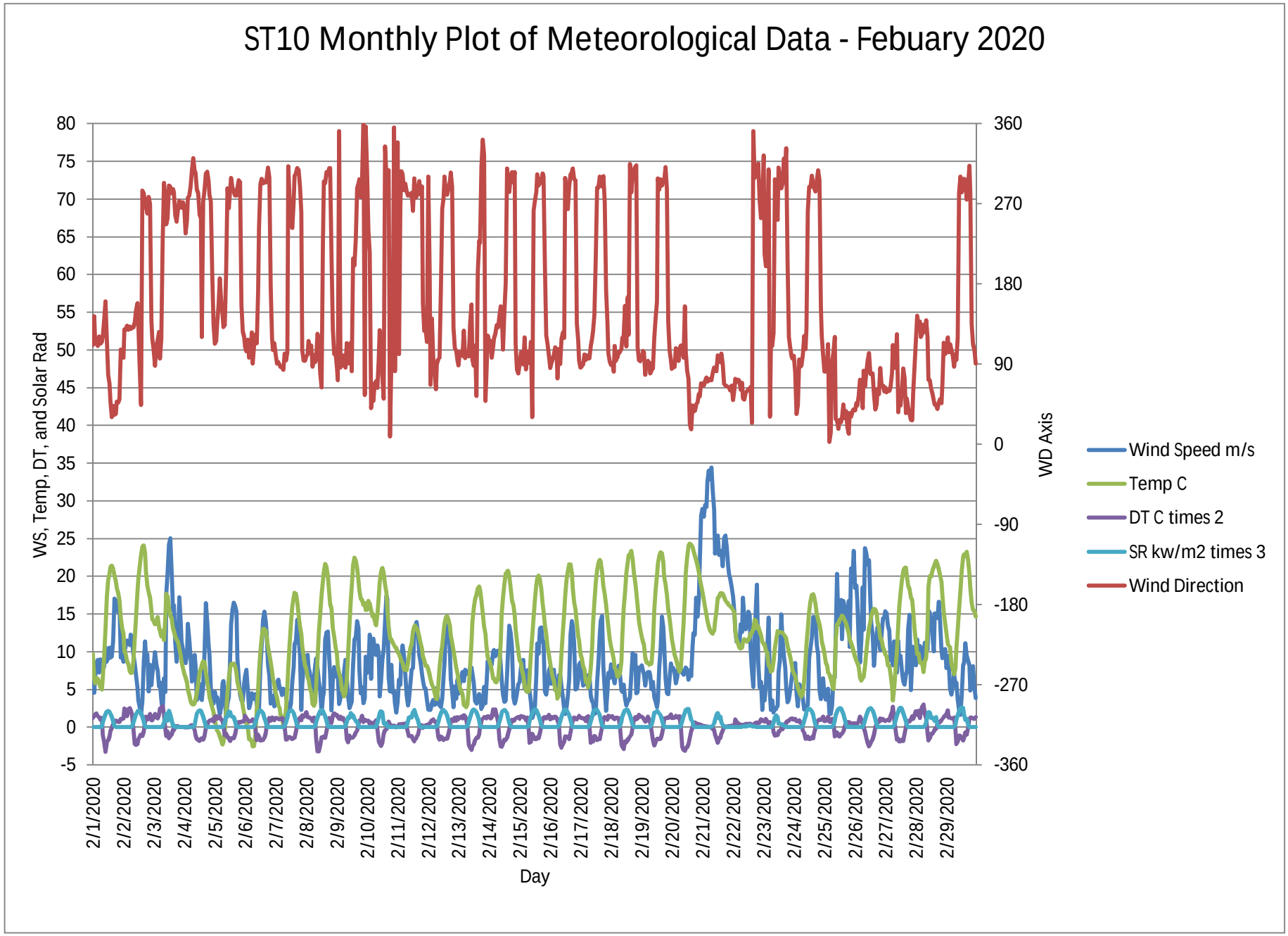
Monthly Data Plots and Tables

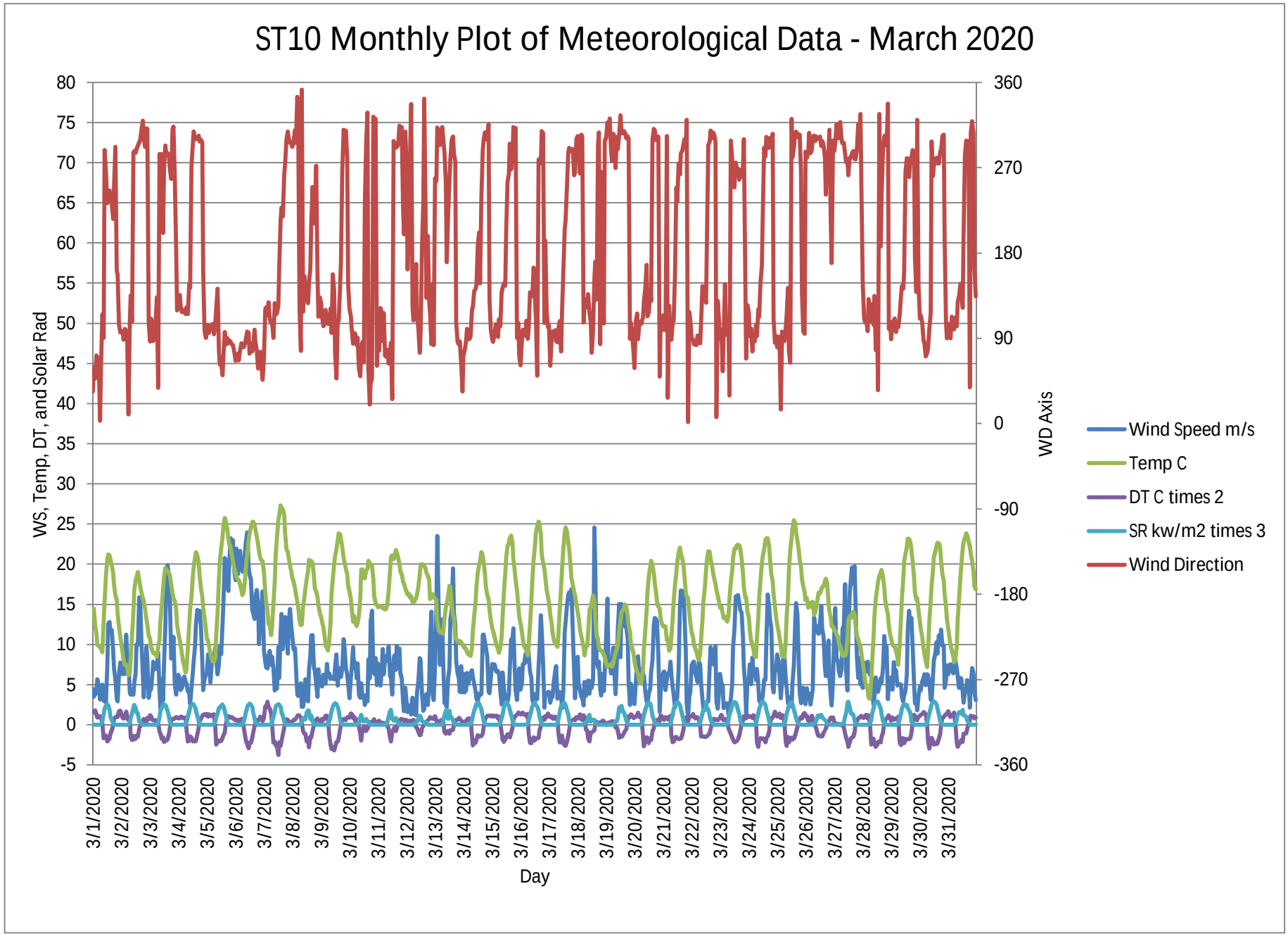

ST10 Monthly Plot of Meteorological Data - October 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
10/1/2019
10/2/2019
10/3/2019
10/4/2019
10/5/2019
10/6/2019
10/7/2019
10/8/2019
10/9/2019
10/10/2019
10/11/2019
10/12/2019
10/13/2019
10/14/2019
10/15/2019
10/16/2019
10/17/2019
10/18/2019
10/19/2019
10/20/2019
10/21/2019
10/22/2019
10/23/2019
10/24/2019
10/25/2019
10/26/2019
10/27/2019
10/28/2019
10/29/2019
10/30/2019
10/31/2019
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - November 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
11/1/2019
11/2/2019
11/3/2019
11/4/2019
11/5/2019
11/6/2019
11/7/2019
11/8/2019
11/9/2019
11/10/2019
11/11/2019
11/12/2019
11/13/2019
11/14/2019
11/15/2019
11/16/2019
11/17/2019
11/18/2019
11/19/2019
11/20/2019
11/21/2019
11/22/2019
11/23/2019
11/24/2019
11/25/2019
11/26/2019
11/27/2019
11/28/2019
11/29/2019
11/30/2019
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - December 2019
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
12/1/2019
12/2/2019
12/3/2019
12/4/2019
12/5/2019
12/6/2019
12/7/2019
12/8/2019
12/9/2019
12/10/2019
12/11/2019
12/12/2019
12/13/2019
12/14/2019
12/15/2019
12/16/2019
12/17/2019
12/18/2019
12/19/2019
12/20/2019
12/21/2019
12/22/2019
12/23/2019
12/24/2019
12/25/2019
12/26/2019
12/27/2019
12/28/2019
12/29/2019
12/30/2019
12/31/2019


ST10 Monthly Plot of Meteorological Data - January 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
1/1/2020
1/2/2020
1/3/2020
1/4/2020
1/5/2020
1/6/2020
1/7/2020
1/8/2020
1/9/2020
1/10/2020
1/11/2020
1/12/2020
1/13/2020
1/14/2020
1/15/2020
1/16/2020
1/17/2020
1/18/2020
1/19/2020
1/20/2020
1/21/2020
1/22/2020
1/23/2020
1/24/2020
1/25/2020
1/26/2020
1/27/2020
1/28/2020
1/29/2020
1/30/2020
1/31/2020
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - Febuary 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
2/1/2020
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020
2/20/2020
2/21/2020
2/22/2020
2/23/2020
2/24/2020
2/25/2020
2/26/2020
2/27/2020
2/28/2020
2/29/2020
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - March 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
3/1/2020
3/2/2020
3/3/2020
3/4/2020
3/5/2020
3/6/2020
3/7/2020
3/8/2020
3/9/2020
3/10/2020
3/11/2020
3/12/2020
3/13/2020
3/14/2020
3/15/2020
3/16/2020
3/17/2020
3/18/2020
3/19/2020
3/20/2020
3/21/2020
3/22/2020
3/23/2020
3/24/2020
3/25/2020
3/26/2020
3/27/2020
3/28/2020
3/29/2020
3/30/2020
3/31/2020
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
OCTOBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	2.8	3.5	5.4	6.2	5.5	7.3	7.7	5.3	4.1	3.9	2.3	3.0	4.6	14.6	15.2	14.5	11.4	12.8	13.8	10.6	5.2	6.3	4.9	3.0	7.2
2	5.6	4.5	5.7	4.2	3.4	5.6	6.7	6.4	4.7	2.6	3.4	3.9	4.5	4.0	7.0	7.8	11.3	14.1	14.8	12.5	12.4	6.2	3.9	4.3	6.6
3	5.6	7.1	5.4	7.8	6.3	7.5	7.0	6.6	6.9	7.7	5.4	3.6	3.1	6.3	7.3	11.0	12.5	13.4	14.0	12.1	8.1	3.2	5.0	6.8	7.5
4	6.6	6.3	5.9	5.5	4.0	4.1	1.6	1.0	2.0	3.7	2.4	3.0	3.3	6.8	13.9	16.1	13.9	13.4	9.0	4.2	3.2	4.7	6.5	6.0	6.1
5	6.4	7.4	7.4	7.3	7.0	5.1	5.5	5.2	5.8	3.6	2.3	2.8	4.6	7.8	10.4	14.4	13.5	13.8	11.4	9.7	4.4	3.1	4.8	4.5	7.0
6	5.1	6.1	6.3	5.9	5.9	5.9	6.7	6.6	5.2	3.3	2.7	3.3	4.5	4.4	4.8	7.0	10.6	13.5	12.9	13.3	10.5	5.3	6.1	7.1	6.8
7	8.1	8.5	6.3	7.7	8.0	8.5	10.2	8.9	10.7	18.1	19.2	19.3	15.4	11.6	8.6	5.4	9.1	11.8	12.2	8.8	10.2	14.5	14.1	6.4	10.9
8	7.7	6.8	9.9	7.7	7.1	8.6	8.2	8.4	6.5	5.1	3.6	3.3	7.7	14.1	16.5	15.1	15.1	14.6	10.5	8.0	6.0	6.0	4.2	8.2	8.7
9	9.0	8.3	7.6	7.4	6.7	6.0	6.0	5.0	4.6	3.2	1.9	3.5	6.0	11.5	13.1	12.3	12.1	11.4	7.6	8.8	8.2	10.3	10.5	6.8	7.8
10	4.6	3.0	3.1	3.3	3.6	4.1	5.7	7.3	3.5	2.8	4.7	11.7	11.3	13.8	15.5	13.5	15.6	13.2	8.9	7.6	8.0	19.0	21.3	19.7	9.4
11	15.5	21.2	20.1	17.6	19.0	22.5	18.6	8.9	16.5	14.9	14.8	17.1	17.4	14.6	13.8	13.2	12.5	13.9	15.0	17.8	18.9	19.8	20.1	22.5	16.9
12	23.5	22.6	23.3	24.8	24.1	25.8	25.1	25.1	26.4	22.3	19.1	16.6	10.0	7.0	3.2	6.4	9.9	12.9	12.3	8.6	1.9	5.5	6.1	7.2	15.4
13	7.7	7.5	7.4	5.3	6.9	7.6	7.1	8.2	6.1	4.9	4.1	3.1	4.1	3.8	4.5	6.6	7.2	10.7	11.1	4.4	4.2	6.7	6.7	7.4	6.4
14	7.9	6.9	6.6	3.9	5.7	6.7	5.8	4.7	4.7	2.4	2.3	2.3	2.6	5.2	3.1	5.6	5.6	9.7	7.5	4.5	2.7	3.8	5.3	6.1	5.1
15	6.8	6.9	5.8	4.8	5.0	7.5	7.0	5.2	3.8	3.8	2.1	3.7	4.8	6.3	7.2	5.1	4.1	3.6	4.4	7.1	7.1	3.8	6.2	9.2	5.5
16	8.5	8.4	7.9	9.3	8.6	9.8	6.1	2.6	7.2	6.3	7.4	10.4	15.3	18.5	17.6	17.9	15.3	16.5	20.3	12.1	4.7	7.9	12.6	14.2	11.1
17	17.0	15.8	9.5	7.1	10.3	15.2	13.7	9.4	11.9	7.9	4.6	4.4	4.8	7.6	14.1	13.7	12.6	16.4	14.5	11.7	13.0	17.1	12.6	11.4	11.5
18	6.7	5.2	5.0	6.1	6.3	3.0	5.5	4.9	8.2	14.3	14.5	11.9	12.7	15.6	14.9	14.2	14.0	12.5	9.6	7.4	6.6	4.7	5.8	6.6	9.0
19	7.8	8.6	8.8	8.9	7.3	7.4	5.6	6.5	5.3	2.5	2.3	2.6	3.5	7.5	12.3	15.1	15.5	13.1	10.9	9.6	2.8	4.9	5.1	6.3	7.5
20	8.4	8.0	7.0	5.8	5.6	5.4	3.9	5.6	5.6	2.2	2.2	3.2	8.8	14.0	17.6	14.9	15.2	14.4	12.1	11.5	5.9	3.2	5.2	7.2	8.0
21	9.8	8.2	8.9	6.9	7.0	6.6	7.2	6.2	5.0	3.8	4.0	3.4	4.2	4.9	7.2	10.2	16.1	15.9	12.3	12.3	6.1	4.9	5.1	5.5	7.6
22	4.9	5.2	5.8	7.9	9.3	9.1	9.6	10.9	11.6	8.2	7.2	10.6	8.4	7.7	4.5	4.7	6.4	3.4	9.3	10.9	5.5	4.6	6.5	7.8	7.5
23	8.4	6.5	6.1	8.5	7.7	8.0	6.8	8.4	6.6	3.9	3.1	2.8	3.0	4.8	8.8	13.1	15.8	15.1	11.5	6.1	3.6	5.8	6.3	5.7	7.4
24	5.4	6.6	7.7	6.2	7.5	5.4	3.2	8.1	21.0	25.3	23.0	18.5	18.1	18.9	18.4	18.4	20.2	21.9	21.2	19.0	20.4	16.6	26.9	22.5	15.8
25	19.0	15.1	17.5	19.1	16.8	12.4	13.6	14.3	22.0	22.4	27.3	24.6	23.7	24.4	22.6	18.4	15.9	16.3	16.2	17.5	19.9	20.6	19.5	19.0	19.1
26	19.7	19.9	19.9	15.9	16.4	14.9	17.6	16.1	15.1	15.9	10.6	10.6	8.5	5.0	2.9	2.6	4.6	8.8	11.4	6.7	3.7	6.8	8.4	8.3	11.3
27	9.1	9.3	7.6	3.7	5.9	5.7	8.9	7.1	6.8	4.9	2.3	2.1	5.2	17.5	19.2	21.5	19.0	15.8	11.3	11.1	4.8	7.0	5.9	7.6	9.1
28	4.6	13.3	15.8	16.5	14.5	13.9	10.6	11.0	10.7	13.3	13.6	15.2	17.4	18.3	16.4	14.4	13.5	14.5	10.3	5.8	3.9	3.6	4.4	6.2	11.7
29	7.1	6.4	5.6	4.5	4.8	8.5	8.1	4.8	6.2	2.2	1.6	2.8	5.6	11.3	15.9	15.4	13.8	14.6	9.9	8.2	8.3	4.0	2.7	5.3	7.4
30	5.9	6.8	5.6	6.7	10.8	22.1	25.9	21.1	20.4	20.7	27.5	22.6	19.2	13.1	12.1	12.9	12.6	12.6	16.6	18.4	23.1	23.6	13.2	8.6	15.9
31	9.6	9.4	12.4	18.8	18.2	19.2	24.8	27.3	26.4	22.3	18.6	20.5	18.3	19.2	18.8	17.4	15.0	15.5	18.5	21.4	17.7	17.6	18.8	17.4	18.4
HRAVE	8.9	9.0	9.0	8.8	8.9	9.6	9.7	8.9	9.7	9.0	8.4	8.6	9.1	11.0	11.9	12.2	12.6	13.2	12.3	10.6	8.4	8.7	9.2	9.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.2	6.6	7.5	6.1	7.0	6.8	10.9	8.7	7.8	9.4	16.9	15.4	6.4	5.1	5.5	11.1	11.5	9.0	7.5	8.0	7.6	7.5	7.4	15.8	19.1
MAX	15.2	14.8	14.0	16.1	14.4	13.5	19.3	16.5	13.1	21.3	22.5	26.4	11.1	9.7	9.2	20.3	17.1	15.6	15.5	17.6	16.1	11.6	15.8	26.9	27.3
MIN	2.3	2.6	3.1	1.0	2.3	2.7	5.4	3.3	1.9	2.8	8.9	1.9	3.1	2.3	2.1	2.6	4.4	3.0	2.3	2.2	3.4	3.4	2.8	3.2	12.4

DAY	26	27	28	29	30	31
AVE	11.3	9.1	11.7	7.4	15.9	18.4
MAX	19.9	21.5	18.3	15.9	27.5	27.3
MIN	2.6	2.1	3.6	1.6	5.6	9.4

MONTHLY AVERAGE = 9.9 MONTHLY MAXIMUM = 27.5 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
OCTOBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	274	293	159	127	116	112	108	107	114	123	143	119	251	262	256	259	277	288	291	299	329	336	266	184	11
2	125	94	91	113	109	102	97	107	142	177	256	285	246	269	291	292	301	298	305	309	308	318	124	88	228
3	111	108	104	91	113	109	102	106	131	156	154	137	170	161	227	284	276	287	296	299	300	214	131	118	116
4	113	109	115	112	111	282	153	219	143	134	221	237	211	242	277	283	277	294	304	282	155	124	116	115	114
5	98	107	110	110	102	121	112	115	122	152	170	264	243	296	304	288	299	297	300	301	306	162	125	106	120
6	111	113	103	103	107	121	100	110	138	119	150	178	257	246	235	251	274	281	303	313	304	192	117	114	79
7	110	106	106	108	113	107	93	120	114	66	72	70	82	72	68	113	84	44	50	50	35	48	67	100	154
8	82	100	73	116	124	97	122	131	144	157	114	100	276	299	288	279	287	292	294	302	320	314	120	113	117
9	113	107	114	118	96	112	119	116	128	156	236	266	287	237	266	256	266	266	256	229	232	292	301	277	51
10	131	131	111	126	101	97	103	102	111	124	284	295	277	275	273	274	287	295	299	306	300	41	39	40	82
11	45	43	55	50	61	66	83	108	79	60	50	41	40	37	28	25	31	32	46	46	46	50	60	68	107
12	66	67	68	69	67	68	73	74	77	75	74	74	68	103	212	282	280	289	303	301	275	120	124	113	107
13	102	97	104	106	115	95	109	112	121	142	140	113	125	105	220	282	300	278	311	271	127	114	114	110	259
14	113	102	100	116	91	115	110	100	119	125	124	8	55	279	261	291	318	311	296	305	310	85	109	101	332
15	104	97	98	101	121	106	109	112	129	143	150	282	61	44	353	37	37	257	304	309	312	41	122	109	103
16	108	122	107	116	108	114	105	99	143	145	83	64	52	70	75	84	80	82	83	107	125	95	92	80	220
17	69	66	100	98	76	66	75	93	74	102	149	71	296	291	245	256	257	271	270	271	266	274	291	276	181
18	269	306	282	298	281	222	292	254	282	279	289	279	275	280	275	276	279	277	293	305	315	278	136	116	15
19	118	114	115	107	127	112	121	111	131	153	121	132	263	279	308	307	290	294	294	309	229	132	130	117	177
20	107	112	115	103	86	88	93	118	104	251	297	272	298	295	279	278	276	290	301	302	298	159	134	119	220
21	88	127	106	116	107	112	108	120	111	151	148	141	239	298	263	281	302	295	299	301	266	118	101	107	178
22	121	122	120	118	126	108	114	111	129	131	123	60	39	62	87	79	77	108	304	304	310	75	106	109	274
23	114	120	109	111	115	109	112	115	123	132	150	145	290	269	291	291	284	295	299	293	265	126	133	110	248
24	105	118	105	112	123	121	122	94	36	31	36	40	48	66	61	57	36	31	35	35	35	69	38	52	73
25	53	80	101	72	74	72	82	87	72	79	70	74	81	86	84	98	71	71	89	90	79	68	65	63	358
26	56	61	68	68	70	72	73	78	80	69	68	72	71	76	64	326	269	275	313	301	234	119	93	94	132
27	93	94	96	68	99	85	94	98	112	128	126	311	295	228	236	235	229	234	242	242	169	132	110	316	355
28	285	242	248	241	247	301	320	313	300	302	296	301	299	291	290	290	288	293	300	295	200	166	130	132	139
29	110	99	103	97	109	93	95	116	105	97	332	288	289	284	265	289	300	305	290	291	301	300	139	138	318
30	114	98	85	66	44	43	38	41	64	55	39	43	33	44	41	27	35	39	44	46	44	46	67	90	270
31	90	102	92	73	69	71	70	66	69	58	53	41	51	70	74	71	70	50	46	46	57	63	59	58	266

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
OCTOBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	31	21	8	5	7	8	7	8	17	24	63	58	47	15	18	15	13	10	6	8	37	31	32	41	22
2	11	14	8	14	16	9	8	12	18	40	33	49	37	44	28	27	14	9	8	6	5	39	15	15	20
3	12	9	10	6	10	9	7	8	10	11	20	46	58	36	45	17	12	8	8	6	7	26	9	8	16
4	8	7	8	9	38	13	45	27	20	21	51	58	56	59	21	15	15	13	8	35	16	11	10	11	24
5	10	6	8	7	8	8	9	7	14	28	42	50	50	33	26	18	15	10	8	6	21	37	10	10	18
6	11	8	8	10	8	8	9	8	14	25	38	35	49	44	40	22	12	7	6	6	7	27	7	7	17
7	8	7	9	8	7	9	6	8	20	12	9	8	16	18	36	45	29	15	10	23	13	10	19	10	15
8	13	15	16	14	15	17	9	5	10	16	32	46	28	19	13	17	12	8	6	7	9	8	52	10	17
9	9	11	11	8	7	11	6	8	14	24	58	32	44	20	22	21	20	11	9	9	10	14	12	22	17
10	20	39	42	49	17	16	9	8	20	33	51	19	25	16	17	18	12	11	8	7	9	14	14	13	20
11	19	16	15	14	15	11	11	14	8	18	20	19	15	17	19	18	15	15	14	11	10	10	13	8	14
12	7	8	8	6	7	7	9	9	7	10	12	14	23	24	68	42	14	9	7	4	34	8	7	7	15
13	8	14	12	10	9	7	8	8	14	16	31	39	43	57	51	32	26	12	7	33	25	9	11	9	20
14	10	8	11	17	10	8	10	8	10	38	47	52	63	35	57	54	41	13	12	9	40	40	13	12	26
15	9	8	18	28	15	8	8	8	14	19	66	43	52	59	45	57	48	33	17	10	7	17	14	6	25
16	10	9	7	11	13	8	18	38	16	23	21	19	19	14	16	14	14	9	7	20	18	11	19	10	15
17	9	9	13	23	14	5	10	15	10	18	27	28	35	27	21	17	15	10	8	7	9	9	9	5	15
18	12	13	45	20	14	19	14	23	11	12	14	20	21	16	13	18	10	7	5	6	9	20	7	11	15
19	7	8	9	8	11	6	6	8	15	40	44	48	51	23	18	14	12	9	5	8	32	9	6	9	17
20	9	10	9	10	16	9	10	7	17	29	32	34	19	17	12	12	9	7	6	6	35	15	11	10	15
21	12	11	7	10	7	8	8	9	13	22	34	42	49	30	19	15	12	8	5	5	28	16	10	14	16
22	14	11	8	6	7	12	11	8	9	12	21	25	27	30	35	47	21	27	8	5	20	17	11	10	17
23	9	8	10	7	7	6	7	7	13	22	29	45	37	21	19	13	10	8	6	11	59	17	11	10	16
24	10	8	7	8	7	21	19	33	19	16	15	20	20	17	18	16	15	15	13	17	18	14	14	16	16
25	16	15	7	7	6	5	8	11	11	12	9	12	16	14	13	12	11	9	9	9	8	8	10	13	10
26	13	12	9	8	7	8	7	7	9	9	17	12	14	20	41	64	19	8	6	11	33	7	6	8	15
27	7	9	9	23	14	11	7	9	10	18	47	36	44	17	16	14	13	12	10	10	27	13	35	35	19
28	19	14	12	11	13	10	11	9	12	14	14	14	12	12	13	14	11	10	10	17	32	45	7	6	14
29	10	9	10	16	10	8	7	11	9	46	26	40	28	19	15	13	11	9	5	6	6	17	18	7	15
30	9	8	9	23	16	12	13	17	17	17	13	19	18	24	23	18	15	13	9	13	13	10	12	18	15
31	17	17	13	10	9	10	8	8	9	15	18	15	16	13	12	10	10	13	9	7	9	9	11	10	12
HRAVE	12	12	12	13	12	10	11	12	13	21	31	32	33	26	26	24	16	12	8	11	20	17	14	12	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	22	20	16	24	18	17	15	17	17	20	14	15	20	26	25	15	15	15	17	15	16	17	16	16	10
MAX	63	49	58	59	50	49	45	52	58	51	20	68	57	63	66	38	35	45	51	35	49	47	59	33	16
MIN	5	5	6	7	6	6	6	5	6	7	8	4	7	8	6	7	5	5	5	6	5	5	6	7	5

DAY	26	27	28	29	30	31
AVE	15	19	14	15	15	12
MAX	64	47	45	46	24	18
MIN	6	7	6	5	8	7

MONTHLY AVERAGE = 17.1 MONTHLY MAXIMUM = 68.1 MONTHLY MINIMUM = 3.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
OCTOBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	21.8	20.9	18.8	18.5	17.9	16.8	16.9	17.7	19.8	23.2	25.3	28.0	29.5	30.9	31.1	31.2	31.0	29.7	27.8	26.1	26.1	25.8	25.2	24.1	24.3
2	22.1	21.5	20.3	19.6	19.4	17.9	18.3	19.4	21.7	24.3	25.7	27.5	29.0	30.2	30.9	31.4	31.2	30.1	28.2	26.9	25.9	25.3	23.4	22.6	24.7
3	21.2	20.8	19.5	19.2	18.3	18.3	18.1	19.4	21.9	25.2	28.0	30.5	32.2	33.9	34.1	33.8	33.4	32.2	30.5	29.1	28.3	27.4	26.2	25.3	26.1
4	24.7	24.1	23.4	23.4	22.6	21.8	21.9	22.2	23.4	26.6	28.6	30.3	32.0	32.8	33.3	32.8	32.3	31.1	29.7	28.7	26.8	25.9	25.0	24.1	27.0
5	22.8	22.4	21.2	20.6	20.1	18.9	19.0	20.0	23.2	25.3	27.6	29.9	31.5	32.5	33.1	33.1	32.5	31.4	29.6	28.2	27.3	26.2	24.6	23.5	26.0
6	22.0	20.9	20.3	18.8	18.7	17.6	17.2	19.4	21.3	24.4	27.2	30.0	31.0	32.7	33.5	33.9	33.3	31.7	29.6	28.6	27.4	25.3	24.0	22.7	25.5
7	21.1	20.4	19.0	18.1	17.8	17.4	17.0	19.0	22.6	27.1	29.1	30.9	32.7	33.8	34.4	34.6	33.8	33.1	32.0	30.9	30.5	30.0	28.9	26.9	26.7
8	26.3	25.7	25.9	24.0	23.3	22.8	21.9	21.9	24.3	28.0	29.7	31.4	33.0	33.8	34.1	33.8	33.0	31.6	29.8	28.5	27.4	27.4	25.2	23.3	27.8
9	22.4	21.3	20.1	19.3	17.3	16.9	17.1	18.0	20.6	23.6	26.4	28.5	30.6	32.3	32.2	32.4	32.0	30.7	29.0	27.1	26.2	26.1	25.8	24.6	25.0
10	23.6	22.5	21.7	20.7	20.7	20.0	19.0	20.2	22.0	24.5	26.2	27.8	28.9	29.4	29.4	29.0	28.1	26.8	25.2	24.2	23.7	23.0	22.0	21.0	24.1
11	20.0	19.2	18.5	18.2	17.8	17.4	17.3	17.7	19.9	21.4	23.2	24.8	26.2	27.5	28.4	28.8	28.8	28.1	27.3	26.4	25.6	24.6	23.7	22.8	23.1
12	22.3	21.8	21.3	20.9	20.3	19.8	19.2	19.5	20.7	22.8	24.9	26.5	28.4	29.8	30.1	30.7	30.6	29.0	27.2	25.9	25.1	22.9	21.9	20.5	24.2
13	19.5	18.4	16.7	16.5	15.6	14.6	14.0	16.1	19.0	21.9	24.6	27.9	29.9	31.0	31.8	31.8	31.2	30.1	28.0	26.5	25.1	23.7	23.0	21.6	23.3
14	20.9	20.0	19.5	18.0	16.7	16.4	16.2	17.5	19.3	22.2	25.0	26.8	28.8	29.6	29.9	29.9	29.6	28.8	27.2	26.2	25.4	24.0	22.7	21.5	23.4
15	20.8	20.1	19.5	18.6	17.5	17.4	17.6	18.9	20.4	23.2	25.7	28.9	30.6	30.7	31.0	30.8	30.6	30.1	28.4	27.1	25.8	24.9	22.4	21.7	24.3
16	20.6	19.3	18.5	17.2	17.0	16.7	16.1	15.5	18.6	24.4	29.0	30.3	30.9	31.8	32.0	31.7	31.2	30.4	29.4	28.6	27.3	26.4	25.6	25.4	24.7
17	24.9	24.4	23.0	21.4	21.1	21.1	20.8	20.6	23.8	26.7	28.3	29.9	31.5	32.8	33.6	32.9	32.3	30.8	29.3	27.9	26.8	26.0	24.9	23.5	26.6
18	23.2	22.5	22.0	21.7	20.5	19.6	19.6	19.0	21.2	23.0	24.1	25.0	26.1	26.3	26.6	26.7	26.2	24.6	23.1	22.4	21.8	21.3	19.5	18.5	22.7
19	17.6	16.7	15.9	15.3	14.4	13.6	13.1	14.4	16.6	19.3	22.2	24.7	26.3	27.3	27.9	27.7	27.1	25.8	24.0	23.0	21.5	19.9	19.2	17.7	20.5
20	16.6	16.1	14.9	13.6	12.1	11.6	10.7	11.6	15.6	17.2	20.2	23.4	26.1	27.1	27.4	27.3	26.7	25.0	23.5	22.2	21.2	20.5	18.9	17.8	19.5
21	16.4	14.6	14.6	12.4	12.4	11.2	10.6	12.1	14.8	18.0	21.0	24.2	26.4	26.5	27.9	28.4	27.3	25.6	23.8	22.8	21.5	20.2	19.4	17.3	19.6
22	16.3	15.3	14.6	13.8	12.9	13.2	12.7	14.2	16.7	20.4	24.9	27.2	28.1	28.9	29.5	29.6	29.1	28.5	26.2	25.2	24.5	22.5	20.2	18.5	21.4
23	18.1	17.2	15.7	14.9	14.4	13.6	12.5	14.2	16.5	19.6	22.7	25.4	27.8	29.6	31.0	30.9	30.0	28.3	26.4	25.3	24.5	22.5	21.0	20.0	21.7
24	18.5	17.5	16.4	15.3	14.4	13.8	12.9	15.5	20.7	21.1	22.1	23.1	24.2	24.7	25.0	25.0	24.2	22.7	21.7	21.0	20.5	19.5	19.6	19.1	19.9
25	18.6	17.6	16.4	15.4	14.5	13.7	13.4	14.7	15.5	17.4	18.3	20.2	21.6	22.6	23.4	23.8	23.0	22.0	21.2	20.4	19.5	19.0	18.3	17.6	18.7
26	17.0	16.3	15.7	14.4	13.9	13.3	13.1	14.0	16.2	17.9	20.7	22.7	24.2	25.4	26.4	27.5	27.5	25.8	24.2	23.0	21.1	19.3	17.3	16.1	19.7
27	15.2	13.9	13.6	12.0	11.2	10.5	10.0	11.6	13.7	17.6	21.6	24.0	27.4	30.5	30.5	30.0	29.0	27.4	26.2	24.9	23.0	22.4	22.3	21.6	20.4
28	20.8	20.8	20.3	19.6	18.6	16.6	15.2	15.2	16.1	17.2	18.5	19.8	20.8	21.1	21.1	20.8	20.1	18.5	16.9	16.1	14.7	12.9	11.9	10.5	17.7
29	9.4	8.4	8.0	6.5	6.1	5.7	5.8	6.4	10.1	12.9	15.5	18.5	21.0	22.6	23.3	22.7	21.6	19.9	18.2	16.9	15.8	15.1	14.7	13.3	14.1
30	12.5	11.6	10.2	8.8	8.9	10.5	9.6	9.5	9.7	10.5	11.2	13.2	14.9	16.5	17.3	17.5	17.4	16.8	15.7	14.4	13.4	13.0	12.1	11.4	12.8
31	11.0	10.3	9.5	10.0	9.3	9.1	9.0	9.4	10.8	12.5	14.4	16.3	18.3	20.0	21.0	21.1	20.5	19.7	19.0	18.5	17.6	16.5	16.2	15.5	14.8
HRAVE	19.6	18.8	17.9	17.0	16.3	15.7	15.3	16.3	18.6	21.3	23.6	25.7	27.4	28.5	29.1	29.1	28.5	27.3	25.8	24.6	23.6	22.6	21.5	20.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	24.3	24.7	26.1	27.0	26.0	25.5	26.7	27.8	25.0	24.1	23.1	24.2	23.3	23.4	24.3	24.7	26.6	22.7	20.5	19.5	19.6	21.4	21.7	19.9	18.7
MAX	31.2	31.4	34.1	33.3	33.1	33.9	34.6	34.1	32.4	29.4	28.8	30.7	31.8	29.9	31.0	32.0	33.6	26.7	27.9	27.4	28.4	29.6	31.0	25.0	23.8
MIN	16.8	17.9	18.1	21.8	18.9	17.2	17.0	21.9	16.9	19.0	17.3	19.2	14.0	16.2	17.4	15.5	20.6	18.5	13.1	10.7	10.6	12.7	12.5	12.9	13.4

DAY	26	27	28	29	30	31
AVE	19.7	20.4	17.7	14.1	12.8	14.8
MAX	27.5	30.5	21.1	23.3	17.5	21.1
MIN	13.1	10.0	10.5	5.7	8.8	9.0

MONTHLY AVERAGE = 22.3 MONTHLY MAXIMUM = 34.6 MONTHLY MINIMUM = 5.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
OCTOBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.6	0.8	0.5	0.3	0.4	0.5	0.4	-0.7	-1.1	-1.2	-0.7	-1.0	-1.0	-0.9	-1.1	-0.8	-0.6	-0.2	0.3	0.4	0.3	0.4	0.4	0.4	-0.1
2	0.4	0.5	0.6	0.5	0.3	0.5	0.3	-0.7	-1.1	-0.8	-0.8	-0.9	-1.1	-1.0	-1.1	-0.9	-0.7	-0.2	0.2	0.3	0.4	0.5	0.6	0.6	-0.1
3	0.4	0.6	0.5	0.6	0.4	0.2	0.3	-0.9	-1.4	-1.7	-1.5	-1.2	-1.0	-1.5	-1.3	-1.0	-0.7	-0.2	0.2	0.3	0.4	0.4	0.5	0.3	-0.3
4	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.1	-0.4	-1.2	-0.8	-0.8	-1.0	-0.9	-1.1	-0.9	-0.6	-0.2	0.3	0.6	0.6	0.4	0.6	0.5	-0.1
5	0.6	0.5	0.9	0.5	0.6	0.6	0.2	-0.9	-1.5	-1.0	-0.8	-0.8	-0.9	-1.0	-1.1	-0.9	-0.6	-0.1	0.3	0.5	0.4	0.6	0.5	0.5	-0.1
6	0.7	0.6	0.6	0.6	0.6	0.7	0.3	-1.0	-1.2	-1.0	-0.9	-1.0	-0.9	-1.0	-1.0	-1.0	-0.6	-0.2	0.4	0.4	0.8	0.8	0.5	0.6	-0.1
7	0.6	0.5	0.7	0.7	0.4	0.4	0.4	-0.6	-0.8	-0.8	-1.2	-1.1	-1.3	-1.1	-1.0	-0.7	-0.1	0.2	0.2	0.3	0.3	0.1	0.1	0.6	-0.1
8	0.4	0.4	0.3	0.6	0.7	0.7	0.7	0.2	-0.9	-1.4	-1.2	-1.1	-1.0	-1.1	-1.1	-0.9	-0.6	-0.1	0.4	0.6	0.5	0.8	0.7	0.5	-0.1
9	0.4	0.5	0.4	0.4	0.6	0.7	0.3	-0.8	-1.0	-0.9	-0.6	-0.8	-1.1	-1.4	-1.1	-1.0	-0.6	-0.1	0.3	0.4	0.4	0.5	0.4	0.5	-0.2
10	0.5	0.5	0.6	0.7	0.7	1.0	0.6	-0.8	-0.9	-0.8	-0.8	-1.1	-1.1	-1.1	-1.1	-1.0	-0.6	-0.1	0.3	0.5	0.6	0.2	0.1	0.1	-0.1
11	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.5	-1.1	-1.0	-1.0	-1.0	-0.8	-0.7	-0.6	-0.3	0.0	0.2	0.2	0.2	0.1	0.1	0.1	0.1	-0.2
12	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.3	-0.8	-1.0	-1.2	-1.3	-1.3	-1.4	-0.8	-0.9	-0.6	-0.1	0.3	0.6	0.6	0.8	0.6	0.6	-0.2
13	0.6	0.7	0.9	0.6	0.4	0.7	0.4	-0.9	-1.3	-1.3	-1.0	-1.0	-1.2	-1.1	-1.0	-0.8	-0.5	-0.1	0.4	0.6	0.6	0.5	0.6	0.6	-0.1
14	0.4	0.6	0.6	0.4	0.6	0.4	0.5	-0.4	-1.1	-0.7	-0.9	-0.8	-1.1	-1.0	-0.9	-0.9	-0.4	0.0	0.4	0.5	0.6	0.7	0.5	0.7	-0.1
15	0.5	0.5	0.5	0.6	0.5	0.6	0.2	-0.9	-0.9	-0.9	-0.7	-1.0	-1.1	-1.0	-0.8	-0.6	-0.2	0.0	0.6	0.7	0.7	0.7	0.6	0.7	0.0
16	1.0	0.6	0.6	0.7	0.9	0.4	0.5	-0.1	-1.0	-1.0	-1.3	-1.3	-1.0	-0.8	-0.7	-0.4	0.0	0.3	0.4	0.3	0.6	0.7	0.5	0.4	0.0
17	0.3	0.3	0.3	0.3	0.4	0.5	0.3	0.0	-0.8	-1.4	-1.1	-1.3	-1.0	-1.1	-1.1	-0.7	-0.4	0.0	0.2	0.3	0.3	0.2	0.3	0.4	-0.2
18	0.4	0.4	0.3	0.4	0.4	0.3	0.2	0.2	-0.2	-0.6	-0.9	-1.0	-1.1	-1.1	-1.1	-0.9	-0.6	0.0	0.3	0.5	0.4	0.4	0.3	0.3	-0.1
19	0.4	0.3	0.4	0.3	0.3	0.6	0.4	-0.8	-1.3	-0.6	-0.8	-0.9	-0.9	-1.0	-0.9	-0.8	-0.5	0.1	0.5	0.6	0.6	0.4	0.5	0.5	-0.1
20	0.5	0.4	0.5	0.6	0.8	0.6	0.5	-0.6	-1.2	-0.6	-0.8	-0.8	-1.1	-0.9	-1.0	-0.9	-0.4	0.1	0.5	0.5	0.7	0.5	0.6	0.5	0.0
21	0.8	1.1	0.5	1.5	0.7	0.9	0.6	-0.5	-1.1	-1.0	-1.0	-1.1	-1.0	-0.8	-1.0	-0.8	-0.3	0.1	0.4	0.6	0.6	0.7	0.8	0.7	0.1
22	0.6	0.5	0.4	1.1	0.7	0.3	0.2	-0.7	-1.3	-1.5	-1.2	-1.1	-0.9	-0.9	-0.9	-0.5	0.1	0.5	0.7	0.6	0.6	0.9	0.7	0.8	0.0
23	0.6	0.6	0.6	0.7	0.5	0.5	0.6	-0.8	-1.2	-1.0	-0.9	-0.9	-0.9	-0.8	-1.0	-0.8	-0.4	0.2	0.5	0.5	0.5	0.6	0.8	0.7	0.0
24	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.4	-0.2	-0.4	-0.6	-0.7	-0.8	-0.6	-0.5	-0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1
25	0.2	0.3	0.3	0.2	0.2	0.3	0.3	-0.4	-0.7	-0.9	-0.9	-1.0	-1.0	-0.8	-0.5	-0.4	0.1	0.2	0.4	0.3	0.3	0.2	0.2	0.2	-0.1
26	0.1	0.2	0.2	0.2	0.2	0.3	0.3	-0.2	-0.8	-0.9	-1.1	-1.3	-1.2	-1.1	-0.6	-0.7	-0.4	0.2	0.6	0.6	0.5	0.7	0.8	0.8	-0.1
27	0.8	0.8	0.9	0.6	0.7	0.5	0.6	-0.2	-1.0	-1.1	-0.8	-0.8	-1.0	-1.1	-0.8	-0.6	-0.3	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.0
28	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.0	-0.3	-0.6	-0.8	-1.0	-1.1	-0.9	-1.0	-0.9	-0.5	0.1	0.3	0.4	0.7	0.5	0.7	0.6	-0.1
29	0.6	0.5	0.6	0.4	0.6	0.4	0.5	-0.5	-1.4	-0.6	-0.7	-0.9	-0.9	-0.9	-0.8	-0.8	-0.3	0.2	0.6	0.6	0.7	0.6	0.4	0.5	0.0
30	0.6	0.8	0.6	0.6	0.7	0.1	0.1	-0.1	-0.5	-0.7	-0.6	-0.7	-0.6	-0.6	-0.5	-0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.3	0.4	0.0
31	0.4	0.4	0.6	0.3	0.2	0.2	0.2	-0.1	-0.4	-0.6	-0.7	-0.6	-0.7	-0.5	-0.4	-0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.3	0.3	0.0
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.4	-0.9	-0.9	-0.9	-1.0	-1.0	-1.0	-0.9	-0.7	-0.4	0.1	0.4	0.4	0.5	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	-0.1	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	0.0	0.0	-0.2	-0.1	-0.1	0.0	0.1	0.0	0.0	0.1	-0.1
MAX	0.8	0.6	0.6	0.6	0.9	0.8	0.7	0.8	0.7	1.0	0.2	0.8	0.9	0.7	0.7	1.0	0.5	0.5	0.6	0.8	1.5	1.1	0.8	0.7	0.4
MIN	-1.2	-1.1	-1.7	-1.2	-1.5	-1.2	-1.3	-1.4	-1.4	-1.1	-1.1	-1.4	-1.3	-1.1	-1.1	-1.3	-1.4	-1.1	-1.3	-1.2	-1.1	-1.5	-1.2	-0.8	-1.0

DAY	26	27	28	29	30	31
AVE	-0.1	0.0	-0.1	0.0	0.0	0.0
MAX	0.8	0.9	0.7	0.7	0.8	0.6
MIN	-1.3	-1.1	-1.1	-1.4	-0.7	-0.7

MONTHLY AVERAGE = -0.1 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = -1.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
OCTOBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	697	697	697	697	697	697	698	698	699	699	699	698	698	698	697	697	697	697	697	698	698	699	699	699	698
2	700	700	700	700	701	701	701	702	702	702	702	701	701	700	699	699	699	699	699	700	700	700	700	700	700
3	700	701	701	701	701	701	701	701	702	702	701	701	700	699	699	698	698	698	698	699	699	700	700	700	700
4	700	700	700	700	701	701	701	702	702	702	702	701	701	700	700	700	700	700	700	701	701	701	702	702	701
5	702	702	702	702	703	703	704	704	704	704	704	704	703	702	701	701	701	701	701	701	701	702	702	702	702
6	702	702	702	702	703	703	703	704	704	704	704	703	703	702	701	701	701	701	701	702	702	702	702	702	702
7	702	703	702	702	703	703	703	703	703	703	703	702	701	700	700	699	699	699	699	699	699	699	699	699	701
8	699	699	699	699	699	699	699	699	700	700	699	698	698	697	697	696	696	696	697	697	697	698	698	698	698
9	698	698	698	698	698	698	698	699	699	699	699	698	697	696	696	695	695	695	695	695	696	696	696	696	697
10	696	697	697	697	697	698	698	698	699	699	699	699	698	698	697	697	698	698	699	699	700	700	700	701	698
11	701	702	702	702	702	703	703	704	704	704	703	702	702	701	700	700	699	699	699	700	700	700	700	700	701
12	700	700	700	700	700	700	700	701	701	701	701	700	700	699	698	698	698	698	698	699	699	699	700	700	700
13	700	700	700	700	700	700	701	701	702	701	701	700	700	699	698	698	698	698	698	698	699	699	699	699	700
14	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	699	699	700	700	700	700	700
15	701	701	701	701	702	702	702	703	703	703	703	702	701	701	700	700	700	700	700	701	701	702	702	702	701
16	702	702	702	703	703	703	703	704	704	703	703	703	701	700	700	699	699	698	698	699	699	700	700	699	701
17	699	699	699	699	699	699	699	699	699	699	698	697	696	696	695	695	694	694	694	694	695	695	696	696	697
18	696	696	696	696	696	697	697	697	698	698	698	698	697	697	697	697	698	698	698	699	699	699	699	699	697
19	700	700	700	700	700	700	701	701	701	701	701	700	699	699	698	698	698	698	698	698	698	699	699	699	699
20	699	699	699	698	698	699	699	700	700	701	700	700	699	699	698	698	698	698	699	699	700	700	701	701	699
21	701	701	701	701	701	702	702	703	704	704	704	703	703	702	701	701	701	702	702	703	703	704	704	704	702
22	704	705	705	704	704	705	705	706	706	706	705	705	704	703	702	702	701	701	701	702	702	702	702	702	703
23	702	702	702	701	701	702	702	702	702	702	702	701	700	699	699	698	698	698	699	699	699	700	700	700	700
24	700	700	700	701	701	701	702	703	703	703	703	703	703	702	702	702	702	702	703	703	703	704	704	704	702
25	705	705	706	706	706	707	707	708	708	708	707	706	706	705	704	704	703	703	703	703	703	703	703	703	705
26	703	703	702	702	702	702	702	702	702	701	701	700	699	698	698	697	697	697	697	698	698	698	698	698	700
27	698	698	698	698	698	698	698	699	699	699	698	698	697	696	695	695	695	695	696	696	696	696	696	696	697
28	697	697	698	698	699	700	700	701	701	702	702	701	701	700	700	700	700	700	700	700	701	701	701	701	700
29	701	701	701	700	700	700	700	700	700	700	700	699	698	697	697	697	697	697	698	698	699	700	700	701	699
30	701	701	701	702	702	703	704	705	706	707	706	706	705	705	705	705	705	705	706	706	706	707	707	707	705
31	707	708	708	707	708	708	708	708	708	708	708	707	706	705	705	704	704	704	704	705	705	705	705	705	706
HRAVE	700	700	701	701	701	701	701	702	702	702	702	701	700	700	699	699	699	699	699	700	700	700	700	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	698	700	700	701	702	702	701	698	697	698	701	700	700	700	701	701	697	697	699	699	702	703	700	702	705
MAX	699	702	702	702	704	704	703	700	699	701	704	701	702	701	703	704	699	699	701	701	704	706	702	704	708
MIN	697	699	698	700	701	701	699	696	695	696	699	698	698	698	700	698	694	696	698	698	701	701	698	700	703

DAY	26	27	28	29	30	31
AVE	700	697	700	699	705	706
MAX	703	699	702	701	707	708
MIN	697	695	697	697	701	704

MONTHLY AVERAGE = 700.4 MONTHLY MAXIMUM = 708.3 MONTHLY MINIMUM = 694.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
OCTOBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	44	46	54	55	58	63	61	57	51	42	36	30	26	19	22	21	21	22	24	26	26	27	29	31	37
2	38	40	41	46	48	50	50	49	50	41	41	40	38	34	32	31	29	29	34	36	37	39	45	47	40
3	50	52	56	54	57	63	60	53	51	43	37	33	30	29	28	28	28	30	31	33	33	36	39	42	41
4	44	46	48	49	53	55	56	55	51	42	37	34	31	30	28	28	29	31	34	37	41	44	46	48	42
5	51	51	54	57	59	63	63	58	48	42	37	33	29	26	25	24	24	25	27	29	32	33	37	40	40
6	43	45	46	49	50	55	53	50	47	39	33	27	23	21	19	18	17	20	22	23	24	27	31	33	34
7	35	38	40	43	44	44	42	39	33	26	29	32	30	28	26	25	27	28	30	33	34	35	38	42	34
8	44	45	45	48	51	53	55	54	49	41	38	34	26	22	20	19	20	21	22	24	26	26	29	32	35
9	34	35	39	41	44	46	46	43	38	33	29	26	23	19	19	19	18	21	24	27	27	25	27	29	30
10	32	36	39	38	36	36	38	34	31	26	24	21	19	19	21	22	23	25	26	26	25	21	16	14	27
11	13	12	12	12	12	11	11	12	11	12	14	15	15	15	16	16	17	18	19	20	21	23	24	26	16
12	27	28	28	29	30	31	32	32	31	29	27	26	24	23	22	21	22	22	23	25	27	30	31	33	27
13	34	36	39	40	43	43	46	41	35	31	27	23	20	19	18	18	18	20	22	24	27	30	30	31	30
14	32	34	34	37	39	41	41	39	35	32	31	31	30	29	28	28	26	27	30	33	35	37	39	40	34
15	42	42	44	48	52	52	54	48	43	38	33	28	23	21	18	20	20	21	25	26	29	30	32	34	34
16	35	38	39	43	42	45	44	48	41	30	22	21	21	19	19	19	20	22	22	23	27	28	28	29	30
17	29	29	32	35	35	34	34	35	31	28	26	25	25	24	24	25	26	27	28	30	35	40	42	43	31
18	43	45	48	50	52	55	55	57	52	51	46	42	36	33	30	28	24	27	30	32	33	33	35	37	41
19	38	40	42	45	47	50	53	48	41	35	30	27	24	23	22	22	21	21	22	22	22	24	25	29	32
20	30	31	33	35	39	38	42	40	32	29	25	20	16	16	16	16	17	18	19	20	22	23	25	27	26
21	27	30	31	35	35	39	38	36	31	26	21	17	14	14	13	12	14	15	17	18	20	21	23	24	24
22	26	27	28	29	30	31	32	30	26	22	18	15	14	14	13	13	14	15	18	19	21	21	24	25	22
23	27	28	31	32	34	36	38	35	30	26	23	21	19	17	16	16	17	19	21	22	23	26	28	30	26
24	32	33	35	37	38	39	42	32	16	16	16	15	14	13	11	10	9	10	10	10	11	12	12	12	20
25	13	14	15	21	26	30	32	31	30	26	25	22	19	18	16	15	16	18	20	21	22	23	23	24	22
26	25	26	26	28	29	30	30	29	26	24	21	19	17	15	13	13	14	15	16	17	19	20	22	23	21
27	24	25	26	29	30	31	32	30	27	23	20	20	18	16	15	14	16	17	19	19	22	25	29	28	23
28	31	34	34	38	45	35	32	29	27	26	24	22	21	21	20	20	19	21	23	22	23	24	27	29	27
29	31	33	34	37	37	37	36	35	28	25	23	22	20	17	13	14	14	14	15	16	18	20	19	21	24
30	23	24	25	27	29	25	21	13	12	13	13	12	10	9	9	9	9	9	10	12	12	13	13	14	15
31	14	14	14	13	14	14	14	14	13	12	12	11	10	9	9	9	9	10	10	11	12	13	14	14	12
HRAVE	33	34	36	38	40	41	41	39	35	30	27	25	22	20	19	19	19	21	22	24	25	27	28	30	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	37	40	41	42	40	34	34	35	30	27	16	27	30	34	34	30	31	41	32	26	24	22	26	20	22
MAX	63	50	63	56	63	55	44	55	46	39	26	33	46	41	54	48	43	57	53	42	39	32	38	42	32
MIN	19	29	28	28	24	17	25	19	18	14	11	21	18	26	18	19	24	24	21	16	12	13	16	9	13

DAY	26	27	28	29	30	31
AVE	21	23	27	24	15	12
MAX	30	32	45	37	29	14
MIN	13	14	19	13	9	9

MONTHLY AVERAGE = 29.0 MONTHLY MAXIMUM = 63.5 MONTHLY MINIMUM = 8.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
OCTOBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.21	0.44	0.62	0.77	0.86	0.88	0.82	0.70	0.53	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.24
2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.42	0.61	0.75	0.84	0.86	0.81	0.69	0.52	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.14
3	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.42	0.60	0.74	0.82	0.84	0.80	0.68	0.49	0.29	0.08	0.00	0.00	0.00	0.00	0.00	0.00	6.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.22	0.57	0.74	0.83	0.83	0.79	0.67	0.49	0.29	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.61
5	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.42	0.60	0.75	0.83	0.84	0.79	0.67	0.50	0.29	0.08	0.00	0.00	0.00	0.00	0.00	0.00	6.01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.21	0.42	0.60	0.76	0.84	0.86	0.80	0.68	0.51	0.29	0.07	0.00	0.00	0.00	0.00	0.00	0.00	6.06
7	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.40	0.58	0.72	0.80	0.82	0.76	0.65	0.48	0.23	0.07	0.00	0.00	0.00	0.00	0.00	0.00	5.73
8	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.37	0.58	0.62	0.82	0.75	0.77	0.66	0.48	0.27	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.51
9	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.40	0.59	0.73	0.81	0.83	0.77	0.65	0.48	0.27	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.80
10	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.60	0.74	0.82	0.84	0.78	0.65	0.48	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.85
11	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.60	0.74	0.82	0.84	0.78	0.66	0.48	0.27	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.87
12	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.38	0.57	0.71	0.80	0.81	0.75	0.64	0.47	0.25	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.63
13	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.40	0.58	0.73	0.81	0.82	0.76	0.64	0.46	0.25	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.71
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.37	0.56	0.70	0.79	0.81	0.73	0.66	0.46	0.24	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.50
15	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.37	0.56	0.70	0.79	0.80	0.75	0.63	0.45	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.52
16	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.39	0.58	0.72	0.80	0.80	0.75	0.63	0.43	0.19	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.52
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.36	0.55	0.69	0.78	0.80	0.73	0.55	0.32	0.19	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.13
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.55	0.61	0.70	0.75	0.72	0.60	0.43	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.96
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.36	0.55	0.69	0.78	0.78	0.72	0.60	0.43	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.33
20	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.37	0.56	0.70	0.78	0.79	0.73	0.61	0.44	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.41
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.37	0.56	0.70	0.79	0.80	0.74	0.61	0.43	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.44
22	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.36	0.54	0.69	0.77	0.79	0.72	0.61	0.43	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.32
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.36	0.55	0.69	0.77	0.78	0.71	0.60	0.42	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.27
24	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.55	0.70	0.78	0.79	0.73	0.61	0.43	0.22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.37
25	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.54	0.68	0.76	0.77	0.72	0.60	0.43	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.24
26	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.53	0.67	0.76	0.77	0.71	0.59	0.42	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.15
27	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.53	0.67	0.75	0.76	0.68	0.55	0.39	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	5.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.53	0.68	0.76	0.77	0.70	0.57	0.40	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.11
29	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.52	0.67	0.75	0.76	0.70	0.58	0.40	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	5.05
30	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.34	0.56	0.66	0.79	0.79	0.74	0.58	0.41	0.17	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.22
31	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.35	0.53	0.68	0.76	0.77	0.71	0.59	0.41	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.15
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.57	0.70	0.79	0.80	0.75	0.63	0.45	0.23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.24	6.14	6.00	5.61	6.01	6.06	5.73	5.51	5.80	5.85	5.87	5.63	5.71	5.50	5.52	5.52	5.13	4.96	5.33	5.41	5.44	5.32	5.27	5.37	5.24
MAX	0.88	0.86	0.84	0.83	0.84	0.86	0.82	0.82	0.83	0.84	0.84	0.81	0.82	0.81	0.80	0.80	0.80	0.75	0.78	0.79	0.80	0.79	0.78	0.79	0.77
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.15	5.00	5.11	5.05	5.22	5.15
MAX	0.77	0.76	0.77	0.76	0.79	0.77
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
OCTOBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.20 MONTHLY MAXIMUM = 0.20 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
NOVEMBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	17.6	16.8	14.4	13.0	9.9	9.5	9.2	9.9	9.9	10.1	9.3	12.8	12.8	11.5	7.9	5.2	1.9	4.0	4.1	4.9	5.4	5.7	7.9	9.1	9.3
2	10.8	9.8	10.3	10.9	11.5	11.4	10.3	12.7	18.9	19.3	18.1	17.5	16.4	17.7	16.9	19.3	20.1	19.2	18.9	18.5	19.3	21.8	23.3	23.2	16.5
3	23.2	19.5	17.3	16.2	15.9	15.2	12.9	7.9	7.7	7.8	7.3	9.6	7.4	6.2	3.0	4.2	7.9	11.1	10.2	5.4	4.2	7.7	6.1	7.0	10.0
4	7.9	5.2	7.7	6.3	5.3	8.8	8.5	8.5	7.0	4.6	2.6	2.8	2.2	2.2	4.2	3.9	5.5	5.3	11.3	9.2	5.3	5.3	6.8	7.2	6.0
5	8.2	8.4	4.6	4.7	7.8	8.1	8.5	8.9	8.9	7.5	7.6	8.9	2.7	4.0	7.8	2.4	8.5	8.9	7.2	3.6	4.9	2.0	8.7	7.9	6.7
6	8.4	9.6	9.2	8.3	8.6	7.4	6.9	7.9	11.3	11.3	11.3	11.4	13.0	11.9	7.7	5.3	8.8	11.9	7.2	3.6	1.4	2.2	7.3	4.3	8.2
7	8.3	3.1	5.4	6.2	7.8	6.0	6.7	6.6	7.2	6.6	7.3	12.9	13.8	10.8	7.3	9.2	8.3	9.5	11.6	9.2	7.9	11.8	13.2	12.9	8.7
8	11.6	15.9	17.6	14.7	16.3	15.7	17.2	16.4	17.0	17.4	15.2	11.8	14.9	15.6	19.0	18.3	17.0	17.8	20.0	16.7	17.3	13.5	14.9	16.4	16.2
9	17.1	17.1	16.8	18.4	22.2	20.2	18.8	20.3	17.1	16.4	17.6	17.3	15.4	13.3	10.6	7.6	8.1	9.6	11.4	13.4	14.6	12.8	12.0	8.6	14.9
10	8.5	8.8	9.1	6.1	7.7	8.7	9.1	8.7	6.8	6.8	5.6	2.5	2.6	3.6	5.4	7.9	8.9	10.5	10.9	9.5	3.1	2.8	5.2	5.2	6.8
11	7.2	6.8	3.8	3.0	3.8	3.5	4.3	6.3	5.2	4.3	1.6	1.9	5.3	5.8	5.7	9.0	13.7	14.6	11.7	10.8	3.7	6.2	5.2	7.8	6.3
12	10.9	20.5	28.4	31.0	26.5	28.0	26.9	24.7	24.0	24.0	24.2	22.4	24.0	23.3	22.1	23.3	21.4	21.8	23.8	24.7	23.7	24.6	26.2	22.8	23.9
13	20.5	21.1	20.8	21.1	18.5	19.0	16.3	16.0	15.3	7.8	9.8	7.0	5.7	3.8	2.7	4.9	7.5	12.4	14.3	8.2	4.6	5.5	8.1	5.8	11.5
14	6.3	5.2	5.8	7.6	5.6	6.3	7.0	7.6	6.6	5.9	4.9	4.5	3.4	2.6	1.9	3.3	8.5	5.0	3.5	4.7	9.6	11.6	10.1	9.4	6.1
15	11.7	15.1	17.2	16.5	18.2	19.8	21.6	24.9	20.8	17.3	15.9	14.1	14.2	15.3	15.4	15.7	15.5	16.7	17.8	18.8	19.5	16.7	15.3	15.7	17.1
16	15.4	14.3	9.4	8.9	12.9	8.7	8.4	8.1	14.7	10.2	7.8	9.4	9.6	12.6	13.4	10.0	11.8	11.6	7.8	11.3	8.9	5.1	4.8	4.8	10.0
17	9.3	8.9	8.4	7.9	9.0	9.1	8.0	8.8	9.7	7.1	9.5	9.1	6.8	4.6	7.0	15.7	15.0	13.2	10.5	4.3	8.8	11.0	10.3	8.4	9.2
18	9.6	11.3	8.5	7.9	8.8	9.4	7.8	9.1	8.3	6.6	4.0	4.2	3.7	2.9	2.7	5.0	6.1	5.3	5.1	2.6	6.4	7.2	7.6	8.6	6.6
19	7.5	6.7	5.2	5.1	7.8	8.1	9.0	11.1	9.1	8.0	7.2	6.2	3.3	4.1	18.2	7.4	7.4	13.3	18.6	18.7	14.9	14.1	11.0	6.8	9.5
20	7.9	6.3	3.3	7.7	8.3	4.9	3.9	5.3	4.3	4.6	7.6	7.1	6.8	9.4	10.1	6.6	6.0	8.2	5.8	7.0	22.3	16.5	8.2	5.8	7.7
21	6.4	7.1	3.3	3.4	4.5	3.1	4.8	7.0	10.4	7.9	9.1	6.5	14.6	9.7	6.2	6.0	4.6	5.0	5.1	5.7	6.8	3.7	4.2	5.9	6.3
22	4.5	5.7	4.6	4.1	6.3	6.2	3.8	2.9	5.0	7.7	5.3	5.0	4.9	3.9	5.8	3.6	3.8	1.5	2.6	5.3	3.5	1.8	1.1	5.1	4.3
23	8.7	6.6	9.2	8.5	8.7	9.1	6.9	9.6	8.9	11.7	14.1	13.4	14.6	17.9	16.8	11.6	10.5	12.0	13.9	17.4	16.4	21.0	16.2	14.9	12.4
24	15.0	12.8	11.0	8.2	10.1	10.9	11.4	11.1	10.4	7.8	9.0	6.7	8.6	9.3	8.9	8.5	6.1	2.6	5.1	5.3	2.3	1.9	2.7	3.7	7.9
25	5.8	7.8	6.1	7.6	2.6	3.7	7.3	7.0	6.8	4.1	1.4	2.0	1.9	5.0	12.1	12.0	10.7	8.7	8.2	7.9	11.5	19.5	22.1	21.7	8.5
26	20.4	21.6	17.2	16.1	14.7	12.6	5.6	5.7	6.4	3.6	3.5	6.9	12.2	12.4	11.3	10.1	9.1	8.0	4.4	2.0	6.2	7.6	4.7	6.8	9.5
27	7.5	8.2	7.1	8.9	9.2	10.4	11.0	11.6	9.5	10.1	8.2	5.8	4.8	9.5	10.7	11.9	16.4	18.6	18.1	16.0	9.9	12.7	15.7	13.0	11.0
28	16.8	17.6	18.4	16.2	15.2	16.6	17.2	13.9	14.2	9.5	10.9	12.4	14.3	9.9	9.8	12.1	13.6	14.3	15.2	11.0	9.4	7.7	7.3	9.3	13.0
29	6.0	10.3	13.3	16.6	10.8	16.1	17.0	24.5	11.7	5.3	5.8	6.0	8.2	14.0	14.6	13.9	13.5	11.5	9.2	7.7	8.3	6.5	4.2	3.6	10.8
30	2.5	2.6	2.8	2.8	2.6	3.5	1.4	2.0	3.3	3.3	3.0	3.7	3.4	4.8	4.2	4.0	3.0	1.7	6.6	5.0	5.7	10.0	11.7	11.3	4.4
HRAVE	10.7	11.0	10.5	10.5	10.6	10.7	10.3	10.8	10.5	9.2	8.8	8.7	9.0	9.3	9.6	9.3	10.0	10.5	10.7	9.6	9.5	9.9	10.1	9.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.3	16.5	10.0	6.0	6.7	8.2	8.7	16.2	14.9	6.8	6.3	23.9	11.5	6.1	17.1	10.0	9.2	6.6	9.5	7.7	6.3	4.3	12.4	7.9	8.5
MAX	17.6	23.3	23.2	11.3	8.9	13.0	13.8	20.0	22.2	10.9	14.6	31.0	21.1	11.6	24.9	15.4	15.7	11.3	18.7	22.3	14.6	7.7	21.0	15.0	22.1
MIN	1.9	9.8	3.0	2.2	2.0	1.4	3.1	11.6	7.6	2.5	1.6	10.9	2.7	1.9	11.7	4.8	4.3	2.6	3.3	3.3	3.1	1.1	6.6	1.9	1.4

DAY	26	27	28	29	30	31
AVE	9.5	11.0	13.0	10.8	4.4	***
MAX	21.6	18.6	18.4	24.5	11.7	***
MIN	2.0	4.8	7.3	3.6	1.4	***

MONTHLY AVERAGE = 10.0 MONTHLY MAXIMUM = 31.0 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
NOVEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	55	65	72	79	118	115	116	107	152	159	99	79	58	74	74	82	104	42	335	53	58	55	117	137	20
2	134	108	116	128	134	122	111	92	69	65	66	55	56	45	43	40	40	44	48	59	59	46	48	66	338
3	68	67	64	63	67	65	77	109	110	134	123	73	72	73	83	268	288	308	305	282	140	97	90	106	359
4	103	107	117	103	113	120	112	101	137	126	114	104	247	350	269	304	256	276	300	314	63	110	107	104	134
5	100	116	79	88	100	100	97	122	109	118	90	73	122	65	74	266	63	45	28	300	56	97	66	90	341
6	120	124	119	116	95	130	128	73	80	75	75	69	66	69	66	326	301	291	302	292	241	69	104	80	114
7	89	113	106	101	121	111	97	113	127	145	112	72	39	42	65	36	10	21	29	49	65	61	37	50	165
8	64	49	48	63	68	57	52	58	65	68	65	42	83	82	86	85	83	76	64	56	51	56	61	66	205
9	66	68	52	56	47	54	58	52	59	64	46	40	39	39	34	52	46	35	39	47	49	51	56	122	286
10	124	121	121	109	114	132	129	124	130	136	161	111	222	190	262	258	280	298	310	306	303	135	110	97	353
11	101	100	65	26	58	96	109	107	131	141	20	323	275	269	237	277	292	305	304	298	206	116	112	92	337
12	80	61	71	70	74	72	77	75	83	83	100	103	103	101	84	74	82	78	70	69	65	59	69	66	254
13	74	65	68	61	64	65	61	70	72	123	77	86	101	118	58	246	261	299	300	287	167	122	93	103	21
14	82	110	110	95	109	104	91	103	117	126	150	147	136	57	168	71	77	38	330	339	55	84	113	111	330
15	86	72	69	70	70	74	75	77	75	64	68	63	54	41	41	39	43	44	48	53	64	57	57	59	228
16	71	73	102	105	81	113	120	121	77	92	129	94	71	71	69	74	61	50	53	54	46	20	103	132	291
17	130	124	118	116	111	105	112	105	109	120	147	145	82	104	90	42	37	39	25	45	45	66	110	110	69
18	107	113	114	106	112	97	117	116	118	125	110	122	150	108	268	255	274	285	301	227	122	89	115	95	283
19	100	96	105	91	94	97	110	90	91	103	95	97	64	314	300	50	45	46	28	60	67	66	72	39	320
20	98	106	33	128	107	132	128	98	113	117	144	168	176	194	158	154	98	113	110	237	268	283	295	315	163
21	75	127	228	179	141	145	178	98	153	160	163	173	295	312	66	46	142	94	55	353	319	148	134	91	349
22	109	89	125	120	311	74	49	105	130	141	149	143	160	158	206	256	209	276	322	304	337	37	62	82	103
23	121	116	129	120	120	132	118	143	157	104	63	54	52	39	38	57	52	62	50	48	54	49	53	64	195
24	71	77	94	115	144	142	145	134	137	136	155	153	91	78	75	73	65	307	46	5	35	152	155	127	359
25	123	98	114	70	358	85	96	106	94	86	280	265	283	264	292	275	277	296	297	271	278	232	235	235	180
26	251	269	299	301	300	300	290	298	313	271	250	254	278	275	279	280	284	309	301	17	74	72	81	131	122
27	121	116	136	124	129	140	130	135	140	150	150	128	108	77	63	65	61	62	55	47	82	69	63	69	189
28	76	57	51	52	57	60	53	50	59	74	66	66	62	57	72	69	48	53	54	59	69	78	168	236	344
29	172	228	206	174	168	150	223	292	285	269	143	119	129	236	230	232	237	226	280	302	276	283	137	154	75
30	126	119	103	326	342	132	155	108	105	117	125	258	282	249	239	243	247	277	16	73	52	55	59	78	67

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
NOVEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	10	7	8	9	16	17	17	19	15	9	20	14	14	8	10	15	35	37	54	26	21	33	19	16	19
2	7	7	9	10	7	11	21	18	9	12	14	19	19	17	16	12	11	11	12	13	12	10	9	9	12
3	6	7	10	9	9	9	12	20	24	20	26	11	13	10	48	38	14	8	6	18	28	8	11	7	16
4	12	19	9	8	17	6	7	7	7	19	35	46	66	47	34	62	18	9	5	7	28	8	11	9	21
5	7	8	13	14	12	8	8	12	9	16	22	15	42	43	12	52	12	10	26	18	28	47	6	13	19
6	7	4	10	13	18	31	36	34	18	11	11	11	8	10	15	25	15	6	5	27	19	41	11	16	17
7	6	26	9	11	7	7	7	8	7	10	26	16	18	19	29	23	19	10	8	8	15	9	8	10	13
8	9	10	10	11	10	11	14	10	9	9	15	19	14	14	12	12	11	8	11	13	11	11	9	7	11
9	7	6	9	12	9	11	12	12	14	14	16	12	13	16	18	23	12	11	11	8	7	10	22	13	12
10	10	7	7	6	6	5	17	7	8	11	21	33	57	43	28	17	9	7	6	5	14	34	8	7	16
11	8	9	43	31	42	10	9	12	10	14	32	26	21	22	28	17	12	7	6	7	58	10	12	12	19
12	13	11	8	8	8	9	10	9	11	12	11	10	11	14	14	10	11	9	9	9	9	12	7	9	10
13	8	10	7	10	10	9	10	8	7	19	10	16	26	33	45	16	12	7	6	43	6	6	8	11	14
14	9	8	18	6	10	7	7	7	8	16	18	19	41	38	56	33	6	35	25	14	15	13	12	13	18
15	11	6	5	7	7	7	7	7	7	11	12	15	17	15	15	13	12	10	10	10	7	11	11	10	10
16	6	7	16	20	11	20	22	18	14	22	24	13	16	12	6	8	9	10	18	12	16	32	21	15	15
17	4	6	6	7	11	7	7	8	6	13	13	13	18	23	16	12	12	9	13	53	21	7	11	11	13
18	8	8	8	6	7	8	6	9	7	15	24	28	37	31	42	13	8	6	11	36	9	7	17	10	15
19	9	13	10	11	7	7	12	8	13	13	11	12	30	18	18	61	41	21	32	15	16	14	24	33	19
20	14	13	56	20	12	40	27	19	19	20	14	17	19	18	17	23	24	16	15	37	18	10	24	30	22
21	12	16	23	31	27	25	22	37	16	15	13	23	35	16	29	30	21	19	18	48	26	43	26	28	25
22	22	15	17	53	13	22	20	52	9	11	22	21	34	44	25	36	22	19	15	12	14	34	35	11	24
23	10	10	7	8	10	7	16	11	6	20	15	19	20	12	13	15	13	8	10	9	12	9	10	8	12
24	6	5	13	17	7	4	5	5	6	10	8	18	20	9	7	6	31	10	36	13	33	43	20	16	15
25	10	8	12	20	15	9	8	11	10	28	42	41	45	17	11	12	11	8	13	13	13	10	9	9	16
26	11	10	10	10	9	9	21	10	11	21	44	21	17	14	14	13	15	8	15	38	10	7	24	11	15
27	6	9	6	7	10	12	7	6	8	7	7	19	23	11	11	12	10	11	13	14	21	28	12	11	12
28	9	10	10	10	12	14	10	12	11	11	10	8	8	14	10	9	14	10	9	11	11	24	47	18	13
29	26	18	18	11	17	16	20	9	12	28	16	13	42	14	13	12	13	10	11	8	7	13	39	32	17
30	31	20	20	27	39	18	49	24	16	22	38	27	32	21	31	27	23	15	15	13	14	10	14	9	23
HRAVE	10	10	14	14	13	13	15	14	11	15	20	19	26	21	21	22	16	12	15	19	17	18	17	14	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19	12	16	21	19	17	13	11	12	16	19	10	14	18	10	15	13	15	19	22	25	24	12	15	16
MAX	54	21	48	66	52	41	29	19	23	57	58	14	45	56	17	32	53	42	61	56	48	53	20	43	45
MIN	7	7	6	5	6	4	6	7	6	5	6	7	6	6	5	6	4	6	7	10	12	9	6	4	8

DAY	26	27	28	29	30	31
AVE	15	12	13	17	23	***
MAX	44	28	47	42	49	***
MIN	7	6	8	7	9	***

MONTHLY AVERAGE = 16.1 MONTHLY MAXIMUM = 66.0 MONTHLY MINIMUM = 3.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
NOVEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	14.5	13.0	12.0	11.5	8.7	8.5	7.7	9.2	9.8	14.2	18.5	20.7	22.1	23.6	24.5	25.0	25.1	23.7	22.0	20.4	19.0	18.1	17.0	14.1	16.8
2	13.9	13.3	12.7	11.2	11.2	11.3	10.9	13.1	17.1	19.2	21.0	22.4	23.9	24.9	25.6	25.7	25.2	24.4	23.9	23.4	22.7	21.9	21.2	20.3	19.2
3	19.3	18.4	18.0	16.8	16.1	15.7	14.4	12.8	14.7	17.8	20.8	23.4	25.2	26.4	27.5	28.5	28.2	26.6	24.9	23.4	21.5	19.7	18.1	16.6	20.6
4	15.7	14.7	13.7	12.8	11.8	11.6	11.9	12.6	14.2	18.3	21.5	24.2	26.7	28.1	29.2	28.9	28.9	26.9	25.4	23.8	22.9	21.0	19.3	18.5	20.1
5	18.0	17.0	15.2	14.5	13.9	14.1	14.1	14.3	15.7	19.7	23.8	26.4	28.0	28.6	29.1	29.5	28.7	27.9	26.9	25.4	24.6	23.5	23.6	22.5	21.9
6	21.5	20.5	20.0	19.9	20.0	19.4	19.1	18.3	18.5	19.2	20.3	21.7	24.0	25.2	25.9	26.0	26.4	25.0	23.5	22.9	22.3	20.7	18.4	17.4	21.5
7	16.0	15.5	14.8	13.9	13.4	12.9	12.2	12.1	14.1	17.5	21.2	23.5	24.3	25.4	26.2	26.1	25.9	25.2	24.5	23.6	22.4	21.8	22.0	20.7	19.8
8	19.4	20.3	19.6	19.0	18.6	18.0	17.6	17.9	18.8	19.0	21.4	23.0	24.2	24.7	25.6	25.3	24.5	23.7	23.2	22.4	21.9	21.1	20.4	19.5	21.2
9	19.4	18.8	19.0	18.6	18.1	17.8	17.5	17.9	18.6	20.1	21.5	23.1	24.5	25.4	26.0	26.2	26.0	25.3	24.7	24.2	23.8	23.0	22.3	20.0	21.7
10	19.5	18.4	17.7	17.1	16.0	15.7	15.1	15.7	16.8	19.1	22.2	24.4	26.6	28.0	28.7	28.9	27.5	26.2	25.0	24.2	23.8	22.3	20.9	19.8	21.6
11	18.8	18.5	18.0	16.7	16.0	15.5	14.8	15.5	16.8	19.2	21.4	23.9	26.2	27.1	28.0	28.1	27.1	25.5	24.2	23.2	22.0	21.0	20.3	18.5	21.1
12	18.2	18.9	17.5	16.1	15.1	14.5	13.9	13.8	14.7	16.2	18.1	19.6	20.3	20.8	20.7	20.1	19.7	18.7	17.6	16.8	16.0	15.3	14.9	14.4	17.2
13	13.6	13.2	12.4	12.1	11.6	11.2	10.9	11.2	12.5	14.6	16.5	18.7	20.4	22.1	22.6	23.7	23.6	22.3	20.7	19.5	18.1	16.8	15.7	14.4	16.6
14	13.4	12.7	11.1	10.8	10.0	9.9	8.8	9.4	12.5	15.9	18.5	21.7	23.7	25.1	26.3	26.4	25.6	24.5	23.6	22.7	21.4	19.6	18.3	17.8	17.9
15	17.0	16.6	16.7	16.5	16.4	16.4	16.0	16.4	17.1	18.7	20.4	21.8	22.4	23.4	24.1	24.4	24.0	23.0	22.4	21.8	21.0	20.5	19.6	19.2	19.8
16	17.9	17.4	16.0	15.6	16.6	15.0	14.5	14.2	17.0	18.6	19.5	21.5	23.4	24.3	24.6	25.3	24.6	23.8	22.5	21.6	20.7	19.5	18.0	16.7	19.5
17	15.0	14.6	13.6	12.6	12.7	11.6	10.5	11.2	13.5	17.4	20.5	23.7	25.0	26.3	26.1	25.4	24.9	24.2	23.6	21.8	21.2	19.7	17.4	15.5	18.7
18	14.5	14.2	12.8	12.2	11.1	10.4	9.3	9.1	12.6	15.4	18.6	21.5	23.5	25.4	26.7	26.9	25.8	24.3	23.1	21.5	19.4	18.4	16.8	16.4	17.9
19	15.6	14.0	13.6	11.7	11.3	11.2	10.2	11.5	12.3	15.3	18.7	21.4	22.6	21.8	17.0	13.3	12.9	13.9	13.9	13.0	13.8	14.3	13.4	13.3	14.6
20	12.8	12.8	12.5	12.4	12.6	13.0	13.0	13.4	13.9	14.1	14.3	14.9	16.1	17.9	18.4	17.4	17.5	16.4	15.9	16.3	13.8	12.6	12.6	12.3	14.4
21	11.9	11.9	11.4	11.4	11.2	11.2	11.0	10.8	11.2	12.1	13.3	14.1	12.5	10.5	11.9	11.2	10.3	9.7	9.8	9.9	9.4	9.1	9.1	9.0	11.0
22	8.9	8.9	8.9	8.7	8.7	8.9	8.8	8.6	9.9	11.8	12.7	13.9	15.0	15.8	16.8	16.8	16.5	15.3	14.6	13.0	12.8	12.1	11.7	10.3	12.1
23	8.9	8.8	7.8	7.8	7.2	7.0	7.2	6.1	7.9	11.7	14.1	15.3	16.5	17.3	17.7	18.0	17.7	16.5	16.2	16.1	15.4	15.2	14.9	14.1	12.7
24	13.4	12.5	11.2	10.3	8.2	8.3	7.6	8.3	9.3	11.0	13.1	15.6	18.4	19.3	19.7	19.8	19.3	18.8	17.2	15.8	15.2	14.1	12.3	11.6	13.8
25	10.2	10.0	10.0	8.6	7.9	8.3	7.4	7.3	8.4	10.2	11.6	13.2	14.7	16.3	17.7	18.0	17.6	16.2	15.3	14.2	14.5	15.1	14.9	14.3	12.6
26	14.1	13.6	12.0	10.9	9.7	9.0	8.1	7.7	7.7	9.3	10.6	12.1	12.9	12.8	13.1	13.1	12.5	11.1	10.2	9.0	7.8	7.2	6.8	6.1	10.3
27	6.2	6.6	6.3	5.5	4.9	4.8	5.0	4.4	5.9	7.0	9.4	11.1	13.0	14.4	15.1	15.4	15.1	14.8	14.4	14.5	14.1	13.9	13.1	12.7	10.3
28	12.5	12.1	11.8	11.9	11.7	11.9	12.0	12.1	12.4	13.1	12.6	13.7	14.9	15.8	16.7	16.9	16.5	16.1	15.9	15.6	15.1	15.2	16.3	16.4	14.1
29	16.2	16.1	14.6	14.9	15.1	14.1	11.2	6.7	6.3	5.3	5.3	5.6	7.8	10.8	12.0	11.8	11.6	10.8	9.8	9.3	8.2	7.7	7.0	6.9	10.2
30	6.6	6.5	6.2	5.8	5.8	5.6	5.8	5.9	7.3	8.9	10.2	10.9	11.6	12.4	13.1	13.1	12.7	11.9	10.9	9.6	9.0	8.6	8.7	8.3	9.0
HRAVE	14.8	14.3	13.6	12.9	12.4	12.1	11.6	11.6	12.9	15.0	17.0	18.9	20.3	21.3	21.9	21.8	21.4	20.4	19.5	18.6	17.8	17.0	16.2	15.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16.8	19.2	20.6	20.1	21.9	21.5	19.8	21.2	21.7	21.6	21.1	17.2	16.6	17.9	19.8	19.5	18.7	17.9	14.6	14.4	11.0	12.1	12.7	13.8	12.6
MAX	25.1	25.7	28.5	29.2	29.5	26.4	26.2	25.6	26.2	28.9	28.1	20.8	23.7	26.4	24.4	25.3	26.3	26.9	22.6	18.4	14.1	16.8	18.0	19.8	18.0
MIN	7.7	10.9	12.8	11.6	13.9	17.4	12.1	17.6	17.5	15.1	14.8	13.8	10.9	8.8	16.0	14.2	10.5	9.1	10.2	12.3	9.0	8.6	6.1	7.6	7.3

DAY	26	27	28	29	30	31
AVE	10.3	10.3	14.1	10.2	9.0	***
MAX	14.1	15.4	16.9	16.2	13.1	***
MIN	6.1	4.4	11.7	5.3	5.6	***

MONTHLY AVERAGE = 16.6 MONTHLY MAXIMUM = 29.5 MONTHLY MINIMUM = 4.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
NOVEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.2	0.4	0.3	0.4	1.1	0.9	1.1	0.4	-0.5	-1.6	-1.4	-1.3	-0.9	-0.9	-0.6	-0.4	0.0	0.6	0.7	0.5	0.9	0.7	0.7	1.4	0.1
2	1.0	0.7	1.2	1.1	0.7	1.4	1.5	0.5	-0.2	-0.6	-0.7	-0.6	-0.7	-0.5	-0.3	-0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
3	0.2	0.3	0.2	0.3	0.3	0.3	0.4	0.6	-0.1	-1.0	-1.1	-1.3	-1.2	-1.0	-0.7	-0.6	-0.3	0.4	0.7	0.8	0.5	0.9	0.6	0.9	0.0
4	0.8	0.7	0.9	0.7	0.6	0.6	0.9	-0.2	-0.9	-1.2	-0.9	-0.8	-0.7	-0.6	-0.7	-0.6	-0.2	0.4	0.7	0.7	0.7	0.8	0.7	0.7	0.1
5	0.9	0.9	0.8	0.5	0.8	0.6	0.8	0.1	-0.1	-1.3	-1.4	-1.1	-0.8	-0.7	-0.7	-0.5	0.1	0.3	0.5	0.6	0.7	0.3	0.6	0.6	0.1
6	0.6	0.5	0.2	0.3	0.4	0.5	0.7	0.4	0.1	0.2	-0.2	-0.6	-0.7	-0.7	-0.5	-0.2	-0.2	0.3	0.7	0.5	0.5	0.6	0.9	0.8	0.2
7	0.6	0.4	0.7	0.6	0.5	0.6	0.5	0.2	-0.5	-1.1	-0.9	-1.0	-0.7	-0.6	-0.6	-0.2	0.2	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.1
8	0.7	0.2	0.1	0.2	0.1	0.1	0.1	-0.1	-0.4	-0.2	-0.9	-0.7	-0.8	-0.5	-0.5	-0.2	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.4	-0.1
9	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.0	-0.2	-0.5	-0.6	-0.6	-0.6	-0.5	-0.4	-0.3	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.0
10	0.5	0.6	0.3	0.8	1.2	0.7	0.7	0.3	-0.4	-0.9	-1.1	-0.7	-0.8	-0.9	-0.8	-0.7	-0.1	0.3	0.4	0.6	0.3	0.4	0.6	0.6	0.1
11	0.6	0.5	0.8	0.4	0.5	0.5	0.5	-0.2	-0.4	-0.7	-0.6	-0.8	-0.9	-0.7	-0.8	-0.7	-0.2	0.3	0.5	0.6	0.5	0.6	0.8	0.6	0.1
12	0.6	0.2	0.1	0.0	0.1	0.0	0.1	-0.1	-0.6	-0.8	-1.2	-1.3	-1.1	-0.9	-0.5	-0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.2
13	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.1	-0.6	-1.3	-1.4	-1.5	-1.3	-1.1	-0.6	-0.6	-0.2	0.3	0.5	0.5	0.4	0.6	0.6	0.6	-0.2
14	0.5	0.6	0.7	0.5	0.6	0.5	0.5	-0.1	-1.1	-1.3	-1.0	-1.2	-0.9	-0.7	-0.5	-0.3	0.3	0.4	0.6	0.7	0.7	0.6	0.5	0.6	0.1
15	0.6	0.6	0.8	0.4	0.3	0.3	0.3	0.1	-0.3	-0.6	-0.8	-0.7	-0.6	-0.4	-0.3	-0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.1
16	0.3	0.3	0.3	0.3	0.3	0.6	0.4	0.4	-0.2	-0.7	-0.8	-1.1	-1.0	-0.7	-0.4	-0.2	0.2	0.3	0.4	0.3	0.3	0.5	0.6	0.7	0.1
17	0.5	0.5	0.6	0.8	0.8	1.0	1.4	0.1	-0.8	-1.5	-1.5	-1.6	-1.0	-0.7	-0.4	-0.2	0.2	0.3	0.6	0.4	0.5	0.8	1.0	1.4	0.1
18	1.1	0.7	0.6	0.6	0.6	0.6	0.9	0.4	-1.1	-1.2	-1.2	-1.1	-0.9	-0.7	-0.5	-0.4	0.2	0.7	0.6	0.6	0.7	0.9	0.8	0.8	0.2
19	0.8	0.7	0.7	0.9	0.7	0.7	0.6	0.6	0.2	-0.9	-1.1	-1.2	-0.6	-0.1	0.2	0.0	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.2
20	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.2	0.1	0.0	-0.3	-0.2	-0.1	0.0	0.1	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.1
21	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	-0.3	-0.5	-0.6	-0.6	-0.2	-0.1	-0.3	0.1	0.2	0.2	0.2	0.1	0.0	-0.1	0.0	0.1	0.0
22	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	-0.6	-1.1	-1.1	-1.0	-0.8	-0.7	-0.7	-0.5	-0.2	0.2	0.3	0.4	0.4	0.5	0.3	0.5	-0.1
23	0.5	0.8	0.5	0.5	1.2	0.7	0.9	0.6	-0.6	-0.4	-0.4	-0.4	-0.3	-0.1	0.1	0.2	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.3
24	0.5	0.6	0.7	0.9	1.1	0.8	1.0	0.6	-0.2	-0.5	-0.6	-0.8	-0.7	-0.4	-0.1	0.2	0.6	0.5	0.6	0.6	0.4	0.6	0.6	0.6	0.3
25	0.9	0.7	0.4	0.4	0.5	0.7	0.5	0.6	0.0	-0.5	-0.3	-0.4	-0.4	-0.5	-0.3	-0.2	0.0	0.5	0.6	0.7	0.5	0.4	0.3	0.3	0.2
26	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	-0.5	-0.5	-0.7	-0.6	-0.6	-0.6	-0.5	-0.1	0.5	0.5	0.4	0.9	0.6	0.4	0.4	0.1
27	0.2	0.3	0.3	0.5	0.6	0.5	0.6	0.3	-0.3	-0.5	-0.6	-0.1	-0.3	-0.3	-0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1
28	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-0.2	-0.1	-0.4	-0.3	-0.3	-0.4	-0.2	0.0	0.1	0.2	0.2	0.4	0.3	0.4	0.4	0.0
29	0.3	0.2	0.2	0.3	0.2	0.3	0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.5	-0.6	-0.6	-0.3	0.1	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.1
30	0.3	0.3	0.5	0.3	0.4	0.3	0.4	0.1	-0.6	-0.7	-0.7	-0.6	-0.6	-0.6	-0.5	-0.5	-0.1	0.2	0.5	0.7	0.7	0.6	0.4	0.5	0.1
HRAVE	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.2	-0.4	-0.7	-0.8	-0.8	-0.7	-0.6	-0.4	-0.3	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.2	0.0	0.1	0.1	0.2	0.1	-0.1	0.0	0.1	0.1	-0.2	-0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.0	-0.1	0.3	0.3	0.2
MAX	1.4	1.5	0.9	0.9	0.9	0.9	0.7	0.7	0.4	1.2	0.8	0.6	0.6	0.7	0.8	0.7	1.4	1.1	0.9	0.3	0.2	0.5	1.2	1.1	0.9
MIN	-1.6	-0.7	-1.3	-1.2	-1.4	-0.7	-1.1	-0.9	-0.6	-1.1	-0.9	-1.3	-1.5	-1.3	-0.8	-1.1	-1.6	-1.2	-1.2	-0.3	-0.6	-1.1	-0.6	-0.8	-0.5

DAY	26	27	28	29	30	31
AVE	0.1	0.1	0.0	0.1	0.1	***
MAX	0.9	0.6	0.4	0.5	0.7	***
MIN	-0.7	-0.6	-0.4	-0.6	-0.7	***

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = -1.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
NOVEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	705	705	705	705	705	705	706	706	707	707	707	706	705	704	704	704	704	704	704	705	705	705	705	706	705
2	706	706	706	706	706	706	706	707	707	707	706	706	705	704	703	703	703	702	703	703	703	703	703	703	705
3	703	703	703	703	703	703	703	704	704	704	704	703	702	701	701	700	700	700	701	701	701	701	701	701	702
4	702	702	702	702	702	702	702	703	703	703	703	702	701	701	700	700	700	700	701	701	701	702	702	702	702
5	703	703	703	703	703	703	704	704	705	704	704	703	703	702	701	701	701	701	701	701	701	702	701	701	702
6	701	701	701	701	701	701	701	702	702	702	702	702	701	700	700	700	700	700	700	701	702	702	702	702	701
7	703	703	703	703	704	704	705	705	706	706	706	705	704	704	703	703	704	704	704	705	705	705	706	706	704
8	706	706	706	706	706	706	706	707	707	707	707	706	706	705	705	704	704	704	704	705	705	705	705	705	705
9	705	705	705	704	704	704	704	705	705	705	705	704	703	703	702	702	702	702	702	702	702	703	703	703	703
10	703	703	703	703	703	702	703	703	703	703	703	702	701	701	700	700	700	700	700	701	701	701	701	701	702
11	701	701	702	702	702	702	702	703	703	703	703	703	702	701	701	701	701	702	702	702	703	703	704	704	702
12	704	705	705	705	706	706	707	707	708	708	707	706	706	705	704	704	704	704	704	704	704	704	704	704	705
13	704	704	704	703	703	703	704	704	704	704	704	704	703	702	701	701	701	701	701	702	702	703	703	703	703
14	703	703	704	704	704	704	705	705	706	706	706	705	705	704	703	703	703	704	704	705	705	705	705	706	704
15	706	706	706	706	706	706	706	706	706	707	706	705	705	704	703	703	702	702	702	702	703	703	703	703	704
16	703	703	703	703	703	703	703	703	703	703	703	703	702	701	701	701	701	701	701	702	702	702	703	703	702
17	703	703	703	703	703	703	704	704	704	704	704	704	703	703	702	702	702	702	702	702	703	703	703	703	703
18	703	703	703	703	703	703	703	704	704	704	703	703	702	701	700	700	700	700	700	700	701	701	701	701	702
19	701	701	701	701	701	701	701	701	701	701	700	699	698	697	699	699	699	698	698	697	697	696	696	696	699
20	696	695	695	694	694	695	695	695	696	696	696	696	696	696	695	695	695	695	695	695	696	697	698	698	696
21	698	698	698	698	698	698	699	699	699	700	700	700	699	700	700	701	701	702	702	703	704	704	704	705	700
22	705	705	705	705	705	705	705	705	706	706	706	706	705	704	704	704	704	704	704	705	705	705	706	706	705
23	706	705	705	705	705	705	706	706	707	707	707	706	705	704	704	704	704	704	704	704	704	704	705	705	705
24	705	705	704	705	704	705	705	705	706	706	705	705	704	703	702	702	702	702	702	702	702	702	702	702	703
25	702	701	701	700	700	700	700	700	700	700	700	699	698	696	695	695	694	694	694	694	694	695	695	695	698
26	696	696	696	696	696	697	698	699	700	700	700	700	700	700	699	699	699	699	700	700	700	700	700	700	699
27	700	700	699	699	699	699	699	699	699	699	699	698	696	696	695	694	694	694	694	694	695	695	695	696	697
28	695	696	696	696	696	696	696	696	697	698	698	698	697	697	696	696	696	696	696	696	696	696	696	696	696
29	695	695	695	694	693	692	692	694	697	698	699	699	699	699	699	700	700	701	701	701	702	702	702	703	698
30	703	703	703	703	703	704	705	705	706	706	707	706	706	705	705	705	705	705	705	705	705	705	705	705	705
HRAVE	702	702	702	702	702	702	702	703	703	703	703	703	702	701	701	701	701	701	701	701	702	702	702	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	705	705	702	702	702	701	704	705	703	702	702	705	703	704	704	702	703	702	699	696	700	705	705	703	698
MAX	707	707	704	703	705	702	706	707	705	703	704	708	704	706	707	703	704	704	701	698	705	706	707	706	702
MIN	704	702	700	700	701	700	703	704	702	700	701	704	701	703	702	701	702	700	696	694	698	704	704	702	694

DAY	26	27	28	29	30	31
AVE	699	697	696	698	705	***
MAX	700	700	698	703	707	***
MIN	696	694	695	692	703	***

MONTHLY AVERAGE = 701.9 MONTHLY MAXIMUM = 707.5 MONTHLY MINIMUM = 692.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
NOVEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	15	16	17	17	22	23	24	22	23	19	14	13	13	14	15	13	12	13	16	15	15	17	17	21	17
2	22	24	25	27	28	27	27	23	17	16	15	15	15	15	14	14	15	15	16	17	18	19	20	21	19
3	22	23	23	24	25	26	28	31	28	25	22	19	18	17	16	16	17	18	19	20	23	25	27	29	23
4	30	32	34	35	37	39	39	37	35	29	25	22	20	19	18	19	19	21	22	25	26	27	29	30	28
5	32	33	35	36	37	36	37	38	35	29	24	23	22	24	25	26	27	28	29	33	33	35	34	35	31
6	37	39	41	42	43	46	51	67	68	70	68	62	52	48	46	46	42	36	37	38	40	47	58	66	50
7	71	71	73	75	74	79	82	81	69	58	53	50	46	40	34	30	31	33	34	35	40	42	42	45	54
8	48	48	54	58	59	61	61	60	56	56	49	45	40	36	33	36	38	39	39	40	41	43	45	47	47
9	47	48	48	48	50	51	52	52	50	45	42	38	35	34	34	34	35	37	38	39	40	41	43	49	43
10	51	54	57	59	62	64	67	65	61	55	47	41	38	35	34	33	36	39	42	43	44	47	51	53	49
11	56	57	59	61	63	65	67	63	59	51	46	39	34	34	32	31	32	34	37	39	42	44	46	49	47
12	49	47	51	52	52	52	51	49	45	42	37	35	34	33	33	34	35	38	38	39	40	41	41	43	42
13	44	45	47	46	47	48	49	48	45	41	36	33	30	27	27	28	28	29	32	34	37	40	42	44	39
14	45	49	51	52	54	54	56	54	46	38	34	29	26	22	20	20	21	23	24	27	27	29	32	33	36
15	34	34	33	33	33	33	34	33	32	30	28	26	26	24	24	23	23	23	24	25	26	26	28	28	28
16	30	31	34	35	33	36	37	38	33	31	30	27	25	24	23	22	24	25	27	28	29	32	33	34	30
17	37	39	41	43	44	45	48	47	40	34	30	24	22	20	20	21	21	21	21	24	25	27	30	33	31
18	35	36	38	40	42	42	46	45	38	32	27	25	22	18	17	18	18	19	20	22	24	25	27	27	29
19	29	31	32	35	35	35	37	34	33	29	25	22	21	24	64	96	99	94	93	99	92	86	96	96	56
20	99	100	100	100	100	100	100	100	99	100	99	97	92	79	72	79	78	83	89	83	90	99	100	97	93
21	100	100	100	100	100	100	100	100	94	84	78	75	81	94	89	96	93	99	100	98	100	100	100	100	95
22	100	100	100	100	100	100	100	100	100	91	84	79	71	63	57	55	57	61	65	75	76	80	83	86	83
23	92	92	95	95	97	96	94	97	92	73	60	55	49	44	42	41	42	46	46	45	48	50	51	55	66
24	59	63	70	75	85	84	88	86	82	76	68	60	45	41	40	41	45	50	54	59	62	66	73	77	64
25	86	86	86	89	95	95	96	97	91	82	78	70	63	60	58	55	58	63	66	70	63	57	58	61	74
26	58	57	64	67	66	61	60	60	56	48	42	37	30	28	26	27	28	30	33	40	48	49	50	57	47
27	57	55	58	63	65	66	64	68	62	60	51	48	47	47	49	50	55	63	62	63	66	70	73	72	60
28	70	69	69	70	70	70	70	71	71	71	78	75	71	67	65	65	68	69	70	72	73	71	65	65	70
29	67	67	75	73	70	78	94	100	100	100	100	100	94	75	67	67	59	57	71	79	85	86	87	85	81
30	90	90	94	95	95	97	98	99	94	80	67	55	51	46	43	43	46	49	57	67	69	66	63	62	72
HRAVE	54	54	57	58	59	60	62	62	58	53	49	45	41	38	38	39	40	42	44	46	48	50	51	53	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	17	19	23	28	31	50	54	47	43	49	47	42	39	36	28	30	31	29	56	93	95	83	66	64	74
MAX	24	28	31	39	38	70	82	61	52	67	67	52	49	56	34	38	48	46	99	100	100	100	97	88	97
MIN	12	14	16	18	22	36	30	33	34	33	31	33	27	20	23	22	20	17	21	72	75	55	41	40	55

DAY	26	27	28	29	30	31
AVE	47	60	70	81	72	***
MAX	67	73	78	100	99	***
MIN	26	47	65	57	43	***

MONTHLY AVERAGE = 50.1 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 12.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
NOVEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.52	0.67	0.74	0.76	0.70	0.58	0.40	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	5.04
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.31	0.51	0.58	0.62	0.69	0.68	0.55	0.36	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.52
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.24	0.43	0.55	0.72	0.72	0.66	0.54	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.48
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.32	0.49	0.64	0.71	0.72	0.66	0.54	0.37	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.71
5	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.17	0.46	0.63	0.70	0.62	0.54	0.47	0.34	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.14
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.12	0.27	0.67	0.66	0.59	0.48	0.13	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.15
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.20	0.39	0.55	0.62	0.63	0.61	0.51	0.35	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.05
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.23	0.16	0.71	0.47	0.44	0.27	0.46	0.16	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.09
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.20	0.37	0.48	0.54	0.55	0.48	0.32	0.19	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.31
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.15	0.36	0.53	0.63	0.68	0.63	0.51	0.34	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.95
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.17	0.34	0.52	0.65	0.66	0.58	0.50	0.33	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.01
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.44	0.58	0.66	0.67	0.62	0.50	0.34	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.30
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.45	0.58	0.66	0.68	0.62	0.50	0.34	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.33
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.45	0.59	0.67	0.68	0.62	0.51	0.34	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.37
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.43	0.55	0.46	0.49	0.41	0.39	0.34	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.53
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.19	0.43	0.28	0.52	0.66	0.60	0.48	0.31	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.67
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.44	0.58	0.66	0.61	0.40	0.23	0.33	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.73
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.44	0.58	0.66	0.66	0.60	0.49	0.25	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.09
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.34	0.35	0.42	0.21	0.05	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.03	0.07	0.08	0.28	0.27	0.17	0.12	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.20	0.30	0.28	0.31	0.13	0.14	0.18	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.41	0.54	0.62	0.65	0.60	0.50	0.36	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.11
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.43	0.56	0.64	0.63	0.55	0.40	0.26	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.87
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.14	0.23	0.27	0.53	0.65	0.59	0.48	0.31	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.34
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.13	0.27	0.34	0.37	0.44	0.47	0.31	0.23	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.69
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.42	0.56	0.65	0.66	0.60	0.49	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.93
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.15	0.22	0.25	0.21	0.24	0.22	0.18	0.09	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.62
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.10	0.13	0.28	0.24	0.26	0.27	0.16	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.05	0.09	0.49	0.57	0.52	0.20	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.40	0.55	0.63	0.64	0.58	0.47	0.31	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.95
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.19	0.35	0.46	0.54	0.56	0.51	0.42	0.27	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.04	4.52	4.48	4.71	4.14	3.15	4.05	3.09	3.31	3.95	4.01	4.30	4.33	4.37	3.53	3.67	3.73	4.09	1.50	1.18	1.60	4.11	3.87	3.34	2.69
MAX	0.76	0.69	0.72	0.72	0.70	0.67	0.63	0.71	0.55	0.68	0.66	0.67	0.68	0.68	0.55	0.66	0.66	0.66	0.42	0.28	0.31	0.65	0.64	0.65	0.47
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	3.93	1.62	1.59	2.02	3.95	***
MAX	0.66	0.25	0.28	0.57	0.64	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.8 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
NOVEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.25	0.05	0.01	0.11	0.05	0.00	0.02	0.03	0.60
20	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.02	0.02	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.05	0.09	0.12	0.04	0.40
21	0.01	0.01	0.00	0.00	0.00	0.00	0.16	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.06	0.03	0.09	0.02	0.02	0.12	0.04	0.00	0.03	0.65
22	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.15	0.15	0.07	0.05	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.40	0.65	0.04	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.12	0.16	0.03	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.64	0.00	***
MAX	0.00	0.00	0.00	0.15	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 2.37 MONTHLY MAXIMUM = 0.25 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
DECEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	10.9	9.4	9.3	9.3	7.6	9.6	8.4	10.8	11.0	19.7	21.6	17.2	14.5	20.1	22.9	23.0	18.7	17.8	18.6	21.2	22.6	23.1	18.0	17.9	16.0
2	16.6	17.1	15.5	13.4	13.1	16.5	20.9	21.2	19.6	14.3	16.4	17.0	16.6	14.2	10.9	7.8	5.5	4.4	7.6	11.6	13.7	7.8	5.4	8.1	13.1
3	8.9	9.8	7.7	8.5	7.9	8.4	8.7	8.5	9.2	8.0	7.9	8.3	8.2	6.4	3.5	4.6	4.0	12.6	5.1	13.7	11.4	11.1	6.7	4.1	8.1
4	7.9	7.7	8.2	12.4	7.4	7.1	4.8	4.4	7.9	10.1	11.0	7.9	9.2	6.2	1.9	2.9	7.3	5.3	11.1	11.2	12.5	12.1	16.7	8.1	8.4
5	3.1	2.7	2.6	3.7	9.7	9.9	3.9	3.8	2.2	4.4	6.1	4.0	5.8	7.2	8.5	7.9	7.7	8.1	9.0	7.5	5.2	4.8	5.5	6.2	5.8
6	8.3	7.2	7.5	7.6	8.3	7.8	8.2	8.2	8.2	7.6	11.4	10.2	13.4	11.7	11.8	12.1	10.8	10.0	10.9	9.9	9.4	8.8	6.5	5.8	9.2
7	5.8	7.3	10.3	8.5	7.4	6.1	9.1	10.7	8.2	7.6	7.3	4.2	3.9	6.0	2.6	3.0	2.5	3.8	4.8	8.7	12.7	11.2	8.9	6.6	7.0
8	3.6	4.3	3.0	4.9	4.8	2.6	4.6	4.7	2.8	2.2	2.0	1.9	2.6	3.8	5.2	7.0	9.3	7.1	4.7	8.6	4.5	3.9	4.0	4.0	4.4
9	2.9	6.0	5.4	4.9	7.6	7.3	6.3	6.7	6.5	4.8	6.4	7.4	11.4	11.6	8.6	4.2	5.2	8.3	8.4	5.3	4.0	2.4	6.9	5.6	6.4
10	4.3	4.2	2.7	5.9	5.5	6.2	5.0	3.6	6.2	5.5	5.1	4.9	5.4	3.3	7.0	5.3	7.6	4.2	4.1	7.9	12.1	11.7	12.1	8.6	6.2
11	8.7	7.6	9.0	10.8	13.0	16.3	15.6	8.6	14.5	12.8	12.3	18.5	14.9	12.0	11.5	10.5	9.2	9.2	12.9	12.1	5.3	2.2	5.7	6.7	10.8
12	7.1	8.0	7.5	7.3	7.1	7.2	7.7	7.7	8.0	7.9	7.3	4.5	3.1	2.0	2.9	3.9	5.2	8.9	10.4	3.4	3.1	5.9	4.9	5.7	6.1
13	7.2	6.6	7.0	7.1	6.7	6.0	6.1	6.0	6.5	6.5	6.1	2.5	2.2	3.1	2.7	4.5	11.3	10.6	10.5	9.9	2.6	1.1	4.6	6.3	6.0
14	6.9	6.3	6.1	4.5	4.0	5.1	8.5	4.5	4.5	2.3	1.5	4.4	3.8	6.1	9.9	13.4	10.6	7.6	4.8	3.9	4.3	4.9	3.9	5.8	5.7
15	3.9	6.2	3.6	3.6	1.9	1.5	3.6	5.2	2.0	1.2	9.0	13.3	14.4	16.1	18.5	15.3	15.2	7.9	7.0	4.1	4.6	6.4	4.7	3.0	7.2
16	3.8	6.4	4.3	3.5	3.9	4.7	7.0	7.1	7.9	6.0	4.1	7.1	4.1	4.1	5.3	4.7	3.5	6.6	17.3	26.0	24.0	9.4	8.7	11.4	7.9
17	17.1	22.1	23.9	19.9	19.1	13.4	13.8	14.9	15.1	18.5	18.7	16.2	19.6	18.7	21.7	20.0	16.0	14.6	11.9	15.8	22.1	22.9	23.5	20.4	18.3
18	20.0	20.6	24.1	26.9	27.9	29.1	28.8	30.2	29.8	35.3	31.9	28.2	25.4	26.9	25.4	25.4	23.2	21.1	20.6	22.4	21.4	19.4	19.3	21.8	25.2
19	20.6	21.3	22.2	20.5	20.3	17.4	16.7	17.6	16.6	16.0	7.7	6.7	8.5	6.0	3.5	5.7	6.6	4.8	8.1	7.2	4.4	3.0	4.4	4.5	11.3
20	6.5	7.5	8.9	6.7	3.1	5.4	10.6	11.6	11.8	11.2	9.4	7.3	11.6	13.8	16.1	15.3	14.9	16.1	18.2	20.5	20.6	16.3	15.7	14.1	12.2
21	11.2	12.1	16.2	15.6	14.6	13.5	14.9	14.0	12.1	12.0	17.5	18.2	14.0	13.5	15.0	15.4	18.9	17.2	20.9	23.5	23.1	21.8	18.5	16.9	16.3
22	15.5	18.6	17.6	18.7	20.7	20.4	18.1	20.8	20.5	23.2	18.9	18.5	13.0	13.4	15.4	17.9	17.0	15.5	23.5	20.8	20.4	18.4	16.0	15.9	18.3
23	16.0	14.4	11.9	10.6	8.9	11.6	12.6	10.3	9.0	10.3	12.1	14.0	12.4	8.4	10.7	9.5	13.1	13.0	10.9	8.2	8.4	10.0	9.9	7.0	11.0
24	7.3	7.3	7.9	7.9	7.6	12.5	11.0	10.4	8.0	9.5	8.4	19.3	13.9	8.3	15.4	17.8	8.9	5.1	6.6	4.2	2.3	5.0	3.8	6.5	9.0
25	7.6	6.5	5.2	4.9	3.0	2.8	5.1	7.3	6.8	3.8	5.8	8.6	5.5	8.5	13.5	11.6	10.8	5.1	2.9	1.7	3.3	4.9	5.8	4.3	6.1
26	4.7	7.3	8.7	7.4	7.1	8.2	8.8	9.8	9.8	7.4	5.2	3.6	2.7	3.4	3.6	7.3	7.5	11.6	14.4	12.4	12.8	19.3	18.5	17.1	9.1
27	15.7	13.2	4.5	16.1	7.5	5.7	10.8	4.7	4.7	2.0	5.8	5.7	5.7	12.0	9.2	10.5	13.1	8.6	7.5	4.5	2.5	2.0	3.3	0.6	7.3
28	1.8	2.5	3.6	1.8	2.2	3.7	3.1	3.8	6.6	11.2	13.2	16.6	15.7	18.8	23.5	19.6	18.2	9.7	8.4	6.0	6.8	5.9	4.9	3.2	8.8
29	4.8	3.3	6.1	5.1	5.8	3.2	5.3	7.2	7.5	4.6	3.6	4.6	7.2	8.0	6.2	5.2	4.1	2.6	5.6	6.4	8.6	10.6	9.6	7.8	6.0
30	9.3	6.8	9.3	15.8	16.3	16.6	18.5	17.7	15.4	17.9	21.3	20.1	22.1	20.9	22.3	21.9	25.6	22.6	19.9	20.4	20.2	23.7	23.7	21.3	18.7
31	20.1	19.2	22.0	26.0	22.5	20.1	21.0	21.2	21.0	21.4	21.7	23.6	22.1	18.0	19.8	20.0	22.0	18.1	17.4	15.8	16.2	12.3	9.9	6.3	19.1
HRAVE	9.3	9.7	9.7	10.3	9.8	9.9	10.6	10.4	10.3	10.5	10.9	11.1	10.7	10.7	11.4	11.4	11.4	10.3	11.1	11.4	11.1	10.4	10.0	9.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16.0	13.1	8.1	8.4	5.8	9.2	7.0	4.4	6.4	6.2	10.8	6.1	6.0	5.7	7.2	7.9	18.3	25.2	11.3	12.2	16.3	18.3	11.0	9.0	6.1
MAX	23.1	21.2	13.7	16.7	9.9	13.4	12.7	9.3	11.6	12.1	18.5	10.4	11.3	13.4	18.5	26.0	23.9	35.3	22.2	20.6	23.5	23.5	16.0	19.3	13.5
MIN	7.6	4.4	3.5	1.9	2.2	5.8	2.5	1.9	2.4	2.7	2.2	2.0	1.1	1.5	1.2	3.5	11.9	19.3	3.0	3.1	11.2	13.0	7.0	2.3	1.7

DAY	26	27	28	29	30	31
AVE	9.1	7.3	8.8	6.0	18.7	19.1
MAX	19.3	16.1	23.5	10.6	25.6	26.0
MIN	2.7	0.6	1.8	2.6	6.8	6.3

MONTHLY AVERAGE = 10.5 MONTHLY MAXIMUM = 35.3 MONTHLY MINIMUM = 0.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
DECEMBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	81	101	129	145	123	99	102	81	94	73	74	68	51	41	44	43	45	45	51	47	48	49	66	66	132
2	68	69	73	79	78	72	68	66	68	64	70	58	55	59	52	38	58	34	50	29	39	37	142	116	34
3	118	129	107	118	113	123	117	111	111	136	139	149	162	163	208	80	360	51	25	46	12	309	299	334	126
4	108	141	99	126	108	95	140	98	77	75	59	63	67	76	52	338	64	321	301	289	285	289	289	294	220
5	185	121	55	316	314	312	52	101	134	96	65	302	291	301	296	272	286	315	294	306	306	84	89	105	274
6	109	105	114	95	99	109	109	111	126	119	77	71	64	58	53	47	54	56	48	55	62	78	81	44	309
7	110	136	124	127	121	139	121	126	126	137	151	151	108	92	123	254	294	306	316	318	309	298	316	307	263
8	340	79	114	123	111	56	91	91	148	110	100	94	98	294	284	289	300	314	226	299	307	296	335	238	110
9	65	137	99	86	98	89	95	100	104	345	310	148	65	62	77	111	44	40	27	50	39	65	91	86	308
10	64	104	61	89	101	92	109	91	98	107	125	148	166	121	56	65	73	55	23	48	44	49	58	107	66
11	123	127	106	103	80	73	80	130	74	64	58	54	51	54	45	41	51	41	42	41	346	37	93	119	46
12	116	116	111	111	115	107	101	98	116	129	151	141	161	143	249	253	264	294	302	342	133	105	111	96	29
13	103	101	98	96	92	108	96	110	118	118	107	148	250	253	256	270	282	294	300	300	305	160	114	92	52
14	109	103	111	109	81	113	92	97	87	116	302	278	269	255	285	277	304	300	313	175	111	87	80	85	36
15	71	75	330	55	302	187	60	95	97	245	287	287	264	285	298	295	289	259	244	171	285	284	239	131	217
16	137	108	80	74	83	115	111	106	117	140	133	83	101	272	240	247	263	325	36	26	33	49	49	84	199
17	39	37	40	52	64	91	89	68	60	71	66	66	72	71	94	107	93	97	96	86	84	87	86	83	308
18	88	79	79	84	90	86	84	80	81	84	77	79	79	74	83	85	77	67	64	68	68	68	73	69	32
19	71	71	68	70	66	65	66	62	64	66	123	76	80	80	39	280	282	304	301	320	7	79	106	114	89
20	139	129	122	130	356	137	134	107	114	129	150	124	54	40	38	44	43	42	42	46	48	62	72	69	61
21	87	78	70	71	67	74	74	79	82	83	73	59	65	55	65	54	50	54	49	48	53	62	67	69	37
22	73	68	68	69	64	65	62	53	54	59	60	54	59	66	54	48	49	52	48	56	53	63	72	74	30
23	68	72	88	95	113	86	85	100	130	129	90	73	77	107	100	94	64	72	91	120	104	134	88	307	111
24	39	15	31	44	80	130	124	354	44	301	324	71	81	140	129	202	300	43	94	137	159	159	243	285	127
25	279	269	258	283	313	150	78	88	90	311	34	77	93	328	309	306	309	291	192	97	89	115	101	93	255
26	126	115	112	93	95	120	116	120	129	141	140	143	131	138	138	68	50	301	304	286	290	290	299	306	171
27	313	310	287	80	160	130	87	135	120	224	38	66	89	129	206	269	297	309	314	302	291	147	299	248	31
28	189	169	174	18	177	191	195	236	290	272	265	271	264	266	271	268	307	306	321	349	58	57	52	66	233
29	82	73	75	77	60	24	109	98	100	135	143	115	81	83	72	84	91	68	45	68	71	66	68	94	228
30	126	123	77	52	49	61	70	71	75	64	68	70	60	53	54	47	45	45	59	60	61	71	63	60	317
31	59	55	53	44	48	62	68	68	65	64	65	55	42	48	45	40	45	45	49	51	47	54	116	104	40

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
DECEMBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	9	14	6	5	16	18	23	16	16	7	7	13	16	11	10	10	9	10	11	8	9	8	10	9	11
2	7	7	8	10	10	8	8	6	8	14	12	13	15	13	11	21	22	26	13	14	11	43	28	7	14
3	6	8	6	6	5	6	6	9	7	7	14	13	13	13	26	27	21	12	39	16	51	10	12	51	16
4	25	23	42	17	19	12	30	41	12	9	9	10	9	13	39	32	8	35	6	8	8	10	7	16	18
5	33	13	45	39	10	12	31	19	25	14	17	36	23	21	19	12	8	8	12	9	31	12	14	12	20
6	7	10	7	8	7	6	9	6	7	25	13	14	17	16	15	12	9	11	11	15	14	11	23	20	12
7	21	11	6	6	6	7	5	5	10	10	11	32	32	14	28	17	10	13	20	11	8	9	31	24	15
8	44	16	43	16	13	41	14	24	24	45	42	33	26	15	10	8	6	10	27	8	12	30	35	63	25
9	30	32	24	16	10	13	12	11	22	54	53	26	10	11	9	21	19	14	13	22	50	17	10	14	21
10	17	23	33	9	11	8	9	11	7	12	18	19	19	58	23	20	8	46	30	19	12	10	11	11	18
11	15	20	21	19	13	7	9	20	10	11	14	12	15	18	17	14	13	10	8	12	19	60	16	9	16
12	6	6	8	6	5	6	6	7	7	11	13	20	29	41	52	17	8	5	7	38	15	10	10	11	14
13	7	8	8	7	7	8	7	7	12	8	18	32	54	23	28	25	5	4	5	6	26	18	8	12	14
14	7	10	12	11	13	10	6	13	11	21	29	13	20	16	15	10	12	11	10	35	13	27	33	10	15
15	27	21	46	50	23	38	47	13	65	52	9	14	13	17	11	14	10	8	11	25	25	10	17	37	25
16	14	13	22	16	18	16	12	9	9	10	28	20	39	42	24	20	20	23	16	14	14	19	29	25	20
17	21	13	12	17	13	16	13	13	11	7	9	11	10	11	13	10	12	9	8	8	8	9	8	8	11
18	9	8	7	8	9	10	9	8	8	11	9	12	11	9	12	12	10	10	10	8	8	8	9	8	9
19	8	8	7	8	7	8	10	9	11	7	23	21	13	16	34	19	11	18	7	8	19	10	14	16	13
20	10	6	6	10	73	52	13	8	9	8	11	30	19	18	14	9	8	9	9	7	8	9	6	11	15
21	10	11	10	5	9	6	6	7	9	9	7	14	16	17	11	13	9	11	9	9	11	8	9	6	10
22	8	8	6	7	9	8	12	13	12	10	14	13	15	13	12	11	9	9	7	11	12	9	9	7	10
23	9	9	13	15	16	12	11	15	15	13	20	7	9	22	23	12	11	9	14	22	23	16	50	45	17
24	50	66	46	59	40	42	22	27	49	25	31	7	33	36	9	27	12	29	17	30	45	34	61	13	34
25	9	25	25	12	18	25	11	19	22	14	23	12	23	44	12	11	13	24	23	11	12	16	13	12	18
26	11	9	6	8	6	6	5	4	5	12	16	32	43	37	37	24	26	9	13	8	8	9	8	9	15
27	11	13	27	14	30	13	13	11	26	24	22	12	16	12	23	13	10	12	11	12	23	37	28	23	18
28	16	12	25	43	22	18	24	40	12	11	13	14	15	12	10	12	14	15	16	36	9	10	11	21	18
29	14	32	8	10	24	32	14	8	8	14	22	26	17	18	27	26	18	17	12	7	5	6	6	16	16
30	8	13	11	9	11	10	7	8	8	12	11	12	15	15	14	13	11	13	15	13	14	11	10	12	12
31	12	14	12	11	14	12	10	8	11	12	14	14	15	18	14	11	9	11	9	9	9	13	12	11	12
HRAVE	16	16	18	15	16	16	13	13	15	16	18	18	20	21	19	16	12	14	14	15	17	16	18	18	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	11	14	16	18	20	12	15	25	21	18	16	14	14	15	25	20	11	9	13	15	10	10	17	34	18
MAX	23	43	51	42	45	25	32	63	54	58	60	52	54	35	65	42	21	12	34	73	17	15	50	66	44
MIN	5	6	5	6	8	6	5	6	9	7	7	5	4	6	8	9	7	7	7	6	5	6	7	7	9

DAY	26	27	28	29	30	31
AVE	15	18	18	16	12	12
MAX	43	37	43	32	15	18
MIN	4	10	9	5	7	8

MONTHLY AVERAGE = 16.2 MONTHLY MAXIMUM = 73.4 MONTHLY MINIMUM = 4.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
DECEMBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	7.8	6.5	5.0	4.2	4.2	4.9	4.4	5.5	6.4	9.4	10.9	12.4	14.1	14.8	15.3	15.4	15.5	14.9	14.1	14.0	13.7	13.3	12.2	11.9	10.4
2	11.3	10.8	10.5	9.7	9.2	10.0	10.0	10.0	10.9	12.5	14.4	15.5	16.7	17.4	17.9	18.0	17.3	16.8	16.1	16.0	15.3	14.3	11.9	11.0	13.5
3	10.2	8.7	8.7	7.4	7.4	6.6	6.8	6.9	8.2	9.3	13.2	15.7	17.8	19.1	19.5	19.0	18.4	18.0	17.5	17.8	17.2	15.9	14.7	14.6	13.3
4	14.1	13.8	14.1	13.4	14.0	14.6	13.6	13.5	14.2	14.8	16.0	18.4	20.2	20.7	21.8	21.6	20.5	20.0	19.3	18.5	18.0	17.4	16.1	15.7	16.9
5	15.2	14.9	14.6	13.4	12.6	12.5	12.4	12.0	12.4	14.1	15.2	16.7	17.9	18.5	19.0	19.1	18.6	17.5	15.9	15.1	14.3	13.1	12.3	11.4	14.9
6	11.1	10.4	10.0	9.2	9.2	8.8	8.6	8.8	9.2	11.3	15.5	16.9	18.0	18.8	18.7	19.1	18.5	18.3	18.5	17.9	16.9	15.8	14.6	13.4	14.1
7	13.0	12.4	12.4	12.2	11.7	10.4	10.3	10.2	11.1	13.4	15.2	17.3	19.4	21.2	21.4	20.8	20.3	19.5	18.5	18.1	17.1	16.4	14.7	13.2	15.4
8	12.9	12.9	12.8	12.5	12.7	12.6	12.3	12.3	12.5	13.2	13.9	14.5	15.0	15.3	15.9	16.3	16.1	15.9	15.0	15.0	15.0	14.4	13.6	12.9	14.0
9	12.5	12.3	12.3	12.1	12.2	12.1	11.9	11.7	11.9	12.2	12.4	11.1	10.6	11.1	11.8	12.4	12.6	12.1	11.7	11.0	10.6	9.5	8.9	8.2	11.5
10	7.8	7.1	6.7	6.1	5.6	5.3	5.1	5.0	6.5	8.5	11.1	13.1	14.9	16.3	16.6	16.8	15.5	15.0	14.1	13.3	13.4	12.8	12.0	10.3	10.8
11	9.4	9.0	8.6	8.6	9.2	9.6	9.6	7.4	10.1	12.2	13.2	13.7	14.8	16.0	16.8	17.0	16.5	15.8	15.1	14.5	13.0	12.4	10.6	9.5	12.2
12	9.1	7.9	7.6	6.6	6.0	5.7	5.3	4.9	7.0	9.5	11.5	13.7	15.3	16.8	17.7	17.8	17.4	16.2	15.1	13.7	12.5	11.1	10.3	9.0	11.2
13	8.7	7.8	7.2	7.0	6.1	5.9	5.5	5.6	6.9	9.2	12.4	14.4	16.2	17.7	19.0	19.6	19.0	17.4	16.1	15.3	14.1	13.0	11.1	10.2	11.9
14	9.6	9.0	8.6	7.7	7.2	6.2	6.3	6.2	6.9	9.2	11.7	13.7	16.2	18.6	20.1	20.5	19.5	17.7	16.2	15.4	14.2	13.3	11.8	11.5	12.4
15	10.7	10.0	10.0	9.4	9.6	9.2	8.7	9.0	9.8	11.5	13.5	15.4	16.0	15.4	14.4	14.5	13.6	12.2	11.1	10.0	10.1	9.4	8.2	8.6	11.3
16	7.1	6.1	5.2	4.4	3.6	2.8	2.4	2.7	4.3	6.5	8.7	10.7	12.1	12.3	13.1	13.3	12.9	11.6	10.4	9.2	8.7	8.2	7.8	7.6	8.0
17	7.4	6.9	6.3	5.8	5.5	5.4	5.2	4.9	5.5	6.7	8.3	9.7	10.9	12.0	13.4	13.3	12.6	11.6	10.6	9.9	9.2	9.1	8.5	7.9	8.6
18	7.6	6.8	6.4	7.0	7.5	7.6	7.5	7.3	7.7	9.1	10.1	11.6	12.6	12.9	13.6	13.8	13.2	12.5	11.8	11.1	10.6	10.2	9.9	9.6	9.9
19	9.3	9.1	8.9	8.7	8.2	7.2	6.7	6.4	7.3	8.7	10.9	12.7	14.1	14.9	15.7	16.0	15.4	14.0	12.1	11.1	10.7	9.3	7.6	6.5	10.5
20	5.9	5.1	4.9	4.7	2.9	1.6	1.9	3.5	4.5	7.1	10.1	13.2	15.0	15.8	16.7	17.1	16.8	16.0	14.9	14.4	13.7	12.6	11.5	11.1	10.0
21	10.3	9.2	9.8	9.6	8.9	8.2	7.6	7.6	8.3	10.5	13.2	14.8	16.3	16.8	16.6	17.2	17.3	16.3	16.0	15.6	14.7	13.9	13.2	12.9	12.7
22	12.6	13.1	12.5	12.1	12.2	12.0	12.0	12.1	11.9	12.7	14.5	16.1	17.0	17.7	18.2	18.2	17.8	17.0	16.7	15.7	15.2	14.6	13.5	12.1	14.5
23	12.0	11.3	10.3	9.4	8.8	9.7	9.5	9.1	8.2	9.4	11.3	13.3	13.6	13.6	13.8	13.3	14.0	13.6	13.1	12.5	12.6	10.8	11.9	10.6	11.5
24	10.2	10.0	10.3	11.4	11.1	10.2	9.6	9.5	9.4	10.1	10.2	10.0	11.0	11.7	11.7	11.4	9.3	9.3	9.2	9.1	9.0	9.4	9.3	9.3	10.1
25	8.6	8.6	8.8	8.8	9.0	8.6	7.9	7.7	8.0	8.0	8.3	9.9	10.6	11.3	10.9	11.5	11.4	10.7	9.3	9.0	8.3	7.4	6.7	6.1	9.0
26	5.8	5.1	5.1	4.6	3.9	3.9	4.0	3.9	5.0	6.9	9.6	12.0	14.3	15.9	16.5	15.8	14.9	14.1	12.6	11.5	10.7	9.4	7.7	7.3	9.2
27	6.4	5.9	5.5	5.4	5.0	4.5	4.8	4.7	5.0	4.8	5.2	6.3	7.2	7.9	7.8	8.1	7.0	6.5	6.6	6.3	5.8	5.7	5.7	5.6	6.0
28	5.5	5.5	5.4	5.3	5.3	5.1	5.0	5.0	5.2	6.2	7.4	7.8	8.4	8.4	8.6	8.0	6.3	5.6	6.0	4.4	3.5	3.1	2.9	2.2	5.7
29	1.3	0.9	0.3	-0.2	-0.4	-0.8	-1.3	-1.1	0.4	2.1	4.2	5.8	7.1	7.7	7.9	8.1	7.9	7.6	6.8	5.4	4.6	3.9	3.8	3.6	3.6
30	3.1	2.5	3.4	4.3	4.2	3.8	3.6	3.6	4.3	5.6	6.0	6.6	7.5	8.1	8.7	9.3	9.3	9.2	9.0	9.0	9.1	8.9	8.5	8.5	6.5
31	8.5	8.6	8.5	8.4	8.2	7.8	7.9	7.8	8.2	8.8	9.5	10.5	10.8	11.8	11.9	12.1	12.0	11.4	10.8	10.2	10.0	9.6	7.5	6.6	9.5
HRAVE	9.2	8.7	8.4	8.0	7.8	7.5	7.3	7.2	8.0	9.5	11.2	12.7	13.9	14.7	15.2	15.3	14.8	14.0	13.2	12.6	12.0	11.2	10.3	9.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	10.4	13.5	13.3	16.9	14.9	14.1	15.4	14.0	11.5	10.8	12.2	11.2	11.9	12.4	11.3	8.0	8.6	9.9	10.5	10.0	12.7	14.5	11.5	10.1	9.0
MAX	15.5	18.0	19.5	21.8	19.1	19.1	21.4	16.3	12.6	16.8	17.0	17.8	19.6	20.5	16.0	13.3	13.4	13.8	16.0	17.1	17.3	18.2	14.0	11.7	11.5
MIN	4.2	9.2	6.6	13.4	11.4	8.6	10.2	12.3	8.2	5.0	7.4	4.9	5.5	6.2	8.2	2.4	4.9	6.4	6.4	1.6	7.6	11.9	8.2	9.0	6.1

DAY	26	27	28	29	30	31
AVE	9.2	6.0	5.7	3.6	6.5	9.5
MAX	16.5	8.1	8.6	8.1	9.3	12.1
MIN	3.9	4.5	2.2	-1.3	2.5	6.6

MONTHLY AVERAGE = 10.9 MONTHLY MAXIMUM = 21.8 MONTHLY MINIMUM = -1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
DECEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.5	0.5	0.4	0.7	1.1	0.6	0.6	0.3	-0.1	-0.3	-0.3	-0.3	-0.3	-0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.2
2	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.2	-0.1	-0.3	-0.5	-0.4	-0.3	-0.2	-0.1	0.0	0.3	0.4	0.6	0.4	0.4	0.5	0.8	0.7	0.2
3	0.7	0.8	0.6	1.0	0.7	0.8	0.4	0.1	-0.3	-0.5	-1.2	-1.3	-1.2	-0.9	-0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.1
4	0.4	0.3	0.3	0.2	0.3	0.5	0.4	0.3	0.2	0.0	-0.2	-0.6	-0.7	-0.2	-0.4	-0.2	0.3	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.1
5	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.1	-0.1	-0.7	-0.5	-0.6	-0.7	-0.6	-0.5	-0.5	-0.1	0.4	0.6	0.5	0.5	0.7	0.5	0.4	0.0
6	0.4	0.5	0.6	0.5	0.4	0.3	0.3	0.2	0.2	-0.1	-0.5	-0.5	-0.5	-0.3	-0.2	0.0	0.2	0.4	0.3	0.4	0.5	0.6	0.6	0.6	0.2
7	0.6	0.8	0.4	0.4	0.7	0.5	0.7	0.4	-0.3	-0.8	-1.1	-0.8	-0.8	-0.9	-0.3	-0.1	0.2	0.4	0.3	0.2	0.2	0.2	0.5	0.2	0.1
8	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.0	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	-0.3	0.1	0.3	0.3	0.4	0.2	0.3	0.4	0.2	0.0
9	0.4	0.2	0.2	0.3	0.3	0.4	0.3	0.3	-0.1	-0.1	0.1	0.1	0.0	-0.1	-0.2	-0.4	0.1	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.2
10	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	-0.7	-1.0	-1.1	-1.0	-0.8	-0.4	-0.1	0.1	0.5	0.5	0.6	0.6	0.4	0.3	0.4	0.4	0.1
11	0.5	0.5	0.5	0.6	0.4	0.4	0.4	0.6	0.2	-0.1	-0.2	-0.1	-0.2	-0.2	0.0	0.2	0.4	0.6	0.5	0.4	0.5	0.4	0.7	0.9	0.3
12	0.7	0.7	0.5	0.6	0.5	0.5	0.5	0.2	-0.9	-1.1	-1.2	-1.0	-0.7	-0.4	-0.3	-0.2	0.1	0.7	0.6	0.5	0.4	0.6	0.5	0.6	0.1
13	0.6	0.6	0.7	0.6	0.5	0.6	0.6	0.3	-0.7	-1.1	-1.1	-0.6	-0.4	-0.4	-0.3	-0.3	0.2	0.6	0.9	0.6	0.5	0.4	0.8	0.9	0.2
14	0.7	0.7	0.6	0.5	0.5	0.6	0.7	0.3	-0.5	-0.4	-0.5	-0.5	-0.5	-0.3	-0.3	-0.2	0.1	0.6	0.5	0.5	0.6	0.8	0.9	0.7	0.2
15	0.7	0.5	0.6	0.6	0.7	0.6	0.6	0.8	0.2	-0.2	-0.2	-0.3	-0.4	-0.4	-0.3	-0.3	0.1	0.3	0.3	0.4	0.4	0.6	0.5	0.5	0.3
16	0.4	0.5	0.8	0.5	0.8	0.4	0.7	0.5	-0.6	-0.9	-0.6	-0.8	-0.9	-0.5	-0.5	-0.4	0.0	0.5	0.3	0.2	0.2	0.4	0.3	0.3	0.1
17	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.2	-0.1	-0.4	-0.4	-0.5	-0.4	-0.3	-0.2	-0.1	0.3	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.1
18	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.0	-0.3	-0.3	-0.4	-0.5	-0.3	-0.1	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.1
19	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.0	-0.4	-1.1	-0.9	-0.9	-0.6	-0.6	-0.4	-0.1	0.5	0.7	0.5	0.6	0.6	0.6	0.7	0.0
20	1.0	0.6	0.5	0.6	0.6	0.9	0.6	0.2	-0.7	-1.1	-1.5	-0.9	-0.4	-0.2	0.1	0.1	0.3	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.1
21	0.6	0.8	0.4	0.5	0.5	0.6	0.6	0.4	0.1	-0.3	-0.5	-0.4	-0.4	-0.2	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.2
22	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	-0.2	-0.3	-0.4	-0.4	-0.2	-0.1	0.0	0.1	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.1
23	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.2	0.1	-0.2	-0.1	-0.2	-0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.4	0.5	0.2
24	0.5	0.3	0.2	0.3	0.4	0.4	0.3	0.6	0.2	0.3	0.2	0.1	-0.1	-0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.2	0.4	0.3	0.2
25	0.1	0.3	0.4	0.4	0.3	0.2	0.3	0.3	0.1	0.2	-0.1	-0.5	-0.6	-0.4	-0.2	-0.2	0.0	0.3	0.4	0.3	0.3	0.5	0.5	0.5	0.1
26	0.4	0.7	0.4	0.4	0.5	0.6	0.5	0.7	-0.4	-0.8	-0.8	-0.6	-0.6	-0.6	-0.5	-0.1	0.2	0.3	0.2	0.1	0.2	0.1	0.0	0.0	0.0
27	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	-0.2	-0.2	-0.3	-0.5	-0.4	-0.2	-0.1	-0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
28	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.1	-0.3	-0.3	-0.5	-0.3	-0.3	-0.2	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.0
29	0.3	0.4	0.3	0.2	0.2	0.3	0.4	0.3	-0.6	-0.9	-0.8	-0.8	-0.9	-0.8	-0.4	-0.2	0.1	0.4	0.7	0.7	0.9	0.8	0.8	0.4	0.1
30	0.4	0.5	0.4	0.2	0.2	0.2	0.3	0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2
31	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.0	-0.1	-0.3	-0.3	-0.4	-0.2	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.8	0.1
HRAVE	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	-0.1	-0.4	-0.5	-0.5	-0.5	-0.4	-0.2	-0.1	0.1	0.4	0.4	0.3	0.3	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.2	0.2	0.1	0.1	0.0	0.2	0.1	0.0	0.2	0.1	0.3	0.1	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.2	0.2	0.1
MAX	1.1	0.8	1.0	0.5	0.7	0.6	0.8	0.4	0.4	0.6	0.9	0.7	0.9	0.9	0.8	0.8	0.5	0.4	0.7	1.0	0.8	0.4	0.5	0.6	0.5
MIN	-0.3	-0.5	-1.3	-0.7	-0.7	-0.5	-1.1	-0.4	-0.4	-1.1	-0.2	-1.2	-1.1	-0.5	-0.4	-0.9	-0.5	-0.5	-1.1	-1.5	-0.5	-0.4	-0.2	-0.1	-0.6

DAY	26	27	28	29	30	31
AVE	0.0	0.0	0.0	0.1	0.2	0.1
MAX	0.7	0.1	0.3	0.9	0.5	0.8
MIN	-0.8	-0.5	-0.5	-0.9	-0.1	-0.4

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = -1.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
DECEMBER - 2019

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	705	705	705	705	705	705	705	706	706	706	706	706	705	704	704	704	704	704	704	705	705	705	705	706	705
2	706	706	706	706	706	706	706	706	706	707	706	706	705	704	704	704	704	704	704	705	705	705	706	705	705
3	705	705	705	705	705	705	705	706	706	706	706	706	705	704	704	703	703	703	703	703	704	704	704	704	704
4	704	704	704	703	703	703	703	703	704	704	704	703	702	701	700	700	700	701	701	702	702	703	703	703	702
5	703	703	703	703	703	704	704	704	705	705	706	705	705	704	704	704	704	704	705	705	706	706	706	706	704
6	706	706	706	706	706	706	706	707	707	708	708	708	707	706	705	705	705	705	706	706	706	706	707	707	706
7	706	706	706	706	706	706	706	707	707	707	707	707	706	705	704	704	704	704	704	704	704	705	705	705	705
8	705	704	704	704	704	704	704	704	704	704	704	704	703	702	702	702	702	702	701	702	702	701	701	701	703
9	701	701	701	700	700	700	700	700	700	700	701	701	701	701	700	701	701	701	702	702	703	703	703	704	701
10	704	704	705	705	705	705	706	707	707	708	708	708	707	707	706	706	706	706	707	707	707	707	707	707	706
11	707	707	707	706	706	706	706	706	707	707	707	706	706	705	705	704	704	705	705	705	705	706	706	706	706
12	706	706	707	707	707	707	707	708	708	709	708	708	707	706	706	706	706	706	706	707	707	707	707	707	707
13	706	706	706	706	706	706	707	707	707	707	707	706	705	704	703	702	702	702	703	703	703	703	703	703	705
14	702	702	702	701	701	701	701	701	701	701	701	700	699	699	698	698	698	698	698	698	698	698	698	697	699
15	697	697	697	697	697	697	698	698	699	699	699	699	699	699	699	699	700	700	701	701	702	702	703	703	699
16	703	703	704	704	704	704	705	706	706	707	707	707	706	706	705	705	706	706	707	707	707	708	708	709	706
17	709	708	709	709	709	710	710	711	711	711	711	710	709	709	708	708	708	708	708	708	708	708	708	708	709
18	708	707	707	707	706	706	706	706	706	706	706	705	704	703	703	703	703	703	703	703	703	703	703	703	705
19	703	703	702	702	702	703	703	703	704	704	704	704	703	702	702	703	703	703	704	705	705	706	706	706	704
20	706	706	706	707	707	707	708	708	708	709	709	709	708	707	707	707	707	707	708	708	708	709	709	709	708
21	709	709	709	709	709	709	709	709	710	710	710	709	708	707	706	706	706	706	706	706	706	706	706	706	708
22	706	706	706	705	705	705	705	705	706	706	706	705	705	704	703	703	703	703	703	702	702	703	703	703	704
23	703	702	702	702	702	702	702	702	703	703	703	703	702	701	701	701	700	700	700	700	701	701	701	700	702
24	700	700	699	699	698	698	698	699	699	700	700	699	697	697	696	697	698	698	698	699	699	699	699	699	698
25	699	699	700	700	700	700	700	701	701	701	702	701	701	700	700	700	700	701	701	701	701	701	701	701	700
26	701	701	701	701	700	700	700	700	701	701	701	700	699	698	697	697	697	697	697	698	698	698	698	698	699
27	699	698	699	698	698	698	698	698	698	699	699	699	698	697	698	698	699	699	699	700	700	700	700	700	699
28	700	700	700	700	700	700	700	700	701	701	701	700	700	699	699	699	700	701	701	702	702	703	703	703	701
29	703	704	704	704	704	705	705	705	706	707	707	707	706	705	705	705	705	705	705	705	705	705	704	704	705
30	704	704	703	703	703	703	703	703	704	704	704	703	702	701	701	701	701	701	701	701	701	702	702	702	702
31	702	702	702	701	701	702	702	702	702	703	703	703	702	702	701	701	701	702	702	702	703	703	703	703	702
HRAVE	704	704	704	704	703	704	704	704	704	705	705	704	704	703	702	702	702	703	703	703	703	704	704	704	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	705	705	704	702	704	706	705	703	701	706	706	707	705	699	699	706	709	705	704	708	708	704	702	698	700
MAX	706	707	706	704	706	708	707	705	704	708	707	709	707	702	703	709	711	708	706	709	710	706	703	700	702
MIN	704	704	703	700	703	705	704	701	700	704	704	706	702	697	697	703	708	703	702	706	706	702	700	696	699

DAY	26	27	28	29	30	31
AVE	699	699	701	705	702	702
MAX	701	700	703	707	704	703
MIN	697	697	699	703	701	701

MONTHLY AVERAGE = 703.5 MONTHLY MAXIMUM = 711.3 MONTHLY MINIMUM = 696.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
DECEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	62	68	85	89	87	76	78	72	72	57	51	48	45	43	41	40	41	44	47	48	49	51	55	57	59
2	60	62	64	68	71	66	65	64	61	55	49	46	43	42	42	42	43	45	46	45	47	51	62	68	54
3	73	81	82	87	88	90	89	88	82	78	59	54	47	44	42	41	46	45	47	45	48	58	64	64	64
4	67	69	68	72	68	66	72	72	67	64	60	54	49	48	43	46	50	55	56	59	56	54	61	63	60
5	66	67	72	84	95	94	96	100	98	88	82	74	65	60	56	54	55	60	69	75	78	84	87	90	77
6	91	93	95	98	98	97	98	96	93	84	64	58	55	52	52	50	52	53	53	55	58	62	67	75	73
7	76	81	83	84	86	90	91	90	86	75	67	58	51	45	45	51	52	57	62	64	68	71	87	95	71
8	97	98	97	100	99	99	100	100	100	99	97	93	91	92	87	85	87	86	90	88	85	90	97	99	94
9	100	100	100	100	100	100	100	100	100	99	98	100	100	97	91	83	81	84	85	88	89	97	99	99	95
10	100	100	100	100	100	100	100	100	100	96	80	71	67	55	48	48	59	63	68	70	66	69	73	84	80
11	87	90	91	92	87	84	84	91	82	71	67	65	61	56	52	50	52	55	58	61	68	71	80	86	73
12	88	92	93	96	98	99	100	100	91	77	70	60	56	50	48	49	52	56	64	73	77	84	87	92	77
13	93	97	95	97	99	100	100	100	93	78	68	60	55	49	44	43	47	51	55	58	65	72	81	85	74
14	87	87	89	92	94	98	97	96	90	77	67	65	58	55	50	49	52	58	64	66	74	78	84	86	75
15	88	91	91	94	93	97	97	97	89	79	73	57	53	58	62	58	48	49	54	61	59	58	64	63	72
16	70	76	82	87	91	93	93	93	83	74	60	42	37	37	37	35	36	39	29	28	29	31	31	31	56
17	29	29	30	32	33	33	33	33	32	30	26	25	23	23	17	18	19	22	24	27	30	29	30	32	27
18	32	34	36	33	31	30	31	33	32	30	28	26	25	24	24	25	26	27	29	30	32	33	33	33	30
19	34	34	35	36	37	39	40	41	39	36	35	30	30	28	28	30	32	35	40	43	45	51	57	62	38
20	62	65	65	65	74	79	76	68	63	53	44	34	25	24	21	21	23	24	26	26	29	32	34	36	45
21	39	42	39	40	41	44	45	45	43	38	31	28	26	26	26	24	24	26	26	26	27	29	31	31	33
22	32	31	32	33	32	31	31	30	30	30	27	25	24	24	24	23	23	24	24	26	27	28	31	35	28
23	35	37	40	43	46	41	42	44	49	46	39	33	34	37	37	39	35	36	38	42	41	51	50	64	41
24	71	76	75	69	68	71	74	87	89	89	96	97	89	82	79	82	99	100	100	100	100	100	100	99	87
25	100	100	99	97	94	94	100	100	97	99	98	89	85	80	80	77	76	79	91	97	98	100	100	100	93
26	100	100	100	100	100	100	100	100	100	93	79	68	60	54	49	56	61	63	71	77	77	81	92	92	82
27	99	99	99	98	97	100	97	97	100	100	100	97	95	94	95	90	94	94	93	96	100	100	100	100	97
28	100	100	100	100	100	100	100	100	99	91	81	75	70	66	58	59	69	75	72	81	87	89	90	95	86
29	100	100	100	100	100	100	100	100	98	90	71	61	53	49	47	44	47	49	54	63	67	66	61	59	74
30	66	73	63	54	55	57	60	61	61	56	54	54	51	50	49	48	46	46	48	48	48	50	52	51	54
31	50	49	48	46	46	49	48	49	48	47	44	42	43	44	43	43	44	47	49	52	54	55	66	71	49
HRAVE	73	75	76	77	78	78	79	79	76	70	63	58	54	51	49	49	51	53	56	59	60	64	68	71	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	59	54	64	60	77	73	71	94	95	80	73	77	74	75	72	56	27	30	38	45	33	28	41	87	93
MAX	89	71	90	72	100	98	95	100	100	100	92	100	100	98	97	93	33	36	62	79	45	35	64	100	100
MIN	40	42	41	43	54	50	45	85	81	48	50	48	43	49	48	28	17	24	28	21	24	23	33	68	76

DAY	26	27	28	29	30	31
AVE	82	97	86	74	54	49
MAX	100	100	100	100	73	71
MIN	49	90	58	44	46	42

MONTHLY AVERAGE = 65.2 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 17.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
DECEMBER - 2019

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.40	0.54	0.62	0.63	0.58	0.48	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.96
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.41	0.53	0.51	0.56	0.44	0.32	0.19	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.30
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.12	0.23	0.54	0.55	0.64	0.51	0.25	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.09
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.12	0.27	0.52	0.62	0.28	0.39	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.33	0.29	0.55	0.61	0.56	0.44	0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.28
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.32	0.40	0.41	0.50	0.38	0.27	0.20	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.66
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.30	0.43	0.48	0.56	0.49	0.28	0.13	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.88
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.13	0.12	0.12	0.15	0.22	0.22	0.13	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.13	0.01	0.01	0.08	0.16	0.16	0.26	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.05
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.37	0.51	0.59	0.61	0.57	0.46	0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.77
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.28	0.29	0.29	0.52	0.57	0.46	0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.98
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.36	0.50	0.58	0.61	0.54	0.40	0.21	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.53
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.36	0.50	0.58	0.61	0.56	0.45	0.29	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.69
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.36	0.50	0.58	0.54	0.47	0.45	0.32	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.37	0.50	0.59	0.59	0.39	0.31	0.28	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.34
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.31	0.34	0.56	0.63	0.59	0.47	0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.52
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.37	0.52	0.61	0.63	0.59	0.49	0.33	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.90
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.36	0.44	0.41	0.57	0.57	0.48	0.32	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.40
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.50	0.59	0.61	0.57	0.47	0.31	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.71
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.36	0.51	0.60	0.63	0.59	0.49	0.33	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.83
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.36	0.50	0.60	0.61	0.46	0.33	0.30	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.49
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.31	0.43	0.53	0.44	0.40	0.31	0.23	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.80
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.10	0.15	0.20	0.15	0.18	0.11	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.13	0.21	0.08	0.06	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.05	0.18	0.36	0.35	0.35	0.22	0.19	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.84
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.34	0.48	0.57	0.60	0.59	0.35	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.41
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.05	0.13	0.18	0.23	0.19	0.14	0.16	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.42	0.43	0.50	0.39	0.48	0.17	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.52
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.49	0.58	0.61	0.57	0.47	0.32	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.73
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.21	0.19	0.21	0.22	0.17	0.28	0.20	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.75
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.14	0.26	0.44	0.54	0.50	0.38	0.27	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.73
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.27	0.37	0.45	0.50	0.44	0.35	0.23	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.96	3.30	3.09	2.45	3.28	2.66	2.88	1.18	1.05	3.77	2.98	3.53	3.69	3.57	3.34	3.52	3.90	3.40	3.71	3.83	3.49	2.80	0.98	0.63	1.84
MAX	0.63	0.56	0.64	0.62	0.61	0.50	0.56	0.22	0.26	0.61	0.57	0.61	0.61	0.58	0.59	0.63	0.63	0.57	0.61	0.63	0.61	0.53	0.20	0.21	0.36
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	3.41	1.17	2.52	3.73	1.75	2.73
MAX	0.60	0.23	0.50	0.61	0.28	0.54
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
DECEMBER - 2019

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.05
8	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.06	0.23
9	0.00	0.03	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.15	0.22	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
24	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.00	0.00	0.07	0.01	0.00	0.00	0.00	0.03	0.14	0.07	0.06	0.00	0.00	0.00	0.00	0.00	0.48
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.06	0.05	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.06	0.02	0.00	0.01	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.38
28	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.01	0.00	0.05	0.23	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.48	0.05
MAX	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.11	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.04
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.38	0.05	0.00	0.00	0.00
MAX	0.00	0.07	0.03	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.82 MONTHLY MAXIMUM = 0.22 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
JANUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.7	3.5	6.9	5.4	9.3	7.9	7.5	6.1	2.8	4.4	3.0	2.9	2.4	3.5	8.1	10.5	9.9	10.0	7.4	5.8	5.3	2.7	2.7	1.7	5.6
2	2.6	5.1	3.5	1.2	2.3	2.0	2.7	2.0	3.9	2.0	1.9	4.4	8.4	7.7	13.2	17.2	17.1	15.5	14.1	11.1	4.9	4.8	5.2	6.4	6.6
3	5.0	5.8	7.1	8.0	6.2	2.2	3.4	3.8	3.9	4.9	3.0	5.8	3.7	3.3	5.4	6.8	8.1	9.0	6.5	7.7	3.6	7.0	7.6	8.9	5.7
4	8.9	10.0	7.7	8.3	8.7	9.1	9.2	10.1	4.1	8.0	11.0	9.3	8.3	11.3	12.7	11.9	6.4	5.7	5.5	12.1	12.7	6.9	8.2	8.5	8.9
5	9.3	10.4	11.6	11.0	12.0	11.7	12.5	11.4	11.6	10.4	10.2	8.7	8.8	6.4	5.3	4.7	3.5	3.6	2.1	3.9	2.9	4.7	5.4	3.0	7.7
6	7.7	6.3	10.2	6.8	5.1	5.3	2.5	5.1	7.8	7.1	6.5	5.2	10.9	15.3	15.3	8.6	6.5	6.2	10.0	4.2	5.6	9.6	9.2	9.4	7.8
7	10.1	10.3	10.3	10.2	11.2	13.2	18.9	19.1	18.1	20.8	20.9	19.1	18.5	16.3	15.0	17.9	17.3	18.7	23.4	16.0	17.3	19.9	19.9	18.8	16.7
8	15.8	15.1	14.1	11.8	10.1	10.5	12.1	11.2	11.1	9.4	5.9	2.8	2.5	3.0	5.6	8.0	15.5	11.7	11.0	8.7	6.8	2.4	2.6	2.0	8.7
9	6.2	8.6	9.2	10.1	4.4	6.0	6.2	9.1	7.0	4.7	5.2	3.1	3.5	5.3	2.3	6.6	10.8	7.4	17.1	22.7	4.6	6.5	6.6	4.3	7.4
10	4.7	3.8	4.4	2.4	4.3	5.7	3.8	3.9	2.0	1.4	3.2	7.7	8.9	8.1	11.8	13.1	15.0	13.4	13.1	6.5	3.8	4.1	4.4	5.4	6.5
11	5.5	5.2	6.6	7.8	7.7	8.8	10.4	8.8	8.8	6.6	4.5	2.9	4.1	5.5	4.6	2.3	3.2	6.5	5.0	3.1	5.1	4.1	4.8	5.4	5.7
12	5.3	6.3	7.1	8.3	6.3	6.7	7.7	7.8	7.6	5.9	4.0	3.2	3.7	3.3	3.7	4.1	6.7	7.6	6.9	3.6	2.5	7.2	9.9	9.6	6.0
13	6.1	3.4	7.1	9.0	3.8	5.8	7.9	7.8	7.1	4.8	3.6	2.3	3.5	4.8	5.0	5.8	6.0	6.9	4.0	4.2	4.8	6.2	8.3	7.8	5.7
14	9.3	8.1	9.5	9.6	8.9	8.9	10.9	9.3	8.0	6.9	6.6	4.8	2.0	3.5	1.9	3.5	5.9	5.2	2.5	1.0	2.5	7.9	8.2	8.6	6.4
15	7.4	7.5	7.4	5.0	6.2	8.8	9.7	9.1	6.3	7.5	6.8	5.4	5.7	8.5	8.4	8.5	4.2	3.7	4.0	4.9	4.5	7.6	7.4	7.7	6.8
16	4.9	10.8	9.1	7.4	9.8	5.5	7.1	6.6	6.5	7.1	6.7	12.4	8.9	7.4	8.7	9.0	10.0	9.4	10.3	10.1	7.8	5.8	7.3	8.1	8.2
17	7.8	8.8	8.3	9.4	9.4	7.6	8.1	6.9	6.2	5.5	3.0	2.7	3.9	2.5	9.0	9.0	8.3	9.6	10.2	3.9	2.6	2.4	6.7	4.8	6.5
18	9.2	9.2	8.3	7.1	4.9	3.3	6.7	8.1	10.6	6.8	7.5	10.8	12.8	13.3	19.5	19.0	18.1	19.4	19.3	15.8	17.7	18.2	16.2	12.9	12.3
19	13.9	14.9	12.9	11.8	13.7	17.1	15.1	13.4	13.2	19.5	20.1	18.8	20.1	17.9	16.0	16.5	18.6	20.2	18.9	16.4	16.9	18.7	18.1	17.6	16.7
20	15.5	20.0	22.3	24.1	21.1	19.5	20.6	20.4	22.2	24.0	27.9	26.2	24.3	22.1	21.6	19.0	18.2	23.0	21.5	19.3	18.3	16.3	15.2	14.6	20.7
21	13.4	11.1	12.8	7.8	11.4	6.2	2.2	1.5	9.7	8.5	3.6	2.0	2.3	3.3	2.0	3.2	3.9	2.5	2.1	5.7	5.5	7.0	5.3	8.0	5.9
22	7.7	5.7	5.6	3.9	2.5	2.8	6.3	3.7	1.9	1.8	1.4	5.4	10.4	11.7	11.6	10.6	11.8	11.4	9.3	8.6	4.2	2.1	4.7	5.7	6.3
23	3.6	4.3	7.8	6.3	6.2	6.9	6.2	2.6	CAL	CAL	CAL	4.8	4.0	7.6	9.5	8.1	8.9	8.4	7.7	10.8	7.5	8.4	6.3	6.0	6.8
24	8.2	9.7	8.4	7.4	7.8	8.6	10.2	10.0	10.8	8.5	7.4	7.2	4.5	2.9	7.5	10.5	8.9	7.2	3.1	3.3	1.9	5.0	6.8	5.7	7.1
25	8.8	8.4	5.6	3.5	5.2	7.1	6.4	9.3	7.5	5.0	4.3	2.9	1.6	2.3	5.1	8.5	12.2	11.6	10.5	10.0	4.2	5.2	4.3	8.3	6.6
26	7.8	6.9	5.7	6.0	6.6	5.4	7.6	7.4	7.3	5.7	4.5	2.7	3.1	4.4	8.8	11.8	11.7	10.6	10.9	2.7	2.0	5.4	5.1	4.3	6.4
27	4.4	6.4	6.0	4.3	2.6	2.9	4.6	4.4	3.1	1.4	2.5	8.9	18.2	20.0	19.5	22.0	20.0	16.3	11.5	8.1	5.3	4.9	5.1	7.3	8.7
28	5.4	6.1	6.9	4.9	3.7	3.7	4.5	6.1	3.3	3.3	5.4	10.4	5.4	4.4	5.9	6.6	8.5	9.1	6.4	9.5	4.7	4.9	8.6	8.5	6.1
29	8.3	8.1	4.0	3.0	5.9	9.2	7.5	6.8	7.5	6.2	4.0	1.9	7.4	15.2	14.3	9.8	5.5	5.1	4.5	4.4	2.7	3.6	2.9	2.4	6.3
30	2.6	4.2	2.8	5.4	6.3	5.4	7.1	6.1	6.8	2.3	3.0	3.5	8.4	6.3	9.1	12.6	14.2	12.0	12.6	12.4	6.0	3.5	5.0	3.2	6.7
31	3.4	3.7	3.5	8.7	7.9	7.0	7.8	9.8	7.5	5.5	7.6	7.5	8.0	5.7	5.7	3.9	4.8	4.5	3.5	8.4	4.2	5.9	6.6	8.1	6.2
HRAVE	7.6	8.0	8.2	7.6	7.5	7.5	8.2	8.0	7.8	7.2	6.8	7.0	7.7	8.2	9.4	10.0	10.3	10.0	9.5	8.5	6.4	7.1	7.6	7.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	5.6	6.6	5.7	8.9	7.7	7.8	16.7	8.7	7.4	6.5	5.7	6.0	5.7	6.4	6.8	8.2	6.5	12.3	16.7	20.7	5.9	6.3	6.8	7.1	6.6
MAX	10.5	17.2	9.0	12.7	12.5	15.3	23.4	15.8	22.7	15.0	10.4	9.9	9.0	10.9	9.7	12.4	10.2	19.5	20.2	27.9	13.4	11.8	10.8	10.8	12.2
MIN	1.7	1.2	2.2	4.1	2.1	2.5	10.1	2.0	2.3	1.4	2.3	2.5	2.3	1.0	3.7	4.9	2.4	3.3	11.8	14.6	1.5	1.4	2.6	1.9	1.6

DAY	26	27	28	29	30	31
AVE	6.4	8.7	6.1	6.3	6.7	6.2
MAX	11.8	22.0	10.4	15.2	14.2	9.8
MIN	2.0	1.4	3.3	1.9	2.3	3.4

MONTHLY AVERAGE = 8.1 MONTHLY MAXIMUM = 27.9 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JANUARY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	136	127	124	100	118	109	112	85	91	121	125	179	177	262	270	308	307	308	306	312	297	297	183	212	111
2	188	180	117	108	286	162	114	88	109	120	193	274	304	294	293	287	287	300	313	295	338	125	121	96	91
3	82	109	101	101	103	138	339	108	70	113	145	293	267	296	263	271	274	300	298	295	297	128	116	110	220
4	102	102	117	121	117	111	101	121	132	141	155	159	158	81	66	59	43	27	22	46	55	98	113	110	323
5	101	111	128	123	120	120	133	129	139	144	154	139	85	102	82	79	255	37	36	74	45	87	136	87	149
6	99	107	81	84	103	89	109	133	105	146	156	161	81	76	75	79	75	34	24	314	28	91	105	124	118
7	131	129	137	94	88	80	73	71	68	59	64	54	43	48	61	65	67	56	46	63	67	59	56	73	64
8	78	74	79	92	109	135	138	133	128	134	150	118	102	255	260	278	291	307	294	294	179	104	133	55	28
9	99	92	85	85	52	85	104	95	103	110	164	303	295	289	259	278	305	301	290	309	89	75	91	124	280
10	122	110	128	197	322	302	207	276	314	204	246	282	304	301	282	288	304	299	307	345	68	132	131	118	156
11	128	108	114	95	116	111	108	105	119	131	129	132	118	90	72	70	269	292	9	33	42	102	85	70	277
12	92	95	86	88	101	99	90	102	106	92	108	122	74	71	80	81	261	292	305	327	56	99	94	94	116
13	104	5	108	79	69	97	88	88	102	99	141	298	264	271	266	269	267	302	21	86	89	96	103	102	281
14	103	100	95	95	94	100	91	105	123	148	145	151	125	249	235	281	274	300	47	56	63	100	95	84	98
15	90	85	101	107	94	92	94	102	119	110	129	143	109	78	74	66	47	37	72	329	86	129	97	86	30
16	120	122	108	120	108	95	121	130	61	92	93	57	8	81	95	79	68	71	64	66	86	112	86	83	210
17	78	91	84	71	92	69	79	57	61	78	98	257	279	272	290	306	302	310	303	319	44	84	99	95	297
18	120	102	109	99	94	73	103	114	111	126	142	63	50	54	42	46	47	47	46	58	52	62	71	74	309
19	72	73	82	80	75	66	72	74	82	67	58	62	43	46	38	37	41	41	54	54	57	59	59	66	42
20	71	68	65	61	61	66	70	73	70	69	70	75	70	70	76	52	51	46	47	56	58	57	63	59	236
21	63	80	69	317	322	68	8	101	96	125	206	337	98	299	354	329	298	279	263	280	298	306	300	294	26
22	301	289	300	291	261	256	283	249	200	199	228	285	301	294	295	304	304	309	308	302	292	127	122	90	214
23	75	120	116	112	100	102	103	40	CAL	CAL	CAL	133	143	60	30	52	44	21	13	33	52	58	85	126	255
24	140	117	115	105	118	121	125	115	115	136	150	150	134	81	54	64	60	56	317	352	346	106	91	93	132
25	84	89	87	66	99	82	106	84	97	100	112	118	114	215	271	303	303	305	304	295	183	112	117	97	258
26	96	98	104	100	95	100	95	111	95	95	102	147	247	264	289	305	305	306	307	255	136	104	90	77	333
27	80	110	108	105	304	45	73	137	306	102	184	278	286	289	286	287	295	293	306	320	275	147	120	100	53
28	114	93	100	128	138	147	144	162	171	163	149	72	84	84	273	283	293	287	295	297	288	127	95	100	174
29	99	106	86	327	108	110	102	114	107	121	128	267	283	296	291	322	105	259	308	321	252	301	283	297	236
30	168	136	115	161	147	147	139	155	153	152	260	313	306	256	275	296	288	299	300	301	326	124	81	66	64
31	107	308	206	173	130	104	71	121	119	135	119	85	85	99	249	162	198	237	269	300	5	71	112	110	78

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JANUARY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	11	15	6	9	6	7	7	12	18	11	44	31	40	27	15	17	10	9	9	9	14	20	12	21	16
2	55	54	26	48	29	28	16	23	12	24	39	17	17	23	15	10	8	7	6	12	35	12	11	10	22
3	21	14	15	11	13	48	24	28	22	16	38	15	22	23	20	16	8	6	8	6	29	5	7	6	18
4	7	11	9	7	10	7	6	6	12	6	7	9	19	8	6	11	20	24	27	13	12	17	7	7	11
5	7	8	10	6	5	5	5	5	6	9	8	17	12	22	15	14	24	34	49	26	31	12	10	18	15
6	7	10	6	14	12	12	28	12	22	15	17	24	14	10	11	12	15	11	29	36	20	11	6	13	15
7	9	9	9	17	14	12	7	8	12	12	12	17	17	18	18	11	9	12	8	12	9	10	11	8	12
8	7	6	7	13	14	9	4	5	6	9	12	26	41	43	19	16	9	8	4	5	18	36	12	26	15
9	10	8	6	6	19	16	12	10	9	30	35	15	18	17	31	56	11	13	10	9	29	10	24	23	18
10	10	9	18	26	24	16	56	42	43	33	23	16	19	20	14	14	12	7	6	39	28	47	14	11	23
11	19	14	10	7	10	10	8	8	7	11	24	43	29	36	26	29	16	11	28	32	13	35	16	15	19
12	13	7	8	8	8	11	8	7	8	17	22	28	22	30	19	17	14	5	7	26	40	9	8	9	15
13	17	39	7	7	20	7	7	8	10	14	21	42	20	18	15	13	9	8	26	15	10	7	7	8	15
14	7	7	6	6	6	7	5	8	5	9	12	19	58	25	35	22	7	5	25	25	30	14	7	8	15
15	8	8	9	12	9	8	5	7	10	7	11	19	20	8	7	7	22	27	22	25	29	8	9	17	13
16	18	8	9	11	10	38	23	23	72	54	59	11	23	34	9	15	9	12	9	9	11	13	9	10	21
17	10	13	8	7	9	9	7	10	14	11	26	39	22	28	27	18	16	8	6	61	42	26	9	15	18
18	8	7	7	10	12	22	11	8	7	11	22	16	17	15	11	10	9	8	9	10	10	8	7	10	11
19	8	9	8	10	7	8	7	9	9	11	13	17	15	16	13	14	12	11	10	11	10	10	11	9	11
20	8	8	9	9	10	8	8	9	8	9	9	8	7	9	9	13	13	8	10	12	12	14	12	13	10
21	12	30	31	23	10	27	33	27	9	21	23	35	25	26	21	19	11	14	12	8	11	9	10	7	19
22	9	8	10	18	16	18	8	25	20	17	30	18	15	13	12	16	13	8	8	5	19	18	9	6	14
23	22	11	7	9	9	7	9	23	CAL	CAL	CAL	25	32	30	18	15	14	10	21	7	11	8	16	19	15
24	7	8	7	8	7	7	6	7	6	10	9	17	31	44	52	11	11	15	45	24	54	39	8	8	18
25	6	7	9	17	8	9	7	5	7	12	22	34	62	50	21	18	10	8	8	3	17	8	8	7	15
26	7	7	8	8	6	9	6	7	8	14	20	42	28	29	17	14	11	8	6	24	31	8	9	13	14
27	22	11	16	25	45	48	33	27	44	60	44	23	12	11	11	10	10	9	8	11	18	8	10	16	22
28	15	10	14	12	27	30	38	33	36	57	48	14	34	37	28	20	21	7	6	6	26	7	7	7	23
29	9	7	35	41	31	9	9	11	9	14	22	58	22	13	20	48	45	39	10	13	42	7	41	43	25
30	44	11	33	31	11	23	10	29	9	64	26	41	18	25	20	16	9	7	7	6	13	37	26	35	23
31	31	70	47	41	17	13	51	18	10	13	18	17	16	45	33	32	22	11	13	6	27	20	14	15	25
HRAVE	14	14	13	15	14	16	15	15	16	20	24	24	24	24	19	18	14	12	15	16	23	16	12	14	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16	22	18	11	15	15	12	15	18	23	19	15	15	15	13	21	18	11	11	10	19	14	15	18	15
MAX	44	55	48	27	49	36	18	43	56	56	43	40	42	58	29	72	61	22	17	14	35	30	32	54	62
MIN	6	6	5	6	5	6	7	4	6	6	7	5	7	5	5	8	6	7	7	7	7	5	7	6	3

DAY	26	27	28	29	30	31
AVE	14	22	23	25	23	25
MAX	42	60	57	58	64	70
MIN	6	8	6	7	6	6

MONTHLY AVERAGE = 16.9 MONTHLY MAXIMUM = 71.5 MONTHLY MINIMUM = 3.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JANUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.1	4.6	3.8	3.0	2.8	2.7	1.8	1.3	2.2	4.8	7.7	9.9	11.8	12.7	14.2	14.4	13.4	12.2	11.1	10.7	10.0	9.1	8.1	7.7	7.7
2	6.5	5.8	5.6	6.2	5.5	4.7	4.3	4.1	4.8	6.0	8.0	9.4	11.8	13.1	13.6	13.4	12.6	11.4	10.6	9.8	9.0	7.8	6.8	5.4	8.2
3	4.5	4.0	3.5	2.9	2.3	2.4	1.1	0.6	2.0	4.2	6.8	8.4	11.9	13.6	14.8	15.6	15.4	13.9	11.8	11.2	9.5	7.9	7.2	6.8	7.6
4	6.1	4.9	4.5	3.8	3.7	3.5	3.0	3.1	4.0	5.8	9.0	12.2	15.1	17.1	17.1	17.7	17.9	16.9	16.0	15.0	14.5	12.1	10.6	8.6	10.1
5	8.0	7.5	6.0	6.1	5.6	5.7	4.6	4.5	5.4	8.3	11.1	14.4	17.3	18.9	19.2	19.5	20.2	17.8	16.3	14.5	12.8	11.1	9.2	8.6	11.4
6	7.0	6.0	5.3	4.2	4.1	3.2	3.2	2.4	6.3	8.3	14.3	17.2	19.0	19.5	19.7	20.1	19.8	19.2	17.8	15.7	14.9	12.6	11.1	9.4	11.7
7	8.0	7.4	5.7	7.7	8.2	7.9	8.8	9.3	10.1	11.8	12.9	14.7	16.1	17.3	18.0	18.4	18.3	17.5	16.8	15.8	14.7	14.0	13.5	12.3	12.7
8	10.8	8.9	8.3	7.3	6.2	4.8	4.2	4.0	5.5	8.0	10.6	13.3	15.9	17.4	18.7	19.6	18.8	16.2	14.1	13.0	11.4	11.4	10.0	9.0	11.1
9	7.1	7.2	5.6	5.5	3.9	3.0	3.4	2.9	3.7	4.1	5.6	6.8	7.9	10.2	11.4	13.2	13.4	12.7	10.7	7.9	7.1	7.1	6.9	6.7	7.2
10	6.6	6.5	6.1	6.2	6.3	6.1	5.8	5.4	5.6	7.1	8.6	9.9	10.9	12.0	12.8	13.0	12.3	11.2	10.2	9.8	9.0	7.5	6.4	5.4	8.4
11	4.2	3.8	2.8	1.9	1.1	2.0	1.9	1.1	2.3	4.7	7.3	9.6	11.5	12.8	13.4	14.1	14.5	13.0	11.6	10.2	9.2	7.5	6.0	5.2	7.2
12	4.3	3.3	2.6	1.7	1.3	1.3	0.5	0.5	3.1	5.6	8.2	11.0	13.0	14.5	15.7	16.3	16.5	14.9	13.3	12.4	11.4	8.4	7.3	7.0	8.1
13	6.8	4.3	3.9	3.2	2.6	1.9	1.8	1.2	3.3	5.7	8.2	10.7	12.9	15.5	17.4	18.2	18.1	16.4	15.1	12.7	10.6	9.5	8.3	8.1	9.0
14	6.8	6.0	5.2	4.2	4.1	3.4	3.6	3.2	4.8	6.8	10.1	13.6	15.6	17.0	18.6	19.3	18.5	17.2	16.1	15.2	13.4	11.3	10.4	9.2	10.6
15	8.2	7.0	6.8	5.9	5.9	4.7	5.6	5.3	5.3	8.7	11.3	14.6	17.1	18.4	19.0	19.0	18.6	17.6	16.7	15.5	14.9	13.4	13.6	12.4	11.9
16	11.9	11.2	11.3	11.3	11.3	10.6	9.4	10.1	10.6	10.6	11.7	11.4	11.5	10.4	10.2	10.3	10.3	10.2	10.2	10.1	9.8	9.2	8.8	8.6	10.5
17	8.2	7.3	6.9	6.3	6.1	6.0	6.0	6.1	6.3	6.7	7.6	8.4	9.8	12.4	15.5	15.8	15.9	14.7	13.2	12.0	11.1	10.2	7.9	7.5	9.5
18	6.3	6.7	6.2	5.1	4.7	3.9	3.1	3.5	5.6	7.8	11.1	14.1	15.7	16.6	17.0	17.4	17.3	16.8	16.3	15.3	15.2	14.3	13.5	13.1	11.1
19	12.6	12.0	10.8	10.1	10.7	11.5	11.3	11.1	10.6	13.4	14.8	16.3	17.2	18.5	19.4	19.7	19.9	19.2	18.1	17.7	17.1	16.7	16.1	15.4	15.0
20	14.8	14.8	14.6	14.8	14.4	14.1	14.3	14.2	14.6	15.9	17.0	18.3	19.2	19.6	19.7	19.1	18.7	18.7	18.4	17.9	17.6	17.6	17.1	16.9	16.8
21	16.5	15.6	16.0	15.1	13.1	11.5	10.5	10.3	9.9	10.1	10.6	11.4	12.2	12.3	12.2	11.9	11.5	11.0	10.8	10.5	10.5	10.4	10.4	10.4	11.9
22	10.2	10.0	10.1	10.1	9.9	9.6	9.5	9.6	9.9	10.6	11.6	12.9	13.8	13.8	14.3	14.7	14.3	13.4	12.4	11.6	11.0	10.1	9.2	8.4	11.3
23	7.7	7.0	6.8	6.7	5.7	6.0	5.0	4.2	CAL	CAL	CAL	13.3	15.4	17.6	18.1	18.3	18.0	17.6	16.4	16.1	14.8	13.6	12.9	11.6	12.0
24	9.7	9.3	8.6	7.9	7.2	6.5	6.3	6.7	8.1	10.0	12.4	15.7	18.3	19.4	19.3	18.7	18.5	17.7	16.7	15.4	14.8	13.0	11.4	10.0	12.6
25	9.3	8.5	8.2	7.1	6.0	5.8	5.2	5.5	7.4	9.8	12.7	15.0	17.0	19.0	19.8	20.4	20.1	18.9	17.1	15.7	14.1	13.1	12.0	10.4	12.4
26	9.4	8.9	8.0	7.5	6.4	6.5	5.8	5.3	7.4	9.8	12.8	15.5	17.2	18.9	19.9	20.2	19.7	18.6	16.9	15.4	14.2	12.6	11.7	10.9	12.5
27	10.1	9.8	10.2	9.9	9.7	9.1	8.7	9.1	9.1	11.1	13.4	15.7	17.2	17.5	17.6	18.0	17.8	16.8	15.4	15.0	14.4	12.6	11.4	10.0	12.9
28	8.6	7.8	6.7	6.7	5.9	5.4	5.1	5.9	7.8	10.2	13.8	15.9	16.9	17.6	17.9	18.2	17.9	16.5	14.9	13.0	11.8	10.0	8.8	8.0	11.3
29	7.2	7.0	5.2	4.4	3.6	3.6	3.8	3.0	5.7	8.4	11.2	12.5	14.5	16.1	16.7	16.9	15.7	13.9	12.5	12.0	11.1	10.4	9.0	8.3	9.7
30	7.3	6.5	6.4	4.6	5.0	5.1	5.5	4.4	6.0	8.4	10.9	13.5	14.9	16.6	17.5	17.7	16.4	15.5	14.3	13.3	13.0	11.3	9.3	8.9	10.5
31	7.7	7.4	9.2	7.9	9.0	9.5	10.4	9.4	8.9	10.9	14.4	16.1	17.4	18.2	18.7	19.0	19.6	18.6	17.1	15.0	13.9	12.3	9.9	9.1	12.9
HRAVE	8.3	7.6	7.1	6.6	6.2	5.9	5.6	5.4	6.5	8.5	10.9	13.0	14.7	15.9	16.7	17.0	16.8	15.7	14.5	13.4	12.5	11.2	10.1	9.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.7	8.2	7.6	10.1	11.4	11.7	12.7	11.1	7.2	8.4	7.2	8.1	9.0	10.6	11.9	10.5	9.5	11.1	15.0	16.8	11.9	11.3	12.0	12.6	12.4
MAX	14.4	13.6	15.6	17.9	20.2	20.1	18.4	19.6	13.4	13.0	14.5	16.5	18.2	19.3	19.0	11.9	15.9	17.4	19.9	19.7	16.5	14.7	18.3	19.4	20.4
MIN	1.3	4.1	0.6	3.0	4.5	2.4	5.7	4.0	2.9	5.4	1.1	0.5	1.2	3.2	4.7	8.6	6.0	3.1	10.1	14.1	9.9	8.4	4.2	6.3	5.2

DAY	26	27	28	29	30	31
AVE	12.5	12.9	11.3	9.7	10.5	12.9
MAX	20.2	18.0	18.2	16.9	17.7	19.6
MIN	5.3	8.7	5.1	3.0	4.4	7.4

MONTHLY AVERAGE = 10.8 MONTHLY MAXIMUM = 20.4 MONTHLY MINIMUM = 0.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JANUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.9	0.6	0.6	0.5	0.5	0.5	0.6	0.4	-0.3	-0.9	-0.8	-0.7	-0.6	-0.5	-0.5	-0.2	0.2	0.4	0.3	0.3	0.4	0.5	0.4	0.3	0.1
2	0.5	0.5	0.3	0.3	0.4	0.4	0.4	0.5	-0.2	-0.4	-0.4	-0.5	-0.6	-0.6	-0.4	-0.3	-0.1	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.1
3	0.5	0.7	0.6	0.6	0.5	0.4	0.5	0.4	-0.2	-1.0	-0.6	-0.5	-0.6	-0.6	-0.4	-0.4	-0.1	0.6	0.6	0.9	0.7	0.6	0.6	0.5	0.2
4	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.4	-0.3	-0.7	-1.0	-1.2	-1.2	-0.5	0.0	0.2	0.3	0.6	0.6	0.5	0.5	0.6	0.6	1.3	0.2
5	0.9	1.0	0.9	0.9	0.4	0.8	0.7	0.4	-0.5	-1.1	-1.3	-1.1	-0.9	-0.9	-0.4	-0.1	-0.1	0.4	0.4	0.6	0.8	0.7	0.9	0.6	0.2
6	0.7	0.9	0.7	0.5	0.6	0.4	0.5	0.6	1.7	1.2	-0.6	-0.8	-0.6	-0.2	0.0	0.2	0.6	0.9	0.9	0.6	0.7	1.0	1.2	1.5	0.5
7	1.4	1.6	1.7	1.0	0.7	0.8	0.7	0.4	0.0	-0.2	-0.3	-0.4	-0.4	-0.3	-0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4
8	0.5	0.6	0.5	0.5	0.7	1.0	0.9	0.9	-0.2	-1.0	-1.1	-0.6	-0.7	-0.6	-0.4	-0.4	0.0	0.5	0.8	0.7	0.6	0.4	0.5	0.5	0.2
9	0.7	0.8	0.6	0.8	0.5	0.7	0.5	0.4	0.1	-0.1	-0.1	-0.4	-0.5	-0.6	-0.4	-0.2	0.0	0.2	0.1	0.0	0.1	0.3	0.2	0.1	0.2
10	0.1	0.2	0.3	0.1	0.2	0.2	0.2	0.4	0.0	-0.3	-0.5	-0.5	-0.6	-0.6	-0.5	-0.4	-0.1	0.3	0.5	0.5	0.5	0.6	0.7	0.6	0.1
11	0.6	0.6	0.5	0.5	0.8	0.5	0.3	0.4	-0.7	-1.1	-0.9	-0.5	-0.8	-0.9	-0.4	-0.2	-0.2	0.4	0.6	0.6	0.7	0.6	0.7	0.8	0.1
12	0.6	0.7	0.7	0.4	0.5	0.6	0.5	0.5	-0.6	-0.9	-0.9	-0.7	-0.7	-0.5	-0.4	-0.1	-0.1	0.5	0.8	0.5	0.5	0.7	0.8	0.7	0.2
13	0.5	0.4	0.7	0.6	0.6	0.7	0.5	0.3	-0.6	-0.9	-0.6	-0.5	-0.6	-0.5	-0.4	-0.4	-0.1	0.6	0.8	0.8	0.8	0.7	0.9	0.7	0.2
14	0.6	0.8	0.8	0.9	0.6	0.8	0.9	1.2	0.0	-0.9	-1.0	-0.9	-0.5	-0.4	-0.3	-0.4	0.2	0.6	0.5	0.4	0.5	0.6	0.9	0.7	0.3
15	0.6	0.7	1.0	0.7	0.7	0.7	0.9	0.6	0.0	-0.9	-1.0	-0.8	-0.8	-0.5	-0.3	0.0	0.2	0.4	0.5	0.5	0.6	0.9	0.8	0.6	0.3
16	0.6	0.7	0.8	0.7	0.7	0.6	0.8	0.6	0.4	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.2	0.4
17	0.2	0.2	0.3	0.1	0.1	0.0	-0.1	0.0	-0.1	-0.4	-0.4	-0.4	-0.6	-1.2	-0.5	-0.3	-0.1	0.5	0.6	0.5	0.6	0.7	0.6	0.6	0.0
18	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.5	-0.6	-1.0	-1.1	-0.5	-0.3	-0.2	0.0	0.1	0.2	0.4	0.3	0.4	0.4	0.4	0.5	0.6	0.2
19	0.5	0.5	0.6	0.6	0.7	0.4	0.5	0.4	0.2	-0.2	-0.3	-0.4	-0.3	-0.2	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.2
20	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	-0.2	-0.3	-0.5	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1
21	0.2	0.3	0.3	0.3	0.4	0.5	0.2	0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	-0.1	-0.3	-0.3	-0.6	-0.8	-0.6	-0.6	-0.5	-0.3	0.1	0.3	0.6	0.5	0.4	0.5	0.5	0.0
23	0.3	0.4	0.3	0.3	0.5	0.4	0.3	0.2	CAL	CAL	CAL	-1.1	-0.9	-0.5	-0.1	0.1	0.4	0.7	0.9	0.7	0.9	1.1	0.9	1.3	0.4
24	1.4	1.0	0.5	0.6	0.7	0.8	0.5	0.3	-0.6	-1.1	-1.1	-1.1	-0.9	-0.7	-0.3	0.0	0.2	0.5	0.5	0.6	0.4	0.6	0.8	0.6	0.2
25	0.9	0.8	0.6	0.6	0.5	0.5	0.7	0.5	-0.7	-1.3	-1.0	-0.9	-0.5	-0.5	-0.5	-0.4	0.0	0.4	0.6	0.6	0.5	0.6	0.6	0.6	0.1
26	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	-0.6	-1.1	-1.1	-0.7	-0.6	-0.6	-0.5	-0.4	0.0	0.4	0.7	0.5	0.6	0.8	0.8	0.5	0.1
27	0.5	0.6	0.4	0.4	0.3	0.3	0.4	0.5	0.1	-0.4	-0.5	-0.5	-0.5	-0.5	-0.5	-0.4	-0.1	0.2	0.5	0.5	0.6	0.4	0.6	0.8	0.2
28	0.9	0.7	0.7	0.6	0.8	0.5	2.3	1.3	0.4	-0.1	-0.6	-0.9	-0.9	-0.8	-0.6	-0.6	-0.3	0.3	0.6	0.8	0.6	0.7	0.6	0.7	0.3
29	0.7	0.5	0.6	0.5	0.5	0.4	0.5	0.4	-0.9	-1.3	-1.1	-0.6	-0.8	-0.6	-0.6	-0.6	-0.3	0.0	0.3	0.6	0.6	0.6	0.7	0.7	0.0
30	0.8	0.6	1.0	0.7	1.0	1.1	0.6	0.5	-0.2	-0.5	-0.6	-0.5	-0.7	-0.7	-0.7	-0.5	-0.1	0.3	0.5	0.5	0.6	0.6	0.6	0.6	0.2
31	0.9	1.5	1.6	1.3	1.2	0.9	0.6	0.5	-0.8	-0.9	-1.2	-1.2	-1.2	-0.8	-0.6	-0.4	-0.5	0.2	0.4	0.8	0.6	0.8	0.6	0.6	0.2
HRAVE	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.5	-0.2	-0.6	-0.7	-0.6	-0.6	-0.5	-0.3	-0.2	0.0	0.4	0.5	0.5	0.5	0.6	0.6	0.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.1	0.2	0.2	0.2	0.5	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.0	0.2	0.2	0.1	0.0	0.0	0.4	0.2	0.1
MAX	0.9	0.6	0.9	1.3	1.0	1.7	1.7	1.0	0.8	0.7	0.8	0.8	0.9	1.2	1.0	0.8	0.7	0.7	0.7	0.4	0.5	0.6	1.3	1.4	0.9
MIN	-0.9	-0.6	-1.0	-1.2	-1.3	-0.8	-0.4	-1.1	-0.6	-0.6	-1.1	-0.9	-0.9	-1.0	-1.0	0.1	-1.2	-1.1	-0.4	-0.5	-0.3	-0.8	-1.1	-1.1	-1.3

DAY	26	27	28	29	30	31
AVE	0.1	0.2	0.3	0.0	0.2	0.2
MAX	0.8	0.8	2.3	0.7	1.1	1.6
MIN	-1.1	-0.5	-0.9	-1.3	-0.7	-1.2

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 2.3 MONTHLY MINIMUM = -1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JANUARY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	703	703	703	703	703	703	703	703	704	704	704	703	701	700	699	699	699	699	699	698	698	698	698	697	701
2	697	697	697	697	697	697	697	698	698	699	699	699	699	698	698	698	699	700	700	701	702	702	703	703	699
3	704	704	705	705	705	705	706	707	708	708	709	708	708	707	707	707	707	708	708	708	709	709	709	709	707
4	709	709	709	709	709	709	709	710	711	711	711	710	710	709	708	708	708	708	709	709	709	709	710	709	709
5	709	709	708	708	708	708	709	709	709	710	710	709	708	707	706	706	706	706	706	706	707	707	707	708	708
6	708	707	707	708	708	708	709	709	710	710	710	709	708	708	707	708	708	708	708	709	709	709	709	709	708
7	709	709	708	708	708	708	708	708	708	709	708	707	706	705	705	704	704	704	704	704	704	704	704	704	706
8	704	703	703	703	703	702	702	702	702	702	702	702	701	700	699	699	699	699	699	699	700	700	701	701	701
9	701	700	700	700	700	700	700	700	700	700	700	700	699	698	697	697	697	697	698	698	699	699	699	699	699
10	699	699	700	700	700	701	701	702	703	704	705	705	704	704	704	704	705	705	706	706	706	707	707	707	704
11	707	707	707	707	706	706	706	706	706	707	706	706	705	704	703	702	702	701	701	701	701	702	702	702	704
12	703	703	703	703	703	703	704	704	704	705	705	704	703	702	702	701	701	702	702	702	702	703	703	703	703
13	703	703	702	702	702	703	703	704	704	705	705	705	704	704	703	703	703	703	704	704	704	704	704	704	704
14	704	704	704	704	704	704	704	704	705	705	705	705	704	703	703	702	702	702	702	702	703	703	703	703	704
15	703	702	702	702	702	702	702	703	703	704	704	703	702	701	701	701	701	701	701	702	702	702	702	702	702
16	702	702	702	703	702	702	703	703	703	704	705	705	705	704	704	704	704	704	704	704	704	704	704	704	704
17	704	704	704	704	704	704	705	705	705	706	706	706	706	705	705	705	705	705	705	706	706	706	706	707	705
18	707	706	706	706	706	707	707	708	708	709	709	708	707	706	705	705	705	705	705	706	706	706	706	706	706
19	706	706	706	706	706	706	707	707	707	707	707	707	706	705	704	704	704	704	705	705	705	705	706	706	706
20	706	705	705	705	705	705	706	706	706	706	706	706	705	704	704	703	703	704	704	703	704	704	704	703	705
21	703	703	703	703	703	704	704	705	704	704	704	705	704	703	703	703	703	704	704	704	704	704	704	705	704
22	704	704	704	704	704	704	704	705	705	705	705	705	704	704	704	704	704	704	704	704	704	705	705	705	704
23	705	705	705	705	705	705	705	705	CAL	CAL	CAL	706	704	703	703	702	702	702	702	702	702	702	703	703	703
24	702	702	703	703	702	702	703	703	703	704	704	703	702	701	701	700	700	700	701	701	702	702	702	702	702
25	702	702	702	703	703	703	703	703	704	704	705	704	704	703	702	702	702	702	703	703	704	704	704	705	703
26	705	705	705	705	705	705	705	705	706	706	706	705	705	704	703	703	703	703	703	703	703	703	703	703	704
27	703	703	703	703	703	703	704	704	704	704	704	704	704	703	703	703	703	703	704	704	704	705	705	705	704
28	705	705	705	705	705	705	705	705	706	706	706	705	705	704	704	703	703	703	703	703	703	703	703	702	704
29	702	702	702	701	701	701	700	701	701	700	700	700	699	698	697	697	698	698	699	699	699	699	699	700	700
30	700	700	700	700	700	701	701	702	702	703	703	703	703	702	701	702	702	702	702	703	704	704	704	705	702
31	705	705	705	705	706	706	706	707	708	709	709	708	708	707	707	707	706	706	707	707	708	708	708	708	707
HRAVE	704	704	704	704	704	704	704	705	705	705	705	705	704	703	703	703	703	703	703	703	704	704	704	704	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	699	707	709	708	708	706	701	699	704	704	703	704	704	702	704	705	706	706	705	704	704	703	702	703
MAX	704	703	709	711	710	710	709	704	701	707	707	705	705	705	704	705	707	709	707	706	705	705	706	704	705
MIN	697	697	704	708	706	707	704	699	697	699	701	701	702	702	701	702	704	705	704	703	703	704	702	700	702

DAY	26	27	28	29	30	31
AVE	704	704	704	700	702	707
MAX	706	705	706	702	705	709
MIN	703	703	702	697	700	705

MONTHLY AVERAGE = 703.9 MONTHLY MAXIMUM = 711.2 MONTHLY MINIMUM = 696.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JANUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	77	81	84	90	90	90	93	95	90	79	62	55	49	47	46	47	50	57	63	66	70	76	79	81	71
2	88	96	96	93	95	98	100	100	100	88	76	75	60	52	49	51	57	60	64	66	70	77	82	88	78
3	91	93	92	93	95	94	98	100	94	81	65	66	46	37	35	34	35	43	54	57	64	69	70	69	70
4	72	79	80	83	82	82	84	82	77	70	58	49	43	35	36	34	35	37	39	39	40	50	57	65	59
5	67	68	75	75	76	75	78	78	74	63	52	44	36	33	33	33	34	41	46	52	58	64	71	75	58
6	80	84	85	89	90	94	94	96	74	64	41	30	21	20	19	19	21	22	21	29	28	34	41	47	52
7	53	56	62	50	46	46	42	40	38	34	31	28	26	24	23	22	21	21	22	23	24	26	26	29	34
8	33	39	41	44	47	50	53	54	51	45	37	31	27	26	26	25	27	36	42	45	50	53	57	62	42
9	68	67	74	74	76	81	79	79	75	73	66	65	62	51	49	44	44	48	67	92	99	98	99	100	72
10	100	100	100	100	100	100	100	100	100	96	81	79	72	65	57	54	59	62	65	67	73	79	84	88	82
11	90	91	93	97	97	92	89	94	87	74	58	48	43	38	35	33	36	44	51	55	57	66	74	78	67
12	83	87	89	92	94	94	95	96	84	70	59	49	41	34	31	29	33	39	44	48	53	64	69	69	64
13	68	78	83	84	88	91	91	92	83	73	58	51	50	42	36	30	31	35	39	48	55	58	62	63	62
14	66	70	73	77	78	81	79	80	71	64	52	42	37	35	30	31	36	41	47	50	54	60	62	65	58
15	69	73	75	78	77	81	77	77	77	63	53	43	37	35	34	36	38	41	41	48	46	53	52	55	57
16	58	61	59	60	59	64	70	67	65	67	67	78	87	98	100	100	100	100	100	100	100	100	100	100	82
17	100	100	100	100	100	100	100	100	100	100	100	100	94	87	66	57	54	57	64	70	76	81	91	92	87
18	94	93	95	97	100	100	100	100	95	84	68	53	50	48	46	43	44	45	47	50	49	52	56	59	70
19	59	58	63	66	62	55	53	52	55	46	43	42	41	38	35	34	34	35	38	39	41	41	43	44	46
20	46	45	46	45	46	47	47	47	46	43	40	39	38	39	39	41	42	42	43	44	45	45	46	46	44
21	48	52	50	58	76	92	100	100	100	100	100	99	94	96	93	95	99	100	100	100	100	100	100	100	90
22	100	100	100	100	100	100	100	100	100	99	91	84	79	78	73	68	70	75	81	85	89	95	99	100	90
23	100	100	100	100	100	100	100	100	CAL	CAL	CAL	74	66	51	43	40	41	44	47	46	53	58	60	67	71
24	77	81	86	88	90	93	93	92	84	74	67	58	48	44	46	47	47	49	57	63	66	71	79	86	70
25	88	91	91	96	100	100	100	99	91	77	67	60	54	47	45	45	46	49	57	62	70	76	81	86	74
26	90	91	95	97	99	99	99	100	92	80	68	59	54	49	46	45	45	48	54	60	67	74	77	81	74
27	83	85	84	86	86	90	92	90	90	78	68	64	55	49	47	43	42	42	46	49	51	57	65	71	67
28	77	82	86	86	85	84	82	74	64	57	43	30	28	26	27	26	29	34	42	48	51	59	64	66	56
29	69	68	75	80	85	83	83	87	71	58	48	45	44	38	41	42	45	53	60	62	66	69	74	76	63
30	79	83	84	88	84	82	79	85	76	67	59	50	45	40	36	36	39	39	41	42	42	49	60	62	60
31	68	66	54	56	50	47	39	41	49	45	34	27	24	23	23	23	24	25	29	35	38	44	51	54	40
HRAVE	76	78	80	81	82	83	84	84	78	70	60	55	50	46	43	42	44	47	52	56	60	64	69	72	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	71	78	70	59	58	52	34	42	72	82	67	64	62	58	57	82	87	70	46	44	90	90	71	70	74
MAX	95	100	100	84	78	96	62	62	100	100	97	96	92	81	81	100	100	100	66	47	100	100	100	93	100
MIN	46	49	34	34	33	19	21	25	44	54	33	29	30	30	34	58	54	43	34	38	48	68	40	44	45

DAY	26	27	28	29	30	31
AVE	74	67	56	63	60	40
MAX	100	92	86	87	88	68
MIN	45	42	26	38	36	23

MONTHLY AVERAGE = 64.9 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 19.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JANUARY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.34	0.48	0.59	0.51	0.50	0.48	0.24	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.40
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.30	0.40	0.46	0.62	0.58	0.48	0.33	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.49
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.45	0.45	0.61	0.59	0.49	0.33	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.62
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.16	0.34	0.41	0.56	0.60	0.59	0.50	0.35	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.71
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.50	0.60	0.64	0.60	0.50	0.35	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.89
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.36	0.51	0.61	0.65	0.61	0.52	0.37	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.01
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.51	0.61	0.67	0.61	0.51	0.37	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.95
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.35	0.50	0.60	0.64	0.61	0.51	0.36	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.92
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.08	0.12	0.15	0.29	0.33	0.25	0.19	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.56
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.32	0.49	0.52	0.64	0.60	0.50	0.36	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.73
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.50	0.60	0.64	0.61	0.51	0.37	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.94
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.51	0.61	0.65	0.62	0.52	0.37	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.01
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.51	0.61	0.65	0.61	0.52	0.37	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.31	0.48	0.60	0.64	0.56	0.50	0.31	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.70
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.29	0.43	0.49	0.59	0.39	0.36	0.19	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.96
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.05	0.07	0.07	0.06	0.03	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.13	0.22	0.32	0.59	0.62	0.53	0.38	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.07
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.36	0.52	0.62	0.66	0.63	0.55	0.40	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.16
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.36	0.52	0.62	0.66	0.64	0.55	0.40	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.17
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.30	0.46	0.57	0.51	0.35	0.20	0.11	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.67
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.10	0.16	0.19	0.10	0.09	0.06	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.78
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.16	0.28	0.48	0.51	0.38	0.44	0.38	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.91
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	CAL	CAL	CAL	0.63	0.67	0.65	0.56	0.41	0.23	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.19
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.45	0.58	0.62	0.56	0.45	0.29	0.16	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.68
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.37	0.52	0.64	0.69	0.65	0.57	0.41	0.23	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.31
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.37	0.53	0.64	0.65	0.67	0.56	0.42	0.19	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.27
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.36	0.53	0.64	0.69	0.66	0.57	0.42	0.23	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.33
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.40	0.56	0.67	0.71	0.69	0.59	0.44	0.25	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.58
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.39	0.55	0.66	0.72	0.61	0.54	0.51	0.18	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.42
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.39	0.58	0.52	0.69	0.68	0.60	0.37	0.12	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.20
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.41	0.57	0.68	0.72	0.70	0.60	0.45	0.27	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.69
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.31	0.44	0.53	0.59	0.55	0.47	0.33	0.16	0.02	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.40	3.49	3.62	3.71	3.89	4.01	3.95	3.92	1.56	3.73	3.94	4.01	4.00	3.70	2.96	0.40	3.07	4.16	4.17	2.67	0.78	2.91	3.19	3.68	4.31
MAX	0.59	0.62	0.61	0.60	0.64	0.65	0.67	0.64	0.33	0.64	0.64	0.65	0.65	0.64	0.59	0.07	0.62	0.66	0.66	0.57	0.19	0.51	0.67	0.62	0.69
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.27	4.33	4.58	4.42	4.20	4.69
MAX	0.67	0.69	0.71	0.72	0.69	0.72
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JANUARY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.01	0.00	0.12
10	0.01	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.05	0.05	0.07	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.32
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.03	0.05	0.08	0.10	0.06	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.04	0.00	0.01	0.00	0.00	0.41
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	CAL	CAL	CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.05	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.41	0.00	0.01	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.10	0.00	0.01	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.91 MONTHLY MAXIMUM = 0.10 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
FEBRUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	7.8	4.6	6.6	8.5	8.9	7.3	9.0	7.6	8.3	8.0	10.6	8.7	9.0	10.5	9.2	9.4	11.4	17.0	16.3	16.7	15.3	16.5	9.2	9.6	10.3
2	8.7	9.9	10.7	11.5	11.1	10.9	12.3	11.5	9.6	8.4	6.8	5.3	3.5	2.7	1.7	3.4	8.5	11.4	9.4	9.6	4.8	8.3	5.6	7.0	8.0
3	8.3	9.9	8.4	7.5	5.4	5.9	3.6	2.1	6.5	4.7	17.6	20.5	24.2	25.0	20.5	15.5	16.1	11.2	8.7	11.0	17.2	14.1	11.3	10.3	11.9
4	8.9	8.5	9.6	13.7	11.7	9.4	6.0	7.9	9.6	8.3	3.6	5.3	5.8	3.8	3.6	5.4	9.8	16.4	14.0	11.0	9.6	5.2	3.0	3.1	8.1
5	4.7	3.6	4.0	2.8	1.7	2.7	5.7	6.1	3.9	1.4	3.1	4.0	9.4	13.6	15.6	16.5	16.0	15.2	9.2	6.5	4.3	3.5	3.5	5.7	6.8
6	6.8	7.6	5.0	2.5	3.2	4.5	3.7	4.0	4.4	3.2	1.8	2.4	7.8	10.9	14.2	15.3	14.1	12.5	8.3	6.8	3.1	3.6	4.2	2.8	6.4
7	5.6	5.5	6.3	5.1	5.0	4.2	5.1	5.0	4.2	2.7	2.1	2.3	3.1	6.0	8.0	11.0	11.4	14.2	11.7	9.6	2.3	5.6	8.0	9.4	6.4
8	8.7	9.6	7.9	7.1	5.9	4.7	6.3	8.2	9.1	7.8	6.0	4.8	1.8	3.9	4.6	11.6	12.6	12.7	9.2	6.9	2.2	6.2	8.0	6.8	7.2
9	6.8	6.9	3.1	3.8	6.4	5.5	7.4	8.9	6.6	4.0	2.5	3.1	3.4	8.2	11.5	11.9	14.1	13.1	7.6	4.5	5.3	3.2	3.9	9.3	6.7
10	7.2	8.1	12.3	6.4	11.5	11.8	10.5	9.6	10.8	9.8	4.1	6.0	8.9	10.3	14.0	17.4	16.9	6.6	4.7	8.2	4.6	4.8	3.1	2.0	8.7
11	3.3	6.3	5.7	9.4	10.8	9.5	7.0	4.2	2.9	3.5	5.6	7.6	7.8	12.7	13.3	13.9	12.6	9.6	8.6	7.1	6.2	5.3	5.1	3.6	7.6
12	2.3	2.3	2.3	3.1	3.6	3.0	3.1	5.2	3.2	2.9	2.6	3.8	6.7	8.4	12.7	12.8	13.6	10.0	6.4	4.8	2.7	5.4	3.8	6.3	5.5
13	4.4	5.7	6.4	7.3	6.1	7.6	7.0	7.3	7.1	8.0	7.9	7.1	5.9	3.4	3.2	3.7	4.4	3.9	2.4	2.8	5.3	3.2	5.2	8.8	5.6
14	8.3	8.9	8.3	9.9	10.2	9.4	10.1	10.1	10.2	8.2	6.3	4.3	3.3	3.5	6.9	9.8	13.5	12.5	10.5	4.0	3.1	3.6	4.5	5.7	7.7
15	6.0	8.0	7.9	8.9	5.1	6.3	7.5	5.0	4.8	3.3	1.2	1.8	2.9	6.9	11.1	9.8	13.0	13.2	11.3	11.4	4.8	4.3	5.7	7.4	7.0
16	8.0	5.7	7.1	7.6	5.0	5.9	4.5	6.9	7.0	5.3	4.0	2.4	1.8	2.5	4.1	6.3	12.3	14.0	13.4	11.1	5.0	5.1	6.2	8.3	6.7
17	8.6	7.3	5.5	7.4	5.7	6.9	6.5	6.9	4.1	3.5	3.2	1.8	1.9	6.0	8.6	12.3	14.0	14.7	7.9	4.9	2.2	4.8	7.2	6.5	6.6
18	8.3	7.5	6.3	5.8	7.2	7.1	8.1	6.8	4.9	4.7	5.6	3.8	2.9	3.5	3.5	3.9	7.0	9.8	9.0	9.6	4.5	4.7	7.9	7.9	6.3
19	8.2	7.4	7.0	5.5	6.8	7.3	7.3	6.8	5.0	6.0	4.0	3.4	2.6	3.5	7.9	10.4	14.6	13.3	10.9	6.6	4.6	4.3	6.5	8.4	7.0
20	7.6	7.8	7.3	5.8	6.6	8.3	7.8	7.8	7.2	7.0	7.4	7.9	7.7	6.3	7.5	6.8	10.7	12.4	12.3	17.2	14.7	17.0	21.6	28.0	10.4
21	28.9	27.9	29.5	29.2	32.5	34.0	32.8	34.4	31.2	28.8	23.0	24.9	25.4	22.8	23.4	23.2	21.3	25.0	25.4	23.9	21.5	20.3	19.5	18.5	26.1
22	17.4	15.1	12.7	11.3	11.6	10.8	13.6	12.6	17.2	14.5	13.0	13.6	15.3	14.8	10.2	7.5	5.3	11.7	16.3	18.9	8.6	5.3	6.0	2.3	11.9
23	5.3	3.5	5.6	10.3	14.5	4.3	2.3	3.6	1.9	2.3	2.4	2.8	7.3	8.8	14.9	11.5	9.4	7.8	5.3	3.3	3.7	4.9	6.4	7.3	6.2
24	6.7	8.5	4.5	2.8	5.7	5.4	5.2	3.8	2.4	2.7	2.7	2.9	9.2	10.5	11.9	14.6	14.6	14.1	10.9	9.6	4.9	3.7	5.5	6.5	7.0
25	4.3	3.7	4.2	5.1	1.8	1.8	2.9	6.6	6.6	12.0	20.3	13.6	14.4	16.8	11.7	16.7	15.9	14.2	13.7	16.7	10.6	21.0	19.2	23.4	11.6
26	18.5	18.8	16.6	11.4	8.6	11.5	18.5	12.9	23.7	23.0	21.6	22.1	16.6	13.7	12.4	8.1	10.4	12.1	13.3	12.2	10.2	12.3	14.4	14.6	14.9
27	15.4	15.1	13.4	12.8	8.8	9.8	8.2	11.4	10.3	7.2	11.4	8.5	9.5	7.5	6.1	5.7	7.0	7.3	13.1	14.9	4.9	8.6	10.6	9.1	9.9
28	8.2	11.6	8.7	10.8	9.2	9.1	9.9	11.2	10.7	10.3	15.5	15.2	14.3	11.9	10.1	15.1	14.8	14.5	16.6	13.9	10.1	9.1	9.3	10.3	11.7
29	7.9	9.4	8.5	5.1	4.3	5.3	7.0	5.6	5.9	3.7	2.2	1.6	4.3	8.2	8.5	11.1	9.5	8.8	8.2	4.9	6.4	8.1	5.3	3.8	6.4
HRAVE	8.7	8.8	8.3	8.2	8.1	7.9	8.2	8.3	8.2	7.4	7.5	7.3	8.2	9.2	10.0	11.1	12.2	12.4	10.8	10.0	7.0	7.7	7.9	8.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	10.3	8.0	11.9	8.1	6.8	6.4	6.4	7.2	6.7	8.7	7.6	5.5	5.6	7.7	7.0	6.7	6.6	6.3	7.0	10.4	26.1	11.9	6.2	7.0	11.6
MAX	17.0	12.3	25.0	16.4	16.5	15.3	14.2	12.7	14.1	17.4	13.9	13.6	8.8	13.5	13.2	14.0	14.7	9.8	14.6	28.0	34.4	18.9	14.9	14.6	23.4
MIN	4.6	1.7	2.1	3.0	1.4	1.8	2.1	1.8	2.5	2.0	2.9	2.3	2.4	3.1	1.2	1.8	1.8	2.9	2.6	5.8	18.5	2.3	1.9	2.4	1.8

DAY	26	27	28	29	30	31
AVE	14.9	9.9	11.7	6.4	***	***
MAX	23.7	15.4	16.6	11.1	***	***
MIN	8.1	4.9	8.2	1.6	***	***

MONTHLY AVERAGE = 8.8 MONTHLY MAXIMUM = 34.4 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
FEBRUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	112	144	116	112	110	121	113	115	121	139	160	118	78	68	48	31	43	33	34	48	47	51	106	99	88
2	97	129	128	133	128	132	130	131	131	137	151	159	134	86	44	285	282	271	268	259	278	270	139	119	246
3	106	88	110	118	126	96	118	227	294	276	247	254	290	289	282	286	282	257	250	263	273	267	266	272	181
4	266	237	252	277	279	289	307	322	307	305	286	282	258	254	120	272	285	304	306	296	280	273	194	135	269
5	113	117	135	155	186	160	146	132	133	194	288	265	287	299	288	284	279	279	288	297	294	156	127	120	85
6	110	104	117	97	101	125	90	110	123	114	170	243	291	298	293	294	294	298	311	300	177	119	106	114	39
7	101	91	92	89	87	87	84	102	94	103	312	275	247	243	272	301	304	310	308	290	260	106	94	94	221
8	99	101	116	107	111	87	101	92	97	124	116	79	64	226	295	294	306	303	309	310	213	130	101	102	115
9	87	72	352	86	93	100	88	86	113	91	100	114	82	209	201	230	287	292	298	278	300	359	55	357	151
10	309	241	215	41	58	49	69	71	64	96	128	114	75	51	334	301	303	307	8	92	122	356	82	215	252
11	339	101	268	307	303	285	293	284	279	281	279	282	262	298	277	278	286	295	281	289	159	128	129	115	323
12	301	198	67	141	98	81	62	90	95	97	173	264	277	301	282	280	287	295	305	289	131	108	105	94	98
13	88	104	101	99	128	97	104	103	99	136	157	95	88	111	54	194	228	226	311	342	325	49	76	122	31
14	116	116	97	109	119	124	134	131	144	155	152	106	148	181	310	293	283	301	305	294	306	112	84	79	67
15	90	103	100	90	120	84	103	104	91	115	31	262	274	283	303	291	298	293	304	301	202	122	113	99	331
16	86	90	95	100	109	104	74	107	90	119	125	119	299	283	264	289	303	306	310	297	296	136	117	94	197
17	86	88	90	101	95	100	96	97	111	119	127	145	208	288	289	300	293	289	301	272	173	136	102	93	174
18	89	91	81	111	94	97	103	103	106	119	121	155	110	165	123	315	283	303	308	312	313	109	94	93	197
19	96	105	103	78	93	94	92	80	83	85	120	142	160	299	286	297	290	296	296	311	287	138	105	94	14
20	85	87	87	108	102	94	107	111	106	97	155	103	82	73	23	17	43	37	38	44	47	56	54	68	111
21	68	66	71	75	71	72	73	72	81	86	84	82	100	99	92	102	91	68	66	65	64	64	60	66	7
22	50	62	73	70	72	71	61	69	52	50	58	60	62	61	64	24	352	299	301	308	315	274	254	267	145
23	324	214	200	236	309	31	109	111	125	297	261	252	311	300	288	293	321	310	332	208	120	108	99	96	133
24	99	81	34	44	95	87	89	100	122	107	130	262	289	289	302	292	288	284	296	308	297	157	121	100	175
25	81	82	93	112	3	13	93	103	121	28	26	17	27	25	30	45	30	37	19	12	35	31	36	39	151
26	38	46	44	54	73	67	41	83	65	80	94	102	79	78	79	56	39	45	62	56	86	65	66	59	355
27	64	58	61	60	65	80	111	86	92	124	36	53	44	60	85	74	35	51	41	34	27	27	57	86	25
28	115	144	134	138	121	124	134	126	139	120	72	72	62	57	49	45	45	40	47	51	46	67	114	101	235
29	106	120	103	112	106	100	87	101	95	120	283	301	283	291	298	296	275	291	313	282	135	113	106	90	161

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
FEBRUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	12	68	20	12	10	7	8	6	8	7	7	20	16	17	22	18	14	10	9	7	10	11	18	15	15
2	20	13	14	10	13	7	5	4	5	9	10	19	39	50	66	35	14	8	8	10	50	15	9	11	18
3	8	11	17	15	21	50	45	52	11	19	16	13	14	10	14	13	11	12	11	12	10	10	11	10	17
4	10	11	11	8	9	8	11	11	13	20	39	38	37	46	52	42	23	10	8	5	4	10	28	19	20
5	14	22	14	35	32	47	8	6	15	32	22	26	20	15	13	11	9	8	11	12	21	15	11	7	18
6	6	10	12	19	15	9	12	9	15	34	62	61	22	17	14	12	11	9	8	6	32	25	12	20	19
7	9	9	8	10	9	9	10	8	11	43	27	43	34	18	19	18	15	10	6	6	37	11	8	8	16
8	8	9	9	13	11	21	10	7	8	10	15	18	64	38	33	15	12	10	6	7	39	23	6	12	17
9	10	26	26	12	9	11	12	6	9	17	36	37	31	40	22	14	15	7	14	33	47	56	69	47	25
10	23	26	16	38	9	10	8	7	10	18	30	35	27	28	23	11	15	38	53	34	46	45	41	41	26
11	43	17	40	15	8	6	7	13	40	17	19	16	21	14	12	11	16	12	10	20	13	13	11	11	17
12	32	20	19	12	8	20	13	9	15	21	52	39	25	26	16	17	14	11	8	12	12	11	29	11	19
13	14	10	8	8	12	7	7	7	8	13	14	21	26	44	39	35	28	17	28	46	14	24	39	11	20
14	8	7	7	8	9	8	5	4	7	8	17	35	48	41	33	24	10	9	8	17	22	16	13	10	16
15	10	8	7	8	10	8	6	9	11	20	57	48	40	21	18	19	15	10	7	6	26	14	11	7	16
16	7	10	7	9	9	7	14	14	8	16	29	39	45	60	36	26	13	10	7	7	29	9	11	6	18
17	7	7	10	7	7	8	7	7	9	21	35	44	45	21	18	16	14	10	8	14	19	8	5	8	15
18	6	7	9	8	7	7	6	7	10	13	18	29	50	52	46	53	22	12	8	6	42	21	11	9	19
19	8	7	7	10	7	6	6	8	9	10	22	36	46	46	23	18	13	11	5	10	13	13	6	7	14
20	8	9	7	9	8	6	7	7	8	12	14	22	14	19	25	19	20	13	12	10	13	13	13	7	12
21	7	7	10	10	9	8	9	8	10	11	12	12	10	12	11	9	10	9	8	9	9	10	12	9	10
22	12	11	8	12	12	15	10	9	10	10	10	7	7	10	9	29	34	13	8	9	27	30	30	38	15
23	56	45	40	16	15	28	20	16	19	46	40	54	16	14	9	11	10	10	15	28	15	11	8	9	23
24	9	5	27	22	8	9	9	18	25	22	33	38	21	22	18	14	14	9	8	8	32	16	7	9	17
25	10	15	15	16	48	44	41	10	15	60	19	25	26	25	26	22	19	18	17	18	26	16	16	13	23
26	12	11	11	11	8	11	12	13	8	12	13	13	15	21	21	28	21	16	12	13	10	8	6	8	13
27	6	8	9	9	14	14	22	16	24	23	14	23	20	22	15	23	26	18	9	10	43	13	11	13	17
28	14	5	8	9	14	14	17	18	15	23	9	13	13	18	18	10	13	11	8	10	13	14	8	7	13
29	5	8	7	29	19	10	7	9	11	21	37	50	33	29	23	15	18	11	7	16	9	14	44	51	20
HRAVE	14	15	14	14	13	14	12	11	13	20	25	30	28	27	24	20	16	12	11	14	23	17	17	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15	18	17	20	18	19	16	17	25	26	17	19	20	16	16	18	15	19	14	12	10	15	23	17	23
MAX	68	66	52	52	47	62	43	64	69	53	43	52	46	48	57	60	45	53	46	25	12	38	56	38	60
MIN	6	4	8	4	6	6	6	6	6	7	6	8	7	4	6	6	5	6	5	6	7	7	8	5	10

DAY	26	27	28	29	30	31
AVE	13	17	13	20	***	***
MAX	28	43	23	51	***	***
MIN	6	6	5	5	***	***

MONTHLY AVERAGE = 17.5 MONTHLY MAXIMUM = 68.8 MONTHLY MINIMUM = 3.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
FEBRUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	9.7	6.4	5.8	6.5	6.4	5.9	5.2	5.0	6.4	9.3	12.9	17.2	19.5	20.4	21.2	21.4	21.0	20.1	19.3	18.5	17.8	16.8	14.5	13.1	13.4
2	12.4	10.1	9.7	8.8	8.3	7.4	7.2	7.2	8.7	11.6	14.7	17.9	19.7	21.3	22.9	23.9	24.1	23.0	20.6	18.8	17.9	17.2	15.5	14.3	15.1
3	14.1	13.7	14.1	14.6	13.2	12.8	12.1	12.8	11.6	14.6	17.7	17.3	15.9	14.9	14.4	13.1	12.7	12.0	11.6	11.3	10.5	9.5	8.7	7.8	12.9
4	7.1	6.6	5.9	5.0	4.3	3.5	3.1	3.0	3.2	3.7	4.6	5.9	7.3	7.8	8.2	8.7	8.6	7.2	6.0	5.0	4.0	3.3	2.6	2.0	5.3
5	0.8	0.1	-0.5	-0.7	-1.2	-1.7	-2.3	-1.9	-0.6	1.9	4.6	6.5	7.9	8.4	8.3	8.4	8.1	7.2	6.0	5.2	4.8	4.0	2.8	1.8	3.2
6	1.1	0.5	0.0	-1.6	-1.6	-2.0	-2.5	-2.5	-1.0	2.3	4.9	7.4	10.0	11.9	13.0	13.1	12.8	11.9	10.7	9.7	8.6	7.4	6.4	5.7	5.3
7	4.5	3.9	2.9	2.5	1.5	1.5	0.3	0.2	2.5	5.4	7.9	11.0	13.8	16.0	17.2	17.8	17.7	16.6	14.8	13.3	12.4	10.8	9.5	8.3	8.8
8	7.7	6.6	6.4	5.2	4.7	3.1	2.8	3.4	5.5	9.0	12.6	15.0	17.5	19.4	20.6	21.6	21.2	20.0	17.8	16.3	15.8	13.1	12.0	10.6	12.0
9	9.7	8.1	7.2	6.5	5.1	4.6	4.1	4.6	6.2	9.8	13.6	16.8	18.6	21.5	22.5	22.1	21.1	19.4	18.1	17.0	16.9	16.2	16.5	15.5	13.4
10	15.6	16.7	16.4	15.6	14.7	14.9	14.1	13.5	14.9	17.3	19.1	20.5	21.1	20.4	18.9	17.9	15.9	13.4	11.8	11.6	11.2	10.9	10.7	10.4	15.3
11	10.0	9.7	9.2	8.8	8.5	7.6	7.6	7.5	8.5	9.4	10.4	11.0	12.7	13.3	13.4	13.2	12.6	12.0	11.1	10.4	9.4	8.9	8.1	8.1	10.1
12	7.7	7.0	6.3	5.7	5.4	4.5	3.8	3.7	5.3	7.9	9.6	10.8	12.6	13.7	14.5	14.7	14.2	13.4	12.1	11.3	10.2	9.1	7.9	7.1	9.1
13	6.2	5.3	4.8	4.4	3.0	2.9	2.6	3.1	5.2	8.2	11.2	14.0	15.7	17.0	17.5	18.4	18.7	18.1	16.8	15.1	13.4	12.4	10.8	9.2	10.6
14	8.9	8.4	7.6	6.5	6.4	6.0	5.9	6.3	8.2	11.3	15.0	17.1	18.9	20.4	20.5	20.8	19.9	18.5	16.8	16.2	14.9	13.1	11.4	10.0	12.9
15	8.8	8.5	7.6	6.9	5.5	4.9	4.7	4.8	6.6	9.8	12.1	14.6	17.0	18.9	19.6	20.1	19.5	18.3	16.4	15.4	13.6	12.3	10.6	9.6	11.9
16	8.4	7.7	6.7	6.1	4.9	4.8	3.8	4.1	6.6	9.9	12.7	15.2	17.3	19.5	20.7	21.6	21.6	20.4	18.4	16.5	15.6	13.8	12.1	11.5	12.5
17	9.7	9.1	8.1	7.6	6.0	6.4	5.3	6.1	7.9	10.5	13.8	16.5	19.1	20.8	21.8	22.2	21.9	20.6	18.7	17.6	16.2	14.4	13.3	11.7	13.6
18	10.6	9.9	9.0	7.8	7.6	6.7	6.8	7.2	8.7	12.0	15.6	17.8	20.4	21.8	22.7	22.8	23.4	22.2	20.3	19.1	18.0	16.1	14.1	12.9	14.7
19	12.0	11.3	10.9	9.2	8.5	8.6	8.2	8.3	8.5	11.0	15.6	18.1	20.1	21.7	22.6	23.2	23.1	22.0	19.9	18.9	17.6	15.6	14.4	12.8	15.1
20	11.7	10.7	9.6	9.1	8.3	7.8	7.4	7.8	10.8	13.7	17.2	20.4	22.5	24.0	24.3	24.2	23.9	23.4	22.8	22.2	21.5	20.5	19.7	18.8	16.8
21	17.9	16.9	15.9	14.9	14.1	13.4	12.8	12.5	12.4	12.8	14.0	15.3	17.1	17.2	17.8	17.8	17.7	17.3	16.8	16.5	16.4	16.2	16.0	15.9	15.6
22	15.6	15.1	12.7	11.6	11.1	10.6	10.4	10.5	11.2	11.7	11.5	11.3	11.6	12.0	12.4	12.5	13.0	14.2	14.1	13.1	13.3	12.7	12.2	11.3	12.3
23	11.0	11.0	10.1	9.9	8.2	8.0	7.4	7.5	8.8	10.5	11.7	12.8	12.6	12.6	12.5	12.5	12.3	12.1	11.7	10.7	10.1	9.3	8.4	7.5	10.4
24	7.2	6.8	5.9	5.2	4.7	4.4	4.0	4.4	6.2	8.7	11.0	13.1	15.3	16.8	17.5	17.7	17.2	16.4	14.9	14.2	13.6	12.6	11.4	10.6	10.8
25	9.8	8.6	8.1	7.3	7.0	6.5	5.6	5.1	7.3	11.5	13.6	13.8	14.2	14.5	14.7	14.6	14.2	13.7	13.1	12.4	11.7	11.2	10.6	10.0	10.8
26	9.3	8.8	8.6	8.0	6.6	6.2	6.5	6.7	8.0	10.0	11.7	13.2	14.0	14.8	15.3	15.7	15.6	15.0	13.9	13.2	11.8	11.6	10.6	10.2	11.0
27	9.6	9.4	8.2	8.2	7.0	5.5	3.5	5.2	7.7	10.1	13.7	15.8	17.8	19.5	20.7	21.1	21.1	20.0	18.8	18.3	17.2	16.8	15.5	13.1	13.5
28	11.4	9.7	9.7	8.6	8.5	8.5	7.3	8.7	9.3	13.2	18.6	20.0	20.0	20.7	21.3	21.6	22.0	21.5	20.9	20.1	19.2	17.5	15.2	13.8	15.3
29	12.4	11.0	10.8	10.6	8.4	7.8	7.0	7.8	10.4	12.9	15.6	18.0	20.7	22.5	22.9	22.6	23.2	22.2	20.3	18.5	16.5	15.5	15.4	14.7	15.3
HRAVE	9.7	8.9	8.2	7.5	6.7	6.2	5.7	5.9	7.4	10.0	12.7	14.6	16.2	17.4	17.9	18.1	17.9	17.0	15.7	14.7	13.8	12.7	11.6	10.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	13.4	15.1	12.9	5.3	3.2	5.3	8.8	12.0	13.4	15.3	10.1	9.1	10.6	12.9	11.9	12.5	13.6	14.7	15.1	16.8	15.6	12.3	10.4	10.8	10.8
MAX	21.4	24.1	17.7	8.7	8.4	13.1	17.8	21.6	22.5	21.1	13.4	14.7	18.7	20.8	20.1	21.6	22.2	23.4	23.2	24.3	17.9	15.6	12.8	17.7	14.7
MIN	5.0	7.2	7.8	2.0	-2.3	-2.5	0.2	2.8	4.1	10.4	7.5	3.7	2.6	5.9	4.7	3.8	5.3	6.7	8.2	7.4	12.4	10.4	7.4	4.0	5.1

DAY	26	27	28	29	30	31
AVE	11.0	13.5	15.3	15.3	***	***
MAX	15.7	21.1	22.0	23.2	***	***
MIN	6.2	3.5	7.3	7.0	***	***

MONTHLY AVERAGE = 12.0 MONTHLY MAXIMUM = 24.3 MONTHLY MINIMUM = -2.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
FEBRUARY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.6	0.7	0.8	0.9	0.7	0.7	0.5	0.6	-0.5	-1.0	-1.6	-1.1	-0.9	-0.6	-0.3	0.0	0.2	0.4	0.4	0.4	0.4	0.3	0.6	0.5	0.1
2	0.6	1.2	0.8	0.7	1.2	1.3	1.1	0.8	-0.1	-1.1	-1.2	-1.1	-0.9	-0.7	-0.5	-0.6	-0.3	0.3	0.7	0.5	0.5	0.9	0.5	0.5	0.2
3	0.7	0.9	0.6	0.6	0.9	1.2	1.2	1.4	0.9	-0.2	-0.6	-0.3	-0.7	-0.6	-0.5	-0.2	-0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2
4	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	-0.2	-0.5	-0.8	-0.8	-0.9	-0.8	-0.7	-0.8	-0.6	0.0	0.2	0.3	0.4	0.4	0.5	0.4	-0.2
5	0.7	0.7	0.5	0.6	0.7	0.5	0.4	0.1	-0.5	-0.4	-0.6	-0.8	-0.9	-0.7	-0.7	-0.8	-0.5	0.0	0.2	0.3	0.3	0.4	0.4	0.4	0.0
6	0.8	0.6	0.5	0.4	0.4	0.4	0.5	0.5	-0.1	-0.9	-0.5	-0.6	-0.9	-0.9	-0.8	-0.7	-0.4	0.1	0.4	0.6	0.4	0.6	0.6	0.5	0.1
7	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.0	-0.8	-0.8	-0.7	-0.6	-0.7	-0.8	-0.7	-0.7	-0.3	0.2	0.5	0.6	0.5	0.8	0.7	0.8	0.1
8	1.0	0.7	0.6	0.6	0.6	0.4	0.6	0.3	-0.8	-1.6	-1.6	-1.2	-0.7	-0.7	-0.6	-0.7	-0.3	0.2	0.6	0.6	0.3	0.7	0.9	0.8	0.0
9	0.8	0.7	0.5	0.7	0.5	0.6	0.5	0.3	-0.8	-1.0	-0.6	-0.7	-0.7	-0.7	-0.6	-0.4	-0.2	0.2	0.4	0.4	0.8	0.3	0.5	0.4	0.1
10	0.4	0.4	0.2	0.3	0.2	0.2	0.3	0.5	-0.1	-0.9	-1.1	-1.2	-1.0	-0.4	-0.2	-0.1	0.0	0.4	0.1	0.1	0.1	0.1	0.1	0.0	-0.1
11	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.0	-0.4	-0.6	-0.6	-0.6	-0.8	-0.9	-0.8	-0.7	-0.5	-0.1	0.1	0.1	-0.1	0.0	0.1	0.1	-0.2
12	0.2	0.3	0.3	0.4	0.5	0.4	0.4	0.2	-0.6	-0.8	-0.6	-0.7	-0.9	-0.8	-0.8	-0.8	-0.4	0.0	0.4	0.5	0.4	0.6	0.4	0.7	0.0
13	0.5	0.6	0.7	0.6	0.8	0.7	0.6	0.1	-1.1	-1.4	-1.5	-1.3	-1.1	-0.9	-0.7	-0.7	-0.5	0.0	0.4	0.5	0.7	0.7	0.6	0.7	0.0
14	0.7	0.6	0.7	1.2	0.8	1.2	0.8	0.4	-0.8	-1.3	-1.3	-1.1	-0.8	-0.9	-0.7	-0.5	-0.1	0.2	0.5	0.4	0.5	0.6	0.6	0.7	0.1
15	0.5	0.7	0.7	0.7	0.6	0.4	0.6	-0.1	-1.0	-1.0	-0.4	-0.6	-0.8	-0.8	-0.7	-0.8	-0.4	0.0	0.5	0.6	0.6	0.6	0.7	0.8	0.1
16	0.5	0.7	0.6	0.7	0.7	0.6	0.4	0.2	-1.1	-1.4	-1.2	-0.9	-0.6	-0.6	-0.7	-0.8	-0.3	0.2	0.4	0.6	0.6	0.5	0.7	0.8	0.0
17	0.6	0.6	0.6	0.6	0.4	0.7	0.7	0.1	-1.0	-0.9	-0.9	-0.6	-0.7	-0.9	-0.8	-0.8	-0.4	0.0	0.5	0.7	0.6	0.5	0.8	0.7	0.0
18	0.7	0.7	0.6	0.5	0.6	0.6	0.6	0.0	-1.1	-1.3	-1.5	-0.9	-1.0	-0.8	-0.8	-0.6	-0.5	0.0	0.5	0.6	0.5	0.6	0.8	0.7	0.0
19	0.7	0.6	0.5	0.4	0.5	0.7	0.5	0.3	-0.2	-0.8	-1.2	-1.0	-0.8	-0.8	-0.8	-0.8	-0.5	0.0	0.6	0.6	0.6	0.6	0.7	0.9	0.1
20	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.0	-1.3	-1.5	-1.6	-1.4	-1.3	-1.1	-0.7	-0.3	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	-0.1
21	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.5	-0.7	-1.0	-0.7	-0.7	-0.4	-0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	-0.2
22	0.0	0.1	0.5	0.4	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.5	0.4	0.2
23	0.4	0.4	0.6	0.4	0.2	0.3	0.2	0.2	-0.3	-0.5	-0.5	-0.5	-0.3	-0.2	-0.1	-0.1	0.0	0.1	0.3	0.4	0.4	0.5	0.5	0.6	0.1
24	0.5	0.6	0.4	0.4	0.4	0.3	0.3	-0.2	-0.4	-0.8	-0.8	-0.6	-0.8	-0.8	-0.6	-0.7	-0.4	-0.1	0.3	0.4	0.5	0.5	0.5	0.7	0.0
25	0.4	0.4	0.5	0.7	0.4	0.3	0.6	0.3	-0.6	-0.3	-0.3	-0.6	-0.6	-0.5	-0.4	-0.3	0.0	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1
26	0.2	0.2	0.2	0.4	0.7	0.5	0.2	0.0	-0.3	-0.7	-1.0	-1.3	-1.1	-1.0	-0.8	-0.5	0.0	0.2	0.3	0.3	0.6	0.5	0.5	0.4	-0.1
27	0.4	0.4	0.5	0.4	0.8	1.0	1.4	0.5	-0.2	-0.8	-0.8	-0.9	-0.9	-0.8	-0.9	-0.4	0.0	0.3	0.4	0.4	0.5	0.7	0.6	0.8	0.1
28	1.0	0.8	1.1	0.6	0.9	1.3	1.5	0.9	0.6	-0.4	-0.9	-0.7	-0.4	-0.4	-0.3	-0.2	-0.1	0.2	0.3	0.4	0.5	0.5	0.7	0.8	0.4
29	0.9	1.1	0.6	0.6	0.6	0.6	0.6	-0.2	-1.1	-1.0	-0.6	-0.6	-0.8	-0.9	-0.7	-0.4	-0.5	-0.1	0.6	0.6	0.6	0.6	0.6	0.7	0.1
HRAVE	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.2	-0.5	-0.8	-0.9	-0.8	-0.8	-0.7	-0.6	-0.5	-0.3	0.1	0.4	0.4	0.4	0.5	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.2	0.2	-0.2	0.0	0.1	0.1	0.0	0.1	-0.1	-0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	-0.1	-0.2	0.2	0.1	0.0	0.1
MAX	0.9	1.3	1.4	0.5	0.7	0.8	0.8	1.0	0.8	0.5	0.2	0.7	0.8	1.2	0.8	0.8	0.8	0.8	0.9	0.7	0.1	0.5	0.6	0.7	0.7
MIN	-1.6	-1.2	-0.7	-0.9	-0.9	-0.9	-0.8	-1.6	-1.0	-1.2	-0.9	-0.9	-1.5	-1.3	-1.0	-1.4	-1.0	-1.5	-1.2	-1.6	-1.0	0.0	-0.5	-0.8	-0.6

DAY	26	27	28	29	30	31
AVE	-0.1	0.1	0.4	0.1	***	***
MAX	0.7	1.4	1.5	1.1	***	***
MIN	-1.3	-0.9	-0.9	-1.1	***	***

MONTHLY AVERAGE = 0.0 MONTHLY MAXIMUM = 1.5 MONTHLY MINIMUM = -1.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
FEBRUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	708	708	708	708	708	709	709	710	710	710	710	709	708	707	707	706	706	706	706	706	706	706	706	706	708
2	705	705	705	704	704	704	704	704	704	705	704	703	702	701	700	699	699	698	698	698	698	698	698	698	702
3	697	697	696	696	695	695	695	695	696	695	695	695	694	694	694	695	695	695	696	696	697	697	698	698	696
4	698	698	698	698	698	699	699	699	700	701	701	701	701	700	700	699	699	700	700	700	701	701	701	701	700
5	701	701	701	701	701	701	701	702	703	703	703	703	702	701	701	701	701	701	702	702	703	703	703	703	702
6	703	703	703	703	703	704	704	704	705	705	705	705	704	703	702	702	701	702	702	702	702	703	703	703	703
7	703	703	703	703	702	703	703	703	704	704	704	704	703	702	702	701	701	702	702	703	703	703	703	703	703
8	703	703	703	703	703	703	703	704	704	704	704	703	701	701	700	699	699	699	699	700	700	700	700	700	701
9	700	700	700	699	699	699	699	699	700	700	700	699	698	697	697	696	696	697	697	697	698	698	698	698	698
10	698	698	698	698	698	698	698	698	698	699	699	698	697	696	696	696	697	697	698	698	699	699	699	699	698
11	699	698	698	698	699	699	700	700	701	700	701	701	700	700	699	699	699	700	700	701	701	701	701	702	700
12	702	702	702	702	701	702	702	703	703	704	704	704	703	702	702	702	702	702	703	703	703	703	703	704	703
13	704	704	704	704	704	704	704	704	705	705	705	704	704	703	702	702	702	702	702	702	703	703	703	703	703
14	703	703	703	703	703	703	703	703	704	704	704	703	703	702	702	701	702	702	702	703	703	704	704	704	703
15	704	704	704	704	704	705	705	706	706	706	706	706	705	704	704	704	703	704	704	704	705	705	705	705	705
16	705	705	705	705	705	705	706	706	706	706	706	705	704	703	702	701	701	701	701	702	702	702	702	702	704
17	701	701	701	701	701	700	701	701	701	702	701	701	700	699	698	698	698	699	699	699	700	700	700	701	700
18	701	701	701	701	701	701	701	702	703	703	703	702	701	701	700	700	700	700	700	701	701	702	702	702	701
19	702	702	702	702	702	702	702	702	703	703	703	703	702	701	701	701	701	701	702	702	703	703	703	704	702
20	704	704	704	704	704	704	705	706	706	707	707	706	705	704	704	704	703	703	703	704	704	705	705	705	705
21	705	705	705	705	705	705	706	706	707	708	708	707	706	706	705	705	704	704	705	705	705	705	705	705	705
22	705	705	705	705	704	705	704	704	704	704	704	703	703	702	701	701	701	701	702	702	702	703	703	703	703
23	703	703	703	702	703	704	704	705	706	706	706	706	706	705	705	705	705	705	706	706	706	706	707	706	705
24	706	706	706	706	706	706	706	706	707	707	706	705	704	704	703	703	702	702	702	703	703	704	704	704	705
25	704	704	704	704	704	704	704	705	706	706	707	707	707	707	706	706	706	707	707	708	709	709	709	710	706
26	710	710	710	710	710	710	710	711	711	711	711	711	710	709	709	708	708	708	707	708	708	709	709	708	709
27	708	708	708	708	708	708	708	709	709	709	709	709	708	707	706	706	705	706	706	706	707	707	708	708	707
28	707	707	707	706	706	707	707	707	708	708	708	707	706	706	705	705	705	705	704	704	705	705	705	705	706
29	705	704	704	704	704	703	703	704	704	704	704	703	703	702	701	701	700	700	700	700	700	701	701	700	702
HRAVE	703	703	703	703	703	703	703	704	704	704	704	704	703	702	702	702	701	702	702	702	703	703	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	708	702	696	700	702	703	703	701	698	698	700	703	703	703	705	704	700	701	702	705	705	703	705	705	706
MAX	710	705	698	701	703	705	704	704	700	699	702	704	705	704	706	706	702	703	704	707	708	705	707	707	710
MIN	706	698	694	698	701	701	701	699	696	696	698	701	702	701	703	701	698	700	701	703	704	701	702	702	704

DAY	26	27	28	29	30	31
AVE	709	707	706	702	***	***
MAX	711	709	708	705	***	***
MIN	707	705	704	700	***	***

MONTHLY AVERAGE = 702.9 MONTHLY MAXIMUM = 711.1 MONTHLY MINIMUM = 693.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
FEBRUARY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	49	61	64	61	60	60	62	64	60	52	43	32	25	24	23	24	25	26	26	27	29	31	38	42	42
2	44	52	53	54	55	58	57	56	52	45	38	34	30	26	24	22	22	23	27	30	32	32	36	38	39
3	39	41	43	43	48	51	55	55	55	52	48	46	52	50	46	47	42	41	37	33	31	24	24	25	43
4	24	25	25	24	25	27	29	29	28	28	26	26	24	22	20	21	23	27	31	35	37	40	42	45	28
5	53	56	57	56	57	59	60	57	50	42	32	27	23	22	24	23	24	26	27	30	31	32	36	39	39
6	43	45	46	56	58	57	63	63	54	41	33	30	27	26	26	28	29	31	34	36	40	44	48	51	42
7	55	58	62	64	69	70	75	75	64	51	46	39	33	31	31	30	30	33	37	40	44	49	53	57	50
8	59	63	64	69	71	78	80	78	66	54	42	38	33	29	27	29	29	32	35	38	41	47	51	55	51
9	60	64	68	71	75	78	79	77	67	54	45	39	35	30	28	27	31	35	38	42	42	44	43	45	51
10	45	42	48	53	58	57	62	64	59	50	43	39	36	40	50	54	58	83	98	97	100	100	100	100	64
11	100	100	99	97	94	98	98	97	90	83	76	73	61	57	57	57	61	63	69	73	81	84	89	89	81
12	92	95	100	99	100	100	100	100	98	84	75	71	60	54	44	42	44	44	51	56	63	68	75	80	75
13	84	87	89	91	94	95	96	94	81	68	58	47	41	38	36	34	32	33	37	42	51	56	60	66	63
14	69	72	74	78	79	81	81	80	73	63	51	45	41	35	35	32	28	33	37	38	44	52	60	66	56
15	71	71	75	77	84	87	88	87	76	60	52	47	39	33	30	28	31	33	39	41	46	52	59	65	57
16	69	74	76	79	84	85	89	87	74	58	48	42	34	28	26	24	24	27	32	38	41	46	52	56	54
17	62	65	70	71	78	76	81	77	67	55	46	38	32	30	31	29	30	31	36	39	43	48	53	60	52
18	63	67	70	76	76	80	80	77	69	56	45	42	36	31	29	30	30	33	38	40	43	49	57	61	53
19	64	66	66	74	77	77	79	79	78	67	49	42	38	33	33	32	30	32	37	40	43	49	54	59	54
20	63	67	71	74	76	78	79	77	63	53	45	37	32	30	30	30	30	31	34	37	39	40	41	41	50
21	42	43	45	48	49	51	53	53	54	53	50	48	45	45	44	45	45	47	47	48	48	49	50	51	48
22	52	56	80	92	95	98	100	100	99	98	99	100	100	100	100	100	100	99	95	87	73	74	72	79	90
23	80	79	83	84	94	96	100	100	94	86	71	69	71	72	71	71	72	74	75	82	88	93	96	99	83
24	100	100	100	100	100	100	100	100	98	83	75	71	68	62	55	54	57	61	69	72	76	80	86	90	81
25	94	99	100	100	100	100	100	100	95	55	27	25	25	22	21	21	22	21	20	18	20	21	22	23	52
26	26	27	27	28	34	35	30	32	29	29	28	26	26	25	24	24	25	26	28	30	35	34	36	36	29
27	38	38	42	41	46	52	60	52	45	41	30	28	26	24	23	23	23	24	27	28	31	32	36	45	36
28	52	58	57	60	60	60	64	57	56	45	31	28	29	29	28	27	25	25	25	26	27	32	39	45	41
29	50	54	57	55	68	73	77	72	59	47	41	37	33	26	26	23	23	25	28	33	38	41	41	44	45
HRAVE	60	63	66	68	71	73	75	74	67	57	48	44	40	37	36	35	36	39	42	44	47	50	53	57	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	42	39	43	28	39	42	50	51	51	64	81	75	63	56	57	54	52	53	54	50	48	90	83	81	52
MAX	64	58	55	45	60	63	75	80	79	100	100	100	96	81	88	89	81	80	79	79	54	100	100	100	100
MIN	23	22	24	20	22	26	30	27	27	36	57	42	32	28	28	24	29	29	30	30	42	52	69	54	18

DAY	26	27	28	29	30	31
AVE	29	36	41	45	***	***
MAX	36	60	64	77	***	***
MIN	24	23	25	23	***	***

MONTHLY AVERAGE = 53.4 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 18.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
FEBRUARY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.40	0.56	0.68	0.72	0.69	0.61	0.46	0.27	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.67
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.21	0.41	0.58	0.69	0.73	0.71	0.62	0.47	0.27	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.75
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.39	0.59	0.29	0.72	0.54	0.31	0.05	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.23
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.31	0.60	0.71	0.75	0.72	0.63	0.47	0.27	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.60
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.42	0.49	0.69	0.66	0.49	0.47	0.44	0.24	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.20
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.20	0.40	0.58	0.69	0.74	0.70	0.63	0.41	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.67
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.43	0.59	0.70	0.75	0.72	0.63	0.48	0.29	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.90
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.42	0.59	0.71	0.76	0.73	0.64	0.48	0.29	0.05	0.00	0.00	0.00	0.00	0.00	0.00	4.94
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.25	0.45	0.40	0.62	0.48	0.52	0.36	0.27	0.24	0.05	0.00	0.00	0.00	0.00	0.00	0.00	3.68
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.21	0.42	0.59	0.70	0.67	0.18	0.13	0.16	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.12
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.27	0.42	0.46	0.42	0.66	0.76	0.62	0.44	0.30	0.07	0.00	0.00	0.00	0.00	0.00	0.00	4.47
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.44	0.61	0.72	0.77	0.70	0.65	0.50	0.27	0.08	0.00	0.00	0.00	0.00	0.00	0.00	4.99
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.45	0.62	0.73	0.78	0.75	0.66	0.51	0.31	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.19
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.45	0.61	0.72	0.76	0.71	0.62	0.40	0.19	0.06	0.00	0.00	0.00	0.00	0.00	0.00	4.80
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.46	0.63	0.74	0.79	0.76	0.67	0.52	0.32	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.29
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.46	0.63	0.74	0.79	0.77	0.67	0.52	0.32	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.30
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.46	0.63	0.74	0.79	0.76	0.67	0.52	0.32	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.30
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.46	0.62	0.74	0.79	0.76	0.67	0.52	0.33	0.10	0.00	0.00	0.00	0.00	0.00	0.00	5.31
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.32	0.63	0.65	0.72	0.68	0.61	0.52	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	4.68
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.48	0.64	0.76	0.81	0.80	0.56	0.33	0.24	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.02
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.16	0.33	0.50	0.62	0.38	0.47	0.23	0.12	0.03	0.00	0.00	0.00	0.00	0.00	0.00	2.93
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.03	0.04	0.07	0.09	0.08	0.04	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.47
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.20	0.44	0.53	0.45	0.16	0.15	0.12	0.13	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	2.31
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.49	0.65	0.77	0.82	0.79	0.70	0.54	0.34	0.11	0.00	0.00	0.00	0.00	0.00	0.00	5.58
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.52	0.69	0.81	0.85	0.82	0.73	0.58	0.37	0.13	0.00	0.00	0.00	0.00	0.00	0.00	5.90
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.52	0.68	0.80	0.85	0.83	0.74	0.58	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	5.92
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.52	0.69	0.81	0.86	0.81	0.63	0.45	0.26	0.08	0.00	0.00	0.00	0.00	0.00	0.00	5.51
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.51	0.65	0.64	0.40	0.42	0.32	0.27	0.44	0.09	0.00	0.00	0.00	0.00	0.00	0.00	4.01
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.52	0.69	0.81	0.86	0.85	0.57	0.32	0.37	0.13	0.01	0.00	0.00	0.00	0.00	0.00	5.56
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.42	0.57	0.66	0.69	0.64	0.54	0.40	0.26	0.07	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.67	4.75	3.23	4.60	4.20	4.67	4.90	4.94	3.68	3.12	4.47	4.99	5.19	4.80	5.29	5.30	5.30	5.31	4.68	5.02	2.93	0.47	2.31	5.58	5.90
MAX	0.72	0.73	0.72	0.75	0.69	0.74	0.75	0.76	0.62	0.70	0.76	0.77	0.78	0.76	0.79	0.79	0.79	0.79	0.72	0.81	0.62	0.09	0.53	0.82	0.85
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.92	5.51	4.01	5.56	***	***
MAX	0.85	0.86	0.65	0.86	***	***
MIN	0.00	0.00	0.00	0.00	***	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
FEBRUARY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.00	0.16	0.01	0.01	0.01	0.26
11	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.03	0.04	0.03	0.08	0.12	0.10	0.08	0.05	0.01	0.07	0.03	0.01	0.02	0.08	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93
23	0.00	0.00	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.06	0.00	0.01
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.05	0.00	0.01
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	***	***
MAX	0.00	0.00	0.00	0.00	***	***
MIN	0.00	0.00	0.00	0.00	***	***

MONTHLY TOTAL = 1.27 MONTHLY MAXIMUM = 0.18 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 696 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	4.5	3.5	3.7	4.4	5.7	4.8	3.2	4.1	5.0	3.0	3.5	2.7	7.2	12.5	12.8	11.7	11.8	9.3	7.0	5.6	3.3	2.9	6.3	7.8	6.1
2	6.8	6.3	7.5	6.3	11.2	9.0	8.0	4.1	3.8	3.8	3.8	5.2	6.5	10.0	10.0	15.9	15.6	10.1	6.3	3.4	6.3	9.7	8.2	3.4	7.5
3	4.6	4.4	6.1	7.9	6.9	7.2	6.9	9.0	4.2	2.0	5.7	3.0	7.5	12.2	17.9	19.8	18.3	15.7	8.2	8.8	10.9	5.0	3.7	5.2	8.4
4	6.2	5.9	4.3	4.6	5.1	6.0	5.3	5.1	4.2	4.0	2.6	4.6	6.5	8.0	9.8	12.6	14.3	13.5	14.2	12.3	8.0	4.3	5.6	6.3	7.2
5	6.4	8.7	7.9	5.3	7.6	8.6	8.5	9.7	8.0	6.2	7.6	9.8	8.8	12.5	15.2	20.8	19.2	17.5	16.7	20.4	23.2	21.0	23.0	19.2	13.0
6	18.0	21.9	18.8	21.5	21.6	19.6	19.0	19.5	21.5	22.9	24.0	19.7	18.8	18.1	14.4	14.0	13.2	15.9	16.8	15.2	10.0	13.4	14.0	16.6	17.9
7	9.2	7.8	7.1	7.0	8.6	9.2	7.5	8.4	7.1	4.2	4.8	4.5	9.6	5.8	11.5	13.8	9.4	12.0	13.4	12.4	8.9	13.0	14.4	12.1	9.2
8	11.0	9.4	9.5	7.3	3.8	3.6	3.9	5.2	2.2	2.2	3.4	5.7	4.0	2.9	6.8	8.7	11.1	11.2	7.2	6.7	5.0	3.5	6.9	5.1	6.1
9	5.8	4.8	6.2	5.3	5.1	7.6	6.3	6.4	5.7	5.9	5.9	5.7	7.2	8.8	4.9	6.5	7.0	5.9	7.0	10.6	9.5	7.1	6.2	5.1	6.5
10	3.3	5.8	7.2	9.7	7.1	7.7	5.8	7.6	3.8	3.4	5.2	3.4	3.7	2.5	3.6	2.9	8.1	5.8	12.9	14.2	6.9	6.3	8.3	4.9	6.2
11	7.6	7.3	4.9	6.4	9.4	6.3	8.2	8.6	8.0	9.8	6.1	5.9	3.8	8.1	8.7	6.8	9.8	9.2	9.5	6.5	5.8	2.9	1.7	4.6	6.9
12	2.6	1.6	2.0	2.5	1.3	3.4	1.8	1.3	1.2	4.1	5.4	8.3	8.0	3.8	1.7	1.9	3.6	3.8	2.4	5.0	10.6	14.1	3.7	3.1	4.0
13	7.2	14.5	23.5	14.6	7.5	11.9	13.1	8.1	2.7	2.6	2.2	5.8	7.0	13.1	14.3	19.5	13.9	12.5	7.9	6.4	5.8	4.1	7.3	4.0	9.6
14	6.3	4.0	4.3	6.5	5.1	5.6	6.4	6.8	5.9	5.1	4.2	3.3	2.9	3.9	3.7	3.8	11.2	11.2	10.3	9.6	8.5	4.2	4.0	5.9	5.9
15	7.6	7.3	7.5	6.8	6.6	6.7	6.5	4.2	2.5	6.5	4.5	3.3	2.7	2.8	3.8	6.8	10.6	10.6	12.0	7.0	4.2	3.1	5.8	7.0	6.1
16	4.4	5.2	7.5	7.6	8.8	7.8	9.8	8.7	6.6	5.8	3.2	2.7	3.8	3.1	3.2	7.3	9.3	13.6	11.7	7.7	2.1	3.9	3.9	4.1	6.3
17	4.1	2.8	3.5	3.5	5.5	6.7	7.3	3.3	3.7	4.1	3.6	2.1	4.1	11.5	12.8	14.8	16.2	16.5	15.6	16.9	11.7	6.5	3.3	6.4	7.8
18	8.5	5.0	4.3	3.5	3.4	2.4	5.3	3.6	4.7	5.5	3.9	5.4	4.6	5.6	24.6	19.5	7.8	7.1	7.8	4.4	3.6	6.4	4.2	6.6	6.6
19	10.9	15.7	8.4	7.8	6.4	7.8	9.6	6.8	3.8	8.0	11.9	15.0	8.4	15.0	13.7	14.6	12.2	12.1	10.7	5.3	2.5	5.1	4.1	4.5	9.2
20	2.6	5.3	7.8	8.5	5.3	6.2	6.9	6.3	6.0	4.1	2.8	2.7	3.9	4.6	6.6	8.0	12.4	13.3	13.1	12.8	8.8	1.6	3.9	5.7	6.6
21	6.5	6.6	4.3	5.7	6.4	6.3	7.8	6.2	4.6	3.8	2.1	2.8	3.5	6.7	14.6	16.7	15.9	16.7	13.7	9.2	2.7	0.9	3.7	4.1	7.2
22	7.4	7.7	7.9	6.5	5.9	5.3	7.8	7.5	5.2	3.1	2.1	2.3	2.6	2.8	2.9	7.2	9.7	9.0	7.5	8.9	9.8	2.8	2.0	4.2	5.8
23	6.3	5.2	4.9	2.1	2.5	2.5	2.7	1.2	1.4	3.2	4.9	9.7	11.8	16.0	15.2	16.1	15.1	14.3	14.0	10.8	7.2	4.9	1.4	5.6	7.5
24	5.7	7.5	5.0	8.4	6.8	6.9	5.6	6.9	5.1	3.0	2.8	3.0	3.7	5.6	5.6	10.6	16.2	14.7	13.2	12.0	4.7	4.0	6.8	6.8	7.1
25	8.8	7.9	6.3	3.3	5.4	8.1	8.6	5.8	4.6	2.7	3.4	2.4	2.3	5.3	7.3	12.7	15.1	13.7	7.5	4.0	2.7	4.5	4.6	3.6	6.3
26	2.6	4.6	3.2	3.8	2.5	3.6	4.4	13.3	12.1	11.6	12.2	11.3	12.6	14.8	12.0	11.0	7.2	6.1	9.0	10.5	6.1	3.5	2.4	5.5	7.7
27	11.8	14.5	8.2	7.9	6.7	6.1	6.9	11.8	12.4	17.5	6.8	4.3	11.1	16.2	18.3	19.6	17.6	19.7	15.3	8.6	5.8	8.3	5.0	5.8	11.1
28	4.6	7.7	6.9	6.6	7.8	6.9	6.2	6.5	4.0	2.5	3.5	5.9	4.7	4.1	4.8	5.8	5.3	7.1	11.1	9.7	9.7	3.2	4.9	5.5	6.0
29	5.9	4.4	7.8	6.5	6.8	4.9	5.1	5.1	5.0	3.5	2.9	3.7	4.2	6.2	11.8	14.2	12.3	13.3	9.6	5.3	2.7	3.0	1.8	3.7	6.2
30	4.7	4.3	5.3	5.8	6.3	4.9	6.2	6.2	5.3	3.1	3.0	6.0	8.1	8.7	10.2	8.9	11.1	10.1	11.8	9.9	9.9	4.6	5.5	7.4	7.0
31	6.3	7.4	7.5	6.7	6.4	7.6	8.0	6.9	6.0	4.6	5.8	5.7	4.1	2.8	4.0	4.5	5.6	5.5	2.1	4.7	7.1	6.3	4.1	3.1	5.5
HRAVE	6.7	7.3	7.1	6.8	6.6	6.8	7.0	6.9	5.7	5.5	5.3	5.7	6.4	8.2	9.9	11.5	11.8	11.5	10.5	9.2	7.2	5.9	5.8	6.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.1	7.5	8.4	7.2	13.0	17.9	9.2	6.1	6.5	6.2	6.9	4.0	9.6	5.9	6.1	6.3	7.8	6.6	9.2	6.6	7.2	5.8	7.5	7.1	6.3
MAX	12.8	15.9	19.8	14.3	23.2	24.0	14.4	11.2	10.6	14.2	9.8	14.1	23.5	11.2	12.0	13.6	16.9	24.6	15.7	13.3	16.7	9.8	16.1	16.2	15.1
MIN	2.7	3.4	2.0	2.6	5.3	10.0	4.2	2.2	4.8	2.5	1.7	1.2	2.2	2.9	2.5	2.1	2.1	2.4	2.5	1.6	0.9	2.0	1.2	2.8	2.3

DAY	26	27	28	29	30	31
AVE	7.7	11.1	6.0	6.2	7.0	5.5
MAX	14.8	19.7	11.1	14.2	11.8	8.0
MIN	2.4	4.3	2.5	1.8	3.0	2.1

MONTHLY AVERAGE = 7.6 MONTHLY MAXIMUM = 24.6 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	34	59	48	72	70	63	3	59	115	91	289	265	233	245	246	237	232	216	250	292	161	157	104	96	309
2	97	97	89	100	95	97	10	107	135	108	286	288	286	290	293	297	299	311	320	300	292	311	311	106	11
3	87	111	87	87	98	113	133	38	284	213	284	201	268	293	284	285	281	268	258	310	313	258	183	119	162
4	121	136	123	117	120	118	116	123	116	147	143	272	295	308	300	300	301	304	298	300	297	161	97	90	11
5	96	104	96	103	102	105	94	107	122	143	76	62	64	51	72	97	83	91	85	88	86	83	83	76	268
6	66	71	74	67	78	85	82	81	85	90	97	96	74	85	76	81	99	86	78	58	71	76	58	47	337
7	69	121	123	114	128	110	106	107	90	127	115	117	125	166	214	228	219	263	274	300	308	300	296	295	201
8	292	298	310	296	345	322	122	77	352	118	156	145	132	127	148	163	211	250	211	225	272	155	113	133	237
9	127	113	103	105	120	108	105	105	121	96	158	140	75	48	109	109	143	170	267	310	304	309	279	146	273
10	121	113	99	84	96	94	83	90	58	50	75	86	65	229	296	328	57	20	43	48	324	309	322	61	242
11	89	77	122	117	87	117	72	71	78	63	72	85	26	298	291	295	291	294	314	307	313	227	200	308	261
12	267	163	214	293	337	123	109	131	168	113	100	75	96	186	235	343	225	133	198	129	116	84	148	83	29
13	259	256	313	310	294	296	313	301	286	254	170	219	257	278	299	303	285	277	107	87	83	87	65	34	206
14	71	78	87	100	97	89	92	119	123	140	142	146	188	202	148	240	288	299	307	299	305	316	130	99	25
15	89	86	94	105	96	92	110	103	139	143	148	146	202	255	264	296	268	280	313	310	312	91	106	71	27
16	62	88	99	93	93	109	90	100	138	137	134	165	133	111	51	278	279	275	309	307	106	193	117	102	162
17	104	61	89	97	95	99	87	86	100	108	76	116	160	204	214	250	287	291	288	289	290	262	265	300	60
18	303	297	264	305	303	107	123	131	123	137	117	107	75	97	154	171	131	293	307	84	266	190	106	298	21
19	302	318	311	322	288	277	306	303	270	303	289	304	325	310	306	309	307	301	303	300	90	106	94	74	171
20	59	108	116	89	108	105	106	112	130	143	168	113	118	141	130	300	311	310	299	302	303	50	103	99	60
21	114	102	99	303	27	124	94	88	106	108	157	249	234	275	263	285	287	296	300	294	321	2	118	109	164
22	90	89	84	84	83	93	90	85	107	145	138	135	128	196	294	297	309	301	307	306	297	7	129	107	249
23	90	99	55	91	147	94	104	97	30	298	280	259	249	275	269	269	257	259	268	270	300	161	68	125	83
24	117	92	101	76	93	87	104	92	121	113	150	167	221	291	282	303	292	291	302	291	306	110	85	93	42
25	81	83	92	15	97	93	87	101	114	143	77	64	321	281	290	307	308	306	302	305	265	139	97	95	207
26	287	280	286	307	286	289	301	304	298	303	301	301	303	293	298	294	281	242	283	286	310	214	170	299	25
27	288	297	316	301	313	318	300	296	296	284	276	278	262	281	281	285	288	279	279	289	316	303	327	252	201
28	148	112	107	108	98	131	107	108	126	104	135	78	107	36	327	187	242	289	303	304	294	338	100	107	162
29	89	105	109	111	97	107	102	114	135	145	142	160	266	280	264	260	280	280	289	288	176	139	321	146	265
30	111	114	107	89	85	71	75	79	100	116	298	261	272	280	281	275	275	286	288	303	305	192	107	90	15
31	105	96	90	113	110	100	112	103	128	135	148	146	123	198	283	299	292	298	38	307	319	306	165	134	345

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	44	47	37	34	21	15	29	47	16	25	36	51	37	20	20	16	11	11	9	27	18	65	25	12	28
2	15	17	15	18	7	9	44	42	22	23	41	26	29	19	29	15	10	13	12	18	37	8	8	24	21
3	19	13	11	15	23	15	34	25	35	60	35	52	33	20	14	13	12	10	12	10	10	31	17	17	22
4	12	12	12	13	7	7	8	9	13	25	47	39	27	23	20	13	12	10	7	6	5	33	9	7	16
5	9	6	6	10	8	6	7	9	10	19	25	17	23	17	18	14	15	11	9	10	11	9	10	10	12
6	9	8	8	7	8	7	7	7	11	13	12	13	14	17	17	15	15	11	9	12	15	10	11	8	11
7	17	19	8	11	9	6	9	7	9	24	24	33	19	37	22	19	24	17	8	8	11	9	9	12	15
8	8	13	8	10	54	41	51	42	60	38	20	15	29	47	20	15	21	15	15	13	28	51	20	14	27
9	12	13	7	11	15	6	8	9	19	25	29	46	39	24	51	34	18	11	9	8	8	9	25	14	19
10	17	10	9	7	9	13	23	16	27	45	16	44	38	25	24	33	12	25	13	10	33	15	10	27	21
11	12	10	24	16	9	24	13	11	14	7	16	27	36	12	11	16	10	8	8	7	20	53	64	17	19
12	56	52	23	37	35	39	47	49	21	29	15	11	27	43	42	33	25	33	38	38	15	19	43	37	34
13	23	15	8	10	19	9	9	9	61	31	43	28	34	17	15	9	15	33	29	17	14	30	13	29	22
14	26	20	21	12	14	10	9	8	12	20	28	40	53	52	44	42	12	13	8	9	6	35	11	7	21
15	7	8	8	8	7	7	11	20	22	16	23	37	53	46	63	27	21	10	10	9	18	41	13	19	21
16	21	10	6	7	6	7	5	7	10	19	30	36	48	48	54	32	17	10	8	24	55	29	13	14	21
17	12	21	13	11	11	11	9	47	14	20	23	60	50	19	20	19	11	11	6	6	7	19	25	14	19
18	7	12	15	21	35	62	10	17	16	15	26	13	26	23	10	15	28	46	33	51	36	26	21	28	25
19	12	8	14	11	16	16	12	11	54	17	18	14	21	22	14	14	15	12	8	9	39	9	17	17	17
20	30	16	8	6	13	8	6	9	14	21	39	43	39	42	33	37	15	9	7	8	6	42	9	9	20
21	9	9	34	16	28	14	6	10	14	30	41	36	42	31	16	14	13	11	9	9	44	16	9	9	20
22	8	6	7	9	9	10	10	6	11	38	51	43	47	38	46	24	14	9	8	7	5	40	19	13	20
23	9	12	24	40	50	27	26	28	43	33	31	29	23	16	17	16	16	14	9	10	6	45	21	13	23
24	10	9	14	9	10	9	9	8	14	34	48	64	49	40	57	22	11	13	8	6	44	12	7	10	22
25	7	8	10	26	9	7	6	11	14	34	32	49	62	35	28	16	14	11	10	14	15	8	12	53	20
26	72	58	34	15	23	33	14	9	11	12	14	14	12	12	15	14	21	21	13	8	11	20	55	10	22
27	10	10	15	15	12	17	14	11	10	11	40	47	27	21	18	12	16	9	10	6	12	9	32	27	17
28	29	10	9	10	10	7	10	9	20	38	36	36	56	58	51	34	29	18	7	7	8	40	9	8	23
29	10	14	7	8	7	13	15	8	18	32	42	38	40	36	18	18	19	11	8	9	52	32	44	21	22
30	7	9	12	7	7	30	25	11	16	30	48	29	33	26	29	24	19	14	8	5	7	31	9	9	19
31	11	11	17	18	9	6	7	8	15	19	18	20	31	53	30	23	14	10	35	16	13	42	11	14	19
HRAVE	18	16	14	15	16	16	16	17	21	26	31	34	35	30	28	21	16	15	12	13	20	27	19	17	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	28	21	22	16	12	11	15	27	19	21	19	34	22	21	21	21	19	25	17	20	20	20	23	22	20
MAX	65	44	60	47	25	17	37	60	51	45	64	56	61	53	63	55	60	62	54	43	44	51	50	64	62
MIN	9	7	10	5	6	7	6	8	6	7	7	11	8	6	7	5	6	7	8	6	6	5	6	6	6

DAY	26	27	28	29	30	31
AVE	22	17	23	22	19	19
MAX	72	47	58	52	48	53
MIN	8	6	7	7	5	6

MONTHLY AVERAGE = 20.5 MONTHLY MAXIMUM = 71.7 MONTHLY MINIMUM = 4.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	13.2	14.5	12.4	11.3	9.9	9.8	9.6	9.6	9.0	12.8	15.3	18.6	20.6	21.2	21.0	20.6	19.8	18.9	17.5	16.1	15.6	13.8	12.2	10.9	14.8
2	10.2	9.0	8.1	7.5	7.4	7.3	6.2	6.4	8.2	11.1	14.0	16.9	18.0	18.3	19.0	18.0	17.3	16.4	15.8	15.3	14.4	13.1	12.4	11.1	12.6
3	10.7	9.8	9.2	8.9	8.9	8.8	8.4	9.7	10.6	12.9	14.9	16.9	18.4	19.5	19.3	19.1	18.9	18.6	17.4	16.3	15.8	15.4	14.4	12.4	14.0
4	11.4	10.5	9.9	8.8	7.9	7.2	6.5	7.0	9.6	12.4	14.4	15.9	18.4	19.7	20.8	21.5	21.1	20.2	18.6	17.1	16.0	14.6	13.3	12.0	14.0
5	10.8	10.4	9.8	8.8	8.2	7.9	7.8	8.4	11.2	14.0	18.2	20.3	22.0	23.3	24.8	25.8	25.4	24.5	23.3	22.5	22.1	21.0	20.4	19.4	17.1
6	18.8	18.5	18.1	18.0	17.5	16.9	16.1	16.5	18.2	19.7	21.3	23.0	23.7	24.6	25.2	25.3	25.0	24.3	23.4	22.5	21.6	20.8	20.4	20.4	20.8
7	19.0	16.6	15.3	14.2	12.6	12.3	11.2	12.3	15.1	17.8	21.0	23.4	25.5	26.0	27.3	27.1	26.8	26.1	23.9	21.9	21.5	20.7	19.8	19.0	19.8
8	18.3	17.8	17.0	16.3	15.4	14.7	13.0	12.4	12.4	14.8	15.9	16.9	18.2	19.2	20.5	19.9	20.4	20.1	18.5	17.0	16.6	15.9	14.8	13.9	16.7
9	13.4	12.9	12.1	11.4	9.8	9.6	9.3	10.5	12.9	16.2	18.2	20.1	21.0	21.8	23.1	23.8	23.7	23.1	22.1	20.7	20.2	19.4	18.8	17.3	17.1
10	16.6	15.7	14.4	12.9	13.6	12.7	12.3	12.7	13.6	15.8	19.3	19.4	18.6	18.2	19.2	19.4	20.4	20.2	20.0	19.8	18.1	15.9	15.3	14.9	16.6
11	14.6	14.8	14.8	14.7	14.5	14.5	14.4	14.5	15.0	16.6	19.1	20.8	21.1	20.7	20.9	21.8	21.4	20.8	20.0	19.1	18.8	17.8	17.5	17.0	17.7
12	16.5	16.2	16.3	15.8	16.0	15.2	15.5	15.4	15.7	16.2	17.2	18.7	20.0	19.9	20.0	19.8	19.4	18.9	18.6	18.0	15.6	16.0	16.3	15.8	17.2
13	15.8	15.6	12.9	11.9	11.5	11.5	11.4	11.3	13.2	14.6	15.0	16.0	17.3	17.2	15.1	13.6	13.4	10.8	10.8	10.3	10.3	10.4	10.3	10.0	12.9
14	9.8	9.6	9.4	9.1	8.8	8.7	8.6	9.6	11.7	13.6	15.3	17.2	18.9	20.0	20.3	21.5	21.0	20.3	18.8	17.2	16.1	15.6	14.3	13.0	14.5
15	12.1	11.7	11.0	10.2	9.9	9.4	9.0	9.6	10.9	13.4	16.5	18.8	20.8	22.2	22.6	23.3	23.5	22.7	20.6	19.2	18.0	16.8	14.8	13.5	15.9
16	12.6	11.6	10.7	9.8	9.6	9.2	8.6	9.9	12.5	15.4	18.0	20.5	22.2	23.9	24.7	25.3	25.0	23.7	21.2	20.2	19.4	18.3	16.8	15.9	16.9
17	15.2	13.7	12.7	11.5	10.5	10.1	9.9	9.7	11.1	14.3	17.2	19.2	21.9	23.9	24.5	24.0	22.7	21.9	19.8	18.2	17.5	16.5	16.1	14.9	16.5
18	14.0	13.3	11.8	11.0	10.4	9.6	8.6	9.6	9.8	11.3	14.3	14.6	15.3	16.1	15.5	13.1	11.1	10.6	9.6	9.3	9.2	9.1	8.6	8.5	11.4
19	7.8	7.2	7.4	7.5	7.6	7.3	7.7	8.2	9.0	9.4	10.0	11.7	12.9	13.9	14.2	14.6	15.0	14.6	13.5	12.4	11.5	10.1	9.5	8.8	10.5
20	7.9	7.0	6.6	6.4	5.4	5.1	5.6	6.9	9.5	11.7	14.2	16.6	18.6	19.6	20.4	19.7	18.9	17.6	16.5	15.3	14.7	14.5	13.3	12.5	12.7
21	12.2	12.3	12.2	10.6	10.7	9.2	9.4	11.0	13.3	15.4	17.3	18.9	20.2	21.4	22.0	21.4	20.7	19.8	18.4	16.6	15.9	15.8	13.8	12.8	15.5
22	11.5	10.9	10.0	9.5	9.1	8.5	8.1	8.8	10.6	13.0	15.3	16.9	19.2	20.5	21.6	21.6	20.7	19.8	18.8	18.2	17.5	16.8	16.0	15.3	14.9
23	14.6	14.7	13.9	13.3	13.4	13.1	12.9	13.6	15.6	17.8	19.1	20.7	21.9	21.9	22.2	22.5	22.3	21.9	20.7	18.9	17.1	15.9	15.9	14.0	17.4
24	13.4	11.9	10.5	10.0	9.4	8.5	8.4	10.8	13.3	15.8	18.0	20.1	21.0	21.9	23.0	23.2	23.2	22.2	20.7	18.7	17.9	16.1	14.8	13.7	16.1
25	12.5	11.7	11.0	9.8	8.6	8.5	8.4	10.4	13.5	15.9	19.1	21.7	23.2	24.5	25.5	25.1	24.0	22.9	21.8	20.5	19.7	18.2	17.2	16.5	17.1
26	15.6	15.8	14.6	15.1	15.2	14.6	15.3	13.7	14.1	14.7	15.7	16.4	16.4	16.8	17.2	17.2	17.9	18.2	17.5	15.3	14.1	13.4	12.3	12.2	15.4
27	11.8	11.7	11.3	11.0	10.2	9.7	9.1	8.6	8.6	8.6	8.9	10.5	12.9	13.5	13.3	13.8	14.1	13.7	12.5	11.2	10.6	10.2	9.8	8.9	11.0
28	7.8	6.6	5.7	4.7	4.4	3.4	3.3	5.7	7.8	10.9	13.5	15.7	16.9	17.9	18.5	19.0	19.3	18.5	17.0	15.5	14.6	13.7	12.3	11.2	11.8
29	10.7	10.0	9.8	9.8	9.2	8.4	7.5	9.8	13.1	15.7	18.0	20.3	21.3	22.1	23.1	23.2	22.7	21.8	20.3	18.4	16.4	15.6	15.8	14.2	15.7
30	12.9	11.9	11.0	9.6	8.8	7.9	7.2	9.2	12.9	15.5	17.3	19.2	20.9	21.5	22.3	22.7	22.6	22.1	20.5	18.8	18.0	16.2	14.8	13.1	15.7
31	12.0	10.7	9.9	9.3	8.6	7.8	8.2	9.8	13.2	15.7	18.3	19.9	21.9	22.8	23.2	23.8	23.6	22.9	22.2	21.3	20.4	19.0	17.2	16.9	16.6
HRAVE	13.0	12.4	11.6	10.9	10.4	9.9	9.6	10.4	12.1	14.3	16.4	18.2	19.7	20.5	21.0	21.0	20.7	19.9	18.7	17.5	16.6	15.7	14.8	13.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	14.8	12.6	14.0	14.0	17.1	20.8	19.8	16.7	17.1	16.6	17.7	17.2	12.9	14.5	15.9	16.9	16.5	11.4	10.5	12.7	15.5	14.9	17.4	16.1	17.1
MAX	21.2	19.0	19.5	21.5	25.8	25.3	27.3	20.5	23.8	20.4	21.8	20.0	17.3	21.5	23.5	25.3	24.5	16.1	15.0	20.4	22.0	21.6	22.5	23.2	25.5
MIN	9.0	6.2	8.4	6.5	7.8	16.1	11.2	12.4	9.3	12.3	14.4	15.2	10.0	8.6	9.0	8.6	9.7	8.5	7.2	5.1	9.2	8.1	12.9	8.4	8.4

DAY	26	27	28	29	30	31
AVE	15.4	11.0	11.8	15.7	15.7	16.6
MAX	18.2	14.1	19.3	23.2	22.7	23.8
MIN	12.2	8.6	3.3	7.5	7.2	7.8

MONTHLY AVERAGE = 15.4 MONTHLY MAXIMUM = 27.3 MONTHLY MINIMUM = 3.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.8	0.8	0.9	0.6	0.4	0.5	0.5	0.5	0.1	-0.9	-0.7	-0.7	-1.0	-1.0	-0.9	-0.6	-0.3	-0.1	0.4	0.5	0.5	0.5	0.9	0.9	0.1
2	0.7	0.4	0.4	0.4	0.8	0.6	0.3	0.4	-0.8	-0.9	-0.7	-0.9	-0.9	-0.7	-0.7	-0.3	-0.2	0.1	0.3	0.4	0.2	0.2	0.4	0.3	0.0
3	0.6	0.5	0.3	0.3	0.3	0.3	0.0	0.1	-0.4	-0.5	-0.9	-0.8	-1.1	-1.0	-1.0	-0.9	-0.6	-0.2	0.2	0.4	0.3	0.4	0.5	0.4	-0.1
4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	-0.3	-1.0	-0.9	-0.7	-0.8	-1.0	-1.0	-1.0	-1.0	-0.6	-0.2	0.2	0.3	0.5	0.6	0.7	0.6	-0.1
5	0.7	0.5	0.6	0.6	0.5	0.6	0.6	-0.2	-1.2	-0.9	-1.1	-1.0	-1.0	-0.8	-0.7	-0.5	0.0	0.3	0.5	0.5	0.4	0.5	0.4	0.4	0.0
6	0.3	0.3	0.3	0.2	0.3	0.3	0.4	-0.2	-0.6	-1.0	-1.2	-1.5	-1.1	-1.1	-1.1	-0.8	-0.5	-0.1	0.1	0.3	0.2	0.3	0.5	0.3	0.2	-0.2
7	0.4	1.1	1.1	1.4	1.1	1.0	0.7	0.1	-1.1	-1.0	-1.3	-1.4	-1.9	-1.1	-1.3	-1.0	-0.6	-0.2	0.2	0.3	0.3	0.2	0.2	0.1	-0.1
8	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.5	0.1	-0.4	-0.6	-0.6	-1.0	-0.9	-1.4	-0.8	-0.8	-0.4	0.0	0.3	0.2	0.4	0.3	0.2	-0.1
9	0.1	0.4	0.3	0.3	0.6	0.6	0.4	-0.7	-1.2	-1.5	-1.4	-1.6	-1.4	-1.1	-1.0	-0.9	-0.3	-0.1	0.3	0.3	0.3	0.3	0.4	0.5	-0.3
10	0.4	0.7	0.7	0.4	0.5	0.2	0.3	0.2	-0.1	-0.6	-1.0	-0.3	-0.1	-0.2	-0.4	-0.3	-0.1	0.1	0.2	0.1	0.3	0.3	0.2	0.1	0.1
11	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	-0.1	-0.3	-0.8	-1.0	-0.5	-0.3	-0.2	-0.4	-0.2	0.0	0.2	0.3	0.4	0.3	0.2	0.3	0.0
12	0.3	0.2	0.2	0.2	0.2	0.1	0.3	0.0	-0.2	-0.2	-0.4	-0.6	-0.6	-0.3	-0.1	0.0	0.2	0.2	0.3	0.3	0.5	0.4	0.4	0.4	0.1
13	0.5	0.2	0.1	0.1	0.2	0.3	0.3	0.2	-0.5	-0.6	-0.5	-0.4	-0.6	-0.3	-0.3	-0.3	0.0	0.2	0.3	0.3	0.4	0.4	0.3	0.1	0.0
14	0.2	0.2	0.2	0.3	0.4	0.3	0.4	-0.7	-1.3	-1.1	-1.1	-0.9	-0.6	-0.8	-0.7	-0.7	-0.6	-0.2	0.3	0.4	0.6	0.6	0.5	0.6	-0.2
15	0.5	0.6	0.5	0.6	0.6	0.4	0.5	0.0	-0.5	-0.9	-1.0	-0.9	-0.7	-0.6	-0.7	-0.8	-0.5	-0.2	0.3	0.5	0.5	0.6	0.7	0.7	0.0
16	0.6	0.6	0.8	0.6	0.6	0.6	0.7	-0.6	-1.1	-1.1	-0.9	-0.8	-1.0	-0.9	-0.8	-0.8	-0.4	-0.1	0.3	0.4	0.3	0.5	0.5	0.7	0.0
17	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.3	-0.5	-1.1	-1.1	-0.7	-1.2	-1.3	-1.3	-1.0	-0.7	-0.3	0.2	0.2	0.3	0.4	0.3	0.5	-0.2
18	0.4	0.4	0.6	0.4	0.3	0.6	0.5	-0.3	-0.3	-0.9	-1.0	-0.5	-0.5	-0.4	-0.3	0.0	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0
19	0.0	0.0	0.2	0.1	0.2	0.2	0.2	0.1	-0.2	-0.2	-0.3	-0.8	-0.7	-0.8	-0.7	-0.5	-0.4	-0.3	0.2	0.5	0.5	0.6	0.6	0.4	0.0
20	0.5	0.5	0.6	0.8	0.5	0.6	0.4	-0.7	-1.3	-1.0	-0.8	-0.8	-1.2	-1.0	-0.9	-0.4	-0.2	0.1	0.3	0.3	0.3	0.2	0.6	0.5	-0.1
21	0.4	0.3	0.5	0.4	0.3	0.5	0.6	-0.7	-1.1	-1.0	-0.8	-0.8	-0.8	-0.9	-0.9	-0.9	-0.6	-0.3	0.2	0.5	0.3	0.2	0.5	0.5	-0.2
22	0.5	0.7	0.5	0.4	0.5	0.5	0.3	-0.1	-0.7	-0.7	-0.7	-0.8	-0.8	-0.7	-0.6	-0.5	-0.3	0.0	0.2	0.4	0.3	0.3	0.3	0.4	0.0
23	0.4	0.6	0.4	0.3	0.3	0.3	0.4	-0.2	-0.4	-0.6	-0.8	-0.9	-1.1	-1.1	-1.0	-0.9	-0.7	-0.4	0.1	0.3	0.5	0.5	0.4	0.6	-0.1
24	0.5	0.5	0.5	0.4	0.6	0.5	0.2	-1.1	-1.4	-1.0	-0.9	-0.9	-0.9	-0.9	-1.1	-0.9	-0.7	-0.4	0.1	0.4	0.4	0.5	0.8	0.6	-0.2
25	0.5	0.6	0.7	0.4	0.6	0.6	0.2	-1.1	-1.3	-0.8	-1.1	-0.8	-0.8	-0.9	-0.9	-0.6	-0.4	-0.2	0.2	0.3	0.5	0.4	0.6	0.7	-0.1
26	0.5	0.6	0.2	0.2	0.3	0.6	0.4	0.0	-0.1	-0.3	-0.6	-0.7	-0.7	-0.7	-0.7	-0.5	-0.4	-0.3	0.0	0.2	0.2	0.4	0.4	0.4	0.0
27	0.2	0.0	0.0	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.6	-0.8	-1.0	-1.4	-1.1	-0.8	-0.8	-0.8	-0.5	0.0	0.3	0.3	0.4	0.5	0.6	-0.2
28	0.4	0.4	0.5	0.6	0.4	0.6	0.1	-1.2	-1.0	-0.9	-1.1	-1.4	-1.3	-1.1	-1.0	-1.1	-0.7	-0.5	0.1	0.3	0.4	0.5	0.6	0.4	-0.2
29	0.2	0.4	0.3	0.3	0.4	0.4	0.5	-1.1	-1.3	-0.9	-0.8	-1.1	-0.9	-0.9	-0.9	-0.9	-0.8	-0.5	0.1	0.6	0.5	0.5	0.3	0.4	-0.2
30	0.6	0.6	0.7	0.8	0.7	0.6	0.0	-1.0	-1.5	-0.9	-0.8	-1.0	-1.2	-1.1	-1.2	-1.1	-0.9	-0.6	0.0	0.4	0.5	0.6	0.7	0.7	-0.2
31	0.8	0.6	0.5	0.6	0.6	0.8	0.0	-1.1	-1.4	-1.2	-1.1	-0.9	-1.0	-0.6	-0.6	-0.5	-0.3	0.0	0.3	0.6	0.5	0.5	0.4	0.4	-0.1
HRAVE	0.4	0.5	0.5	0.4	0.4	0.5	0.3	-0.3	-0.7	-0.8	-0.9	-0.9	-0.9	-0.8	-0.8	-0.7	-0.4	-0.1	0.2	0.4	0.4	0.4	0.4	0.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.0	-0.1	-0.1	0.0	-0.2	-0.1	-0.1	-0.3	0.1	0.0	0.1	0.0	-0.2	0.0	0.0	-0.2	0.0	0.0	-0.1	-0.2	0.0	-0.1	-0.2	-0.1
MAX	0.9	0.8	0.6	0.7	0.7	0.5	1.4	0.6	0.6	0.7	0.4	0.5	0.5	0.6	0.7	0.8	0.5	0.6	0.6	0.8	0.6	0.7	0.6	0.8	0.7
MIN	-1.0	-0.9	-1.1	-1.0	-1.2	-1.5	-1.9	-1.4	-1.6	-1.0	-1.0	-0.6	-0.6	-1.3	-1.0	-1.1	-1.3	-1.0	-0.8	-1.3	-1.1	-0.8	-1.1	-1.4	-1.3

DAY	26	27	28	29	30	31
AVE	0.0	-0.2	-0.2	-0.2	-0.2	-0.1
MAX	0.6	0.6	0.6	0.6	0.8	0.8
MIN	-0.7	-1.4	-1.4	-1.3	-1.5	-1.4

MONTHLY AVERAGE = -0.1 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = -1.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	700	700	700	700	700	700	700	700	700	701	700	700	700	699	699	698	698	698	698	699	699	699	698	698	699
2	698	698	698	697	697	697	697	697	698	698	698	697	696	696	695	695	695	695	696	696	696	697	697	696	697
3	696	696	696	696	696	697	697	697	698	698	698	697	697	696	696	696	696	697	698	699	699	700	701	701	697
4	701	702	702	702	703	703	703	704	705	705	705	705	705	704	703	703	703	703	704	704	705	705	705	705	704
5	705	706	706	706	706	707	707	708	708	708	708	707	706	705	704	703	703	703	703	704	704	705	705	705	705
6	705	705	705	705	705	705	705	705	705	706	705	705	704	703	702	702	701	701	701	702	702	702	702	702	704
7	702	702	702	702	702	702	702	703	703	703	703	702	701	700	699	699	698	698	698	699	700	700	700	700	701
8	700	700	700	700	700	700	700	700	701	701	701	702	701	701	700	700	700	701	701	701	702	703	703	704	701
9	704	704	704	704	704	705	705	705	706	706	706	705	704	703	703	703	703	703	703	704	705	705	705	705	704
10	705	705	705	705	705	706	706	706	707	707	707	707	707	706	705	705	705	705	705	705	705	706	707	706	706
11	706	705	705	705	704	704	704	704	704	704	704	704	703	702	701	701	701	701	701	701	701	702	701	701	703
12	701	701	701	701	700	700	700	700	700	701	701	700	699	698	698	698	698	696	697	697	698	696	697	697	699
13	697	698	698	698	699	699	699	700	700	701	701	701	700	700	700	700	700	701	701	702	702	703	703	703	700
14	703	704	703	703	703	704	704	704	705	705	705	704	704	703	703	703	703	703	703	703	704	704	704	704	704
15	704	704	703	703	703	703	703	704	704	704	704	704	703	703	702	702	702	702	702	702	703	703	703	703	703
16	703	703	703	702	702	702	703	703	704	703	703	702	701	700	700	699	699	699	699	700	700	700	701	700	701
17	700	700	700	700	700	700	700	701	701	701	701	700	700	699	698	698	698	698	698	698	699	699	700	700	699
18	700	700	699	699	699	699	699	699	699	699	699	698	698	697	696	696	696	696	697	697	698	698	698	699	698
19	699	699	700	700	701	701	702	703	704	704	705	705	705	704	704	703	703	704	704	704	705	705	705	705	703
20	705	705	705	705	705	705	706	707	707	707	706	706	706	705	704	704	704	704	704	704	705	704	704	704	705
21	704	703	703	703	703	703	704	704	704	704	704	703	703	702	702	702	702	702	702	703	703	704	704	704	703
22	704	704	704	704	704	704	704	705	705	705	705	705	704	703	703	702	702	702	702	702	703	703	703	703	704
23	703	702	702	702	702	703	703	704	704	704	704	703	703	703	702	702	702	702	702	703	703	704	704	704	703
24	704	704	704	704	704	704	704	705	705	705	705	704	704	703	702	702	702	702	702	702	702	702	702	703	703
25	703	702	702	702	702	702	702	703	703	703	702	701	701	700	699	699	698	698	698	698	698	699	699	699	700
26	699	699	699	698	699	698	699	699	699	700	700	700	699	699	699	698	698	698	698	698	698	699	699	698	699
27	698	698	698	698	699	699	699	700	700	701	702	701	701	701	700	701	701	701	702	702	703	703	704	704	701
28	704	705	705	705	705	705	705	706	706	706	706	705	705	704	703	703	702	702	702	703	703	703	703	703	704
29	702	702	702	702	702	702	702	703	703	702	702	702	701	701	700	700	700	700	700	700	700	701	701	701	701
30	702	702	702	702	703	703	704	705	706	706	706	706	705	705	704	704	704	704	704	704	705	705	705	705	704
31	705	705	705	704	704	704	704	705	705	704	704	703	702	701	700	700	700	699	699	699	699	699	700	699	702
HRAVE	702	702	702	702	702	702	702	703	703	703	703	703	702	701	701	701	700	700	701	701	702	702	702	702	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	699	697	697	704	705	704	701	701	704	706	703	699	700	704	703	701	699	698	703	705	703	704	703	703	700
MAX	701	698	701	705	708	706	703	704	706	707	706	701	703	705	704	704	701	700	705	707	704	705	704	705	703
MIN	698	695	696	701	703	701	698	700	703	705	701	696	697	703	702	699	698	696	699	704	702	702	702	702	698

DAY	26	27	28	29	30	31
AVE	699	701	704	701	704	702
MAX	700	704	706	703	706	705
MIN	698	698	702	700	702	699

MONTHLY AVERAGE = 701.8 MONTHLY MAXIMUM = 707.9 MONTHLY MINIMUM = 694.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	50	45	52	57	64	64	67	66	70	54	50	38	33	31	30	29	31	33	38	40	41	47	52	59	48
2	61	66	70	72	72	72	77	79	70	60	51	43	40	41	40	38	40	43	45	46	50	58	64	72	57
3	74	79	81	81	83	83	87	82	76	64	56	49	45	40	43	44	43	42	44	47	47	47	50	57	60
4	73	81	85	89	92	95	97	92	79	67	59	55	47	43	40	40	41	43	48	51	54	60	68	75	66
5	79	79	82	85	87	87	87	82	71	61	45	41	38	36	30	22	23	25	27	26	24	25	27	31	51
6	34	36	39	41	42	45	47	46	42	38	35	32	31	28	27	27	27	29	30	31	33	35	35	33	35
7	36	45	48	52	58	60	64	60	51	43	37	34	29	28	26	26	27	27	31	34	33	34	34	34	40
8	36	37	41	44	47	49	56	58	60	52	52	48	48	47	44	49	49	46	52	55	54	58	61	64	50
9	66	71	75	78	87	89	90	84	73	60	53	46	43	41	35	28	27	33	33	37	38	40	42	47	55
10	50	53	57	64	62	67	75	75	71	63	50	56	70	73	67	68	61	63	62	61	75	93	99	100	68
11	100	100	100	100	100	100	100	100	100	96	83	74	72	78	77	71	74	78	80	83	85	91	93	95	89
12	97	99	99	100	100	100	100	100	100	100	98	89	79	80	77	79	76	75	77	83	97	92	87	90	91
13	85	77	94	98	100	98	94	93	83	75	74	65	57	56	67	79	80	94	94	97	97	96	97	99	85
14	100	100	100	100	100	100	100	99	88	80	74	64	58	55	46	44	48	50	56	64	68	71	80	88	76
15	93	93	96	98	99	100	100	98	89	78	66	56	45	40	39	37	28	29	42	46	52	59	69	75	68
16	80	85	89	92	91	89	94	87	70	60	51	40	34	28	25	26	26	27	38	41	45	48	56	61	58
17	63	73	79	86	90	92	92	90	83	62	56	50	38	27	25	28	36	38	42	45	46	50	53	59	58
18	64	66	72	77	80	87	92	84	85	77	62	64	60	57	67	83	92	96	100	100	99	95	96	97	81
19	100	100	100	100	100	99	96	93	92	93	85	75	65	65	64	60	56	56	59	64	72	83	86	87	81
20	94	94	95	95	99	100	99	91	80	70	63	51	43	35	36	38	45	50	55	59	61	65	74	81	70
21	80	78	79	88	88	96	96	88	72	60	55	50	45	40	34	38	41	40	41	47	50	51	63	68	62
22	76	80	84	86	88	91	93	89	80	65	56	51	41	31	23	33	35	39	46	48	51	56	62	68	61
23	73	71	76	82	81	84	85	81	65	53	48	41	38	38	37	36	35	36	36	40	50	55	56	64	57
24	66	75	82	84	87	90	92	78	64	54	47	38	36	37	35	36	32	33	35	41	45	53	58	64	57
25	68	72	76	81	88	88	88	77	61	52	43	35	31	31	28	29	30	32	34	39	42	51	55	58	54
26	63	61	67	62	61	65	56	61	56	55	52	51	51	50	47	47	45	44	45	52	56	59	65	63	56
27	60	51	49	46	49	52	54	55	53	59	63	56	46	40	38	35	34	33	35	40	43	45	47	50	47
28	54	59	65	72	73	75	78	66	54	44	39	33	28	24	25	25	27	29	32	35	38	41	49	55	47
29	58	61	57	56	64	72	74	63	48	40	34	26	24	26	20	18	21	20	22	27	33	34	35	39	40
30	44	49	52	58	62	66	71	62	50	38	32	30	28	28	27	27	27	27	29	33	34	38	45	52	42
31	57	61	65	65	67	74	66	64	47	42	38	36	33	32	33	33	34	37	37	39	39	44	50	51	48
HRAVE	69	71	74	77	79	81	83	79	70	62	55	49	44	42	40	41	42	43	47	50	53	57	62	66	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	48	57	60	66	51	35	40	50	55	68	89	91	85	76	68	58	58	81	81	70	62	61	57	57	54
MAX	70	79	87	97	87	47	64	64	90	100	100	100	100	100	100	94	92	100	100	100	96	93	85	92	88
MIN	29	38	40	40	22	27	26	36	27	50	71	75	56	44	28	25	25	57	56	35	34	23	35	32	28

DAY	26	27	28	29	30	31
AVE	56	47	47	40	42	48
MAX	67	63	78	74	71	74
MIN	44	33	24	18	27	32

MONTHLY AVERAGE = 59.9 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 18.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.13	0.45	0.65	0.79	0.85	0.81	0.62	0.35	0.21	0.08	0.01	0.00	0.00	0.00	0.00	0.00	4.99
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.29	0.47	0.69	0.82	0.70	0.53	0.47	0.14	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4.31
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.31	0.55	0.71	0.82	0.84	0.82	0.72	0.56	0.36	0.14	0.01	0.00	0.00	0.00	0.00	0.00	5.89
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.33	0.53	0.70	0.82	0.87	0.84	0.74	0.58	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	6.06
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.31	0.47	0.70	0.75	0.73	0.83	0.76	0.59	0.40	0.15	0.01	0.00	0.00	0.00	0.00	0.00	5.81
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.54	0.71	0.82	0.87	0.85	0.75	0.53	0.26	0.10	0.01	0.00	0.00	0.00	0.00	0.00	5.90
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.33	0.55	0.71	0.82	0.87	0.83	0.74	0.52	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.05
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.28	0.23	0.23	0.52	0.59	0.56	0.24	0.37	0.15	0.01	0.00	0.00	0.00	0.00	0.00	3.30
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.36	0.56	0.73	0.84	0.89	0.86	0.75	0.57	0.25	0.07	0.01	0.00	0.00	0.00	0.00	0.00	6.03
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.09	0.30	0.41	0.19	0.14	0.16	0.24	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	1.86
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.33	0.56	0.62	0.25	0.17	0.20	0.28	0.19	0.06	0.00	0.00	0.00	0.00	0.00	0.00	2.78
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.12	0.27	0.37	0.34	0.16	0.12	0.07	0.05	0.09	0.00	0.00	0.00	0.00	0.00	0.00	1.73
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.38	0.58	0.35	0.25	0.57	0.34	0.30	0.18	0.06	0.02	0.02	0.00	0.00	0.00	0.00	0.00	3.17
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.58	0.75	0.86	0.91	0.88	0.77	0.63	0.35	0.17	0.01	0.00	0.00	0.00	0.00	0.00	6.47
15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.28	0.41	0.72	0.86	0.93	0.88	0.78	0.63	0.42	0.18	0.02	0.00	0.00	0.00	0.00	0.00	6.21
16	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.40	0.60	0.77	0.86	0.92	0.85	0.75	0.59	0.34	0.16	0.01	0.00	0.00	0.00	0.00	0.00	6.43
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.23	0.53	0.78	0.76	0.88	0.90	0.80	0.61	0.43	0.18	0.01	0.00	0.00	0.00	0.00	0.00	6.19
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.11	0.34	0.41	0.13	0.20	0.18	0.20	0.05	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.81
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.15	0.14	0.30	0.71	0.56	0.79	0.59	0.50	0.37	0.18	0.02	0.00	0.00	0.00	0.00	0.00	4.37
20	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.41	0.62	0.79	0.90	0.91	0.88	0.71	0.37	0.22	0.08	0.01	0.00	0.00	0.00	0.00	0.00	6.11
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.20	0.42	0.63	0.79	0.90	0.94	0.91	0.81	0.64	0.43	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.87
22	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.24	0.47	0.61	0.60	0.95	0.67	0.63	0.37	0.22	0.07	0.01	0.00	0.00	0.00	0.00	0.00	4.96
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.41	0.60	0.80	0.91	0.94	0.92	0.82	0.62	0.43	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.85
24	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.65	0.81	0.93	0.96	0.92	0.82	0.63	0.44	0.17	0.03	0.00	0.00	0.00	0.00	0.00	7.05
25	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.65	0.80	0.91	0.93	0.84	0.64	0.43	0.28	0.11	0.02	0.00	0.00	0.00	0.00	0.00	6.30
26	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.10	0.19	0.36	0.40	0.32	0.41	0.34	0.25	0.21	0.14	0.05	0.00	0.00	0.00	0.00	0.00	2.83
27	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.06	0.36	0.48	0.87	0.95	0.72	0.48	0.44	0.43	0.16	0.02	0.00	0.00	0.00	0.00	0.00	5.01
28	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.46	0.67	0.83	0.94	0.97	0.94	0.81	0.67	0.43	0.16	0.02	0.00	0.00	0.00	0.00	0.00	7.17
29	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.24	0.47	0.68	0.80	0.85	0.83	0.83	0.67	0.59	0.46	0.15	0.04	0.00	0.00	0.00	0.00	0.00	6.64
30	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.24	0.47	0.68	0.84	0.94	0.98	0.94	0.84	0.67	0.45	0.16	0.04	0.00	0.00	0.00	0.00	0.00	7.29
31	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.42	0.52	0.50	0.47	0.62	0.39	0.37	0.33	0.19	0.09	0.01	0.00	0.00	0.00	0.00	0.00	4.19
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.29	0.49	0.63	0.71	0.75	0.70	0.61	0.44	0.30	0.12	0.02	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	4.99	4.31	5.89	6.06	5.81	5.90	6.05	3.30	6.03	1.86	2.78	1.73	3.17	6.47	6.21	6.43	6.19	1.81	4.37	6.11	6.87	4.96	6.85	7.05	6.30
MAX	0.85	0.82	0.84	0.87	0.83	0.87	0.87	0.59	0.89	0.41	0.62	0.37	0.58	0.91	0.93	0.92	0.90	0.41	0.79	0.91	0.94	0.95	0.94	0.96	0.93
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	2.83	5.01	7.17	6.64	7.29	4.19
MAX	0.41	0.95	0.97	0.85	0.98	0.62
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MARCH - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.08	0.01	0.20
11	0.02	0.00	0.00	0.00	0.01	0.18	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
12	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.00	0.00	0.00	0.15
13	0.00	0.00	0.00	0.07	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.12	0.01	0.00	0.00	0.00	0.00	0.50
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	0.13	0.16	0.01	0.00	0.00	0.01	0.41
19	0.01	0.10	0.05	0.07	0.14	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.26	0.15	0.50	0.00	0.00	0.00	0.00	0.41	0.39	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.09	0.27	0.00	0.00	0.00	0.00	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 1.91 MONTHLY MAXIMUM = 0.27 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

APRIL THROUGH SEPTEMBER 2020

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

November 2020

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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Appendix A – Audit and Calibration Results
Appendix B – Data Screening and Validation Results
Appendix C – Monthly Data Tables

1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period April through September 2020. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the audit and calibration results. Appendix B presents the data screening results. Appendix C presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

An audit and calibration of the system was performed on July 9, 2020. There were no other significant operational events during the reporting period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

A performance audit of all equipment was performed on July 9, 2020, and a calibration was performed immediately after the audit. Audit and calibration results are presented in Appendix A, and they indicate that the meteorological systems were operating within the acceptable DQO ranges. It should be noted that due to the results of the previous audit performed on January 23, 2020, which indicated the relative humidity sensor accuracy was slightly outside of DQO limits, the relative humidity sensor was checked on June 30, 2020, and was found to be reading +8.2% high, outside of the DQO limit of ± 7%. Therefore, the relative humidity sensor was replaced during the calibration on July 9, 2020, and the calibration indicated the new sensor was within the DQO accuracy limit. The relative humidity data has been flagged with a validation code of 7 (i.e., suspect data) for the time period from the last acceptable calibration on July 10, 2019,

through July 9, 2020, but the relative humidity data is still being reported rather than invalidated because the previous accuracy errors were only slightly greater than the DQO limit.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western

Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were -1.6, -3.5, and -5.1 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix B presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix B presents comments from the manual review.

No data edits were required during the data screening and validation process.

In the digital data file that accompanies this data validation report, each hourly data point has been assigned a QC code as listed in Table 8-3 of EPA's Met Monitoring Guidance. The QC codes used were:

Code 0 - valid data,

Code 2 - valid data with corrections (i.e., data with readily identifiable offsets and simple corrections),

Code 7 – suspect data (i.e., lack of calibration documentation, and/or inconsistencies between Level 2 intercomparisons),

Code 8 - invalid data (inconsistent readings between "as-left" and "as-found" calibrations that make developing a correction factor impossible).

Note that all invalid data also has a value of 999.0 in the data file.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these data capture goals for the reporting period.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Oct-19	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Nov-19	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dec-19	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Jan-20	99.6	99.6	99.6	99.6	99.6	99.6	99.6
Feb-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mar-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Apr-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
May-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Jun-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Jul-20	99.6	99.6	99.6	99.6	99.6	99.6	99.6
Aug-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sep-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Quarter 1	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Quarter 2	99.9	99.9	99.9	99.9	99.9	99.9	99.9
Quarter 3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Quarter 4	99.9	99.9	99.9	99.9	99.9	99.9	99.9
Total	99.9	99.9	99.9	99.9	99.9	99.9	99.9

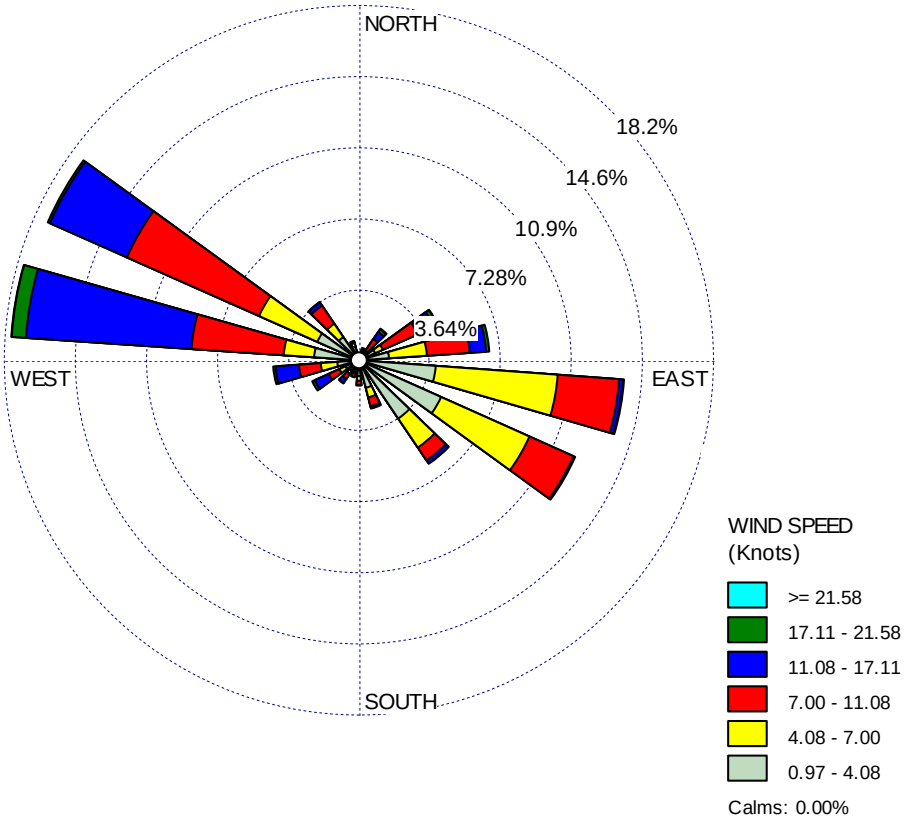
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix C presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly valid 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east-southeast (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours with higher wind speeds). This is similar to wind patterns previously observed at the monitoring site.

Figure 1 – 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Audit and Calibration Results

ASARCO Hayden Air Monitoring
Meteorological Tower Calibration Form

Site: ST-10 Date: 7/9/2020 By: Kendra Ford

RM Young Wind Monitor AQ Sensor SN :	154835
Temp Sensors	Matched RM Young RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY81502
Pressure Sensor	Met One 092 SN N01914
Relative Humidity Sensor	Campbell CS215 SN E16175
Precip Sensor	Met One 360 SN N2486
Wind Speed Standard:	RM Young 18802 SN CA04015
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torque Gauges	RM Young 18331 and 18310
Temp and Pressure Standard	Streamline Pro SN C191103, temp. probe T191103
Relative Humidity Standard	Testo 635 S/N 80510054/803

AS Found WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
410	4.7	4.8	0.1	2.2%
900	10.3	10.3	0.0	0.0%
1500	17.2	17.2	0.0	0.0%
3000	34.4	34.4	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.8 gr/cm

As Found WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	0	3	3
45	40	43	3
90	85	89	4
135	130	134	4
180	175	177	2
225	220	221	1
270	265	267	2
315	310	313	3
360	355	357	2

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic reading) = 349

Vane alignment rod (true reading) = 359

Sensor Measured Alignment (true) = 358 Logger reading

Alignment Difference (degrees) -1

Note - for fixture tests of combined linearity and orientation, the fixture index direction must be adjusted for:

Data logger offset of -4 degrees plus any alignment difference = -5 degrees

WD Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 6 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.3	0.10	-0.2	0.12	-0.2	0.03
22.1	22.22	0.1	22.23	0.1	0.01
56.3	56.68	0.4	56.59	0.3	-0.08

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

RELATIVE HUMIDITY SENSOR

Standard (% RH)	Logger (% RH)	Difference (% RH)
9.4	13.7	4.3

For RH the DQO limit is $\pm$ 7%

BAROMETRIC PRESSURE SENSOR

(mm Hg)	(mm Hg)	(mm Hg)
699.6	700	0.4

Acceptable tolerance is 2.3 mm Hg

PRECIPITATION SENSOR

INPUT (inches)	Logger (inches)	Difference (inches)
0.20	0.19	-0.01

Note: Input 100 ml for a target of 0.20 inches (20 tips).
The water must be input over at least 5 minutes.

Comments:

Calibration start 08:05 mst

Calibration end 10:25 mst

Installed a new sensor element for the CS215 Temperature and Relative Humidity Probe.

ASARCO Hayden Meteorological Tower
QA Audit Form

Site: ST-10 Date: 7/9/2020 Auditor: Danielle Zinsmaster

Sensor/Standard	ID Information
RM Young Wind Monitor AQ Sensor SN	154835
Temp Sensors	RTDs SN 22586 (2m),22530 (10m)
Solar Rad Sensor	Licor LI-200 SN PY81502
Wind Speed Audit Standard:	RM Young 18802 SN CA02494
Wind Direction Standard:	RM Young 18112 Vane Angle Fixture
Torque Gauges	RM Young 18331 and 18310
Solar Radiation Audit Standard	LiCor 200 SN PY 15862
Temperature/Delta T Audit Standard	Oakton Acorn series SN 86818 Probe SN P13397

WIND SPEED SENSOR DATA

RPM Input	Target Speed (mph)	Logger Speed (mph)	Difference (mph)	Difference %
0	0.0	0.0	0.0	NA
300	3.4	3.4	0.0	-0.1%
900	10.3	10.3	0.0	0.0%
1800	20.6	20.6	0.0	0.0%
3600	41.2	41.2	0.0	0.0%
6000	68.7	68.7	0.0	0.0%

Acceptable Tolerance is 0.2 mps or 5%, whichever is greater

Sensor Torque 0.5 mps threshold is 1 gr/cm Found at 0.8 gr/cm

WIND DIRECTION SENSOR DATA

Fixture Index	Target Direction	Logger Output	Difference (degrees)
5	-1	1	2
45	39	40	1
90	84	85	1
135	129	131	2
180	174	176	2
225	219	219	0
270	264	264	0
315	309	310	1

Acceptable Tolerance is 3 degrees linearity, 5 degrees total

Magnetic Deviation (east is positive) = 10.3

Vane alignment rod (magnetic) = 350

Vane alignment rod (true) = 360

Sensor Measured Alignment (true) = 358 Logger reading

Alignment Difference (degrees) -2

Note - for fixture tests of combined linearity and orientation, the fixture index direction must be adjusted for:

Data logger offset of -4 degrees plus any alignment difference = -6 degrees

WD Sensor Torque 0.5 mps threshold is 11 gr/cm Found at 6 gr/cm

TEMPERATURE SYSTEM DATA

Standard Reading	2 M Logger Temperature	Difference (degrees)	10 M Logger Temperature	Difference (degrees)	Logger Delta Temperature
0.5	0.10	-0.4	0.12	-0.4	0.03
22.4	22.22	-0.2	22.23	-0.2	0.01
56.3	56.68	0.4	56.59	0.3	-0.08

Acceptable Tolerance is 0.5C absolute, 0.1C for delta temperature

SOLAR RADIATION SENSOR

Standard (kw/m2)	Logger (kw/m2)	Difference (kw/m2)	Difference (% of FS)
0.88	0.87	-0.01	-1%

Full Scale is 2.0 kw/m2, acceptable tolerance is 5 %

(Note - sensor mV readings are converted to kw/m2 by multiplying 0.1047) mVolt reading 8.4

Comments:

Audit started at 08:05 mst, ended at 10:25 mst.

APPENDIX B

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for April through September 2020 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

ITYPE	PARM	DATE	CODE	Value	Comments
2	WS	20081616	HIGH RATE OF CHANGE	30.56	High WS gusts observed at other stations, data is valid
2	WS	20081617	HIGH RATE OF CHANGE	29.08	High WS gusts observed at other stations, data is valid
4	WS	20050502	WIND SPD TOO CONSTANT 3 HR	0.11	Light to moderate winds in stable period - WS is valid
4	WS	20050706	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable period - WS is valid
4	WS	20051020	WIND SPD TOO CONSTANT 3 HR	0.07	Light to moderate winds in stable period - WS is valid
4	WS	20051402	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable period - WS is valid
4	WS	20052602	WIND SPD TOO CONSTANT 3 HR	0.18	Light to moderate winds in stable period - WS is valid
4	WS	20052611	WIND SPD TOO CONSTANT 3 HR	0.02	Moderate to high steady winds - data is valid
4	WS	20061401	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable period - WS is valid
4	WS	20070103	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable period - WS is valid
4	WS	20071805	WIND SPD TOO CONSTANT 3 HR	0.2	Light to moderate winds in stable period - WS is valid
4	WS	20072323	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable period - WS is valid
4	WS	20072407	WIND SPD TOO CONSTANT 3 HR	0.09	Light to moderate winds in stable period - WS is valid
4	WS	20072610	WIND SPD TOO CONSTANT 3 HR	0.11	Moderate to high steady winds - data is valid
4	WS	20080117	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
4	WS	20080501	WIND SPD TOO CONSTANT 3 HR	0.13	Light to moderate winds in stable period - WS is valid
4	WS	20082605	WIND SPD TOO CONSTANT 3 HR	0.02	Light to moderate winds in stable period - WS is valid
4	WS	20082913	WIND SPD TOO CONSTANT 3 HR	0.07	Moderate to high steady winds - data is valid
4	WS	20091803	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable period - WS is valid
4	WS	20091900	WIND SPD TOO CONSTANT 3 HR	0.13	Light to moderate winds in stable period - WS is valid
4	WS	20092111	WIND SPD TOO CONSTANT 3 HR	0.11	Moderate to high steady winds - data is valid
4	WS	20092112	WIND SPD TOO CONSTANT 3 HR	0.09	Moderate to high steady winds - data is valid
4	WS	20092804	WIND SPD TOO CONSTANT 3 HR	0.07	Light to moderate winds in stable period - WS is valid
7	WD	20040821	WIND DIR TOO CONSTANT 3 HR	0.8	Moderate to high steady winds - data is valid
7	WD	20051520	WIND DIR TOO CONSTANT 3 HR	0.6	Light to moderate winds in stable period - WD is valid
7	WD	20061005	WIND DIR TOO CONSTANT 3 HR	0.7	Light to moderate winds in stable period - WD is valid
7	WD	20062714	WIND DIR TOO CONSTANT 3 HR	0.9	Moderate to high steady winds - data is valid
7	WD	20071416	WIND DIR TOO CONSTANT 3 HR	0.8	Moderate to high steady winds - data is valid
7	WD	20071623	WIND DIR TOO CONSTANT 3 HR	0.8	Light to moderate winds in stable period - WD is valid
7	WD	20073119	WIND DIR TOO CONSTANT 3 HR	0.9	Moderate to high steady winds - data is valid
7	WD	20091121	WIND DIR TOO CONSTANT 3 HR	0.66	Light to moderate winds in stable period - WD is valid
7	WD	20091511	WIND DIR TOO CONSTANT 3 HR	0.76	Moderate to high steady winds - data is valid
7	WD	20092010	WIND DIR TOO CONSTANT 3 HR	0.69	Moderate to high steady winds - data is valid
10	TP	20073114	OUT OF C LIMITS	45.04	Slightly above flagging value, peak temperature of year in late July, data is valid
10	TP	20073115	OUT OF C LIMITS	45.06	Slightly above flagging value, peak temperature of year in late July, data is valid
11	TP	20052908	HIGH RATE OF C CHANGE	5.22	Transition - early morning or early evening - Temp data is valid
11	TP	20071516	HIGH RATE OF C CHANGE	7.12	Transition - early morning or early evening - Temp data is valid
11	T2	20071516	HIGH RATE OF C CHANGE	6.32	Transition - early morning or early evening - Temp data is valid
11	TP	20071619	HIGH RATE OF C CHANGE	5.8	Transition - early morning or early evening - Temp data is valid
11	T2	20071619	HIGH RATE OF C CHANGE	5.46	Transition - early morning or early evening - Temp data is valid
11	TP	20072413	HIGH RATE OF C CHANGE	8.06	Frontal passage, rain event, large drop in temperatures
11	T2	20072413	HIGH RATE OF C CHANGE	6.95	Frontal passage, rain event, large drop in temperatures
11	TP	20081616	HIGH RATE OF C CHANGE	9.76	Frontal passage, rain event, large drop in temperatures
11	T2	20081616	HIGH RATE OF C CHANGE	9.27	Frontal passage, rain event, large drop in temperatures
11	TP	20082018	HIGH RATE OF C CHANGE	5.94	Transition - early morning or early evening - Temp data is valid
11	T2	20082018	HIGH RATE OF C CHANGE	5.62	Transition - early morning or early evening - Temp data is valid
11	TP	20082418	HIGH RATE OF C CHANGE	6.09	Transition - early morning or early evening - Temp data is valid
11	TP	20082921	HIGH RATE OF C CHANGE	5.59	Frontal passage, rain event, large drop in temperatures
11	T2	20082921	HIGH RATE OF C CHANGE	5.06	Frontal passage, rain event, large drop in temperatures
11	TP	20091309	HIGH RATE OF C CHANGE	5.01	Transition - early morning or early evening - Temp data is valid
15	D1	20051911	DT LARGE READING	-2.09	Strong solar radiation - Delta Temp data is valid
15	D1	20052911	DT LARGE READING	-2.16	Strong solar radiation - Delta Temp data is valid
15	D1	20060910	DT LARGE READING	-2.04	Strong solar radiation - Delta Temp data is valid
15	D1	20060911	DT LARGE READING	-2.29	Strong solar radiation - Delta Temp data is valid
15	D1	20061613	DT LARGE READING	-2.02	Strong solar radiation - Delta Temp data is valid
15	D1	20071713	DT LARGE READING	-2.21	Strong solar radiation - Delta Temp data is valid
15	D1	20072211	DT LARGE READING	-2.18	Strong solar radiation - Delta Temp data is valid
15	D1	20072213	DT LARGE READING	-2.23	Strong solar radiation - Delta Temp data is valid
15	D1	20072613	DT LARGE READING	-2.01	Strong solar radiation - Delta Temp data is valid
15	D1	20072710	DT LARGE READING	-2.15	Strong solar radiation - Delta Temp data is valid
15	D1	20072711	DT LARGE READING	-2.24	Strong solar radiation - Delta Temp data is valid
15	D1	20072712	DT LARGE READING	-2.2	Strong solar radiation - Delta Temp data is valid
15	D1	20081712	DT LARGE READING	-2.29	Strong solar radiation - Delta Temp data is valid
15	D1	20090511	DT LARGE READING	-2.08	Strong solar radiation - Delta Temp data is valid
16	D1	20072413	DT + During Daytime	0.14	Frontal passage, rain event, large drop in temperatures
17	D1	20040902	DT - During Nighttime	-0.13	Slightly above flagging value, moderate winds to break any inversion - data is valid
17	D1	20040903	DT - During Nighttime	-0.15	Slightly above flagging value, moderate winds to break any inversion - data is valid
17	D1	20070300	DT - During Nighttime	-0.12	Slightly above flagging value, moderate winds to break any inversion - data is valid
17	D1	20072204	DT - During Nighttime	-0.11	Slightly above flagging value, moderate winds to break any inversion - data is valid
17	D1	20072303	DT - During Nighttime	-0.13	Wind shift, moderate winds to break any inversion - data is valid
17	D1	20072304	DT - During Nighttime	-0.27	Wind shift, moderate winds to break any inversion - data is valid
17	D1	20082223	DT - During Nighttime	-0.12	Slightly above flagging value, moderate winds to break any inversion - data is valid
19	RH	20041202	OUT OF LIMITS	96	Nighttime, cool ambient temperatures - data is valid
20	SR	20052012	SR OUT OF MAX/MIN	1.09	Slightly above threshold, near solar noon, data is valid
20	SR	20052112	SR OUT OF MAX/MIN	1.1	Slightly above threshold, near solar noon, data is valid
20	SR	20052212	SR OUT OF MAX/MIN	1.09	Slightly above threshold, near solar noon, data is valid
20	SR	20052512	SR OUT OF MAX/MIN	1.09	Slightly above threshold, near solar noon, data is valid
20	SR	20052612	SR OUT OF MAX/MIN	1.1	Slightly above threshold, near solar noon, data is valid
20	SR	20070212	SR OUT OF MAX/MIN	1.13	Slightly above threshold, near solar noon, data is valid
21	PR	20072412	OUT OF LIMITS	0.22	Frontal passage, rain event, large drop in temperatures
21	PR	20082921	OUT OF LIMITS	0.26	Frontal passage, rain event, large drop in temperatures

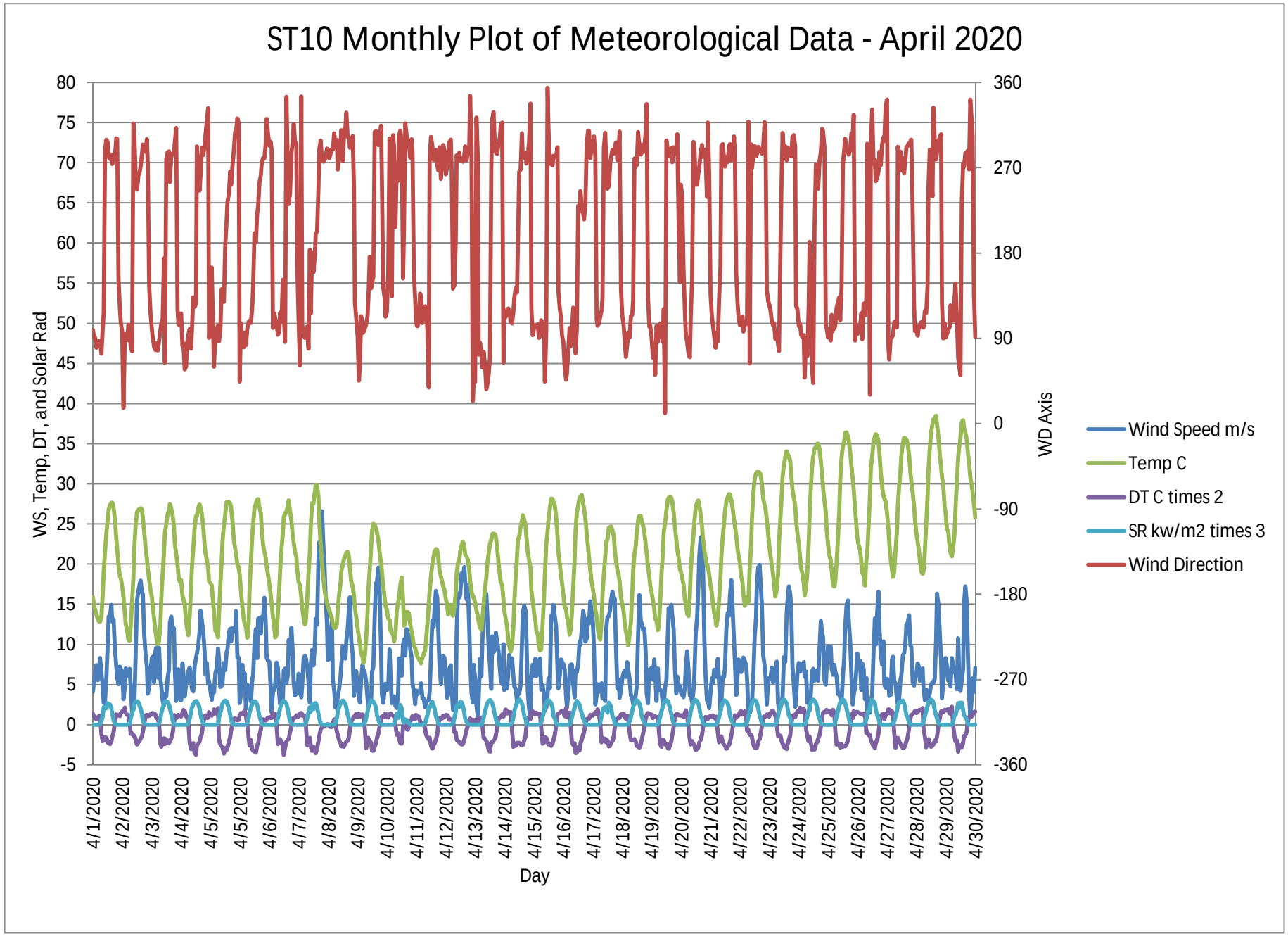
AZMET and ST10 Reported Precipitation Totals

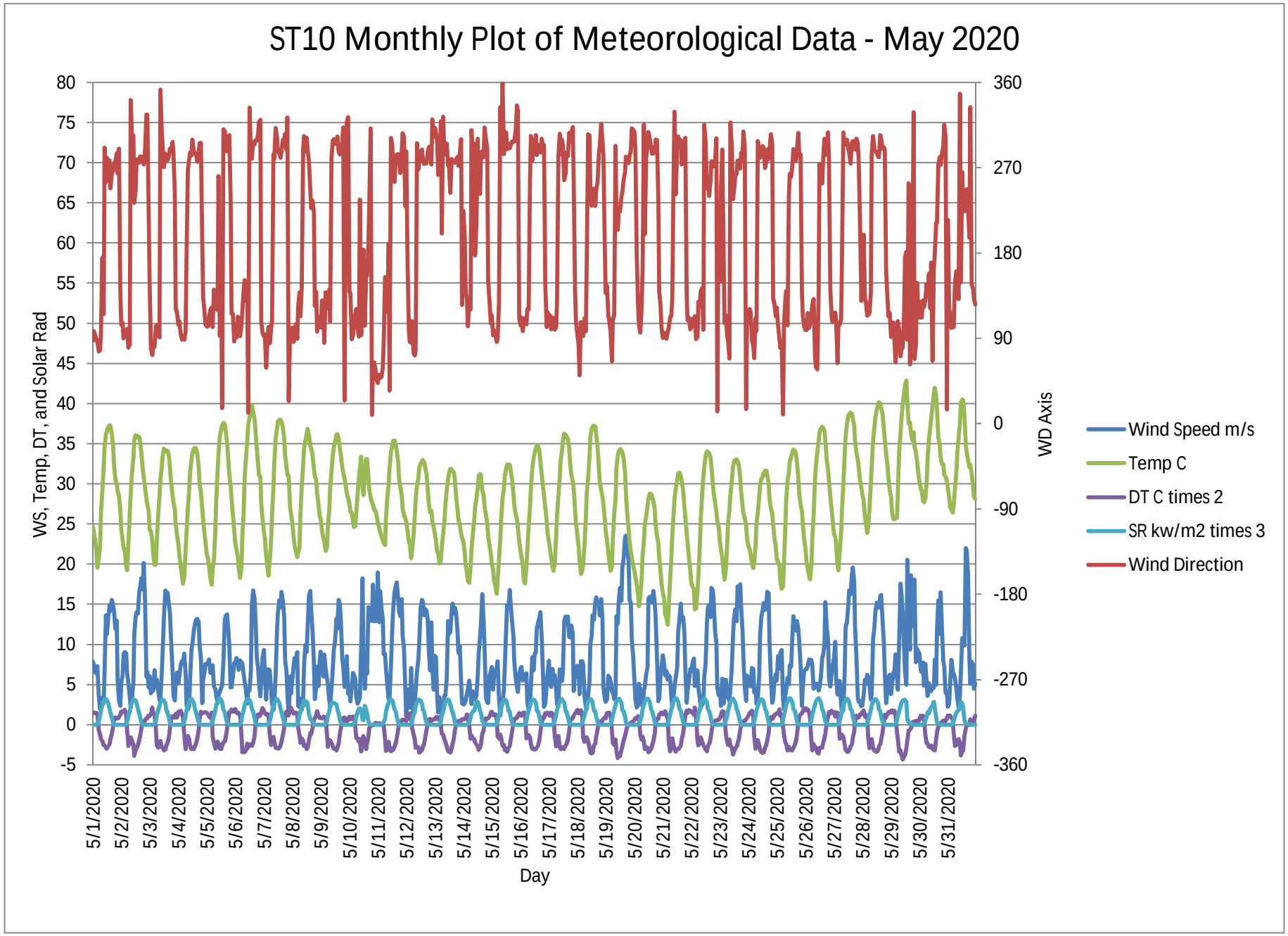
(inches/month)

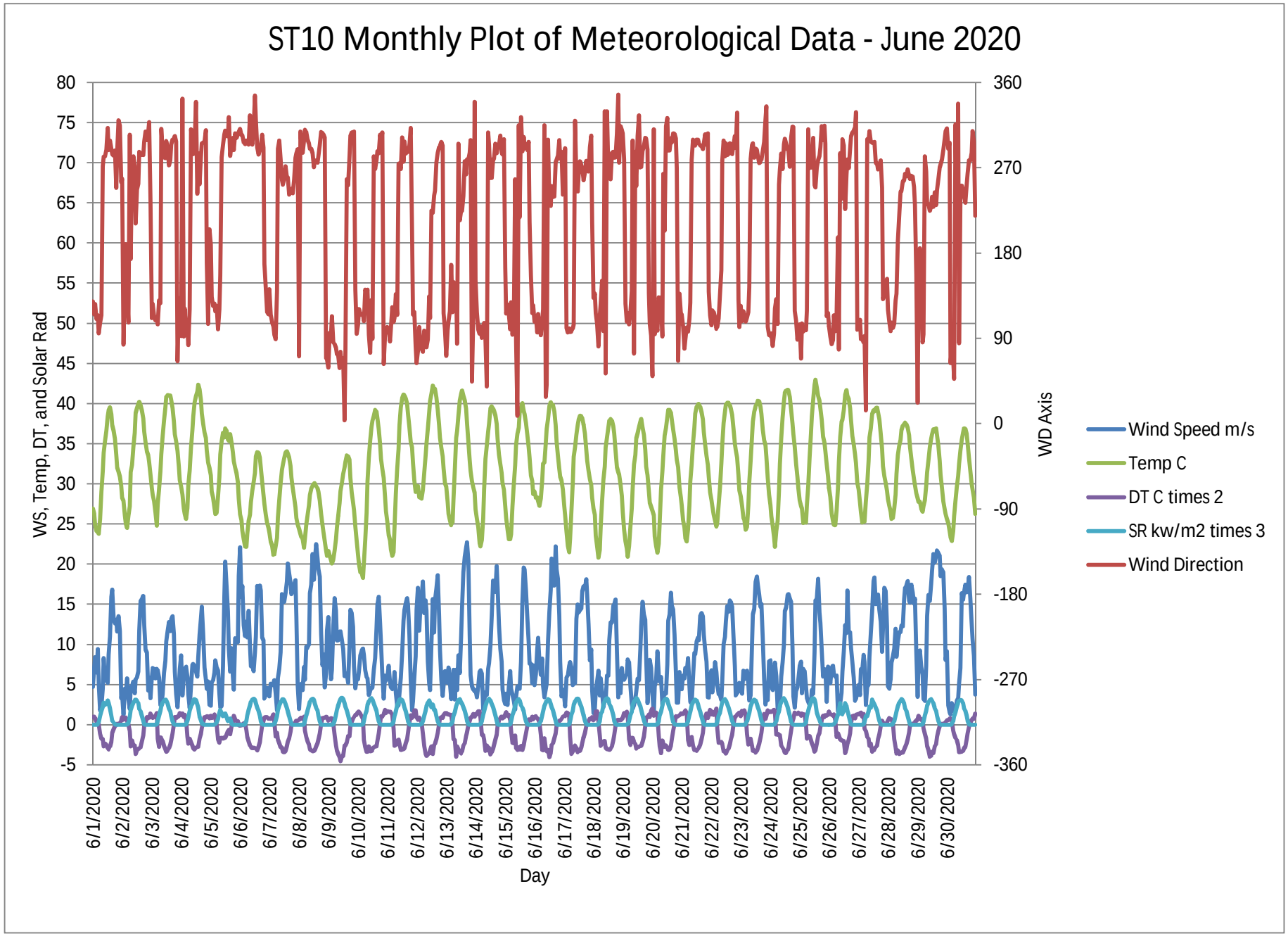
Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Oct-19	0.00	0.03	0.02	0.20
Nov-19	2.47	2.66	2.57	2.37
Dec-19	1.63	1.21	1.42	1.82
Jan-20	0.15	0.42	0.29	0.91
Feb-20	0.61	0.90	0.76	1.27
Mar-20	1.23	0.64	0.94	1.91
Apr-20	0.00	0.00	0.00	0.16
May-20	0.01	0.00	0.01	0.00
Jun-20	0.00	0.03	0.02	0.00
Jul-20	0.66	0.59	0.63	0.44
Aug-20	0.36	0.39	0.38	0.53
Sep-20	0.00	0.00	0.00	0.00
Totals Nov-Sept	7.12	6.84	6.98	9.41

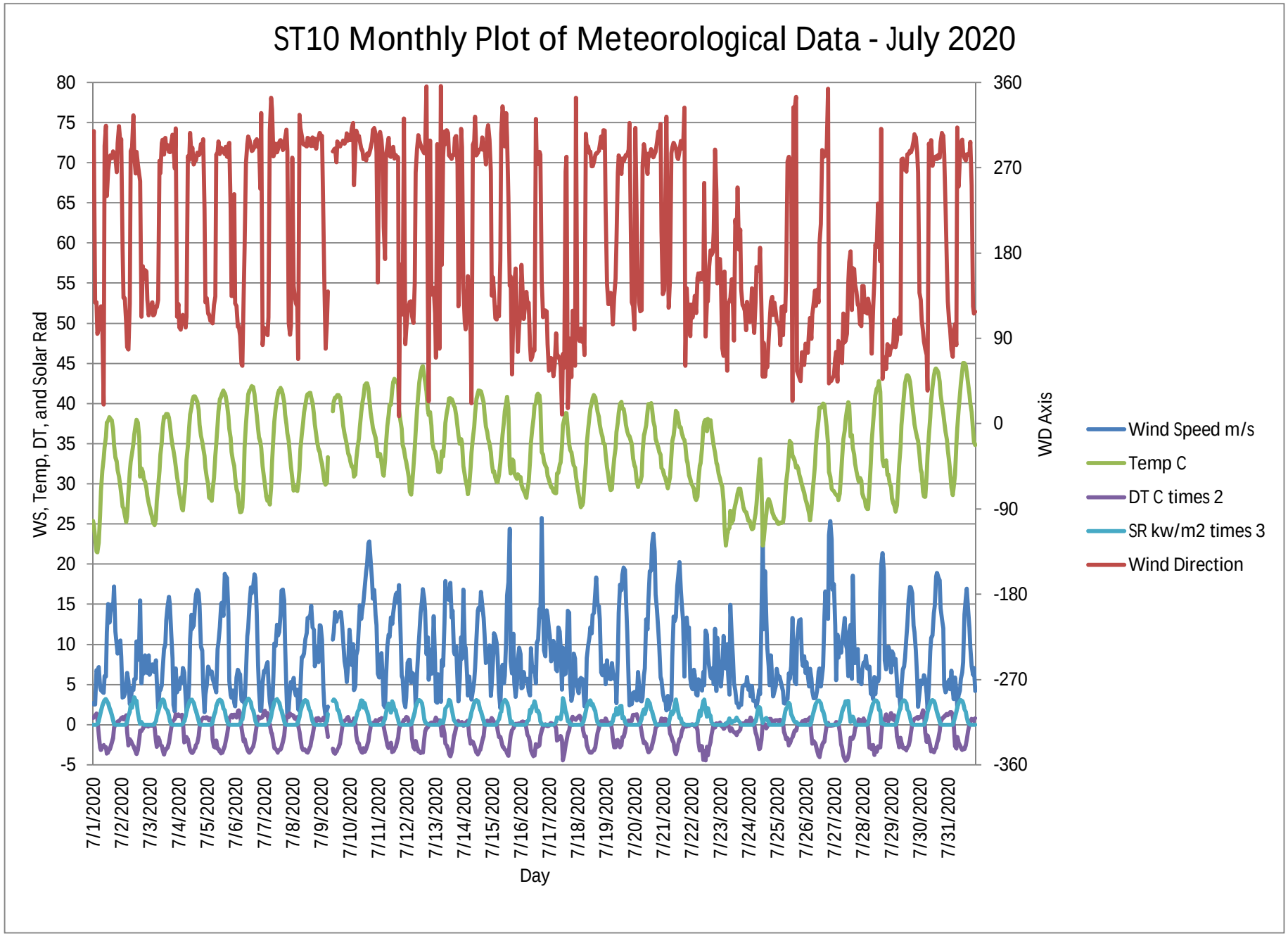
APPENDIX C

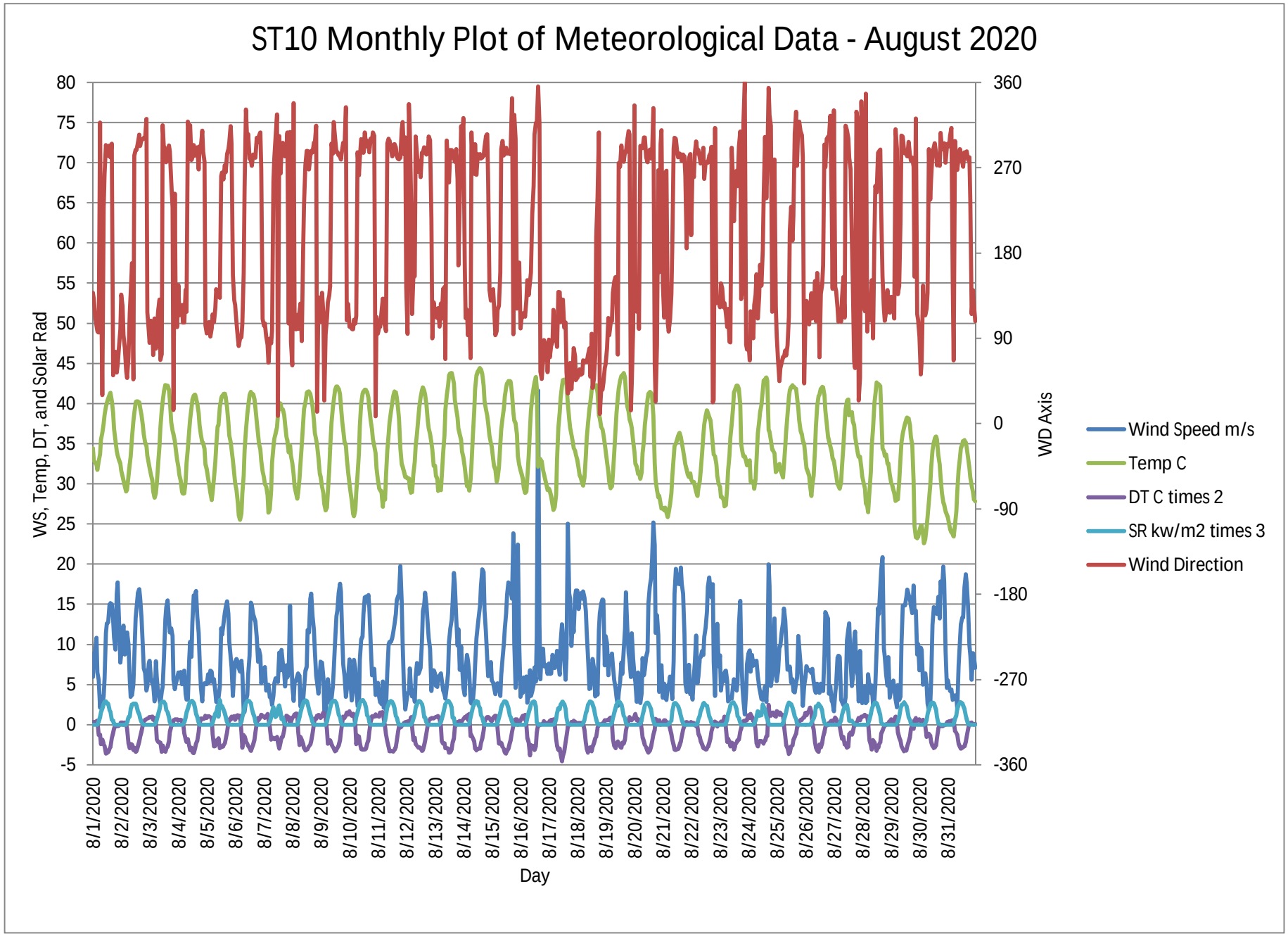
Monthly Data Plots and Tables

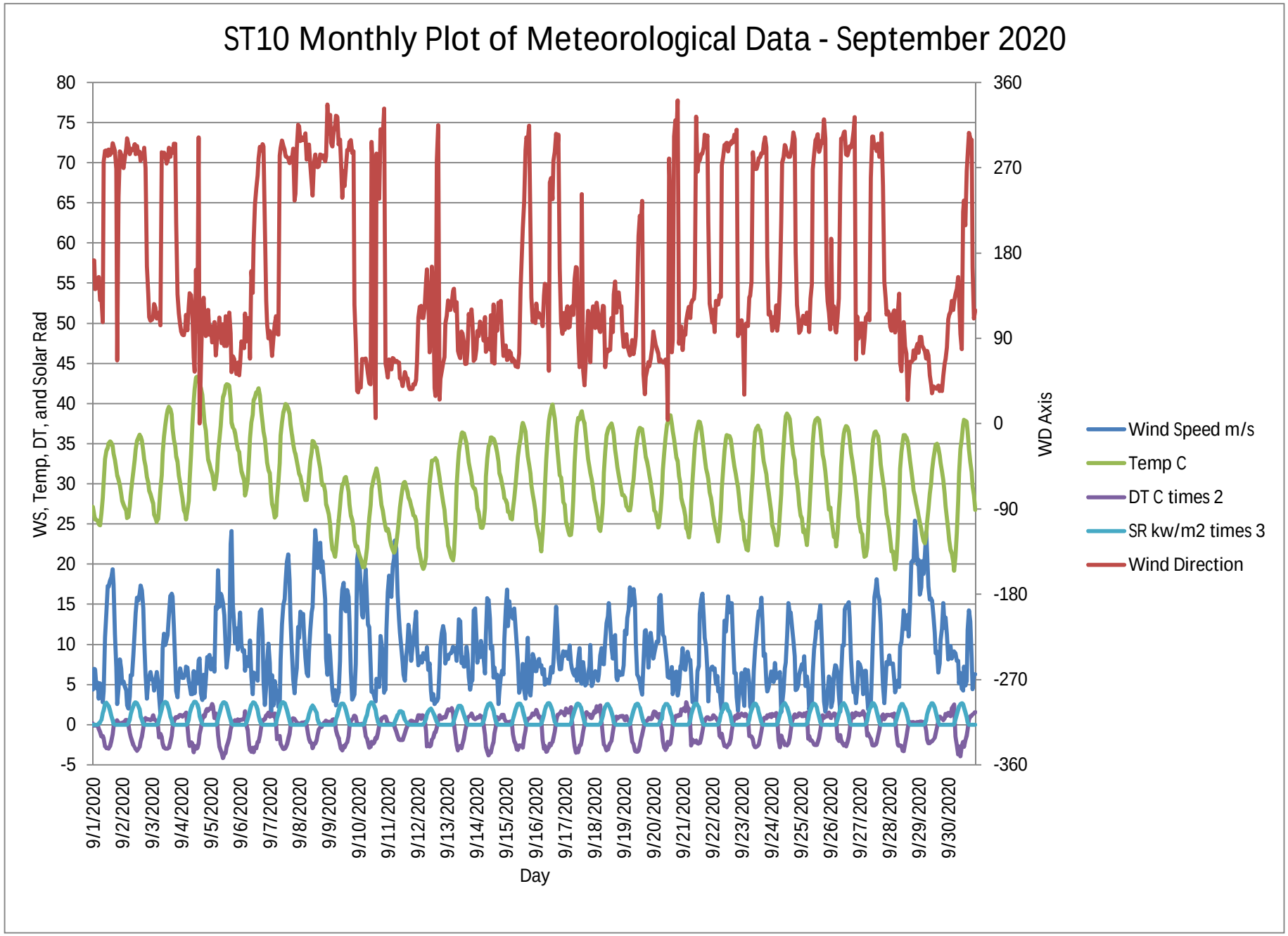

ST10 Monthly Plot of Meteorological Data - April 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
4/1/2020
4/2/2020
4/3/2020
4/4/2020
4/5/2020
4/5/2020
4/6/2020
4/7/2020
4/8/2020
4/9/2020
4/10/2020
4/11/2020
4/12/2020
4/13/2020
4/14/2020
4/15/2020
4/16/2020
4/17/2020
4/18/2020
4/19/2020
4/20/2020
4/21/2020
4/22/2020
4/23/2020
4/24/2020
4/25/2020
4/26/2020
4/27/2020
4/28/2020
4/29/2020
4/30/2020
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - May 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
5/1/2020
5/2/2020
5/3/2020
5/4/2020
5/5/2020
5/6/2020
5/7/2020
5/8/2020
5/9/2020
5/10/2020
5/11/2020
5/12/2020
5/13/2020
5/14/2020
5/15/2020
5/16/2020
5/17/2020
5/18/2020
5/19/2020
5/20/2020
5/21/2020
5/22/2020
5/23/2020
5/24/2020
5/25/2020
5/26/2020
5/27/2020
5/28/2020
5/29/2020
5/30/2020
5/31/2020
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - June 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
6/1/2020
6/2/2020
6/3/2020
6/4/2020
6/5/2020
6/6/2020
6/7/2020
6/8/2020
6/9/2020
6/10/2020
6/11/2020
6/12/2020
6/13/2020
6/14/2020
6/15/2020
6/16/2020
6/17/2020
6/18/2020
6/19/2020
6/20/2020
6/21/2020
6/22/2020
6/23/2020
6/24/2020
6/25/2020
6/26/2020
6/27/2020
6/28/2020
6/29/2020
6/30/2020


ST10 Monthly Plot of Meteorological Data - July 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
7/1/2020
7/2/2020
7/3/2020
7/4/2020
7/5/2020
7/6/2020
7/7/2020
7/8/2020
7/9/2020
7/10/2020
7/11/2020
7/12/2020
7/13/2020
7/14/2020
7/15/2020
7/16/2020
7/17/2020
7/18/2020
7/19/2020
7/20/2020
7/21/2020
7/22/2020
7/23/2020
7/24/2020
7/25/2020
7/26/2020
7/27/2020
7/28/2020
7/29/2020
7/30/2020
7/31/2020


ST10 Monthly Plot of Meteorological Data - August 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
8/1/2020
8/2/2020
8/3/2020
8/4/2020
8/5/2020
8/6/2020
8/7/2020
8/8/2020
8/9/2020
8/10/2020
8/11/2020
8/12/2020
8/13/2020
8/14/2020
8/15/2020
8/16/2020
8/17/2020
8/18/2020
8/19/2020
8/20/2020
8/21/2020
8/22/2020
8/23/2020
8/24/2020
8/25/2020
8/26/2020
8/27/2020
8/28/2020
8/29/2020
8/30/2020
8/31/2020
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - September 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed m/s
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
9/1/2020
9/2/2020
9/3/2020
9/4/2020
9/5/2020
9/6/2020
9/7/2020
9/8/2020
9/9/2020
9/10/2020
9/11/2020
9/12/2020
9/13/2020
9/14/2020
9/15/2020
9/16/2020
9/17/2020
9/18/2020
9/19/2020
9/20/2020
9/21/2020
9/22/2020
9/23/2020
9/24/2020
9/25/2020
9/26/2020
9/27/2020
9/28/2020
9/29/2020
9/30/2020

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
APRIL - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	4.1	5.7	6.5	7.4	5.5	6.6	8.3	6.3	4.8	2.7	3.0	5.9	10.0	13.4	13.4	14.9	12.8	13.1	9.4	7.3	5.8	5.0	7.2	6.9	7.8
2	6.7	3.2	4.7	7.0	6.3	6.0	6.9	4.7	1.7	1.9	2.3	8.7	15.4	16.7	17.2	17.9	16.5	16.2	11.3	8.8	7.2	3.8	4.7	6.7	8.4
3	8.2	8.4	5.3	9.1	9.6	5.9	9.6	5.6	4.7	3.0	2.4	3.8	3.5	5.8	6.9	12.7	13.4	12.2	12.0	7.0	2.9	3.7	6.9	6.6	7.1
4	3.0	7.6	6.3	3.5	5.0	5.4	6.6	7.1	5.7	4.4	4.1	7.2	8.3	8.8	9.9	11.6	14.2	13.0	11.7	9.2	6.3	7.7	5.1	5.4	7.4
5	4.2	3.0	4.7	4.0	6.3	7.0	9.5	8.3	4.7	4.8	5.2	7.7	6.8	9.0	9.4	11.5	11.9	10.4	12.0	11.6	11.7	14.1	8.4	8.3	8.1
6	2.7	3.8	7.5	4.8	6.4	2.0	5.0	4.3	4.4	2.9	5.5	6.3	10.1	11.9	8.3	13.1	13.3	11.3	13.4	13.2	15.8	12.6	8.4	8.0	8.1
7	7.8	4.7	1.5	4.0	4.3	4.9	7.7	7.1	3.7	2.6	3.7	3.2	6.8	7.0	5.2	6.2	10.5	8.9	12.1	9.0	5.3	3.7	5.1	3.8	5.8
8	6.3	4.7	3.4	4.9	8.1	8.6	8.2	7.2	5.3	2.7	7.4	9.3	7.4	9.8	13.2	12.5	20.5	22.7	22.7	26.6	22.3	20.6	15.8	12.6	11.8
9	8.1	8.2	11.4	13.0	5.5	4.3	2.1	2.8	3.5	4.4	6.0	7.5	9.8	9.4	8.2	10.4	11.9	14.5	15.9	10.4	8.8	3.6	4.7	6.7	8.0
10	4.5	3.8	2.8	5.7	7.4	6.9	6.5	5.4	3.4	2.3	2.7	2.9	6.5	7.2	13.4	17.6	17.7	19.6	16.5	9.6	3.8	2.7	4.3	5.1	7.4
11	4.2	4.6	9.4	6.4	2.7	3.2	3.5	2.3	2.1	3.9	8.2	7.1	6.1	10.0	10.6	8.6	11.9	11.2	11.2	9.4	8.3	5.1	4.1	2.6	6.5
12	4.2	3.8	4.2	4.1	5.2	3.3	3.3	2.2	2.8	3.0	3.1	4.0	8.5	12.9	12.2	14.6	16.7	15.8	12.1	7.4	5.0	8.3	8.6	8.3	7.2
13	5.5	3.3	3.7	6.9	7.4	4.4	1.8	2.2	2.0	11.6	16.3	15.9	16.2	18.8	18.1	19.6	17.8	15.6	17.3	12.0	7.9	4.0	2.8	7.5	10.0
14	5.7	2.4	1.1	3.4	8.2	6.1	10.0	14.3	15.9	16.2	13.7	9.8	7.4	4.5	11.0	9.0	9.5	11.4	10.4	9.1	7.0	5.6	5.1	10.0	8.6
15	4.3	6.1	4.5	6.7	8.7	7.7	8.2	6.0	4.8	4.4	3.0	3.9	3.9	4.8	9.9	13.9	14.8	14.2	10.7	4.2	1.9	1.0	6.0	7.5	6.7
16	6.1	8.2	6.0	6.4	7.7	8.2	4.3	4.9	3.7	1.7	2.1	3.7	5.7	4.5	13.6	13.8	14.9	13.5	12.2	7.0	4.5	6.1	8.1	7.9	7.3
17	7.6	6.8	3.6	2.1	3.9	6.5	7.4	7.5	5.0	3.4	6.7	6.6	7.5	10.4	10.0	11.9	14.1	13.6	10.4	10.7	13.2	12.6	15.3	13.9	8.8
18	13.5	9.5	2.5	3.7	5.0	4.1	4.7	5.2	3.3	4.1	3.0	11.9	13.4	13.5	14.4	15.5	16.5	15.2	15.7	9.5	4.5	5.6	3.3	4.3	8.4
19	5.8	6.5	6.7	6.0	7.8	6.9	5.8	3.7	3.2	2.6	2.6	3.8	4.7	11.1	16.2	12.9	12.6	11.8	12.0	8.9	4.0	2.7	6.8	6.0	7.1
20	7.1	5.6	8.1	6.4	3.0	7.0	4.2	4.4	4.2	2.5	2.5	4.6	5.5	11.1	14.5	13.8	14.9	13.5	11.9	6.7	3.9	6.0	4.8	4.8	7.1
21	4.1	3.7	3.4	4.7	7.2	9.1	6.8	3.6	3.9	2.8	4.2	6.1	11.4	13.2	17.3	21.0	23.4	23.4	20.5	11.0	6.1	3.0	3.0	2.1	9.0
22	4.1	5.7	5.2	6.8	6.6	5.9	8.2	5.2	1.9	2.7	6.0	5.9	7.1	11.9	13.9	13.6	15.9	18.0	14.3	10.6	8.0	3.7	6.4	8.1	8.2
23	7.6	6.6	7.9	8.3	7.9	7.4	5.8	1.9	1.5	2.0	2.7	6.1	10.9	13.4	17.6	19.6	19.9	17.9	15.0	8.6	7.4	6.1	2.5	5.8	8.8
24	5.6	5.7	7.1	5.2	5.7	5.9	7.8	2.6	2.0	2.1	2.7	3.5	8.4	7.8	13.7	15.5	17.2	16.2	14.8	7.1	4.9	2.3	3.4	6.5	7.2
25	7.7	6.6	7.4	7.5	7.8	6.0	6.6	2.7	3.4	1.8	4.1	6.7	7.0	5.5	5.7	6.8	5.5	9.5	12.9	11.4	10.8	5.5	5.0	7.3	6.7
26	9.8	9.3	9.7	7.0	6.2	7.5	6.5	6.0	3.8	3.8	3.4	2.8	6.0	8.4	12.1	14.7	15.5	12.9	10.5	6.0	2.5	3.7	4.6	6.9	7.5
27	8.9	7.2	7.9	4.3	7.6	6.9	3.2	5.8	1.7	2.1	1.5	2.9	3.8	8.9	13.2	10.0	13.8	16.5	12.2	9.0	7.5	10.4	5.0	4.6	7.3
28	5.7	5.0	3.6	3.7	8.1	8.5	5.5	5.1	3.0	2.6	3.3	5.6	6.2	8.5	8.9	10.4	12.4	12.7	13.6	9.9	9.7	5.2	4.9	5.8	7.0
29	6.3	7.6	7.1	5.5	6.8	7.0	4.5	3.1	4.3	2.9	2.6	4.0	5.0	5.3	5.2	5.7	10.6	16.3	15.0	11.6	8.1	3.3	5.2	7.8	6.7
30	8.3	7.3	5.5	6.1	4.8	8.3	7.3	6.5	6.6	4.4	10.8	6.6	4.2	5.5	6.9	15.1	17.2	15.3	10.2	3.8	1.0	3.3	5.8	4.1	7.3
HRAVE	6.3	5.8	5.6	5.8	6.4	6.3	6.2	5.1	4.0	3.8	4.8	6.1	7.8	9.6	11.7	13.1	14.6	14.6	13.3	9.6	7.2	6.0	6.0	6.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	7.8	8.4	7.1	7.4	8.1	8.1	5.8	11.8	8.0	7.4	6.5	7.2	10.0	8.6	6.7	7.3	8.8	8.4	7.1	7.1	9.0	8.2	8.8	7.2	6.7
MAX	14.9	17.9	13.4	14.2	14.1	15.8	12.1	26.6	15.9	19.6	11.9	16.7	19.6	16.2	14.8	14.9	15.3	16.5	16.2	14.9	23.4	18.0	19.9	17.2	12.9
MIN	2.7	1.7	2.4	3.0	3.0	2.0	1.5	2.7	2.1	2.3	2.1	2.2	1.8	1.1	1.0	1.7	2.1	2.5	2.6	2.5	2.1	1.9	1.5	2.0	1.8

DAY	26	27	28	29	30	31
AVE	7.5	7.3	7.0	6.7	7.3	***
MAX	15.5	16.5	13.6	16.3	17.2	***
MIN	2.5	1.5	2.6	2.6	1.0	***

MONTHLY AVERAGE = 7.8 MONTHLY MAXIMUM = 26.6 MONTHLY MINIMUM = 1.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
APRIL - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	99	90	91	80	86	87	87	74	101	116	289	300	296	281	279	284	274	279	282	301	300	151	121	107	92
2	97	17	94	92	88	104	90	83	76	317	305	262	247	261	263	271	284	294	291	287	300	273	145	117	351
3	99	90	81	78	85	77	87	98	106	111	174	64	279	286	287	255	281	285	286	297	312	121	105	104	21
4	116	82	85	57	60	84	93	100	79	99	133	123	127	293	268	246	261	291	283	292	304	319	333	90	337
5	99	165	102	60	93	101	103	87	97	142	134	129	187	214	234	242	266	252	271	288	308	309	322	317	289
6	44	106	87	80	96	83	101	106	109	106	123	146	201	191	221	229	254	261	275	280	280	296	322	306	156
7	294	297	289	101	116	112	105	94	97	117	108	152	116	86	345	266	231	244	286	298	316	298	295	167	20
8	108	61	345	104	97	91	96	103	79	184	116	181	160	179	199	202	247	290	299	277	277	277	282	290	289
9	289	280	285	290	289	306	292	299	268	294	295	310	277	305	313	328	302	302	291	301	304	249	128	111	117
10	92	45	62	113	96	97	101	105	113	132	176	143	148	155	308	309	306	294	300	315	257	143	133	113	142
11	118	158	301	238	134	304	291	207	272	257	304	309	296	153	206	317	304	300	295	281	300	285	159	130	291
12	106	103	109	137	134	106	115	124	119	100	38	278	303	293	278	283	288	273	267	292	258	278	294	288	205
13	263	271	282	297	300	267	143	145	192	283	278	286	278	279	276	283	293	278	286	292	346	290	24	46	233
14	44	323	282	73	85	75	59	76	62	36	40	51	70	270	321	329	290	286	285	295	301	314	318	64	214
15	119	112	120	121	119	108	106	118	132	143	139	187	266	268	306	280	284	286	274	281	298	338	121	94	104
16	101	103	104	105	90	93	109	105	102	44	97	354	311	279	273	272	282	281	282	292	139	122	111	93	342
17	86	60	46	53	79	101	82	99	122	98	74	101	230	224	246	228	223	216	233	296	309	309	280	293	337
18	291	303	283	110	104	105	113	119	132	292	307	279	248	250	273	281	289	285	291	297	278	291	308	142	285
19	114	103	89	70	84	96	91	113	115	130	280	271	272	308	292	284	294	286	293	308	337	134	102	103	296
20	91	69	81	52	103	86	100	106	97	86	121	11	299	289	289	282	290	276	292	290	285	305	216	149	146
21	252	240	162	119	94	86	74	70	112	152	297	293	252	252	264	271	286	294	281	289	283	239	318	262	176
22	136	113	105	93	80	95	87	132	167	292	295	279	271	281	276	291	295	278	285	303	286	158	127	113	186
23	104	107	113	97	105	109	105	319	63	295	270	282	293	282	285	292	287	289	285	293	318	308	141	129	89
24	126	121	108	104	106	89	94	84	77	176	263	307	287	293	278	291	290	286	282	303	304	292	125	120	248
25	103	105	95	92	93	49	87	72	124	192	109	54	43	208	273	254	248	277	287	311	308	292	104	101	32
26	91	92	87	115	98	101	104	122	128	133	109	145	274	289	301	288	286	284	289	306	306	326	87	104	52
27	94	101	101	117	89	127	114	133	295	288	31	294	332	274	278	256	259	265	287	273	294	302	298	335	212
28	342	81	68	90	91	93	107	108	102	292	274	287	267	280	264	279	292	293	296	298	299	222	125	98	353
29	102	93	104	102	107	108	101	119	116	145	251	289	258	240	333	297	279	286	297	301	305	127	90	106	223
30	91	95	99	101	125	121	108	133	148	113	69	61	51	233	274	271	285	285	288	268	342	320	304	137	231

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
APRIL - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	10	11	10	8	14	10	10	15	20	23	33	29	27	16	19	15	17	11	9	5	7	24	10	11	15
2	11	50	45	16	13	12	8	22	41	33	51	22	18	19	15	16	15	13	9	4	5	33	12	7	20
3	7	8	15	7	7	12	6	9	18	34	62	36	70	46	43	25	21	19	9	5	42	34	11	7	23
4	17	11	11	28	26	23	12	9	11	22	36	30	38	24	36	20	19	12	8	7	8	10	42	9	20
5	23	56	49	29	33	16	8	7	21	24	36	36	62	31	25	25	19	19	10	6	8	10	16	34	25
6	35	15	7	29	9	46	35	17	18	44	36	45	31	22	37	29	16	15	8	6	7	14	12	10	23
7	12	21	35	13	11	10	9	10	25	40	53	54	47	67	45	38	23	15	9	8	12	25	12	20	26
8	6	19	22	40	9	16	14	10	16	57	20	35	27	29	26	26	18	11	11	8	8	8	7	8	19
9	9	11	8	10	16	12	24	22	28	40	38	45	24	28	37	28	22	13	9	8	8	28	11	8	20
10	33	16	24	7	7	8	9	9	27	54	54	67	43	59	21	14	13	12	10	9	31	23	14	11	24
11	8	29	9	26	27	12	22	35	47	34	18	27	39	55	39	16	10	10	12	10	8	24	9	16	23
12	8	12	7	20	6	15	9	15	20	25	41	32	21	17	18	17	15	11	10	5	13	10	8	10	15
13	14	16	28	26	15	35	28	34	51	16	14	16	19	17	19	14	11	9	9	8	25	53	36	20	22
14	28	64	35	29	15	37	17	10	16	14	19	27	41	48	36	29	36	19	9	7	9	11	28	14	25
15	25	15	10	9	7	6	7	11	22	28	41	62	49	63	31	16	14	11	8	17	22	11	7	6	21
16	7	8	8	9	7	10	10	10	28	50	60	49	48	55	19	24	20	13	9	7	30	8	8	9	21
17	10	23	29	42	31	19	10	13	19	30	23	35	49	21	39	23	17	14	13	9	8	8	5	5	21
18	5	7	36	17	13	12	18	10	28	26	52	22	20	20	23	19	15	13	12	10	11	8	9	31	18
19	11	8	8	10	9	11	11	14	25	44	51	53	42	27	15	19	18	13	9	7	35	37	7	9	21
20	9	12	8	29	37	7	13	10	23	48	52	44	53	40	17	18	16	13	10	7	19	8	22	39	23
21	43	40	14	12	9	7	17	18	26	41	39	42	30	28	22	15	13	13	9	11	45	42	18	30	24
22	10	11	9	7	9	10	7	12	43	39	33	34	34	24	17	20	15	10	9	8	9	33	8	8	17
23	14	12	10	8	12	10	12	28	59	38	41	35	19	17	19	18	12	12	9	10	8	13	26	20	19
24	9	7	10	10	14	10	13	24	41	42	42	65	32	41	24	17	14	13	8	9	37	34	19	10	23
25	7	11	8	8	22	40	12	30	24	50	51	47	47	61	47	34	47	18	7	7	5	37	20	8	27
26	7	7	7	12	9	8	8	12	21	26	34	55	57	31	26	16	15	11	9	8	19	13	20	10	18
27	8	8	10	15	7	10	18	14	36	24	36	48	41	38	22	31	23	12	12	10	16	7	48	31	22
28	35	13	17	13	8	9	9	9	33	48	34	25	31	35	35	26	20	14	9	6	4	21	10	9	20
29	10	9	8	8	12	7	11	19	17	41	47	38	40	56	40	56	27	10	9	8	34	27	10	17	23
30	14	20	9	15	17	9	6	9	13	35	12	31	35	42	62	14	12	11	9	23	51	19	21	14	21
HRAVE	15	18	17	17	14	15	13	16	27	36	39	40	38	36	29	23	18	13	9	8	18	21	16	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15	20	23	20	25	23	26	19	20	24	23	15	22	25	21	21	21	18	21	23	24	17	19	23	27
MAX	33	51	70	42	62	46	67	57	45	67	55	41	53	64	63	60	49	52	53	53	45	43	59	65	61
MIN	5	4	5	7	6	6	8	6	8	7	8	5	8	7	6	7	5	5	7	7	7	7	8	7	5

DAY	26	27	28	29	30	31
AVE	18	22	20	23	21	***
MAX	57	48	48	56	62	***
MIN	7	7	4	7	6	***

MONTHLY AVERAGE = 21.3 MONTHLY MAXIMUM = 70.2 MONTHLY MINIMUM = 4.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
APRIL - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	15.9	14.8	14.3	13.7	13.1	12.9	12.8	13.5	16.3	19.1	21.6	23.8	25.7	26.7	27.3	27.6	27.6	27.0	25.6	23.2	21.9	19.9	18.5	18.3	20.0
2	17.2	15.9	13.9	12.5	11.7	10.5	10.5	12.3	15.2	18.3	22.0	24.8	26.5	26.6	26.9	27.0	26.8	25.7	24.0	22.0	20.7	19.5	18.0	16.8	19.4
3	15.9	14.8	13.2	11.7	10.8	10.0	10.5	12.4	15.8	18.8	21.5	23.9	25.0	26.2	26.5	27.5	26.9	26.1	24.8	22.5	21.3	20.0	18.7	17.8	19.3
4	18.0	16.1	15.6	15.0	12.8	12.1	11.2	13.6	16.9	19.6	21.9	24.4	26.0	25.9	27.0	27.4	27.0	26.2	24.8	22.6	21.4	20.6	19.6	17.9	20.1
5	17.6	17.4	15.3	14.0	11.8	11.4	10.9	13.5	17.2	20.4	22.8	24.9	26.1	27.7	27.6	27.8	27.5	27.0	25.5	23.0	22.0	21.1	20.0	19.5	20.5
6	18.7	16.6	14.7	13.2	12.5	12.2	10.8	12.6	16.7	20.4	23.4	25.0	27.0	27.5	28.0	28.1	27.1	26.3	24.5	22.4	21.5	20.8	19.7	18.6	20.3
7	17.6	16.1	15.1	13.4	12.1	10.9	11.2	13.9	16.8	19.2	21.9	23.8	25.8	26.3	26.5	27.3	27.9	26.6	25.4	23.5	22.7	21.5	20.9	19.2	20.2
8	17.8	17.3	15.9	14.6	13.3	12.5	13.0	15.6	18.8	21.5	24.6	27.6	27.6	29.0	29.8	29.8	28.4	25.2	22.5	20.0	18.3	17.0	15.9	15.2	20.5
9	14.7	14.3	13.7	13.2	12.6	12.0	12.0	12.6	14.6	16.2	17.5	19.2	19.9	20.6	21.0	21.4	21.6	20.8	19.4	17.8	17.2	16.1	14.5	13.4	16.5
10	12.0	10.9	10.1	8.9	8.4	7.7	8.5	10.7	13.7	16.9	19.3	22.1	24.0	25.0	24.9	24.4	24.0	23.0	21.5	20.1	19.1	17.3	15.9	14.9	16.8
11	14.3	13.2	13.0	11.8	11.4	11.1	10.4	11.2	14.2	15.2	15.8	17.4	18.3	15.6	12.3	12.9	14.0	14.0	13.9	12.4	11.6	11.0	9.9	9.5	13.1
12	9.1	8.4	8.2	8.0	7.7	8.4	8.8	9.3	10.5	12.5	15.0	16.6	18.4	20.1	20.9	21.6	21.9	21.7	20.8	19.2	18.4	17.8	17.2	16.8	14.9
13	15.7	14.8	13.7	14.8	14.9	14.0	13.5	14.6	16.4	18.9	20.1	20.5	21.6	22.3	22.8	22.2	21.2	20.9	20.6	19.3	18.0	16.5	16.0	15.9	17.9
14	15.2	14.2	13.6	12.8	12.0	11.8	13.0	15.1	17.0	18.3	20.0	21.2	22.5	23.1	23.7	23.8	23.7	23.4	22.0	20.2	18.6	17.8	17.4	15.6	18.2
15	14.2	13.1	12.3	10.5	9.7	9.1	9.8	12.2	15.1	18.4	20.8	23.0	23.5	24.6	25.4	26.0	25.5	24.8	23.4	21.5	20.4	19.5	16.6	15.3	18.1
16	13.9	12.9	11.7	11.3	9.7	9.2	9.4	12.5	15.8	18.6	22.4	24.1	25.5	26.9	28.1	28.1	27.7	27.3	25.9	23.6	21.4	20.1	18.5	17.7	19.3
17	16.2	14.6	14.5	13.4	12.6	11.2	11.7	13.9	17.3	20.5	24.1	26.4	27.3	28.3	28.2	28.6	27.6	26.9	25.6	23.7	22.1	20.8	19.2	17.7	20.5
18	17.1	16.0	14.4	13.4	12.2	11.0	10.6	13.0	16.3	18.7	20.9	22.6	23.0	24.5	24.6	24.6	24.2	23.6	22.0	20.3	19.3	18.6	17.8	15.8	18.5
19	15.0	14.1	12.9	11.6	10.8	9.9	11.1	12.8	16.3	19.2	21.2	22.4	24.0	25.4	26.0	26.0	25.4	24.9	23.9	22.4	21.5	19.8	18.4	17.3	18.8
20	16.5	15.5	14.4	13.2	12.9	11.8	12.2	15.1	18.7	21.2	23.9	25.1	26.6	28.0	28.3	28.4	28.2	27.8	26.4	24.6	23.0	21.9	20.8	19.4	21.0
21	19.1	18.3	17.4	15.6	15.2	13.8	13.5	16.0	19.3	21.7	23.7	25.2	27.2	27.6	27.9	27.3	26.2	24.7	23.2	21.8	20.7	19.7	19.7	18.7	21.0
22	17.3	16.4	15.2	14.0	13.1	12.3	13.3	15.6	18.3	21.0	23.3	25.1	26.6	27.7	28.3	28.7	28.6	28.0	27.0	25.6	24.8	23.5	21.9	21.1	21.5
23	20.2	18.4	17.7	16.3	14.8	15.3	15.9	15.3	19.5	22.3	25.8	28.8	30.6	31.3	31.5	31.5	31.4	31.1	30.1	28.2	27.4	26.9	25.5	23.8	24.1
24	22.6	21.1	19.9	18.7	17.5	16.0	16.9	18.8	22.6	25.6	28.5	30.9	32.3	33.4	34.0	33.8	33.4	32.8	31.2	29.3	28.2	27.4	25.4	23.8	26.0
25	22.5	20.8	19.5	18.8	17.6	16.1	17.0	18.9	22.6	26.0	29.9	32.4	33.4	34.4	34.5	35.0	35.0	34.3	32.8	30.8	29.5	27.9	26.5	24.1	26.7
26	22.4	21.1	20.5	19.2	17.4	17.2	17.8	20.3	23.2	26.8	30.5	33.3	34.7	35.4	36.3	36.4	35.9	35.4	34.0	32.1	30.6	29.3	27.0	24.8	27.6
27	23.3	22.4	21.8	20.1	18.9	18.7	17.3	20.5	21.3	24.8	28.4	31.9	33.4	35.2	35.8	36.2	36.0	35.3	34.0	31.4	29.6	28.5	28.2	27.7	27.5
28	26.3	24.4	22.7	20.6	19.3	18.4	19.0	21.8	24.0	27.2	29.8	31.8	33.6	35.1	35.7	35.7	35.5	34.9	33.6	31.4	30.3	28.9	27.3	25.6	28.0
29	24.0	22.8	21.6	20.4	19.1	18.8	19.1	21.6	25.0	28.3	31.6	34.4	36.4	37.5	38.0	38.2	38.5	37.4	36.0	33.8	32.2	30.9	29.7	27.1	29.3
30	26.4	24.4	24.0	22.1	21.5	21.0	22.2	23.8	26.8	30.0	33.3	34.5	35.7	37.6	37.9	37.0	36.4	35.6	34.1	32.7	30.8	29.9	29.0	27.5	29.8
HRAVE	17.9	16.7	15.7	14.6	13.6	12.9	13.1	15.1	18.1	20.9	23.5	25.6	26.9	27.9	28.2	28.3	28.0	27.3	25.9	24.0	22.8	21.7	20.5	19.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20.0	19.4	19.3	20.1	20.5	20.3	20.2	20.5	16.5	16.8	13.1	14.9	17.9	18.2	18.1	19.3	20.5	18.5	18.8	21.0	21.0	21.5	24.1	26.0	26.7
MAX	27.6	27.0	27.5	27.4	27.8	28.1	27.9	29.8	21.6	25.0	18.3	21.9	22.8	23.8	26.0	28.1	28.6	24.6	26.0	28.4	27.9	28.7	31.5	34.0	35.0
MIN	12.8	10.5	10.0	11.2	10.9	10.8	10.9	12.5	12.0	7.7	9.5	7.7	13.5	11.8	9.1	9.2	11.2	10.6	9.9	11.8	13.5	12.3	14.8	16.0	16.1

DAY	26	27	28	29	30	31
AVE	27.6	27.5	28.0	29.3	29.8	***
MAX	36.4	36.2	35.7	38.5	37.9	***
MIN	17.2	17.3	18.4	18.8	21.0	***

MONTHLY AVERAGE = 21.2 MONTHLY MAXIMUM = 38.5 MONTHLY MINIMUM = 7.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
APRIL - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.7	0.5	0.4	0.3	0.4	0.5	0.6	-0.6	-1.0	-1.0	-0.8	-0.8	-1.1	-1.1	-1.2	-1.1	-0.8	-0.5	0.1	0.6	0.6	0.6	0.5	0.7	-0.1
2	0.9	0.8	1.1	0.7	0.6	0.6	0.1	-0.6	-0.5	-0.7	-0.7	-0.9	-1.2	-1.1	-1.0	-0.9	-0.7	-0.4	0.1	0.5	0.6	0.5	0.6	0.6	0.0
3	0.6	0.7	0.7	0.6	0.4	0.4	0.1	-1.2	-1.4	-1.1	-0.9	-1.2	-0.9	-1.1	-1.1	-1.1	-0.8	-0.5	0.0	0.6	0.4	0.5	0.6	0.6	-0.2
4	0.5	0.7	0.9	0.9	0.5	0.5	0.2	-1.1	-1.5	-1.4	-1.2	-1.8	-1.9	-1.3	-1.2	-1.1	-0.8	-0.6	0.0	0.5	0.6	0.4	0.4	0.8	-0.3
5	0.7	0.5	0.7	0.9	0.7	0.8	1.0	-0.9	-1.2	-1.3	-1.4	-1.8	-1.5	-1.6	-1.4	-1.1	-0.8	-0.4	0.0	0.4	0.4	0.3	0.3	0.3	-0.3
6	0.6	0.7	0.7	0.7	0.9	0.6	0.0	-0.8	-1.3	-0.9	-1.5	-1.6	-1.7	-1.8	-1.3	-1.2	-0.6	-0.3	0.1	0.3	0.3	0.2	0.3	0.4	-0.3
7	0.4	0.5	0.4	0.7	0.6	0.7	0.0	-1.2	-1.1	-0.9	-1.2	-1.2	-1.9	-1.4	-1.0	-0.9	-0.9	-0.4	-0.1	0.4	0.4	0.4	0.6	0.5	-0.3
8	0.5	0.7	0.7	0.5	0.6	0.6	0.0	-1.3	-1.3	-0.8	-1.4	-1.6	-1.4	-1.6	-1.8	-1.5	-1.0	-0.7	-0.3	-0.2	-0.1	-0.1	0.0	0.0	-0.5
9	0.0	-0.1	-0.1	-0.2	0.1	0.3	0.0	-0.4	-0.6	-1.0	-1.1	-1.4	-1.3	-1.4	-1.2	-1.1	-1.0	-0.7	-0.2	0.2	0.3	0.5	0.5	0.7	-0.4
10	0.5	0.7	0.5	0.6	0.6	0.6	-0.2	-1.5	-0.9	-0.8	-1.0	-1.1	-1.6	-1.6	-1.4	-1.1	-0.8	-0.6	-0.1	0.3	0.5	0.6	0.5	0.7	-0.3
11	0.5	0.4	0.6	0.7	0.6	0.6	0.5	0.0	-0.6	-0.5	-0.9	-1.2	-1.2	-0.1	0.1	0.0	-0.2	-0.3	-0.1	0.2	0.3	0.5	0.4	0.4	0.0
12	0.6	0.4	0.5	0.2	0.1	0.1	0.0	-0.2	-0.6	-0.8	-0.9	-0.8	-1.3	-1.5	-1.3	-1.2	-0.9	-0.6	-0.1	0.4	0.4	0.4	0.6	0.5	-0.3
13	0.6	0.6	0.5	0.3	0.3	0.3	0.2	-0.4	-0.5	-0.9	-1.0	-1.1	-1.2	-1.2	-1.2	-0.9	-0.7	-0.3	-0.1	0.2	0.4	0.2	0.3	0.2	-0.2
14	0.2	0.3	0.2	0.4	0.4	0.4	0.0	-0.8	-0.9	-1.0	-1.2	-1.5	-1.7	-1.1	-1.1	-1.0	-0.9	-0.7	-0.2	0.4	0.4	0.5	0.6	0.5	-0.3
15	0.7	0.9	0.7	0.8	0.7	0.8	-0.3	-1.4	-1.3	-1.3	-1.1	-1.2	-1.1	-1.2	-1.3	-1.3	-1.0	-0.7	-0.1	0.4	0.4	0.3	0.8	0.8	-0.2
16	0.7	0.6	0.8	0.6	0.7	0.7	-0.2	-1.2	-1.1	-0.8	-0.8	-1.1	-1.2	-1.2	-1.3	-1.2	-1.0	-0.6	-0.1	0.6	0.7	0.7	0.8	0.8	-0.2
17	0.8	0.5	1.0	0.5	0.7	0.8	0.0	-1.1	-1.3	-1.1	-1.8	-1.7	-1.4	-1.6	-1.2	-0.9	-0.6	-0.5	0.0	0.3	0.3	0.3	0.6	0.6	-0.3
18	0.6	0.7	0.8	0.6	0.9	0.6	0.1	-1.1	-0.8	-0.9	-0.9	-1.1	-1.0	-1.3	-1.3	-1.2	-1.0	-0.7	-0.2	0.2	0.3	0.5	0.4	0.6	-0.2
19	0.6	0.7	0.5	0.3	0.5	0.5	-0.4	-1.0	-1.0	-1.0	-0.9	-1.1	-1.3	-1.4	-1.4	-1.2	-1.0	-0.6	-0.2	0.4	0.6	0.7	0.6	0.6	-0.3
20	0.6	0.4	0.5	0.5	0.5	0.5	-0.3	-1.2	-1.4	-0.9	-1.0	-1.2	-1.2	-1.4	-1.5	-1.3	-1.0	-0.7	-0.1	0.6	0.6	0.7	0.6	0.6	-0.3
21	0.6	0.6	0.5	0.7	0.9	0.6	-0.2	-1.0	-1.2	-1.0	-1.2	-1.3	-1.6	-1.5	-1.4	-1.1	-0.9	-0.6	-0.2	0.2	0.5	0.4	0.3	0.5	-0.3
22	0.5	0.5	0.6	0.5	0.4	0.5	-0.5	-1.1	-0.7	-0.8	-1.1	-1.2	-1.3	-1.5	-1.4	-1.3	-1.1	-0.7	-0.2	0.3	0.6	0.4	0.6	0.6	-0.3
23	0.8	0.8	0.6	0.7	0.8	0.6	-0.4	-0.3	-0.6	-0.6	-0.8	-1.2	-1.4	-1.5	-1.4	-1.1	-0.9	-0.6	-0.1	0.5	0.5	0.5	0.6	0.6	-0.2
24	0.5	0.7	0.8	0.9	0.8	0.6	0.0	-0.7	-0.7	-0.7	-1.0	-1.1	-1.4	-1.3	-1.5	-1.2	-1.0	-0.6	-0.1	0.6	0.6	0.5	0.7	0.9	-0.2
25	0.8	1.1	0.8	0.8	1.0	0.8	-0.2	-0.7	-1.0	-0.7	-1.2	-1.6	-1.5	-1.5	-1.2	-1.1	-0.9	-0.7	-0.2	0.4	0.8	0.8	0.8	0.9	-0.2
26	0.8	0.8	0.7	0.6	0.9	0.7	-0.4	-1.2	-1.1	-1.2	-1.4	-1.2	-1.4	-1.3	-1.4	-1.2	-1.0	-0.7	-0.1	0.6	0.4	0.8	0.6	0.8	-0.2
27	0.8	0.8	0.7	0.7	0.6	0.6	0.7	-0.5	-0.4	-0.7	-0.7	-1.0	-1.1	-1.4	-1.5	-1.1	-0.9	-0.6	-0.1	0.5	0.6	0.7	0.4	0.6	-0.1
28	0.7	0.9	1.0	0.7	0.9	0.8	-0.5	-1.4	-0.9	-0.8	-1.0	-1.2	-1.3	-1.5	-1.4	-1.2	-1.0	-0.8	-0.2	0.4	0.6	0.7	0.8	0.9	-0.2
29	0.7	0.8	0.9	0.9	0.9	1.0	-0.3	-0.7	-1.4	-1.0	-0.9	-1.2	-1.4	-1.3	-1.2	-1.0	-1.0	-0.7	-0.1	0.4	0.8	0.8	0.8	0.9	-0.1
30	0.9	0.9	1.0	0.7	0.7	1.1	-0.1	-0.8	-1.0	-1.0	-1.7	-1.3	-1.3	-1.4	-1.1	-0.7	-0.7	-0.4	0.1	0.5	0.5	0.5	0.6	0.8	-0.1
HRAVE	0.6	0.6	0.6	0.6	0.6	0.6	0.0	-0.9	-1.0	-0.9	-1.1	-1.3	-1.4	-1.3	-1.3	-1.1	-0.9	-0.6	-0.1	0.4	0.5	0.5	0.5	0.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.1	0.0	-0.2	-0.3	-0.3	-0.3	-0.3	-0.5	-0.4	-0.3	0.0	-0.3	-0.2	-0.3	-0.2	-0.2	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2
MAX	0.7	1.1	0.7	0.9	1.0	0.9	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.9	0.8	1.0	0.9	0.7	0.7	0.9	0.6	0.8	0.9	1.1
MIN	-1.2	-1.2	-1.4	-1.9	-1.8	-1.8	-1.9	-1.8	-1.4	-1.6	-1.2	-1.5	-1.2	-1.7	-1.4	-1.3	-1.8	-1.3	-1.4	-1.5	-1.6	-1.5	-1.5	-1.5	-1.6

DAY	26	27	28	29	30	31
AVE	-0.2	-0.1	-0.2	-0.1	-0.1	***
MAX	0.9	0.8	1.0	1.0	1.1	***
MIN	-1.4	-1.5	-1.5	-1.4	-1.7	***

MONTHLY AVERAGE = -0.2 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = -1.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
APRIL - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	699	699	699	698	698	698	698	698	699	699	698	698	697	697	696	696	696	696	696	696	697	697	698	698	698
2	698	698	698	698	698	699	699	699	700	700	699	699	698	698	697	697	697	697	697	698	698	699	699	700	698
3	700	699	699	699	699	699	700	700	700	700	700	699	698	697	697	696	696	696	696	696	697	697	698	698	698
4	698	698	698	698	698	698	699	699	699	699	699	699	698	697	697	696	696	696	696	696	697	697	698	698	698
5	699	699	698	698	699	699	699	700	700	700	699	699	698	698	697	696	696	696	696	697	697	698	699	699	698
6	699	699	699	699	699	700	700	701	701	701	701	701	700	700	699	699	699	699	699	700	701	701	702	703	700
7	703	703	703	703	703	703	703	704	704	704	704	703	703	702	701	701	700	700	700	700	701	701	702	702	702
8	702	702	702	701	701	702	702	702	702	702	702	701	701	700	699	698	698	699	700	701	702	703	703	703	701
9	703	703	703	704	704	704	704	705	705	705	704	704	703	702	702	701	701	701	701	701	702	702	702	702	703
10	702	702	702	702	702	702	702	703	702	702	702	701	700	699	699	698	698	698	698	698	698	699	699	699	700
11	699	699	699	699	699	699	700	700	700	700	700	700	699	699	699	699	699	699	699	700	700	701	701	700	700
12	700	700	700	701	701	701	701	702	702	702	703	702	702	701	701	700	700	700	700	700	700	701	701	701	701
13	701	701	701	701	701	701	701	702	702	702	701	701	701	701	700	700	700	700	700	701	702	703	703	703	701
14	703	703	703	703	704	704	704	705	705	705	705	704	704	703	702	702	702	702	702	702	703	703	703	703	703
15	703	703	703	703	703	703	704	704	704	704	703	703	702	701	701	700	700	700	700	700	700	701	701	701	702
16	701	701	701	701	701	701	701	702	702	702	701	701	700	700	699	698	698	698	698	699	699	700	700	700	700
17	700	700	701	701	701	701	701	702	702	702	701	701	700	700	699	698	698	698	698	699	700	700	701	701	700
18	701	701	701	701	701	701	701	701	701	701	701	701	700	700	699	699	699	699	699	700	700	701	701	701	700
19	702	701	701	701	701	702	702	703	703	703	702	702	701	701	700	700	700	699	699	700	700	701	701	701	701
20	701	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	699	700	701	701	701	701
21	702	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	699	700	700	701	701	702	702	702	701
22	702	702	702	702	702	702	703	703	703	703	703	702	702	701	701	700	700	701	701	701	702	702	702	702	702
23	702	702	702	702	702	702	703	703	703	703	702	702	701	700	699	699	699	698	698	699	699	700	700	700	701
24	700	700	700	700	701	701	701	702	702	702	702	701	701	700	699	699	699	699	699	699	700	700	700	700	700
25	701	701	701	701	701	702	702	703	703	703	703	702	702	701	701	700	700	700	700	700	701	701	701	702	701
26	702	702	702	702	702	702	702	703	703	702	702	702	701	700	700	699	699	699	699	699	700	700	700	700	701
27	700	700	700	701	701	701	702	702	702	702	702	702	701	700	700	700	699	699	699	699	700	701	701	701	701
28	701	702	702	702	702	702	703	703	703	703	703	703	702	701	701	700	700	700	700	701	701	702	702	702	702
29	702	702	702	702	702	703	703	704	704	703	703	702	702	701	700	700	699	699	699	700	700	701	701	701	701
30	701	701	701	701	701	701	701	702	702	701	701	700	700	699	698	698	698	698	698	698	698	699	699	699	699	700
HRAVE	701	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	699	699	699	699	700	700	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	698	698	698	698	698	700	702	701	703	700	700	701	701	703	702	700	700	700	701	701	701	702	701	700	701
MAX	699	700	700	699	700	703	704	703	705	703	701	703	703	705	704	702	702	701	703	702	702	703	703	702	703
MIN	696	697	696	696	696	699	700	698	701	698	699	700	700	702	700	698	698	699	699	699	699	700	698	699	700

DAY	26	27	28	29	30	31
AVE	701	701	702	701	700	***
MAX	703	702	703	704	702	***
MIN	699	699	700	699	698	***

MONTHLY AVERAGE = 700.5 MONTHLY MAXIMUM = 704.9 MONTHLY MINIMUM = 695.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
APRIL - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	57	62	65	67	70	71	71	69	58	45	38	33	28	23	22	21	21	20	22	27	32	37	40	40	43
2	42	46	54	62	64	68	68	58	46	40	30	26	24	23	23	22	22	23	26	31	33	36	39	43	40
3	46	50	56	62	64	68	65	57	47	38	32	26	25	25	25	21	23	23	25	30	32	34	38	41	40
4	43	47	50	52	61	64	68	59	48	37	28	22	20	21	17	16	18	19	20	23	25	27	30	33	35
5	32	33	39	44	53	54	56	48	38	31	27	21	18	16	18	18	18	18	20	25	26	26	29	30	31
6	33	39	44	50	53	55	60	53	43	33	26	21	16	17	16	15	17	17	18	22	23	26	30	34	32
7	35	37	40	47	52	58	56	48	39	33	30	28	24	23	23	24	25	28	30	34	35	38	38	43	36
8	46	47	53	58	63	65	63	54	45	39	33	26	25	23	24	23	26	34	38	43	44	47	52	54	43
9	56	58	60	61	63	66	66	61	53	48	44	40	37	35	33	32	31	30	30	33	34	37	42	45	46
10	50	53	58	62	64	67	63	54	44	36	31	24	19	19	23	23	23	23	25	28	30	34	38	41	39
11	42	44	47	51	55	56	60	57	48	49	49	43	40	59	83	83	70	68	66	70	76	78	83	86	61
12	91	95	96	93	93	91	89	86	81	72	62	60	53	47	45	42	41	40	40	45	48	48	49	49	65
13	54	57	62	59	58	60	63	60	52	46	42	42	40	38	38	42	47	48	47	50	55	60	64	63	52
14	66	71	74	78	79	80	75	60	42	36	29	25	23	21	17	17	19	18	20	23	27	28	28	32	41
15	36	38	40	46	47	50	47	40	33	27	23	19	17	17	17	16	15	15	16	19	22	23	28	31	28
16	34	34	40	39	46	48	47	39	30	25	20	17	17	16	14	14	14	14	15	17	20	22	24	25	26
17	28	32	32	36	38	42	41	37	29	23	21	18	19	18	19	18	19	19	18	17	17	18	19	21	25
18	23	25	29	32	35	38	39	35	30	28	24	24	24	23	24	25	27	29	33	36	38	39	40	45	31
19	49	51	55	59	61	65	61	53	43	36	32	30	29	27	25	24	24	25	26	29	31	34	37	40	39
20	42	45	48	52	52	58	57	47	38	32	28	27	25	20	17	17	17	16	19	22	25	26	28	32	33
21	33	34	35	39	39	43	45	40	31	26	26	24	20	18	17	20	23	25	28	32	35	38	39	42	31
22	45	47	51	55	58	62	58	49	41	37	34	30	29	27	26	26	26	27	28	30	31	33	36	37	38
23	39	43	44	49	54	51	49	49	38	32	26	23	20	19	18	18	19	19	20	23	24	24	26	28	31
24	30	32	35	38	41	45	43	39	32	26	23	19	17	16	16	16	15	16	17	20	22	23	25	28	26
25	29	33	35	37	40	43	42	38	30	25	20	16	15	14	14	14	14	14	15	17	18	19	21	25	25
26	27	30	30	31	37	36	36	31	27	23	19	16	16	15	14	14	13	13	15	17	19	20	22	25	23
27	27	29	29	32	36	33	38	31	30	26	22	20	19	16	14	15	13	14	15	17	19	20	20	20	23
28	22	25	28	31	33	35	34	28	24	21	20	19	16	15	15	15	15	16	17	19	19	21	23	25	22
29	28	29	32	33	36	35	36	30	26	22	18	17	15	13	13	13	14	15	16	18	19	21	23	25	23
30	26	29	30	33	34	35	33	31	28	25	22	21	19	17	16	16	16	16	19	20	22	23	23	25	24
HRAVE	40	43	46	50	53	55	54	48	40	34	29	26	24	23	23	23	23	23	25	28	30	32	34	37	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	43	40	40	35	31	32	36	43	46	39	61	65	52	41	28	26	25	31	39	33	31	38	31	26	25
MAX	71	68	68	68	56	60	58	65	66	67	86	96	64	80	50	48	42	45	65	58	45	62	54	45	43
MIN	20	22	21	16	16	15	23	23	30	19	40	40	38	17	15	14	17	23	24	16	17	26	18	15	14

DAY	26	27	28	29	30	31
AVE	23	23	22	23	24	***
MAX	37	38	35	36	35	***
MIN	13	13	15	13	16	***

MONTHLY AVERAGE = 35.1 MONTHLY MAXIMUM = 96.0 MONTHLY MINIMUM = 12.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
APRIL - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.36	0.71	0.77	0.70	0.90	0.84	0.84	0.67	0.45	0.19	0.04	0.00	0.00	0.00	0.00	0.00	6.68
2	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.48	0.68	0.84	0.94	0.98	0.94	0.84	0.67	0.44	0.19	0.04	0.00	0.00	0.00	0.00	0.00	7.34
3	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.26	0.48	0.69	0.85	0.95	0.98	0.94	0.84	0.67	0.44	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.39
4	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.26	0.49	0.70	0.86	0.95	0.99	0.95	0.85	0.68	0.43	0.20	0.04	0.00	0.00	0.00	0.00	0.00	7.45
5	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.27	0.50	0.71	0.87	0.96	1.00	0.96	0.85	0.69	0.41	0.18	0.05	0.00	0.00	0.00	0.00	0.00	7.48
6	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.28	0.51	0.71	0.86	0.96	0.98	0.94	0.82	0.64	0.38	0.18	0.03	0.00	0.00	0.00	0.00	0.00	7.35
7	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.27	0.50	0.70	0.86	0.96	0.99	0.95	0.85	0.61	0.40	0.15	0.05	0.00	0.00	0.00	0.00	0.00	7.35
8	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.27	0.50	0.73	0.53	0.83	0.66	0.87	0.90	0.72	0.47	0.25	0.05	0.00	0.00	0.00	0.00	0.00	6.85
9	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.52	0.72	0.88	0.97	1.00	0.96	0.85	0.69	0.40	0.24	0.05	0.00	0.00	0.00	0.00	0.00	7.65
10	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.52	0.73	0.89	0.99	1.02	0.97	0.85	0.69	0.38	0.25	0.05	0.00	0.00	0.00	0.00	0.00	7.71
11	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.47	0.28	0.37	0.82	0.68	0.15	0.06	0.23	0.19	0.18	0.07	0.00	0.00	0.00	0.00	0.00	3.72
12	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.20	0.39	0.70	0.70	0.85	0.96	0.77	0.67	0.34	0.25	0.05	0.00	0.00	0.00	0.00	0.00	5.97
13	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.28	0.52	0.77	0.85	0.75	0.96	0.92	0.78	0.50	0.24	0.12	0.04	0.00	0.00	0.00	0.00	0.00	6.78
14	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.31	0.53	0.74	0.90	0.99	1.02	0.98	0.88	0.71	0.38	0.26	0.06	0.00	0.00	0.00	0.00	0.00	7.85
15	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.55	0.75	0.91	1.01	1.04	0.99	0.88	0.71	0.39	0.27	0.06	0.00	0.00	0.00	0.00	0.00	7.98
16	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.55	0.76	0.91	1.01	1.03	0.99	0.89	0.71	0.36	0.27	0.06	0.00	0.00	0.00	0.00	0.00	7.96
17	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.31	0.52	0.69	0.86	0.99	0.92	0.83	0.65	0.46	0.26	0.21	0.05	0.00	0.00	0.00	0.00	0.00	6.83
18	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.33	0.55	0.70	0.66	0.74	0.50	0.92	0.84	0.70	0.38	0.26	0.06	0.00	0.00	0.00	0.00	0.00	6.74
19	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.55	0.75	0.91	0.99	1.01	0.98	0.87	0.65	0.37	0.21	0.07	0.00	0.00	0.00	0.00	0.00	7.79
20	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.33	0.55	0.75	0.89	0.99	1.02	0.98	0.88	0.71	0.41	0.27	0.06	0.00	0.00	0.00	0.00	0.00	7.95
21	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.33	0.56	0.76	0.90	1.00	1.03	0.99	0.88	0.70	0.37	0.27	0.06	0.00	0.00	0.00	0.00	0.00	7.96
22	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.33	0.54	0.75	0.90	0.99	1.01	0.98	0.87	0.68	0.35	0.26	0.07	0.00	0.00	0.00	0.00	0.00	7.84
23	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.33	0.54	0.76	0.91	1.00	1.03	0.99	0.88	0.68	0.39	0.27	0.07	0.00	0.00	0.00	0.00	0.00	7.97
24	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.35	0.56	0.77	0.92	1.01	1.04	1.00	0.89	0.69	0.40	0.28	0.07	0.00	0.00	0.00	0.00	0.00	8.10
25	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.35	0.58	0.78	0.93	1.01	1.04	1.00	0.90	0.69	0.41	0.26	0.08	0.00	0.00	0.00	0.00	0.00	8.16
26	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.35	0.57	0.78	0.93	1.02	1.04	1.00	0.90	0.67	0.43	0.29	0.07	0.00	0.00	0.00	0.00	0.00	8.18
27	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.21	0.37	0.59	0.59	1.01	1.03	0.99	0.89	0.63	0.41	0.29	0.08	0.00	0.00	0.00	0.00	0.00	7.17
28	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.55	0.78	0.93	0.93	0.98	1.01	0.89	0.62	0.38	0.29	0.09	0.00	0.00	0.00	0.00	0.00	7.96
29	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.58	0.77	0.92	1.01	1.04	1.00	0.89	0.62	0.39	0.29	0.08	0.00	0.00	0.00	0.00	0.00	8.10
30	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.40	0.41	0.62	0.89	0.70	0.91	0.92	0.64	0.39	0.31	0.22	0.05	0.00	0.00	0.00	0.00	0.00	6.60
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.29	0.50	0.70	0.83	0.93	0.96	0.93	0.82	0.64	0.38	0.23	0.06	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.68	7.34	7.39	7.45	7.48	7.35	7.35	6.85	7.65	7.71	3.72	5.97	6.78	7.85	7.98	7.96	6.83	6.74	7.79	7.95	7.96	7.84	7.97	8.10	8.16
MAX	0.90	0.98	0.98	0.99	1.00	0.98	0.99	0.90	1.00	1.02	0.82	0.96	0.96	1.02	1.04	1.03	0.99	0.92	1.01	1.02	1.03	1.01	1.03	1.04	1.04
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	8.18	7.17	7.96	8.10	6.60	***
MAX	1.04	1.03	1.01	1.04	0.92	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
APRIL - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.16 MONTHLY MAXIMUM = 0.08 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
MAY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	7.1	7.9	7.4	6.5	6.4	7.3	3.7	2.0	2.7	3.4	2.7	6.7	13.6	11.3	13.2	14.9	14.2	15.5	14.8	14.1	12.0	12.9	5.5	3.0	8.7
2	2.3	5.1	6.2	8.7	9.0	8.8	6.4	5.1	3.5	2.1	3.3	5.2	11.3	13.4	14.0	13.9	16.5	17.1	18.3	16.8	20.1	15.1	6.0	6.6	9.8
3	4.7	6.0	3.9	5.3	4.2	6.8	4.7	5.6	4.4	3.1	3.4	6.4	9.0	13.6	16.7	16.4	16.4	14.9	14.1	10.1	6.7	3.6	3.0	5.3	7.9
4	6.5	5.2	6.0	7.4	7.9	7.7	8.9	6.4	2.5	1.9	2.4	5.8	9.4	10.0	11.6	12.6	13.0	13.2	12.9	9.9	8.3	2.7	5.6	6.5	7.7
5	7.6	7.5	7.7	8.1	6.4	7.1	7.4	4.7	4.4	3.6	2.7	3.6	4.1	4.6	4.9	7.9	13.0	13.5	13.7	11.8	9.9	4.7	4.6	6.0	7.1
6	7.7	7.5	8.3	7.6	6.8	8.0	7.8	7.6	6.2	5.4	4.3	2.6	4.3	4.3	6.7	14.8	16.7	15.8	13.5	8.5	7.0	5.3	3.5	5.6	7.7
7	8.3	9.3	6.0	3.2	6.8	6.9	6.7	4.2	2.7	1.9	2.6	6.1	11.8	13.9	15.4	14.6	16.5	15.4	13.4	8.1	6.7	4.0	1.2	6.0	8.0
8	3.9	5.6	7.3	8.3	7.9	9.0	2.3	2.2	3.3	1.8	3.0	7.3	9.9	9.1	12.1	16.0	16.6	14.1	11.7	7.5	3.2	4.7	7.2	4.8	7.5
9	8.1	9.1	8.1	6.0	8.8	6.9	5.8	5.0	3.0	2.3	4.4	7.0	9.2	10.4	13.2	11.9	15.5	14.8	12.7	8.2	7.3	4.7	6.2	8.5	8.2
10	3.9	4.0	2.9	4.8	6.4	6.1	5.7	3.5	2.6	3.1	3.3	9.6	18.2	8.9	4.5	7.6	6.4	14.6	13.0	13.0	12.9	17.4	12.9	12.9	8.3
11	13.4	18.9	12.8	16.7	14.5	13.1	8.8	8.8	7.0	4.9	3.1	3.3	7.3	11.9	14.3	16.5	17.3	17.7	15.7	14.2	13.5	15.7	11.1	9.6	12.1
12	4.6	1.1	4.4	4.3	2.2	7.1	3.3	1.6	2.7	4.3	6.7	8.1	10.3	14.6	15.5	15.3	13.6	14.4	14.2	13.0	9.4	6.8	12.7	6.9	8.2
13	4.3	8.6	8.4	3.2	1.5	3.4	1.4	1.7	2.4	3.6	3.6	5.8	12.9	11.3	11.5	14.1	15.1	13.8	14.6	13.8	11.5	9.0	9.8	5.2	7.9
14	2.6	2.5	2.7	3.1	3.8	4.4	5.5	3.7	2.6	4.1	3.8	3.2	3.6	6.2	8.9	10.9	12.6	16.3	12.9	9.7	3.4	2.7	2.7	6.1	5.8
15	6.6	7.2	4.4	5.9	6.9	6.9	7.9	3.3	1.2	2.1	2.7	4.4	7.3	11.8	14.8	14.5	16.7	15.0	13.0	11.1	7.9	5.9	4.7	4.1	7.8
16	6.2	7.0	7.2	5.5	6.0	6.2	6.4	2.8	1.8	2.6	4.9	8.4	6.8	8.6	9.1	11.9	12.7	13.3	14.0	10.8	6.0	2.2	2.7	4.9	7.0
17	6.4	7.9	6.0	4.7	6.9	5.9	6.1	4.4	2.5	2.3	6.9	6.1	5.4	6.6	12.8	13.5	13.2	13.5	11.0	10.9	12.3	11.3	4.2	6.1	7.8
18	6.4	7.4	6.8	3.8	7.9	7.9	7.5	3.7	2.3	2.0	3.6	5.2	10.1	11.1	13.6	13.1	15.3	15.9	14.9	14.9	13.6	15.6	13.1	4.6	9.2
19	3.3	2.9	3.1	6.1	5.9	5.3	4.2	4.0	3.2	3.7	13.5	12.6	15.4	17.0	15.4	19.5	20.7	23.2	23.5	22.2	20.3	15.6	15.1	10.7	11.9
20	8.6	5.4	3.3	2.1	2.4	5.1	4.3	3.4	2.2	4.3	4.8	6.2	7.1	15.6	15.9	15.6	15.3	16.7	15.2	13.4	8.4	2.9	3.1	6.2	7.8
21	7.2	8.6	7.4	6.2	6.7	5.6	6.2	5.9	3.4	2.2	3.6	4.9	6.0	7.2	11.4	13.2	15.1	13.2	13.4	11.4	6.8	2.7	4.3	5.5	7.4
22	6.9	6.8	7.7	8.2	4.8	6.8	6.8	4.6	3.3	2.0	2.4	2.9	6.0	7.6	12.8	14.5	14.9	13.4	17.0	16.7	15.3	11.6	10.1	4.5	8.7
23	3.7	4.5	2.3	5.7	2.6	5.6	5.6	3.4	3.5	3.0	4.5	6.9	11.2	13.2	14.3	12.9	17.2	17.0	17.5	14.6	11.7	8.3	4.6	3.0	8.2
24	6.1	5.8	5.0	4.7	7.0	6.9	4.0	4.6	2.7	3.4	6.0	11.2	13.5	14.3	15.1	14.3	15.0	16.5	16.4	10.2	5.8	2.7	3.2	5.5	8.3
25	6.3	5.5	8.5	7.0	8.9	9.3	3.2	1.9	3.6	4.3	5.8	5.0	7.4	7.2	11.3	13.5	12.3	11.7	12.9	11.9	10.4	7.3	2.4	4.8	7.6
26	6.7	6.8	6.9	7.3	8.1	7.8	8.1	7.3	4.5	5.1	5.1	5.1	4.3	4.7	5.9	8.3	8.7	10.0	15.2	12.0	10.8	5.8	4.7	6.4	7.3
27	7.4	8.2	10.3	5.7	3.8	5.4	5.4	2.5	1.5	1.8	6.6	12.2	12.8	14.9	16.7	16.2	18.8	19.6	17.8	12.0	8.5	3.5	2.8	2.9	9.1
28	2.3	2.3	3.6	5.6	5.2	6.2	5.9	4.9	3.2	3.9	10.7	12.1	14.0	15.2	15.1	14.6	15.9	16.1	13.0	10.1	6.5	2.7	4.3	5.8	8.3
29	6.2	3.8	4.9	6.4	6.3	8.7	5.9	4.3	10.5	17.5	16.3	13.8	9.5	6.6	5.0	20.5	12.0	9.4	18.6	17.2	12.3	18.1	7.8	9.4	10.5
30	9.2	8.8	6.8	6.6	7.7	4.9	7.5	5.3	3.6	5.2	4.4	4.1	4.5	4.6	8.1	5.0	11.9	15.5	11.3	16.5	12.1	7.9	7.2	4.0	7.6
31	4.0	2.2	2.7	4.9	8.1	6.6	6.3	5.7	4.6	3.3	2.2	3.6	6.4	10.8	10.5	9.9	22.0	21.6	18.6	8.2	5.1	7.8	7.5	4.4	7.8
HRAVE	6.1	6.4	6.1	6.1	6.4	6.9	5.8	4.3	3.5	3.7	4.9	6.6	9.1	10.3	12.0	13.5	14.9	15.3	14.8	12.4	9.9	7.8	6.3	6.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	8.7	9.8	7.9	7.7	7.1	7.7	8.0	7.5	8.2	8.3	12.1	8.2	7.9	5.8	7.8	7.0	7.8	9.2	11.9	7.8	7.4	8.7	8.2	8.3	7.6
MAX	15.5	20.1	16.7	13.2	13.7	16.7	16.5	16.6	15.5	18.2	18.9	15.5	15.1	16.3	16.7	14.0	13.5	15.9	23.5	16.7	15.1	17.0	17.5	16.5	13.5
MIN	2.0	2.1	3.0	1.9	2.7	2.6	1.2	1.8	2.3	2.6	3.1	1.1	1.4	2.5	1.2	1.8	2.3	2.0	2.9	2.1	2.2	2.0	2.3	2.7	1.9

DAY	26	27	28	29	30	31
AVE	7.3	9.1	8.3	10.5	7.6	7.8
MAX	15.2	19.6	16.1	20.5	16.5	22.0
MIN	4.3	1.5	2.3	3.8	3.6	2.2

MONTHLY AVERAGE = 8.3 MONTHLY MAXIMUM = 23.5 MONTHLY MINIMUM = 1.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
MAY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	92	88	98	93	88	87	76	78	97	175	116	291	254	281	276	278	248	264	267	274	276	285	264	290	64
2	139	104	106	90	95	93	100	80	83	341	302	304	233	246	279	277	275	282	282	281	273	290	326	326	181
3	222	151	79	72	80	81	102	104	97	91	352	309	293	271	285	282	278	283	290	288	297	286	243	122	292
4	117	104	108	95	89	91	88	97	175	268	280	286	283	300	288	285	284	276	286	296	296	189	133	118	263
5	105	103	103	113	120	122	102	141	122	139	119	261	93	157	16	310	309	297	287	301	304	238	116	116	322
6	87	98	91	113	102	92	104	118	142	152	130	130	12	333	288	280	296	294	299	299	305	319	320	107	71
7	96	93	94	59	89	102	85	101	109	283	280	312	302	287	286	281	287	299	300	306	289	323	24	97	25
8	93	101	86	91	105	89	123	139	113	144	288	303	287	301	289	276	246	228	235	223	124	139	97	112	161
9	102	102	130	114	85	139	122	131	141	108	281	298	300	295	296	303	287	284	284	297	313	24	264	317	243
10	323	140	137	89	94	114	115	121	100	92	236	93	165	183	103	156	156	190	232	311	9	60	64	56	228
11	47	43	51	48	49	59	85	155	154	118	190	35	302	294	268	255	282	284	285	279	264	286	306	302	30
12	229	287	169	98	86	86	108	76	72	78	296	268	277	286	289	279	274	277	275	287	291	292	273	321	32
13	302	312	307	295	263	277	319	201	324	284	291	295	272	272	244	279	278	276	275	279	282	272	285	300	182
14	125	225	197	141	130	103	128	120	309	285	295	177	211	301	255	242	281	287	281	313	300	291	151	130	42
15	106	114	94	99	94	86	89	125	334	285	360	284	308	307	289	295	290	294	298	297	298	308	336	331	215
16	111	104	112	98	109	111	105	121	120	258	303	277	298	292	304	284	294	286	286	300	291	294	145	102	332
17	118	107	114	99	112	111	99	102	129	282	306	284	299	294	257	264	286	283	307	297	307	313	256	143	108
18	108	95	83	51	107	104	92	111	98	172	305	304	251	230	230	248	230	246	254	286	293	316	298	284	338
19	189	138	145	114	108	96	66	110	115	293	222	205	223	224	239	243	257	265	282	279	275	283	288	312	255
20	311	308	290	179	124	104	96	124	160	316	200	281	293	308	300	292	285	285	288	299	299	238	140	124	36
21	102	91	94	96	90	97	101	111	115	132	268	329	242	300	303	298	299	274	281	292	301	135	109	112	336
22	100	101	111	108	113	89	91	128	125	138	143	99	315	298	248	260	240	257	277	274	271	276	301	13	190
23	232	150	247	289	181	106	114	92	88	69	318	295	237	245	261	263	277	278	269	286	285	308	292	15	158
24	109	110	121	117	88	82	69	111	98	298	288	281	290	293	291	270	276	289	279	289	305	295	132	126	161
25	113	122	104	89	80	87	9	104	130	140	104	241	263	261	274	290	282	278	290	307	283	284	138	114	300
26	103	99	99	117	101	105	114	125	131	72	60	57	134	274	264	254	278	300	283	292	307	279	143	113	313
27	107	110	117	108	64	105	105	111	177	307	294	299	300	290	286	274	297	298	292	289	301	295	279	213	74
28	129	160	199	132	129	114	114	116	137	284	304	289	288	285	282	281	304	301	290	291	289	160	132	114	192
29	117	91	96	106	92	65	90	108	98	71	79	81	119	175	181	89	253	62	148	146	329	68	83	149	354
30	124	112	128	112	130	123	130	147	133	158	122	170	66	164	178	211	212	273	281	273	285	292	315	303	352
31	15	215	122	115	101	111	102	149	161	152	131	348	149	265	233	224	241	247	227	196	334	147	143	132	265

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
MAY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	7	8	7	8	10	10	21	26	30	32	58	47	24	28	26	20	22	16	11	8	9	12	49	42	22
2	28	17	13	8	7	8	13	15	32	58	43	45	29	19	21	18	18	13	9	8	8	12	11	49	21
3	53	14	24	12	12	14	20	14	16	43	47	44	32	24	16	14	15	14	9	6	7	22	29	10	21
4	9	9	8	7	7	9	8	12	34	51	56	48	37	27	25	20	17	15	8	5	5	27	5	7	19
5	8	6	7	8	10	8	9	13	18	26	45	49	66	61	57	52	18	15	7	6	5	30	31	9	24
6	8	8	7	7	8	8	7	10	14	21	32	63	36	55	69	22	13	13	13	8	8	15	16	34	21
7	7	7	15	26	8	11	10	11	35	46	33	41	24	21	20	17	20	15	12	7	7	11	17	28	19
8	48	11	9	8	9	8	34	46	33	54	40	29	26	36	23	14	15	11	12	11	39	23	8	20	24
9	15	11	8	15	15	9	5	12	26	51	31	38	26	24	17	24	13	9	8	5	8	35	40	10	19
10	21	34	38	9	12	10	10	20	48	48	62	47	29	23	45	24	25	15	22	14	20	13	11	11	25
11	14	13	13	10	12	11	23	8	12	31	46	50	46	29	22	20	17	14	11	6	10	10	11	15	19
12	26	42	28	32	48	14	27	57	39	42	43	34	32	15	21	23	18	15	11	7	6	10	12	16	26
13	21	13	8	32	26	16	62	45	58	59	53	45	21	29	25	21	15	16	12	7	7	10	12	31	27
14	36	26	47	24	9	7	9	11	44	26	39	66	70	28	35	24	18	10	10	9	14	30	19	8	26
15	9	12	13	10	6	9	8	28	41	53	61	49	30	27	18	18	15	14	12	8	9	14	14	32	21
16	8	9	12	16	17	18	11	22	42	45	36	26	34	30	36	23	20	14	9	8	10	16	35	10	21
17	8	8	18	27	9	6	10	16	36	45	26	50	51	44	34	20	20	18	15	8	9	9	41	16	23
18	11	7	9	19	9	10	8	17	37	49	35	35	32	31	21	28	20	16	14	9	9	13	14	37	20
19	31	33	14	8	9	11	34	15	42	44	34	24	20	19	25	16	14	14	9	8	8	8	7	10	19
20	12	17	35	19	16	9	18	22	45	40	46	51	40	20	20	19	17	11	10	7	27	48	30	7	24
21	7	7	10	14	10	9	8	15	25	59	58	43	40	44	24	21	16	15	10	7	9	22	9	14	21
22	9	8	10	9	10	7	8	12	26	47	59	71	54	43	25	24	18	20	12	8	8	12	21	38	23
23	31	43	49	9	19	10	8	18	25	52	56	31	24	29	23	25	17	16	12	8	8	10	30	23	24
24	7	8	10	12	7	9	17	13	48	46	31	26	25	18	16	23	16	12	9	7	9	40	36	10	19
25	10	14	8	10	10	10	31	41	21	30	53	45	44	35	26	17	18	15	11	7	6	36	23	18	22
26	15	11	11	10	7	7	7	13	24	27	32	40	55	70	47	31	36	20	8	7	5	46	8	8	23
27	7	11	9	17	24	12	9	20	62	60	28	18	22	19	17	14	14	11	9	6	6	23	21	38	20
28	44	44	23	6	8	8	7	10	35	39	20	18	20	16	19	18	15	12	11	7	6	21	11	12	18
29	9	52	15	8	39	20	40	27	21	12	20	19	34	47	60	37	31	29	11	24	19	13	37	17	27
30	17	9	13	11	10	12	9	13	26	19	38	55	46	71	56	39	25	20	28	23	13	21	16	34	26
31	31	45	22	10	9	9	14	10	15	26	45	48	29	27	38	44	15	13	34	28	37	40	11	15	26
HRAVE	18	18	17	14	13	10	16	20	33	41	42	42	35	33	30	24	18	15	12	9	11	21	21	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	22	21	21	19	24	21	19	24	19	25	19	26	27	26	21	21	23	20	19	24	21	23	24	19	22
MAX	58	58	53	56	66	69	46	54	51	62	50	57	62	70	61	45	51	49	44	51	59	71	56	48	53
MIN	7	7	6	5	5	7	7	8	5	9	6	6	7	7	6	8	6	7	7	7	7	7	8	7	6

DAY	26	27	28	29	30	31
AVE	23	20	18	27	26	26
MAX	70	62	44	60	71	48
MIN	5	6	6	8	9	9

MONTHLY AVERAGE = 22.2 MONTHLY MAXIMUM = 71.4 MONTHLY MINIMUM = 4.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
MAY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	25.8	24.7	24.1	23.0	21.6	19.6	20.6	22.2	26.4	29.1	32.1	34.5	36.2	36.5	37.1	37.3	37.2	36.3	34.7	32.4	30.6	30.0	29.1	28.5	29.6
2	26.6	24.4	23.1	22.1	21.6	19.7	19.2	22.7	26.3	28.7	31.5	33.2	35.5	36.0	35.8	36.0	35.8	35.2	33.7	31.7	30.9	29.6	28.1	27.4	28.9
3	26.6	24.3	24.0	23.0	21.2	19.9	19.9	22.8	26.2	28.5	30.5	32.0	33.4	34.4	34.1	34.2	34.1	33.5	32.1	30.0	28.6	27.6	26.8	24.9	28.0
4	23.6	22.5	21.1	19.7	18.5	17.5	18.4	21.7	23.8	26.9	29.2	31.5	32.9	33.8	34.3	34.5	34.4	33.6	32.2	29.9	29.0	26.9	25.4	23.8	26.9
5	22.8	21.3	20.6	19.8	18.2	17.4	19.4	20.6	24.1	28.0	31.5	33.7	35.9	36.7	37.2	37.5	37.4	36.7	35.1	32.9	31.2	29.7	28.2	26.1	28.4
6	24.3	22.8	21.8	20.8	19.4	18.3	19.5	23.3	26.6	30.7	33.2	35.5	37.3	38.2	39.2	39.7	39.0	38.1	36.8	34.5	32.4	31.1	30.9	27.6	30.0
7	25.6	24.0	23.3	21.0	19.4	18.6	20.5	23.1	26.0	29.4	32.6	35.7	36.8	37.8	38.0	38.0	37.7	37.0	35.7	33.5	32.1	31.1	31.0	27.1	29.8
8	26.3	25.1	23.3	22.3	21.6	20.9	21.4	22.1	26.2	29.7	32.2	34.4	35.3	36.3	36.8	36.0	34.7	34.5	33.6	31.8	30.9	30.5	28.9	27.5	29.3
9	25.9	25.6	24.1	23.1	22.9	21.6	22.1	24.8	26.6	29.4	31.5	33.6	34.5	35.4	36.0	36.2	35.6	34.2	33.5	32.1	31.4	30.7	29.7	28.9	29.6
10	28.2	27.5	26.5	26.4	25.3	24.6	24.8	26.4	28.6	31.0	31.9	33.3	29.5	28.6	31.5	33.1	33.1	31.0	29.3	28.3	27.7	27.4	26.7	26.6	28.6
11	26.1	25.2	24.5	24.0	23.4	23.0	22.6	22.4	25.7	28.2	30.0	32.0	33.9	34.8	35.3	35.4	34.8	34.0	32.8	30.7	29.6	28.6	26.9	26.1	28.8
12	25.7	25.3	24.2	22.9	22.5	20.7	21.7	23.4	26.0	28.1	29.8	30.7	32.0	32.5	32.7	33.0	32.7	32.1	31.2	29.2	27.6	26.5	26.6	25.4	27.6
13	24.6	23.7	23.0	21.5	21.3	20.1	20.5	22.0	23.8	25.5	27.4	29.2	30.7	31.3	31.9	31.8	31.6	31.4	30.4	28.4	26.7	25.5	24.9	23.8	26.3
14	23.3	22.7	21.5	19.9	18.9	17.9	17.6	19.7	21.9	23.8	25.3	27.1	28.1	29.6	31.0	31.2	31.0	29.2	28.6	27.1	26.2	25.0	23.5	22.3	24.7
15	21.3	20.0	19.3	18.0	17.3	16.3	18.0	20.5	23.1	25.8	28.3	29.4	31.0	31.9	32.3	32.4	32.3	31.6	30.6	28.9	27.4	26.2	25.6	24.5	25.5
16	22.9	21.6	20.9	20.0	18.0	17.6	19.7	21.8	24.8	27.1	29.5	31.9	33.2	33.8	34.4	34.6	34.7	34.1	32.9	31.1	29.7	28.6	27.0	25.4	27.3
17	23.8	22.8	22.1	20.8	19.6	19.1	20.1	23.5	26.0	28.4	30.8	33.0	34.0	35.3	36.2	36.1	35.9	35.5	34.5	32.7	31.0	30.3	29.4	26.9	28.7
18	25.1	23.7	22.2	20.5	18.8	19.1	19.9	22.4	25.6	28.8	30.7	33.3	35.8	36.9	37.1	37.2	37.1	36.2	34.6	32.0	30.1	29.3	28.4	27.5	28.8
19	25.7	24.1	23.0	21.4	20.4	19.2	19.7	23.1	26.2	28.2	32.1	33.5	34.0	34.3	34.1	33.9	33.1	31.5	28.8	26.2	24.4	22.9	21.5	20.8	26.8
20	19.9	19.1	18.5	17.4	16.1	14.8	15.9	18.1	21.0	22.9	25.0	25.9	27.3	28.2	28.8	28.7	28.4	27.8	26.8	24.9	23.5	22.7	20.8	19.1	22.6
21	17.6	16.4	15.7	13.9	13.3	12.5	14.5	17.9	20.9	23.7	26.3	28.1	29.6	30.5	31.3	31.4	31.0	30.3	29.2	27.1	25.9	23.8	22.6	20.8	23.1
22	19.2	17.8	17.2	17.0	14.4	14.4	16.7	18.6	21.9	25.4	28.4	30.8	32.1	33.4	34.1	33.9	33.8	33.2	32.1	30.1	28.8	27.7	26.5	25.3	25.5
23	24.6	22.7	21.9	20.8	19.1	18.0	19.3	22.5	25.3	26.6	28.6	30.2	32.1	32.6	33.0	33.0	32.8	32.2	30.7	29.0	27.3	26.4	25.7	24.9	26.6
24	23.2	22.3	21.8	21.2	20.0	19.5	20.2	22.3	25.0	26.4	28.3	29.8	30.7	30.9	31.4	31.6	31.6	31.1	30.1	28.1	27.0	26.3	24.9	23.2	26.1
25	22.2	20.7	20.2	19.8	17.8	16.9	17.2	20.1	24.4	27.9	30.4	31.4	32.8	33.3	33.9	34.2	34.2	33.6	32.6	30.7	28.7	27.4	26.6	24.9	26.8
26	23.0	21.8	20.3	19.3	18.5	18.1	19.8	23.2	26.2	30.6	32.2	33.8	35.3	36.4	36.9	37.1	37.0	36.6	35.4	33.0	31.7	30.4	28.5	26.7	28.8
27	25.6	23.8	23.4	22.4	20.0	19.2	21.7	23.9	26.8	30.0	33.7	35.9	37.5	38.5	38.5	38.9	38.8	38.1	37.3	35.2	33.9	33.1	32.1	30.5	30.8
28	29.6	28.8	27.9	25.8	25.1	23.9	24.6	26.9	30.0	32.3	35.4	37.1	38.3	39.2	39.8	40.1	40.0	39.5	38.7	36.8	35.4	33.7	32.3	30.9	33.0
29	29.2	28.4	26.5	25.7	25.6	25.8	25.7	28.9	34.1	36.2	38.1	40.0	41.3	42.2	42.9	40.2	37.5	37.6	36.3	35.5	36.4	34.6	34.0	32.7	34.0
30	31.6	30.2	29.5	29.2	27.9	27.7	28.1	30.2	32.9	35.6	36.9	38.1	39.6	41.3	41.9	41.0	39.1	35.7	34.9	33.3	32.5	32.4	31.1	30.9	33.8
31	30.4	29.5	28.3	27.2	26.8	26.4	27.3	29.5	31.3	33.8	35.7	37.5	40.0	40.5	40.5	38.6	34.7	33.9	32.9	32.1	32.4	31.3	29.7	28.5	32.4
HRAVE	24.8	23.6	22.7	21.6	20.5	19.6	20.5	22.9	25.9	28.6	30.9	32.8	34.1	34.9	35.4	35.4	34.9	34.0	32.8	30.9	29.7	28.6	27.5	26.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	29.6	28.9	28.0	26.9	28.4	30.0	29.8	29.3	29.6	28.6	28.8	27.6	26.3	24.7	25.5	27.3	28.7	28.8	26.8	22.6	23.1	25.5	26.6	26.1	26.8
MAX	37.3	36.0	34.4	34.5	37.5	39.7	38.0	36.8	36.2	33.3	35.4	33.0	31.9	31.2	32.4	34.7	36.2	37.2	34.3	28.8	31.4	34.1	33.0	31.6	34.2
MIN	19.6	19.2	19.9	17.5	17.4	18.3	18.6	20.9	21.6	24.6	22.4	20.7	20.1	17.6	16.3	17.6	19.1	18.8	19.2	14.8	12.5	14.4	18.0	19.5	16.9

DAY	26	27	28	29	30	31
AVE	28.8	30.8	33.0	34.0	33.8	32.4
MAX	37.1	38.9	40.1	42.9	41.9	40.5
MIN	18.1	19.2	23.9	25.6	27.7	26.4

MONTHLY AVERAGE = 28.3 MONTHLY MAXIMUM = 42.9 MONTHLY MINIMUM = 12.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
MAY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.8	0.7	0.7	0.7	0.7	0.7	-0.3	-0.6	-0.9	-1.0	-1.3	-1.3	-1.4	-1.5	-1.3	-1.2	-0.9	-0.6	-0.1	0.3	0.4	0.4	0.4	0.5	-0.3
2	0.6	0.8	0.8	0.8	0.9	0.6	-0.3	-1.3	-1.2	-0.8	-1.0	-1.2	-2.0	-1.6	-1.5	-1.2	-1.0	-0.7	-0.2	0.2	0.2	0.2	0.4	0.4	-0.3
3	0.6	0.5	0.6	1.1	0.7	0.7	-0.3	-1.3	-1.4	-1.2	-1.0	-1.4	-1.5	-1.6	-1.5	-1.3	-1.1	-0.8	-0.3	0.3	0.5	0.5	0.4	0.7	-0.3
4	0.4	0.8	0.7	0.9	0.7	0.5	-0.6	-1.5	-0.8	-0.7	-0.9	-1.3	-1.5	-1.4	-1.5	-1.3	-1.2	-0.8	-0.3	0.4	0.8	0.7	0.7	0.8	-0.3
5	0.8	0.7	0.6	0.5	0.4	0.7	-0.7	-1.1	-1.5	-1.2	-1.0	-1.2	-1.5	-1.5	-1.3	-1.1	-1.0	-0.8	-0.3	0.4	0.8	0.8	0.9	0.8	-0.3
6	0.8	1.0	0.8	0.7	0.7	0.6	-0.7	-1.7	-1.6	-1.7	-1.6	-1.2	-1.4	-1.3	-1.2	-1.3	-1.1	-0.7	-0.2	0.6	0.6	0.5	0.6	0.8	-0.3
7	1.0	0.8	0.7	0.6	0.6	0.6	-0.6	-1.3	-0.9	-0.8	-1.0	-1.4	-1.5	-1.5	-1.5	-1.3	-1.0	-0.7	-0.2	0.5	0.8	0.6	0.6	1.0	-0.2
8	1.0	0.9	0.7	0.8	0.8	0.7	-0.2	-0.6	-1.1	-0.8	-1.0	-1.3	-1.3	-1.5	-1.4	-1.0	-0.5	-0.6	-0.2	0.2	0.4	0.6	0.9	0.6	-0.2
9	0.4	0.4	0.4	0.5	0.5	0.5	-0.6	-1.4	-0.9	-1.0	-1.1	-1.4	-1.5	-1.5	-1.6	-1.4	-1.2	-0.5	-0.2	0.3	0.4	0.4	0.2	0.2	-0.4
10	0.4	0.5	0.3	0.4	0.5	0.5	-0.1	-0.8	-0.8	-1.1	-0.9	-1.7	-0.9	-0.7	-1.1	-1.5	-1.2	-0.7	-0.2	-0.1	-0.1	0.0	0.0	0.1	-0.4
11	0.1	0.0	0.1	0.0	0.1	0.1	-0.1	-0.8	-1.6	-1.5	-1.1	-1.4	-1.7	-1.6	-1.6	-1.4	-1.1	-0.8	-0.3	0.2	0.2	0.2	0.3	0.3	-0.6
12	0.3	0.2	0.6	0.7	0.3	0.7	-0.2	-0.6	-0.9	-1.4	-1.4	-1.4	-1.7	-1.7	-1.6	-1.4	-1.2	-0.8	-0.3	0.1	0.3	0.3	0.2	0.3	-0.4
13	0.3	0.3	0.5	0.5	0.3	0.5	-0.1	-0.6	-0.6	-0.9	-1.1	-1.4	-1.6	-1.7	-1.8	-1.4	-1.2	-0.8	-0.4	0.1	0.2	0.2	0.2	0.3	-0.4
14	0.3	0.3	0.4	0.4	0.6	0.5	-0.1	-0.9	-0.7	-0.9	-0.9	-1.1	-1.2	-1.4	-1.6	-1.4	-1.2	-0.6	-0.4	0.1	0.4	0.3	0.4	0.5	-0.3
15	0.7	0.8	0.6	0.6	0.6	0.4	-0.8	-0.9	-0.6	-0.9	-1.3	-1.3	-1.6	-1.5	-1.7	-1.5	-1.3	-1.0	-0.4	0.1	0.3	0.4	0.4	0.6	-0.4
16	0.7	0.7	0.6	0.7	0.8	0.7	-0.8	-0.8	-0.6	-0.8	-1.2	-1.5	-1.5	-1.5	-1.5	-1.4	-1.3	-0.9	-0.5	0.1	0.5	0.4	0.7	0.7	-0.3
17	0.7	0.6	0.6	0.8	0.7	0.6	-0.7	-1.4	-0.9	-0.7	-1.4	-1.5	-1.4	-1.4	-1.5	-1.4	-1.2	-1.0	-0.4	0.2	0.3	0.4	0.6	0.7	-0.4
18	0.7	0.9	0.7	0.7	0.9	0.5	-0.8	-1.1	-0.8	-0.8	-1.0	-1.4	-1.8	-1.8	-1.8	-1.3	-1.2	-0.8	-0.3	0.1	0.2	0.2	0.2	0.4	-0.4
19	0.5	0.4	0.7	0.6	0.8	0.6	-0.4	-1.1	-1.3	-0.9	-1.7	-2.1	-2.0	-2.0	-1.6	-1.3	-1.0	-0.7	-0.5	-0.1	0.0	0.1	0.1	0.2	-0.5
20	0.2	0.3	0.4	0.4	0.5	0.4	-0.6	-0.9	-0.8	-1.1	-1.5	-1.4	-1.4	-1.7	-1.6	-1.5	-1.3	-1.0	-0.6	0.1	0.4	0.4	0.6	0.7	-0.5
21	0.8	0.6	0.7	0.9	0.6	0.4	-1.0	-1.6	-1.3	-0.8	-1.3	-1.5	-1.7	-1.6	-1.5	-1.4	-1.3	-0.9	-0.6	0.1	0.6	0.9	0.7	0.9	-0.4
22	0.9	0.8	0.7	0.6	1.0	0.4	-1.0	-1.3	-1.1	-0.8	-1.0	-1.3	-1.4	-1.5	-1.6	-1.4	-1.2	-0.9	-0.4	0.1	0.2	0.3	0.3	0.3	-0.4
23	0.3	0.4	0.6	0.8	0.8	0.6	-0.6	-1.1	-1.3	-0.9	-1.3	-1.4	-1.8	-1.7	-1.5	-1.4	-1.2	-0.9	-0.3	0.0	0.2	0.2	0.2	0.3	-0.5
24	0.4	0.6	0.7	0.7	0.9	0.6	-0.7	-1.5	-1.1	-1.0	-1.3	-1.5	-1.7	-1.8	-1.8	-1.5	-1.2	-1.0	-0.5	0.2	0.5	0.4	0.4	0.6	-0.4
25	0.7	0.7	0.7	0.9	0.5	0.6	-0.2	-0.6	-1.1	-1.2	-1.6	-1.4	-1.5	-1.6	-1.6	-1.5	-1.3	-1.0	-0.6	0.1	0.5	0.6	0.7	0.8	-0.3
26	1.0	0.9	1.0	0.9	0.8	0.4	-1.0	-1.6	-1.2	-1.5	-1.4	-1.7	-1.8	-1.5	-1.4	-1.4	-1.2	-0.8	-0.6	0.1	0.5	0.8	0.7	0.9	-0.4
27	0.7	0.8	0.5	0.8	0.7	0.5	-0.9	-0.6	-0.6	-0.8	-1.2	-1.6	-1.7	-1.7	-1.6	-1.4	-1.2	-0.8	-0.4	0.2	0.6	0.4	0.4	0.6	-0.3
28	0.6	0.8	0.9	0.5	0.5	0.6	-0.8	-1.5	-1.0	-0.9	-1.4	-1.6	-1.7	-1.7	-1.6	-1.4	-1.2	-0.9	-0.5	0.2	0.6	0.4	0.6	0.8	-0.4
29	0.8	0.8	0.9	0.8	0.9	0.5	-0.5	-0.9	-1.7	-1.6	-1.9	-2.2	-2.0	-1.9	-1.5	-1.0	-0.4	-0.3	-0.2	0.0	0.2	0.0	0.2	0.2	-0.4
30	0.2	0.3	0.6	0.4	0.5	0.5	-0.6	-1.1	-1.2	-1.4	-1.4	-1.3	-1.5	-1.6	-1.6	-0.9	-0.5	-0.1	-0.1	0.1	0.2	0.2	0.1	0.3	-0.4
31	0.4	0.6	0.5	0.6	0.4	0.3	-0.5	-1.3	-1.3	-1.1	-0.9	-1.1	-1.9	-1.7	-1.6	-0.7	-0.2	-0.1	0.0	0.0	0.3	0.1	0.1	0.3	-0.4
HRAVE	0.6	0.6	0.6	0.7	0.6	0.5	-0.5	-1.1	-1.1	-1.0	-1.2	-1.4	-1.6	-1.6	-1.5	-1.3	-1.1	-0.7	-0.3	0.2	0.4	0.4	0.4	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.4	-0.4	-0.6	-0.4	-0.4	-0.3	-0.4	-0.3	-0.4	-0.4	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4	-0.3
MAX	0.8	0.9	1.1	0.9	0.9	1.0	1.0	1.0	0.5	0.5	0.3	0.7	0.5	0.6	0.8	0.8	0.8	0.9	0.8	0.7	0.9	1.0	0.8	0.9	0.9
MIN	-1.5	-2.0	-1.6	-1.5	-1.5	-1.7	-1.5	-1.5	-1.6	-1.7	-1.7	-1.7	-1.8	-1.6	-1.7	-1.5	-1.5	-1.8	-2.1	-1.7	-1.7	-1.6	-1.8	-1.8	-1.6

DAY	26	27	28	29	30	31
AVE	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4
MAX	1.0	0.8	0.9	0.9	0.6	0.6
MIN	-1.8	-1.7	-1.7	-2.2	-1.6	-1.9

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = -2.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
MAY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	700	699	699	699	700	700	701	701	701	701	701	701	700	700	699	699	698	698	699	699	699	700	700	701	700
2	701	701	701	701	701	702	702	702	702	702	702	702	701	701	700	700	699	699	699	700	700	701	701	702	701
3	702	702	702	702	702	702	702	703	703	702	702	702	701	701	700	700	700	699	699	700	700	700	701	701	701
4	701	701	701	701	701	701	702	702	702	702	702	701	701	700	700	699	699	699	699	700	700	701	701	701	701
5	701	701	701	701	701	701	702	702	703	702	702	702	701	701	700	700	699	699	700	700	701	701	701	701	701
6	701	701	701	701	702	702	702	703	703	702	702	702	701	700	700	699	699	699	699	699	700	700	700	700	701
7	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	698	698	699	699	699	699	700
8	700	700	700	700	700	700	701	701	702	702	702	701	701	700	700	699	699	699	699	700	700	700	701	701	700
9	701	701	701	701	701	702	702	703	702	702	702	702	701	700	700	699	699	699	699	700	700	701	701	701	701
10	702	702	701	701	701	702	702	703	703	702	702	702	702	702	701	700	700	700	701	701	701	701	701	701	701
11	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	698	698	698	698	698	698	699	699	700	700
12	700	700	700	700	700	701	701	701	701	701	701	701	700	699	699	698	698	698	697	698	698	699	699	699	700
13	699	699	699	700	700	700	700	701	701	701	700	700	700	699	699	698	698	698	698	698	698	699	699	700	700	699
14	700	700	700	700	701	701	701	702	702	701	701	701	701	700	700	699	699	699	699	699	699	699	700	700	700
15	700	700	700	700	700	700	701	701	701	700	700	700	699	699	698	698	697	697	698	698	698	699	699	699	699
16	699	699	699	699	700	700	700	701	701	701	700	700	699	699	698	698	698	698	698	698	698	699	699	699	699
17	699	699	700	700	700	701	701	701	702	701	701	701	700	700	699	699	699	699	698	699	699	700	700	700	700
18	700	700	700	700	700	701	701	702	702	701	701	701	700	700	699	698	698	698	698	698	699	699	700	700	700
19	700	700	700	700	699	700	700	700	700	700	699	699	699	698	698	697	697	697	698	698	699	700	700	701	699
20	701	701	701	702	702	702	702	703	703	702	702	702	702	701	701	700	700	700	700	700	700	700	700	701	701
21	701	701	701	701	701	701	701	702	702	701	701	701	700	700	699	699	699	699	698	698	699	699	700	700	700	700
22	700	700	700	700	700	700	701	701	701	700	700	699	699	698	698	697	697	696	696	697	697	698	698	699	699
23	699	699	699	699	699	699	699	700	700	699	699	698	698	698	697	697	696	696	696	697	697	698	698	699	698
24	699	699	699	699	699	699	700	700	700	700	700	700	699	699	698	698	697	697	697	698	698	698	698	698	699
25	698	698	698	699	699	699	700	700	700	700	699	699	699	698	698	697	697	697	698	698	699	699	700	700	699
26	700	700	700	700	700	701	701	701	701	701	701	701	700	700	699	699	699	698	698	699	699	700	700	700	700
27	700	700	700	700	700	701	701	702	702	701	701	700	700	699	699	699	698	698	698	699	699	699	700	700	700
28	700	700	700	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	700	700	700	701	701	701	701
29	701	701	702	702	702	703	703	703	703	703	702	702	701	700	699	699	700	700	700	701	700	701	701	701	701
30	701	701	701	701	701	701	701	701	701	701	701	700	699	699	698	697	697	697	698	699	699	699	700	699	700
31	699	699	699	700	700	700	701	701	701	701	700	700	699	699	698	697	698	698	699	699	699	700	700	701	699
HRAVE	700	700	700	700	700	701	701	701	701	701	701	701	700	700	699	699	698	698	698	699	699	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	701	701	701	701	701	700	700	701	701	700	700	699	700	699	699	700	700	699	701	700	699	698	699	699
MAX	701	702	703	702	703	703	701	702	703	703	702	701	701	702	701	701	702	702	701	703	702	701	700	700	700
MIN	698	699	699	699	699	699	698	699	699	700	698	697	698	699	697	698	698	698	697	700	698	696	696	697	697

DAY	26	27	28	29	30	31
AVE	700	700	701	701	700	699
MAX	701	702	702	703	701	701
MIN	698	698	699	699	697	697

MONTHLY AVERAGE = 699.9 MONTHLY MAXIMUM = 703.1 MONTHLY MINIMUM = 696.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
MAY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	28	30	30	32	35	40	37	35	25	20	17	12	9	10	9	9	8	9	9	10	12	12	13	14	19
2	17	19	22	23	24	26	28	26	22	21	20	18	16	14	15	14	15	15	16	17	17	17	19	19	19
3	21	26	26	27	30	32	33	29	24	23	22	21	19	18	17	16	16	16	17	20	23	25	26	28	23
4	29	32	33	36	39	41	39	32	26	22	18	17	16	15	14	13	13	13	15	17	17	19	21	23	23
5	24	26	27	28	30	33	30	28	24	20	18	16	12	10	10	12	12	13	14	15	17	18	20	22	20
6	24	26	28	29	31	34	32	25	21	18	16	14	11	11	10	9	10	10	11	12	14	15	16	18	19
7	21	22	23	27	29	30	27	24	20	17	14	13	12	10	10	10	10	10	11	13	13	14	15	18	17
8	19	20	22	23	24	25	25	25	20	18	16	15	14	13	13	13	15	17	18	21	22	23	25	27	20
9	29	34	38	40	41	45	43	37	34	28	26	23	21	20	20	18	19	20	21	24	25	26	28	31	29
10	33	34	36	36	37	39	40	35	31	27	26	25	32	35	26	24	22	30	31	35	37	37	39	39	33
11	40	43	45	47	48	50	50	50	41	35	32	25	21	17	17	15	16	16	16	17	17	18	21	25	30
12	29	31	33	36	38	40	38	34	29	25	23	21	19	18	18	18	18	18	18	21	24	27	24	24	26
13	24	23	23	26	28	32	33	33	33	29	25	20	19	19	17	18	18	18	18	21	24	29	31	33	25
14	34	36	36	39	42	45	46	41	35	30	26	23	21	19	15	15	16	19	20	23	24	26	29	30	29
15	32	34	35	38	39	42	38	32	29	26	23	23	22	20	19	18	17	18	18	22	25	26	26	28	27
16	30	32	33	35	39	40	35	31	27	26	24	22	19	19	18	17	17	17	17	21	23	24	26	28	26
17	29	30	31	34	36	37	35	29	25	23	21	19	18	17	15	16	16	16	17	17	16	13	13	17	23
18	18	20	23	25	27	26	26	23	20	18	17	16	13	14	13	12	11	12	13	17	21	21	18	19	18
19	22	23	24	27	29	31	30	26	24	22	16	15	13	14	16	16	13	15	23	27	25	22	21	19	21
20	19	20	22	23	25	28	26	23	19	19	17	16	15	13	12	10	10	9	11	12	13	14	16	17	17
21	19	20	21	24	25	28	24	20	16	15	14	11	11	10	10	9	9	10	11	14	14	16	17	19	16
22	20	22	22	22	27	27	24	22	17	14	12	11	11	11	10	11	11	12	11	13	15	17	20	22	17
23	24	28	30	30	33	35	32	27	22	19	18	17	14	14	14	13	13	14	14	16	17	18	18	20	21
24	21	22	23	25	26	27	26	28	26	24	22	19	17	16	15	16	15	15	15	15	16	16	17	18	20
25	19	21	22	23	26	28	27	24	20	16	13	12	12	12	11	11	11	12	12	14	15	16	17	19	17
26	20	22	24	25	26	27	24	20	18	14	14	13	10	10	9	10	10	10	10	12	12	13	15	16	16
27	17	19	19	20	24	25	22	20	17	15	14	13	12	12	12	12	12	13	13	15	16	17	18	19	17
28	20	21	21	23	24	25	25	23	19	18	16	15	14	14	13	13	13	13	14	16	16	18	19	20	18
29	22	23	25	26	26	26	26	23	23	22	21	19	18	17	15	17	21	20	22	23	20	24	25	27	22
30	30	33	35	36	38	39	37	34	28	24	21	20	19	16	14	15	18	22	24	27	28	28	32	32	27
31	33	35	37	38	37	36	35	30	27	24	21	19	16	17	17	19	24	24	28	30	28	30	35	38	28
HRAVE	25	27	28	30	32	33	32	29	25	22	20	18	16	15	14	14	15	15	17	19	20	21	22	24	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	19	19	23	23	20	19	17	20	29	33	30	26	25	29	27	26	23	18	21	17	16	17	21	20	17
MAX	40	28	33	41	33	34	30	27	45	40	50	40	33	46	42	40	37	27	31	28	28	27	35	28	28
MIN	8	14	16	13	10	9	10	13	18	22	15	18	17	15	17	17	13	11	13	9	9	10	13	15	11

DAY	26	27	28	29	30	31
AVE	16	17	18	22	27	28
MAX	27	25	25	27	39	38
MIN	9	12	13	15	14	16

MONTHLY AVERAGE = 22.0 MONTHLY MAXIMUM = 50.0 MONTHLY MINIMUM = 8.4
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
MAY - 2020

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.59	0.80	0.95	1.04	1.07	1.02	0.91	0.65	0.47	0.31	0.09	0.00	0.00	0.00	0.00	0.00	8.43
2	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.37	0.55	0.78	0.93	1.02	1.04	1.01	0.89	0.65	0.46	0.29	0.08	0.00	0.00	0.00	0.00	0.00	8.23
3	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.38	0.59	0.79	0.93	1.01	1.04	1.00	0.90	0.61	0.48	0.30	0.09	0.00	0.00	0.00	0.00	0.00	8.28
4	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.80	0.95	1.04	1.06	1.02	0.92	0.63	0.52	0.31	0.09	0.00	0.00	0.00	0.00	0.00	8.49
5	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.80	0.95	1.04	1.07	1.03	0.92	0.64	0.52	0.31	0.10	0.00	0.00	0.00	0.00	0.00	8.53
6	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.39	0.61	0.81	0.96	1.05	1.07	1.03	0.92	0.67	0.53	0.31	0.10	0.00	0.00	0.00	0.00	0.00	8.62
7	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.39	0.58	0.80	0.96	1.05	1.07	1.03	0.92	0.64	0.53	0.31	0.10	0.00	0.00	0.00	0.00	0.00	8.54
8	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.38	0.54	0.71	0.87	1.00	0.82	0.95	0.86	0.44	0.24	0.22	0.08	0.00	0.00	0.00	0.00	0.00	7.25
9	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.37	0.56	0.75	0.88	0.92	0.91	0.88	0.84	0.66	0.46	0.18	0.09	0.00	0.00	0.00	0.00	0.00	7.63
10	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.35	0.51	0.67	0.67	0.61	0.20	0.18	0.78	0.60	0.46	0.14	0.01	0.00	0.00	0.00	0.00	0.00	5.27
11	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.24	0.54	0.76	0.92	1.02	1.03	1.00	0.90	0.63	0.53	0.31	0.10	0.00	0.00	0.00	0.00	0.00	8.09
12	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.38	0.53	0.76	0.94	1.02	1.05	1.01	0.90	0.61	0.53	0.29	0.10	0.00	0.00	0.00	0.00	0.00	8.26
13	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.38	0.54	0.78	0.94	1.03	1.05	1.01	0.85	0.61	0.54	0.32	0.11	0.00	0.00	0.00	0.00	0.00	8.32
14	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.29	0.46	0.56	0.58	0.69	0.96	0.96	0.84	0.58	0.50	0.15	0.10	0.00	0.00	0.00	0.00	0.00	6.77
15	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.58	0.80	0.94	1.02	1.04	1.00	0.90	0.60	0.54	0.32	0.11	0.00	0.00	0.00	0.00	0.00	8.41
16	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.59	0.80	0.94	1.03	1.05	1.01	0.91	0.59	0.55	0.33	0.11	0.00	0.00	0.00	0.00	0.00	8.47
17	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.61	0.81	0.95	1.03	1.06	1.01	0.91	0.58	0.55	0.32	0.11	0.01	0.00	0.00	0.00	0.00	8.51
18	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.39	0.61	0.80	0.95	1.04	1.06	1.01	0.90	0.58	0.55	0.33	0.12	0.01	0.00	0.00	0.00	0.00	8.54
19	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.39	0.61	0.81	0.97	1.05	1.07	1.02	0.91	0.59	0.55	0.33	0.11	0.01	0.00	0.00	0.00	0.00	8.61
20	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.40	0.64	0.83	0.98	1.06	1.09	1.04	0.94	0.63	0.58	0.35	0.13	0.01	0.00	0.00	0.00	0.00	8.88
21	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.40	0.63	0.83	0.98	1.07	1.10	1.05	0.95	0.64	0.58	0.35	0.13	0.01	0.00	0.00	0.00	0.00	8.92
22	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.40	0.64	0.82	0.97	1.06	1.09	1.03	0.93	0.65	0.57	0.34	0.13	0.01	0.00	0.00	0.00	0.00	8.84
23	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.39	0.60	0.79	0.96	1.04	1.08	1.02	0.92	0.65	0.56	0.34	0.09	0.00	0.00	0.00	0.00	0.00	8.63
24	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.59	0.79	0.95	1.03	1.07	1.02	0.92	0.65	0.56	0.34	0.13	0.01	0.00	0.00	0.00	0.00	8.62
25	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.40	0.63	0.83	0.97	1.06	1.09	1.04	0.94	0.66	0.58	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.89
26	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.40	0.64	0.82	0.97	1.06	1.10	1.04	0.94	0.65	0.58	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.89
27	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.39	0.60	0.81	0.96	1.04	1.08	1.03	0.92	0.65	0.57	0.35	0.14	0.01	0.00	0.00	0.00	0.00	8.74
28	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.61	0.80	0.94	1.03	1.06	1.01	0.91	0.64	0.56	0.34	0.13	0.01	0.00	0.00	0.00	0.00	8.60
29	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.59	0.75	0.91	1.00	1.04	1.00	0.95	0.23	0.08	0.09	0.05	0.01	0.00	0.00	0.00	0.00	7.24
30	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.32	0.51	0.46	0.67	0.72	0.81	0.96	0.69	0.34	0.09	0.02	0.02	0.00	0.00	0.00	0.00	0.00	5.82
31	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.49	0.55	0.60	0.77	0.93	0.87	0.70	0.19	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.00	5.70
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.58	0.76	0.90	0.99	1.01	0.98	0.89	0.59	0.48	0.28	0.10	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	8.43	8.23	8.28	8.49	8.53	8.62	8.54	7.25	7.63	5.27	8.09	8.26	8.32	6.77	8.41	8.47	8.51	8.54	8.61	8.88	8.92	8.84	8.63	8.62	8.89
MAX	1.07	1.04	1.04	1.06	1.07	1.07	1.07	1.00	0.92	0.78	1.03	1.05	1.05	0.96	1.04	1.05	1.06	1.06	1.07	1.09	1.10	1.09	1.08	1.07	1.09
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	8.89	8.74	8.60	7.24	5.82	5.70
MAX	1.10	1.08	1.06	1.04	0.96	0.93
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
MAY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.00 MONTHLY MAXIMUM = 0.00 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
JUNE - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	5.1	4.7	7.2	8.4	6.5	9.4	5.1	1.8	2.4	4.5	8.3	5.5	5.8	5.2	8.7	11.0	15.9	16.8	13.3	12.6	13.1	11.6	13.5	11.7	8.7
2	3.3	3.7	1.2	4.5	3.6	5.8	3.1	1.9	4.6	4.7	5.4	3.9	5.6	5.9	6.6	11.7	15.4	15.7	16.0	12.4	9.4	9.0	4.2	5.8	6.8
3	3.3	5.9	7.0	6.9	5.7	7.0	6.8	5.9	2.4	2.4	3.8	6.4	8.0	10.4	11.7	12.8	11.7	13.1	13.5	11.3	6.6	3.8	2.2	4.6	7.2
4	6.9	8.6	3.6	6.1	7.0	7.2	5.9	3.7	2.1	4.8	7.3	7.6	7.3	6.6	6.0	8.4	11.2	13.2	14.7	11.3	7.1	5.6	4.5	5.4	7.2
5	2.5	2.3	5.2	5.5	6.5	8.0	7.1	6.7	3.8	2.2	2.3	7.3	16.0	20.3	17.2	14.1	9.4	6.6	9.6	6.0	4.4	10.8	10.6	10.2	8.1
6	18.5	22.1	15.9	17.2	12.4	11.1	12.9	10.9	14.2	9.8	7.3	7.4	6.6	8.9	11.0	17.3	16.3	17.3	16.7	10.9	10.5	3.2	3.6	4.6	11.9
7	4.5	3.5	5.1	4.9	5.2	5.6	3.9	1.8	5.8	6.9	9.0	16.3	16.0	15.3	16.4	17.8	20.1	18.9	17.7	16.3	16.9	17.4	18.0	13.4	11.5
8	4.9	2.0	4.8	5.1	4.3	7.2	5.6	9.7	9.6	9.9	16.4	17.5	21.2	18.1	20.4	22.5	20.7	19.4	18.4	11.3	7.4	8.8	4.6	6.4	11.5
9	11.7	13.4	8.1	5.6	6.9	12.2	15.7	14.2	10.5	10.5	11.6	11.6	10.6	9.4	6.1	6.0	6.3	5.2	9.6	14.3	13.8	12.2	7.3	4.5	9.9
10	5.7	5.7	6.7	8.6	9.1	9.5	8.7	6.8	6.0	5.8	3.7	4.3	4.6	4.6	6.8	8.3	12.0	15.0	15.9	12.6	10.1	6.2	3.2	6.1	7.7
11	5.5	5.8	7.4	5.3	4.7	4.4	4.8	6.6	3.9	2.3	2.5	3.8	5.8	8.9	13.0	14.3	15.2	15.8	14.9	11.3	5.5	1.8	2.9	5.9	7.2
12	8.5	14.3	17.1	11.7	15.3	15.8	17.9	13.9	15.5	14.2	7.8	5.1	4.3	10.1	15.7	11.5	15.5	16.9	18.6	13.6	9.3	5.6	3.5	4.9	12.0
13	6.7	6.6	5.2	7.1	5.3	3.2	5.8	6.9	3.1	6.8	4.3	8.6	6.4	11.1	14.6	19.0	20.9	22.0	22.7	20.4	11.1	6.2	4.8	4.4	9.7
14	4.2	4.3	3.4	4.8	6.6	6.8	6.3	1.9	2.9	4.0	3.7	7.0	7.7	9.8	13.6	18.0	17.0	16.5	19.8	17.1	12.5	9.5	7.8	4.3	8.7
15	3.1	2.6	3.8	2.5	4.8	6.7	4.4	3.7	3.0	1.9	3.5	4.7	4.6	4.5	7.9	15.2	19.6	19.3	16.7	13.4	10.3	7.6	7.6	5.1	7.3
16	7.4	4.9	6.3	9.4	10.8	7.8	6.2	8.2	4.8	3.4	4.4	5.1	10.4	14.1	16.8	20.7	17.4	17.3	22.2	19.4	18.2	13.6	7.8	3.5	10.8
17	4.3	3.4	2.3	5.8	6.1	7.3	7.8	7.1	4.9	5.2	5.2	13.1	15.0	14.0	14.2	14.4	16.6	17.2	17.0	18.1	16.1	12.5	8.0	9.3	10.2
18	4.3	1.5	2.0	4.1	5.4	6.7	3.6	5.8	4.1	2.2	3.2	3.0	6.1	6.1	10.5	12.7	12.7	14.8	14.9	15.6	9.3	3.4	6.7	3.9	6.8
19	7.1	5.8	5.6	6.0	6.3	8.1	7.8	4.8	2.7	2.0	2.4	3.2	4.2	5.7	5.6	9.3	12.3	15.3	13.7	13.0	8.4	2.7	5.3	8.1	6.9
20	7.1	3.7	1.4	4.8	5.5	9.1	6.2	5.4	5.9	2.5	3.3	3.9	3.9	7.5	12.9	13.8	16.4	14.8	14.3	11.2	6.5	2.8	2.7	6.5	7.2
21	4.7	4.4	6.1	5.8	7.1	6.4	8.3	4.9	2.8	2.7	5.8	8.9	8.8	10.3	10.8	10.6	13.5	13.9	13.4	11.2	9.3	7.9	3.4	3.3	7.7
22	5.9	6.8	4.0	5.5	7.8	6.5	5.0	3.8	3.7	3.1	5.5	10.0	10.9	12.8	14.8	14.1	15.5	15.3	14.6	10.9	7.3	3.7	3.9	4.1	8.2
23	5.2	4.8	3.8	6.7	5.6	6.2	6.7	5.0	3.0	3.7	9.8	13.8	14.4	17.7	18.4	17.4	16.2	14.7	15.1	10.7	5.7	2.5	3.5	3.1	8.9
24	7.9	8.0	5.1	4.3	6.4	7.7	6.0	2.0	1.9	2.3	6.0	7.7	9.9	14.1	14.6	16.0	16.2	15.7	15.2	9.6	3.5	2.1	4.2	4.7	8.0
25	5.7	7.3	7.9	3.9	6.9	6.7	4.8	3.3	2.8	2.4	2.9	4.3	3.9	9.0	15.5	15.7	18.2	13.9	12.7	9.2	6.0	6.9	6.9	2.9	7.5
26	7.2	6.9	5.2	7.0	7.3	6.3	6.0	6.1	1.7	1.5	2.6	4.0	6.6	9.1	12.4	11.5	16.7	11.5	11.5	9.6	7.8	5.9	2.9	3.2	7.1
27	4.1	4.9	3.7	6.9	6.8	8.7	7.8	2.4	4.8	5.0	8.5	11.4	14.2	17.8	18.4	15.1	15.2	16.2	14.2	12.8	9.1	12.1	17.0	16.6	10.6
28	12.2	4.8	4.5	5.6	7.8	8.5	9.4	11.9	8.5	10.3	11.5	11.5	12.3	12.2	15.6	17.0	17.3	17.9	15.5	15.2	17.4	16.5	15.1	15.7	12.3
29	9.1	3.5	8.5	9.2	7.2	6.2	3.2	2.9	7.3	13.5	16.2	15.4	17.5	19.2	21.2	20.2	21.0	21.7	21.4	21.0	18.5	19.4	19.0	14.5	14.0
30	8.1	9.2	2.4	1.6	1.3	2.7	1.9	1.7	2.1	2.9	3.2	5.1	7.1	16.4	15.6	16.5	17.4	16.5	16.9	18.4	15.8	12.6	10.6	8.6	8.9
HRAVE	6.5	6.2	5.7	6.4	6.7	7.5	6.8	5.7	5.0	5.1	6.3	7.9	9.2	11.2	13.1	14.4	15.7	15.6	15.7	13.4	10.2	8.1	7.2	6.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	8.7	6.8	7.2	7.2	8.1	11.9	11.5	11.5	9.9	7.7	7.2	12.0	9.7	8.7	7.3	10.8	10.2	6.8	6.9	7.2	7.7	8.2	8.9	8.0	7.5
MAX	16.8	16.0	13.5	14.7	20.3	22.1	20.1	22.5	15.7	15.9	15.8	18.6	22.7	19.8	19.6	22.2	18.1	15.6	15.3	16.4	13.9	15.5	18.4	16.2	18.2
MIN	1.8	1.2	2.2	2.1	2.2	3.2	1.8	2.0	4.5	3.2	1.8	3.5	3.1	1.9	1.9	3.4	2.3	1.5	2.0	1.4	2.7	3.1	2.5	1.9	2.4

DAY	26	27	28	29	30	31
AVE	7.1	10.6	12.3	14.0	8.9	***
MAX	16.7	18.4	17.9	21.7	18.4	***
MIN	1.5	2.4	4.5	2.9	1.3	***

MONTHLY AVERAGE = 9.0 MONTHLY MAXIMUM = 22.7 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JUNE - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	125	129	115	126	110	114	95	106	114	272	282	282	289	312	289	298	290	284	283	288	249	287	320	314	172
2	255	258	83	161	189	142	107	305	174	274	282	272	211	247	253	287	284	285	283	298	308	299	308	318	329
3	235	112	126	113	109	113	105	130	127	311	287	281	280	298	291	273	278	295	300	301	304	297	66	132	348
4	118	92	343	92	121	95	100	83	121	310	297	284	295	340	243	285	252	281	296	297	298	309	170	105	269
5	205	189	134	124	126	118	124	99	120	156	281	294	305	309	303	304	323	282	295	302	289	306	302	305	132
6	307	311	304	304	297	295	299	297	294	325	306	294	311	346	321	291	284	290	293	305	291	168	144	118	51
7	115	142	115	107	103	94	89	140	290	299	279	257	252	258	271	260	260	242	246	248	243	257	281	285	287
8	290	71	308	295	286	298	310	308	300	295	290	290	285	271	278	276	276	283	294	308	307	305	301	69	180
9	68	59	96	95	113	86	84	80	73	72	59	76	60	69	3	79	258	252	281	303	307	307	308	141	205
10	95	104	121	116	115	115	108	142	138	141	94	75	130	90	282	269	278	287	285	305	297	307	63	94	258
11	99	102	101	87	101	123	107	112	137	115	274	274	269	302	276	298	285	288	287	293	312	202	115	118	95
12	82	64	76	102	80	80	76	98	88	81	89	134	111	225	223	240	246	275	286	292	293	297	293	116	15
13	100	71	99	108	118	167	118	149	145	141	84	296	214	225	225	240	277	263	279	279	286	299	44	115	76
14	339	151	117	100	95	103	91	95	106	89	39	307	294	259	259	279	280	295	285	292	293	304	286	284	267
15	300	165	116	126	115	99	128	94	107	258	87	8	315	218	323	287	303	293	292	289	297	213	156	117	158
16	125	107	113	96	116	100	93	108	120	315	28	41	300	233	230	250	239	240	276	278	282	299	280	287	202
17	242	244	290	101	96	100	97	97	100	104	319	258	245	263	277	273	269	257	265	277	267	266	291	304	233
18	213	133	137	117	105	81	114	127	151	98	330	53	329	265	261	258	285	287	280	281	306	347	275	314	51
19	310	306	279	127	108	117	105	118	140	298	74	287	250	304	325	270	271	288	293	302	301	289	138	105	120
20	93	50	310	94	106	98	133	130	133	92	264	204	314	322	288	288	301	297	306	306	301	269	66	137	116
21	117	115	102	79	89	102	97	110	127	278	300	296	294	299	299	296	293	293	290	296	305	294	306	139	4
22	114	104	120	118	112	100	102	111	137	162	277	299	282	296	284	285	296	288	284	294	304	291	328	131	188
23	102	124	108	118	109	107	112	118	144	279	293	296	281	290	289	283	275	276	278	288	297	321	335	102	186
24	93	92	95	82	95	121	132	105	252	268	285	269	295	300	295	289	288	271	302	313	313	119	108	89	161
25	100	105	69	106	97	101	99	119	311	270	274	270	301	252	249	270	278	283	292	314	300	314	295	114	160
26	117	103	92	84	89	114	98	116	197	78	285	238	300	293	226	263	279	270	290	303	307	309	312	329	291
27	99	102	109	89	90	86	93	14	300	298	309	297	296	296	297	275	274	268	273	278	249	131	136	142	342
28	153	120	108	98	106	101	106	130	137	193	219	244	246	255	257	263	261	268	261	258	262	261	250	231	103
29	157	22	140	185	152	86	94	282	266	232	231	224	230	239	229	244	231	246	258	270	273	279	289	300	178
30	308	311	290	296	64	82	67	47	316	188	337	85	236	251	246	243	233	252	264	278	278	286	309	297	246

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JUNE - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	11	9	9	10	15	10	35	42	36	35	17	28	35	50	27	25	13	10	7	7	12	21	13	10	20
2	39	37	55	11	31	19	34	38	24	27	35	52	46	38	35	27	12	12	9	8	7	7	23	21	27
3	47	7	11	10	13	12	9	15	39	48	42	27	29	28	32	23	28	15	14	9	5	11	53	6	22
4	11	14	37	11	12	10	9	16	36	27	25	24	33	54	45	49	20	13	10	7	5	7	16	15	21
5	65	44	15	7	8	8	10	11	23	37	47	34	12	10	14	12	20	32	10	20	50	9	15	11	22
6	10	9	11	10	10	8	10	11	12	22	43	43	46	37	28	14	14	12	10	11	6	15	11	6	17
7	7	25	7	7	9	7	16	42	20	33	38	18	20	22	23	20	16	14	13	12	9	10	6	6	17
8	37	34	19	16	25	15	14	15	19	20	15	16	13	21	17	13	18	14	11	11	7	7	36	42	19
9	10	22	25	29	46	26	14	15	18	23	22	18	26	32	51	43	29	24	13	8	8	8	8	35	23
10	12	11	11	7	7	11	9	12	15	22	55	36	58	44	46	33	22	11	8	8	7	24	30	9	21
11	12	9	11	16	14	29	24	10	29	57	47	40	39	36	22	21	15	14	8	8	10	25	16	7	22
12	11	17	11	19	13	10	9	14	14	14	46	50	58	53	17	35	19	15	9	8	7	15	29	28	22
13	13	34	24	17	26	50	30	11	37	23	46	29	48	31	25	21	19	14	10	7	9	13	33	11	24
14	40	30	25	14	9	7	12	32	26	34	54	29	40	32	28	21	15	15	10	9	7	8	13	40	23
15	28	33	13	27	15	12	18	14	43	78	45	34	46	46	52	21	13	14	11	7	7	26	18	11	26
16	10	17	10	10	7	10	13	16	50	40	48	53	31	28	19	17	21	14	11	7	7	8	23	52	22
17	37	64	44	10	9	11	7	11	19	38	51	25	23	26	23	23	18	15	11	7	9	14	15	36	23
18	40	30	18	19	12	10	25	13	21	52	56	59	45	57	25	23	18	16	10	7	12	43	48	56	30
19	18	16	21	7	8	5	8	14	25	70	65	61	72	44	61	36	21	14	12	9	7	37	10	12	27
20	9	28	37	34	11	8	8	13	17	65	41	42	63	42	26	21	17	15	13	9	14	19	22	9	24
21	10	11	12	8	9	8	10	20	29	45	37	22	23	28	27	27	18	14	11	8	7	7	33	11	18
22	8	13	23	10	6	7	10	17	21	44	33	27	22	18	18	17	15	13	11	8	6	16	8	38	17
23	9	12	18	12	8	9	8	12	38	46	22	20	18	15	13	13	15	13	10	6	6	19	18	15	16
24	6	8	12	10	8	8	12	33	54	43	21	20	23	21	17	17	14	15	11	8	27	20	14	14	18
25	11	13	26	39	8	9	10	22	40	36	41	41	56	42	19	17	13	15	13	9	8	6	15	21	22
26	9	11	10	7	7	13	9	9	57	46	45	38	18	26	17	29	18	24	14	8	6	8	14	28	20
27	14	12	16	8	10	8	21	34	18	19	19	20	17	16	14	23	20	16	13	8	22	15	10	10	16
28	10	28	14	15	9	10	10	16	22	27	23	28	27	30	16	19	19	16	14	12	11	11	12	11	17
29	24	50	20	23	29	18	17	31	25	21	17	19	19	17	18	19	18	15	14	10	8	7	7	9	19
30	14	8	61	61	41	28	31	41	46	57	60	65	50	20	21	22	19	17	14	8	7	6	7	20	30
HRAVE	19	22	21	16	14	13	15	20	29	38	38	34	35	32	26	23	18	15	11	9	10	15	19	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20	27	22	21	22	17	17	19	23	21	22	22	24	23	26	22	23	30	27	24	18	17	16	18	22
MAX	50	55	53	54	65	46	42	42	51	58	57	58	50	54	78	53	64	59	72	65	45	44	46	54	56
MIN	7	7	5	5	7	6	6	7	8	7	7	7	7	7	7	7	7	7	5	8	7	6	6	6	6

DAY	26	27	28	29	30	31
AVE	20	16	17	19	30	***
MAX	57	34	30	50	65	***
MIN	6	8	9	7	6	***

MONTHLY AVERAGE = 21.5 MONTHLY MAXIMUM = 78.3 MONTHLY MINIMUM = 4.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JUNE - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	28.1	26.9	26.3	24.9	24.1	24.1	23.8	25.6	29.0	31.6	33.9	35.3	36.6	38.4	39.2	39.5	38.7	37.3	36.6	35.6	33.6	32.0	31.5	30.9	31.8
2	29.7	28.2	27.9	26.0	25.1	24.5	26.0	27.2	31.5	32.4	34.6	36.3	38.8	39.5	40.0	40.2	39.8	39.1	38.2	36.5	35.2	34.0	33.5	32.7	33.2
3	31.1	29.5	28.6	27.8	26.4	24.8	27.5	29.4	31.5	33.7	36.0	37.8	39.5	40.8	41.0	41.0	41.0	40.4	39.4	37.7	36.2	35.2	34.1	32.1	34.3
4	30.5	29.7	28.6	26.9	26.2	25.6	27.0	29.8	31.6	34.5	36.6	38.4	40.2	40.9	41.4	42.3	41.7	40.4	38.8	37.5	36.4	35.7	34.2	32.7	34.5
5	32.0	31.0	29.0	28.3	27.0	26.2	26.4	28.4	30.9	33.7	35.3	36.3	35.8	36.9	36.6	35.5	35.3	36.2	35.2	33.9	32.8	32.0	31.4	30.2	32.4
6	28.2	26.2	25.5	24.2	23.1	22.2	22.2	23.8	25.4	26.2	27.7	29.1	30.2	31.4	33.4	33.9	33.9	33.2	32.0	30.3	28.6	27.5	26.2	25.1	27.9
7	24.6	23.9	22.9	22.3	21.1	21.2	22.2	23.3	25.8	28.0	30.1	31.8	32.4	33.2	33.9	34.0	33.8	33.2	32.2	30.8	29.4	28.3	27.1	25.7	28.0
8	24.9	24.4	23.8	23.4	23.1	22.0	23.2	24.9	26.1	27.3	28.6	29.3	29.6	30.0	30.1	29.7	29.4	29.0	27.9	26.3	24.9	24.0	22.9	21.7	26.1
9	21.0	21.6	21.0	20.5	20.1	20.6	21.7	23.1	24.5	26.0	27.6	29.1	30.1	31.2	32.0	32.8	33.5	33.4	33.0	30.7	28.9	27.7	26.8	24.7	26.7
10	22.9	21.1	20.0	19.0	19.0	18.3	20.2	23.0	26.4	30.3	33.2	35.4	37.1	37.9	38.4	39.2	39.0	38.2	36.8	34.9	33.1	31.9	30.7	28.4	29.8
11	26.6	25.3	23.7	23.0	21.8	21.0	21.5	24.6	28.8	31.9	34.3	37.3	39.6	40.7	41.1	41.0	40.6	39.9	38.7	37.0	35.2	34.5	32.6	30.4	32.1
12	29.0	29.7	29.8	28.3	28.4	28.1	29.2	31.3	33.4	35.0	36.8	38.9	40.3	41.2	42.2	41.8	41.8	40.8	39.2	37.4	35.7	34.5	33.5	31.9	34.9
13	30.1	29.6	27.8	26.2	25.5	24.8	25.2	28.1	31.8	35.7	36.6	38.5	40.4	41.2	41.6	41.0	40.4	39.4	37.6	35.3	32.9	31.6	30.3	29.6	33.4
14	28.9	26.8	25.6	24.6	22.7	22.2	23.0	25.8	29.3	33.1	34.8	36.5	37.5	39.3	39.7	39.4	39.1	38.5	37.5	35.5	33.7	32.5	31.3	30.0	32.0
15	29.3	27.2	25.7	24.3	23.1	23.1	23.7	27.2	29.9	32.3	34.8	36.2	37.0	38.8	39.4	40.1	39.1	38.6	37.6	36.1	34.6	33.3	31.0	30.3	32.2
16	28.7	29.0	28.3	28.3	27.9	27.3	28.2	30.3	32.5	32.6	35.1	36.8	38.1	39.6	40.2	39.7	39.8	39.0	37.3	35.3	33.5	31.8	30.9	30.4	33.4
17	29.3	27.3	26.1	24.0	22.2	21.5	23.2	26.7	30.1	33.4	34.5	36.1	37.4	38.0	38.5	38.4	38.2	37.4	36.2	34.2	32.8	31.6	30.6	29.8	31.6
18	28.3	26.9	26.1	23.6	22.2	20.8	21.7	24.6	27.7	30.5	32.1	34.6	35.8	37.0	37.9	38.1	37.8	37.1	36.3	34.1	32.1	31.5	31.1	30.0	30.7
19	28.5	26.5	24.3	22.8	21.9	20.9	22.2	24.7	26.9	29.5	32.4	33.6	35.7	36.3	37.1	37.7	38.1	37.0	36.1	34.2	32.1	31.1	29.0	27.6	30.3
20	27.1	26.6	26.1	23.5	22.3	21.4	22.5	25.2	29.3	31.5	33.5	36.0	37.0	38.3	39.2	39.2	38.9	38.0	36.8	35.6	34.2	33.0	32.1	29.5	31.5
21	28.3	27.3	25.5	24.6	23.2	22.8	24.3	27.2	30.3	32.3	35.0	36.9	38.7	39.6	39.9	40.0	39.6	38.9	38.0	36.4	34.9	33.5	32.4	30.9	32.5
22	28.9	28.0	27.2	26.1	25.4	24.7	25.3	27.4	29.5	32.5	34.9	37.6	39.0	39.9	40.1	40.1	39.8	39.4	38.6	36.8	35.0	34.2	33.3	31.1	33.1
23	29.2	28.4	27.2	25.8	25.5	24.3	24.6	27.4	30.2	32.8	35.8	37.8	39.0	39.6	39.9	40.3	40.3	39.6	38.7	36.8	35.5	34.8	33.4	30.7	33.2
24	28.7	27.4	25.9	24.8	23.4	22.2	24.1	25.3	29.1	32.5	35.7	38.3	40.3	41.3	41.6	41.8	41.6	40.8	39.2	37.5	36.2	34.6	32.5	30.9	33.1
25	29.5	28.0	27.2	26.9	25.1	25.4	25.2	27.4	29.8	33.2	36.2	38.4	40.5	42.3	43.0	42.0	41.0	40.3	39.4	38.0	35.8	35.1	34.1	32.4	34.0
26	30.9	29.5	28.4	26.3	25.4	24.9	24.9	26.7	29.5	32.7	35.8	37.7	38.0	39.2	41.0	41.7	41.0	40.5	39.5	37.9	36.0	34.9	33.7	32.6	33.7
27	30.1	29.3	27.6	26.5	25.2	25.3	25.3	27.9	29.9	32.8	35.8	36.9	38.7	39.1	39.1	39.4	39.5	38.9	38.0	36.2	34.4	32.2	31.0	30.1	32.9
28	29.1	28.1	27.3	26.5	25.6	25.7	26.9	28.7	31.2	33.6	34.7	35.5	36.7	37.2	37.5	37.6	37.4	37.0	36.1	34.6	33.1	31.8	30.6	29.8	32.2
29	28.8	28.2	27.8	27.8	26.9	26.5	27.2	27.9	29.7	31.4	32.9	34.6	35.6	36.2	36.8	36.6	36.9	36.0	34.8	32.8	31.0	29.5	27.8	26.8	31.3
30	26.2	25.6	25.1	24.1	23.4	22.9	24.1	26.0	27.9	29.6	31.0	32.5	34.1	35.5	36.4	36.9	36.8	36.2	35.1	33.2	31.6	30.0	29.3	28.3	30.1
HRAVE	28.3	27.2	26.2	25.0	24.1	23.5	24.4	26.6	29.3	31.8	33.9	35.7	37.0	38.0	38.6	38.7	38.5	37.8	36.7	35.0	33.3	32.1	31.0	29.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	31.8	33.2	34.3	34.5	32.4	27.9	28.0	26.1	26.7	29.8	32.1	34.9	33.4	32.0	32.2	33.4	31.6	30.7	30.3	31.5	32.5	33.1	33.2	33.1	34.0
MAX	39.5	40.2	41.0	42.3	36.9	33.9	34.0	30.1	33.5	39.2	41.1	42.2	41.6	39.7	40.1	40.2	38.5	38.1	38.1	39.2	40.0	40.1	40.3	41.8	43.0
MIN	23.8	24.5	24.8	25.6	26.2	22.2	21.1	21.7	20.1	18.3	21.0	28.1	24.8	22.2	23.1	27.3	21.5	20.8	20.9	21.4	22.8	24.7	24.3	22.2	25.1

DAY	26	27	28	29	30	31
AVE	33.7	32.9	32.2	31.3	30.1	***
MAX	41.7	39.5	37.6	36.9	36.9	***
MIN	24.9	25.2	25.6	26.5	22.9	***

MONTHLY AVERAGE = 31.8 MONTHLY MAXIMUM = 43.0 MONTHLY MINIMUM = 18.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JUNE - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.6	0.5	0.5	0.4	0.2	0.2	0.0	-0.6	-0.9	-0.9	-1.3	-1.2	-1.3	-1.5	-1.5	-1.4	-1.1	-0.5	-0.3	-0.1	0.0	0.1	0.0	0.1	-0.4
2	0.3	0.5	0.3	0.4	0.4	0.3	0.0	-0.4	-1.4	-1.0	-1.3	-1.3	-1.8	-1.6	-1.5	-1.5	-1.4	-1.0	-0.7	-0.1	0.2	0.5	0.4	0.4	-0.5
3	0.7	0.6	0.4	0.5	0.5	0.7	-0.9	-1.4	-0.8	-0.9	-1.0	-1.3	-1.5	-1.7	-1.6	-1.5	-1.2	-1.0	-0.5	0.0	0.5	0.4	0.5	0.5	-0.4
4	0.7	0.6	0.7	0.5	0.6	0.3	-0.8	-1.2	-0.9	-1.1	-1.3	-1.5	-1.5	-1.4	-1.4	-1.4	-0.9	-0.6	-0.2	0.2	0.5	0.4	0.5	0.5	-0.4
5	0.4	0.6	0.4	0.5	0.6	0.4	0.0	-0.9	-1.1	-0.8	-0.8	-0.9	-0.8	-0.8	-0.6	-0.4	-0.3	-0.6	-0.1	0.2	0.6	0.3	0.2	0.2	-0.2
6	0.0	-0.1	0.0	0.0	0.1	0.1	-0.3	-0.8	-1.0	-1.3	-1.4	-1.5	-1.4	-1.5	-1.5	-1.6	-1.4	-1.1	-0.7	-0.1	0.2	0.4	0.5	0.5	-0.6
7	0.4	0.4	0.3	0.4	0.6	0.2	-0.8	-0.5	-0.9	-1.1	-1.4	-1.4	-1.7	-1.7	-1.6	-1.3	-1.1	-0.8	-0.4	-0.1	0.1	0.1	0.1	0.2	-0.5
8	0.3	0.3	0.4	0.4	0.4	0.5	-0.4	-0.8	-1.0	-1.2	-1.5	-1.6	-1.7	-1.6	-1.6	-1.4	-1.1	-0.9	-0.6	0.1	0.4	0.4	0.4	0.5	-0.5
9	0.4	0.3	0.3	0.4	0.4	0.1	-0.6	-1.3	-1.6	-1.8	-2.0	-2.3	-2.0	-2.0	-1.3	-1.3	-1.1	-0.7	-0.7	-0.1	0.2	0.4	0.5	0.6	-0.6
10	0.6	0.8	0.8	0.7	0.5	0.4	-1.0	-1.4	-1.7	-1.7	-1.4	-1.7	-1.6	-1.6	-1.4	-1.3	-1.4	-1.0	-0.5	0.1	0.5	0.5	0.6	0.9	-0.5
11	0.7	0.8	0.8	0.8	0.8	0.6	-0.3	-1.3	-1.2	-1.0	-0.9	-1.2	-1.6	-1.6	-1.5	-1.5	-1.2	-0.9	-0.5	0.1	0.6	0.4	0.5	0.9	-0.3
12	0.9	0.4	0.3	0.4	0.3	0.2	-0.5	-1.3	-1.8	-1.9	-1.9	-1.8	-1.6	-1.4	-1.8	-1.3	-1.2	-0.9	-0.5	0.0	0.4	0.5	0.4	0.6	-0.6
13	0.7	0.7	0.6	0.6	0.6	0.6	-0.1	-0.9	-0.9	-2.0	-1.4	-1.5	-1.7	-1.8	-1.7	-1.3	-1.2	-0.7	-0.5	0.0	0.2	0.4	0.5	0.7	-0.4
14	0.5	0.7	0.6	0.8	0.8	0.4	-0.6	-0.6	-0.9	-1.6	-1.3	-1.6	-1.4	-1.9	-1.7	-1.5	-1.3	-0.9	-0.6	-0.1	0.3	0.4	0.5	0.4	-0.4
15	0.5	0.6	0.8	0.6	0.6	0.3	-0.4	-1.1	-1.2	-0.7	-1.5	-1.6	-1.4	-1.6	-1.3	-1.6	-1.3	-1.0	-0.6	-0.1	0.3	0.3	0.3	0.5	-0.4
16	0.3	0.4	0.5	0.4	0.4	0.1	-0.6	-1.6	-1.6	-0.8	-1.5	-1.7	-1.6	-2.0	-1.8	-1.3	-1.2	-0.8	-0.5	-0.1	0.2	0.2	0.2	0.3	-0.6
17	0.5	0.6	0.5	0.8	0.7	0.5	-0.8	-1.8	-1.7	-1.6	-1.3	-1.4	-1.7	-1.6	-1.6	-1.4	-1.2	-0.8	-0.5	-0.1	0.1	0.2	0.4	0.3	-0.5
18	0.5	0.3	0.4	0.8	0.8	0.2	-0.7	-1.3	-1.2	-1.0	-1.0	-1.4	-1.5	-1.5	-1.6	-1.5	-1.3	-1.0	-0.7	-0.1	0.3	0.3	0.3	0.3	-0.5
19	0.4	0.4	0.7	0.6	0.8	0.5	-0.9	-1.3	-0.8	-0.8	-1.1	-1.2	-1.5	-1.4	-1.4	-1.3	-1.3	-1.1	-0.7	-0.1	0.4	0.5	0.6	0.5	-0.4
20	0.8	1.0	0.6	0.7	0.7	0.5	-0.7	-1.4	-1.8	-1.0	-1.2	-1.4	-1.3	-1.4	-1.6	-1.5	-1.3	-0.9	-0.4	0.0	0.5	0.5	0.5	0.6	-0.4
21	0.7	0.7	0.7	0.8	0.9	0.7	-0.9	-1.3	-0.9	-0.8	-1.3	-1.6	-1.6	-1.6	-1.5	-1.4	-1.2	-0.9	-0.5	0.0	0.4	0.7	0.4	0.6	-0.4
22	0.9	0.6	0.8	0.6	0.7	1.0	-0.2	-1.1	-1.1	-1.1	-1.2	-1.7	-1.6	-1.8	-1.6	-1.5	-1.2	-0.9	-0.6	0.0	0.5	0.5	0.6	0.6	-0.4
23	0.7	0.5	0.9	0.8	0.9	0.6	-0.6	-1.2	-1.0	-0.9	-1.3	-1.6	-1.6	-1.8	-1.6	-1.5	-1.2	-0.8	-0.5	0.2	0.7	0.4	0.6	0.9	-0.4
24	0.8	0.8	0.8	0.8	0.9	0.7	-0.6	-0.6	-0.7	-0.7	-1.3	-1.4	-1.6	-1.8	-1.8	-1.6	-1.4	-0.9	-0.4	0.2	0.4	0.7	0.7	0.7	-0.3
25	0.8	0.7	0.6	0.7	0.6	0.6	0.0	-0.9	-0.7	-0.7	-1.0	-1.2	-1.4	-1.7	-1.6	-1.2	-0.7	-0.5	-0.1	0.3	0.6	0.5	0.6	0.5	-0.2
26	0.6	0.8	0.7	0.6	0.6	0.6	0.3	-0.8	-0.5	-0.7	-0.9	-0.9	-1.0	-1.0	-1.8	-1.5	-1.2	-0.9	-0.5	0.1	0.5	0.5	0.4	0.6	-0.2
27	0.6	0.7	0.6	0.8	0.5	0.7	-0.2	-0.4	-0.8	-0.9	-1.3	-1.2	-1.7	-1.6	-1.6	-1.4	-1.3	-0.9	-0.6	-0.1	0.3	0.1	0.1	0.1	-0.4
28	0.1	0.2	0.4	0.4	0.3	0.1	-0.9	-1.4	-1.8	-1.6	-1.8	-1.8	-1.7	-1.7	-1.5	-1.4	-1.2	-0.9	-0.5	-0.1	0.0	0.1	0.1	0.2	-0.7
29	0.2	0.3	0.6	0.3	0.3	0.2	-0.2	-0.6	-0.9	-1.3	-1.6	-2.0	-1.9	-1.7	-1.8	-1.3	-1.2	-0.8	-0.4	-0.1	0.0	0.0	0.1	0.1	-0.6
30	0.2	0.3	0.3	0.4	0.4	0.2	-0.4	-0.6	-0.8	-1.0	-1.3	-1.7	-1.7	-1.7	-1.6	-1.5	-1.4	-0.9	-0.5	-0.1	0.1	0.3	0.4	0.4	-0.5
HRAVE	0.5	0.5	0.5	0.6	0.6	0.4	-0.5	-1.0	-1.1	-1.1	-1.3	-1.5	-1.6	-1.6	-1.6	-1.4	-1.2	-0.9	-0.5	0.0	0.3	0.4	0.4	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.4	-0.5	-0.4	-0.4	-0.2	-0.6	-0.5	-0.5	-0.6	-0.5	-0.3	-0.6	-0.4	-0.4	-0.4	-0.6	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.2
MAX	0.6	0.5	0.7	0.7	0.6	0.5	0.6	0.5	0.6	0.9	0.9	0.9	0.7	0.8	0.8	0.5	0.8	0.8	0.8	1.0	0.9	1.0	0.9	0.9	0.8
MIN	-1.5	-1.8	-1.7	-1.5	-1.1	-1.6	-1.7	-1.7	-2.3	-1.7	-1.6	-1.9	-2.0	-1.9	-1.6	-2.0	-1.8	-1.6	-1.5	-1.8	-1.6	-1.8	-1.8	-1.8	-1.7

DAY	26	27	28	29	30	31
AVE	-0.2	-0.4	-0.7	-0.6	-0.5	***
MAX	0.8	0.8	0.4	0.6	0.4	***
MIN	-1.8	-1.7	-1.8	-2.0	-1.7	***

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = -2.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JUNE - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	701	701	701	701	701	702	702	702	702	702	702	701	701	700	699	698	698	698	698	699	700	701	701	702	701
2	702	701	701	701	702	702	703	703	703	702	702	702	701	700	700	699	699	699	699	700	700	701	701	701	701
3	701	701	701	700	701	701	701	702	702	701	701	701	700	699	699	698	698	698	698	698	698	699	699	699	700
4	699	699	699	699	699	700	700	700	700	700	700	699	699	698	697	696	696	696	696	696	697	697	697	697	698
5	697	697	697	697	697	698	698	698	698	698	698	697	697	696	696	696	696	695	695	695	695	696	696	696	697
6	696	696	697	698	699	699	699	700	700	700	700	700	699	699	698	697	697	697	697	697	697	697	698	698	698
7	698	698	698	698	698	698	699	699	699	699	699	699	698	698	697	697	697	697	697	697	697	698	698	698	698
8	698	698	698	699	699	699	700	700	700	700	701	701	701	701	701	700	701	701	701	702	702	702	703	703	700
9	703	703	704	704	704	705	705	705	705	705	705	704	704	703	703	702	702	701	701	702	702	702	703	703	703
10	703	703	703	703	703	704	704	704	704	704	703	703	702	702	701	701	700	700	700	701	701	702	702	702	702
11	702	702	702	703	703	703	704	704	704	704	704	703	703	702	702	701	701	701	701	702	702	703	703	703	703
12	704	704	704	704	704	705	705	705	705	705	704	704	703	702	701	700	700	699	699	700	700	701	701	701	702
13	701	701	701	701	701	701	701	701	701	701	700	700	699	698	697	697	696	696	696	697	698	698	699	699	699
14	699	699	699	700	700	700	701	701	701	701	701	700	699	699	698	698	698	698	698	698	699	700	700	701	699
15	701	701	701	701	702	702	703	703	703	703	703	702	702	701	700	699	699	699	699	699	700	701	701	701	701
16	701	701	701	701	701	701	702	702	702	701	701	701	700	699	699	698	698	698	698	698	699	699	700	700	700
17	700	700	700	700	701	701	701	701	701	701	701	701	700	700	700	699	699	698	698	698	699	699	700	700	700
18	701	701	701	701	701	701	701	702	702	701	701	701	700	700	699	699	698	698	698	698	698	699	700	700	700
19	700	700	700	700	700	701	701	701	701	701	701	701	701	700	700	699	699	698	698	698	699	699	700	700	700
20	701	701	701	701	702	702	702	703	703	702	702	702	701	701	700	700	699	699	699	699	700	700	700	700	701
21	700	700	700	700	701	701	702	702	702	702	701	701	700	700	699	699	698	698	698	699	699	699	700	700	700
22	700	700	701	701	701	702	702	702	703	702	702	702	702	701	701	700	700	700	700	700	700	700	700	700	701
23	700	701	701	701	701	702	702	702	702	702	702	702	701	701	700	700	699	699	699	699	699	699	700	700	700
24	700	699	699	699	700	700	700	701	701	700	700	700	699	698	698	697	697	696	697	697	697	698	698	698	699
25	698	698	698	698	699	699	700	700	700	700	700	699	698	698	698	697	697	697	697	697	698	698	699	699	698
26	699	699	699	700	700	700	701	701	701	701	701	701	700	700	700	699	699	699	699	699	699	699	700	700	700
27	700	700	700	700	700	700	701	701	701	701	701	700	700	699	699	698	698	697	697	698	698	699	699	699	699
28	699	699	699	699	700	700	700	700	700	699	699	698	698	697	696	696	696	695	695	695	696	697	697	697	698
29	697	698	698	698	698	698	699	699	699	699	699	698	698	697	697	697	696	696	697	697	698	699	699	700	698
30	700	700	700	701	701	701	701	702	702	701	701	701	700	700	699	699	698	698	698	699	699	700	700	701	700
HRAVE	700	700	700	700	701	701	701	702	702	701	701	701	700	700	699	698	698	698	698	698	699	699	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	701	700	698	697	698	698	700	703	702	703	702	699	699	701	700	700	700	700	701	700	701	700	699	698
MAX	702	703	702	700	698	700	699	703	705	704	704	705	701	701	703	702	701	702	701	703	702	703	702	701	700
MIN	698	699	698	696	695	696	697	698	701	700	701	699	696	698	699	698	698	698	698	699	698	700	699	696	697

DAY	26	27	28	29	30	31
AVE	700	699	698	698	700	***
MAX	701	701	700	700	702	***
MIN	699	697	695	696	698	***

MONTHLY AVERAGE = 699.9 MONTHLY MAXIMUM = 705.2 MONTHLY MINIMUM = 694.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JUNE - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	39	41	41	44	49	47	46	42	33	29	26	24	22	19	18	18	19	20	21	22	26	30	33	34	31
2	37	40	42	43	45	46	43	40	32	30	25	23	20	18	17	17	18	18	19	20	21	22	23	23	28
3	25	28	29	30	33	36	32	29	27	24	22	20	18	17	16	16	16	16	16	16	18	19	20	22	24	23
4	25	27	28	30	32	32	30	26	25	24	22	19	17	16	16	15	15	17	19	20	21	22	23	25	23
5	26	27	29	30	32	33	32	28	25	22	20	20	22	20	19	20	21	21	23	24	28	24	21	25	25
6	30	27	27	27	31	33	34	32	29	30	27	25	23	20	16	16	16	17	18	19	21	22	24	25	25
7	27	29	33	36	36	37	32	33	33	32	27	22	23	23	21	21	22	22	23	25	29	29	27	25	28
8	26	28	29	31	31	32	30	27	28	26	24	22	20	19	18	16	13	13	13	13	14	14	14	15	21
9	14	12	13	14	16	17	17	16	15	14	12	10	9	9	9	9	10	10	10	12	14	15	16	18	13
10	19	21	22	23	22	22	19	17	15	13	12	10	8	9	8	9	9	10	11	12	13	14	15	17	15
11	18	20	21	22	23	24	23	20	16	14	13	11	10	10	10	10	10	11	12	12	13	13	15	16	15
12	17	22	31	29	35	37	36	31	28	26	24	20	17	14	12	13	13	14	13	14	14	15	16	17	21
13	18	20	25	23	24	25	25	24	24	24	21	17	14	14	11	10	11	11	10	10	11	12	12	13	17
14	13	14	16	17	19	19	19	16	17	17	13	13	13	13	14	12	12	12	13	12	11	12	13	14	14
15	15	17	18	20	22	22	21	19	16	14	15	15	16	15	15	16	17	18	19	18	17	19	31	33	19
16	33	35	37	36	36	38	36	33	29	27	24	22	20	18	14	12	11	11	13	13	12	12	12	12	23
17	12	14	16	17	19	20	18	16	13	12	12	12	11	11	11	11	11	11	12	13	13	13	14	14	14
18	16	18	18	21	22	23	22	20	17	15	13	12	11	10	9	9	10	10	9	11	12	13	13	14	15
19	16	19	20	20	22	23	21	18	17	15	13	12	11	10	9	7	7	8	9	11	13	14	15	16	14
20	17	18	19	20	21	23	21	19	16	15	15	11	11	12	12	12	12	12	13	14	15	16	18	19	16
21	20	21	23	24	25	26	23	21	18	17	16	14	13	12	12	12	12	13	13	14	15	16	17	18	17
22	20	21	22	23	24	24	23	22	20	17	16	14	13	12	12	12	12	12	12	13	15	15	16	18	17
23	19	20	21	22	23	24	23	21	18	17	15	14	13	12	12	11	11	12	12	13	13	14	15	17	16
24	18	19	21	23	24	25	22	21	18	16	15	13	11	10	10	10	10	11	12	13	14	16	17	18	16
25	19	20	21	21	23	23	23	21	20	16	15	14	12	11	10	9	9	9	9	9	10	10	11	12	15
26	13	14	15	17	17	18	18	17	15	12	11	10	10	10	10	10	10	10	10	11	12	13	14	15	13
27	16	17	19	20	21	22	22	21	20	18	17	18	16	16	16	15	15	14	14	16	19	27	30	32	19
28	34	37	39	40	43	44	41	38	32	23	19	18	18	17	16	17	17	18	19	19	21	20	20	20	26
29	21	22	22	22	25	27	31	30	31	28	24	22	19	18	18	19	15	14	15	18	23	26	25	26	23
30	28	30	33	34	35	37	33	32	34	34	32	30	25	20	19	17	16	16	16	16	17	17	17	18	25
HRAVE	22	23	25	26	28	29	27	25	23	21	19	17	16	15	14	13	13	14	14	15	17	18	19	20	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	31	28	23	23	25	25	28	21	13	15	15	21	17	14	19	23	14	15	14	16	17	17	16	16	15
MAX	49	46	36	32	33	34	37	32	18	23	24	37	25	19	33	38	20	23	23	23	26	24	24	25	23
MIN	18	17	16	15	19	16	21	13	9	8	10	12	10	11	14	11	11	9	7	11	12	12	11	10	9

DAY	26	27	28	29	30	31
AVE	13	19	26	23	25	***
MAX	18	32	44	31	37	***
MIN	10	14	16	14	16	***

MONTHLY AVERAGE = 19.6 MONTHLY MAXIMUM = 49.1 MONTHLY MINIMUM = 7.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JUNE - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.35	0.58	0.75	0.91	0.81	0.86	1.00	0.90	0.67	0.38	0.16	0.08	0.02	0.00	0.00	0.00	0.00	7.57
2	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.34	0.62	0.78	0.92	1.01	1.04	0.99	0.89	0.66	0.56	0.35	0.16	0.01	0.00	0.00	0.00	0.00	8.42
3	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.57	0.76	0.92	1.01	1.05	1.00	0.88	0.67	0.55	0.34	0.14	0.01	0.00	0.00	0.00	0.00	8.44
4	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.32	0.57	0.76	0.86	1.00	1.07	1.02	0.83	0.71	0.34	0.19	0.06	0.01	0.00	0.00	0.00	0.00	7.91
5	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.25	0.49	0.62	0.51	0.35	0.42	0.46	0.31	0.15	0.16	0.26	0.05	0.00	0.00	0.00	0.00	0.00	4.13
6	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.38	0.61	0.80	0.95	1.04	1.07	1.02	0.89	0.71	0.58	0.37	0.15	0.01	0.00	0.00	0.00	0.00	8.76
7	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.38	0.60	0.79	0.94	1.03	1.06	1.00	0.87	0.69	0.56	0.36	0.15	0.01	0.00	0.00	0.00	0.00	8.61
8	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.40	0.59	0.81	0.95	1.04	1.08	1.02	0.88	0.71	0.59	0.37	0.15	0.01	0.00	0.00	0.00	0.00	8.77
9	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.41	0.62	0.79	0.98	1.07	1.11	1.06	0.90	0.74	0.60	0.39	0.17	0.02	0.00	0.00	0.00	0.00	9.04
10	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.41	0.59	0.82	0.96	1.06	1.09	1.04	0.88	0.72	0.58	0.36	0.14	0.01	0.00	0.00	0.00	0.00	8.83
11	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.36	0.55	0.79	0.94	1.04	1.07	1.02	0.87	0.70	0.55	0.34	0.14	0.01	0.00	0.00	0.00	0.00	8.53
12	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.37	0.57	0.76	0.92	1.01	0.91	0.73	0.83	0.61	0.61	0.34	0.15	0.02	0.00	0.00	0.00	0.00	7.98
13	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.37	0.52	0.77	0.87	1.02	1.06	0.91	0.88	0.73	0.58	0.37	0.16	0.01	0.00	0.00	0.00	0.00	8.40
14	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.40	0.55	0.79	0.95	1.03	1.07	1.02	0.86	0.73	0.59	0.39	0.17	0.02	0.00	0.00	0.00	0.00	8.73
15	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.39	0.57	0.80	0.94	1.03	1.06	1.01	0.80	0.72	0.56	0.35	0.14	0.02	0.00	0.00	0.00	0.00	8.55
16	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.37	0.55	0.78	0.92	0.98	1.06	1.02	0.85	0.73	0.60	0.38	0.16	0.02	0.00	0.00	0.00	0.00	8.55
17	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.40	0.58	0.81	0.96	1.05	1.09	1.04	0.88	0.75	0.59	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.88
18	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.40	0.53	0.82	0.97	1.06	1.10	1.05	0.88	0.76	0.60	0.39	0.17	0.02	0.00	0.00	0.00	0.00	8.91
19	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.55	0.80	0.96	1.05	1.10	1.04	0.89	0.76	0.61	0.39	0.18	0.02	0.00	0.00	0.00	0.00	8.88
20	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.40	0.54	0.79	0.95	1.04	1.07	1.02	0.87	0.71	0.57	0.33	0.11	0.02	0.00	0.00	0.00	0.00	8.57
21	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.54	0.77	0.93	1.02	1.05	1.01	0.87	0.71	0.55	0.33	0.15	0.02	0.00	0.00	0.00	0.00	8.48
22	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.50	0.76	0.92	1.02	1.06	1.01	0.86	0.71	0.51	0.35	0.17	0.02	0.00	0.00	0.00	0.00	8.39
23	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.35	0.48	0.77	0.92	1.01	1.05	1.01	0.86	0.73	0.57	0.33	0.16	0.01	0.00	0.00	0.00	0.00	8.39
24	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.55	0.80	0.95	1.05	1.10	1.04	0.89	0.74	0.60	0.38	0.10	0.01	0.00	0.00	0.00	0.00	8.74
25	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.36	0.57	0.78	0.93	1.04	1.09	1.04	0.90	0.50	0.33	0.20	0.08	0.01	0.00	0.00	0.00	0.00	7.93
26	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.26	0.43	0.59	0.90	0.45	0.43	0.54	0.90	0.78	0.59	0.36	0.15	0.02	0.00	0.00	0.00	0.00	6.50
27	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.36	0.36	0.56	0.74	0.71	1.04	0.93	0.83	0.70	0.58	0.37	0.17	0.02	0.00	0.00	0.00	0.00	7.50
28	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.54	0.76	0.92	1.01	1.06	1.01	0.88	0.69	0.58	0.36	0.15	0.02	0.00	0.00	0.00	0.00	8.48
29	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.38	0.57	0.78	0.93	1.02	1.06	1.01	0.89	0.69	0.58	0.38	0.16	0.02	0.00	0.00	0.00	0.00	8.61
30	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.53	0.75	0.92	0.99	1.03	1.01	0.89	0.69	0.59	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.47
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.37	0.55	0.76	0.91	0.97	1.01	0.97	0.85	0.69	0.54	0.34	0.14	0.02	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	7.57	8.42	8.44	7.91	4.13	8.76	8.61	8.77	9.04	8.83	8.53	7.98	8.40	8.73	8.55	8.55	8.88	8.91	8.88	8.57	8.48	8.39	8.39	8.74	7.93
MAX	1.00	1.04	1.05	1.07	0.62	1.07	1.06	1.08	1.11	1.09	1.07	1.01	1.06	1.07	1.06	1.06	1.09	1.10	1.10	1.07	1.05	1.06	1.05	1.10	1.09
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.50	7.50	8.48	8.61	8.47	***
MAX	0.90	1.04	1.06	1.06	1.03	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JUNE - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.00 MONTHLY MAXIMUM = 0.00 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
JULY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	3.8	2.7	2.5	2.5	6.8	6.5	7.2	4.8	4.3	4.1	4.0	6.0	6.0	11.5	15.1	12.7	14.0	14.9	14.7	17.2	11.6	9.9	8.9	9.9	8.4
2	10.5	8.5	3.3	3.4	3.8	5.2	6.4	5.4	2.5	2.8	4.6	4.3	5.7	5.7	10.4	8.1	10.6	15.4	5.2	7.6	6.4	8.6	7.2	6.4	6.6
3	8.6	6.2	6.9	7.5	6.7	6.6	8.0	5.4	2.1	4.2	4.3	4.9	6.9	9.4	10.0	13.0	14.8	15.9	14.9	11.4	8.3	2.4	1.6	7.0	7.8
4	4.0	4.8	4.4	5.8	5.2	7.1	6.4	3.5	1.6	2.4	5.1	10.6	13.7	11.9	12.2	15.0	16.1	16.8	16.3	14.8	9.7	9.2	4.8	1.6	8.5
5	3.7	4.9	7.2	6.9	6.3	6.6	5.8	5.2	4.6	4.1	9.4	10.3	12.1	15.0	15.2	13.6	18.8	18.6	18.3	13.9	5.4	3.8	3.3	4.2	9.0
6	2.8	2.3	5.9	6.8	6.6	6.3	3.2	2.9	3.8	2.5	6.5	11.0	12.0	15.1	17.1	16.4	17.2	18.7	18.2	14.0	7.3	4.4	1.7	1.7	8.5
7	5.2	6.7	6.6	7.2	7.8	5.3	2.9	1.9	1.9	6.0	10.1	9.8	12.4	11.1	11.6	13.8	16.6	16.8	15.5	10.0	4.1	0.9	2.0	4.5	7.9
8	5.3	4.6	5.8	4.3	3.7	4.4	1.9	1.7	4.6	8.4	8.5	8.9	10.6	11.4	13.3	13.3	13.6	14.8	12.1	11.8	7.3	8.3	9.6	7.8	8.2
9	12.4	12.3	10.5	4.6	2.4	0.9	1.9	2.2	CAL	CAL	CAL	10.6	11.5	14.0	12.9	13.4	13.5	13.9	14.0	12.1	10.4	7.9	6.8	5.3	9.2
10	7.4	11.8	10.3	7.4	10.0	4.3	4.8	8.7	9.4	12.6	14.9	13.2	14.6	15.3	17.2	19.0	20.0	22.5	22.8	20.4	18.1	15.7	16.8	13.6	13.8
11	12.4	6.4	5.9	8.6	8.9	5.2	2.4	2.1	5.6	9.7	11.2	10.9	13.3	12.5	13.9	15.2	16.3	16.4	15.2	17.4	12.3	6.1	5.8	2.9	9.9
12	2.2	3.4	7.7	8.1	8.1	5.3	6.4	6.2	5.3	2.3	6.3	9.4	11.2	14.0	15.4	16.9	15.7	14.2	8.8	10.9	5.6	9.4	6.3	7.4	8.6
13	13.5	8.0	2.9	2.7	6.2	4.1	2.9	8.0	7.3	12.7	17.9	15.7	15.9	15.6	17.7	13.4	14.2	9.1	8.8	9.7	5.3	2.9	5.7	10.9	9.6
14	8.2	16.8	9.9	9.5	6.4	3.6	6.0	3.9	3.1	4.2	5.4	7.1	10.7	14.1	14.6	14.3	16.5	14.8	13.3	11.3	7.7	8.0	8.8	9.9	9.5
15	3.6	5.1	8.2	11.4	11.0	10.2	8.4	4.1	2.1	5.5	7.4	5.1	6.1	10.5	16.1	17.7	24.4	7.8	6.4	11.3	5.2	3.5	5.1	8.2	8.5
16	9.6	8.8	4.5	4.7	6.6	5.4	5.6	5.7	4.2	3.6	9.5	6.6	7.2	7.1	5.2	10.2	10.6	14.4	13.4	25.8	14.7	9.2	8.5	14.3	9.0
17	13.6	11.9	11.0	7.9	9.0	10.4	9.3	6.8	6.7	12.1	11.6	9.6	4.4	9.6	6.2	6.3	8.6	14.2	13.9	5.4	3.0	3.9	8.9	8.2	8.9
18	4.9	4.7	3.9	5.6	5.8	5.7	4.9	2.3	3.0	8.3	9.8	10.9	12.1	11.4	13.7	13.9	16.5	18.4	15.0	14.7	13.1	6.5	6.1	6.7	9.1
19	7.4	5.0	8.0	5.8	6.6	5.7	7.7	6.6	5.7	6.0	2.7	8.3	13.9	17.4	16.8	18.7	19.6	19.3	15.9	11.5	5.5	2.4	3.1	2.6	9.3
20	4.0	4.1	3.5	3.0	6.5	5.0	3.1	2.9	3.4	6.2	7.0	13.1	11.9	15.6	19.1	19.2	22.4	23.8	21.5	16.2	14.3	11.7	9.8	5.9	10.6
21	5.6	3.9	3.0	3.3	1.8	3.6	2.0	2.7	3.0	8.5	13.4	12.9	13.4	17.2	18.4	20.2	16.8	15.1	12.9	6.0	12.0	13.3	12.1	12.1	9.7
22	5.8	4.9	4.4	6.8	6.2	3.8	3.6	5.6	5.2	5.1	4.2	6.5	4.9	11.7	11.1	8.7	7.2	6.0	5.8	7.0	5.0	11.9	4.2	10.8	6.5
23	7.7	6.4	4.8	7.0	11.0	9.0	7.0	10.0	6.3	3.7	14.9	11.1	8.0	5.2	4.3	2.7	2.7	2.1	2.5	2.5	4.7	4.9	5.0	4.9	6.2
24	5.9	4.4	4.9	3.5	4.8	3.0	2.9	3.0	2.2	3.1	4.3	3.8	13.3	24.1	11.9	19.1	13.0	9.6	7.3	4.9	8.6	5.6	3.5	4.2	7.1
25	4.9	6.9	6.0	6.0	5.5	4.9	4.2	2.7	2.6	3.0	3.2	6.4	5.7	7.3	13.3	8.6	5.3	5.0	10.5	12.0	13.0	13.1	8.1	7.3	6.9
26	8.5	6.4	7.8	6.2	4.8	6.9	5.8	4.1	3.3	3.3	3.4	4.4	6.6	7.0	4.8	6.3	7.3	13.6	16.6	13.3	13.1	23.6	25.3	23.1	9.4
27	16.8	17.5	12.3	5.6	11.2	8.4	10.1	8.9	10.5	11.6	13.3	10.1	9.4	6.1	11.6	12.4	5.7	18.5	10.7	7.7	8.3	9.4	5.4	6.6	10.3
28	5.0	6.9	7.7	7.4	8.6	7.0	7.0	7.2	3.8	4.2	3.2	5.9	3.8	5.8	5.4	5.8	16.5	19.9	21.4	19.1	8.0	6.9	8.0	9.7	8.5
29	9.1	6.5	9.1	8.8	7.4	8.2	5.5	3.6	3.8	2.0	4.8	6.8	7.3	8.4	10.9	12.4	15.6	17.2	17.1	16.3	12.3	11.5	9.2	5.8	9.1
30	2.2	3.9	5.5	5.1	5.2	6.2	5.6	3.8	1.9	4.7	9.1	10.8	11.2	13.9	14.8	18.4	18.9	18.3	18.0	14.5	13.2	12.0	4.8	4.1	9.4
31	4.5	5.3	5.6	4.4	6.7	4.2	3.2	5.9	4.2	2.1	3.7	4.3	5.7	6.5	7.8	13.7	15.8	16.9	14.4	12.1	9.6	7.3	6.2	7.1	7.4
HRAVE	7.1	6.8	6.5	6.1	6.7	5.8	5.2	4.8	4.3	5.6	7.8	8.7	9.7	11.7	12.5	13.3	14.3	14.9	13.6	12.3	9.1	8.2	7.2	7.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	8.4	6.6	7.8	8.5	9.0	8.5	7.9	8.2	9.2	13.8	9.9	8.6	9.6	9.5	8.5	9.0	8.9	9.1	9.3	10.6	9.7	6.5	6.2	7.1	6.9
MAX	17.2	15.4	15.9	16.8	18.8	18.7	16.8	14.8	14.0	22.8	17.4	16.9	17.9	16.8	24.4	25.8	14.2	18.4	19.6	23.8	20.2	11.9	14.9	24.1	13.3
MIN	2.5	2.5	1.6	1.6	3.3	1.7	0.9	1.7	0.9	4.3	2.1	2.2	2.7	3.1	2.1	3.6	3.0	2.3	2.4	2.9	1.8	3.6	2.1	2.2	2.6

DAY	26	27	28	29	30	31
AVE	9.4	10.3	8.5	9.1	9.4	7.4
MAX	25.3	18.5	21.4	17.2	18.9	16.9
MIN	3.3	5.4	3.2	2.0	1.9	2.1

MONTHLY AVERAGE = 8.8 MONTHLY MAXIMUM = 25.8 MONTHLY MINIMUM = 0.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
JULY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	219	286	309	128	128	95	100	113	124	100	20	293	314	240	267	280	283	280	287	286	281	265	296	314	177
2	297	300	185	133	132	106	81	78	126	287	291	325	282	264	287	274	263	256	113	166	153	162	160	131	89
3	114	122	122	128	114	116	124	123	131	277	265	295	299	284	301	290	294	287	286	296	305	292	269	311	335
4	113	126	101	99	110	115	112	101	113	282	278	307	284	291	273	279	278	286	284	285	295	293	300	226	195
5	128	132	116	115	108	108	106	125	134	283	286	298	284	291	287	289	284	292	282	294	296	227	135	135	279
6	242	127	124	102	103	93	63	61	137	185	275	295	303	298	292	288	289	292	298	300	292	297	248	328	9
7	83	102	95	99	93	112	309	344	331	282	285	296	286	290	296	299	295	289	294	302	310	287	106	94	154
8	103	281	145	136	127	124	68	326	312	304	295	294	294	292	302	300	294	293	302	293	300	290	297	301	94
9	307	304	303	216	153	79	108	139	CAL	CAL	CAL	287	289	290	276	298	294	292	295	296	298	295	299	306	334
10	299	305	299	311	317	252	289	309	304	303	298	290	287	279	282	278	285	283	285	291	298	310	312	305	321
11	286	149	303	308	300	280	208	174	282	292	302	283	282	286	292	280	284	282	280	8	168	143	115	322	45
12	84	99	117	125	128	129	113	106	148	265	290	304	299	294	290	288	285	292	356	132	24	298	136	143	49
13	143	116	70	295	182	79	356	168	283	308	295	310	306	283	281	279	283	284	301	304	273	124	177	311	136
14	292	142	108	100	122	156	126	94	21	294	298	324	283	286	289	290	289	302	289	292	273	310	315	300	202
15	266	135	154	137	112	110	123	113	172	306	335	318	292	328	302	238	146	155	52	119	147	164	110	76	6
16	106	116	168	135	110	124	139	127	128	83	67	71	79	77	322	275	274	287	284	151	112	119	119	119	262
17	84	56	57	69	59	50	63	95	72	71	67	60	10	73	59	266	282	16	50	89	49	119	69	61	130
18	344	92	91	87	101	86	96	73	306	293	292	286	287	271	272	276	283	285	286	288	294	303	291	310	18
19	309	226	148	126	126	138	124	105	134	153	192	264	283	278	264	280	277	281	284	283	289	317	201	128	196
20	124	99	312	215	151	128	118	120	271	295	289	277	263	285	283	290	288	281	285	287	297	308	303	316	185
21	202	137	141	213	324	188	122	152	285	291	296	294	291	281	279	287	298	290	291	333	61	143	123	126	355
22	92	125	112	123	135	116	154	158	152	159	156	152	254	92	129	129	166	183	178	181	202	289	245	148	350
23	174	174	151	80	71	160	98	56	126	129	133	152	123	88	215	196	249	184	204	142	125	124	119	98	59
24	129	110	107	112	143	110	96	129	165	163	161	186	122	49	85	50	63	60	88	105	129	134	115	128	345
25	117	108	106	103	83	123	93	124	118	157	277	282	268	279	24	334	333	345	56	52	49	45	75	75	156
26	62	84	82	75	100	112	90	115	127	140	124	142	128	190	211	288	281	284	283	290	353	42	45	45	262
27	47	51	69	76	44	87	85	74	64	116	86	87	95	149	170	182	120	164	163	147	139	126	125	105	177
28	103	145	145	118	121	116	132	122	109	74	120	153	189	186	232	223	171	311	47	66	70	58	84	73	303
29	72	81	80	85	109	80	88	108	112	95	278	280	268	273	266	284	284	288	286	291	298	305	303	286	332
30	265	138	130	110	97	87	79	73	35	295	285	299	272	281	279	282	279	283	281	297	307	304	284	228	356
31	166	129	107	100	78	70	96	105	83	313	250	282	295	300	286	281	278	284	284	283	297	251	124	116	271

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
JULY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	26	24	29	41	12	14	11	13	18	33	59	35	43	37	20	27	22	14	12	8	10	11	15	13	23
2	8	7	22	12	9	7	10	16	47	49	40	50	41	53	40	27	33	16	54	12	13	10	14	14	25
3	9	12	11	13	10	13	11	17	50	31	46	47	44	33	34	20	20	13	10	11	9	19	19	10	21
4	39	12	12	9	9	10	7	18	45	46	36	24	23	27	24	17	19	13	10	8	5	5	17	38	20
5	9	4	9	10	7	8	12	12	25	39	21	29	25	20	20	22	17	12	10	10	10	12	13	17	15
6	37	29	8	7	9	7	21	31	16	40	26	18	25	22	19	14	13	13	10	9	5	34	24	23	19
7	29	8	8	11	7	15	45	37	69	27	18	25	24	25	29	22	16	14	10	10	8	23	19	9	21
8	20	39	8	8	20	12	50	26	25	20	27	35	24	26	32	25	21	20	14	9	6	4	5	6	20
9	9	7	10	16	15	22	25	28	CAL	CAL	CAL		24	26	19	21	23	21	16	11	10	8	7	6	6	16
10	6	7	8	13	10	17	16	15	16	18	15	19	15	12	15	11	12	9	8	8	8	9	8	5	12
11	18	15	27	15	5	12	22	35	23	23	22	18	14	17	21	18	16	13	10	40	27	50	19	26	21
12	47	11	8	12	12	14	11	16	22	52	30	21	23	18	15	14	14	24	29	13	35	46	38	19	23
13	11	12	48	18	18	36	31	36	41	12	14	16	15	13	12	18	14	19	20	12	13	21	35	10	21
14	15	11	16	10	15	22	14	21	43	45	39	37	23	20	17	19	19	18	16	9	9	12	9	12	20
15	29	11	9	10	9	9	11	17	43	19	37	49	47	31	19	31	12	29	41	10	19	15	12	16	22
16	14	15	11	8	9	11	9	13	16	28	11	23	19	39	48	23	20	15	12	17	11	19	10	9	17
17	12	11	7	17	14	11	11	17	16	8	13	15	44	14	42	40	43	33	14	47	28	19	8	9	21
18	23	34	28	8	16	12	13	23	36	19	19	23	21	32	22	19	14	11	11	9	9	9	11	8	18
19	9	19	11	19	15	16	9	11	19	19	66	42	15	17	15	12	11	9	9	6	9	31	27	18	18
20	49	11	36	31	15	9	27	17	37	25	21	12	21	19	16	16	14	8	9	8	8	10	11	11	18
21	20	24	21	55	51	64	32	29	34	25	15	16	21	15	12	10	12	10	8	25	23	10	13	10	23
22	16	18	16	13	9	17	17	18	29	19	40	33	67	22	22	28	24	25	25	8	21	13	33	10	23
23	11	15	30	19	16	56	14	14	23	32	13	15	15	16	46	48	38	29	22	12	13	11	10	17	22
24	10	10	19	15	9	8	14	16	31	42	41	69	54	11	12	9	10	11	14	15	11	12	31	15	20
25	9	9	9	9	10	10	16	30	33	42	52	33	45	38	24	24	42	24	12	13	11	9	14	11	22
26	10	11	11	10	16	8	12	19	34	37	43	39	39	33	48	40	37	14	9	8	18	10	10	7	22
27	8	9	8	33	9	20	9	14	14	21	16	21	29	57	24	21	19	12	12	14	11	9	12	19	18
28	25	8	9	7	7	8	6	9	24	28	45	36	57	42	41	38	22	17	16	12	18	8	11	26	22
29	13	9	9	10	9	9	10	16	19	54	39	29	30	31	20	20	14	13	9	8	8	7	7	24	17
30	48	18	10	7	12	7	12	13	46	25	19	17	19	16	16	13	11	11	8	8	8	7	15	25	16
31	40	16	15	29	9	31	30	18	19	47	46	52	51	38	35	20	15	11	10	8	11	25	10	12	25
HRAVE	20	14	16	16	13	17	17	20	30	31	31	30	31	26	25	22	20	16	15	13	13	16	16	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	23	25	21	20	15	19	21	20	16	12	21	23	21	20	22	17	21	18	18	18	23	23	22	20	22
MAX	59	54	50	46	39	40	69	50	28	19	50	52	48	45	49	48	47	36	66	49	64	67	56	69	52
MIN	8	7	9	5	4	5	7	4	6	5	5	8	10	9	9	8	7	8	6	8	8	8	10	8	9

DAY	26	27	28	29	30	31
AVE	22	18	22	17	16	25
MAX	48	57	57	54	48	52
MIN	7	8	6	7	7	8

MONTHLY AVERAGE = 20.0 MONTHLY MAXIMUM = 68.8 MONTHLY MINIMUM = 3.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
JULY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	26.2	25.4	24.9	23.3	21.6	21.5	22.6	26.1	29.1	31.6	33.1	34.5	35.8	37.6	37.9	38.3	38.2	37.9	36.7	34.8	33.3	32.7	31.7	30.9	31.1
2	29.6	28.8	27.2	27.0	26.1	25.2	25.9	28.9	31.5	32.7	33.8	35.0	36.2	37.4	38.0	37.5	35.8	30.9	31.9	31.5	30.6	30.3	29.4	28.5	31.2
3	27.6	27.1	26.4	25.8	25.1	24.8	25.6	27.9	29.7	31.6	33.6	35.1	37.0	38.4	38.3	38.7	38.7	38.2	37.5	35.9	34.7	34.1	33.1	32.2	32.4
4	30.9	29.7	28.8	27.9	26.9	26.7	28.4	30.4	33.0	34.7	37.2	38.6	39.5	40.4	40.9	40.9	40.7	40.2	39.2	37.4	36.0	35.2	34.5	33.5	34.6
5	32.0	30.8	29.9	28.3	28.1	27.9	29.2	30.8	33.5	34.9	37.3	39.0	40.5	40.9	41.2	41.6	41.3	40.9	39.9	38.4	36.8	35.8	34.0	32.9	35.3
6	32.2	30.9	29.4	28.8	27.5	26.5	26.5	27.0	30.4	34.5	37.5	39.7	41.1	41.6	41.9	42.2	42.0	41.1	40.1	38.6	36.8	35.8	35.2	34.5	35.1
7	32.2	30.9	30.0	28.5	27.9	28.4	27.4	29.6	32.7	35.8	37.8	39.4	40.6	41.2	41.7	42.0	41.7	41.1	40.1	38.7	37.4	36.3	35.3	33.3	35.4
8	32.1	30.7	29.2	29.7	29.4	29.1	29.9	31.8	34.3	36.1	37.7	38.9	39.9	40.8	41.2	41.3	41.3	40.8	40.0	38.7	37.4	36.2	35.3	34.4	35.7
9	33.9	33.2	32.5	31.2	30.4	29.9	30.2	33.3	CAL	CAL	CAL	39.0	40.2	40.7	40.8	41.0	41.1	40.8	39.9	38.5	37.3	36.2	35.5	34.9	36.2
10	33.8	33.3	32.7	32.2	32.0	30.9	31.1	33.0	34.6	35.7	37.1	38.9	40.2	40.8	42.3	42.5	42.5	41.8	40.6	38.9	37.8	37.0	36.3	35.7	36.7
11	35.0	33.4	33.6	33.7	32.7	31.4	31.0	32.9	34.9	37.2	38.6	39.8	39.9	41.7	42.6	43.1	42.8	42.7	42.4	39.2	37.9	36.8	34.9	34.2	37.2
12	33.2	32.7	31.7	30.7	29.0	28.7	29.8	32.0	34.5	36.5	39.2	41.3	42.7	43.8	44.4	44.7	43.4	42.8	41.5	39.2	38.6	39.0	37.2	35.2	37.2
13	34.3	34.0	33.6	32.5	31.5	31.5	31.9	34.0	33.5	35.6	37.6	38.8	39.7	40.6	40.7	40.6	40.3	39.8	39.5	38.5	37.1	36.0	35.0	35.6	36.3
14	35.1	32.2	31.1	30.4	29.6	28.7	29.8	31.9	33.9	35.7	37.1	38.8	40.6	41.2	41.6	41.6	41.5	40.8	40.1	38.8	37.1	36.4	35.6	35.0	36.0
15	33.9	32.6	31.5	31.5	30.7	30.2	30.2	31.1	32.6	34.0	36.1	37.7	39.0	40.1	40.8	39.4	32.2	31.3	33.1	32.8	31.3	30.9	30.6	31.2	33.5
16	30.8	30.9	29.9	29.4	29.2	28.8	28.3	29.2	30.2	32.8	35.1	36.8	38.2	39.8	40.0	40.9	41.2	41.0	39.8	34.0	33.7	32.7	32.3	32.0	34.0
17	31.0	30.5	30.1	29.6	29.5	29.0	28.9	28.8	31.2	31.4	32.3	32.7	34.7	37.2	38.0	38.7	38.8	36.8	35.0	34.3	33.9	32.9	32.3	32.0	32.9
18	30.9	29.8	28.7	28.1	27.1	27.3	27.7	30.3	32.6	35.0	36.7	38.4	39.3	40.0	40.6	41.0	40.8	40.1	39.0	38.3	37.3	36.5	35.8	35.0	34.9
19	34.9	33.7	32.1	31.0	30.0	29.2	29.4	31.3	33.2	34.4	36.5	37.7	38.8	40.0	40.2	39.4	39.3	38.3	37.3	36.5	36.0	35.9	35.3	34.9	35.2
20	33.1	32.3	32.0	30.4	29.6	30.3	30.2	30.9	33.9	36.0	36.4	37.3	39.0	39.9	40.0	40.0	39.4	37.8	37.1	35.6	35.0	34.5	34.0	33.6	34.9
21	32.0	31.7	31.0	30.8	30.2	29.5	29.9	30.8	33.5	35.3	36.0	37.0	39.1	38.9	38.2	37.1	37.0	36.3	35.8	35.4	34.8	33.1	32.6	31.1	34.0
22	30.6	30.1	29.8	29.4	28.4	28.0	28.4	30.4	32.2	32.7	34.4	37.1	37.6	38.0	36.6	38.1	37.7	37.9	36.8	35.6	34.8	33.9	32.6	32.3	33.5
23	31.2	30.6	30.1	29.6	27.8	24.8	22.3	23.6	24.1	24.5	26.6	25.1	25.4	26.6	27.4	28.2	28.8	29.4	29.4	28.7	27.8	27.1	26.6	26.5	27.2
24	26.1	25.4	25.4	24.9	24.4	24.5	25.3	26.3	27.4	29.6	32.1	33.1	30.4	22.3	23.0	24.9	26.3	27.6	28.1	27.8	27.2	26.5	26.2	25.8	26.7
25	25.6	25.4	25.0	25.0	25.2	25.1	25.2	26.0	28.6	30.2	31.5	33.7	35.3	35.1	33.4	33.3	32.8	32.0	32.2	31.8	31.2	30.6	29.8	29.4	29.7
26	28.9	28.1	27.7	27.1	26.3	25.5	26.8	28.5	30.4	32.3	34.7	36.5	38.0	39.5	39.5	39.6	40.0	39.8	38.7	37.0	34.9	31.5	30.8	29.5	33.0
27	29.2	29.1	28.8	28.6	28.6	28.0	28.8	31.2	33.0	35.5	36.7	38.0	39.2	40.1	39.8	35.9	36.1	34.5	33.7	32.5	31.6	30.8	30.3	30.8	32.9
28	30.4	28.9	28.2	28.0	27.1	26.9	26.9	29.5	32.6	35.3	37.5	39.7	41.0	41.8	42.1	42.8	41.5	37.3	32.9	32.2	32.3	32.9	31.1	31.1	33.8
29	30.1	29.6	28.2	27.6	27.3	26.5	27.3	29.3	32.4	34.5	37.3	39.3	41.3	42.5	43.3	43.5	43.3	42.7	41.8	39.9	38.5	37.4	36.5	35.8	35.7
30	35.3	33.7	31.7	31.3	29.0	28.5	28.4	31.0	33.6	36.1	38.3	40.4	42.0	43.4	44.0	44.4	44.2	43.8	42.7	41.1	39.9	38.8	37.8	36.5	37.3
31	35.5	34.2	32.8	31.7	29.6	28.6	29.6	31.1	34.9	36.9	39.2	41.2	42.5	44.0	45.0	45.1	44.6	43.9	42.5	41.2	40.0	38.9	36.7	35.3	37.7
HRAVE	31.5	30.6	29.8	29.2	28.3	27.8	28.2	30.0	32.1	34.0	35.8	37.4	38.5	39.2	39.5	39.6	39.2	38.4	37.6	36.2	35.1	34.3	33.4	32.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	31.1	31.2	32.4	34.6	35.3	35.1	35.4	35.7	36.2	36.7	37.2	37.2	36.3	36.0	33.5	34.0	32.9	34.9	35.2	34.9	34.0	33.5	27.2	26.7	29.7
MAX	38.3	38.0	38.7	40.9	41.6	42.2	42.0	41.3	41.1	42.5	43.1	44.7	40.7	41.6	40.8	41.2	38.8	41.0	40.2	40.0	39.1	38.1	31.2	33.1	35.3
MIN	21.5	25.2	24.8	26.7	27.9	26.5	27.4	29.1	29.9	30.9	31.0	28.7	31.5	28.7	30.2	28.3	28.8	27.1	29.2	29.6	29.5	28.0	22.3	22.3	25.0

DAY	26	27	28	29	30	31
AVE	33.0	32.9	33.8	35.7	37.3	37.7
MAX	40.0	40.1	42.8	43.5	44.4	45.1
MIN	25.5	28.0	26.9	26.5	28.4	28.6

MONTHLY AVERAGE = 34.1 MONTHLY MAXIMUM = 45.1 MONTHLY MINIMUM = 21.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
JULY - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.7	0.4	0.5	0.6	0.7	0.4	-0.6	-1.4	-1.6	-1.4	-1.3	-1.4	-1.4	-1.8	-1.8	-1.6	-1.4	-1.1	-0.8	-0.2	0.1	0.1	0.2	0.2	-0.6
2	0.3	0.4	0.5	0.3	0.5	0.6	-0.4	-1.3	-0.9	-1.0	-1.2	-1.3	-1.5	-1.6	-1.8	-1.6	-0.9	-0.4	-0.4	-0.2	-0.1	-0.1	-0.1	-0.1	-0.5
3	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-1.0	-1.4	-0.8	-1.0	-1.3	-1.3	-1.6	-1.9	-1.5	-1.6	-1.4	-1.1	-0.8	-0.2	0.1	0.3	0.4	0.6	-0.7
4	0.5	0.6	0.5	0.5	0.6	0.2	-1.1	-1.1	-0.8	-0.9	-1.3	-1.6	-1.7	-1.8	-1.6	-1.5	-1.3	-1.1	-0.7	-0.2	0.2	0.4	0.4	0.4	-0.5
5	0.4	0.5	0.4	0.3	0.4	0.2	-0.9	-1.4	-1.4	-1.0	-1.5	-1.5	-1.7	-1.8	-1.8	-1.5	-1.3	-1.0	-0.6	-0.1	0.4	0.5	0.6	0.4	-0.6
6	0.6	0.6	0.4	0.8	0.9	0.7	-0.2	-0.5	-1.0	-0.9	-1.3	-1.5	-1.7	-1.7	-1.6	-1.5	-1.4	-1.0	-0.6	0.0	0.5	0.4	0.4	0.4	-0.4
7	0.5	0.8	0.9	0.6	0.7	0.3	0.0	-0.5	-0.6	-1.1	-1.4	-1.5	-1.6	-1.7	-1.6	-1.5	-1.4	-1.1	-0.7	-0.1	0.4	0.6	0.5	0.7	-0.4
8	0.6	0.6	0.6	0.4	0.4	0.5	-0.1	-0.4	-0.9	-1.4	-1.6	-1.5	-1.6	-1.7	-1.7	-1.5	-1.4	-1.0	-0.7	-0.2	0.3	0.4	0.3	0.4	-0.5
9	0.3	0.2	0.3	0.5	0.2	0.2	-0.3	-0.8	CAL	CAL	CAL	-1.5	-1.7	-1.8	-1.7	-1.5	-1.4	-1.2	-0.7	-0.1	0.1	0.3	0.3	0.4	-0.5
10	0.5	0.2	0.2	0.2	0.1	0.4	0.0	-0.7	-1.1	-1.2	-1.5	-1.6	-1.8	-1.5	-1.7	-1.5	-1.3	-1.0	-0.6	-0.2	0.0	0.1	0.1	0.3	-0.6
11	0.2	0.2	0.3	0.3	0.4	0.3	-0.1	-0.6	-0.8	-1.2	-1.5	-1.5	-1.1	-1.7	-1.7	-1.6	-1.4	-1.2	-0.8	-0.2	0.0	0.1	0.1	0.3	-0.5
12	0.3	0.5	0.4	0.2	0.1	0.0	-0.9	-1.4	-1.6	-1.0	-1.4	-1.7	-1.6	-1.8	-1.7	-1.7	-0.9	-0.4	-0.2	-0.2	0.0	0.1	0.1	0.1	-0.6
13	0.0	0.3	0.4	0.3	0.2	0.3	-0.2	-0.7	-0.1	-0.5	-1.2	-1.3	-1.5	-1.8	-2.0	-1.7	-1.4	-0.7	-0.5	-0.2	0.2	0.2	0.1	0.1	-0.5
14	0.2	-0.1	0.0	0.1	0.2	0.2	-0.7	-1.2	-1.0	-1.1	-1.3	-1.5	-1.8	-1.9	-1.8	-1.6	-1.4	-1.0	-0.7	-0.1	0.2	0.2	0.2	0.2	-0.6
15	0.2	0.4	0.3	0.2	0.1	0.1	-0.3	-0.8	-0.8	-1.0	-1.4	-1.4	-1.6	-1.6	-1.8	-2.0	-1.1	-0.7	-0.3	-0.2	-0.1	0.1	0.1	0.1	-0.6
16	0.1	0.1	0.2	0.2	0.1	0.2	-0.3	-0.6	-0.8	-1.1	-1.6	-1.8	-2.0	-1.9	-1.2	-1.4	-1.3	-1.3	-0.7	-0.4	-0.1	-0.1	0.0	0.0	-0.7
17	-0.1	-0.1	0.0	0.1	0.1	0.0	0.0	-0.2	-1.0	-0.9	-0.9	-0.7	-1.0	-2.2	-1.9	-1.3	-1.0	-0.6	-0.3	0.0	0.3	0.5	0.3	0.4	-0.4
18	0.3	0.4	0.4	0.6	0.4	0.2	-0.4	-0.7	-0.8	-1.3	-1.5	-1.7	-1.8	-1.7	-1.6	-1.6	-1.4	-1.0	-0.5	-0.2	0.0	0.2	0.2	0.1	-0.6
19	0.1	0.4	0.2	0.0	0.1	0.2	-0.3	-0.9	-1.4	-1.4	-1.0	-1.0	-1.1	-1.4	-1.3	-0.8	-0.8	-0.4	-0.1	0.1	0.2	0.2	0.3	0.2	-0.4
20	0.6	0.6	0.6	0.6	0.4	0.3	0.0	-0.5	-0.8	-1.1	-1.1	-1.2	-1.6	-1.7	-1.6	-1.5	-1.3	-0.9	-0.6	-0.2	-0.1	0.0	0.0	0.1	-0.5
21	0.4	0.3	0.2	0.4	0.3	0.2	0.2	-0.5	-0.7	-0.9	-1.1	-1.5	-1.8	-1.5	-1.2	-0.9	-0.8	-0.4	-0.2	0.0	-0.1	-0.1	0.0	-0.1	-0.4
22	0.0	0.0	0.0	0.0	-0.1	0.0	-0.3	-1.1	-1.6	-1.3	-1.4	-2.2	-1.6	-2.2	-1.4	-1.9	-1.4	-1.1	-0.6	-0.2	0.0	-0.2	0.1	0.0	-0.8
23	0.1	0.1	0.0	-0.1	-0.3	-0.2	0.1	0.1	0.0	-0.2	-0.4	-0.2	-0.4	-0.5	-0.5	-0.6	-0.4	-0.4	-0.3	0.1	0.1	0.1	0.1	0.2	-0.2
24	0.2	0.2	0.2	0.5	0.2	0.2	0.0	-0.5	-0.6	-1.0	-1.5	-1.5	-1.0	0.1	0.1	0.0	-0.2	-0.1	0.0	0.4	0.4	0.2	0.2	0.2	-0.1
25	0.3	0.3	0.3	0.2	0.3	0.3	0.2	-0.4	-0.7	-0.9	-0.9	-1.3	-1.2	-0.9	-0.8	-0.6	-0.4	-0.4	-0.2	0.0	0.0	0.1	0.2	0.2	-0.3
26	0.2	0.3	0.2	0.3	0.3	0.4	-0.6	-1.2	-1.0	-1.1	-1.3	-1.6	-1.9	-2.0	-1.6	-1.3	-1.1	-1.0	-0.6	0.0	0.1	-0.1	-0.1	-0.1	-0.6
27	0.0	0.0	0.1	0.2	0.1	0.1	-0.4	-1.2	-1.4	-1.9	-2.2	-2.2	-2.2	-2.0	-1.7	-0.8	-0.9	-0.9	-0.6	-0.2	0.0	0.0	0.3	0.2	-0.7
28	0.3	0.3	0.4	0.2	0.1	0.2	-0.2	-1.4	-1.3	-1.5	-1.3	-1.9	-1.5	-1.7	-1.3	-1.5	-1.4	-0.7	0.2	0.2	0.3	0.6	0.3	0.2	-0.5
29	0.4	0.7	0.3	0.3	0.6	0.4	-0.7	-0.9	-1.4	-0.8	-1.1	-1.4	-1.5	-1.5	-1.6	-1.5	-1.3	-1.0	-0.5	0.0	0.3	0.4	0.4	0.5	-0.5
30	0.4	0.5	0.4	0.6	0.9	0.8	-0.5	-1.1	-0.7	-0.9	-1.3	-1.7	-1.6	-1.7	-1.6	-1.4	-1.1	-0.9	-0.4	0.2	0.3	0.4	0.5	0.6	-0.4
31	0.7	0.6	0.7	0.8	0.8	0.5	0.1	-1.3	-1.5	-0.8	-1.1	-1.3	-1.4	-1.6	-1.5	-1.5	-1.3	-1.0	-0.4	0.0	0.2	0.4	0.3	0.2	-0.4
HRAVE	0.3	0.3	0.3	0.3	0.3	0.3	-0.3	-0.9	-1.0	-1.1	-1.3	-1.5	-1.5	-1.6	-1.5	-1.4	-1.2	-0.8	-0.5	-0.1	0.1	0.2	0.2	0.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.6	-0.5	-0.7	-0.5	-0.6	-0.4	-0.4	-0.5	-0.5	-0.6	-0.5	-0.6	-0.5	-0.6	-0.6	-0.7	-0.4	-0.6	-0.4	-0.5	-0.4	-0.8	-0.2	-0.1	-0.3
MAX	0.7	0.6	0.6	0.6	0.6	0.9	0.9	0.6	0.5	0.5	0.4	0.5	0.4	0.2	0.4	0.2	0.5	0.6	0.4	0.6	0.4	0.1	0.2	0.5	0.3
MIN	-1.8	-1.8	-1.9	-1.8	-1.8	-1.7	-1.7	-1.7	-1.8	-1.8	-1.7	-1.8	-2.0	-1.9	-2.0	-2.0	-2.2	-1.8	-1.4	-1.7	-1.8	-2.2	-0.6	-1.5	-1.3

DAY	26	27	28	29	30	31
AVE	-0.6	-0.7	-0.5	-0.5	-0.4	-0.4
MAX	0.4	0.3	0.6	0.7	0.9	0.8
MIN	-2.0	-2.2	-1.9	-1.6	-1.7	-1.6

MONTHLY AVERAGE = -0.5 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = -2.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
JULY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	701	701	701	701	701	701	701	702	702	702	701	701	700	700	699	699	698	698	698	698	699	700	700	701	700
2	701	701	701	701	701	702	702	703	703	703	703	702	702	701	701	700	700	701	701	701	701	702	702	702	701
3	702	702	702	703	703	703	704	704	704	704	704	703	702	702	701	701	700	700	700	701	701	702	702	702	702
4	702	702	702	702	702	702	703	703	703	703	703	702	702	701	701	700	699	699	699	700	700	701	701	701	701
5	701	701	701	701	701	702	702	702	702	702	702	701	701	700	699	699	698	698	698	698	699	699	699	699	700
6	699	699	699	700	700	700	701	701	702	701	701	701	700	700	699	699	699	698	698	698	699	699	700	700	700
7	700	700	700	700	700	701	701	702	702	702	701	701	700	700	699	699	698	698	698	698	698	699	699	699	700
8	699	699	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	697	698	698	699	699	699	699
9	699	699	699	700	700	701	701	699	CAL	CAL	CAL	700	699	699	699	698	698	698	698	698	698	698	699	699	700	699
10	700	700	700	701	701	702	702	703	703	703	702	702	701	700	700	699	699	698	698	699	699	700	700	700	700
11	700	700	701	701	701	701	702	702	702	702	702	701	701	700	699	699	699	698	698	699	700	700	700	700	700
12	700	700	699	699	700	700	701	701	701	700	700	699	698	697	697	696	696	696	696	697	697	697	698	698	698
13	698	699	699	699	699	699	700	700	700	700	700	700	699	699	699	698	698	698	697	698	698	699	699	699	699
14	700	700	700	700	700	700	701	701	701	701	701	700	700	699	699	698	698	697	697	697	698	698	699	699	699
15	699	699	699	700	700	700	701	701	701	701	700	700	699	698	698	698	699	699	698	699	699	699	699	700	699
16	700	699	699	699	700	700	701	701	701	701	701	700	700	699	698	698	697	697	698	699	700	700	701	701	700
17	702	702	701	702	702	702	703	703	703	703	703	703	702	701	701	700	699	699	699	699	700	700	701	701	701
18	701	701	701	701	701	701	702	702	702	702	702	701	700	699	699	698	698	697	697	697	698	698	699	699	700
19	699	699	699	699	699	699	699	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	698	698
20	699	699	699	699	699	699	699	700	700	700	700	699	699	698	698	697	697	696	696	697	697	698	698	698	698
21	698	698	698	698	698	698	699	699	699	699	699	699	698	698	697	697	696	696	697	697	698	698	699	700	698
22	699	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	698	698	698	698	699
23	699	699	699	699	700	700	701	701	701	701	701	702	701	700	700	700	699	699	699	699	699	699	699	700	700
24	700	700	700	700	700	700	700	701	701	701	701	700	700	700	700	700	699	699	699	699	700	700	701	701	700
25	700	700	700	700	700	700	701	701	701	701	701	700	700	699	699	699	699	699	699	699	699	699	700	700	700	700
26	700	700	700	700	700	700	701	701	701	701	701	700	700	699	698	698	697	697	697	697	698	699	700	700	699
27	700	700	699	699	700	700	700	701	701	700	700	700	699	698	698	698	698	698	698	698	699	699	699	699	699
28	699	698	698	698	699	699	700	700	700	700	699	699	698	697	697	696	696	696	697	697	697	697	698	698	698
29	698	698	698	698	699	699	700	700	700	700	700	699	699	698	697	697	696	696	696	697	697	698	698	698	698
30	698	698	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	697	697	698	698	698
31	698	698	698	698	698	698	699	700	700	700	700	700	699	699	698	697	697	697	697	697	697	698	699	699	698
HRAVE	700	700	700	700	700	700	701	701	701	701	701	700	700	699	699	698	698	698	698	698	698	699	699	699	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	701	702	701	700	700	700	699	699	700	700	698	699	699	699	700	701	700	698	698	698	699	700	700	700
MAX	702	703	704	703	702	702	702	701	701	703	702	701	700	701	701	701	703	702	700	700	700	700	702	701	701
MIN	698	700	700	699	698	698	698	697	698	698	698	696	697	697	698	697	699	697	697	696	696	697	699	699	699

DAY	26	27	28	29	30	31
AVE	699	699	698	698	698	698
MAX	701	701	700	700	700	700
MIN	697	698	696	696	697	697

MONTHLY AVERAGE = 699.5 MONTHLY MAXIMUM = 704.2 MONTHLY MINIMUM = 695.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
JULY - 2020

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	20	22	23	25	27	26	25	22	20	19	21	21	19	18	19	18	19	19	20	21	22	22	23	23	21
2	24	25	27	28	29	30	28	25	21	19	18	19	19	19	20	21	27	42	39	41	44	43	45	48	29
3	52	54	56	58	61	62	58	50	43	41	37	32	30	27	26	26	25	25	24	29	31	33	35	36	40
4	38	39	41	42	44	44	39	36	32	30	27	24	23	21	20	19	19	19	21	23	26	26	27	29	30
5	31	32	33	36	36	37	33	31	29	26	23	21	20	18	18	17	17	16	17	16	17	18	20	21	24
6	22	24	25	25	26	27	27	27	22	17	15	12	12	12	12	11	11	12	13	15	16	17	18	19	18
7	21	22	23	24	26	25	26	23	20	19	18	16	14	14	14	14	14	15	16	17	19	21	22	23	19
8	24	25	27	27	28	31	29	28	28	27	25	23	22	21	20	20	20	21	21	23	25	26	27	28	25
9	27	28	29	31	32	34	31	27	CAL	CAL	CAL	13	12	14	15	15	15	14	15	17	18	18	19	21	21
10	22	25	27	29	29	31	31	26	23	22	20	19	18	17	15	16	16	17	19	21	20	21	22	23	22
11	24	26	26	27	28	31	32	28	26	23	21	19	19	17	16	16	16	16	16	21	22	23	27	29	23
12	31	33	35	36	43	45	40	34	29	23	20	17	15	14	14	13	14	12	14	18	19	18	21	24	24
13	26	27	29	30	31	32	31	27	28	24	21	19	18	17	17	18	16	17	18	20	22	23	23	22	23
14	22	31	33	35	37	39	36	30	26	22	19	18	16	14	14	14	15	16	16	16	17	19	21	22	23
15	24	25	26	30	35	36	37	34	29	26	22	20	18	17	16	19	32	35	27	27	33	34	34	32	28
16	34	34	37	38	38	40	41	39	36	28	25	21	19	16	15	15	14	14	14	28	27	29	30	30	27
17	34	36	37	38	38	40	40	40	34	36	32	31	25	19	18	17	18	22	25	26	26	28	28	28	30
18	30	32	34	35	36	35	34	28	26	23	20	18	17	16	15	14	14	15	15	16	17	18	19	20	23
19	19	21	25	33	37	39	37	32	28	26	19	18	16	15	15	16	16	16	17	18	18	18	18	18	22
20	20	21	20	21	21	19	19	20	18	17	16	14	11	12	13	13	14	15	16	17	17	18	18	19	17
21	21	21	23	23	24	26	26	24	21	18	17	16	15	15	15	17	17	17	18	18	23	25	27	32	21
22	34	36	37	38	41	44	42	37	32	31	27	21	19	20	23	20	21	20	22	25	26	29	33	34	30
23	38	41	41	44	52	71	92	79	81	80	66	65	64	57	54	50	45	43	45	49	53	57	58	59	58
24	60	64	64	68	71	69	66	59	54	42	35	33	49	87	86	73	71	61	58	59	60	66	66	69	62
25	71	72	74	73	71	71	72	65	51	44	39	30	26	26	31	32	34	36	34	35	37	39	41	43	48
26	45	48	49	51	55	59	53	44	38	33	29	24	21	20	19	18	17	17	18	18	25	37	39	45	34
27	44	42	44	45	45	48	47	40	36	28	27	24	23	20	21	29	28	32	32	37	40	42	44	42	36
28	43	51	54	57	62	63	62	50	37	29	24	19	15	15	15	14	18	27	33	35	37	36	44	43	37
29	48	49	56	57	57	59	54	43	32	25	19	17	15	13	12	11	12	12	12	13	15	16	17	18	28
30	19	21	24	25	33	34	33	27	22	20	18	15	14	12	11	10	9	9	10	11	12	13	14	16	18
31	17	19	22	24	28	30	26	25	20	17	16	13	12	10	9	11	11	11	13	15	15	16	20	22	18
HRAVE	32	34	35	37	40	41	40	36	31	28	25	22	21	20	20	20	20	21	22	24	26	27	29	30	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	21	29	40	30	24	18	19	25	21	22	23	24	23	23	28	27	30	23	22	17	21	30	58	62	48
MAX	27	48	62	44	37	27	26	31	34	31	32	45	32	39	37	41	40	36	39	21	32	44	92	87	74
MIN	18	18	24	19	16	11	14	20	12	15	16	12	16	14	16	14	17	14	15	11	15	19	38	33	26

DAY	26	27	28	29	30	31
AVE	34	36	37	28	18	18
MAX	59	48	63	59	34	30
MIN	17	20	14	11	9	9

MONTHLY AVERAGE = 28.4 MONTHLY MAXIMUM = 91.7 MONTHLY MINIMUM = 9.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
JULY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.38	0.55	0.78	0.92	1.01	1.06	1.01	0.89	0.68	0.59	0.41	0.18	0.02	0.00	0.00	0.00	0.00	8.63
2	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.38	0.55	0.83	0.70	0.99	1.13	0.99	0.99	0.48	0.18	0.04	0.11	0.01	0.00	0.00	0.00	0.00	7.50
3	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.53	0.74	0.90	1.00	1.05	0.98	0.70	0.66	0.57	0.37	0.16	0.02	0.00	0.00	0.00	0.00	8.16
4	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.55	0.76	0.91	1.00	1.04	1.01	0.91	0.66	0.58	0.37	0.16	0.02	0.00	0.00	0.00	0.00	8.47
5	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.36	0.54	0.75	0.92	1.01	1.05	1.01	0.92	0.67	0.59	0.38	0.17	0.02	0.00	0.00	0.00	0.00	8.53
6	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.21	0.54	0.79	0.94	1.03	1.07	1.02	0.94	0.68	0.59	0.36	0.17	0.02	0.00	0.00	0.00	0.00	8.49
7	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.35	0.56	0.78	0.93	1.02	1.06	1.01	0.92	0.67	0.59	0.37	0.16	0.02	0.00	0.00	0.00	0.00	8.57
8	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.34	0.54	0.75	0.89	0.98	1.03	0.98	0.90	0.65	0.56	0.35	0.15	0.02	0.00	0.00	0.00	0.00	8.28
9	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.44	CAL	CAL	CAL	0.99	1.04	0.98	0.89	0.64	0.57	0.36	0.16	0.02	0.00	0.00	0.00	0.00	6.23
10	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.30	0.50	0.61	0.81	1.01	0.99	0.71	0.89	0.63	0.56	0.35	0.15	0.02	0.00	0.00	0.00	0.00	7.67
11	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.26	0.49	0.73	0.88	0.78	0.50	0.96	0.89	0.63	0.58	0.39	0.22	0.04	0.00	0.00	0.00	0.00	7.48
12	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.31	0.51	0.74	0.89	0.98	1.03	0.98	0.90	0.67	0.24	0.10	0.05	0.02	0.00	0.00	0.00	0.00	7.55
13	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.15	0.06	0.34	0.66	0.74	0.81	1.03	0.98	0.65	0.47	0.19	0.13	0.03	0.00	0.00	0.00	0.00	6.42
14	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.33	0.52	0.71	0.89	0.98	1.03	0.99	0.90	0.64	0.56	0.36	0.16	0.01	0.00	0.00	0.00	0.00	8.20
15	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.20	0.45	0.53	0.88	0.97	1.02	0.97	0.92	0.69	0.30	0.07	0.12	0.02	0.00	0.00	0.00	0.00	7.23
16	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.14	0.18	0.61	0.51	0.75	0.79	0.96	0.76	0.56	0.58	0.40	0.14	0.02	0.00	0.00	0.00	0.00	6.45
17	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.11	0.29	0.30	0.28	0.23	0.53	1.09	0.89	0.56	0.45	0.14	0.12	0.01	0.00	0.00	0.00	0.00	5.04
18	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.32	0.55	0.74	0.88	0.97	1.01	0.80	0.85	0.68	0.56	0.31	0.10	0.02	0.00	0.00	0.00	0.00	7.89
19	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.16	0.40	0.40	0.70	0.43	0.57	0.77	0.78	0.28	0.32	0.12	0.04	0.00	0.00	0.00	0.00	0.00	5.05
20	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.25	0.48	0.62	0.45	0.67	1.03	0.99	0.90	0.61	0.56	0.34	0.15	0.01	0.00	0.00	0.00	0.00	7.15
21	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.30	0.53	0.42	0.52	0.79	1.05	0.73	0.54	0.28	0.26	0.09	0.05	0.00	0.00	0.00	0.00	0.00	5.60
22	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.27	0.58	0.37	0.70	0.99	1.04	0.61	0.33	0.68	0.47	0.37	0.11	0.01	0.00	0.00	0.00	0.00	6.63
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.11	0.25	0.18	0.07	0.14	0.15	0.17	0.29	0.23	0.15	0.06	0.01	0.00	0.00	0.00	1.89
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.13	0.29	0.61	0.73	0.69	0.29	0.07	0.15	0.22	0.28	0.20	0.11	0.01	0.00	0.00	0.00	3.83
25	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.26	0.56	0.67	0.77	0.92	0.85	0.44	0.31	0.22	0.11	0.11	0.07	0.01	0.00	0.00	0.00	0.00	5.34
26	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.32	0.55	0.74	0.88	0.96	1.00	0.98	0.89	0.60	0.57	0.34	0.14	0.01	0.00	0.00	0.00	0.00	8.11
27	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.32	0.52	0.69	0.82	0.97	0.97	0.99	0.54	0.10	0.20	0.34	0.18	0.01	0.00	0.00	0.00	0.00	6.76
28	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.34	0.54	0.68	0.88	0.97	1.02	0.99	0.91	0.63	0.57	0.06	0.07	0.02	0.00	0.00	0.00	0.00	7.76
29	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.32	0.54	0.72	0.89	0.98	1.01	0.98	0.90	0.63	0.54	0.33	0.13	0.01	0.00	0.00	0.00	0.00	8.11
30	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.32	0.51	0.74	0.90	0.99	1.02	0.99	0.90	0.64	0.53	0.33	0.12	0.01	0.00	0.00	0.00	0.00	8.13
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.31	0.54	0.71	0.89	0.98	1.02	0.99	0.90	0.65	0.54	0.31	0.09	0.01	0.00	0.00	0.00	8.06
HRAVE	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.28	0.47	0.64	0.77	0.87	0.91	0.88	0.78	0.56	0.46	0.27	0.13	0.02	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	8.63	7.50	8.16	8.47	8.53	8.49	8.57	8.28	6.23	7.67	7.48	7.55	6.42	8.20	7.23	6.45	5.04	7.89	5.05	7.15	5.60	6.63	1.89	3.83	5.34
MAX	1.06	1.13	1.05	1.04	1.05	1.07	1.06	1.03	1.04	1.01	0.96	1.03	1.03	1.03	1.02	0.96	1.09	1.01	0.78	1.03	1.05	1.04	0.29	0.73	0.92
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	8.11	6.76	7.76	8.11	8.13	8.06
MAX	1.00	0.99	1.02	1.01	1.02	1.02
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.1 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
JULY - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CAL	CAL	CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.13	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.37	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.22	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.44 MONTHLY MAXIMUM = 0.22 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 99.6% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
AUGUST - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	4.2	5.9	8.8	9.1	10.8	6.5	5.6	2.1	3.5	2.4	3.6	5.8	11.4	12.6	12.7	14.9	15.1	15.0	13.0	10.9	9.4	16.2	17.7	13.1	9.6
2	7.8	8.8	11.1	12.4	8.7	10.2	11.5	10.1	5.6	3.5	3.7	5.0	8.4	13.3	14.5	16.4	16.9	15.8	13.4	9.7	7.1	6.5	4.2	4.7	9.5
3	7.5	7.9	5.8	5.1	5.0	2.9	7.9	5.8	3.9	3.1	2.7	4.1	4.7	8.5	13.1	14.6	15.4	13.0	11.5	12.0	11.0	5.6	4.4	5.0	7.5
4	5.7	6.5	6.3	6.6	5.0	5.8	6.7	3.8	3.1	3.1	8.1	10.3	8.5	12.8	16.1	16.1	16.6	13.4	11.4	8.2	4.6	2.9	4.9	5.1	8.0
5	5.0	5.0	6.3	5.3	6.7	6.6	5.3	5.6	4.1	2.8	2.8	3.3	4.8	12.0	11.2	12.5	13.9	14.6	15.4	13.8	10.3	8.5	7.2	3.6	7.8
6	6.6	7.8	8.2	7.7	7.1	6.6	8.0	6.5	1.5	1.6	2.9	3.7	6.3	8.6	15.2	14.9	13.8	13.2	12.9	10.9	7.8	9.4	8.6	5.1	8.1
7	5.7	6.7	7.2	4.3	4.7	5.0	3.4	3.3	2.5	3.5	5.1	5.8	5.6	5.3	8.9	6.8	9.3	7.6	6.5	4.8	7.4	5.9	6.7	14.8	6.1
8	9.9	4.8	3.0	5.3	5.5	6.0	6.4	6.1	2.3	2.8	3.0	4.5	6.7	7.2	11.8	11.5	15.7	16.3	13.5	11.8	9.2	6.1	5.3	3.9	7.4
9	6.4	7.9	7.7	5.9	1.8	1.5	5.1	5.7	3.6	2.7	3.2	4.7	6.8	10.3	13.5	14.2	16.4	17.6	16.5	10.7	7.6	6.1	3.5	4.4	7.7
10	5.9	8.1	5.4	3.0	4.9	8.1	7.0	4.4	2.3	2.3	8.1	10.6	11.0	13.8	15.9	16.0	15.4	16.1	14.6	10.3	6.2	6.7	7.0	3.7	8.6
11	3.9	5.2	3.4	2.8	2.6	5.4	2.1	2.3	1.9	6.6	10.0	10.3	10.3	10.8	11.5	12.5	13.8	15.5	16.0	16.2	19.8	15.2	10.2	4.6	8.9
12	1.9	2.7	3.9	3.9	7.0	4.1	3.5	4.3	2.8	6.1	7.7	6.3	6.6	7.1	10.4	14.1	15.0	16.4	14.9	12.3	10.8	9.5	4.2	5.9	7.6
13	6.8	6.3	4.8	4.7	6.0	6.0	6.4	5.5	4.3	3.8	3.2	4.7	6.5	10.3	12.0	13.1	15.1	18.9	17.5	13.4	9.9	11.9	6.8	9.8	8.7
14	7.3	4.6	3.7	6.7	8.7	8.1	6.4	2.9	2.6	3.0	4.7	7.4	10.7	12.4	13.4	14.9	17.3	19.4	19.0	14.2	11.5	8.1	6.1	6.6	9.1
15	7.8	5.5	5.2	4.7	3.8	4.9	5.1	4.8	3.6	6.2	8.3	10.1	11.9	13.9	16.1	17.7	17.4	16.7	15.7	23.8	10.2	4.6	7.7	22.4	10.3
16	10.0	3.5	4.0	4.0	5.9	5.0	6.0	2.7	3.5	6.8	3.6	4.2	5.0	7.1	5.4	11.1	41.6	12.5	5.7	9.4	9.5	7.3	7.5	7.0	7.8
17	6.3	7.6	6.3	6.4	8.7	7.9	7.1	8.0	9.2	7.6	6.2	10.3	12.5	11.2	7.9	5.6	8.3	25.0	16.4	15.7	9.8	12.8	11.6	15.9	10.2
18	16.7	16.7	14.4	15.7	16.4	15.7	16.6	15.8	14.1	11.4	8.2	4.4	4.5	6.6	8.2	7.1	3.5	6.1	3.8	11.8	13.8	15.0	15.6	15.5	11.6
19	7.4	11.0	10.1	6.2	8.6	7.9	8.9	7.4	5.5	4.5	3.5	2.4	3.9	5.3	7.7	6.3	9.1	12.0	16.5	12.1	8.9	8.0	6.0	11.4	7.9
20	8.2	6.1	5.3	2.8	6.5	3.0	2.7	3.9	8.3	6.2	6.8	8.5	9.2	15.2	17.1	18.3	20.4	25.2	22.4	11.4	13.6	11.1	4.1	6.9	10.1
21	7.4	3.4	5.1	3.3	3.1	4.9	4.8	6.0	4.3	3.2	7.8	16.3	19.4	17.5	18.6	17.5	19.5	17.6	16.3	11.4	5.2	4.1	4.2	7.4	9.5
22	3.8	4.6	3.2	6.1	7.6	11.1	5.2	6.0	8.1	8.4	9.1	8.7	10.9	12.0	14.1	17.1	18.3	16.8	15.9	17.5	7.9	3.6	10.2	12.6	9.9
23	7.3	8.6	4.2	5.7	5.4	6.4	6.7	5.4	2.9	3.1	3.4	3.2	4.8	5.6	4.5	4.3	5.3	12.4	15.4	9.2	4.6	3.0	1.3	4.1	5.7
24	7.6	8.8	9.3	6.6	8.7	7.3	7.9	7.6	8.0	6.0	4.7	4.1	3.2	3.1	4.0	4.7	2.8	5.7	19.9	17.2	4.8	6.1	9.6	13.2	7.5
25	6.7	5.4	6.7	9.7	9.8	11.6	12.7	14.5	13.0	10.5	6.9	7.0	7.2	5.3	5.6	4.2	4.0	5.2	5.8	11.0	9.5	7.4	5.3	2.4	7.8
26	4.8	6.0	7.3	6.8	6.8	6.8	6.4	6.9	5.4	4.2	4.0	5.1	5.0	4.0	5.1	4.8	4.2	8.6	14.0	13.6	13.2	3.9	4.7	3.0	6.4
27	2.7	1.7	4.0	5.0	8.3	8.6	8.4	3.1	2.8	2.5	2.6	3.4	10.5	11.9	12.6	7.8	4.8	5.8	10.6	11.6	6.8	6.1	2.9	9.2	6.4
28	4.1	2.7	3.6	4.8	2.7	2.9	6.2	4.8	4.0	4.8	2.5	3.0	4.9	9.5	14.5	13.8	17.1	19.2	20.8	9.5	8.5	6.2	4.8	8.4	7.6
29	3.4	4.4	5.3	5.5	4.5	3.1	2.2	4.9	3.1	3.5	9.9	14.8	14.8	14.9	15.9	16.8	16.1	15.6	14.8	13.9	17.3	14.2	14.2	8.7	10.1
30	10.0	6.8	9.6	9.3	5.0	5.5	6.4	4.9	2.6	1.9	2.5	5.4	12.4	14.6	14.5	14.0	13.8	15.9	13.2	17.8	16.6	19.7	17.8	9.2	10.4
31	4.6	5.6	4.7	4.2	4.4	3.1	3.1	3.6	3.5	2.0	7.3	10.4	12.5	13.3	13.3	17.1	18.7	17.6	14.6	9.9	8.7	5.6	8.9	8.4	8.5
HRAVE	6.6	6.3	6.2	6.1	6.5	6.4	6.5	5.8	4.7	4.5	5.4	6.7	8.4	10.2	11.8	12.3	14.0	14.5	14.1	12.5	9.7	8.3	7.5	8.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.6	9.5	7.5	8.0	7.8	8.1	6.1	7.4	7.7	8.6	8.9	7.6	8.7	9.1	10.3	7.8	10.2	11.6	7.9	10.1	9.5	9.9	5.7	7.5	7.8
MAX	17.7	16.9	15.4	16.6	15.4	15.2	14.8	16.3	17.6	16.1	19.8	16.4	18.9	19.4	23.8	41.6	25.0	16.7	16.5	25.2	19.5	18.3	15.4	19.9	14.5
MIN	2.1	3.5	2.7	2.9	2.8	1.5	2.5	2.3	1.5	2.3	1.9	1.9	3.2	2.6	3.6	2.7	5.6	3.5	2.4	2.7	3.1	3.2	1.3	2.8	2.4

DAY	26	27	28	29	30	31
AVE	6.4	6.4	7.6	10.1	10.4	8.5
MAX	14.0	12.6	20.8	17.3	19.7	18.7
MIN	3.0	1.7	2.5	2.2	1.9	2.0

MONTHLY AVERAGE = 8.5 MONTHLY MAXIMUM = 41.6 MONTHLY MINIMUM = 1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
AUGUST - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	118	138	132	114	103	98	96	318	164	30	228	264	294	289	282	293	281	295	51	75	76	54	62	81	147
2	99	136	124	93	80	56	48	70	118	137	169	47	282	289	289	296	305	293	300	300	302	301	322	117	109
3	99	85	109	104	73	111	79	98	119	131	67	73	315	288	291	276	283	294	287	256	228	14	243	119	68
4	102	146	114	120	125	106	107	141	118	318	308	315	278	281	294	283	283	292	268	292	293	309	287	276	175
5	104	95	101	107	92	101	115	107	122	142	134	137	133	261	265	258	272	265	284	289	297	314	295	157	230
6	130	125	107	90	82	90	91	106	158	249	331	295	305	280	277	272	284	282	280	301	297	303	307	269	162
7	111	103	106	92	83	64	90	85	98	255	280	304	326	8	303	264	289	296	293	282	291	307	106	308	305
8	86	61	338	112	99	115	100	118	127	87	182	231	273	288	288	268	282	288	286	296	295	314	12	133	125
9	128	107	138	116	24	94	111	128	135	145	295	285	318	301	286	287	283	283	279	290	296	293	334	109	231
10	126	102	104	100	99	110	106	114	286	262	280	300	298	286	307	293	299	292	286	301	299	307	303	8	38
11	112	95	102	102	117	132	109	103	98	295	301	299	291	282	293	295	291	283	279	279	280	311	318	284	304
12	302	144	95	337	308	232	116	157	156	303	283	266	277	260	286	286	292	288	284	288	303	299	215	90	246
13	128	117	116	111	122	103	127	111	142	144	68	299	270	255	288	289	281	284	277	290	258	167	238	314	121
14	299	322	170	111	120	93	117	69	307	266	264	295	262	284	279	285	280	281	282	292	303	305	256	141	89
15	130	135	142	125	93	98	121	125	159	290	298	283	288	291	285	288	285	290	343	94	326	300	122	162	93
16	170	101	110	114	117	113	131	151	136	149	160	222	251	305	317	316	356	316	55	47	67	88	67	85	39
17	54	89	70	82	87	120	97	90	81	139	139	107	130	131	101	107	54	32	38	64	36	58	80	72	189
18	46	48	52	57	52	52	67	64	67	65	73	80	49	95	38	47	73	197	239	307	10	35	36	43	23
19	59	63	79	111	93	106	108	138	149	154	133	73	275	271	293	282	276	287	286	299	309	305	14	43	101
20	99	336	135	118	143	100	293	291	290	301	302	281	276	287	289	280	281	333	62	23	83	267	160	295	104
21	310	147	112	265	267	106	97	109	136	187	290	302	300	286	281	285	283	277	284	282	261	185	248	280	352
22	285	199	272	260	285	298	285	289	281	274	277	291	258	275	276	275	282	285	292	23	26	312	127	131	325
23	132	123	148	142	123	127	117	102	121	87	86	291	255	213	260	267	251	292	308	131	141	318	360	83	345
24	78	88	67	119	94	90	125	136	158	111	134	168	146	183	239	303	238	272	354	325	314	118	183	279	192
25	123	93	66	45	58	64	70	71	77	72	82	113	203	229	193	219	306	329	272	319	318	308	304	280	302
26	43	114	129	109	105	122	137	111	113	151	108	159	136	70	137	147	167	295	271	301	303	301	325	234	136
27	142	331	144	140	123	108	114	108	132	155	112	314	309	301	281	269	191	148	66	59	329	320	24	48	114
28	340	287	126	118	348	97	129	109	133	151	90	197	251	244	285	287	289	225	155	121	109	118	141	120	277
29	117	134	128	121	111	311	290	137	145	215	304	302	287	285	286	282	297	283	278	280	271	155	322	116	285
30	110	92	52	66	146	118	114	121	138	290	236	259	285	291	296	285	273	280	272	307	290	289	296	275	271
31	292	295	292	304	312	147	67	298	278	268	281	290	284	276	271	286	286	287	278	281	235	116	141	126	342

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
AUGUST - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	16	18	16	10	13	14	10	40	45	68	48	56	24	20	22	22	14	11	25	15	16	16	11	13	23
2	10	14	10	10	12	10	11	11	28	38	49	35	31	19	18	17	15	16	11	9	8	5	13	17	17
3	8	12	14	7	29	30	7	8	20	29	53	49	54	34	23	18	13	16	12	20	38	26	39	33	25
4	18	12	11	10	16	20	13	19	30	37	26	23	34	16	16	19	14	17	11	8	13	21	25	53	20
5	10	10	9	8	9	9	10	10	21	36	53	40	50	28	26	23	18	18	11	8	7	10	12	21	19
6	12	9	8	8	11	8	8	8	55	64	47	48	59	36	20	18	20	17	16	7	7	8	7	29	22
7	8	11	10	17	12	28	19	31	34	36	32	19	25	39	32	37	21	37	14	18	6	34	28	20	24
8	38	23	61	25	15	17	6	13	40	41	54	44	46	44	23	27	16	13	12	8	5	9	30	31	27
9	9	9	11	10	51	31	11	11	23	36	47	40	31	29	18	19	17	10	8	6	5	8	14	40	21
10	12	7	11	23	15	11	10	14	40	36	22	20	25	18	17	17	17	12	10	8	7	8	11	29	17
11	10	8	23	27	30	14	22	17	40	24	23	18	24	21	23	16	16	15	8	8	20	15	12	12	19
12	43	39	36	51	11	15	22	17	35	24	23	32	30	33	24	18	17	12	10	7	6	5	23	45	24
13	10	8	41	12	9	9	9	13	19	26	44	55	47	27	24	20	20	11	8	8	36	12	23	9	21
14	8	13	23	11	9	9	6	26	21	34	32	23	21	27	16	18	13	10	8	7	8	7	23	13	16
15	13	22	13	11	9	10	9	11	37	27	24	17	17	19	16	18	14	12	22	13	41	43	23	8	19
16	14	16	18	16	8	15	18	22	26	17	49	59	50	39	55	50	22	39	44	49	14	30	26	37	31
17	42	29	25	17	12	11	11	12	19	22	33	43	19	27	36	44	29	21	17	14	17	14	14	13	23
18	8	9	12	11	10	10	6	7	7	10	20	51	56	55	52	29	25	26	15	14	19	13	11	10	20
19	29	11	16	17	12	10	9	9	14	28	40	76	49	48	39	37	27	15	9	8	9	6	32	13	23
20	15	42	36	42	11	21	40	21	13	22	30	21	28	17	15	16	12	37	14	51	22	65	49	14	27
21	24	32	11	57	43	20	33	11	16	30	21	16	14	15	14	16	11	9	10	7	16	19	21	30	21
22	67	22	38	15	13	10	12	20	18	19	20	27	19	17	18	13	11	12	12	22	27	42	16	12	21
23	20	14	36	8	8	6	12	12	32	50	38	41	46	46	42	43	46	19	18	49	20	27	40	26	29
24	13	20	24	19	13	16	16	7	8	27	33	30	37	52	53	40	66	22	40	17	36	14	34	25	28
25	18	10	19	11	10	14	11	8	12	14	35	31	37	67	55	52	45	25	17	20	14	12	15	45	25
26	18	23	16	8	8	7	16	11	15	16	26	30	33	63	34	49	48	20	13	12	9	52	23	35	24
27	13	51	11	10	9	9	10	26	26	42	66	43	25	15	9	10	23	13	28	9	25	16	24	26	22
28	30	18	39	11	32	13	5	11	17	21	39	57	43	25	17	18	14	16	11	17	13	17	13	19	22
29	21	12	9	12	13	37	53	14	20	43	22	18	21	18	15	15	17	14	8	7	31	63	11	43	23
30	13	13	14	14	14	10	6	13	32	51	40	27	18	14	16	16	13	9	11	11	9	8	8	9	16
31	18	12	11	12	7	26	19	11	19	45	22	23	18	21	18	14	11	11	7	7	15	27	13	14	17
HRAVE	19	18	20	17	15	15	15	15	25	33	36	36	33	31	26	25	21	17	15	15	17	21	21	24	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	23	17	25	20	19	22	24	27	21	17	19	24	21	16	19	31	23	20	23	27	21	21	29	28	25
MAX	68	49	54	53	53	64	39	61	51	40	40	51	55	34	43	59	44	56	76	65	57	67	50	66	67
MIN	10	5	7	8	7	7	6	5	5	7	8	5	8	6	8	8	11	6	6	11	7	10	6	7	8

DAY	26	27	28	29	30	31
AVE	24	22	22	23	16	17
MAX	63	66	57	63	51	45
MIN	7	9	5	7	6	7

MONTHLY AVERAGE = 22.0 MONTHLY MAXIMUM = 76.3 MONTHLY MINIMUM = 5.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
AUGUST - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	34.8	34.4	33.0	32.6	32.4	31.8	32.8	33.7	35.5	36.3	37.5	38.6	39.6	40.0	40.6	41.1	41.4	40.4	38.8	36.8	35.5	34.1	33.5	33.0	36.2
2	32.5	31.6	30.9	30.4	29.7	29.0	29.3	30.9	32.5	33.4	35.9	37.8	38.8	40.0	40.2	40.3	40.2	39.5	38.6	37.3	36.2	35.1	34.7	33.5	34.9
3	32.6	32.0	31.1	30.5	29.0	28.3	28.9	30.1	32.5	34.8	37.0	39.2	40.2	41.6	42.3	42.2	42.2	41.7	40.5	37.7	36.6	36.2	35.3	34.4	35.7
4	33.0	32.1	31.1	30.4	29.1	28.8	28.8	30.3	32.5	34.4	36.6	38.0	39.4	40.5	40.9	41.1	40.7	39.9	38.8	37.3	36.1	35.2	35.1	34.3	35.2
5	32.5	31.8	30.6	30.0	28.9	28.0	28.9	30.7	32.7	34.7	37.1	37.3	39.5	40.6	41.0	41.2	41.2	40.8	39.6	37.7	36.0	35.2	34.3	32.9	35.1
6	31.2	30.1	29.2	27.6	26.1	25.5	26.3	28.9	31.0	34.2	36.7	38.7	39.7	41.0	41.5	41.2	41.1	40.5	39.5	37.8	36.1	35.0	34.3	32.9	34.4
7	31.6	30.8	30.0	29.7	28.6	26.4	26.9	29.2	32.7	34.5	35.6	36.3	37.1	38.5	40.0	40.0	39.3	39.3	38.5	37.4	35.9	35.4	34.0	34.8	34.3
8	33.5	32.6	31.1	29.6	28.9	28.2	28.9	30.7	32.4	34.8	37.5	39.3	40.1	41.2	41.4	41.5	41.2	40.6	39.6	37.9	36.3	35.5	34.8	33.3	35.5
9	31.3	30.9	29.7	28.8	27.5	26.7	27.1	29.0	31.8	34.4	37.6	39.5	40.4	41.7	42.1	42.1	41.8	41.1	39.7	37.7	36.7	35.2	34.8	33.2	35.0
10	31.4	30.0	29.1	28.0	26.3	26.0	26.8	29.0	31.2	33.9	37.2	40.0	41.2	41.5	41.7	41.7	41.5	40.7	39.5	37.9	36.8	35.5	34.7	33.8	34.8
11	32.0	30.5	29.4	29.2	29.1	27.2	28.7	28.0	30.9	34.2	36.2	37.7	38.9	40.1	40.9	41.5	41.4	40.8	39.3	38.1	34.4	32.5	32.1	31.5	34.4
12	30.9	30.8	30.7	30.7	29.5	28.9	29.0	31.3	32.8	34.7	36.3	38.3	39.5	40.8	41.7	42.0	41.6	41.0	39.8	37.8	36.9	36.2	35.1	34.2	35.4
13	32.3	32.3	31.0	30.6	29.1	29.4	29.2	31.0	33.8	36.1	39.2	41.0	42.3	43.4	43.8	43.8	43.3	42.5	40.4	39.3	38.2	36.9	36.1	35.4	36.7
14	34.0	33.3	32.1	31.1	29.7	30.1	29.2	30.5	32.4	36.0	39.0	41.8	43.5	44.0	44.1	44.4	44.3	43.6	42.3	40.2	39.3	38.5	37.6	36.0	37.4
15	35.1	34.6	33.2	32.2	31.8	30.3	30.7	32.1	34.9	36.7	38.2	39.4	40.9	42.0	42.5	42.8	42.8	42.7	41.2	38.9	37.9	37.5	36.1	33.4	37.0
16	32.4	31.6	31.3	30.6	29.5	28.9	29.1	30.7	33.4	36.9	39.1	40.8	42.0	42.7	43.3	41.9	32.1	32.9	33.1	32.8	31.7	31.2	30.4	29.7	34.1
17	29.2	29.4	29.1	28.5	27.4	26.7	27.1	28.7	33.0	37.0	39.0	40.7	42.2	42.9	43.0	42.6	42.5	40.0	38.1	37.0	36.1	35.2	34.5	34.1	35.2
18	33.6	33.0	31.9	31.1	30.7	30.1	29.8	30.8	33.5	35.7	37.7	39.4	40.2	41.7	42.3	42.2	42.0	42.3	41.3	38.6	38.2	37.1	36.8	36.2	36.5
19	35.0	34.1	32.8	31.5	30.2	29.4	29.6	31.1	33.8	36.8	38.7	40.7	41.9	42.8	43.4	43.5	43.8	43.2	41.5	39.7	39.0	38.1	37.5	37.0	37.3
20	35.3	34.0	32.5	32.1	31.2	31.5	30.6	31.4	33.8	35.4	37.3	38.9	40.5	41.2	41.5	41.3	40.9	38.5	32.5	30.5	29.2	28.3	28.5	27.5	34.4
21	26.9	27.0	26.7	27.0	26.5	25.9	26.4	27.4	28.8	30.9	33.2	34.7	35.0	35.5	35.9	36.3	35.8	35.1	34.2	33.2	32.4	31.8	31.2	30.9	31.2
22	31.3	30.6	30.2	30.2	29.7	29.0	28.5	29.5	30.3	31.5	33.7	36.1	37.4	38.4	39.2	38.8	38.3	37.8	36.7	34.9	33.7	33.4	32.4	30.9	33.4
23	30.0	29.7	28.4	28.3	28.0	27.2	27.3	29.5	31.7	33.6	35.8	37.4	39.5	41.3	41.8	42.3	42.3	41.8	39.9	34.9	33.9	33.4	33.4	32.9	34.3
24	32.3	32.5	32.9	30.4	30.2	30.3	29.4	30.6	32.8	36.3	37.7	38.9	39.8	41.6	42.9	42.9	43.2	42.8	36.7	36.5	35.5	34.3	34.2	33.8	35.8
25	31.4	31.8	31.9	32.5	31.7	31.3	30.8	32.3	34.7	36.6	38.6	40.8	41.6	42.1	42.3	42.1	42.0	41.9	40.8	39.3	37.8	36.6	36.1	35.4	36.8
26	34.9	33.1	32.0	31.5	31.0	29.8	28.5	29.8	31.0	34.3	37.1	39.8	41.0	41.1	41.9	42.1	42.0	41.1	39.2	37.5	35.8	35.4	34.7	34.0	35.8
27	33.2	32.8	31.7	31.1	30.0	29.8	29.4	30.2	32.2	34.6	37.6	39.3	40.3	40.5	38.5	38.8	38.9	37.8	37.3	35.9	34.8	33.8	33.4	33.4	34.8
28	32.0	30.9	30.1	29.4	27.6	27.2	26.5	29.1	31.4	34.6	37.0	40.1	41.1	42.6	42.4	42.4	42.2	39.2	34.4	34.1	33.5	33.6	32.5	32.5	34.4
29	31.2	30.2	29.9	29.3	28.9	27.9	28.0	28.0	30.2	33.2	35.1	36.3	37.0	37.5	38.0	38.3	38.1	37.3	35.8	34.9	30.4	24.8	23.3	23.2	31.9
30	23.4	24.1	24.7	24.8	23.7	22.6	23.2	24.6	25.9	27.8	29.8	32.0	34.2	35.2	35.5	35.9	35.4	33.5	32.4	30.8	28.8	27.7	27.4	26.6	28.7
31	26.1	25.8	25.0	24.4	24.0	23.7	23.5	24.9	26.6	29.0	31.8	33.3	34.4	34.9	35.3	35.4	35.2	34.5	33.2	32.0	30.8	29.8	29.0	28.0	29.6
HRAVE	31.8	31.2	30.4	29.8	28.9	28.2	28.4	29.8	32.0	34.4	36.7	38.4	39.6	40.6	41.0	41.1	40.6	39.8	38.2	36.5	35.2	34.1	33.5	32.7	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	36.2	34.9	35.7	35.2	35.1	34.4	34.3	35.5	35.0	34.8	34.4	35.4	36.7	37.4	37.0	34.1	35.2	36.5	37.3	34.4	31.2	33.4	34.3	35.8	36.8
MAX	41.4	40.3	42.3	41.1	41.2	41.5	40.0	41.5	42.1	41.7	41.5	42.0	43.8	44.4	42.8	43.3	43.0	42.3	43.8	41.5	36.3	39.2	42.3	43.2	42.3
MIN	31.8	29.0	28.3	28.8	28.0	25.5	26.4	28.2	26.7	26.0	27.2	28.9	29.1	29.2	30.3	28.9	26.7	29.8	29.4	27.5	25.9	28.5	27.2	29.4	30.8

DAY	26	27	28	29	30	31
AVE	35.8	34.8	34.4	31.9	28.7	29.6
MAX	42.1	40.5	42.6	38.3	35.9	35.4
MIN	28.5	29.4	26.5	23.2	22.6	23.5

MONTHLY AVERAGE = 34.7 MONTHLY MAXIMUM = 44.4 MONTHLY MINIMUM = 22.6
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
AUGUST - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.4	0.2	0.2	0.2	0.2	0.3	-0.6	-0.6	-1.2	-0.9	-1.2	-1.3	-1.8	-1.8	-1.7	-1.5	-1.4	-0.9	-0.5	-0.3	0.0	-0.1	-0.1	-0.1	-0.6
2	0.1	0.1	0.1	0.0	0.1	0.0	-0.3	-1.1	-1.5	-1.2	-1.2	-1.6	-1.4	-1.7	-1.6	-1.3	-1.0	-0.8	-0.4	0.0	0.2	0.3	0.3	0.4	-0.6
3	0.4	0.5	0.5	0.5	0.3	0.4	0.1	-0.9	-1.1	-1.1	-1.1	-1.7	-1.3	-1.5	-1.7	-1.5	-1.4	-1.0	-0.5	-0.1	0.0	0.3	0.3	0.3	-0.5
4	0.3	0.2	0.3	0.3	0.2	0.2	-0.5	-0.9	-1.1	-0.9	-1.3	-1.6	-1.5	-1.7	-1.8	-1.5	-1.2	-1.0	-0.4	0.1	0.4	0.3	0.4	0.4	-0.5
5	0.6	0.4	0.5	0.5	0.5	0.4	-0.6	-1.3	-1.3	-1.0	-1.2	-0.9	-1.5	-1.4	-1.4	-1.4	-1.2	-0.9	-0.5	0.1	0.3	0.3	0.5	0.4	-0.4
6	0.5	0.3	0.6	0.6	0.4	0.6	-0.5	-1.4	-0.6	-0.8	-1.0	-1.2	-1.3	-1.5	-1.6	-1.5	-1.2	-0.9	-0.5	0.1	0.4	0.3	0.4	0.6	-0.4
7	0.5	0.5	0.4	0.5	0.7	0.3	-0.2	-0.9	-0.9	-0.8	-0.9	-0.9	-0.8	-1.1	-1.5	-1.1	-0.8	-0.7	-0.4	0.2	0.6	0.5	0.5	0.1	-0.3
8	0.2	0.5	0.5	0.6	0.7	0.7	-0.4	-1.3	-0.8	-1.0	-1.2	-1.5	-1.6	-1.6	-1.6	-1.4	-1.2	-1.0	-0.5	0.1	0.4	0.3	0.6	0.6	-0.4
9	0.5	0.4	0.5	0.7	0.6	0.4	-0.3	-1.2	-1.1	-1.0	-1.2	-1.4	-1.5	-1.6	-1.6	-1.5	-1.3	-1.0	-0.5	0.2	0.5	0.4	0.6	0.8	-0.4
10	0.6	0.8	0.7	0.6	0.7	0.6	0.0	-1.2	-0.7	-0.7	-1.1	-1.5	-1.5	-1.5	-1.5	-1.5	-1.2	-1.0	-0.4	0.2	0.5	0.5	0.5	0.6	-0.3
11	0.5	0.6	0.5	0.8	0.7	0.8	0.4	-0.1	-0.6	-1.0	-1.4	-1.7	-1.6	-1.6	-1.7	-1.6	-1.4	-1.0	-0.4	-0.1	-0.2	-0.1	0.0	0.1	-0.4
12	0.2	0.2	0.2	0.2	0.1	0.5	-0.1	-0.9	-0.8	-1.2	-1.3	-1.4	-1.4	-1.5	-1.6	-1.6	-1.3	-1.0	-0.5	0.0	0.2	0.4	0.4	0.4	-0.5
13	0.4	0.4	0.5	0.5	0.5	0.4	-0.1	-1.0	-1.2	-1.2	-1.5	-1.5	-1.5	-1.8	-1.7	-1.5	-1.1	-0.9	-0.2	0.1	0.2	0.1	0.2	0.2	-0.5
14	0.2	0.3	0.5	0.4	0.6	0.3	0.7	-0.7	-0.7	-0.8	-1.1	-1.5	-1.6	-1.5	-1.5	-1.5	-1.1	-0.9	-0.4	0.1	0.3	0.5	0.5	0.4	-0.4
15	0.2	0.2	0.4	0.5	0.6	0.5	-0.3	-1.2	-1.2	-1.1	-1.4	-1.5	-1.7	-1.8	-1.7	-1.5	-1.2	-1.0	-0.5	-0.1	0.2	0.3	0.3	0.0	-0.5
16	0.1	0.2	0.4	0.6	0.4	0.6	-0.1	-0.8	-1.1	-1.9	-1.3	-1.4	-1.3	-1.6	-1.3	-0.5	0.0	-0.1	0.0	0.0	0.0	0.2	0.1	0.1	-0.4
17	0.1	0.2	0.2	0.3	0.2	0.3	0.0	-0.9	-1.3	-1.6	-1.5	-1.9	-2.3	-2.0	-1.7	-1.1	-0.8	-0.2	0.0	0.0	0.2	0.1	0.2	0.2	-0.5
18	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-0.3	-1.1	-1.5	-1.8	-1.6	-1.4	-1.7	-1.4	-1.2	-0.8	-0.8	-0.2	-0.1	0.0	0.0	0.1	0.1	-0.5
19	0.3	0.3	0.3	0.3	0.3	0.4	0.1	-0.9	-1.3	-1.5	-1.2	-1.0	-1.2	-1.4	-1.4	-1.1	-1.2	-0.9	-0.4	0.0	0.3	0.5	0.4	0.3	-0.4
20	0.4	0.5	0.7	0.3	0.4	0.2	0.2	-0.3	-0.8	-1.0	-1.3	-1.4	-1.6	-1.7	-1.6	-1.4	-1.1	-0.6	-0.3	0.4	0.3	0.1	0.3	0.0	-0.4
21	0.1	0.1	0.3	0.3	0.0	0.1	0.1	-0.3	-0.6	-0.9	-1.3	-1.5	-1.6	-1.5	-1.5	-1.3	-1.0	-0.7	-0.3	-0.1	0.1	0.2	0.1	0.0	-0.5
22	0.1	0.2	0.1	0.1	0.0	-0.1	-0.2	-0.6	-0.8	-1.0	-1.2	-1.4	-1.5	-1.5	-1.5	-1.4	-1.2	-0.8	-0.4	-0.1	0.0	0.2	0.1	-0.1	-0.5
23	0.0	0.1	0.2	0.2	0.3	0.5	-0.2	-1.1	-0.9	-1.1	-1.4	-1.1	-1.2	-1.5	-1.3	-1.1	-0.9	-0.9	-0.4	-0.2	0.1	0.2	0.2	0.2	-0.5
24	0.3	0.6	0.4	0.7	0.5	0.2	0.3	-0.3	-1.1	-1.4	-1.1	-1.0	-1.0	-1.1	-1.2	-1.0	-0.7	-0.7	1.2	0.7	0.6	0.7	0.8	0.6	-0.1
25	0.5	0.9	0.8	0.6	0.8	0.6	0.6	-0.1	-0.7	-1.3	-1.5	-1.8	-1.8	-1.4	-1.3	-1.0	-0.8	-0.6	-0.2	0.1	0.2	0.3	0.3	0.4	-0.3
26	0.5	0.7	0.6	0.8	0.9	1.1	0.8	0.1	-0.3	-1.1	-1.4	-1.6	-1.7	-1.2	-1.4	-1.1	-0.8	-0.4	-0.1	0.0	0.0	0.1	0.2	0.2	-0.2
27	0.2	0.2	0.4	0.4	0.1	0.1	-0.1	-0.6	-0.9	-0.8	-1.2	-1.2	-1.5	-1.4	-0.6	-0.5	-0.6	-0.5	-0.1	0.0	0.1	0.2	0.4	0.3	-0.3
28	0.5	0.5	0.5	0.6	0.5	0.5	0.1	-1.0	-1.2	-1.5	-1.0	-1.1	-1.3	-1.6	-1.5	-1.3	-1.1	-0.6	-0.4	-0.2	-0.1	0.0	0.0	0.1	-0.4
29	0.2	0.3	0.2	0.2	0.3	0.5	0.2	-0.4	-0.8	-1.0	-1.3	-1.5	-1.7	-1.6	-1.6	-1.4	-1.1	-0.8	-0.3	-0.1	-0.3	0.3	0.4	0.2	-0.5
30	0.2	0.3	0.2	0.2	0.3	0.2	-0.1	-0.8	-0.6	-0.6	-0.7	-1.1	-1.3	-1.5	-1.4	-1.3	-0.8	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.4
31	0.1	0.2	0.2	0.2	0.2	0.3	0.3	-0.4	-0.5	-0.6	-1.2	-1.4	-1.5	-1.4	-1.4	-1.3	-1.1	-0.8	-0.3	0.1	0.1	0.1	0.0	0.0	-0.4
HRAVE	0.3	0.4	0.4	0.4	0.4	0.4	0.0	-0.8	-0.9	-1.1	-1.2	-1.4	-1.5	-1.5	-1.5	-1.3	-1.0	-0.8	-0.3	0.0	0.2	0.2	0.3	0.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.6	-0.6	-0.5	-0.5	-0.4	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.5	-0.5	-0.4	-0.5	-0.4	-0.5	-0.5	-0.4	-0.4	-0.5	-0.5	-0.5	-0.1	-0.3
MAX	0.4	0.4	0.5	0.4	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.5	0.5	0.7	0.6	0.6	0.3	0.1	0.5	0.7	0.3	0.2	0.5	1.2	0.9
MIN	-1.8	-1.7	-1.7	-1.8	-1.5	-1.6	-1.5	-1.6	-1.6	-1.5	-1.7	-1.6	-1.8	-1.6	-1.8	-1.9	-2.3	-1.8	-1.5	-1.7	-1.6	-1.5	-1.5	-1.4	-1.8

DAY	26	27	28	29	30	31
AVE	-0.2	-0.3	-0.4	-0.5	-0.4	-0.4
MAX	1.1	0.4	0.6	0.5	0.3	0.3
MIN	-1.7	-1.5	-1.6	-1.7	-1.5	-1.5

MONTHLY AVERAGE = -0.4 MONTHLY MAXIMUM = 1.2 MONTHLY MINIMUM = -2.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
AUGUST - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	699	700	700	700	701	702	702	702	703	703	702	702	701	701	700	699	699	699	699	699	700	701	701	701	701
2	701	701	702	702	702	702	703	703	703	703	703	702	701	701	700	699	699	699	699	699	700	700	701	701	701
3	701	700	701	701	701	701	702	702	702	702	702	701	701	700	699	699	698	698	698	699	700	700	700	700	700
4	701	701	701	701	701	702	702	702	702	702	702	701	701	700	700	699	699	699	699	699	699	700	700	700	701
5	700	700	700	700	700	700	700	701	701	701	701	700	700	699	698	698	697	697	697	697	698	698	698	699	699
6	699	699	699	699	699	699	700	700	700	700	700	699	699	698	698	697	697	697	697	697	697	698	698	698	698
7	698	699	699	699	699	700	700	701	701	701	701	701	700	700	699	699	699	698	698	699	699	699	700	700	699
8	700	700	700	700	701	701	701	702	702	702	701	701	700	699	699	699	698	698	698	698	699	699	700	700	700
9	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	698	698	698	698	699	699	700
10	699	699	700	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	698	699	699	699	699	700
11	699	699	700	700	700	700	701	701	701	701	701	700	700	699	699	698	697	697	697	698	699	700	700	700	700
12	700	700	700	700	700	700	701	701	701	701	701	700	700	699	698	698	698	697	698	698	699	699	699	699	699
13	699	699	699	699	699	700	700	700	700	700	700	700	699	698	698	697	697	697	697	698	699	700	699	699	699
14	699	699	699	699	699	700	700	700	701	700	700	700	699	698	698	697	697	696	697	697	697	698	698	699	699
15	699	699	699	699	699	699	700	700	701	701	700	700	699	699	698	697	697	696	697	698	698	698	700	701	699
16	701	701	701	701	701	701	701	701	701	701	701	700	700	699	698	698	699	700	699	700	700	701	701	701	700
17	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	699	699	700	700	700	701	701	702	702	701
18	702	702	702	702	703	703	703	704	704	703	703	702	702	701	700	699	699	698	698	699	699	700	699	699	701
19	700	700	700	700	700	700	701	701	701	700	700	699	699	698	697	696	696	696	696	696	697	697	697	697	698
20	697	698	698	698	698	698	699	699	699	699	698	698	697	696	696	695	695	695	697	698	698	699	700	700	698
21	699	699	698	698	698	699	699	700	700	700	700	700	699	699	698	698	698	698	698	698	699	699	699	698	699
22	698	699	699	700	700	701	701	701	701	701	700	700	699	698	698	697	697	697	698	698	699	699	699	700	699
23	700	700	700	699	699	700	700	701	701	701	700	699	699	698	697	697	696	696	696	697	698	698	698	698	699
24	698	699	698	699	699	699	699	699	700	699	699	699	698	698	697	696	696	696	696	696	697	698	698	698	698
25	699	698	698	698	698	698	698	699	699	699	699	698	698	697	696	696	695	695	695	695	696	696	697	697	697
26	696	697	697	697	697	697	698	698	698	698	698	697	696	696	695	694	694	694	694	695	695	696	696	696	696
27	696	695	695	695	696	696	697	697	697	697	697	696	696	695	695	695	694	694	695	695	696	696	696	697	696
28	697	697	697	697	697	698	698	698	698	698	698	698	697	696	696	695	695	696	697	697	698	698	698	698	697
29	699	699	699	699	699	699	700	700	701	701	700	700	700	699	698	697	697	697	697	698	700	701	702	701	699
30	701	700	700	700	700	700	700	700	700	700	700	699	699	698	697	697	697	696	697	697	698	699	699	699	699
31	699	699	698	698	699	699	699	700	700	700	699	699	698	698	697	697	696	697	697	697	697	698	698	699	698
HRAVE	699	699	699	699	699	700	700	701	701	701	700	700	699	699	698	697	697	697	697	698	698	699	699	699	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	701	700	701	699	698	699	700	700	700	700	699	699	699	699	700	701	701	698	698	699	699	699	698	697
MAX	703	703	702	702	701	700	701	702	701	701	701	701	700	701	701	701	703	704	701	700	700	701	701	700	699
MIN	699	699	698	699	697	697	698	698	698	698	697	697	697	696	696	698	699	698	696	695	698	697	696	696	695

DAY	26	27	28	29	30	31
AVE	696	696	697	699	699	698
MAX	698	697	698	702	701	700
MIN	694	694	695	697	696	696

MONTHLY AVERAGE = 699.0 MONTHLY MAXIMUM = 703.5 MONTHLY MINIMUM = 693.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
AUGUST - 2020

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	23	26	27	27	28	29	26	24	22	22	20	22	24	25	23	21	20	21	24	28	31	29	29	30	25
2	31	32	34	37	41	43	39	35	30	26	22	18	20	19	20	21	19	19	21	24	25	26	28	30	27
3	31	32	35	37	40	42	38	35	28	24	21	19	18	16	14	14	12	13	16	21	23	23	24	25	25
4	29	31	34	35	38	39	37	32	27	22	19	18	15	13	11	11	10	13	15	18	19	20	19	19	23
5	23	24	26	27	29	30	27	25	22	20	17	17	14	11	11	12	10	9	9	11	12	13	14	15	18
6	17	18	19	22	24	25	24	20	17	14	11	9	9	10	10	10	10	11	12	13	15	16	16	17	15
7	20	20	20	22	23	26	26	22	19	18	17	16	15	13	12	13	13	13	14	16	19	19	21	21	18
8	23	24	26	28	29	31	29	26	23	21	17	15	15	13	14	13	13	14	14	15	15	16	17	19	20
9	21	23	26	27	29	31	29	26	23	20	15	13	12	11	10	10	10	11	12	13	14	14	15	16	18
10	18	20	21	23	25	25	24	20	19	15	13	10	9	9	9	10	10	11	12	13	14	15	15	16	16
11	18	20	21	22	22	25	24	23	21	24	24	21	19	17	15	14	13	14	15	17	28	32	32	33	21
12	35	35	35	35	38	39	39	32	28	26	25	22	19	17	17	16	16	16	17	20	21	22	23	24	26
13	26	27	30	31	34	33	33	30	25	22	18	15	13	11	11	12	12	12	14	15	17	21	22	23	21
14	25	25	27	29	31	30	31	28	25	20	17	13	12	11	11	11	10	10	11	13	14	15	16	17	19
15	21	23	26	28	29	28	28	26	24	26	25	22	20	18	17	16	15	16	16	16	15	16	19	27	22
16	29	31	32	33	35	36	35	32	27	22	20	19	16	15	14	16	31	28	27	27	32	32	35	38	28
17	40	39	40	43	47	46	44	40	28	20	17	15	13	12	11	11	12	13	14	18	20	21	22	22	25
18	23	24	26	27	28	30	31	28	23	20	17	15	14	12	11	10	10	10	11	17	18	20	18	19	19
19	21	22	24	25	28	29	27	23	20	17	15	12	11	11	10	11	11	12	15	16	15	16	17	18	18
20	19	21	22	23	24	30	29	29	31	29	26	24	21	19	18	19	20	21	29	42	45	51	51	57	29
21	60	60	61	57	62	66	60	50	44	37	31	30	30	28	28	27	29	31	32	35	37	38	40	42	42
22	41	42	44	45	50	57	60	55	51	47	41	32	30	27	26	26	26	26	28	24	25	25	28	34	37
23	35	37	40	41	42	44	43	36	30	27	24	22	18	14	14	13	13	17	20	25	30	32	32	31	28
24	31	30	25	36	35	33	36	34	31	22	19	18	16	14	12	11	11	12	25	22	25	29	28	28	24
25	36	34	33	29	30	31	31	28	23	21	17	15	14	13	13	13	13	13	15	17	20	21	21	23	22
26	23	25	26	26	27	29	30	26	24	17	14	11	11	12	11	11	11	15	18	22	26	27	29	30	21
27	31	32	34	34	34	34	34	31	27	23	19	16	16	16	18	17	19	22	22	23	25	28	29	27	25
28	30	32	33	35	39	41	42	34	29	24	20	16	15	14	14	13	13	18	28	28	30	29	32	31	27
29	35	38	38	40	43	45	43	43	37	31	31	29	28	27	25	25	24	25	28	30	40	71	75	82	39
30	81	73	68	68	76	83	80	69	62	52	42	40	32	29	28	28	28	33	37	42	47	52	54	53	52
31	54	53	55	56	57	59	63	54	49	39	34	29	27	26	27	25	27	27	30	33	41	46	49	54	42
HRAVE	31	31	33	34	36	38	37	33	29	25	22	19	18	16	16	15	16	17	19	22	24	27	28	30	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	25	27	25	23	18	15	18	20	18	16	21	26	21	19	22	28	25	19	18	29	42	37	28	24	22
MAX	31	43	42	39	30	25	26	31	31	25	33	39	34	31	29	38	47	31	29	57	66	60	44	36	36
MIN	20	18	12	10	9	9	12	13	10	9	13	16	11	10	15	14	11	10	10	18	27	24	13	11	13

DAY	26	27	28	29	30	31
AVE	21	25	27	39	52	42
MAX	30	34	42	82	83	63
MIN	11	16	13	24	28	25

MONTHLY AVERAGE = 25.6 MONTHLY MAXIMUM = 82.6 MONTHLY MINIMUM = 8.9
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
AUGUST - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.32	0.52	0.67	0.86	0.95	0.97	0.92	0.86	0.61	0.53	0.21	0.16	0.02	0.00	0.00	0.00	0.00	7.72
2	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.30	0.36	0.64	0.84	0.87	0.87	0.87	0.79	0.55	0.42	0.27	0.11	0.01	0.00	0.00	0.00	0.00	6.98
3	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.23	0.43	0.63	0.81	0.93	0.94	0.94	0.86	0.62	0.52	0.32	0.09	0.01	0.00	0.00	0.00	0.00	7.41
4	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.30	0.50	0.67	0.85	0.95	0.99	0.98	0.91	0.68	0.47	0.32	0.10	0.00	0.00	0.00	0.00	0.00	7.80
5	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.27	0.47	0.48	0.77	0.33	1.03	0.73	0.77	0.64	0.49	0.33	0.12	0.01	0.00	0.00	0.00	0.00	6.54
6	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.52	0.74	0.89	0.99	0.99	0.97	0.89	0.68	0.47	0.32	0.11	0.00	0.00	0.00	0.00	0.00	7.99
7	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.53	0.73	0.46	0.32	0.38	0.67	0.81	0.54	0.24	0.30	0.08	0.01	0.00	0.00	0.00	0.00	5.49
8	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.31	0.49	0.72	0.87	0.97	1.00	0.98	0.87	0.63	0.44	0.32	0.11	0.00	0.00	0.00	0.00	0.00	7.82
9	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.32	0.51	0.71	0.92	0.97	1.00	0.98	0.89	0.71	0.42	0.32	0.11	0.00	0.00	0.00	0.00	0.00	7.96
10	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.32	0.52	0.74	0.89	0.99	1.02	0.98	0.89	0.69	0.39	0.31	0.10	0.00	0.00	0.00	0.00	0.00	7.93
11	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.16	0.37	0.72	0.86	0.95	0.98	0.95	0.87	0.69	0.36	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.34
12	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.44	0.70	0.85	0.95	0.98	0.95	0.86	0.68	0.32	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.46
13	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.25	0.45	0.68	0.87	0.96	0.98	0.97	0.88	0.72	0.30	0.27	0.03	0.00	0.00	0.00	0.00	0.00	7.47
14	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.30	0.47	0.71	0.86	0.96	0.99	0.94	0.80	0.70	0.39	0.30	0.09	0.00	0.00	0.00	0.00	0.00	7.55
15	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.29	0.49	0.70	0.85	0.94	0.98	0.95	0.85	0.68	0.39	0.31	0.13	0.01	0.00	0.00	0.00	0.00	7.66
16	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.50	0.69	0.84	0.94	0.97	0.95	0.74	0.09	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	6.11
17	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.49	0.69	0.66	0.84	0.94	0.94	0.85	0.66	0.27	0.01	0.02	0.00	0.00	0.00	0.00	0.00	6.68
18	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.20	0.48	0.58	0.84	0.94	0.97	0.94	0.84	0.67	0.38	0.21	0.03	0.00	0.00	0.00	0.00	0.00	7.13
19	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.49	0.68	0.84	0.94	0.97	0.93	0.83	0.67	0.37	0.27	0.07	0.00	0.00	0.00	0.00	0.00	7.40
20	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.39	0.61	0.80	0.89	0.92	0.89	0.79	0.63	0.38	0.16	0.02	0.00	0.00	0.00	0.00	0.00	6.70
21	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.16	0.56	0.81	0.90	0.90	0.83	0.76	0.60	0.35	0.22	0.05	0.00	0.00	0.00	0.00	0.00	6.26
22	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.22	0.37	0.56	0.71	0.88	0.90	0.83	0.78	0.62	0.35	0.23	0.07	0.00	0.00	0.00	0.00	0.00	6.57
23	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.45	0.62	0.80	0.89	0.92	0.89	0.79	0.64	0.35	0.27	0.09	0.00	0.00	0.00	0.00	0.00	7.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.32	0.55	0.36	0.41	0.38	0.83	0.77	0.64	0.34	0.24	0.04	0.00	0.00	0.00	0.00	0.00	5.10
25	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.19	0.38	0.54	0.78	0.91	0.88	0.85	0.72	0.58	0.34	0.23	0.04	0.00	0.00	0.00	0.00	0.00	6.49
26	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.13	0.26	0.43	0.77	0.75	0.88	0.82	0.74	0.58	0.29	0.09	0.02	0.00	0.00	0.00	0.00	0.00	5.81
27	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.19	0.41	0.60	0.74	0.77	0.82	0.54	0.17	0.15	0.16	0.11	0.01	0.00	0.00	0.00	0.00	0.00	4.72
28	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.22	0.44	0.64	0.80	0.89	0.92	0.90	0.73	0.59	0.38	0.08	0.02	0.00	0.00	0.00	0.00	0.00	6.67
29	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.12	0.34	0.64	0.80	0.85	0.93	0.87	0.77	0.61	0.32	0.20	0.03	0.00	0.00	0.00	0.00	0.00	6.52
30	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.20	0.44	0.65	0.80	0.89	0.91	0.90	0.79	0.62	0.31	0.05	0.01	0.00	0.00	0.00	0.00	0.00	6.63
31	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.25	0.39	0.67	0.82	0.91	0.94	0.90	0.80	0.65	0.36	0.22	0.04	0.00	0.00	0.00	0.00	0.00	6.98
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.24	0.43	0.64	0.79	0.86	0.91	0.89	0.80	0.61	0.36	0.23	0.07	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	7.72	6.98	7.41	7.80	6.54	7.99	5.49	7.82	7.96	7.93	7.34	7.46	7.47	7.55	7.66	6.11	6.68	7.13	7.40	6.70	6.26	6.57	7.00	5.10	6.49
MAX	0.97	0.87	0.94	0.99	1.03	0.99	0.81	1.00	1.00	1.02	0.98	0.98	0.98	0.99	0.98	0.97	0.94	0.97	0.97	0.92	0.90	0.90	0.92	0.83	0.91
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	5.81	4.72	6.67	6.52	6.63	6.98
MAX	0.88	0.82	0.92	0.93	0.91	0.94
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 1.0 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
AUGUST - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.07
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.04
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.13
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.03	0.00	0.29
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.13	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.13	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.29	0.00	0.00
MAX	0.00	0.00	0.00	0.26	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.53 MONTHLY MAXIMUM = 0.26 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
SEPTEMBER - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	7.0	4.4	7.0	6.8	4.5	5.2	3.2	5.2	4.2	2.8	4.2	10.9	14.0	17.3	17.2	17.9	18.4	19.3	17.4	11.2	7.2	2.6	4.5	8.1	9.2
2	6.9	5.2	5.4	4.8	4.3	2.5	2.0	3.5	6.2	6.2	8.8	11.8	13.9	15.8	15.5	16.4	17.3	16.6	14.5	10.5	6.2	3.2	5.4	5.9	8.7
3	6.6	5.6	5.5	4.2	5.6	6.6	5.2	3.6	1.5	3.7	9.5	11.3	9.9	10.6	11.2	13.8	16.1	16.3	15.9	12.1	7.5	4.2	3.4	6.2	8.2
4	7.0	6.4	5.8	5.8	6.2	7.2	7.1	5.4	4.9	3.8	3.8	6.7	3.9	6.5	5.2	7.9	8.3	3.9	3.1	6.2	3.4	5.7	8.4	8.3	5.9
5	8.7	6.9	6.9	8.2	6.6	14.7	14.4	19.2	14.7	16.3	16.1	15.2	13.6	9.5	7.1	8.7	10.4	22.5	24.1	14.8	12.3	10.2	12.0	9.4	12.6
6	12.2	14.0	9.9	9.2	9.2	6.7	8.4	7.5	7.3	10.5	6.0	3.8	6.5	6.1	6.4	5.5	11.4	14.1	14.3	11.1	5.4	2.5	4.8	7.7	8.4
7	10.1	7.7	1.5	6.1	2.4	5.4	4.1	4.2	2.2	2.2	8.1	12.5	14.8	15.6	17.7	20.3	21.2	17.9	13.2	9.1	5.7	3.9	5.6	7.0	9.1
8	12.2	10.8	14.1	13.4	13.8	11.3	8.4	6.4	6.1	9.0	11.8	14.0	14.6	19.7	24.2	22.1	19.5	20.9	22.6	19.0	20.4	17.9	15.6	8.3	14.8
9	6.2	11.1	8.8	6.8	4.3	3.0	4.3	2.4	3.2	4.0	8.0	14.1	16.8	17.6	14.5	14.1	16.8	15.9	12.8	6.6	3.1	3.5	3.8	7.6	8.7
10	20.6	21.4	20.5	17.0	13.7	13.3	16.7	19.4	15.1	12.5	12.1	7.4	4.1	4.1	3.6	2.9	5.7	5.3	4.7	11.1	10.2	8.8	4.0	4.3	10.8
11	11.7	16.5	18.5	17.5	15.9	19.7	20.7	22.9	21.9	16.2	13.2	11.5	9.6	7.8	6.2	5.5	8.5	10.2	12.5	11.1	8.0	9.7	10.1	12.4	13.2
12	14.1	9.8	7.4	8.2	8.5	7.8	8.9	8.6	8.1	9.7	6.8	7.6	4.2	3.1	3.8	2.6	2.8	2.9	3.4	7.0	9.9	11.4	12.3	11.3	7.5
13	7.6	8.5	8.2	8.7	8.9	9.0	9.7	9.5	9.6	8.0	10.1	13.1	12.9	7.7	8.4	7.2	7.3	9.7	8.8	5.9	4.4	5.4	5.5	14.2	8.7
14	14.5	10.9	7.7	9.9	8.4	10.4	9.4	8.3	6.4	11.2	15.8	15.6	13.1	9.5	9.8	5.9	7.1	5.8	6.2	2.6	4.2	5.9	6.7	6.3	8.8
15	10.6	14.2	16.8	12.3	15.3	13.5	14.2	13.2	14.5	12.0	9.6	7.8	4.0	4.9	4.9	7.6	4.3	3.2	7.0	10.8	4.3	3.6	5.1	8.8	9.3
16	8.2	6.7	6.7	7.7	8.2	7.3	7.4	6.3	6.9	5.0	5.7	5.5	5.2	5.8	7.2	6.5	7.8	11.2	14.7	11.5	8.3	6.9	7.0	8.6	7.6
17	9.1	8.6	9.1	8.8	8.2	9.9	7.7	7.0	6.4	6.1	6.9	5.5	8.1	9.5	5.4	5.1	7.8	6.1	4.9	5.2	6.3	7.2	9.9	4.8	7.2
18	5.3	6.5	6.7	6.6	5.5	6.3	8.6	9.5	7.6	7.5	10.4	12.7	13.5	15.1	12.7	9.6	8.2	10.9	11.2	5.9	5.5	6.6	6.2	6.3	8.5
19	6.2	7.4	11.7	11.3	13.3	14.3	17.1	14.8	15.8	16.9	15.2	10.2	6.3	5.9	5.3	4.5	3.7	7.7	11.5	11.8	10.4	7.1	8.8	11.4	10.4
20	10.0	8.2	8.9	9.7	10.4	10.3	15.8	16.1	13.0	11.2	10.9	9.3	7.7	5.9	5.8	6.1	7.2	3.8	4.7	6.4	6.6	3.7	4.6	7.2	8.5
21	7.4	9.5	7.0	6.9	7.8	9.1	8.2	8.1	6.1	2.8	2.7	2.8	2.7	6.7	7.3	13.8	15.6	16.3	13.3	10.8	9.7	6.7	2.9	6.8	7.9
22	6.9	7.2	6.8	7.0	5.1	6.0	4.2	4.5	2.6	1.5	6.9	12.9	11.6	13.3	16.0	14.0	15.2	15.1	10.3	6.4	6.4	3.5	1.7	4.8	7.9
23	4.4	6.4	3.8	2.3	6.9	5.7	6.8	5.2	2.3	1.9	3.2	6.7	9.5	11.2	13.2	14.1	13.9	15.8	12.1	8.6	8.8	5.2	4.2	4.7	7.4
24	5.6	6.6	6.5	5.3	7.7	5.8	6.3	6.0	6.5	1.5	2.5	4.2	7.0	7.7	11.0	15.1	13.9	14.0	12.2	10.5	8.5	4.3	4.5	5.0	7.4
25	6.3	6.9	7.5	6.9	8.5	4.8	6.0	4.7	1.9	2.7	2.6	6.4	9.4	10.8	12.8	12.0	13.7	14.9	10.6	7.4	2.9	1.6	2.6	4.1	7.0
26	6.0	5.7	2.2	3.0	6.3	7.4	7.3	6.5	3.7	1.6	6.0	9.8	9.9	14.3	14.8	14.9	15.3	13.3	8.2	5.4	4.0	4.6	2.7	4.5	7.4
27	7.8	7.6	7.0	5.7	3.8	6.6	6.7	3.5	2.0	2.1	2.6	7.7	11.3	15.9	17.0	18.1	16.2	15.5	12.5	8.9	4.9	2.7	5.7	7.8	8.3
28	7.5	8.6	7.6	7.6	7.6	5.6	4.0	4.8	5.5	4.7	9.7	10.3	12.4	14.2	11.9	11.9	13.7	11.0	14.8	20.2	20.5	20.3	25.4	22.4	11.8
29	19.9	20.5	16.2	17.1	20.3	18.8	21.0	24.0	21.4	17.2	15.6	15.7	15.5	13.6	11.4	8.9	9.1	6.5	7.6	10.5	11.9	15.1	12.1	13.3	15.1
30	11.2	8.1	9.1	9.8	8.2	8.9	9.1	8.9	8.0	7.9	5.2	6.5	4.5	4.2	7.2	4.9	5.5	11.8	14.3	12.8	8.3	4.4	6.2	6.3	8.0
HRAVE	9.3	9.3	8.7	8.5	8.5	8.8	9.1	9.0	7.9	7.3	8.3	9.6	9.7	10.3	10.5	10.6	11.4	12.0	11.5	9.7	7.8	6.6	7.1	8.1	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	9.2	8.7	8.2	5.9	12.6	8.4	9.1	14.8	8.7	10.8	13.2	7.5	8.7	8.8	9.3	7.6	7.2	8.5	10.4	8.5	7.9	7.9	7.4	7.4	7.0
MAX	19.3	17.3	16.3	8.4	24.1	14.3	21.2	24.2	17.6	21.4	22.9	14.1	14.2	15.8	16.8	14.7	9.9	15.1	17.1	16.1	16.3	16.0	15.8	15.1	14.9
MIN	2.6	2.0	1.5	3.1	6.6	2.5	1.5	6.1	2.4	2.9	5.5	2.6	4.4	2.6	3.2	5.0	4.8	5.3	3.7	3.7	2.7	1.5	1.9	1.5	1.6

DAY	26	27	28	29	30	31
AVE	7.4	8.3	11.8	15.1	8.0	***
MAX	15.3	18.1	25.4	24.0	14.3	***
MIN	1.6	2.0	4.0	6.5	4.2	***

MONTHLY AVERAGE = 9.1 MONTHLY MAXIMUM = 25.4 MONTHLY MINIMUM = 1.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
SEPTEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	108	172	172	142	143	145	155	131	132	107	276	288	288	282	289	284	285	296	293	287	269	67	239	287	131
2	283	277	270	281	290	301	294	284	290	288	289	295	284	293	285	287	277	280	281	291	270	166	137	113	182
3	109	109	113	126	122	111	114	117	104	286	284	286	282	274	276	291	282	290	286	295	295	212	137	116	348
4	104	98	94	93	100	115	98	124	137	136	119	70	55	162	98	302	0	61	116	133	111	93	97	120	103
5	94	103	86	90	107	72	90	94	112	94	85	105	82	113	82	93	117	95	54	71	68	60	52	64	187
6	51	63	87	83	80	116	87	111	110	69	161	138	191	231	248	262	280	292	288	295	292	210	130	105	64
7	90	98	85	71	90	105	113	95	94	283	291	299	293	289	283	281	280	275	281	278	290	235	243	291	6
8	315	314	298	302	299	299	306	279	289	294	273	254	241	274	284	273	271	272	284	282	280	283	277	282	239
9	337	306	326	297	292	309	315	325	323	295	300	278	238	266	251	269	289	289	297	299	286	287	125	86	96
10	35	33	40	38	68	68	67	69	60	53	43	41	297	267	77	6	285	258	237	311	305	303	333	64	317
11	59	48	68	66	57	69	68	65	66	65	65	48	47	40	46	54	49	48	40	36	36	37	42	41	19
12	47	66	112	123	124	112	112	122	149	163	135	75	99	165	136	38	29	278	315	25	47	55	64	70	86
13	106	114	130	121	120	127	139	142	119	128	77	73	69	97	95	86	63	63	76	116	105	121	108	66	232
14	68	79	98	93	108	104	103	88	112	76	87	90	78	114	65	126	63	109	98	127	117	130	96	71	312
15	73	83	67	68	77	75	66	69	67	60	61	60	74	142	180	207	234	288	302	299	314	206	133	108	84
16	116	106	126	112	117	112	114	103	135	147	143	134	56	254	259	237	277	287	306	289	305	164	106	95	89
17	117	99	116	124	101	102	122	124	115	152	165	164	94	60	67	242	56	41	57	87	119	98	65	111	8
18	124	123	101	127	117	101	97	110	124	123	60	75	78	77	78	111	97	136	150	117	136	139	123	124	29
19	99	81	81	94	83	77	72	73	88	73	83	93	140	198	219	209	235	53	31	49	56	65	61	68	148
20	78	97	92	83	79	74	65	68	65	65	64	68	57	4	280	226	75	89	303	320	302	341	84	100	282
21	103	78	97	94	109	117	123	111	127	131	131	143	324	266	282	278	284	285	292	305	296	304	212	127	325
22	118	107	120	97	130	126	126	136	134	273	281	294	294	296	287	296	295	298	297	305	299	310	92	105	85
23	95	109	96	31	103	106	103	133	135	150	286	276	269	269	274	280	281	286	285	295	302	292	176	115	10
24	118	109	98	112	101	125	98	111	145	213	275	281	294	291	285	281	282	285	294	307	300	181	125	110	91
25	96	98	108	114	110	105	117	109	97	132	147	268	284	298	301	305	287	293	299	296	321	300	147	129	353
26	117	100	195	106	124	100	96	112	132	246	301	301	306	308	284	283	289	292	292	297	310	323	68	113	161
27	90	94	106	106	74	90	112	113	116	109	259	303	303	291	293	288	296	282	287	306	251	150	132	115	168
28	119	115	103	98	115	120	96	114	117	137	64	55	89	107	82	74	25	46	66	65	67	77	68	80	256
29	84	75	92	92	83	80	76	69	77	71	51	41	32	39	38	37	37	40	35	40	34	50	63	68	240
30	81	110	115	118	129	120	129	137	142	154	134	95	78	223	236	210	267	283	307	300	300	165	111	120	21

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
SEPTEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	17	28	11	12	16	15	33	13	16	42	34	26	18	16	15	13	13	12	10	9	9	32	33	28	20
2	16	20	17	15	8	13	13	16	20	35	25	22	20	18	17	15	12	9	7	7	8	13	7	8	15
3	8	8	8	13	11	9	10	15	49	33	22	19	20	21	17	15	10	12	7	7	5	21	19	9	15
4	11	7	10	8	13	7	9	21	26	32	38	19	47	41	50	35	23	25	28	12	12	7	11	7	21
5	12	14	11	11	28	7	7	8	18	16	17	18	20	32	40	42	26	17	14	11	15	12	11	12	17
6	11	10	22	22	13	19	16	22	18	15	45	47	37	39	34	34	20	11	7	7	19	29	19	9	22
7	8	11	43	15	16	7	14	12	32	30	24	18	14	17	14	12	9	10	9	8	10	18	36	40	18
8	12	18	16	10	9	9	11	22	15	16	23	16	19	16	11	13	13	11	10	12	8	8	8	8	13
9	26	11	10	9	24	44	13	24	27	32	22	19	16	15	23	22	12	10	10	10	6	8	43	16	19
10	12	11	10	12	9	9	8	7	16	22	24	37	58	45	63	72	58	22	18	7	6	4	15	28	24
11	12	11	9	10	13	8	8	7	8	12	17	21	22	28	25	23	16	7	8	10	11	11	10	11	13
12	7	10	13	8	7	5	6	8	12	7	21	17	36	57	32	60	39	33	14	10	11	9	10	13	18
13	18	14	9	15	17	15	6	10	19	22	20	15	17	32	38	34	28	13	9	17	19	18	19	10	18
14	11	15	15	12	13	11	11	14	28	18	15	17	26	27	39	48	59	23	11	34	21	13	9	14	21
15	9	14	8	10	8	7	8	10	8	12	20	22	70	40	37	28	61	47	9	9	22	28	10	9	21
16	7	10	10	6	8	7	8	8	11	21	19	28	41	42	46	26	22	15	8	5	7	13	9	15	16
17	8	11	7	9	7	9	14	18	22	15	17	34	34	24	54	47	30	25	11	11	10	10	9	28	19
18	24	12	12	12	8	7	8	6	13	21	18	20	19	18	24	32	24	16	9	18	13	13	18	12	16
19	10	15	19	13	9	11	10	8	14	12	17	39	39	55	31	57	37	45	11	13	13	24	12	19	22
20	11	11	18	13	11	11	5	5	8	10	13	17	38	57	59	33	21	21	15	22	16	39	25	12	21
21	14	8	8	8	13	8	10	9	10	31	46	51	58	43	38	19	13	9	8	7	5	6	32	8	19
22	9	8	9	13	12	9	17	11	30	58	25	17	21	22	14	16	14	12	8	7	5	11	26	8	16
23	10	12	11	19	7	13	15	13	23	46	26	25	24	23	19	16	13	8	6	5	6	14	18	9	16
24	9	7	8	8	8	8	8	9	13	30	36	28	26	28	21	13	13	9	7	6	5	19	9	7	14
25	7	7	10	12	9	9	8	9	46	29	37	20	23	28	22	17	13	11	9	4	23	34	11	10	17
26	8	11	45	11	6	7	8	7	18	32	29	20	28	18	16	14	15	12	7	5	13	9	23	7	15
27	6	8	9	9	8	8	10	17	22	35	45	23	22	15	17	13	13	8	6	8	10	12	9	9	14
28	6	9	9	9	9	9	10	9	10	20	23	20	27	20	19	19	16	14	10	7	8	11	10	11	13
29	11	10	11	10	9	11	10	8	12	10	17	19	17	18	17	21	16	14	9	9	12	9	11	9	12
30	17	12	5	5	10	8	5	5	7	12	31	18	38	51	25	34	26	9	7	5	11	16	9	11	16
HRAVE	11	12	13	11	11	11	11	12	19	24	26	24	30	30	29	28	23	16	10	10	11	16	16	13	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20	15	15	21	17	22	18	13	19	24	13	18	18	21	21	16	19	16	22	21	19	16	16	14	17
MAX	42	35	49	50	42	47	43	23	44	72	28	60	38	59	70	46	54	32	57	59	58	58	46	36	46
MIN	9	7	5	7	7	7	7	8	6	4	7	5	6	9	7	5	7	6	8	5	5	5	5	5	4

DAY	26	27	28	29	30	31
AVE	15	14	13	12	16	***
MAX	45	45	27	21	51	***
MIN	5	6	6	8	5	***

MONTHLY AVERAGE = 17.4 MONTHLY MAXIMUM = 72.1 MONTHLY MINIMUM = 3.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
SEPTEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	27.8	27.2	26.1	25.5	25.5	25.4	25.0	24.8	26.3	28.2	30.2	33.1	34.1	34.5	35.1	35.3	35.1	34.7	33.8	33.0	31.9	31.1	30.5	29.8	30.2
2	28.7	27.9	27.4	27.0	26.7	25.7	25.9	27.2	28.6	30.2	31.6	33.1	34.3	35.3	35.7	36.1	35.9	35.3	34.1	33.0	32.2	30.9	30.1	29.2	30.9
3	28.7	28.1	27.5	26.2	25.8	25.2	25.6	26.9	29.3	31.0	33.8	35.9	37.3	38.6	39.2	39.6	39.3	38.6	36.9	35.5	34.7	33.4	32.8	31.0	32.5
4	30.0	29.1	28.2	26.7	26.3	25.5	26.7	27.9	30.5	33.6	37.3	40.3	41.8	43.2	43.3	43.2	42.5	41.9	41.1	39.0	37.6	36.6	34.3	33.0	35.0
5	32.5	31.7	31.3	30.7	29.3	30.2	31.6	33.8	35.5	37.3	38.9	40.8	41.3	42.2	42.4	42.4	42.2	40.5	37.7	37.0	36.7	36.3	35.2	34.3	36.3
6	34.0	32.8	31.6	31.0	30.5	28.5	29.3	30.4	33.4	35.7	37.6	38.6	40.4	40.8	41.4	41.5	41.9	41.0	39.0	37.5	36.5	35.6	33.9	32.6	35.6
7	31.7	31.3	28.8	27.6	26.9	25.8	26.0	28.2	30.2	32.6	36.0	37.6	38.8	39.5	39.9	39.8	39.4	38.7	37.4	36.2	34.9	34.1	33.7	32.8	33.7
8	31.9	31.3	30.9	30.1	29.3	28.6	28.0	28.0	29.4	30.9	32.8	34.0	35.3	35.2	34.6	34.5	33.9	32.8	31.9	30.4	29.9	29.9	29.0	27.5	31.3
9	26.9	26.2	25.0	23.3	21.9	21.5	20.9	21.8	23.7	25.4	27.2	28.7	29.9	30.0	30.7	30.8	29.9	29.0	27.4	26.1	25.5	24.6	22.9	22.2	25.9
10	22.2	21.7	21.1	20.6	20.1	19.6	19.6	20.6	22.0	23.7	25.8	27.4	29.4	30.2	30.9	31.5	31.9	31.1	30.0	28.4	27.4	26.6	25.5	24.6	25.5
11	24.2	24.4	23.7	23.0	22.3	21.8	21.4	21.7	22.6	24.0	25.7	27.0	28.4	29.5	30.1	30.2	29.6	29.0	28.3	27.9	27.2	26.6	26.1	26.0	25.9
12	25.4	24.2	22.0	21.3	20.4	19.9	19.4	19.9	20.9	24.3	27.5	30.1	31.6	32.9	32.9	33.1	33.2	32.9	31.8	30.8	29.9	28.8	27.7	26.8	27.0
13	25.3	24.4	22.3	22.0	21.3	20.8	20.5	21.2	24.8	29.8	32.5	34.0	35.2	36.2	36.4	36.3	35.7	35.0	34.0	32.6	31.8	30.9	29.8	29.5	29.3
14	29.4	28.3	27.0	26.4	25.2	24.5	24.5	25.1	27.0	30.9	33.1	34.7	35.0	35.8	35.7	35.6	35.3	34.7	33.9	32.8	31.3	30.8	30.0	29.1	30.7
15	28.2	28.0	27.5	26.5	26.5	25.7	25.6	26.8	28.2	30.0	31.9	33.3	34.7	35.6	37.1	37.6	37.1	36.4	35.2	33.4	32.4	31.3	29.8	28.7	31.1
16	27.8	26.6	25.1	24.3	23.5	23.0	21.6	23.8	26.6	29.5	33.0	35.7	37.8	38.5	39.3	39.9	39.1	38.2	36.2	34.2	32.9	31.1	30.8	29.2	31.2
17	27.8	27.4	25.2	24.7	24.1	23.6	23.7	24.7	27.9	32.6	35.6	37.1	38.2	38.0	38.7	39.1	38.1	37.5	36.4	34.8	33.1	32.1	31.4	30.6	31.8
18	29.4	28.0	27.5	26.5	25.7	24.4	24.1	25.5	27.6	31.4	34.0	36.0	36.7	37.0	37.3	37.5	36.8	36.1	34.3	33.0	32.1	31.1	30.1	29.2	31.3
19	28.6	28.6	28.3	27.2	27.0	26.7	26.7	27.4	29.3	30.6	32.8	34.2	35.6	36.6	36.9	36.8	36.8	35.6	34.3	33.4	32.8	31.9	31.1	30.2	31.6
20	28.9	27.9	26.7	26.5	25.6	24.6	25.0	26.6	28.9	31.7	33.8	35.7	37.2	37.6	38.3	38.5	37.5	36.6	35.6	34.2	33.3	32.8	31.0	30.0	31.9
21	28.2	27.5	26.9	26.0	24.5	24.2	23.3	24.7	27.6	30.5	33.0	34.7	36.2	37.1	37.8	37.7	37.0	35.7	34.2	33.2	31.9	31.2	30.5	28.9	30.9
22	28.2	27.1	26.1	25.2	24.2	23.6	22.8	24.4	26.8	29.4	31.8	34.1	35.5	36.1	35.9	35.9	35.5	34.7	33.3	32.1	31.2	30.5	29.5	28.0	30.1
23	26.6	25.6	25.2	23.1	22.7	21.8	21.7	23.8	26.1	28.9	31.5	34.2	36.4	37.0	37.2	36.9	36.7	35.5	33.8	32.8	32.0	31.2	30.0	28.9	30.0
24	27.6	26.4	24.9	24.3	23.5	22.4	22.3	23.6	26.2	28.8	31.8	34.5	37.0	38.4	38.7	38.5	38.0	36.9	35.0	33.7	32.9	31.3	30.2	28.8	30.7
25	27.3	26.1	25.7	24.0	24.3	23.5	22.4	24.4	26.1	29.4	32.7	35.1	37.2	37.9	38.1	38.2	38.0	36.7	34.9	33.7	32.9	31.5	29.8	28.5	30.8
26	26.8	27.0	25.9	24.6	23.4	23.6	22.2	23.9	26.8	29.1	32.0	34.7	36.2	36.7	37.2	37.0	36.5	35.5	33.9	32.8	31.6	30.9	29.2	27.7	30.2
27	25.9	25.0	24.0	23.7	22.2	20.9	21.0	22.0	24.1	28.0	31.1	34.1	35.5	36.3	36.5	36.3	35.9	34.6	32.4	31.6	30.3	29.4	27.4	26.2	28.9
28	25.3	24.2	23.1	21.6	21.6	20.2	19.4	20.6	23.6	27.5	31.9	34.0	35.3	36.1	36.1	35.8	35.2	34.4	32.9	31.6	30.3	29.1	28.4	27.5	28.6
29	26.7	26.0	25.2	24.4	23.7	23.0	22.6	23.4	25.2	26.9	28.8	30.1	31.7	33.1	34.2	34.9	35.0	34.5	33.6	32.6	31.6	30.5	28.8	27.2	28.9
30	25.8	24.2	23.0	21.8	21.3	20.3	19.2	20.9	23.9	27.8	31.3	34.3	35.6	37.3	38.0	37.9	37.7	36.5	34.3	32.7	31.5	29.7	28.6	26.8	29.2
HRAVE	27.9	27.1	26.1	25.2	24.5	23.8	23.6	24.8	27.0	29.6	32.2	34.2	35.7	36.4	36.9	36.9	36.6	35.7	34.3	33.0	32.0	31.1	29.9	28.8	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	30.2	30.9	32.5	35.0	36.3	35.6	33.7	31.3	25.9	25.5	25.9	27.0	29.3	30.7	31.1	31.2	31.8	31.3	31.6	31.9	30.9	30.1	30.0	30.7	30.8
MAX	35.3	36.1	39.6	43.3	42.4	41.9	39.9	35.3	30.8	31.9	30.2	33.2	36.4	35.8	37.6	39.9	39.1	37.5	36.9	38.5	37.8	36.1	37.2	38.7	38.2
MIN	24.8	25.7	25.2	25.5	29.3	28.5	25.8	27.5	20.9	19.6	21.4	19.4	20.5	24.5	25.6	21.6	23.6	24.1	26.7	24.6	23.3	22.8	21.7	22.3	22.4

DAY	26	27	28	29	30	31
AVE	30.2	28.9	28.6	28.9	29.2	***
MAX	37.2	36.5	36.1	35.0	38.0	***
MIN	22.2	20.9	19.4	22.6	19.2	***

MONTHLY AVERAGE = 30.6 MONTHLY MAXIMUM = 43.3 MONTHLY MINIMUM = 19.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
SEPTEMBER - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.1	0.1	-0.1	0.0	-0.1	-0.1	-0.3	-0.4	-0.7	-0.7	-0.9	-1.4	-1.5	-1.4	-1.5	-1.4	-1.0	-0.6	-0.1	0.1	0.2	0.3	0.1	0.1	-0.5
2	0.1	0.1	0.2	0.2	0.3	0.2	0.0	-0.5	-0.8	-1.0	-1.3	-1.4	-1.5	-1.6	-1.5	-1.4	-1.0	-0.8	-0.2	0.2	0.4	0.4	0.3	0.3	-0.4
3	0.3	0.3	0.6	0.3	0.3	0.2	-0.2	-0.8	-0.6	-0.8	-1.2	-1.4	-1.5	-1.5	-1.5	-1.5	-1.1	-0.7	-0.2	0.2	0.4	0.5	0.4	0.5	-0.4
4	0.6	0.6	0.5	0.6	0.6	0.8	-0.1	-1.0	-1.3	-1.1	-1.2	-1.7	-1.3	-1.5	-1.5	-1.2	-0.6	-0.2	0.3	0.6	0.5	0.8	1.0	0.9	-0.2
5	1.0	1.0	1.3	1.1	0.4	0.7	0.2	-0.6	-1.3	-1.6	-1.7	-2.1	-1.8	-1.7	-1.4	-1.1	-0.8	-0.3	-0.1	0.1	0.2	0.3	0.2	0.3	-0.3
6	0.2	0.3	0.3	0.3	0.4	0.8	0.0	-0.3	-1.3	-1.6	-1.7	-1.4	-1.7	-1.4	-1.5	-1.1	-1.1	-0.7	-0.1	0.3	0.3	0.3	0.6	0.5	-0.4
7	0.8	0.5	0.6	0.6	0.5	0.7	0.1	-0.9	-0.8	-0.7	-1.2	-1.4	-1.5	-1.5	-1.5	-1.2	-0.9	-0.6	-0.1	0.2	0.4	0.3	0.3	0.1	-0.3
8	0.1	0.0	0.1	0.1	0.1	0.1	0.2	-0.1	-0.6	-0.9	-1.1	-1.2	-1.5	-1.2	-1.2	-1.0	-0.6	-0.3	-0.2	-0.2	0.0	0.1	0.1	0.2	-0.4
9	0.2	0.2	0.2	0.2	0.3	0.3	0.1	-0.3	-0.6	-0.8	-1.3	-1.5	-1.6	-1.3	-1.4	-1.2	-1.1	-0.7	-0.1	0.2	0.3	0.5	0.6	0.5	-0.4
10	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	-0.7	-0.9	-1.1	-1.4	-1.4	-1.1	-1.2	-1.1	-0.8	-0.9	-0.5	-0.1	0.2	0.3	0.4	0.5	0.5	-0.4
11	0.3	0.1	0.1	0.0	0.0	0.0	0.0	-0.2	-0.4	-0.7	-0.9	-1.0	-1.0	-1.0	-0.8	-0.6	-0.3	-0.1	0.1	0.2	0.2	0.2	0.2	0.2	-0.2
12	0.1	0.3	0.6	0.6	0.4	0.6	0.6	0.3	-0.4	-1.3	-1.2	-1.4	-1.3	-0.9	-0.8	-0.5	-0.5	-0.2	0.3	0.6	0.3	0.4	0.5	0.4	-0.1
13	0.4	0.7	1.0	0.9	0.9	1.0	0.7	0.1	-0.6	-1.3	-1.6	-1.5	-1.3	-1.5	-1.2	-0.9	-0.4	0.0	0.3	0.5	0.6	0.7	0.6	0.4	-0.1
14	0.3	0.4	0.5	0.4	0.6	0.5	0.5	0.0	-0.7	-1.4	-1.7	-1.9	-1.7	-1.7	-1.4	-1.1	-0.6	-0.1	0.5	0.3	0.4	0.5	0.6	0.6	-0.2
15	0.4	0.2	0.1	0.2	0.2	0.2	0.0	-0.6	-1.0	-1.2	-1.5	-1.6	-1.3	-1.3	-1.4	-1.4	-0.8	-0.4	0.1	0.4	0.4	0.4	0.5	0.7	-0.4
16	0.6	0.7	0.9	0.7	0.4	0.5	0.3	-0.9	-1.5	-1.3	-1.7	-1.6	-1.4	-1.2	-1.3	-1.1	-0.9	-0.4	0.2	0.6	0.6	0.7	0.8	0.8	-0.2
17	0.7	0.6	1.0	0.8	0.8	0.9	1.1	0.3	-0.6	-1.4	-1.7	-1.5	-1.7	-1.3	-1.2	-1.0	-0.4	0.0	0.6	0.8	0.6	0.6	0.4	0.4	0.0
18	0.6	0.8	0.7	1.1	0.9	1.0	1.2	0.1	-0.8	-1.2	-1.3	-1.6	-1.5	-1.3	-1.2	-1.0	-0.5	-0.1	0.2	0.5	0.4	0.5	0.5	0.5	-0.1
19	0.6	0.5	0.3	0.5	0.3	0.3	0.1	-0.4	-1.0	-1.2	-1.6	-1.7	-1.7	-1.6	-1.3	-1.0	-0.6	-0.2	0.2	0.2	0.2	0.4	0.4	0.3	-0.3
20	0.4	0.7	0.8	0.8	0.5	0.4	0.7	0.1	-0.4	-1.0	-1.4	-1.6	-1.4	-1.1	-1.2	-1.2	-0.6	-0.1	0.3	0.5	0.6	0.5	0.6	0.6	-0.1
21	0.9	0.9	1.0	0.9	1.4	1.1	1.0	-0.1	-1.3	-0.9	-1.0	-1.1	-1.0	-1.2	-1.2	-1.1	-0.9	-0.4	0.1	0.2	0.4	0.5	0.4	0.3	0.0
22	0.4	0.4	0.6	0.5	0.5	0.3	0.3	-0.7	-0.8	-0.6	-1.0	-1.3	-1.3	-1.4	-1.3	-1.2	-0.9	-0.4	0.1	0.4	0.6	0.4	0.7	0.5	-0.2
23	0.6	0.7	0.6	0.5	0.7	0.6	0.5	-0.7	-0.7	-0.7	-0.9	-1.2	-1.4	-1.4	-1.3	-1.2	-0.9	-0.4	0.1	0.4	0.4	0.4	0.6	0.5	-0.2
24	0.6	0.5	0.7	0.6	0.6	0.7	0.5	-1.0	-1.4	-0.7	-0.9	-1.0	-1.3	-1.2	-1.3	-1.2	-0.8	-0.4	0.2	0.4	0.6	0.5	0.5	0.6	-0.2
25	0.7	0.7	0.5	0.5	0.7	0.6	0.8	-0.9	-0.7	-1.0	-1.0	-1.1	-1.2	-1.3	-1.3	-1.1	-0.8	-0.3	0.2	0.6	0.4	0.5	0.5	0.6	-0.1
26	0.7	0.5	0.4	0.6	0.7	0.7	0.3	-0.9	-1.0	-0.7	-0.9	-1.2	-1.3	-1.2	-1.4	-1.1	-0.8	-0.3	0.3	0.7	0.4	0.5	0.8	0.6	-0.1
27	0.7	0.6	0.7	0.6	0.8	0.7	0.3	-0.7	-0.5	-0.7	-0.9	-1.2	-1.3	-1.3	-1.2	-1.1	-0.7	-0.3	0.2	0.5	0.6	0.3	0.5	0.6	-0.1
28	0.6	0.6	0.6	0.6	0.5	0.7	0.4	-0.6	-1.2	-1.3	-1.3	-1.3	-1.6	-1.6	-1.2	-0.8	-0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	-0.3
29	0.2	0.1	0.2	0.2	0.2	0.2	0.1	-0.4	-0.9	-1.2	-1.1	-1.1	-1.0	-0.9	-0.8	-0.6	-0.2	0.2	0.5	0.4	0.4	0.3	0.4	0.7	-0.2
30	0.6	0.7	0.7	0.5	1.0	1.2	1.3	-0.7	-1.3	-1.9	-1.4	-2.0	-1.4	-1.1	-1.4	-1.0	-0.7	-0.3	0.3	0.5	0.6	0.6	0.7	0.8	-0.1
HRAVE	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.5	-0.9	-1.1	-1.3	-1.4	-1.4	-1.3	-1.3	-1.1	-0.7	-0.3	0.1	0.4	0.4	0.4	0.5	0.5	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.5	-0.4	-0.4	-0.2	-0.3	-0.4	-0.3	-0.4	-0.4	-0.4	-0.2	-0.1	-0.1	-0.2	-0.4	-0.2	0.0	-0.1	-0.3	-0.1	0.0	-0.2	-0.2	-0.2	-0.1
MAX	0.3	0.4	0.6	1.0	1.3	0.8	0.8	0.2	0.6	0.5	0.3	0.6	1.0	0.6	0.7	0.9	1.1	1.2	0.6	0.8	1.4	0.7	0.7	0.7	0.8
MIN	-1.5	-1.6	-1.5	-1.7	-2.1	-1.7	-1.5	-1.5	-1.6	-1.4	-1.0	-1.4	-1.6	-1.9	-1.6	-1.7	-1.7	-1.6	-1.7	-1.6	-1.3	-1.4	-1.4	-1.4	-1.3

DAY	26	27	28	29	30	31
AVE	-0.1	-0.1	-0.3	-0.2	-0.1	***
MAX	0.8	0.8	0.7	0.7	1.3	***
MIN	-1.4	-1.3	-1.6	-1.2	-2.0	***

MONTHLY AVERAGE = -0.2 MONTHLY MAXIMUM = 1.4 MONTHLY MINIMUM = -2.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
SEPTEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	699	699	699	699	700	700	701	701	701	701	701	700	700	699	699	698	698	698	698	699	699	700	700	701	700
2	701	701	701	701	701	702	702	702	702	703	702	702	701	701	700	699	699	699	699	700	700	700	700	701	701
3	701	701	701	701	701	701	701	702	702	702	701	701	700	699	699	698	698	698	698	698	699	699	700	700	700
4	700	700	700	700	700	701	701	702	702	702	701	701	700	700	699	699	699	698	699	699	700	700	701	701	700
5	701	702	702	702	702	703	703	704	704	704	704	704	703	702	702	701	701	701	701	702	702	702	702	702	702
6	703	703	703	703	703	703	704	704	704	704	703	703	702	701	700	699	699	698	698	698	699	699	699	699	701
7	699	698	698	698	698	698	698	698	699	698	698	697	696	695	694	694	693	693	693	693	694	694	694	694	696
8	694	694	694	694	694	694	694	694	694	694	694	693	693	692	692	692	692	691	692	693	693	694	694	694	693
9	695	695	695	696	696	696	697	698	698	698	698	697	697	696	696	696	697	697	697	698	699	700	700	700	697
10	701	701	701	701	702	702	702	703	703	704	703	703	703	702	701	701	701	701	701	701	702	702	702	702	702
11	703	703	703	703	703	703	703	704	704	704	704	703	702	702	701	701	700	700	700	700	701	701	701	701	702
12	701	701	701	701	701	701	701	702	702	702	701	701	700	700	699	699	698	698	699	699	699	700	700	700	700
13	700	700	700	700	701	701	702	702	702	702	702	701	701	700	700	700	700	700	700	700	701	701	702	702	701
14	702	703	703	703	703	703	704	704	704	704	704	704	703	703	702	702	701	701	701	702	702	703	703	703	703
15	704	704	704	704	704	704	705	705	705	705	704	704	703	702	701	701	700	700	700	700	701	701	701	701	703
16	702	702	701	701	701	702	702	702	703	703	702	702	701	700	700	699	699	699	699	699	700	700	701	701	701
17	701	701	701	701	701	702	702	703	703	703	703	702	702	701	700	700	699	699	699	700	700	701	701	701	701
18	702	702	702	702	702	702	703	703	703	703	703	702	702	701	700	700	699	699	700	700	701	701	701	701	701
19	701	701	701	701	701	702	702	702	702	702	702	701	700	700	699	698	698	698	698	698	699	699	699	699	700
20	700	700	700	700	700	701	701	701	701	701	701	700	700	699	699	698	698	698	698	698	699	699	699	700	700
21	700	700	700	700	701	701	701	702	702	702	702	701	701	700	699	699	699	699	699	700	700	701	701	701	700
22	701	701	701	701	702	702	703	703	703	703	703	703	702	701	701	701	700	700	701	701	701	702	702	702	702
23	702	702	702	702	702	702	703	703	703	703	703	702	701	700	700	700	699	699	700	700	700	701	701	701	701
24	700	700	700	700	700	701	701	701	702	701	701	700	700	699	698	698	698	698	698	698	698	699	699	699	700
25	699	699	700	700	700	700	701	701	701	702	702	701	701	700	699	699	699	699	699	699	699	700	700	700	700
26	701	701	701	701	701	701	701	702	702	702	701	701	700	699	699	699	698	698	698	699	699	699	699	700	700
27	700	700	700	700	700	700	701	701	701	701	701	701	700	699	699	699	698	698	698	699	699	699	700	700	700
28	700	700	700	700	701	701	701	702	702	702	702	702	701	701	700	700	700	700	700	701	702	702	703	703	701
29	704	704	704	704	705	705	705	705	706	705	705	704	704	703	702	701	701	701	701	702	702	703	703	703	703
30	703	703	703	703	703	703	704	704	704	704	704	703	702	701	701	700	700	700	700	701	701	701	702	702	702
HRAVE	700	701	701	701	701	701	702	702	702	702	702	701	701	700	699	699	699	699	699	699	700	700	700	700	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	700	701	700	700	702	701	696	693	697	702	702	700	701	703	703	701	701	701	700	700	700	702	701	700	700
MAX	701	703	702	702	704	704	699	694	700	704	704	702	702	704	705	703	703	703	702	701	702	703	703	702	702
MIN	698	699	698	698	701	698	693	691	695	701	700	698	700	701	700	699	699	699	698	698	699	700	699	698	699

DAY	26	27	28	29	30	31
AVE	700	700	701	703	702	***
MAX	702	701	703	706	704	***
MIN	698	698	700	701	700	***

MONTHLY AVERAGE = 700.4 MONTHLY MAXIMUM = 705.5 MONTHLY MINIMUM = 691.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
SEPTEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	55	58	62	64	64	64	66	67	60	51	44	33	30	30	30	29	28	27	28	31	35	40	44	49	45
2	53	56	58	60	61	66	64	57	52	47	42	37	33	29	26	24	24	24	25	27	27	30	32	35	41
3	37	39	39	44	44	45	44	38	33	35	31	25	22	20	19	18	16	16	21	22	23	25	26	28	30
4	30	32	34	37	37	39	36	32	28	23	19	15	11	9	9	10	10	9	10	13	13	13	15	16	21
5	17	19	20	20	22	20	18	16	15	14	13	11	12	11	10	10	11	13	15	16	16	16	18	19	16
6	19	20	22	22	23	26	25	23	21	20	18	16	15	14	14	13	13	13	14	15	16	17	19	20	18
7	21	22	26	27	29	30	29	24	22	20	19	18	17	16	16	14	15	16	19	21	23	26	30	38	22
8	42	43	40	38	41	47	48	46	46	42	33	30	27	28	31	30	32	34	37	44	38	12	10	13	35
9	13	12	19	24	28	29	29	26	17	15	15	21	18	12	11	10	11	12	13	14	15	16	19	22	17
10	38	27	30	38	46	50	52	48	43	37	32	26	19	14	13	13	13	14	15	18	19	20	22	25	28
11	34	42	44	45	47	48	49	48	45	41	37	34	31	29	27	26	28	28	30	31	33	35	37	38	37
12	39	41	45	47	48	50	52	49	46	39	32	27	23	20	20	19	18	18	20	22	22	24	26	28	32
13	31	33	37	38	39	41	42	40	34	25	21	18	15	13	12	11	12	15	16	20	21	23	24	23	25
14	23	24	27	27	29	30	31	29	27	22	21	18	16	15	15	13	15	14	16	18	23	25	27	29	22
15	31	34	37	40	41	43	43	39	36	32	28	24	20	17	15	14	13	14	15	18	21	21	23	24	27
16	23	26	27	29	29	30	32	28	24	20	17	15	12	10	9	8	9	9	10	11	12	13	14	14	18
17	16	16	19	20	20	21	21	20	18	15	14	13	12	11	10	9	9	9	10	12	14	15	17	19	15
18	20	21	21	22	22	24	24	22	20	16	14	12	11	12	12	11	12	14	16	17	18	20	21	23	18
19	25	26	26	28	29	30	30	29	25	24	20	18	16	15	15	15	15	16	18	18	19	20	21	22	22
20	23	25	26	26	27	29	27	24	21	17	16	14	12	12	11	11	11	12	14	15	16	16	19	19	19
21	21	21	22	23	25	25	26	24	20	17	16	15	13	14	13	14	15	17	19	20	21	21	22	25	20
22	26	27	28	30	32	33	34	30	26	22	23	20	18	17	18	18	18	18	20	21	22	23	25	27	24
23	28	29	30	34	34	36	35	31	26	23	21	18	16	15	15	15	15	16	18	18	19	20	21	23	23
24	24	26	28	29	30	32	32	28	25	21	18	15	13	11	11	12	12	12	14	15	16	18	19	21	20
25	22	23	24	26	26	27	29	25	22	18	16	14	12	12	12	12	12	13	15	16	17	18	20	21	19
26	23	23	24	27	28	28	29	26	22	19	17	14	13	13	13	13	14	15	16	17	19	19	22	23	20
27	25	26	27	28	30	32	32	28	25	20	17	15	14	13	12	12	12	13	14	14	15	16	18	20	20
28	21	21	22	25	25	27	28	25	21	17	13	12	12	12	12	12	13	14	15	16	18	19	20	20	18
29	21	21	22	23	23	23	23	21	19	17	15	15	14	13	11	10	9	10	11	11	12	14	15	17	16
30	18	19	21	23	23	25	26	23	20	17	13	10	10	9	8	8	9	10	11	12	13	15	16	18	16
HRAVE	27	28	30	32	33	35	35	32	29	25	22	19	17	16	15	15	15	15	17	19	20	20	22	24	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	45	41	30	21	16	18	22	35	17	28	37	32	25	22	27	18	15	18	22	19	20	24	23	20	19
MAX	67	66	45	39	22	26	38	48	29	52	49	52	42	31	43	32	21	24	30	29	26	34	36	32	29
MIN	27	24	16	9	10	13	14	10	10	13	26	18	11	13	13	8	9	11	15	11	13	17	15	11	12

DAY	26	27	28	29	30	31
AVE	20	20	18	16	16	***
MAX	29	32	28	23	26	***
MIN	13	12	12	9	8	***

MONTHLY AVERAGE = 23.4 MONTHLY MAXIMUM = 66.6 MONTHLY MINIMUM = 8.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
SEPTEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.19	0.48	0.59	0.88	0.92	0.84	0.78	0.60	0.36	0.19	0.03	0.00	0.00	0.00	0.00	0.00	5.97
2	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.22	0.43	0.64	0.78	0.89	0.93	0.89	0.79	0.62	0.36	0.20	0.03	0.00	0.00	0.00	0.00	0.00	6.84
3	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.45	0.65	0.83	0.92	0.95	0.91	0.81	0.64	0.36	0.19	0.03	0.00	0.00	0.00	0.00	0.00	7.03
4	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.47	0.67	0.82	0.92	0.94	0.93	0.83	0.65	0.37	0.19	0.03	0.00	0.00	0.00	0.00	0.00	7.11
5	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.47	0.66	0.81	0.91	0.94	0.90	0.80	0.62	0.36	0.20	0.03	0.00	0.00	0.00	0.00	0.00	7.01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.46	0.62	0.81	0.90	0.93	0.89	0.79	0.62	0.39	0.17	0.03	0.00	0.00	0.00	0.00	0.00	6.93
7	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.46	0.66	0.82	0.91	0.93	0.89	0.78	0.62	0.38	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.96
8	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.11	0.26	0.44	0.60	0.74	0.80	0.72	0.62	0.50	0.25	0.07	0.01	0.00	0.00	0.00	0.00	0.00	5.15
9	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.39	0.61	0.80	0.86	0.88	0.86	0.78	0.62	0.39	0.16	0.02	0.00	0.00	0.00	0.00	0.00	6.62
10	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.41	0.62	0.81	0.90	0.94	0.89	0.77	0.61	0.37	0.13	0.02	0.00	0.00	0.00	0.00	0.00	6.77
11	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.12	0.26	0.40	0.49	0.56	0.56	0.51	0.37	0.20	0.11	0.06	0.01	0.00	0.00	0.00	0.00	0.00	3.67
12	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.26	0.42	0.56	0.63	0.67	0.61	0.51	0.38	0.26	0.10	0.01	0.00	0.00	0.00	0.00	0.00	4.54
13	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.19	0.37	0.57	0.72	0.79	0.78	0.72	0.60	0.43	0.26	0.10	0.01	0.00	0.00	0.00	0.00	0.00	5.58
14	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.39	0.60	0.75	0.86	0.90	0.86	0.73	0.57	0.36	0.14	0.01	0.00	0.00	0.00	0.00	0.00	6.37
15	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.43	0.63	0.78	0.86	0.87	0.86	0.74	0.58	0.37	0.12	0.01	0.00	0.00	0.00	0.00	0.00	6.51
16	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.43	0.62	0.78	0.88	0.90	0.86	0.73	0.55	0.35	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.48
17	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.41	0.60	0.75	0.85	0.87	0.83	0.72	0.56	0.34	0.11	0.01	0.00	0.00	0.00	0.00	0.00	6.28
18	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.39	0.58	0.74	0.84	0.85	0.81	0.70	0.52	0.31	0.10	0.01	0.00	0.00	0.00	0.00	0.00	6.06
19	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.40	0.59	0.74	0.84	0.88	0.82	0.70	0.53	0.32	0.10	0.01	0.00	0.00	0.00	0.00	0.00	6.14
20	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.14	0.23	0.60	0.76	0.86	0.87	0.82	0.75	0.53	0.35	0.08	0.01	0.00	0.00	0.00	0.00	0.00	6.04
21	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.41	0.61	0.76	0.85	0.87	0.82	0.72	0.53	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.21
22	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.17	0.44	0.57	0.63	0.84	0.86	0.82	0.60	0.53	0.33	0.10	0.01	0.00	0.00	0.00	0.00	0.00	5.94
23	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.43	0.62	0.76	0.86	0.88	0.82	0.70	0.53	0.32	0.10	0.01	0.00	0.00	0.00	0.00	0.00	6.29
24	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.43	0.63	0.77	0.87	0.89	0.84	0.72	0.54	0.33	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.38
25	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.43	0.62	0.77	0.86	0.88	0.83	0.72	0.54	0.33	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.31
26	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.43	0.62	0.77	0.86	0.89	0.83	0.71	0.54	0.32	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.32
27	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.19	0.40	0.64	0.73	0.87	0.89	0.83	0.71	0.54	0.33	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.27
28	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.43	0.62	0.76	0.86	0.85	0.79	0.67	0.50	0.29	0.08	0.00	0.00	0.00	0.00	0.00	0.00	6.10
29	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.42	0.62	0.77	0.86	0.89	0.83	0.72	0.54	0.33	0.10	0.00	0.00	0.00	0.00	0.00	0.00	6.31
30	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.43	0.63	0.77	0.86	0.89	0.83	0.70	0.53	0.32	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.29
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.19	0.39	0.59	0.74	0.85	0.87	0.82	0.71	0.54	0.33	0.12	0.01	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	5.97	6.84	7.03	7.11	7.01	6.93	6.96	5.15	6.62	6.77	3.67	4.54	5.58	6.37	6.51	6.48	6.28	6.06	6.14	6.04	6.21	5.94	6.29	6.38	6.31
MAX	0.92	0.93	0.95	0.94	0.94	0.93	0.93	0.80	0.88	0.94	0.56	0.67	0.79	0.90	0.87	0.90	0.87	0.85	0.88	0.87	0.87	0.86	0.88	0.89	0.88
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	6.32	6.27	6.10	6.31	6.29	***
MAX	0.89	0.89	0.86	0.89	0.89	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.3 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
SEPTEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.00 MONTHLY MAXIMUM = 0.00 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

10-METER TOWER METEOROLOGICAL MONITORING DATA VALIDATION REPORT

ST-10 MONITORING STATION

OCTOBER THROUGH DECEMBER 2020

ASARCO HAYDEN COMPLEX
METEOROLOGICAL
MONITORING PROGRAM FOR
REGULATORY MODELING

Prepared for
Haley and Aldrich

Prepared by
RTP Environmental Associates, Inc.
1591 Tamarack Ave.
Boulder, CO 80304

February 2021

ASARCO ST-10 METEOROLOGICAL DATA VALIDATION REPORT
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1.0 INTRODUCTION

The ASARCO Hayden facility is located approximately 80 miles east-southeast of Phoenix and 55 miles north of Tucson, Arizona. ASARCO conducts copper ore processing operations at the facility, including ore crushing, concentrating, and smelting. ASARCO installed a 10 meter meteorological tower near the main Hayden stack in August, 2013, that monitors all AERMOD required parameters. The tower is equipped with an RM Young Wind Monitor AQ wind sensor, RM Young platinum RTD model 43347 ambient temperature sensors at the 2 and 10-meter levels housed in RM Young 43502 motor-aspirated radiation shields, and a Licor model 200 pyranometer that measures solar radiation with a photovoltaic sensor.

The ASARCO meteorological monitoring program has been design to comply with requirements in EPA's "Meteorological Monitoring Guidance for Regulatory Modeling Applications", EPA-454/R-99-005, February 2000 (herein referred to as "EPA's Met Monitoring Guidance"). A Quality Assurance Project Plan (QAPP) has been prepared for the ASARCO Hayden meteorological monitoring program which describes the system design, operational procedures, and Data Quality Objectives (DQOs).

This document is the 10-meter tower data validation report for the period October through December 2020. Section 2 of this report presents a chronology of events that occurred during the reporting period. Section 3 discusses data screening and validation findings, and overall data capture rates. Section 4 summarizes the data collected. Appendix A presents the data screening results. Appendix B presents monthly data plots and data tables for the reporting period.

2.0 CHRONOLOGICAL SUMMARY

There were no significant operational events during the reporting period.

3.0 OPERATION SUMMARY

3.1 10-m Tower Calibrations and Audits

There were no calibrations or audits performed during the reporting quarter.

3.2 Data Validation and Quality Control Screening

Data validation is a process in which suspect data are identified and flagged for additional review and corrective action as necessary. The data validation process provides an additional level of quality assurance for the monitoring program. Some problems that may escape detection during a calibration or audit are often identified during the data validation process. There are various levels of data validation which indicate the level of review and degree of confidence in the data. EPA's Met Monitoring Guidance defines four levels of data validation, and the Project QAPP has directly adopted these validation levels and definitions from EPA as described below:

- Level 0 data validation is essentially raw data obtained directly from the data acquisition systems in the field. Level 0 data have been reduced and possibly reformatted, but are unedited and unreviewed. These data have not received any adjustments for known biases or problems that may have been identified during calibrations or audits. These data can be used to assess the instrument operations on a routine basis, but should not be used for regulatory modeling purposes until they receive Level 1 validation.
- Level 1 data validation involves quantitative and qualitative reviews for accuracy, completeness, and internal consistency. Quantitative checks are performed by software screening programs and qualitative checks are performed by meteorologists or trained personnel who manually review the data for outliers and problems.
- Level 2 data validation involves additional comparisons with other independent data sets.
- Level 3 validation involves a more detailed analysis, when inconsistencies in analysis and modeling results are found to be caused by measurement errors.

As described in the Project QAPP, the data validation process will result in a Level 1 validated meteorological data base of parameters required for regulatory AERMOD modeling analyses. Additional Level 2 comparisons to other data sets are also performed, as well as Level 3 validation as needed.

The data validation process begins with a review of calibration and audit results, followed by quantitative software screening checks and detailed manual review. The meteorological data were screened according to the criteria listed in Appendix C of the Quality Assurance Handbook for Air Measurement Systems (EPA -454/B-08-002 Volume IV). If the comparisons fall outside of typical ranges, the record is flagged for further inspection. Table 1 summarizes the data screening and validation criteria used for the 10 meter meteorological tower parameters.

The ambient temperature, pressure, precipitation, and relative humidity data were then Level 2 screened against monthly maximums, minimums, and averages recorded at the two nearest meteorological monitoring stations from the Arizona Meteorological Network (AZMET), the Safford and Coolidge stations. The period of record for these AZMET stations were from 1987 to 2013. Monthly normal precipitation data from the Globe AZ station reported by Western Regional Climate Center for the period 1975-2008 was also used for comparisons. Larger precipitation events were also Level 2 validated by comparison to concurrent hourly data from the Safford and Coolidge stations. The pressure data was Level 2 validated against one of the PM_{10} Partisol FRM air samplers being operated at ASARCO, the ST-23 sampler (the maximum, average, and minimum hourly pressure differences were -2.5, -3.1, and -4.3 mm Hg over the reporting period, indicating good agreement between the two measurements) . The solar radiation data were Level 2 validated against estimated monthly maximum clear sky radiation values, as determined using the Clear Sky Radiation calculator at http://clearskycalculator.com/pyranometer.htm .

Table 1 - Data Screening and Validation Criteria

Parameter	Data Validation Criteria to Flag Data
Wind Speed	Is less than zero or greater than 25 m/s (56 mph); does not vary by more than 0.1 m/s (0.22 mph) for 3 consecutive hours; does not vary by more than 0.5 m/s (1.1 mph) for 12 consecutive hours; hourly rate of change exceeds 9 m/s (20 mph)
Wind Direction	Is less than zero or greater than 360 degrees; does not vary by more than 1 degree for more than 3 consecutive hours; does not vary by more than 10 degrees for 18 consecutive hours.
2 and 10 meter Ambient Temperature	Is greater than the local record monthly high; is less than the local record monthly low; is greater than a 5C change from the previous hour; does not vary by more than 0.5C for 12 consecutive hours.
10m – 2m Temperature Difference	Is greater than 0.1C/m during the daytime; is less than -0.1C/m during the night time, is greater than 2.0C or less than -2.0C.
Hourly Recorded Solar Radiation	Is greater than zero at night; is more than 5% higher than the maximum theoretical for the month and latitude.
Atmospheric Pressure	Less than 645 mm Hg or greater than 735 mm Hg
Precipitation	Greater than 0.2 inch/hr, less than 0.2 inch/month
Relative Humidity	Greater than 95% and less than 4%

Appendix A presents the results of the computerized screening analyses and data validation reviews. For each data point flagged, the data was manually reviewed and validated using data plots and consistency checking between interrelated parameters to determine if any corrective actions were necessary. The screening summary in Appendix A presents comments from the manual review.

No data edits were required during the data screening and validation process.

In the digital data file that accompanies this data validation report, each hourly data point has been assigned a QC code as listed in Table 8-3 of EPA's Met Monitoring Guidance. The QC codes used were:

Code 0 - valid data,

Code 2 - valid data with corrections (i.e., data with readily identifiable offsets and simple corrections),

Code 7 – suspect data (i.e., lack of calibration documentation, and/or inconsistencies between Level 2 intercomparisons),

Code 8 - invalid data (inconsistent readings between "as-left" and "as-found" calibrations that make developing a correction factor impossible).

Note that all invalid data also has a value of 999.0 in the data file.

3.3 Data Capture Statistics

Based on the data screening and review process, the monitoring data have been validated as Level 1 and data capture statistics have been compiled. Table 2 presents the valid data capture rates for the period. The DQO goals for completeness (i.e., data capture rate) are a minimum of 90% on a quarterly basis. All parameters met these data capture goals for the reporting period.

Table 2 - Data Capture Statistics

Month/Parameter	10m WS	10m WD/ST	Temp/DT	Solar Rad	BaroPress	RelHum	Precip
Jan-20	99.6	99.6	99.6	99.6	99.6	99.6	99.6
Feb-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mar-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Apr-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
May-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Jun-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Jul-20	99.6	99.6	99.6	99.6	99.6	99.6	99.6
Aug-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sep-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Oct-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Nov-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dec-20	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Quarter 1	99.9	99.9	99.9	99.9	99.9	99.9	99.9
Quarter 2	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Quarter 3	99.9	99.9	99.9	99.9	99.9	99.9	99.9
Quarter 4	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total	99.9	99.9	99.9	99.9	99.9	99.9	99.9

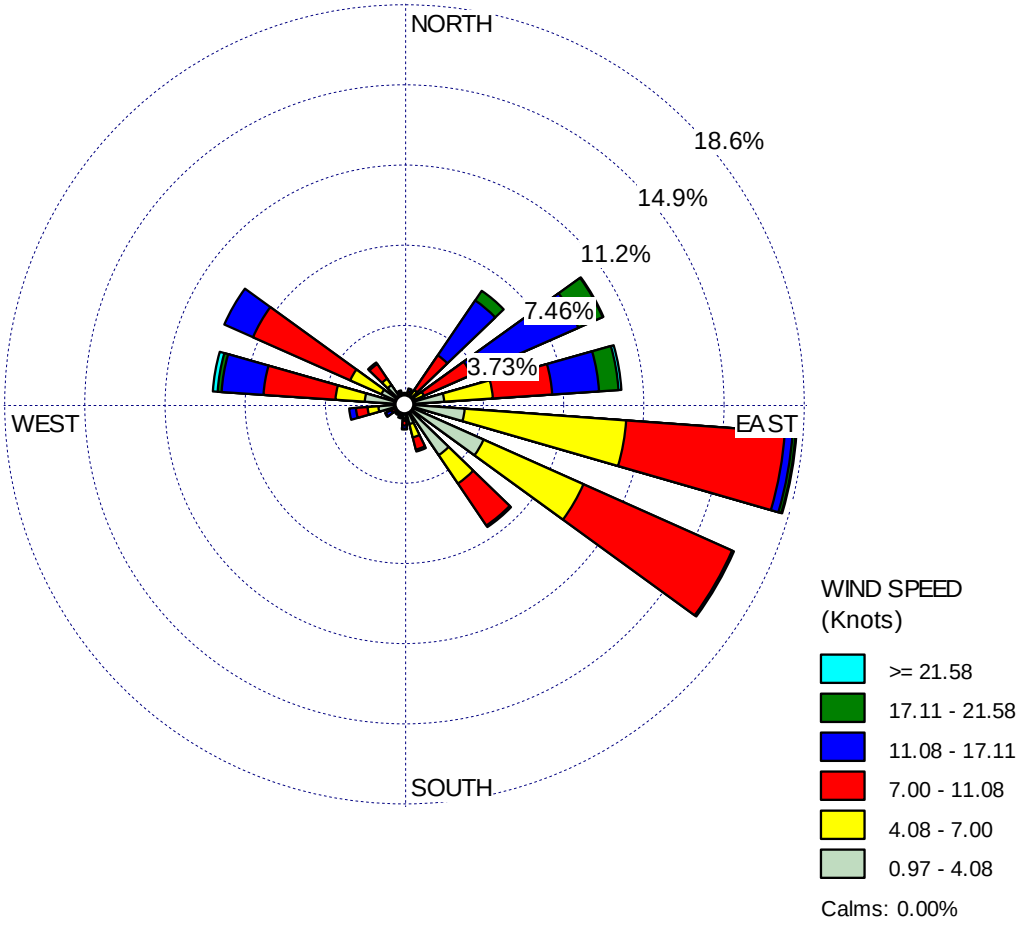
Note: The reported valid data capture rates are the percentage of the possible hours for each month, quarter, and total period.

4.0 DATA RESULTS

Appendix B presents plots of monthly data and monthly data tables for the reporting period.

Figure 1 presents a plot of the quarterly valid 10-meter wind speed and wind direction data in a format called a "wind rose" plot. This wind rose indicates that there are two predominate wind directions at the site; one from the east-southeast (typically occurring in the morning and evening hours), and a second from the west-northwest (typically occurring in the afternoon hours with higher wind speeds). This is similar to wind patterns previously observed at the monitoring site.

Figure 1 – 10m Wind Rose Plot



Wind directions are the direction the wind is blowing FROM.

APPENDIX A

Data Screening and Validation Results

ASARCO ST-10 10-Meter Data - QA Screen Test Results for October through December 2020 - Note that WS is in m/s, Temp and Delta T are in C, and Solar Rad is in kw/m2
Parameters include Wind Speed and Direction (WS WD), Sigma Theta (ST), Temperature and Delat T (TP and D1) and Solar Radiation (SR)

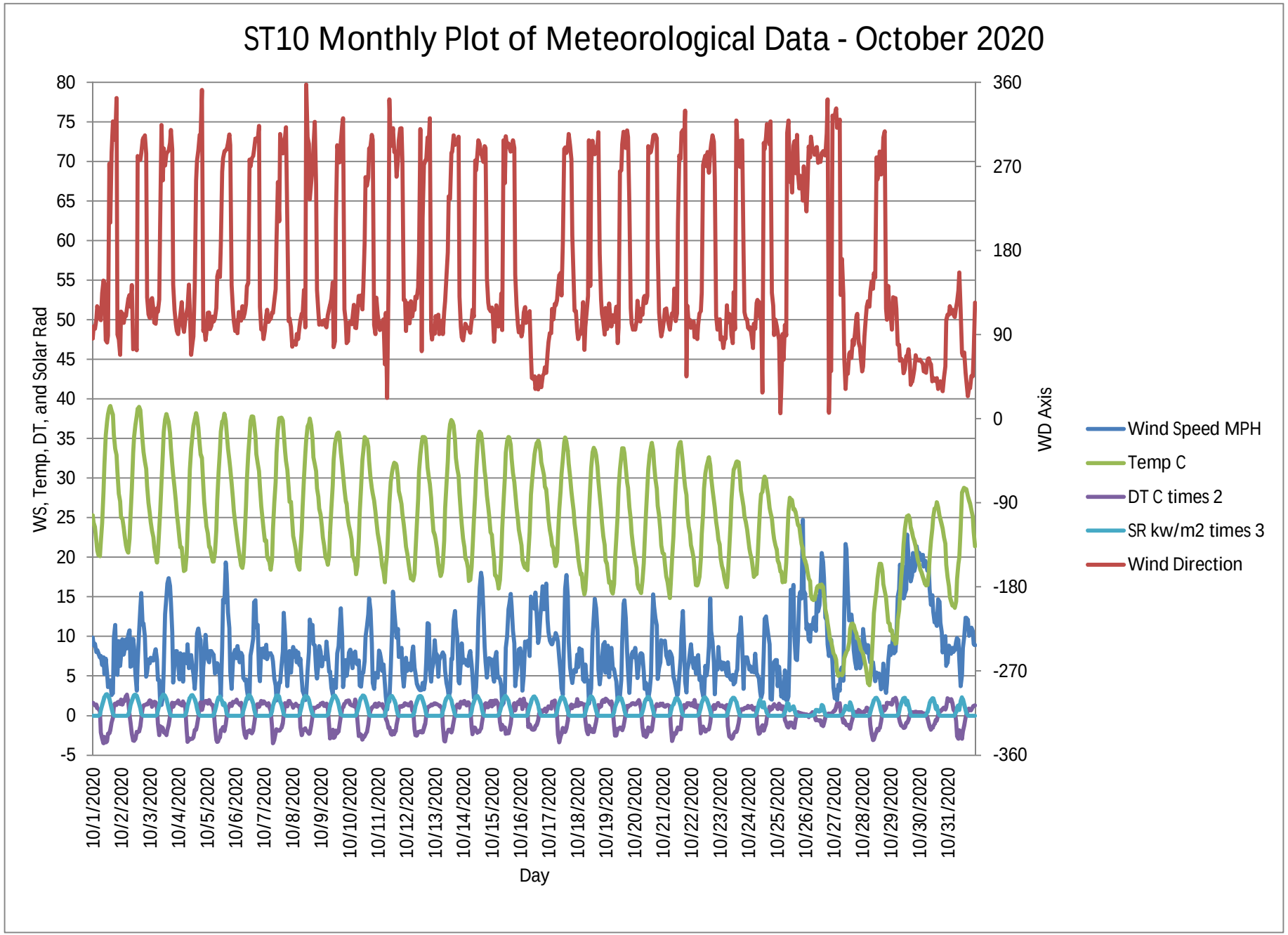
ITYPE	PARM	DATE	CODE	Value	Comments
4	WS	20100706	WIND SPD TOO CONSTANT 3 HR	0.11	#REF!
4	WS	20101213	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate winds, some variations - data is valid
4	WS	20101500	WIND SPD TOO CONSTANT 3 HR	0.13	Moderate to high steady winds - data is valid
4	WS	20102102	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
4	WS	20102500	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate to high steady winds - data is valid
4	WS	20102809	WIND SPD TOO CONSTANT 3 HR	0.13	Moderate to high steady winds - data is valid
4	WS	20110506	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate to high steady winds - data is valid
4	WS	20110805	WIND SPD TOO CONSTANT 3 HR	0.16	Light to moderate winds in stable period - WS is valid
4	WS	20111314	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate winds, some variations - data is valid
4	WS	20112205	WIND SPD TOO CONSTANT 3 HR	0.18	Moderate to high steady winds - data is valid
4	WS	20112207	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
4	WS	20112722	WIND SPD TOO CONSTANT 3 HR	0.09	Light to moderate winds in stable period - WS is valid
4	WS	20120315	WIND SPD TOO CONSTANT 3 HR	0.09	Moderate to high steady winds - data is valid
4	WS	20120516	WIND SPD TOO CONSTANT 3 HR	0.16	Moderate to high steady winds - data is valid
4	WS	20121604	WIND SPD TOO CONSTANT 3 HR	0.11	Moderate to high steady winds - data is valid
4	WS	20121605	WIND SPD TOO CONSTANT 3 HR	0.11	Moderate to high steady winds - data is valid
4	WS	20122906	WIND SPD TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - data is valid
7	WD	20102001	WIND DIR TOO CONSTANT 3 HR	0.6	Light to moderate winds in stable period - WD is valid
7	WD	20110607	WIND DIR TOO CONSTANT 3 HR	0.44	Light to moderate winds in stable period - WD is valid
7	WD	20112617	WIND DIR TOO CONSTANT 3 HR	0.3	Moderate to high steady winds - WD data is valid
7	WD	20120108	WIND DIR TOO CONSTANT 3 HR	0.2	Moderate to high steady winds - WD data is valid
11	TP	20110109	HIGH RATE OF C CHANGE	5.76	Transition - early morning - Temp data is valid
11	TP	20110510	HIGH RATE OF C CHANGE	5.44	Transition - early morning - Temp data is valid
11	TP	20120709	HIGH RATE OF C CHANGE	5.08	Transition - early morning - Temp data is valid
11	TP	20122111	HIGH RATE OF C CHANGE	5.27	Transition - early morning - Temp data is valid
15	D1	20111523	DT LARGE READING	2.45	Strong winds, trending positive DT, slightly above threshold - data is valid
15	D1	20111603	DT LARGE READING	2.02	Strong winds, trending positive DT, slightly above threshold - data is valid
15	D1	20120207	DT LARGE READING	2.1	Strong winds, trending positive DT, slightly above threshold - data is valid
15	D1	20122104	DT LARGE READING	2.09	Strong winds, trending positive DT, slightly above threshold - data is valid
15	D1	20122105	DT LARGE READING	2.35	Strong winds, trending positive DT, slightly above threshold - data is valid
16	D1	20122115	DT + During Daytime	0.11	Occurs immediately before daytime transition - data is valid
17	D1	20102603	DT - During Nighttime	-0.11	Slightly above flagging value, strong winds - data is valid
18	RH	20100415	OUT OF LIMITS	3.97	Hot daytime temperatures, data is valid
19	RH	20121009	OUT OF LIMITS	96.3	Cool temperature, recent precipitation, data is valid
19	RH	20121019	OUT OF LIMITS	95.6	Cool temperature, recent precipitation, data is valid
19	RH	20121100	OUT OF LIMITS	97.7	Cool temperature, recent precipitation, data is valid
19	RH	20121101	OUT OF LIMITS	98.3	Cool temperature, recent precipitation, data is valid
19	RH	20121102	OUT OF LIMITS	99.1	Cool temperature, recent precipitation, data is valid
19	RH	20121103	OUT OF LIMITS	99.4	Cool temperature, recent precipitation, data is valid
19	RH	20121104	OUT OF LIMITS	99.7	Cool temperature, recent precipitation, data is valid
19	RH	20121105	OUT OF LIMITS	99.9	Cool temperature, recent precipitation, data is valid
19	RH	20121106	OUT OF LIMITS	99.9	Cool temperature, recent precipitation, data is valid
19	RH	20121107	OUT OF LIMITS	100	Cool temperature, recent precipitation, data is valid
19	RH	20121108	OUT OF LIMITS	99.2	Cool temperature, recent precipitation, data is valid

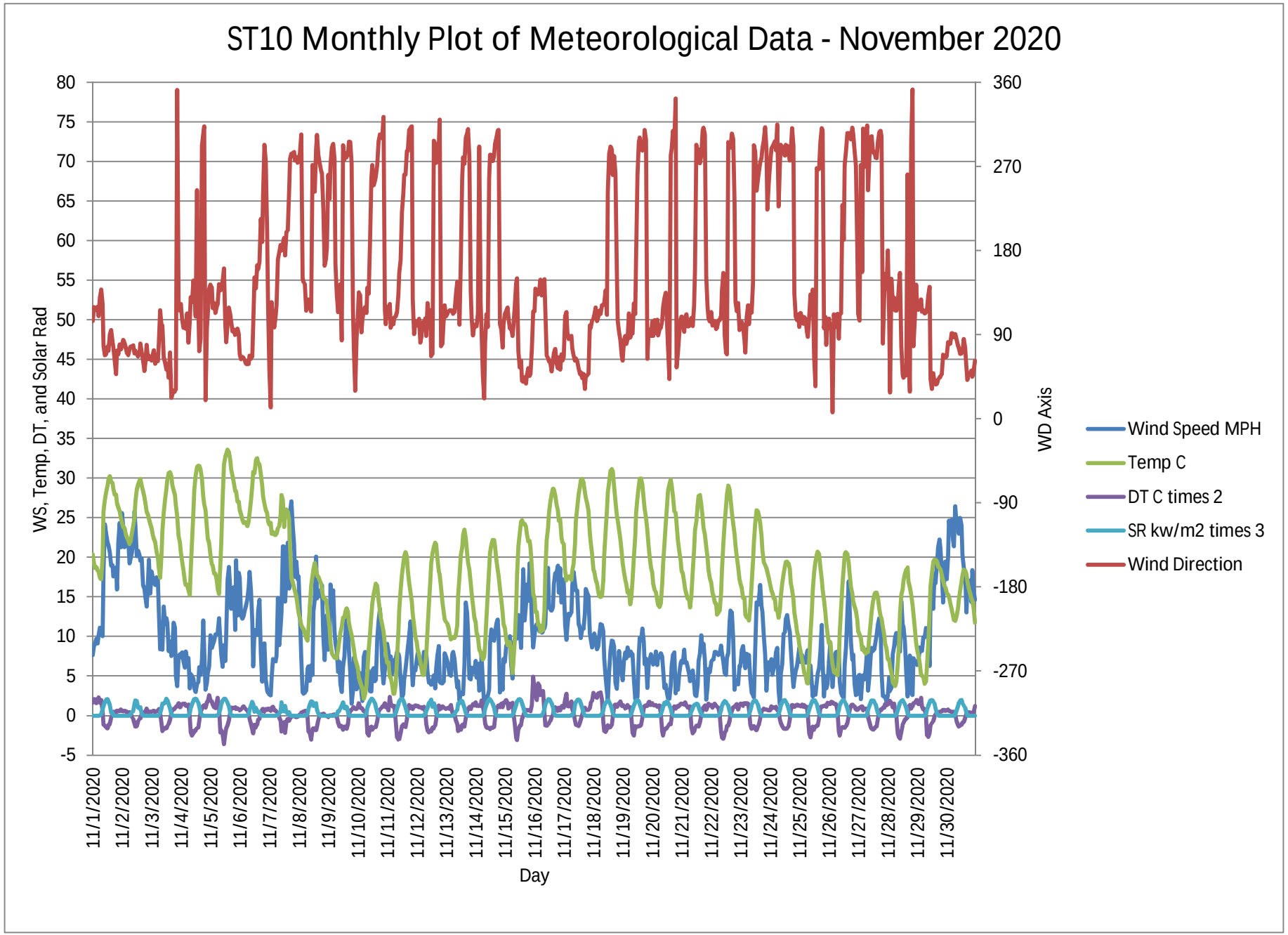
AZMET and ST10 Reported Precipitation Totals
(inches/month)

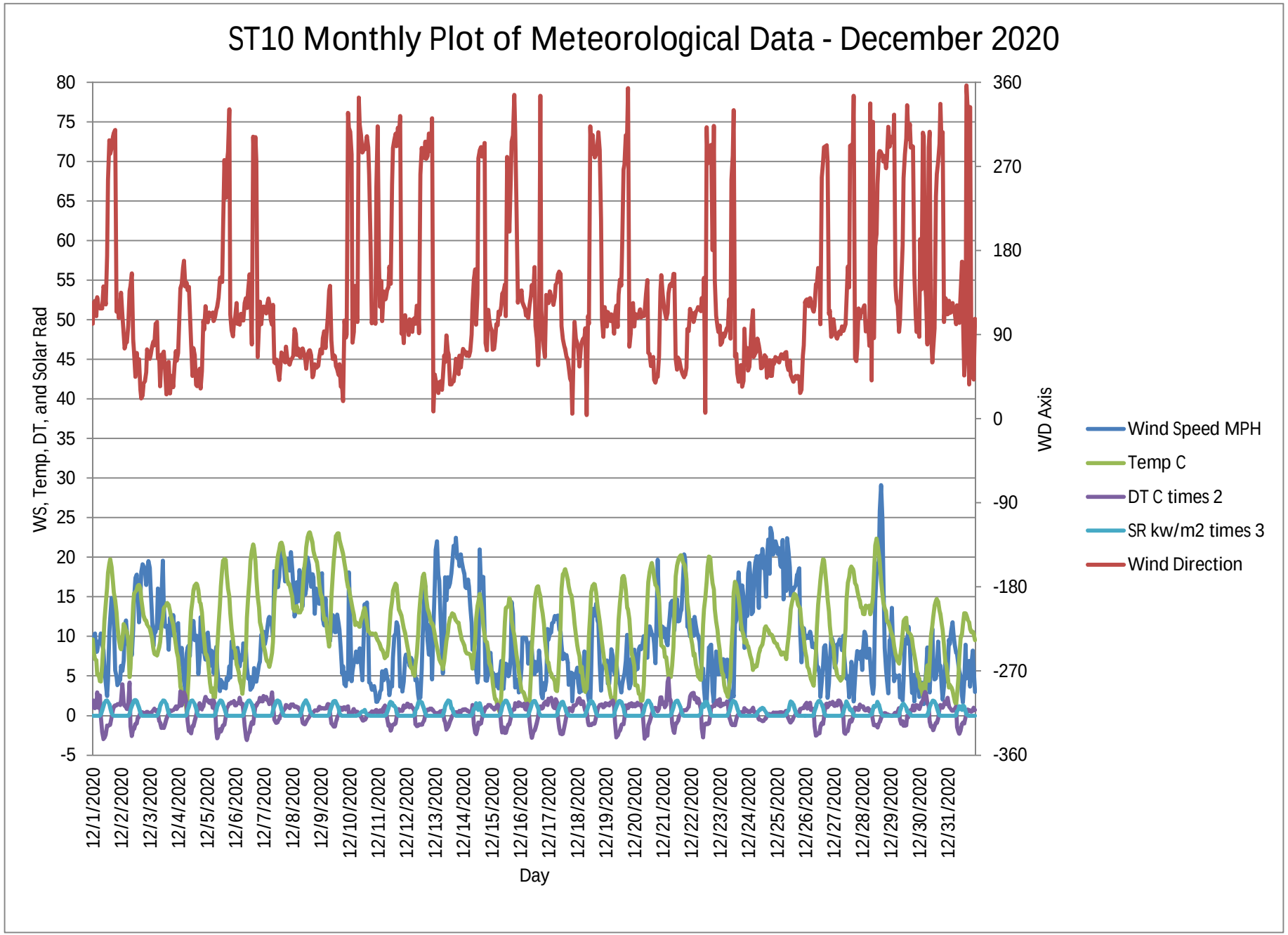
Month	Coolidge	Safford	Ave Cool&Saff	ST-10
Jan-20	0.15	0.42	0.29	0.91
Feb-20	0.61	0.90	0.76	1.27
Mar-20	1.23	0.64	0.94	1.91
Apr-20	0.00	0.00	0.00	0.16
May-20	0.01	0.00	0.01	0.00
Jun-20	0.00	0.03	0.02	0.00
Jul-20	0.66	0.59	0.63	0.44
Aug-20	0.36	0.39	0.38	0.53
Sep-20	0.00	0.00	0.00	0.00
Oct-20	0.00	0.16	0.08	0.05
Nov-20	0.09	0.01	0.05	0.07
Dec-20	0.31	0.49	0.40	0.40
Totals Nov-Sept	3.27	3.21	3.24	4.83

APPENDIX B

Monthly Data Plots and Tables


ST10 Monthly Plot of Meteorological Data - October 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
10/1/2020
10/2/2020
10/3/2020
10/4/2020
10/5/2020
10/6/2020
10/7/2020
10/8/2020
10/9/2020
10/10/2020
10/11/2020
10/12/2020
10/13/2020
10/14/2020
10/15/2020
10/16/2020
10/17/2020
10/18/2020
10/19/2020
10/20/2020
10/21/2020
10/22/2020
10/23/2020
10/24/2020
10/25/2020
10/26/2020
10/27/2020
10/28/2020
10/29/2020
10/30/2020
10/31/2020


ST10 Monthly Plot of Meteorological Data - November 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
11/1/2020
11/2/2020
11/3/2020
11/4/2020
11/5/2020
11/6/2020
11/7/2020
11/8/2020
11/9/2020
11/10/2020
11/11/2020
11/12/2020
11/13/2020
11/14/2020
11/15/2020
11/16/2020
11/17/2020
11/18/2020
11/19/2020
11/20/2020
11/21/2020
11/22/2020
11/23/2020
11/24/2020
11/25/2020
11/26/2020
11/27/2020
11/28/2020
11/29/2020
11/30/2020
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction


ST10 Monthly Plot of Meteorological Data - December 2020
WS, Temp, DT, and Solar Rad
WD Axis
Day
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
360
270
180
90
0
-90
-180
-270
-360
12/1/2020
12/2/2020
12/3/2020
12/4/2020
12/5/2020
12/6/2020
12/7/2020
12/8/2020
12/9/2020
12/10/2020
12/11/2020
12/12/2020
12/13/2020
12/14/2020
12/15/2020
12/16/2020
12/17/2020
12/18/2020
12/19/2020
12/20/2020
12/21/2020
12/22/2020
12/23/2020
12/24/2020
12/25/2020
12/26/2020
12/27/2020
12/28/2020
12/29/2020
12/30/2020
12/31/2020
Wind Speed MPH
Temp C
DT C times 2
SR kw/m2 times 3
Wind Direction

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
OCTOBER - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	9.8	8.9	9.1	8.0	8.3	7.8	7.3	7.5	6.4	7.3	5.2	7.2	5.3	3.6	4.3	4.4	2.6	2.8	9.8	11.4	5.4	5.1	9.4	6.3	6.8
2	7.6	9.6	7.7	8.3	9.6	8.5	10.1	10.7	6.2	6.3	9.7	8.7	5.2	3.1	6.7	10.4	13.7	15.5	11.5	11.6	10.0	4.9	5.5	7.1	8.7
3	6.6	7.3	7.0	6.9	7.7	8.4	7.1	4.5	4.5	1.6	1.3	2.2	5.9	12.8	15.0	16.6	17.3	16.4	14.4	10.5	4.2	6.6	8.1	8.1	8.4
4	6.7	4.6	7.9	6.7	4.3	7.8	7.4	6.6	9.0	6.0	6.4	7.7	6.0	5.2	3.4	5.9	10.3	11.0	9.8	9.5	1.5	6.2	7.3	10.2	7.0
5	8.5	7.3	6.7	8.2	8.1	7.8	7.7	5.3	5.6	6.6	6.0	4.9	2.3	8.6	14.6	14.3	19.4	17.9	13.1	11.1	5.5	3.4	6.8	7.8	8.6
6	8.3	7.3	8.8	7.8	6.7	7.9	7.5	4.8	4.5	4.6	3.3	2.2	2.7	7.6	8.5	9.8	14.4	14.6	11.2	11.5	5.3	4.3	8.4	7.4	7.5
7	8.5	7.3	8.9	7.2	7.9	7.8	7.8	7.5	6.8	4.7	3.8	1.9	2.9	4.2	4.2	6.3	8.1	13.0	10.1	6.4	3.7	6.6	8.1	5.4	6.6
8	7.5	8.7	7.5	8.2	6.7	8.0	6.4	7.2	4.6	3.2	2.7	1.9	2.7	5.7	8.0	12.1	11.1	11.5	9.0	8.9	5.8	4.7	6.4	8.8	7.0
9	8.1	6.2	7.0	7.4	7.1	9.3	7.5	5.5	5.5	3.5	2.6	4.5	4.5	3.5	7.9	8.8	11.0	13.5	9.9	3.6	5.3	7.0	5.0	6.3	6.7
10	7.9	8.3	7.7	6.0	7.8	8.1	6.8	6.4	7.0	3.8	3.7	5.4	5.4	6.9	10.0	11.2	12.8	14.8	13.3	9.1	4.1	3.4	5.3	5.1	7.5
11	4.8	8.2	7.9	7.0	5.7	6.4	4.0	2.4	0.8	2.2	1.8	5.9	10.8	15.7	13.2	11.1	9.8	10.9	7.4	8.1	8.5	5.6	3.6	5.6	7.0
12	7.3	5.7	6.0	6.6	5.7	8.0	8.7	6.1	5.4	4.1	3.6	3.4	3.2	3.2	4.1	3.3	4.5	6.8	11.7	11.5	5.9	4.3	5.8	6.6	5.9
13	9.5	8.0	7.7	4.9	7.0	7.5	7.7	8.0	7.6	5.7	4.1	3.3	2.4	3.0	7.2	7.2	12.0	13.2	11.2	10.0	4.4	4.1	6.8	9.1	7.1
14	6.7	7.1	6.9	6.4	6.3	7.5	8.1	6.4	4.9	2.2	2.5	3.6	7.7	12.1	16.1	18.1	17.3	13.6	8.7	6.8	4.8	6.6	7.2	7.1	8.1
15	7.1	5.2	4.3	7.2	8.1	4.8	4.9	4.6	3.7	1.3	1.5	3.0	8.5	10.0	13.4	14.1	15.4	13.9	10.7	9.1	3.7	5.4	6.7	8.4	7.3
16	8.5	7.6	3.1	5.1	9.4	9.1	9.3	9.5	7.5	15.1	14.5	13.7	13.5	15.5	12.5	9.2	9.8	12.7	13.9	16.3	13.4	13.5	16.7	12.1	11.3
17	10.6	9.5	9.1	9.0	9.6	9.8	10.4	9.9	9.3	7.2	5.3	3.5	2.6	11.0	16.0	17.7	15.1	9.4	6.1	4.7	4.1	5.4	5.7	5.6	8.6
18	7.7	6.1	8.5	8.1	8.3	4.5	4.3	6.5	4.4	4.5	1.5	2.8	3.5	9.9	12.7	14.7	13.6	10.8	5.8	3.9	5.4	7.2	9.0	9.3	7.2
19	5.4	7.7	8.9	4.9	8.1	8.5	6.0	5.8	5.1	4.3	1.8	2.0	2.5	4.5	9.4	14.0	14.6	12.3	8.0	5.6	2.8	6.3	7.7	8.1	6.8
20	7.3	8.6	6.7	4.8	6.3	7.6	7.9	7.7	5.5	3.4	4.1	2.9	2.1	3.2	5.0	10.2	15.3	13.8	12.3	11.4	4.6	6.0	6.8	9.5	7.2
21	9.4	9.3	9.5	7.7	7.1	6.5	8.1	7.8	7.3	4.9	4.5	3.6	2.6	2.7	5.0	7.2	10.6	13.2	8.2	4.3	3.0	5.7	6.6	8.2	6.8
22	9.0	7.1	6.0	7.2	5.3	7.3	7.6	4.5	4.9	3.4	2.5	2.2	6.3	5.1	6.0	8.8	14.8	10.7	9.3	6.7	2.7	6.6	5.8	8.7	6.6
23	6.3	6.8	5.8	6.7	6.6	5.8	5.0	6.7	5.0	4.6	4.5	5.2	4.0	4.2	5.5	5.8	10.1	10.5	12.4	9.0	3.4	6.7	7.4	7.3	6.5
24	6.8	5.8	6.2	5.5	6.1	5.5	7.8	5.3	5.1	4.8	3.0	2.3	2.9	8.0	12.2	12.5	11.5	10.2	9.0	2.2	2.0	6.2	6.8	7.0	6.5
25	7.0	3.7	6.2	4.1	2.4	3.7	2.2	5.7	1.9	1.9	2.5	8.5	15.9	14.9	16.5	10.1	7.2	7.0	9.6	15.0	15.6	14.8	24.7	15.7	9.0
26	15.4	11.0	11.6	9.6	9.4	11.4	10.9	12.3	12.4	10.7	15.1	13.1	13.9	16.2	20.5	19.4	17.4	12.4	12.1	9.0	7.5	9.3	9.6	6.4	12.4
27	3.5	2.2	3.3	1.9	3.9	3.1	5.7	6.1	4.4	13.2	21.7	21.0	15.7	12.0	12.1	12.8	11.0	8.3	6.8	6.0	9.5	8.1	6.0	6.4	8.5
28	7.5	10.9	9.2	8.9	8.0	8.9	7.3	6.7	6.8	6.7	5.7	4.3	5.4	4.8	5.3	4.9	3.3	4.3	6.6	3.8	2.8	4.0	6.9	8.8	6.3
29	7.7	8.8	10.1	7.9	8.1	9.7	15.0	15.9	19.1	18.5	18.9	14.8	15.5	16.0	22.9	20.0	18.0	17.0	17.7	20.5	18.3	19.0	21.4	20.4	15.9
30	20.5	19.6	20.2	20.3	18.8	19.5	19.2	18.3	18.8	16.0	14.0	15.2	13.2	11.8	11.8	11.3	14.7	14.4	11.7	10.6	8.0	9.4	10.0	6.3	14.7
31	6.6	8.8	8.4	7.8	8.5	8.0	8.2	9.3	9.8	9.6	7.0	3.7	5.1	8.6	10.0	12.3	12.4	12.1	10.1	10.7	11.1	10.6	9.1	8.9	9.0
HRAVE	8.2	7.8	7.9	7.3	7.5	7.9	7.9	7.5	6.8	6.2	6.0	6.0	6.5	8.2	10.3	11.1	12.2	11.9	10.4	9.0	6.2	7.0	8.4	8.3	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	6.8	8.7	8.4	7.0	8.6	7.5	6.6	7.0	6.7	7.5	7.0	5.9	7.1	8.1	7.3	11.3	8.6	7.2	6.8	7.2	6.8	6.6	6.5	6.5	9.0
MAX	11.4	15.5	17.3	11.0	19.4	14.6	13.0	12.1	13.5	14.8	15.7	11.7	13.2	18.1	15.4	16.7	17.7	14.7	14.6	15.3	13.2	14.8	12.4	12.5	24.7
MIN	2.6	3.1	1.3	1.5	2.3	2.2	1.9	1.9	2.6	3.4	0.8	3.2	2.4	2.2	1.3	3.1	2.6	1.5	1.8	2.1	2.6	2.2	3.4	2.0	1.9

DAY	26	27	28	29	30	31
AVE	12.4	8.5	6.3	15.9	14.7	9.0
MAX	20.5	21.7	10.9	22.9	20.5	12.4
MIN	6.4	1.9	2.8	7.7	6.3	3.7

MONTHLY AVERAGE = 8.2 MONTHLY MAXIMUM = 24.7 MONTHLY MINIMUM = 0.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
OCTOBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	86	99	97	106	120	113	109	106	134	148	144	84	81	89	273	210	285	318	313	298	343	91	85	68	359
2	114	113	103	109	110	117	128	132	120	143	74	75	77	73	281	277	277	284	298	301	303	284	129	112	201
3	108	126	129	117	103	101	118	115	127	208	314	255	289	271	284	285	287	295	309	288	143	117	101	95	217
4	91	105	111	125	99	93	105	114	119	143	117	68	81	88	142	255	276	287	304	302	352	94	98	84	100
5	92	113	114	96	100	109	104	108	119	152	158	152	186	264	279	286	287	288	295	304	292	143	117	104	93
6	94	105	91	114	111	105	120	108	113	122	142	146	277	270	279	281	288	300	300	297	313	119	95	96	189
7	85	95	110	117	103	106	107	114	113	126	139	193	253	211	305	287	284	295	302	312	207	104	107	98	137
8	77	83	82	79	90	85	98	106	112	112	138	98	358	301	294	235	252	269	289	318	250	138	115	101	119
9	104	101	104	105	99	98	111	117	121	129	146	77	83	213	292	282	274	296	313	321	117	103	81	83	59
10	102	103	101	108	122	97	97	114	132	122	132	117	141	189	258	249	258	289	291	304	298	100	91	129	281
11	112	101	95	100	103	107	58	113	22	139	342	291	299	311	286	285	259	277	298	310	311	276	127	126	280
12	94	124	108	102	126	110	118	117	130	129	140	177	310	72	215	272	276	277	301	299	322	93	85	99	280
13	91	110	103	111	91	103	105	90	115	126	152	178	238	235	284	286	303	293	298	296	302	130	99	88	327
14	84	94	102	98	97	97	92	105	117	109	276	266	285	298	294	283	282	275	292	289	151	124	117	115	6
15	119	113	82	98	122	103	99	100	134	95	298	252	302	291	294	290	286	288	298	290	154	121	100	92	237
16	99	88	93	113	119	103	113	108	115	68	44	42	45	32	43	32	46	38	34	45	48	55	49	70	183
17	82	92	92	117	107	123	122	127	140	154	156	132	189	289	290	285	292	305	293	278	196	148	116	115	302
18	94	85	91	91	98	125	74	98	115	132	298	142	271	297	286	283	289	293	306	176	128	112	104	90	37
19	119	96	100	123	106	99	111	103	108	120	81	98	265	266	293	307	292	290	308	301	229	118	102	96	171
20	96	96	105	126	114	104	118	111	129	132	124	131	292	284	286	291	302	304	304	300	184	113	96	88	278
21	95	106	117	118	108	102	95	104	113	112	139	104	113	209	281	278	307	309	300	330	45	121	101	105	193
22	97	103	104	87	99	85	101	113	115	135	271	276	281	270	285	263	285	294	303	296	257	110	96	99	345
23	106	85	87	75	82	85	121	103	112	108	89	81	135	96	319	298	284	270	297	298	179	114	107	106	253
24	97	95	98	88	75	102	97	123	127	125	108	118	28	295	289	301	315	310	294	318	135	121	90	106	227
25	99	93	84	6	33	90	63	100	89	306	319	254	274	242	292	297	263	304	263	246	260	258	234	270	279
26	241	222	246	291	280	302	289	288	283	289	291	274	280	275	285	286	283	281	305	341	6	52	51	324	262
27	322	325	332	311	311	320	133	171	134	66	32	50	48	69	71	65	84	79	92	109	112	82	76	64	277
28	50	56	88	108	119	126	120	135	147	139	156	151	280	256	270	286	262	272	301	308	118	106	142	108	169
29	114	96	130	114	129	118	79	79	62	64	61	49	53	67	67	74	60	36	39	44	53	68	63	62	87
30	62	63	61	59	50	51	49	62	65	61	59	40	44	43	40	44	32	36	40	36	30	44	56	105	140
31	111	111	121	113	117	112	109	119	125	137	156	116	71	68	71	49	39	24	34	33	46	45	70	124	171

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
OCTOBER - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	6	7	7	6	7	6	6	7	10	12	30	20	19	29	33	40	36	18	13	5	28	22	7	20	16
2	10	6	8	7	10	12	5	7	22	23	12	13	18	55	39	17	12	8	6	6	6	29	7	11	15
3	8	8	10	8	7	7	8	8	13	28	30	35	28	15	14	12	9	8	9	9	37	9	9	11	14
4	10	12	6	10	22	7	8	7	9	18	24	20	22	31	43	30	12	8	5	4	31	11	9	6	15
5	8	9	12	7	9	7	8	8	10	12	15	20	45	22	11	18	10	8	7	6	10	13	6	7	12
6	7	8	6	7	7	6	8	10	12	17	24	44	47	19	21	16	13	9	6	4	21	31	10	10	15
7	7	7	6	6	6	7	6	8	9	18	22	49	47	42	44	28	20	8	7	13	13	13	15	17	17
8	9	9	10	12	7	7	10	7	10	16	38	49	56	53	21	17	16	11	8	8	20	26	13	6	18
9	10	9	9	7	10	8	7	6	11	24	38	27	47	64	62	19	17	10	9	21	27	19	25	18	21
10	7	7	9	13	8	7	8	9	9	26	26	30	41	49	23	18	17	9	7	7	33	22	17	17	17
11	11	8	7	10	21	13	38	23	24	29	37	36	21	17	22	21	14	7	5	5	6	15	17	8	17
12	8	6	11	9	11	7	9	8	13	18	28	34	48	40	60	41	31	6	7	5	8	29	10	13	19
13	8	7	7	12	6	9	8	7	10	16	23	40	62	52	29	35	14	8	5	5	36	10	9	7	18
14	9	10	9	9	7	8	6	12	9	41	35	24	16	18	18	10	9	6	7	7	13	9	7	8	13
15	9	10	12	12	9	13	11	11	25	44	32	25	19	20	15	15	9	7	5	32	12	7	9	8	15
16	9	8	28	10	6	11	9	8	19	11	19	19	19	15	20	21	14	9	9	8	9	9	9	9	13
17	8	17	13	10	6	7	5	4	8	12	17	32	46	20	12	10	9	9	6	20	33	8	9	7	14
18	8	9	8	6	10	12	10	8	10	27	40	39	51	19	16	14	12	9	11	22	9	11	9	6	16
19	11	10	9	9	9	7	9	7	9	17	30	34	29	31	22	14	11	7	6	12	20	9	7	11	14
20	8	7	9	15	11	8	8	6	10	21	20	27	49	50	23	17	10	8	6	5	28	8	8	5	15
21	6	7	7	7	7	7	7	7	8	16	20	33	61	51	30	27	15	9	10	14	25	6	9	7	17
22	8	9	8	6	10	8	7	11	12	33	25	49	26	40	36	35	11	9	6	6	23	10	7	7	17
23	9	12	13	10	8	11	11	7	12	13	22	28	53	58	41	28	14	10	6	6	32	8	7	9	18
24	9	10	9	9	12	9	8	8	9	14	25	45	40	22	13	12	12	8	4	28	30	8	8	9	15
25	8	29	8	22	40	23	39	24	53	56	41	37	15	17	10	13	15	11	10	11	11	11	9	15	22
26	11	17	18	11	15	13	8	6	8	11	10	14	10	10	11	12	10	8	8	18	25	20	12	18	13
27	14	16	13	22	22	26	33	49	24	26	13	17	20	13	11	15	17	13	17	33	10	8	17	18	19
28	17	8	27	21	22	7	8	8	13	20	23	40	42	44	27	22	29	15	13	35	22	24	18	14	22
29	19	21	16	22	18	19	10	10	7	11	15	20	18	18	11	12	10	11	12	11	12	8	8	8	14
30	9	10	10	10	12	11	12	9	9	17	17	13	18	20	12	15	11	10	10	12	16	15	16	11	13
31	11	8	7	8	7	5	9	7	9	12	14	23	30	26	11	12	12	8	9	10	11	12	21	9	12
HRAVE	9	10	11	11	12	10	11	10	13	21	25	30	34	32	25	20	14	9	8	13	20	14	11	11	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16	15	14	15	12	15	17	18	21	17	17	19	18	13	15	13	14	16	14	15	17	17	18	15	22
MAX	40	55	37	43	45	47	49	56	64	49	38	60	62	41	44	28	46	51	34	50	61	49	58	45	56
MIN	5	5	7	4	6	4	6	6	6	7	5	5	5	6	5	6	4	6	6	5	6	6	6	4	8

DAY	26	27	28	29	30	31
AVE	13	19	22	14	13	12
MAX	25	49	44	22	20	30
MIN	6	8	7	7	9	5

MONTHLY AVERAGE = 16.0 MONTHLY MAXIMUM = 63.6 MONTHLY MINIMUM = 4.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
OCTOBER - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	25.3	24.4	23.8	22.1	20.9	20.3	20.1	21.9	24.3	28.3	31.7	35.4	37.2	38.1	38.8	39.1	38.5	38.0	35.5	33.7	32.9	30.8	28.0	27.0	29.8
2	25.0	24.9	23.7	22.8	21.5	21.0	20.6	22.3	25.0	28.7	33.2	35.2	36.7	37.8	38.8	39.0	38.5	37.0	34.6	33.3	32.1	31.2	29.0	26.9	30.0
3	25.5	24.5	23.3	22.5	21.3	20.2	19.4	20.4	23.6	25.7	29.5	33.1	35.8	37.4	38.1	37.7	37.1	35.7	33.8	31.6	30.4	28.8	27.1	25.6	28.7
4	24.1	22.3	21.3	21.2	19.4	18.3	18.4	20.3	23.3	27.2	31.0	33.7	35.4	36.6	37.3	38.2	37.7	36.4	34.2	33.0	32.5	29.1	27.0	25.1	28.5
5	23.9	23.0	21.3	21.2	20.2	19.5	19.5	20.6	23.5	27.2	30.7	33.5	35.9	37.1	37.2	38.1	37.2	35.8	33.7	32.3	31.2	29.4	27.4	25.8	28.5
6	24.3	23.0	22.1	20.8	20.1	19.0	18.7	19.3	22.5	26.4	29.8	33.0	35.4	37.2	37.8	37.8	37.0	35.3	33.0	31.9	30.8	28.9	26.4	24.7	28.1
7	23.6	22.1	22.1	20.1	19.7	19.4	18.5	19.7	23.6	26.9	29.5	33.2	36.0	37.5	37.6	37.6	37.2	35.6	33.4	32.2	31.0	28.7	27.0	27.0	28.3
8	24.4	22.7	21.8	20.9	19.5	18.8	18.4	20.8	23.4	26.4	30.0	33.1	34.9	36.5	36.9	37.5	36.7	34.9	32.6	31.8	30.9	28.7	27.6	26.1	28.1
9	25.3	23.8	22.5	21.4	20.0	19.9	19.0	20.1	23.1	26.2	29.1	32.3	34.3	35.0	35.6	35.8	35.3	33.2	31.7	30.5	28.6	27.1	26.7	24.7	27.5
10	24.0	23.2	22.2	20.1	19.8	19.3	17.9	18.9	22.1	25.6	28.8	32.3	33.3	35.2	34.8	34.9	34.0	32.1	30.0	28.7	28.0	27.2	25.7	24.6	26.8
11	23.0	22.0	21.3	19.9	19.0	18.2	16.8	18.8	20.4	24.2	26.8	29.5	30.8	31.4	31.9	31.8	31.5	30.2	28.3	27.6	26.7	25.5	24.2	22.6	25.1
12	21.3	20.4	19.1	18.3	17.3	17.4	17.1	17.9	20.6	24.0	27.3	30.9	32.9	34.4	35.2	35.2	35.0	34.0	31.3	30.0	29.3	27.4	25.6	23.3	26.1
13	22.8	22.2	21.1	19.2	18.6	17.6	18.2	19.2	22.1	26.2	29.2	32.1	35.1	36.7	37.3	37.2	36.6	34.8	32.6	31.2	30.3	28.1	25.6	24.2	27.4
14	22.3	21.3	20.0	19.5	18.6	17.0	17.1	18.8	21.0	24.7	27.9	30.9	33.8	35.3	35.9	35.6	34.8	33.0	30.8	30.0	27.8	26.4	25.2	23.2	26.3
15	22.9	21.5	19.8	17.8	17.6	16.9	16.0	17.1	20.1	23.6	27.0	30.1	33.2	34.6	35.2	35.1	34.2	32.5	30.6	29.5	28.2	26.3	24.8	23.5	25.8
16	22.5	21.5	19.7	19.1	18.7	19.1	18.4	20.2	23.1	27.9	29.4	31.2	33.0	33.7	34.5	34.8	34.5	33.3	32.0	31.2	30.3	28.9	28.5	26.6	27.2
17	24.8	23.4	22.5	21.5	21.1	19.3	18.9	19.5	22.5	26.1	28.4	30.5	32.4	34.5	35.1	34.5	33.5	31.9	30.3	28.3	27.3	25.9	24.3	22.9	26.6
18	21.4	20.0	18.8	17.8	17.9	16.2	15.3	15.9	18.6	22.4	25.6	29.1	31.3	33.2	33.8	33.6	32.8	31.4	29.7	27.8	26.0	24.3	22.6	21.5	24.5
19	19.6	19.2	18.2	16.8	16.9	15.8	15.4	16.6	19.6	22.5	25.4	28.7	31.1	32.7	33.8	33.7	33.1	31.3	29.5	28.8	26.3	24.8	23.0	21.5	24.3
20	20.2	19.6	18.6	16.6	16.0	15.8	15.4	17.0	19.2	21.9	25.6	29.0	31.1	32.9	34.0	34.4	33.5	31.7	29.8	28.6	26.5	25.3	23.4	21.5	24.5
21	20.5	20.4	19.2	17.6	16.9	16.0	14.8	16.6	19.9	22.6	25.5	28.9	31.7	33.5	34.2	34.6	33.6	32.0	30.0	28.9	27.9	25.5	23.9	22.9	24.9
22	21.5	20.8	19.8	18.4	16.5	16.4	16.8	17.5	19.8	22.9	25.5	28.6	30.6	31.6	31.9	32.6	31.6	30.1	28.5	27.2	26.3	24.5	23.3	22.3	24.4
23	21.6	19.9	18.9	18.3	17.5	16.8	16.2	17.6	20.8	24.2	27.2	29.7	31.0	31.4	32.0	32.1	32.0	30.3	28.5	27.5	26.4	25.2	24.4	23.5	24.7
24	22.5	21.1	20.5	19.8	18.5	17.5	17.7	17.9	19.7	23.3	26.5	28.0	28.3	29.9	30.2	29.8	28.8	27.8	26.2	25.6	24.9	23.1	22.3	21.5	23.8
25	21.0	19.6	19.2	18.2	18.2	16.8	17.3	16.9	19.4	22.0	25.9	27.5	27.3	27.2	26.0	26.1	25.6	24.7	24.1	23.9	23.0	21.6	21.0	20.0	22.2
26	19.5	19.0	18.3	17.3	17.0	15.2	14.7	14.6	14.6	15.5	16.0	16.4	16.5	16.2	16.6	16.3	15.1	13.4	12.6	11.7	10.7	9.8	9.4	8.5	14.8
27	7.9	7.6	7.0	5.6	5.0	5.2	5.2	5.1	5.5	7.2	7.7	8.0	8.3	9.2	10.9	11.6	11.6	11.4	10.8	10.4	9.8	9.6	8.8	8.3	8.2
28	8.0	7.8	6.9	6.1	5.4	4.1	3.8	4.6	7.2	10.3	12.9	14.6	15.8	17.3	18.6	19.2	19.2	18.2	16.6	15.8	14.9	13.6	11.7	11.6	11.8
29	10.7	10.8	9.6	9.9	9.1	9.1	12.1	13.3	15.0	17.6	19.5	21.6	23.6	24.8	25.2	25.3	24.8	23.8	23.1	22.5	22.1	21.3	20.5	19.6	18.1
30	19.1	18.5	18.1	17.5	17.2	16.6	16.4	16.5	18.0	20.0	22.0	23.6	25.0	26.1	26.2	26.9	26.3	25.3	24.8	24.1	23.6	22.5	21.7	19.1	21.5
31	17.5	16.4	15.0	14.4	13.9	13.9	13.6	14.4	17.2	19.2	20.0	23.6	28.1	28.4	28.8	28.7	28.5	27.8	27.1	26.8	25.9	25.1	23.2	21.4	21.6
HRAVE	21.2	20.2	19.2	18.2	17.4	16.7	16.4	17.4	20.0	23.1	26.0	28.6	30.5	31.7	32.3	32.4	31.8	30.4	28.7	27.6	26.5	25.0	23.5	22.2	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	29.8	30.0	28.7	28.5	28.5	28.1	28.3	28.1	27.5	26.8	25.1	26.1	27.4	26.3	25.8	27.2	26.6	24.5	24.3	24.5	24.9	24.4	24.7	23.8	22.2
MAX	39.1	39.0	38.1	38.2	38.1	37.8	37.6	37.5	35.8	35.2	31.9	35.2	37.3	35.9	35.2	34.8	35.1	33.8	33.8	34.4	34.6	32.6	32.1	30.2	27.5
MIN	20.1	20.6	19.4	18.3	19.5	18.7	18.5	18.4	19.0	17.9	16.8	17.1	17.6	17.0	16.0	18.4	18.9	15.3	15.4	15.4	14.8	16.4	16.2	17.5	16.8

DAY	26	27	28	29	30	31
AVE	14.8	8.2	11.8	18.1	21.5	21.6
MAX	19.5	11.6	19.2	25.3	26.9	28.8
MIN	8.5	5.0	3.8	9.1	16.4	13.6

MONTHLY AVERAGE = 24.5 MONTHLY MAXIMUM = 39.1 MONTHLY MINIMUM = 3.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
OCTOBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.8	0.7	0.6	0.7	0.5	0.4	0.3	-1.1	-1.5	-1.7	-1.4	-1.7	-1.6	-1.1	-1.1	-0.9	-0.4	-0.1	0.6	0.7	0.7	0.8	0.9	0.7	-0.2
2	1.0	0.7	1.0	0.9	1.2	1.3	0.9	0.0	-0.4	-1.1	-1.6	-1.6	-1.5	-1.0	-1.0	-1.0	-0.7	-0.2	0.5	0.6	0.6	0.7	0.7	0.8	0.0
3	0.9	0.9	0.6	0.7	0.9	0.8	0.5	-0.5	-1.2	-0.7	-0.7	-0.8	-1.1	-1.1	-1.2	-0.9	-0.6	-0.1	0.4	0.8	0.6	0.8	0.8	0.8	0.0
4	1.0	0.7	0.7	0.6	0.9	0.8	0.5	-0.9	-1.7	-1.5	-1.5	-1.5	-1.5	-1.4	-0.9	-0.9	-0.6	-0.1	0.6	0.8	0.4	0.7	0.9	0.9	-0.1
5	0.9	0.8	1.0	0.8	0.7	0.7	0.4	-0.7	-1.5	-1.7	-1.6	-1.4	-0.9	-0.9	-0.7	-1.0	-0.6	-0.1	0.4	0.6	0.8	0.6	0.9	0.8	-0.1
6	0.9	1.0	0.8	0.8	0.7	0.8	0.4	-0.6	-1.2	-1.4	-1.1	-1.0	-0.9	-1.1	-1.1	-0.9	-0.5	0.0	0.6	0.7	0.6	0.7	0.9	0.8	0.0
7	0.9	0.8	0.8	0.6	0.8	0.6	0.3	-0.7	-1.8	-1.5	-1.1	-0.9	-0.9	-0.9	-0.9	-0.8	-0.5	0.1	0.8	0.7	0.6	0.9	0.9	0.7	0.0
8	0.7	0.5	0.6	0.8	0.7	0.6	0.6	-0.7	-1.2	-1.1	-0.9	-0.8	-0.9	-1.0	-1.2	-1.1	-0.6	0.0	0.5	0.5	0.5	0.5	0.6	0.6	-0.1
9	0.8	0.8	0.8	0.6	0.6	0.8	0.5	-0.6	-1.4	-1.1	-0.9	-1.4	-1.3	-0.9	-1.1	-1.0	-0.6	-0.1	0.4	0.5	0.8	0.8	0.9	0.9	-0.1
10	0.9	0.7	0.6	0.6	0.6	1.0	0.7	-0.3	-1.3	-1.2	-1.2	-1.5	-1.3	-1.4	-1.2	-1.1	-0.6	-0.1	0.3	0.5	0.5	0.6	0.8	0.6	-0.1
11	0.6	0.8	0.7	0.6	0.7	0.5	0.3	-0.2	-0.4	-0.8	-0.8	-1.1	-1.2	-1.0	-1.2	-1.0	-0.6	-0.2	0.4	0.6	0.5	0.6	0.6	0.8	0.0
12	0.7	0.7	0.6	0.7	0.8	0.3	0.3	-0.9	-1.2	-1.3	-1.0	-1.0	-1.0	-1.1	-1.1	-0.8	-0.5	0.0	0.5	0.6	0.6	0.7	0.6	0.7	-0.1
13	0.8	0.7	0.7	0.7	0.6	0.6	0.5	-0.6	-1.6	-1.6	-1.1	-1.0	-0.9	-0.9	-1.1	-0.9	-0.4	0.1	0.6	0.7	0.7	0.5	0.9	0.8	-0.1
14	0.8	0.9	0.8	0.6	0.8	0.8	0.6	-0.7	-1.2	-0.8	-0.8	-0.9	-1.1	-1.0	-1.0	-0.8	-0.4	0.1	0.7	0.8	0.5	0.5	0.8	0.9	0.0
15	0.6	0.9	0.7	0.9	1.0	0.8	0.6	-0.4	-0.9	-0.6	-0.8	-0.8	-1.1	-1.1	-1.1	-0.9	-0.5	0.0	0.5	0.8	0.3	0.7	0.9	0.7	0.1
16	1.0	0.8	0.4	1.1	0.6	0.7	0.6	-0.7	-0.6	-0.8	-0.9	-0.9	-0.9	-0.7	-0.6	-0.3	0.1	0.3	0.3	0.2	0.3	0.4	0.2	0.4	0.1
17	0.6	0.5	0.4	0.9	0.8	0.9	0.4	0.0	-1.2	-1.7	-1.3	-1.1	-0.8	-1.0	-1.0	-0.8	-0.3	0.3	0.6	0.7	0.5	0.6	0.6	0.6	0.0
18	1.0	0.6	0.8	0.7	0.8	0.7	0.7	-0.3	-0.9	-1.2	-0.6	-1.0	-0.8	-1.0	-1.0	-0.8	-0.4	0.2	0.7	0.5	0.6	0.9	1.0	0.9	0.1
19	1.0	1.0	0.9	0.8	0.7	0.9	0.3	-0.6	-1.3	-1.3	-0.8	-0.9	-0.8	-0.8	-0.9	-0.7	-0.4	0.2	0.6	0.5	0.6	0.7	0.8	0.8	0.1
20	0.8	0.7	0.8	0.9	1.0	0.7	0.4	-0.7	-1.3	-0.9	-1.3	-1.2	-0.8	-0.8	-1.0	-0.9	-0.3	0.2	0.6	0.7	0.6	0.6	0.8	0.7	0.0
21	0.7	0.6	0.6	0.6	0.7	0.6	0.6	-0.6	-1.6	-1.3	-1.1	-1.1	-0.9	-0.8	-0.9	-0.9	-0.2	0.2	0.7	0.5	0.6	0.8	0.8	0.8	0.0
22	0.6	0.8	0.6	1.0	0.5	0.6	0.6	-0.2	-1.1	-0.8	-0.7	-0.8	-1.0	-0.9	-0.9	-0.9	-0.4	0.1	0.5	0.7	0.4	0.6	0.8	0.8	0.0
23	0.6	0.6	0.6	0.5	0.6	0.4	0.7	-0.6	-1.3	-1.4	-1.5	-1.4	-1.2	-1.0	-1.0	-0.9	-0.5	0.1	0.4	0.4	0.4	0.5	0.5	0.5	-0.2
24	0.6	0.5	0.6	0.6	0.4	0.4	0.5	0.1	-0.7	-1.1	-1.1	-0.8	-0.6	-0.9	-0.8	-0.5	-0.1	0.2	0.6	0.3	0.4	0.6	0.7	0.6	0.0
25	0.6	0.4	0.8	0.6	0.4	0.6	0.5	-0.3	-0.5	-0.7	-0.8	-0.4	-0.4	-0.5	-0.8	-0.8	-0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0
26	0.1	0.1	0.0	-0.1	0.0	0.1	0.2	0.1	0.0	-0.3	-0.2	-0.3	-0.3	-0.3	-0.6	-0.7	-0.5	-0.1	0.0	0.1	0.1	0.1	0.1	0.2	-0.1
27	0.3	0.3	0.5	0.8	0.7	0.8	0.3	0.0	-0.4	-0.3	-0.5	-0.6	-0.6	-0.7	-0.9	-0.4	-0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.0
28	0.2	0.2	0.3	0.3	0.5	0.4	0.3	-0.6	-1.2	-1.5	-1.5	-1.2	-1.0	-0.8	-0.9	-0.8	-0.4	0.2	0.6	0.3	0.5	0.8	0.8	0.8	-0.2
29	0.8	0.7	1.0	1.0	1.1	1.0	0.5	-0.2	-0.4	-0.6	-0.7	-0.8	-0.7	-0.5	-0.5	-0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
30	0.2	0.2	0.2	0.2	0.1	0.1	0.1	-0.1	-0.5	-0.7	-0.9	-0.8	-0.7	-0.6	-0.3	-0.3	0.0	0.2	0.3	0.3	0.4	0.5	0.4	0.6	0.0
31	1.1	1.0	0.9	1.0	0.8	0.4	0.3	-0.3	-1.3	-1.5	-0.9	-1.0	-1.5	-1.0	-0.6	-0.1	0.1	0.4	0.4	0.4	0.3	0.5	0.6	0.6	0.0
HRAVE	0.7	0.7	0.7	0.7	0.7	0.7	0.5	-0.5	-1.1	-1.1	-1.0	-1.0	-1.0	-0.9	-0.9	-0.8	-0.4	0.1	0.5	0.5	0.5	0.6	0.7	0.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	-0.2	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	-0.2	0.0	0.0
MAX	0.9	1.3	0.9	1.0	1.0	1.0	0.9	0.8	0.9	1.0	0.8	0.8	0.9	0.9	1.0	1.1	0.9	1.0	1.0	1.0	0.8	1.0	0.7	0.7	0.8
MIN	-1.7	-1.6	-1.2	-1.7	-1.7	-1.4	-1.8	-1.2	-1.4	-1.5	-1.2	-1.3	-1.6	-1.2	-1.1	-0.9	-1.7	-1.2	-1.3	-1.3	-1.6	-1.1	-1.5	-1.1	-0.8

DAY	26	27	28	29	30	31
AVE	-0.1	0.0	-0.2	0.1	0.0	0.0
MAX	0.2	0.8	0.8	1.1	0.6	1.1
MIN	-0.7	-0.9	-1.5	-0.8	-0.9	-1.5

MONTHLY AVERAGE = 0.0 MONTHLY MAXIMUM = 1.3 MONTHLY MINIMUM = -1.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
OCTOBER - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	702	702	702	702	702	702	703	703	703	703	703	702	702	701	700	700	700	700	700	700	701	701	701	701	701
2	701	701	702	702	702	702	702	703	703	703	702	702	701	700	699	699	698	698	698	699	699	699	699	700	700
3	700	700	700	700	700	700	700	701	701	701	701	701	700	699	699	698	698	698	699	699	700	700	700	701	700
4	701	701	701	702	702	703	703	703	704	704	704	703	703	702	701	701	701	700	701	701	701	702	702	702	702
5	702	703	703	703	703	703	704	704	704	704	704	703	703	702	701	701	701	701	701	701	701	702	702	702	702
6	702	702	702	702	702	703	703	703	704	704	703	703	702	701	700	700	700	700	700	700	701	701	701	701	702
7	701	701	701	701	701	702	702	702	702	702	702	701	700	699	699	698	698	698	699	699	699	699	700	700	700
8	701	701	701	701	701	701	701	702	702	702	702	701	700	699	699	698	698	698	698	699	699	699	700	700	700
9	700	700	700	700	700	701	701	701	701	701	701	700	700	699	698	698	698	698	698	699	699	699	700	700	700
10	700	700	700	700	701	701	701	701	702	702	701	701	700	699	698	698	698	698	698	699	699	699	700	700	700
11	700	700	700	700	700	701	701	701	702	702	701	701	700	700	700	700	700	700	700	701	701	702	702	702	701
12	702	702	703	702	703	703	704	704	704	704	704	703	702	701	701	700	700	700	701	701	702	702	703	703	702
13	703	703	703	703	703	704	704	704	705	705	705	704	703	702	701	701	701	701	701	702	702	703	703	703	703
14	703	703	703	703	703	703	703	704	704	704	704	703	703	702	701	701	701	701	701	702	702	702	703	703	703
15	703	703	703	702	702	703	703	703	703	703	703	702	701	700	700	700	700	700	700	700	701	701	701	701	702
16	701	701	701	701	702	702	702	703	703	703	703	702	701	700	699	699	699	699	699	699	700	700	700	700	701
17	700	700	700	700	701	701	701	702	702	702	702	702	701	700	700	700	700	700	700	700	701	701	701	702	701
18	702	702	702	702	702	703	703	703	704	704	703	703	702	701	701	700	700	700	701	701	701	701	701	702	702
19	702	702	702	702	702	702	702	702	703	703	702	702	701	700	699	699	699	699	699	699	699	700	700	700	701
20	700	700	700	700	700	700	700	701	701	701	701	700	699	698	698	697	697	697	697	698	698	698	699	699	699
21	699	699	699	699	699	700	700	700	700	700	700	699	699	698	697	697	697	697	697	697	698	698	698	698	698
22	698	698	698	699	699	699	699	700	700	700	700	699	699	698	698	698	698	698	698	699	699	699	699	700	699
23	700	700	700	700	701	701	701	702	702	702	702	701	701	700	699	699	699	700	700	700	701	701	701	701	701
24	701	702	702	701	702	702	702	702	703	702	702	701	700	699	699	699	699	699	699	699	699	699	699	699	700
25	699	699	699	699	699	699	699	699	699	699	698	697	697	696	696	696	695	695	695	695	695	696	696	696	697
26	696	697	696	696	696	696	697	698	698	698	698	698	698	697	697	697	697	698	698	699	699	699	699	699	697
27	699	699	699	699	699	699	700	701	702	702	703	703	703	702	702	702	703	703	703	704	704	705	705	705	702
28	704	705	705	704	704	704	705	705	706	706	705	704	703	702	702	702	702	702	703	703	704	704	704	704	704
29	705	705	704	704	704	705	705	706	706	706	705	705	704	703	703	703	702	702	703	703	704	704	704	704	704
30	704	704	704	704	704	704	704	705	705	705	704	704	703	702	702	701	701	701	701	702	702	702	703	703	703
31	703	703	703	703	704	704	704	705	705	705	705	705	704	703	703	703	703	703	704	704	704	704	705	705	704
HRAVE	701	701	701	701	701	702	702	702	703	703	702	702	701	700	700	699	699	699	700	700	700	701	701	701	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	701	700	700	702	702	702	700	700	700	700	701	702	703	703	702	701	701	702	701	699	698	699	701	700	697
MAX	703	703	701	704	704	704	702	702	701	702	702	704	705	704	703	703	702	704	703	701	700	700	702	703	699
MIN	700	698	698	700	701	700	698	698	698	698	700	700	701	701	700	699	700	700	699	697	697	698	699	699	695

DAY	26	27	28	29	30	31
AVE	697	702	704	704	703	704
MAX	699	705	706	706	705	705
MIN	696	699	702	702	701	703

MONTHLY AVERAGE = 700.9 MONTHLY MAXIMUM = 706.0 MONTHLY MINIMUM = 695.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
OCTOBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	19	20	20	22	23	24	24	21	17	14	11	7	6	5	5	5	5	5	7	7	8	9	11	11	13
2	13	13	14	15	17	16	17	15	14	11	9	8	7	6	5	5	5	5	7	8	8	9	10	12	13	11
3	14	14	15	16	17	19	19	17	14	13	11	9	7	5	5	5	5	5	6	7	8	9	10	10	11
4	12	14	14	14	16	17	17	15	12	10	9	8	7	5	5	4	4	5	6	7	7	9	10	11	10
5	12	13	15	15	15	16	16	14	13	11	9	7	6	6	7	6	6	7	8	9	10	11	12	13	11
6	14	15	16	17	18	19	19	18	14	11	10	8	7	7	5	5	6	7	8	9	10	11	12	13	12
7	14	15	15	17	17	18	19	17	13	11	10	8	7	5	5	5	6	7	8	9	10	11	12	12	11
8	14	15	16	17	19	19	20	17	14	13	10	10	11	9	8	7	7	8	9	12	13	14	16	18	13
9	18	19	20	21	23	22	23	22	17	14	12	10	9	8	7	7	8	10	11	12	14	15	15	17	15
10	18	18	19	22	22	24	25	23	18	15	13	11	9	7	7	7	9	12	14	15	16	17	17	18	16
11	20	22	22	24	26	26	28	25	22	19	19	19	17	16	14	13	14	15	19	21	21	23	25	26	21
12	28	29	32	33	34	32	32	30	24	20	18	15	13	10	8	6	7	8	12	14	15	16	17	19	20
13	19	20	22	24	25	26	26	23	19	15	13	12	10	8	7	7	7	9	10	11	12	14	15	16	15
14	18	19	21	21	22	24	23	21	18	15	13	12	10	8	7	7	7	8	9	10	11	12	13	14	14
15	14	16	18	20	20	21	23	21	17	15	15	16	13	12	12	12	12	13	15	16	18	19	21	22	17
16	23	24	26	28	27	27	27	23	20	15	14	13	12	11	10	10	10	11	12	13	14	15	15	17	17
17	19	20	22	22	23	25	25	24	20	17	15	13	11	11	9	9	9	10	11	12	13	14	16	17	16
18	18	19	21	22	21	24	25	24	20	15	13	11	9	8	8	8	8	9	11	12	14	15	16	17	15
19	19	20	20	22	22	23	23	22	17	14	12	11	10	10	9	9	10	11	13	14	16	18	19	20	16
20	21	22	23	26	27	27	27	24	20	17	14	12	11	9	9	9	10	12	13	14	16	17	19	20	17
21	21	21	22	24	24	25	27	23	18	16	14	12	9	8	8	8	9	11	13	14	15	16	17	18	16
22	19	20	21	23	26	26	25	24	20	18	17	16	18	16	16	14	16	18	20	23	24	26	28	29	21
23	30	32	34	34	36	38	39	36	28	24	21	22	19	20	19	18	16	18	22	25	25	26	26	27	26
24	29	31	33	34	36	38	37	35	31	24	22	26	28	24	22	19	18	19	21	22	24	26	26	27	27
25	28	30	31	33	34	36	35	34	30	26	23	20	20	21	25	25	26	30	31	35	37	41	40	45	31
26	52	57	66	73	74	91	80	70	64	56	39	26	21	17	14	14	15	16	17	22	34	37	37	39	43
27	40	41	42	50	52	51	56	79	82	59	52	53	54	50	40	37	38	40	45	48	51	51	55	60	51
28	60	59	62	65	67	70	69	63	54	43	37	33	28	24	20	19	20	22	27	28	30	34	34	35	42
29	38	40	37	38	39	40	38	35	32	27	25	22	19	17	17	17	18	20	21	22	22	24	25	27	27
30	28	29	30	31	32	34	34	34	32	28	24	22	20	19	19	17	18	19	19	20	21	23	24	29	25
31	31	33	34	36	37	36	37	33	26	23	24	20	16	17	16	15	15	15	15	16	18	19	22	23	24
HRAVE	23	25	26	28	29	30	30	28	25	20	18	16	14	13	12	11	12	13	15	16	18	19	20	22	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	13	11	11	10	11	12	11	13	15	16	21	20	15	14	17	17	16	15	16	17	16	21	26	27	31
MAX	24	17	19	17	16	19	19	20	23	25	28	34	26	24	23	28	25	25	23	27	27	29	39	38	45
MIN	5	5	5	4	6	5	5	7	7	7	13	6	7	7	12	10	9	8	9	9	8	14	16	18	20

DAY	26	27	28	29	30	31
AVE	43	51	42	27	25	24
MAX	91	82	70	40	34	37
MIN	14	37	19	17	17	15

MONTHLY AVERAGE = 20.1 MONTHLY MAXIMUM = 90.7 MONTHLY MINIMUM = 4.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
OCTOBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.22	0.44	0.64	0.78	0.87	0.89	0.84	0.72	0.54	0.32	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.38
2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.43	0.62	0.77	0.86	0.88	0.83	0.71	0.53	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	6.26
3	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.42	0.62	0.77	0.86	0.88	0.82	0.70	0.52	0.30	0.08	0.00	0.00	0.00	0.00	0.00	0.00	6.20
4	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.41	0.61	0.76	0.85	0.87	0.81	0.69	0.51	0.29	0.08	0.00	0.00	0.00	0.00	0.00	0.00	6.11
5	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.42	0.60	0.77	0.80	0.73	0.60	0.44	0.53	0.31	0.09	0.00	0.00	0.00	0.00	0.00	0.00	5.53
6	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.61	0.75	0.85	0.86	0.80	0.68	0.50	0.28	0.07	0.00	0.00	0.00	0.00	0.00	0.00	6.03
7	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.41	0.60	0.75	0.84	0.85	0.79	0.60	0.46	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.79
8	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.40	0.59	0.74	0.82	0.80	0.78	0.65	0.48	0.26	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.79
9	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.61	0.75	0.83	0.85	0.79	0.67	0.49	0.28	0.06	0.00	0.00	0.00	0.00	0.00	0.00	5.96
10	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.20	0.41	0.60	0.74	0.83	0.84	0.79	0.67	0.48	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.89
11	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.40	0.59	0.73	0.81	0.82	0.77	0.65	0.47	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.76
12	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.39	0.58	0.73	0.81	0.83	0.77	0.66	0.48	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.76
13	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.39	0.58	0.72	0.81	0.83	0.77	0.65	0.47	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5.73
14	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.38	0.58	0.72	0.81	0.83	0.77	0.65	0.47	0.26	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.71
15	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.39	0.58	0.72	0.81	0.82	0.76	0.63	0.45	0.24	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.64
16	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.37	0.55	0.70	0.79	0.80	0.74	0.62	0.45	0.23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.47
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.36	0.55	0.69	0.78	0.79	0.72	0.60	0.41	0.20	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.30
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.54	0.70	0.78	0.80	0.74	0.61	0.43	0.22	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.37
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.53	0.70	0.77	0.71	0.72	0.61	0.43	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.25
20	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.37	0.55	0.69	0.78	0.79	0.73	0.61	0.43	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.37
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.39	0.46	0.56	0.73	0.73	0.72	0.60	0.42	0.20	0.03	0.00	0.00	0.00	0.00	0.00	0.00	5.02
22	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.53	0.67	0.75	0.76	0.70	0.58	0.40	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.12
23	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.35	0.53	0.67	0.75	0.76	0.69	0.58	0.41	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.12
24	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.26	0.51	0.68	0.47	0.35	0.55	0.34	0.24	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.64
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.33	0.51	0.51	0.21	0.27	0.27	0.39	0.27	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.98
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.24	0.23	0.22	0.16	0.18	0.44	0.38	0.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	2.21
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.18	0.42	0.38	0.30	0.24	0.55	0.40	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.80
28	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.34	0.52	0.66	0.74	0.75	0.69	0.57	0.40	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	5.01
29	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.33	0.52	0.65	0.74	0.75	0.46	0.63	0.42	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.85
30	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.33	0.51	0.65	0.73	0.74	0.55	0.27	0.41	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.47
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.32	0.43	0.23	0.61	0.77	0.69	0.47	0.23	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.97
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.36	0.54	0.66	0.73	0.74	0.68	0.59	0.44	0.23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	6.38	6.26	6.20	6.11	5.53	6.03	5.79	5.79	5.96	5.89	5.76	5.76	5.73	5.71	5.64	5.47	5.30	5.37	5.25	5.37	5.02	5.12	5.12	3.64	2.98
MAX	0.89	0.88	0.88	0.87	0.80	0.86	0.85	0.82	0.85	0.84	0.82	0.83	0.83	0.83	0.82	0.80	0.79	0.80	0.77	0.79	0.73	0.76	0.76	0.68	0.51
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	2.21	2.80	5.01	4.85	4.47	3.97
MAX	0.44	0.55	0.75	0.75	0.74	0.77
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.9 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
OCTOBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.04	0.01	0.00	0.00	0.00	0.00
MAX	0.02	0.01	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.05 MONTHLY MAXIMUM = 0.02 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
NOVEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	7.7	8.9	9.0	9.7	9.1	10.1	11.1	10.4	10.0	18.3	24.1	22.9	21.9	21.5	20.6	19.0	19.0	17.6	18.4	18.7	15.9	21.9	24.3	21.2	16.3
2	25.6	23.8	21.3	22.2	21.5	22.1	19.2	19.8	20.5	22.1	25.8	24.0	20.1	20.8	20.2	19.6	19.9	16.5	16.1	15.0	13.8	16.9	19.7	15.4	20.1
3	18.2	17.3	17.1	16.5	17.5	17.1	13.3	8.4	11.0	8.3	13.8	11.6	12.3	11.6	8.1	9.4	7.5	8.4	11.7	11.0	5.0	3.7	7.3	7.8	11.4
4	7.4	8.0	6.8	6.1	8.1	7.1	7.2	3.5	5.2	5.0	4.7	3.5	3.0	3.9	4.3	6.1	5.2	7.0	12.0	8.3	3.2	4.1	5.3	6.2	5.9
5	10.1	8.5	9.0	9.5	10.2	10.2	10.4	12.3	9.4	7.7	6.2	8.9	6.9	10.3	17.1	18.8	15.9	13.5	15.6	16.2	10.8	19.6	12.6	18.0	12.0
6	17.4	12.6	12.2	12.6	13.2	13.9	14.7	16.2	18.1	15.9	12.0	6.2	10.8	10.6	10.2	13.2	14.6	7.9	4.3	8.2	9.1	4.6	3.2	2.8	11.0
7	2.6	2.5	4.7	7.1	7.0	6.8	7.6	14.9	8.9	11.2	13.0	21.4	21.3	14.4	17.5	21.8	16.0	25.7	27.0	24.0	21.6	17.5	19.4	17.2	14.6
8	17.6	12.8	7.2	2.9	2.8	2.9	3.1	5.9	6.2	4.4	6.3	5.1	13.1	14.7	20.1	14.8	15.8	15.7	15.0	16.4	10.0	7.0	11.2	12.7	10.2
9	8.3	9.2	16.5	14.6	15.8	10.6	9.2	8.1	5.6	6.8	4.0	3.0	6.2	7.4	10.2	12.5	11.2	8.2	5.4	1.5	3.0	7.3	4.0	3.3	8.0
10	3.9	5.5	5.4	2.7	1.8	7.3	8.0	6.9	6.0	5.3	3.1	3.0	5.7	6.0	4.4	4.5	9.6	11.9	13.5	11.9	5.9	4.1	5.8	7.0	6.2
11	9.1	8.1	5.6	7.5	5.2	6.0	7.0	7.2	8.1	7.8	7.4	4.5	2.3	2.7	4.6	5.9	7.5	8.5	10.1	11.9	5.9	3.8	5.9	5.7	6.6
12	7.2	7.9	6.6	6.6	6.1	6.1	8.0	6.7	8.0	5.5	4.2	4.4	3.9	4.3	5.1	3.5	5.9	7.7	8.8	4.3	4.1	4.0	4.3	7.9	5.9
13	7.4	6.8	5.9	5.1	5.0	7.8	8.0	7.1	5.1	3.5	4.4	1.9	2.9	2.8	2.7	6.3	14.3	13.0	10.5	4.7	4.6	6.0	5.4	5.7	6.1
14	6.9	4.8	6.5	3.2	3.8	7.8	4.2	1.2	2.3	2.3	2.5	3.2	9.2	10.9	10.0	9.4	10.4	11.6	12.1	10.1	2.9	5.7	3.2	7.1	6.3
15	6.8	8.8	9.2	9.8	10.0	6.5	4.7	9.0	9.6	9.9	9.8	12.7	11.2	8.6	12.5	18.5	12.0	14.0	16.5	14.5	19.2	17.2	11.7	8.6	11.3
16	10.2	11.0	11.6	11.6	10.6	11.0	10.5	10.6	11.0	11.5	16.4	18.7	13.7	13.4	13.2	13.8	16.6	18.0	18.1	19.0	15.5	18.6	14.3	17.2	14.0
17	16.8	11.5	9.6	11.2	12.9	12.6	13.0	16.4	18.2	16.6	15.8	15.8	11.6	11.1	9.8	10.9	11.0	12.9	16.0	15.5	15.1	10.4	9.6	8.6	13.0
18	9.3	10.4	9.5	8.4	8.9	10.1	11.6	11.4	10.6	7.2	4.9	3.1	1.9	5.6	8.2	9.4	9.4	8.7	4.1	3.4	5.3	8.2	6.1	5.4	7.5
19	4.4	6.9	8.0	7.2	8.6	7.5	8.1	8.0	7.7	4.6	2.1	2.5	2.4	7.8	9.8	9.5	11.0	9.3	6.5	7.2	3.5	6.4	6.9	7.8	6.8
20	7.0	6.4	6.9	8.1	6.4	7.4	7.3	7.8	7.4	5.9	3.5	3.9	2.7	2.2	2.1	3.8	6.2	7.7	8.0	2.8	4.7	3.2	5.3	6.6	5.6
21	6.9	6.7	8.3	6.7	6.7	6.1	5.2	4.3	5.4	5.7	4.0	2.6	2.5	4.0	6.9	7.9	10.2	8.1	9.0	7.0	2.0	3.7	5.9	5.5	5.9
22	6.7	7.0	7.1	8.0	8.0	7.8	7.7	7.8	8.8	7.9	6.8	5.4	5.2	7.3	7.9	11.9	13.3	13.0	9.7	3.3	4.4	4.4	4.0	6.3	7.5
23	6.2	8.2	8.8	7.2	6.0	7.8	7.2	7.7	4.7	3.0	2.6	2.3	8.4	14.3	14.0	14.5	16.5	13.8	13.1	10.2	7.7	3.2	5.0	6.7	8.3
24	5.8	7.1	5.2	6.0	6.7	7.9	8.5	3.2	1.4	5.3	6.4	10.3	10.5	12.1	12.7	11.4	10.5	8.6	5.8	3.6	4.5	5.6	6.3	7.6	7.2
25	8.6	6.8	7.6	6.9	7.1	6.7	7.9	8.3	6.4	6.3	4.0	2.4	3.5	2.7	4.3	5.3	6.0	8.1	11.4	6.7	2.4	5.0	3.5	4.1	5.9
26	6.8	9.2	7.4	3.6	6.2	7.7	8.1	6.2	8.2	4.3	2.9	2.5	2.2	6.4	8.7	13.0	17.0	13.6	9.2	7.1	7.7	4.0	2.6	2.7	7.0
27	4.8	5.1	2.0	4.3	5.1	4.6	6.0	8.4	3.2	4.9	7.6	8.6	8.2	8.4	9.4	10.1	11.6	12.3	10.9	5.5	2.5	2.4	2.4	1.8	6.2
28	2.5	4.8	3.1	3.4	7.8	8.7	9.8	10.4	9.7	8.3	8.1	14.4	11.5	11.1	9.4	5.3	2.4	4.0	7.6	2.9	2.6	7.3	6.9	6.8	7.0
29	6.4	6.7	8.6	8.1	8.1	9.8	9.9	11.0	11.0	9.9	6.3	14.4	14.8	13.5	17.9	16.7	18.9	21.3	22.2	21.2	18.3	14.3	17.6	19.5	13.6
30	17.2	20.0	24.6	23.1	24.7	22.2	21.4	26.5	24.0	24.9	23.0	25.0	24.1	20.3	18.7	17.8	13.1	16.4	16.3	17.1	14.3	18.4	15.7	14.6	20.1
HRAVE	9.2	9.1	9.0	8.7	9.0	9.3	9.3	9.5	9.1	8.7	8.5	8.9	9.1	9.7	10.7	11.5	11.9	12.1	12.2	10.3	8.2	8.6	8.5	8.9	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	16.3	20.1	11.4	5.9	12.0	11.0	14.6	10.2	8.0	6.2	6.6	5.9	6.1	6.3	11.3	14.0	13.0	7.5	6.8	5.6	5.9	7.5	8.3	7.2	5.9
MAX	24.3	25.8	18.2	12.0	19.6	18.1	27.0	20.1	16.5	13.5	11.9	8.8	14.3	12.1	19.2	19.0	18.2	11.6	11.0	8.1	10.2	13.3	16.5	12.7	11.4
MIN	7.7	13.8	3.7	3.0	6.2	2.8	2.5	2.8	1.5	1.8	2.3	3.5	1.9	1.2	4.7	10.2	8.6	1.9	2.1	2.1	2.0	3.3	2.3	1.4	2.4

DAY	26	27	28	29	30	31
AVE	7.0	6.2	7.0	13.6	20.1	***
MAX	17.0	12.3	14.4	22.2	26.5	***
MIN	2.2	1.8	2.4	6.3	13.1	***

MONTHLY AVERAGE = 9.6 MONTHLY MAXIMUM = 27.0 MONTHLY MINIMUM = 1.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
NOVEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	104	119	116	118	120	110	130	138	123	78	68	70	77	73	90	95	83	76	62	48	73	69	80	74	90
2	79	84	80	75	71	68	74	77	77	79	70	73	70	67	69	81	71	62	51	59	79	64	67	66	298
3	62	69	73	59	63	62	80	116	100	100	65	60	52	58	44	71	22	26	30	29	31	352	124	116	97
4	123	106	97	103	96	113	82	104	130	125	148	136	109	245	119	72	86	292	305	313	20	97	112	139	51
5	144	141	119	124	113	120	123	144	137	141	147	161	101	82	100	119	112	104	94	95	90	90	96	90	168
6	69	64	66	65	63	59	58	59	67	64	66	100	151	140	164	160	168	214	189	240	293	276	201	124	229
7	52	12	125	101	98	110	122	171	178	186	180	187	193	175	200	202	244	278	283	285	285	276	280	274	42
8	275	285	304	150	146	144	116	122	128	119	115	271	255	243	289	304	282	273	266	262	226	164	171	184	255
9	261	235	272	290	294	278	166	133	114	142	144	84	293	277	285	280	282	297	296	273	118	75	30	86	302
10	111	136	132	92	107	115	119	113	140	134	190	257	271	250	255	260	272	297	304	302	300	323	117	101	248
11	120	110	123	97	106	101	108	109	114	133	156	169	221	241	261	261	287	286	309	311	313	128	91	105	329
12	102	100	107	82	87	103	96	107	89	124	108	116	67	69	297	293	274	288	294	320	77	80	107	121	184
13	109	112	115	116	116	115	112	114	132	147	141	101	170	257	279	273	300	305	310	280	137	108	89	101	267
14	98	99	112	291	125	95	46	22	82	112	98	257	283	282	276	281	293	300	308	309	102	96	76	101	148
15	112	115	119	108	97	96	88	99	120	145	150	72	55	62	41	39	44	38	47	54	46	48	74	115	249
16	115	139	135	133	139	149	132	138	149	115	68	65	62	60	51	63	70	74	60	54	65	52	69	62	199
17	66	109	114	92	85	87	88	75	67	62	64	61	54	48	49	43	48	32	46	46	48	100	97	105	80
18	107	111	119	105	110	116	112	121	122	123	137	111	243	283	291	288	261	281	263	160	105	93	84	67	57
19	62	83	89	80	86	113	87	91	91	123	112	175	261	296	301	288	287	291	309	299	64	95	92	88	120
20	104	89	105	92	106	89	95	97	105	119	129	135	100	76	42	282	288	308	297	343	55	70	91	107	94
21	109	104	93	108	112	99	99	104	108	99	121	160	293	279	288	274	282	308	312	304	152	119	108	104	22
22	114	100	105	104	96	98	105	106	110	138	156	90	70	69	296	293	290	305	299	231	125	115	124	95	77
23	104	103	99	85	71	109	121	101	121	114	145	293	286	244	256	264	274	279	289	298	312	288	224	251	347
24	273	288	290	293	297	287	315	227	274	293	291	285	282	293	292	284	276	287	311	292	134	110	106	112	9
25	98	113	107	101	109	107	93	88	109	133	119	138	66	35	268	266	267	296	311	308	97	109	79	104	278
26	107	96	101	7	112	98	101	112	86	112	113	229	192	271	287	306	306	305	299	311	305	287	270	185	46
27	112	105	271	157	310	269	301	314	245	280	301	302	285	285	279	278	296	307	308	302	80	132	155	140	173
28	180	108	28	150	125	129	116	115	123	145	156	78	48	44	49	46	261	80	29	296	352	78	106	143	42
29	123	116	120	128	115	116	113	114	117	132	141	43	32	49	39	37	37	42	45	44	47	68	67	66	132
30	67	82	80	80	92	91	87	90	84	79	76	69	70	71	85	76	54	41	48	48	51	45	51	62	40

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
NOVEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	13	10	16	17	18	19	20	21	23	13	9	9	13	12	12	12	10	8	10	11	13	9	7	8	13
2	9	9	8	8	8	8	9	8	9	10	8	11	11	10	11	13	10	9	13	14	10	12	10	9	10
3	9	8	8	11	8	7	12	20	20	20	14	18	18	19	20	10	20	15	10	8	40	31	16	8	15
4	5	8	8	13	9	9	8	13	9	13	21	28	52	31	39	21	18	30	5	8	30	23	15	13	18
5	7	9	5	10	6	6	9	7	10	14	27	19	42	30	19	13	12	10	10	13	16	10	13	9	14
6	6	8	8	7	9	10	15	12	8	7	11	28	17	14	12	11	10	28	14	17	11	9	19	13	13
7	41	42	58	14	8	7	12	12	14	20	20	16	15	19	19	15	26	20	7	8	9	7	9	8	18
8	7	9	9	43	24	11	18	13	12	22	28	61	21	23	11	13	12	10	10	12	21	16	12	29	19
9	32	19	20	8	11	11	17	12	18	15	40	52	29	21	18	12	14	11	8	51	30	9	21	19	21
10	14	11	9	33	22	18	8	5	14	19	48	36	29	22	33	33	16	7	6	5	21	36	10	12	19
11	8	8	15	7	13	13	8	8	8	12	13	27	64	64	26	17	14	6	6	6	24	23	7	9	17
12	6	7	11	7	8	7	8	7	8	14	22	23	32	24	26	28	14	6	6	31	25	14	10	5	15
13	8	7	8	7	8	6	6	6	9	9	19	31	41	48	42	23	11	8	6	31	9	7	10	10	15
14	9	13	8	29	26	7	12	41	43	36	30	34	16	20	15	13	13	8	5	8	56	25	36	13	21
15	11	8	13	8	7	40	18	7	6	7	20	11	18	20	22	10	13	9	6	9	8	9	11	13	13
16	13	12	7	12	12	10	19	18	16	23	13	11	14	13	14	15	9	9	10	9	9	12	9	11	13
17	8	12	17	14	11	11	16	8	7	10	12	11	22	18	17	14	11	9	8	10	10	10	9	7	12
18	6	5	6	4	6	4	6	9	6	12	20	32	43	18	17	13	14	7	15	7	10	11	12	23	13
19	23	8	8	8	8	9	10	7	7	13	39	37	49	19	17	14	10	5	7	5	24	9	7	7	15
20	9	7	7	6	9	8	6	8	7	13	26	23	33	29	34	26	24	9	5	24	31	21	9	8	16
21	7	8	6	6	6	7	8	6	6	9	16	39	23	20	14	10	6	7	6	4	50	13	6	10	12
22	8	8	8	7	7	7	8	7	6	9	13	18	16	16	23	13	8	8	6	27	8	31	10	8	12
23	7	7	7	11	38	10	7	7	18	36	53	27	20	20	20	16	10	8	6	7	10	46	25	16	18
24	30	10	12	11	19	13	16	33	47	17	22	17	20	17	14	14	10	6	5	31	12	9	14	9	17
25	9	9	6	8	11	8	6	6	8	13	29	56	27	40	32	16	11	7	6	44	24	11	8	14	17
26	6	7	9	39	7	7	6	10	7	16	30	36	45	19	21	15	10	9	5	4	5	18	25	15	15
27	8	9	34	10	14	29	11	7	34	15	19	22	22	24	19	14	13	6	7	19	49	24	47	42	21
28	31	17	66	28	6	6	7	7	7	10	20	17	22	22	20	25	33	19	10	58	38	21	17	12	22
29	10	6	6	9	8	6	6	6	5	8	20	15	14	19	11	11	10	10	9	8	10	14	10	9	10
30	11	8	9	11	11	10	10	10	11	12	13	10	10	11	15	13	16	11	10	9	11	7	10	8	11
HRAVE	12	10	14	14	12	11	11	11	13	15	22	26	27	23	20	16	14	11	8	17	21	17	14	13	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	13	10	15	18	14	13	18	19	21	19	17	15	15	21	13	13	12	13	15	16	12	12	18	17	17
MAX	23	14	40	52	42	28	58	61	52	48	64	32	48	56	40	23	22	43	49	34	50	31	53	47	56
MIN	7	8	7	5	5	6	7	7	8	5	6	5	6	5	6	7	7	4	5	5	4	6	6	5	6

DAY	26	27	28	29	30	31
AVE	15	21	22	10	11	***
MAX	45	49	66	20	16	***
MIN	4	6	6	5	7	***

MONTHLY AVERAGE = 15.4 MONTHLY MAXIMUM = 65.8 MONTHLY MINIMUM = 4.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
NOVEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	20.4	19.1	18.7	18.8	18.3	18.1	17.4	17.2	20.1	25.8	27.2	28.2	29.1	29.8	30.2	29.5	29.4	28.6	27.9	27.9	26.8	26.3	25.8	24.8	24.4
2	24.3	23.8	23.6	22.8	22.5	22.1	21.7	21.9	23.0	23.9	25.0	27.0	28.5	29.1	29.6	29.9	29.1	28.3	27.6	26.9	25.7	25.3	24.8	24.2	25.5
3	23.7	22.8	22.4	21.9	20.7	19.9	18.6	17.4	20.2	23.3	25.6	27.3	28.7	29.8	30.6	30.8	30.2	29.2	28.4	27.8	26.6	25.1	22.7	21.9	24.8
4	20.6	19.5	18.3	17.0	16.5	16.5	15.9	15.2	18.3	22.1	25.7	28.5	30.3	31.4	31.5	31.5	31.0	29.9	27.6	26.7	25.9	23.8	22.4	21.8	23.7
5	20.3	19.1	18.9	18.0	17.9	17.0	16.0	15.4	19.1	21.8	27.3	31.7	32.7	33.0	33.6	33.3	32.3	31.1	30.3	29.4	28.4	28.3	27.0	27.0	25.4
6	26.0	25.4	24.7	24.3	24.4	24.4	23.9	24.6	25.6	27.1	29.0	30.8	30.6	32.2	32.5	31.9	31.7	30.5	29.1	27.7	26.8	26.0	25.6	24.6	27.5
7	24.1	24.4	23.0	23.2	22.8	22.8	23.0	23.6	23.9	25.3	27.9	27.2	23.8	25.5	26.0	25.8	24.7	21.4	17.4	16.9	16.1	15.7	15.1	13.9	22.2
8	13.0	12.3	11.4	11.0	10.9	10.4	9.8	9.5	10.9	13.8	16.4	17.6	18.5	19.3	18.5	17.7	17.5	17.1	16.8	15.8	14.9	14.7	14.6	13.9	14.4
9	12.4	11.1	9.2	7.9	7.6	7.3	7.3	7.2	8.4	9.6	10.4	11.2	12.4	12.4	13.1	13.5	13.0	11.8	10.9	10.2	9.1	8.4	7.2	6.6	9.9
10	5.9	4.8	4.2	3.7	3.4	2.1	2.8	3.8	5.5	8.4	10.4	12.7	14.1	15.3	16.1	16.7	16.4	14.6	13.2	12.3	11.5	10.7	9.0	7.8	9.4
11	6.7	6.7	4.9	4.8	4.0	2.8	2.7	3.8	7.2	10.4	13.4	15.8	17.8	19.2	20.0	20.7	20.1	18.4	16.8	15.6	14.3	12.8	11.4	9.9	11.7
12	9.2	8.3	7.7	6.8	6.1	5.1	5.2	6.6	7.6	10.9	14.0	16.9	19.2	20.5	21.3	21.8	21.6	19.8	18.3	17.7	16.1	14.3	13.0	12.2	13.4
13	11.9	11.6	11.0	10.3	9.6	9.8	9.9	9.8	10.3	11.4	15.2	17.5	20.3	21.2	22.7	23.5	22.4	20.5	19.4	18.5	16.8	15.5	13.9	12.4	15.2
14	11.8	10.5	9.9	8.4	8.0	7.6	7.1	7.5	8.9	12.4	15.5	18.6	20.6	21.6	22.1	22.2	21.5	19.7	18.4	17.7	16.0	14.6	13.0	11.6	14.4
15	11.0	9.6	8.9	9.3	9.3	7.8	5.4	6.9	9.4	13.4	17.6	21.3	23.0	24.5	24.7	24.2	24.2	23.9	22.9	22.0	22.1	21.2	18.7	15.4	16.5
16	14.9	13.1	13.1	11.4	11.4	10.6	10.7	10.8	13.1	18.1	22.2	23.6	25.5	27.0	28.0	28.7	28.5	27.8	26.7	25.9	24.6	24.8	22.5	21.9	20.2
17	21.7	18.3	17.1	17.3	17.6	17.6	17.1	18.3	19.2	21.6	24.6	26.3	27.9	29.0	29.7	29.9	29.4	28.3	27.5	26.8	25.9	23.1	21.8	20.4	23.2
18	18.4	18.1	17.2	16.7	15.5	15.2	15.0	15.1	17.1	20.3	23.2	25.9	28.2	29.5	30.9	31.1	30.9	28.9	27.1	25.4	24.7	23.5	22.2	20.6	22.5
19	19.3	18.1	17.1	16.6	15.5	15.8	14.1	14.7	17.0	20.0	22.5	25.6	27.5	29.1	29.9	29.9	29.1	27.2	26.1	25.0	23.4	21.3	20.2	18.7	21.8
20	18.0	16.6	15.9	15.6	14.6	14.0	13.7	14.2	16.6	19.1	21.7	24.3	26.7	28.4	29.2	29.8	29.1	27.7	25.8	25.6	24.2	22.1	20.7	19.6	21.4
21	18.3	17.9	16.8	16.0	15.3	14.8	14.7	13.6	15.2	18.2	21.0	23.5	24.5	26.7	27.7	27.8	26.7	25.0	23.7	22.9	21.3	19.9	18.4	17.4	20.3
22	16.8	15.5	15.1	14.3	14.1	12.8	13.0	13.3	15.4	18.4	21.7	24.3	26.4	27.9	29.0	28.5	27.4	25.7	24.2	22.9	21.6	20.0	18.8	17.2	20.2
23	16.7	16.1	14.9	14.9	12.7	12.4	12.6	12.0	13.7	16.6	19.4	21.8	24.3	25.9	25.7	25.3	24.3	22.7	20.9	19.4	19.0	18.6	18.2	17.4	18.6
24	16.6	15.8	15.5	14.9	14.7	13.4	13.3	12.4	13.4	15.1	16.6	17.9	18.8	19.4	19.4	19.2	18.5	16.8	15.9	14.7	13.0	12.0	10.6	9.9	15.3
25	9.0	8.1	7.2	6.1	5.4	5.1	4.2	4.0	6.9	10.4	13.1	15.8	18.1	19.5	20.3	20.7	20.4	18.7	17.3	15.9	14.6	13.0	11.7	10.3	12.3
26	9.2	9.3	7.9	6.4	5.5	5.4	5.5	5.1	7.2	10.5	13.6	16.5	18.7	20.3	20.6	20.4	19.3	17.9	16.2	15.4	14.4	13.8	13.2	12.1	12.7
27	10.7	10.2	9.8	8.3	8.6	8.0	7.8	8.0	8.0	10.1	11.9	13.2	14.4	15.2	15.5	15.5	14.9	13.5	12.6	12.3	11.1	10.2	9.1	8.5	11.1
28	7.2	7.1	6.2	5.4	4.2	3.9	3.7	4.3	6.4	9.1	12.8	15.2	15.9	17.0	17.9	18.4	18.7	16.9	16.2	15.2	14.0	12.9	11.1	9.2	11.2
29	8.4	7.6	6.6	5.1	5.1	4.8	4.0	4.3	6.2	9.2	13.0	16.3	17.9	19.3	19.7	19.7	19.5	18.8	18.6	18.5	17.7	17.0	16.4	16.2	12.9
30	15.6	15.3	15.0	14.2	13.4	12.6	12.1	11.9	12.6	13.5	14.6	15.8	16.9	17.7	18.4	18.3	17.9	16.9	16.1	15.5	14.8	14.5	13.5	11.7	14.9
HRAVE	15.4	14.5	13.7	13.0	12.5	12.0	11.6	11.8	13.6	16.3	19.1	21.3	22.7	23.9	24.5	24.5	24.0	22.6	21.3	20.5	19.4	18.3	17.1	16.0	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	24.4	25.5	24.8	23.7	25.4	27.5	22.2	14.4	9.9	9.4	11.7	13.4	15.2	14.4	16.5	20.2	23.2	22.5	21.8	21.4	20.3	20.2	18.6	15.3	12.3
MAX	30.2	29.9	30.8	31.5	33.6	32.5	27.9	19.3	13.5	16.7	20.7	21.8	23.5	22.2	24.7	28.7	29.9	31.1	29.9	29.8	27.8	29.0	25.9	19.4	20.7
MIN	17.2	21.7	17.4	15.2	15.4	23.9	13.9	9.5	6.6	2.1	2.7	5.1	9.6	7.1	5.4	10.6	17.1	15.0	14.1	13.7	13.6	12.8	12.0	9.9	4.0

DAY	26	27	28	29	30	31
AVE	12.7	11.1	11.2	12.9	14.9	***
MAX	20.6	15.5	18.7	19.7	18.4	***
MIN	5.1	7.8	3.7	4.0	11.7	***

MONTHLY AVERAGE = 17.9 MONTHLY MAXIMUM = 33.6 MONTHLY MINIMUM = 2.1
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
NOVEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	0.8	1.0	1.0	0.8	1.1	1.2	0.8	1.0	0.3	-0.6	-0.6	-0.7	-0.8	-0.6	-0.5	-0.1	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.2
2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	-0.1	-0.2	-0.5	-0.7	-0.7	-0.3	-0.2	-0.2	0.1	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.0
3	0.2	0.3	0.3	0.2	0.3	0.3	0.4	0.2	-0.5	-1.0	-0.9	-0.8	-0.8	-0.7	-0.5	-0.3	0.2	0.4	0.4	0.5	0.6	0.6	0.8	0.5	0.0
4	0.6	0.7	0.8	0.7	0.6	0.6	0.7	-0.1	-1.0	-1.3	-1.1	-0.9	-1.0	-0.8	-0.8	-0.3	0.2	0.4	0.6	0.6	0.5	0.8	0.9	1.3	0.1
5	0.9	0.9	0.7	0.5	0.5	0.9	1.1	0.5	-1.1	-0.9	-1.2	-1.8	-1.1	-0.8	-0.6	-0.3	0.2	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.1
6	0.3	0.4	0.5	0.6	0.5	0.4	0.3	0.2	-0.2	-0.5	-0.9	-1.1	-0.6	-0.8	-0.6	-0.3	-0.2	0.2	0.4	0.4	0.2	0.4	0.3	0.4	0.0
7	0.4	0.3	0.5	0.6	0.3	0.3	0.3	0.2	-0.1	-0.3	-1.0	-0.6	-0.4	-1.1	-0.4	-0.2	-0.3	-0.2	-0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1
8	0.0	0.1	0.2	0.2	0.2	0.3	0.3	-0.1	-1.0	-1.1	-1.5	-0.9	-0.8	-0.8	-0.9	-0.7	-0.3	0.0	0.1	0.1	0.1	0.0	0.0	0.0	-0.3
9	-0.1	0.0	0.0	0.0	0.1	0.1	0.0	-0.1	-0.4	-0.7	-0.6	-0.7	-0.9	-0.7	-0.7	-0.8	-0.5	0.1	0.3	0.3	0.5	0.5	0.4	0.4	-0.1
10	0.6	0.8	0.5	0.5	0.4	0.3	0.3	0.0	-1.1	-1.3	-0.7	-0.7	-0.9	-0.8	-0.7	-0.7	-0.4	0.2	0.4	0.4	0.6	0.6	0.8	0.5	0.0
11	0.6	0.3	1.2	0.8	0.6	0.6	0.6	-0.3	-1.4	-1.5	-1.5	-1.1	-0.7	-0.6	-0.7	-0.7	-0.2	0.4	0.7	0.5	0.6	0.4	0.6	0.6	0.0
12	0.6	0.6	0.5	0.5	0.5	0.4	0.6	0.2	-0.5	-0.9	-1.1	-1.0	-1.0	-0.8	-0.8	-0.6	-0.3	0.4	0.6	0.4	0.4	0.6	0.5	0.5	0.0
13	0.4	0.5	0.5	0.4	0.7	0.2	0.2	0.1	-0.3	-0.5	-1.0	-0.7	-0.9	-0.6	-0.6	-0.7	-0.2	0.2	0.4	0.6	0.4	0.6	0.7	0.6	0.0
14	0.8	0.6	0.6	0.6	0.6	1.0	0.6	0.1	-0.5	-0.7	-0.8	-0.8	-0.9	-0.8	-0.8	-0.7	-0.2	0.4	0.5	0.6	0.5	0.8	0.5	0.8	0.1
15	0.8	1.0	0.8	0.4	0.8	0.6	0.8	0.2	-0.5	-1.4	-1.5	-0.9	-0.7	-0.6	-0.2	0.0	0.2	0.4	0.3	0.4	0.3	0.3	0.7	2.5	0.2
16	1.6	1.3	1.0	2.0	1.9	1.3	1.5	1.5	0.2	-0.6	-0.6	-0.6	-0.5	-0.3	-0.1	0.1	0.4	0.5	0.3	0.3	0.5	0.3	0.6	0.6	0.6
17	0.5	1.0	1.4	0.6	0.6	0.6	0.9	0.4	0.2	-0.3	-0.6	-0.6	-0.6	-0.4	-0.2	0.1	0.3	0.5	0.3	0.3	0.4	0.5	0.7	0.9	0.3
18	1.4	1.3	1.2	1.1	1.4	1.3	1.5	1.0	-0.4	-1.0	-1.0	-0.8	-0.6	-0.8	-0.7	-0.6	-0.1	0.5	0.7	0.6	0.6	0.8	0.9	0.6	0.4
19	0.6	0.6	0.4	0.5	0.7	0.5	0.5	0.0	-1.1	-1.3	-0.7	-0.7	-0.7	-0.7	-0.7	-0.6	-0.1	0.5	0.6	0.6	0.6	0.9	0.9	0.7	0.1
20	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.1	-1.0	-1.3	-0.9	-0.8	-0.8	-0.7	-0.5	-0.6	-0.1	0.4	0.6	0.4	0.6	0.6	0.6	0.7	0.1
21	0.8	0.7	0.7	0.8	0.6	0.5	0.6	0.6	-0.8	-1.1	-1.0	-0.8	-0.6	-0.7	-0.7	-0.4	0.0	0.4	0.5	0.6	0.4	0.6	0.8	0.6	0.1
22	0.7	0.5	0.6	0.8	0.6	0.6	0.5	0.1	-1.0	-1.4	-1.5	-1.1	-1.0	-0.7	-0.6	-0.3	0.1	0.3	0.5	0.6	0.6	0.7	0.4	0.7	0.0
23	0.8	0.8	0.6	0.8	0.7	0.8	0.8	0.4	-0.6	-0.8	-0.7	-0.7	-0.8	-0.9	-0.7	-0.6	-0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.1
24	0.3	0.6	0.5	0.5	0.5	0.6	0.3	0.3	-0.3	-0.5	-0.7	-0.8	-0.9	-0.8	-0.8	-0.7	-0.2	0.3	0.7	0.6	0.6	0.6	0.7	0.6	0.1
25	0.6	0.6	0.7	0.6	0.7	0.5	0.5	0.0	-1.1	-1.4	-0.9	-0.7	-0.9	-0.7	-0.6	-0.6	-0.2	0.5	0.6	0.6	0.6	0.6	0.6	0.8	0.1
26	0.7	0.7	0.9	0.9	0.8	0.7	0.7	0.3	-1.0	-1.3	-0.9	-0.7	-0.7	-0.8	-0.7	-0.5	0.0	0.3	0.6	0.7	0.6	0.6	0.4	0.4	0.1
27	0.4	0.5	0.6	0.6	0.3	0.4	0.4	0.4	-0.1	-0.4	-0.7	-0.8	-0.9	-0.8	-0.7	-0.7	-0.2	0.3	0.4	0.3	0.5	0.5	0.7	0.6	0.1
28	0.7	0.9	0.9	0.8	0.5	0.7	0.3	0.0	-1.1	-1.4	-1.5	-1.0	-0.6	-0.5	-0.3	-0.2	-0.1	0.6	0.7	0.4	0.6	0.8	0.8	0.9	0.1
29	1.0	0.7	0.7	1.1	0.6	0.4	0.4	-0.1	-1.2	-1.3	-1.1	-0.6	-0.5	-0.3	-0.1	0.0	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.1
30	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	-0.4	-0.6	-0.7	-0.6	-0.6	-0.4	-0.4	-0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.0
HRAVE	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.2	-0.6	-0.9	-0.9	-0.8	-0.8	-0.7	-0.6	-0.4	-0.1	0.3	0.4	0.4	0.4	0.5	0.5	0.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.2	0.0	0.0	0.1	0.1	0.0	-0.1	-0.3	-0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.3	0.4	0.1	0.1	0.1	0.0	0.1	0.1	0.1
MAX	1.2	0.4	0.8	1.3	1.1	0.6	0.6	0.3	0.5	0.8	1.2	0.6	0.7	1.0	2.5	2.0	1.4	1.5	0.9	0.8	0.8	0.8	0.8	0.7	0.8
MIN	-0.8	-0.7	-1.0	-1.3	-1.8	-1.1	-1.1	-1.5	-0.9	-1.3	-1.5	-1.1	-1.0	-0.9	-1.5	-0.6	-0.6	-1.0	-1.3	-1.3	-1.1	-1.5	-0.9	-0.9	-1.4

DAY	26	27	28	29	30	31
AVE	0.1	0.1	0.1	0.1	0.0	***
MAX	0.9	0.7	0.9	1.1	0.6	***
MIN	-1.3	-0.9	-1.5	-1.3	-0.7	***

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 2.5 MONTHLY MINIMUM = -1.8
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
NOVEMBER - 2020

	HOUR																							DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	705	706	706	706	706	707	707	708	708	708	708	708	707	706	706	706	706	706	706	706	707	707	707	707	707
2	707	707	707	706	707	707	707	707	708	708	707	707	706	705	704	704	704	704	704	704	704	704	704	705	706
3	704	704	704	704	704	704	704	705	705	705	705	704	703	702	702	701	701	701	702	702	702	703	703	703	703
4	704	704	704	704	704	704	705	705	706	706	706	705	704	704	703	703	703	703	704	704	705	705	705	705	704
5	705	705	705	705	705	706	706	706	706	706	705	705	704	703	702	702	701	701	702	702	702	701	701	701	704
6	700	700	700	700	699	699	699	699	699	699	699	698	697	696	696	695	695	695	695	696	696	696	696	696	697
7	696	696	696	695	695	695	695	695	695	695	695	694	694	694	693	693	692	692	694	694	695	696	697	697	695
8	698	698	698	698	698	698	698	698	699	699	698	698	697	696	696	696	696	696	697	697	698	698	698	698	698
9	698	698	699	699	700	701	701	702	703	703	703	703	703	703	703	703	703	703	704	704	704	705	705	705	702
10	705	704	704	704	704	704	704	705	705	705	705	704	704	703	702	702	702	702	702	702	702	703	702	702	703
11	702	702	702	702	702	702	702	703	703	703	703	703	702	701	701	700	701	701	701	701	702	702	702	702	702
12	702	702	703	702	702	703	703	704	704	705	704	704	703	702	702	702	702	702	702	703	703	703	703	703	703
13	703	703	703	703	703	703	704	704	705	705	705	704	703	703	702	702	702	702	703	703	703	703	703	703	703
14	703	703	703	703	703	703	703	704	704	705	705	704	704	703	703	703	703	704	704	705	705	706	706	706	704
15	706	706	706	706	706	706	707	707	708	708	707	707	706	705	705	704	704	704	704	705	705	705	706	706	706
16	706	706	706	706	706	706	706	707	707	707	707	706	705	704	704	703	703	703	703	704	704	704	705	705	705
17	705	705	705	705	705	705	706	706	706	706	706	706	705	704	704	703	703	703	703	703	704	704	704	704	705
18	704	704	704	704	704	704	704	705	705	705	705	704	704	703	703	702	702	702	703	703	703	704	704	704	704
19	704	704	704	704	704	704	705	705	705	706	705	705	704	704	703	703	703	703	704	704	704	705	705	705	704
20	705	705	705	705	705	706	706	706	707	707	707	706	705	704	704	703	704	704	704	704	704	705	705	705	705
21	705	705	704	704	704	704	705	705	705	705	705	704	704	703	703	702	702	702	703	703	703	703	703	703	704
22	703	703	703	703	703	703	703	703	703	703	702	702	701	700	699	699	699	699	699	700	700	700	700	700	701
23	699	699	699	699	699	699	699	699	700	700	699	699	698	697	697	696	696	696	697	697	697	698	698	698	698
24	698	698	699	699	699	700	700	701	702	702	703	703	702	702	702	702	702	703	703	703	704	704	704	704	702
25	704	705	705	705	705	705	705	706	706	706	706	705	704	704	703	702	702	702	703	703	703	703	703	703	704
26	703	703	702	703	702	702	703	703	703	703	703	702	701	701	700	700	700	700	701	701	701	701	702	702	702
27	702	702	702	702	702	703	703	704	704	705	705	705	705	705	704	705	705	705	706	706	706	707	706	707	704
28	707	707	707	707	707	707	707	707	708	708	708	707	706	705	705	704	704	704	705	705	705	705	705	705	706
29	705	705	705	705	705	705	706	706	707	707	707	706	705	705	704	704	704	704	705	705	705	706	706	706	705
30	707	707	707	707	708	708	708	709	709	709	709	708	707	706	705	705	705	705	705	705	705	705	706	706	707
HRAVE	703	703	703	703	703	703	704	704	705	705	704	704	703	702	702	702	702	702	702	702	703	703	703	703	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	707	706	703	704	704	697	695	698	702	703	702	703	703	704	706	705	705	704	704	705	704	701	698	702	704
MAX	708	708	705	706	706	700	697	699	705	705	703	705	705	706	708	707	706	705	706	707	705	703	700	704	706
MIN	705	704	701	703	701	695	692	696	698	702	700	702	702	703	704	703	703	702	703	703	702	699	696	698	702

DAY	26	27	28	29	30	31
AVE	702	704	706	705	707	***
MAX	703	707	708	707	709	***
MIN	700	702	704	704	705	***

MONTHLY AVERAGE = 703.0 MONTHLY MAXIMUM = 709.1 MONTHLY MINIMUM = 692.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
NOVEMBER - 2020

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	24	25	26	26	26	26	25	25	22	18	17	16	15	14	14	15	15	17	17	17	18	19	19	20	20
2	21	22	22	23	23	24	24	24	24	23	21	19	17	16	15	14	15	16	16	17	18	18	19	20	20
3	21	22	23	23	25	26	28	30	26	22	20	18	17	15	14	14	14	15	16	16	18	20	23	23	20
4	25	27	30	32	33	33	35	35	27	22	19	17	15	16	16	11	12	14	19	21	21	22	23	24	23
5	26	28	28	29	29	31	32	33	27	23	18	15	13	12	8	7	9	11	11	12	13	13	15	15	19
6	15	15	15	15	15	15	15	14	13	13	12	11	13	12	12	13	13	14	16	17	18	19	20	21	15
7	21	23	23	23	23	23	25	28	29	28	22	26	37	34	30	30	33	34	37	35	32	33	36	40	30
8	42	43	46	48	48	50	54	52	46	36	31	31	29	31	33	35	37	37	36	40	46	46	45	44	41
9	67	77	90	93	89	79	77	76	68	60	54	49	46	44	39	38	39	44	46	51	57	58	64	66	61
10	70	72	77	81	82	84	82	76	65	52	42	35	31	29	26	24	24	29	32	34	35	37	42	47	50
11	48	44	49	57	61	65	66	59	42	31	25	22	19	18	19	18	19	22	25	28	32	36	37	41	37
12	43	46	47	51	54	58	58	51	48	35	28	23	19	19	18	18	18	21	24	26	28	32	33	35	35
13	37	37	39	41	44	41	39	39	37	34	27	24	20	20	19	20	22	24	25	25	30	33	35	40	31
14	42	46	48	51	54	55	56	55	47	37	31	26	21	18	17	17	18	20	22	23	27	29	32	35	34
15	36	37	39	38	38	41	49	45	35	26	19	13	12	10	10	10	10	11	11	12	12	13	15	19	23
16	19	22	22	24	24	25	25	25	21	16	12	11	10	9	9	9	9	10	10	10	11	11	13	14	15
17	14	17	18	18	18	18	19	18	16	14	12	11	10	9	9	10	10	11	11	12	13	15	17	19	14
18	21	21	23	24	26	26	27	26	23	20	17	15	14	14	14	18	18	21	23	26	28	29	30	33	22
19	36	38	40	42	45	44	49	47	40	31	26	22	21	19	17	16	18	22	21	21	25	28	30	33	30
20	34	37	39	39	42	44	45	44	36	31	26	24	21	19	20	21	22	25	28	29	31	35	38	40	32
21	43	44	47	49	50	52	52	54	48	37	32	28	27	25	25	26	28	30	31	33	37	40	43	46	39
22	48	51	52	55	55	59	59	56	47	38	32	27	24	22	21	23	24	27	30	33	36	38	41	43	39
23	45	46	48	49	54	56	55	57	48	38	32	29	26	23	23	22	23	24	26	29	27	27	28	29	36
24	30	32	34	35	37	41	44	46	43	37	28	23	20	17	16	16	16	18	20	22	25	26	28	29	28
25	31	32	34	36	37	39	42	42	33	24	20	18	16	14	14	14	14	15	17	19	21	22	24	26	25
26	27	27	29	32	34	35	35	35	31	24	20	18	15	15	15	16	18	19	22	23	24	25	27	29	25
27	32	32	32	33	34	35	36	32	31	26	22	22	21	20	20	20	22	24	26	27	30	31	34	36	28
28	39	44	44	46	50	51	51	49	42	34	29	26	25	23	21	21	21	24	24	26	29	31	33	35	34
29	38	40	40	43	43	41	42	39	33	27	23	23	21	17	16	15	15	16	16	16	17	18	19	19	27
30	20	21	23	23	24	24	25	25	24	22	21	20	18	18	17	17	17	18	20	21	22	22	24	26	21
HRAVE	34	36	38	39	41	41	42	41	36	29	25	22	20	19	18	18	19	21	23	24	26	28	29	32	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	20	20	20	23	19	15	30	41	61	50	37	35	31	34	23	15	14	22	30	32	39	39	36	28	25
MAX	26	24	30	35	33	21	40	54	93	84	66	58	44	56	49	25	19	33	49	45	54	59	57	46	42
MIN	14	14	14	11	7	11	21	29	38	24	18	18	19	17	10	9	9	14	16	19	25	21	22	16	14

DAY	26	27	28	29	30	31
AVE	25	28	34	27	21	***
MAX	35	36	51	43	26	***
MIN	15	20	21	15	17	***

MONTHLY AVERAGE = 29.2 MONTHLY MAXIMUM = 92.5 MONTHLY MINIMUM = 7.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
NOVEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.28	0.40	0.58	0.67	0.68	0.60	0.44	0.13	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.95
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.17	0.51	0.64	0.61	0.34	0.30	0.35	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.19
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.31	0.50	0.50	0.56	0.71	0.65	0.48	0.32	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.20
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.31	0.49	0.62	0.70	0.71	0.65	0.54	0.37	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.65
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.30	0.49	0.63	0.70	0.71	0.66	0.55	0.38	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.65
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.25	0.41	0.58	0.50	0.17	0.33	0.21	0.13	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.78
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.17	0.56	0.20	0.18	0.40	0.14	0.06	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.99
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.46	0.60	0.58	0.41	0.41	0.51	0.24	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.67
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.20	0.27	0.41	0.56	0.31	0.32	0.38	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.83
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.33	0.49	0.63	0.70	0.71	0.64	0.53	0.36	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.63
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.29	0.47	0.61	0.69	0.70	0.64	0.52	0.35	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.52
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.20	0.34	0.51	0.58	0.66	0.38	0.53	0.35	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.75
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.14	0.23	0.50	0.53	0.61	0.62	0.50	0.33	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.62
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.46	0.59	0.67	0.69	0.62	0.51	0.34	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.39
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.45	0.59	0.67	0.69	0.63	0.52	0.35	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.40
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.46	0.60	0.68	0.69	0.64	0.52	0.35	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.44
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.08	0.44	0.57	0.65	0.67	0.61	0.50	0.33	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.02
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.22	0.40	0.54	0.62	0.64	0.58	0.46	0.30	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.93
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25	0.43	0.56	0.64	0.65	0.60	0.48	0.31	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.10
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.37	0.53	0.48	0.59	0.56	0.45	0.30	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.68
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.18	0.31	0.44	0.47	0.50	0.49	0.37	0.20	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.07
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.41	0.54	0.61	0.57	0.51	0.42	0.20	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.63
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.42	0.55	0.62	0.63	0.58	0.46	0.31	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.94
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.43	0.57	0.64	0.66	0.60	0.49	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.13
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.43	0.57	0.64	0.66	0.60	0.48	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.12
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.42	0.56	0.64	0.65	0.59	0.48	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.08
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.24	0.41	0.56	0.63	0.64	0.58	0.47	0.31	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.41	0.55	0.63	0.65	0.60	0.49	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.04
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.23	0.40	0.55	0.64	0.66	0.60	0.49	0.31	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.04
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.39	0.54	0.63	0.65	0.51	0.42	0.33	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.86
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.23	0.40	0.55	0.60	0.61	0.55	0.45	0.30	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.95	3.19	4.20	4.65	4.65	2.78	1.99	3.67	2.83	4.63	4.52	3.75	3.62	4.39	4.40	4.44	4.02	3.93	4.10	3.68	3.07	3.63	3.94	4.13	4.12
MAX	0.68	0.64	0.71	0.71	0.71	0.58	0.56	0.60	0.56	0.71	0.70	0.66	0.62	0.69	0.69	0.69	0.67	0.64	0.65	0.59	0.50	0.61	0.63	0.66	0.66
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	4.08	4.01	4.04	4.04	3.86	***
MAX	0.65	0.64	0.65	0.66	0.65	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 0.7 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
NOVEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.02	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.00	0.00	***
MAX	0.00	0.00	0.00	0.00	0.00	***
MIN	0.00	0.00	0.00	0.00	0.00	***

MONTHLY TOTAL = 0.07 MONTHLY MAXIMUM = 0.04 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 720 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Speed (mph)
DECEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	8.9	9.6	10.4	8.0	8.1	9.4	9.3	10.3	8.9	8.2	6.1	4.1	2.5	4.5	10.5	12.4	14.9	14.6	12.1	5.7	4.9	3.8	4.1	4.4	8.2
2	6.3	5.6	7.0	10.7	12.0	10.6	8.9	8.8	9.6	7.6	10.8	14.7	17.4	17.8	15.7	11.8	14.4	18.2	19.1	18.8	18.4	16.5	18.3	19.5	13.3
3	18.6	15.9	12.5	8.7	10.4	10.6	11.7	16.1	11.0	13.9	14.9	19.5	14.1	11.2	11.3	11.3	8.3	12.3	11.1	10.2	12.7	10.5	10.9	11.4	12.5
4	11.7	6.4	7.7	8.6	5.7	4.3	3.2	7.9	8.5	8.9	7.6	10.7	9.9	12.0	9.5	9.9	10.1	5.2	7.5	12.4	11.6	8.1	8.0	7.1	8.4
5	10.3	10.5	8.4	6.3	8.2	7.5	5.4	7.7	8.7	6.1	4.2	3.1	4.5	4.2	3.6	3.5	3.4	4.7	4.4	6.2	4.8	9.4	8.5	7.3	6.3
6	8.3	7.3	8.5	7.6	6.2	7.6	7.0	9.1	8.8	8.2	6.1	4.7	4.9	3.3	3.5	4.1	6.0	4.9	4.3	5.3	6.4	6.8	10.2	8.9	6.6
7	10.6	9.0	9.9	10.9	12.2	12.4	12.1	11.1	10.0	18.3	17.6	17.6	16.2	17.5	20.0	21.1	19.7	19.3	17.0	18.4	18.5	19.8	18.3	20.7	15.8
8	18.4	16.6	12.5	13.3	16.9	14.4	18.4	17.0	14.3	13.9	18.5	15.3	16.1	20.0	19.0	17.7	16.3	17.9	17.4	12.9	16.0	15.1	14.3	14.1	16.1
9	16.2	18.0	12.2	11.4	14.8	12.0	10.4	10.8	9.5	11.3	12.7	12.3	10.6	10.5	12.8	11.7	10.8	8.3	5.3	6.2	4.0	3.7	5.4	4.6	10.2
10	18.1	12.2	4.3	5.6	6.7	7.1	8.1	6.8	7.4	8.5	6.4	4.4	8.3	14.1	12.2	14.3	10.8	4.2	4.1	3.3	3.2	3.8	2.8	1.8	7.4
11	1.8	2.1	2.9	3.2	5.6	4.4	5.5	5.8	4.8	4.1	2.6	3.8	3.6	7.4	10.0	10.3	11.8	11.2	9.7	3.7	4.6	3.0	4.3	7.2	5.6
12	7.7	7.0	6.9	6.2	7.3	6.9	5.9	6.1	4.5	4.6	2.7	1.9	2.3	5.9	9.9	14.4	16.4	12.6	9.5	7.7	11.4	9.4	4.6	11.2	7.6
13	16.3	20.9	22.0	17.8	17.1	12.3	8.1	5.3	10.7	17.5	14.6	17.4	16.2	16.8	18.0	19.3	21.4	20.6	22.5	19.9	19.9	18.9	20.4	19.4	17.2
14	18.5	17.9	16.3	16.1	17.2	16.3	13.8	11.8	8.3	9.0	6.8	5.8	4.2	5.1	21.0	16.1	17.2	17.5	10.2	4.5	4.4	5.4	7.1	7.9	11.6
15	5.2	5.4	5.0	5.1	3.7	5.2	3.5	5.4	6.9	5.4	3.4	5.7	6.6	6.4	5.0	5.4	7.3	14.3	12.9	6.1	3.6	4.1	4.6	2.9	5.8
16	3.9	5.9	9.8	9.9	9.8	9.8	8.9	6.6	8.2	9.3	8.4	6.1	5.3	6.8	5.6	6.0	8.2	6.0	2.8	2.2	4.2	3.2	4.3	10.9	6.7
17	9.6	10.4	10.5	11.7	11.8	12.6	12.2	12.5	12.6	10.9	10.5	9.0	7.1	7.8	7.2	7.6	6.7	3.9	5.4	5.4	1.8	5.2	4.8	5.2	8.4
18	6.0	4.1	2.9	5.1	3.1	5.7	8.1	7.2	4.9	2.5	1.8	1.5	5.6	13.5	12.6	12.6	14.1	12.1	11.7	6.5	3.2	5.8	6.1	6.9	6.8
19	6.5	7.0	4.1	4.0	6.4	8.4	7.6	5.7	5.1	6.7	5.0	4.3	3.9	3.0	3.9	4.9	5.3	6.9	10.2	4.8	3.4	4.1	7.2	7.4	5.7
20	8.3	5.7	7.7	5.9	8.4	8.8	8.4	9.0	10.0	9.3	7.7	7.3	10.4	11.3	10.7	10.2	10.1	9.1	6.6	13.5	19.7	13.5	10.0	11.3	9.7
21	11.2	9.9	11.0	9.5	8.9	10.8	12.7	14.2	14.5	13.8	10.7	13.6	14.7	11.9	12.0	13.1	13.4	16.8	20.4	19.8	15.9	11.2	11.1	10.0	13.0
22	9.9	12.1	10.1	12.4	11.3	10.4	10.1	9.3	7.2	5.5	6.0	3.4	1.3	1.6	4.4	8.6	8.9	9.0	3.1	1.5	5.0	8.1	6.9	5.2	7.1
23	5.9	6.4	5.8	7.1	6.8	4.9	7.1	7.0	4.1	1.4	2.8	3.0	2.4	11.6	12.1	15.0	18.1	15.1	10.9	16.4	15.0	8.6	14.8	12.6	9.0
24	18.0	19.3	17.6	12.8	13.1	17.2	19.3	20.1	17.1	13.6	20.2	19.1	21.0	18.6	19.2	15.0	20.0	22.3	17.9	23.7	23.0	20.4	21.4	22.0	18.8
25	21.3	20.4	21.1	19.0	18.8	22.2	14.7	18.6	15.8	22.4	20.8	18.7	15.2	15.3	16.1	16.1	16.4	17.8	18.0	18.6	10.5	6.7	10.1	11.1	16.9
26	9.8	9.8	10.1	9.8	10.6	10.1	8.7	9.1	8.5	8.7	6.4	6.1	5.2	2.3	4.3	6.4	8.6	8.9	6.3	2.2	4.1	6.5	9.9	9.5	7.6
27	9.0	6.1	6.8	9.0	9.0	9.6	9.5	8.3	10.1	7.6	5.4	4.7	5.0	2.3	3.7	6.8	5.7	1.8	4.6	7.1	8.2	7.8	7.1	8.1	6.8
28	5.8	8.4	10.6	10.1	7.3	7.3	8.5	6.5	4.1	2.8	3.8	14.5	18.2	18.9	19.5	25.8	29.1	24.8	17.8	8.5	5.8	4.5	2.8	9.5	11.5
29	9.5	13.6	7.9	4.4	5.1	4.8	5.0	5.1	2.3	2.6	1.9	4.4	9.6	9.6	9.1	11.2	8.9	5.9	2.9	5.2	1.8	4.7	5.6	5.3	6.1
30	2.4	3.5	4.2	3.6	1.5	4.3	5.4	8.6	3.6	2.9	6.8	11.0	7.2	4.6	4.7	5.8	9.3	6.0	6.2	3.5	2.0	3.7	7.1	4.4	5.1
31	5.6	9.6	9.0	10.7	11.8	10.4	8.9	7.9	7.8	6.4	5.7	4.9	2.5	1.7	4.3	9.0	4.7	5.1	6.9	3.7	6.5	8.2	5.9	3.0	6.7
HRAVE	10.3	10.2	9.5	9.2	9.5	9.6	9.2	9.5	8.6	8.8	8.3	8.8	8.8	9.6	10.7	11.5	12.1	11.5	10.3	9.2	8.9	8.4	8.9	9.4	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	8.2	13.3	12.5	8.4	6.3	6.6	15.8	16.1	10.2	7.4	5.6	7.6	17.2	11.6	5.8	6.7	8.4	6.8	5.7	9.7	13.0	7.1	9.0	18.8	16.9
MAX	14.9	19.5	19.5	12.4	10.5	10.2	21.1	20.0	18.0	18.1	11.8	16.4	22.5	21.0	14.3	10.9	12.6	14.1	10.2	19.7	20.4	12.4	18.1	23.7	22.4
MIN	2.5	5.6	8.3	3.2	3.1	3.3	9.0	12.5	3.7	1.8	1.8	1.9	5.3	4.2	2.9	2.2	1.8	1.5	3.0	5.7	8.9	1.3	1.4	12.8	6.7

DAY	26	27	28	29	30	31
AVE	7.6	6.8	11.5	6.1	5.1	6.7
MAX	10.6	10.1	29.1	13.6	11.0	11.8
MIN	2.2	1.8	2.8	1.8	1.5	1.7

MONTHLY AVERAGE = 9.6 MONTHLY MAXIMUM = 29.1 MONTHLY MINIMUM = 1.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Wind Direction (Degrees true)
DECEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	102	124	126	110	130	120	118	118	118	142	137	122	174	256	298	283	290	302	305	309	115	124	108	121	123
2	135	111	90	75	82	82	99	137	142	155	85	71	45	70	55	64	32	22	25	37	40	50	74	67	143
3	64	68	77	82	79	102	103	65	64	35	68	69	72	52	26	52	61	27	38	46	34	57	72	62	273
4	70	111	139	144	162	169	142	146	138	141	116	79	46	76	68	36	35	42	53	32	51	105	96	120	121
5	105	103	114	111	109	114	105	109	117	120	129	149	151	146	203	277	236	271	286	331	111	94	88	101	285
6	109	124	102	106	101	112	106	105	123	129	119	139	154	130	80	302	275	301	277	66	100	125	101	117	118
7	120	119	113	122	128	124	106	100	122	61	59	63	50	41	53	71	69	65	60	77	64	60	58	64	254
8	65	67	96	90	68	75	67	65	73	75	69	63	54	68	72	73	68	45	47	58	55	55	57	66	65
9	74	70	86	94	75	90	108	137	142	84	64	68	67	57	53	47	58	34	33	19	105	87	91	327	247
10	311	306	282	81	93	142	119	103	343	315	303	285	287	288	292	302	290	261	193	102	120	118	102	247	29
11	313	164	120	147	104	136	128	128	138	141	163	145	251	290	298	305	292	311	300	324	91	103	81	111	24
12	96	103	90	107	103	93	106	108	102	121	119	91	261	290	280	279	296	278	282	305	287	288	322	8	268
13	47	41	36	28	39	40	31	44	68	61	89	72	68	37	37	40	40	51	64	54	48	68	55	65	55
14	74	71	72	67	71	67	73	90	123	149	160	101	133	278	287	291	281	286	295	81	73	116	107	98	13
15	94	74	74	83	101	100	115	111	121	133	136	143	110	280	246	200	254	297	303	346	307	222	124	136	183
16	128	137	125	121	117	110	113	108	122	132	143	132	162	99	86	57	77	346	117	90	74	66	132	130	121
17	124	136	130	129	122	130	143	146	154	158	155	99	85	78	75	66	63	56	44	40	6	74	103	85	64
18	80	75	56	76	82	85	87	97	4	110	102	313	283	304	286	280	284	293	306	288	212	108	88	120	114
19	112	99	114	109	105	112	110	91	111	121	98	133	149	143	186	267	272	303	305	354	77	91	114	124	356
20	99	112	108	108	111	117	108	113	110	115	133	148	70	69	56	64	66	42	39	45	45	67	136	153	268
21	134	119	114	107	113	134	143	144	142	155	155	64	53	66	63	56	52	47	44	46	54	96	94	118	240
22	108	113	104	108	115	117	119	117	115	129	117	151	7	312	273	280	289	293	180	313	148	110	99	93	46
23	100	79	81	91	88	92	97	96	128	86	256	282	330	66	69	49	39	46	57	34	40	96	59	76	338
24	52	56	72	100	116	66	69	72	86	79	69	54	55	62	68	66	44	47	62	46	46	63	59	66	31
25	62	64	60	66	69	67	64	70	71	58	52	62	47	43	40	42	46	43	46	45	28	31	68	78	264
26	124	127	128	120	129	125	119	114	120	144	143	161	156	101	258	275	291	292	293	275	112	116	88	92	140
27	106	93	88	86	91	93	90	99	94	97	102	126	163	140	292	293	284	346	65	62	76	118	108	115	196
28	114	117	121	94	103	104	78	337	41	318	86	185	198	251	283	286	285	282	275	281	268	278	312	291	19
29	302	300	296	325	142	127	121	93	104	147	186	257	283	300	335	299	315	290	292	291	155	110	93	98	44
30	88	192	139	306	302	145	130	79	290	307	95	60	75	97	238	262	275	294	337	287	306	104	129	126	88
31	112	126	113	114	124	117	113	101	122	116	103	135	168	114	46	67	357	327	37	333	61	49	42	107	126

TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10 meter Sigma Theta (Degrees)
DECEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	17	14	7	7	5	5	4	7	7	12	16	29	49	31	15	12	9	6	6	49	10	16	20	16	15
2	7	16	24	18	11	14	15	14	11	13	26	16	14	15	17	21	16	13	13	13	15	18	10	12	15
3	11	10	11	11	10	16	16	9	16	15	16	11	15	26	19	21	22	10	11	8	7	6	7	6	13
4	8	25	12	4	8	12	16	7	6	6	15	10	26	12	21	19	14	28	14	10	11	17	10	17	14
5	10	6	8	7	7	6	10	9	6	14	19	31	28	33	34	19	19	11	12	7	27	7	11	9	15
6	8	6	7	8	10	8	9	6	8	10	16	20	20	30	38	21	9	6	20	11	14	10	7	7	13
7	6	6	9	5	5	6	15	14	23	12	11	13	18	16	13	11	10	8	8	7	6	6	9	4	10
8	5	7	19	15	7	8	5	8	12	14	10	15	17	11	10	12	8	9	11	13	13	15	12	11	11
9	8	8	14	14	9	12	15	9	15	21	15	13	16	18	16	12	9	23	27	35	29	27	26	52	18
10	11	16	57	34	40	15	8	13	39	12	19	17	11	11	12	9	9	25	19	13	12	12	7	17	18
11	33	22	10	20	13	10	12	6	11	12	34	25	28	21	15	15	11	8	6	33	20	55	27	10	19
12	13	12	9	8	7	6	10	8	11	14	40	45	61	22	18	13	10	5	7	14	6	7	22	28	16
13	13	11	14	16	13	14	23	32	28	24	20	12	13	15	13	11	11	12	9	12	11	10	10	8	15
14	8	7	7	9	8	9	8	13	14	10	12	20	34	43	11	12	11	7	9	34	45	10	8	7	15
15	10	11	10	22	12	14	15	12	9	12	21	22	36	23	29	25	21	8	7	17	47	41	18	30	20
16	51	15	7	5	8	6	6	10	8	8	12	17	29	32	42	24	8	12	35	39	17	30	30	6	19
17	7	4	6	6	6	5	8	8	8	9	9	14	12	9	9	7	9	21	18	36	50	8	12	8	12
18	8	11	31	13	20	9	9	10	39	48	39	43	23	17	16	13	8	6	6	18	38	11	9	19	19
19	12	12	12	13	11	10	12	11	9	11	16	24	25	37	28	23	11	7	9	24	13	19	7	12	15
20	7	22	9	10	9	12	8	7	6	8	12	18	22	14	17	12	8	24	16	12	8	9	11	6	12
21	5	6	7	6	6	11	5	5	5	5	18	21	15	9	7	12	11	9	8	8	11	11	10	9	9
22	5	7	7	7	4	5	5	7	8	11	16	26	40	59	35	12	10	7	27	32	8	11	13	11	16
23	8	8	9	7	8	10	7	8	26	31	33	19	58	25	22	18	17	29	37	21	18	25	26	19	20
24	12	10	12	12	9	11	7	7	10	11	9	16	16	17	9	12	9	10	14	10	12	11	12	9	11
25	11	12	10	10	7	7	12	11	18	14	13	16	17	16	10	10	9	10	9	8	11	23	9	10	12
26	14	9	7	6	4	6	6	6	6	8	13	16	20	35	26	18	10	4	10	23	31	9	7	7	13
27	10	10	8	7	6	7	6	8	5	9	13	25	18	33	41	11	11	34	12	21	20	25	11	15	15
28	42	31	29	19	27	20	16	32	36	19	48	22	18	19	11	8	8	8	8	8	11	14	19	8	20
29	9	9	11	30	22	13	13	8	20	29	50	37	17	16	17	16	13	10	37	12	22	12	10	17	19
30	39	36	24	40	50	45	17	17	59	33	29	19	27	51	60	30	8	11	16	39	24	29	26	19	31
31	11	12	6	7	9	7	6	7	9	9	14	32	39	48	42	7	17	8	21	37	44	13	25	54	20
HRAVE	13	13	13	13	12	11	10	11	16	15	20	21	25	25	22	15	11	13	15	20	20	17	14	15	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	15	15	13	14	15	13	10	11	18	18	19	16	15	15	20	19	12	19	15	12	9	16	20	11	12
MAX	49	26	26	28	34	38	23	19	52	57	55	61	32	45	47	51	50	48	37	24	21	59	58	17	23
MIN	4	7	6	4	6	6	4	5	8	7	6	5	8	7	7	5	4	6	7	6	5	4	7	7	7

DAY	26	27	28	29	30	31
AVE	13	15	20	19	31	20
MAX	35	41	48	50	60	54
MIN	4	5	8	8	8	6

MONTHLY AVERAGE = 15.8 MONTHLY MAXIMUM = 61.1 MONTHLY MINIMUM = 3.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

2 meter Temperature (C)
DECEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	9.6	8.1	7.1	7.0	5.1	5.2	4.4	4.3	6.4	9.4	11.9	14.1	16.2	18.0	19.2	19.8	18.8	16.9	15.6	14.6	13.0	11.4	9.6	8.7	11.4
2	8.4	9.6	11.5	11.3	10.7	10.6	9.6	4.8	6.0	10.0	14.0	15.4	15.6	15.9	16.3	16.5	16.0	14.7	13.5	12.6	12.1	12.0	11.5	11.2	12.1
3	11.0	10.5	9.7	8.5	7.9	7.7	7.6	8.0	8.7	9.3	11.3	12.4	13.4	13.8	14.0	14.2	14.0	13.2	12.6	11.9	11.5	10.1	8.9	8.0	10.8
4	7.3	5.5	3.7	3.0	2.1	1.5	2.0	0.5	2.5	5.5	10.0	13.2	14.5	15.7	16.5	16.7	16.5	15.8	14.3	14.2	13.0	10.7	9.6	7.8	9.3
5	7.7	7.1	5.4	4.2	3.0	3.5	2.3	2.3	5.0	8.5	11.4	14.0	16.3	18.5	19.6	19.8	19.7	17.9	16.0	15.0	13.0	10.9	9.6	8.5	10.8
6	8.3	6.5	6.2	5.4	4.5	4.0	2.8	3.8	5.6	8.4	12.4	15.1	17.4	19.6	20.8	21.6	21.1	19.5	17.4	15.0	13.6	11.8	11.1	10.0	11.7
7	8.8	8.1	7.2	6.9	6.6	6.2	6.9	7.9	9.3	14.4	16.6	18.5	20.2	20.9	21.7	21.8	21.3	20.4	19.7	18.5	17.0	16.6	16.5	15.7	14.5
8	14.9	13.5	13.2	13.3	13.8	13.1	13.0	13.0	13.4	15.8	18.3	19.7	21.3	22.5	23.0	23.2	22.5	21.8	20.8	20.1	19.7	19.3	18.0	16.6	17.7
9	15.4	14.9	13.4	12.1	12.3	11.4	10.0	8.7	9.9	14.9	17.7	19.5	21.3	22.7	23.0	23.0	22.2	21.5	20.9	20.4	19.3	18.3	17.2	16.2	16.9
10	16.1	15.1	14.2	13.6	12.8	11.5	11.8	11.7	11.4	11.2	12.1	12.5	13.1	13.6	13.1	11.8	10.6	10.6	10.3	10.4	10.4	10.3	10.4	9.9	12.0
11	9.5	9.2	8.9	8.4	8.3	7.9	7.2	7.4	7.6	8.9	10.9	13.3	14.5	15.7	16.2	16.7	16.5	14.8	13.5	13.0	12.6	12.0	11.0	10.4	11.4
12	9.8	8.8	7.9	6.9	6.1	6.0	5.3	5.0	6.4	7.8	10.3	12.7	14.8	16.3	17.5	17.9	16.7	14.9	13.5	13.0	12.5	11.7	11.7	11.2	11.0
13	10.2	9.5	8.6	7.8	7.1	6.8	6.4	5.9	6.9	7.9	9.5	10.4	11.5	12.4	12.6	12.9	12.8	12.3	12.0	11.8	11.7	11.0	10.1	9.6	9.9
14	9.3	8.8	8.2	7.9	7.8	7.8	7.7	6.9	5.9	7.6	9.8	12.2	13.9	14.4	15.3	14.3	13.4	11.3	10.1	9.4	9.3	8.2	6.7	6.2	9.7
15	5.4	4.1	2.8	2.1	2.0	0.9	0.8	0.3	2.5	5.2	8.0	11.8	13.5	13.7	14.0	14.9	14.3	12.1	11.0	10.1	9.1	7.6	6.6	5.5	7.4
16	4.3	3.1	3.0	2.9	2.3	1.9	1.5	0.8	1.8	5.2	8.6	11.3	14.1	15.3	16.1	16.3	15.7	15.0	13.9	12.9	11.5	9.6	8.0	6.7	8.4
17	6.7	5.6	5.3	4.9	4.7	4.3	3.3	3.1	4.2	7.6	11.4	16.0	17.8	18.2	18.5	17.9	17.1	16.3	15.6	15.2	14.4	12.9	11.6	10.2	10.9
18	8.9	8.2	7.5	5.5	6.2	4.2	3.2	3.0	3.3	6.2	10.1	13.0	15.6	16.4	16.6	16.6	15.6	13.9	13.1	11.9	10.4	9.3	7.9	6.5	9.7
19	6.4	5.2	4.5	3.5	2.6	2.2	2.1	1.2	2.2	5.7	9.1	12.1	14.3	15.9	17.3	17.6	17.2	15.9	13.7	13.4	12.2	9.6	7.9	7.2	9.1
20	6.3	3.8	3.8	3.8	2.8	2.7	1.8	1.9	3.8	7.0	10.7	14.5	16.8	18.1	18.9	19.3	18.4	17.5	16.5	16.3	15.7	14.8	11.1	8.9	10.6
21	8.7	8.6	7.4	7.4	5.9	4.9	4.9	4.9	6.3	8.7	12.3	17.6	19.0	19.4	20.0	20.3	20.2	19.5	19.1	18.7	17.2	14.3	13.0	10.9	12.9
22	9.9	8.9	7.6	7.8	6.5	5.8	4.9	4.7	4.5	6.6	11.5	13.4	14.9	17.0	18.8	20.1	19.9	18.3	16.8	15.9	13.4	11.9	10.8	9.5	11.6
23	8.3	6.8	5.5	5.1	3.8	3.1	2.8	2.3	3.7	5.0	8.5	11.4	15.5	16.9	16.4	15.9	14.9	13.4	11.8	10.7	10.1	9.2	9.6	9.0	9.1
24	8.8	8.0	7.5	7.0	5.7	6.3	6.1	6.2	6.8	7.8	8.4	8.6	9.0	10.0	11.0	11.2	11.1	10.8	10.3	10.3	10.2	9.7	9.3	9.2	8.7
25	9.1	8.7	8.4	8.0	7.7	7.9	8.0	7.9	7.1	8.4	9.9	11.7	13.4	14.4	15.0	15.4	15.2	14.7	14.0	13.7	13.6	11.5	10.7	9.8	11.0
26	8.2	7.3	6.2	5.9	5.1	4.6	4.2	3.8	5.4	7.9	11.0	14.1	15.8	17.1	18.7	19.7	19.6	18.0	16.2	14.8	13.1	11.3	9.7	9.1	11.1
27	8.8	6.4	5.9	5.2	4.8	4.6	4.4	4.6	5.0	8.3	11.0	14.6	16.7	17.5	18.5	18.9	18.5	18.1	16.8	16.5	15.8	15.0	14.5	13.7	11.8
28	13.6	12.9	12.8	13.9	13.7	13.7	13.9	12.8	13.5	14.9	17.7	21.5	22.3	21.7	20.4	19.4	17.1	15.4	14.3	13.5	13.1	11.9	11.8	11.3	15.3
29	10.8	10.3	9.7	8.8	7.8	7.5	6.8	6.5	7.3	8.6	10.4	11.9	12.2	12.3	10.8	10.5	10.3	10.2	9.6	8.7	7.7	6.7	5.9	5.0	9.0
30	4.7	3.6	3.2	2.5	4.1	2.8	5.0	6.3	4.4	6.6	10.1	11.4	12.5	13.8	14.5	14.8	14.4	13.2	12.8	11.6	10.8	8.9	6.7	6.5	8.5
31	5.0	3.5	3.9	3.6	3.2	2.6	1.8	1.4	2.6	4.8	7.4	9.8	10.3	11.5	12.9	12.9	12.6	12.1	11.8	11.0	10.6	10.6	10.3	9.5	7.7
HRAVE	9.0	8.1	7.4	6.9	6.4	5.9	5.6	5.2	6.1	8.5	11.4	13.8	15.4	16.4	17.0	17.2	16.6	15.5	14.4	13.7	12.8	11.6	10.6	9.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	11.4	12.1	10.8	9.3	10.8	11.7	14.5	17.7	16.9	12.0	11.4	11.0	9.9	9.7	7.4	8.4	10.9	9.7	9.1	10.6	12.9	11.6	9.1	8.7	11.0
MAX	19.8	16.5	14.2	16.7	19.8	21.6	21.8	23.2	23.0	16.1	16.7	17.9	12.9	15.3	14.9	16.3	18.5	16.6	17.6	19.3	20.3	20.1	16.9	11.2	15.4
MIN	4.3	4.8	7.6	0.5	2.3	2.8	6.2	13.0	8.7	9.9	7.2	5.0	5.9	5.9	0.3	0.8	3.1	3.0	1.2	1.8	4.9	4.5	2.3	5.7	7.1

DAY	26	27	28	29	30	31
AVE	11.1	11.8	15.3	9.0	8.5	7.7
MAX	19.7	18.9	22.3	12.3	14.8	12.9
MIN	3.8	4.4	11.3	5.0	2.5	1.4

MONTHLY AVERAGE = 11.0 MONTHLY MAXIMUM = 23.2 MONTHLY MINIMUM = 0.3
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

10m minus 2m Delta Temperature (C)
DECEMBER - 2020

	HOUR																								DAILY
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE
1	0.5	1.0	0.5	0.5	1.5	0.5	1.2	0.0	-1.0	-1.5	-1.4	-1.2	-0.6	-0.7	-0.6	-0.6	-0.1	0.4	0.6	0.6	0.6	0.7	0.7	0.7	0.1
2	0.9	2.0	0.8	0.6	0.6	0.4	0.7	2.1	-0.7	-1.3	-0.8	-0.9	-0.5	-0.5	-0.2	-0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2
3	0.1	0.2	0.2	0.3	0.4	0.3	0.4	0.1	-0.3	-0.4	-0.8	-0.7	-0.8	-0.5	-0.2	-0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.6	0.4	0.0
4	0.6	0.6	1.5	0.6	1.0	1.5	1.2	0.7	-0.3	-1.0	-0.9	-1.1	-0.7	-0.7	-0.3	0.0	0.2	0.4	0.8	0.5	0.4	0.6	0.9	1.2	0.3
5	0.9	1.0	0.8	0.8	1.0	0.5	0.9	0.6	-1.0	-1.4	-1.1	-0.9	-1.0	-0.8	-0.6	-0.6	-0.1	0.4	0.6	0.8	0.8	0.8	0.8	0.9	0.2
6	0.6	0.7	0.8	0.8	1.1	0.7	0.8	0.3	-0.6	-1.3	-1.5	-1.2	-1.0	-0.7	-0.4	-0.5	-0.1	0.6	0.6	0.8	0.9	1.1	0.9	0.9	0.2
7	1.2	1.1	1.2	1.0	0.9	0.7	0.9	1.5	0.7	-0.2	-0.4	-0.5	-0.4	-0.2	0.0	0.1	0.3	0.3	0.4	0.7	0.6	0.6	0.5	0.7	0.5
8	0.7	0.7	0.5	0.6	0.5	0.5	0.3	0.3	-0.1	-0.4	-0.5	-0.6	-0.4	-0.3	-0.1	-0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.6	0.2
9	0.5	0.4	0.5	0.4	0.4	0.5	0.7	0.7	0.1	-0.5	-0.6	-0.7	-0.7	-0.4	-0.2	0.0	0.3	0.5	0.4	0.5	0.5	0.4	0.4	0.6	0.2
10	0.1	0.0	0.1	0.2	0.4	0.2	0.2	0.2	0.1	0.0	-0.1	-0.3	-0.3	-0.3	-0.2	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.4	0.1
11	0.2	0.2	0.3	0.3	0.2	0.5	0.6	0.4	-0.2	-0.6	-0.6	-0.9	-0.7	-0.6	-0.5	-0.5	-0.1	0.3	0.4	0.3	0.4	0.3	0.6	0.5	0.0
12	0.5	0.8	0.7	0.5	0.7	0.5	0.5	0.3	-0.5	-0.7	-0.6	-0.6	-0.6	-0.6	-0.5	-0.3	0.0	0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.1
13	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	-0.3	-0.4	-0.9	-0.7	-0.6	-0.4	-0.2	-0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.0
14	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.7	-0.6	-1.1	-1.2	-0.9	-0.4	-0.6	-0.5	-0.2	0.2	0.4	0.5	0.5	0.7	0.7	0.6	0.1
15	0.5	0.5	0.4	0.4	0.6	0.7	0.5	0.3	-0.7	-1.1	-0.8	-1.1	-1.1	-0.8	-0.6	-0.6	-0.2	0.3	0.4	0.4	0.8	0.6	0.6	0.8	0.0
16	0.8	0.6	0.6	0.8	0.4	0.4	0.8	0.6	-0.4	-1.1	-1.4	-1.1	-0.9	-0.8	-0.5	-0.1	0.4	0.6	0.4	0.5	0.7	0.8	0.9	0.7	0.2
17	1.1	1.0	1.1	0.8	0.6	0.5	1.0	0.9	-0.1	-0.8	-1.2	-1.2	-1.2	-0.7	-0.5	0.0	0.2	0.4	0.5	0.4	0.3	0.6	0.6	0.7	0.2
18	0.8	1.0	1.1	0.7	0.9	0.9	0.5	0.3	0.3	-0.4	-0.6	-0.6	-0.6	-0.5	-0.5	-0.5	-0.1	0.4	0.5	0.7	0.7	0.7	0.5	0.6	0.3
19	0.8	0.7	0.8	0.6	0.8	0.8	1.0	0.6	-0.4	-1.4	-1.3	-1.1	-1.0	-0.7	-0.6	-0.5	-0.1	0.6	0.6	0.5	0.7	0.6	0.8	0.6	0.2
20	0.7	0.6	0.6	0.8	0.7	0.7	0.7	0.4	-0.7	-1.5	-1.3	-1.3	-0.6	-0.4	-0.1	0.1	0.4	0.4	0.5	0.4	0.3	0.5	1.1	1.2	0.2
21	0.7	0.9	0.5	0.7	2.1	2.3	1.0	1.0	-0.5	-0.9	-1.1	-0.5	-0.4	-0.3	0.0	0.1	0.3	0.3	0.3	0.3	0.4	0.4	0.5	1.2	0.4
22	1.3	1.4	1.4	1.0	1.1	0.8	1.1	0.8	0.4	-0.8	-1.4	-0.7	-0.5	-0.5	-0.5	-0.5	0.0	0.6	0.6	0.7	0.6	0.8	0.9	0.7	0.4
23	1.0	0.6	0.6	0.8	0.7	0.8	0.9	0.8	-0.1	-0.3	-0.5	-0.6	-0.6	-0.6	-0.2	0.0	0.1	0.2	0.2	0.2	0.2	0.5	0.3	0.3	0.2
24	0.2	0.2	0.3	0.4	0.5	0.2	0.2	0.2	0.0	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1
25	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.0	-0.2	-0.4	-0.4	-0.3	-0.1	-0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.5	0.5	0.1
26	0.7	0.8	0.5	0.5	0.8	0.3	0.4	0.4	-0.7	-1.3	-1.2	-1.1	-1.1	-0.7	-0.5	-0.5	-0.1	0.6	0.8	0.5	0.6	0.8	0.8	0.9	0.1
27	0.7	0.6	0.8	0.6	0.9	0.9	0.8	0.5	0.0	-1.1	-1.1	-1.0	-0.9	-0.5	-0.3	-0.4	-0.1	0.2	0.5	0.5	0.4	0.3	0.7	0.6	0.1
28	0.6	0.6	0.3	0.3	0.4	0.5	0.3	0.3	0.2	-0.3	-0.6	-0.6	-0.7	-0.7	-0.5	-0.4	-0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0
29	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.5	-0.2	-0.5	-0.3	-0.6	-0.6	-0.6	0.0	-0.1	0.1	0.3	0.3	0.6	0.3	0.6	0.7	0.6	0.1
30	0.4	0.6	0.9	1.0	1.2	1.5	1.4	0.7	0.6	-0.3	-0.7	-0.7	-0.9	-0.7	-0.5	-0.5	-0.2	0.4	0.7	0.6	0.5	0.7	0.9	0.7	0.3
31	1.1	0.6	0.5	0.4	0.3	0.3	0.4	0.6	-0.7	-1.0	-1.1	-0.9	-0.5	-0.4	-0.5	-0.1	0.1	0.4	0.3	0.3	0.2	0.3	0.5	0.3	0.1
HRAVE	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.5	-0.2	-0.8	-0.9	-0.8	-0.7	-0.5	-0.3	-0.2	0.1	0.3	0.4	0.4	0.4	0.5	0.6	0.6	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	0.1	0.2	0.0	0.3	0.2	0.2	0.5	0.2	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.2	0.3	0.2	0.2	0.4	0.4	0.2	0.1	0.1
MAX	1.5	2.1	0.6	1.5	1.0	1.1	1.5	0.7	0.7	0.4	0.6	0.8	0.3	0.7	0.8	0.9	1.1	1.1	1.0	1.2	2.3	1.4	1.0	0.5	0.5
MIN	-1.5	-1.3	-0.8	-1.1	-1.4	-1.5	-0.5	-0.6	-0.7	-0.3	-0.9	-0.7	-0.9	-1.2	-1.1	-1.4	-1.2	-0.6	-1.4	-1.5	-1.1	-1.4	-0.6	-0.3	-0.4

DAY	26	27	28	29	30	31
AVE	0.1	0.1	0.0	0.1	0.3	0.1
MAX	0.9	0.9	0.6	0.7	1.5	1.1
MIN	-1.3	-1.1	-0.7	-0.6	-0.9	-1.1

MONTHLY AVERAGE = 0.2 MONTHLY MAXIMUM = 2.3 MONTHLY MINIMUM = -1.5
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Atmospheric Pressure (mmHg)
DECEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	705	705	705	705	705	705	705	705	706	706	705	704	704	703	702	702	702	702	703	703	703	704	704	704	704
2	704	704	704	704	704	704	705	705	706	706	705	705	704	704	703	703	704	704	704	704	705	705	706	706	704
3	706	706	706	707	707	707	708	708	709	709	709	708	707	707	706	706	707	707	707	707	708	708	708	708	707
4	708	707	707	707	707	707	707	708	708	708	708	707	706	706	705	705	705	705	705	706	706	707	707	707	707
5	707	708	708	708	708	708	709	709	710	710	710	710	709	708	707	707	707	707	707	708	708	708	708	708	708
6	708	708	708	708	708	708	708	709	709	709	709	708	707	706	706	705	705	705	705	706	706	706	706	706	707
7	706	706	706	706	706	706	706	706	707	707	707	706	705	704	704	704	704	704	705	705	706	706	706	707	705
8	707	707	707	707	707	708	708	708	709	709	709	708	707	706	706	705	706	706	706	706	706	707	707	707	707
9	707	707	707	707	707	706	707	707	707	707	707	706	705	703	702	702	701	701	702	702	702	701	702	702	704
10	702	701	701	701	701	701	700	701	701	702	702	702	701	701	701	701	702	702	702	703	703	703	703	703	702
11	703	703	703	703	703	703	704	704	704	705	705	704	704	703	703	703	703	703	703	704	704	704	704	703	704
12	703	703	703	703	702	702	702	702	702	702	702	701	700	699	699	699	699	699	700	701	701	702	703	703	701
13	704	704	705	706	706	707	708	709	709	709	710	709	708	708	707	707	707	707	706	707	707	707	706	706	707
14	705	705	704	704	703	703	703	703	703	703	703	701	700	699	699	700	700	700	701	701	702	702	702	702	702
15	702	702	702	703	703	703	704	705	706	706	706	706	705	704	704	704	704	705	705	706	706	706	707	707	705
16	706	706	706	706	706	706	706	707	707	707	707	706	705	704	704	704	704	704	704	704	704	705	705	705	705
17	705	704	704	704	704	703	703	703	704	704	704	703	702	701	700	700	700	700	699	700	700	700	700	701	702
18	701	701	701	701	701	702	702	703	704	704	704	704	704	703	703	704	704	705	705	706	707	707	708	708	704
19	708	708	708	708	708	708	709	709	710	710	710	709	708	708	707	707	707	707	707	708	708	708	708	708	708
20	708	708	708	708	708	708	708	708	709	709	709	708	707	706	705	704	704	704	704	705	705	705	705	705	706
21	705	705	705	705	704	704	704	705	705	705	705	704	703	702	702	702	702	702	702	702	703	703	704	704	703
22	704	704	704	704	704	704	704	704	704	705	705	704	703	702	702	702	702	702	702	702	702	703	703	703	703
23	703	704	704	704	704	704	704	705	705	706	706	706	706	705	706	706	707	708	709	709	710	710	710	710	706
24	711	711	711	711	711	711	712	712	712	712	712	711	710	709	708	708	708	708	708	708	708	708	708	708	710
25	708	707	707	707	707	707	707	708	707	707	707	707	706	705	705	705	704	705	705	705	706	706	706	706	706
26	706	706	706	706	706	705	706	706	707	707	707	706	705	704	703	703	703	703	703	703	704	704	703	703	705
27	703	703	703	703	703	703	703	703	704	704	704	703	702	701	700	700	700	700	700	700	700	700	701	701	702
28	701	700	700	699	699	698	698	699	699	699	699	699	698	697	696	696	697	698	699	699	700	700	700	700	699
29	700	701	701	701	700	701	701	701	702	703	703	702	702	701	701	702	702	702	702	703	703	703	703	703	702
30	703	703	703	703	703	703	704	704	705	705	705	705	704	703	703	703	703	703	703	703	704	704	704	704	704
31	704	704	704	704	703	702	702	702	703	703	703	702	700	699	699	698	698	699	699	699	698	698	698	699	701
HRAVE	705	705	705	705	705	705	705	705	706	706	706	705	704	704	703	703	703	703	704	704	704	704	705	705	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	704	704	707	707	708	707	705	707	704	702	704	701	707	702	705	705	702	704	708	706	703	703	706	710	706
MAX	706	706	709	708	710	709	707	709	707	703	705	703	710	705	707	707	705	708	710	709	705	705	710	712	708
MIN	702	703	706	705	707	705	704	705	701	700	703	699	704	699	702	704	699	701	707	704	702	702	703	708	704

DAY	26	27	28	29	30	31
AVE	705	702	699	702	704	701
MAX	707	704	701	703	705	704
MIN	703	700	696	700	703	698

MONTHLY AVERAGE = 704.5 MONTHLY MAXIMUM = 712.2 MONTHLY MINIMUM = 696.2
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Relative Humidity (%)
DECEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	29	32	33	35	37	38	41	40	34	28	24	21	19	17	16	16	16	19	21	22	25	27	29	31	27
2	30	23	17	16	17	17	19	27	26	20	14	13	12	11	10	10	11	12	13	15	16	17	24	26	17
3	28	29	31	33	34	33	31	29	27	25	21	19	17	17	16	16	16	18	18	19	19	21	23	24	23
4	25	27	29	30	32	33	33	35	30	25	18	15	13	12	11	11	11	11	13	13	15	17	19	19	21
5	20	22	23	24	27	26	28	28	22	17	14	13	12	12	12	14	15	17	19	18	22	24	25	27	20
6	27	29	30	32	33	34	36	35	30	25	19	16	15	12	10	10	11	13	14	17	18	19	20	22	22
7	23	24	25	25	25	25	25	24	21	17	15	13	12	11	11	10	11	11	12	12	13	14	14	15	17
8	15	17	17	18	18	19	19	19	18	16	14	13	12	11	10	10	11	11	12	13	13	13	15	16	15
9	17	17	19	21	21	22	24	27	25	18	15	14	13	13	13	13	14	16	16	16	17	18	19	20	18
10	39	51	57	67	79	89	88	90	94	96	87	85	81	73	75	82	92	93	95	96	94	95	95	95	83
11	98	98	99	99	100	100	100	100	99	91	79	68	66	58	52	47	43	55	61	62	66	67	73	75	77
12	77	82	86	89	92	91	93	94	85	74	57	47	41	35	30	27	32	38	43	45	47	52	53	51	61
13	36	25	22	23	23	22	22	25	23	20	19	18	16	16	16	16	17	17	17	17	18	20	21	23	20
14	24	25	27	28	28	29	29	32	34	32	26	21	18	19	17	19	20	21	24	27	28	31	36	38	26
15	41	46	51	54	58	62	65	66	57	47	36	27	22	22	22	20	22	27	30	33	36	40	43	46	40
16	48	51	50	50	51	52	54	57	52	40	29	24	20	16	14	13	15	17	19	21	25	27	29	33	34
17	35	37	38	39	40	40	43	44	41	33	25	18	16	16	16	18	19	20	22	22	24	27	31	35	29
18	38	40	41	47	44	50	53	52	48	37	26	22	21	21	22	23	26	29	30	31	36	40	44	47	36
19	48	52	56	59	62	63	63	66	59	44	34	29	25	21	18	17	18	20	25	27	29	33	36	36	39
20	39	46	47	47	49	47	53	50	43	33	26	20	17	15	14	14	15	16	16	16	18	19	24	28	30
21	28	28	29	29	33	34	33	32	29	25	20	15	14	14	13	12	11	12	12	13	14	18	20	23	21
22	24	26	29	29	30	31	34	34	35	29	20	19	17	15	13	13	13	15	17	19	21	24	26	28	23
23	31	34	38	39	42	45	46	47	40	36	27	24	19	15	13	12	12	11	11	12	11	12	10	11	25
24	11	12	13	13	14	14	14	14	14	13	12	12	13	11	11	11	11	11	12	12	12	13	13	13	12
25	13	13	14	14	14	14	14	19	27	20	17	15	15	15	14	14	14	15	14	14	15	17	17	18	16
26	25	29	38	41	41	45	45	44	41	36	26	22	20	17	18	16	16	18	20	22	25	28	31	33	29
27	35	37	39	41	42	43	43	45	40	33	30	24	24	23	22	24	25	25	25	25	26	28	30	32	32
28	32	33	34	33	34	34	33	36	34	31	26	21	20	19	20	24	31	37	39	39	39	42	44	47	33
29	48	51	55	69	81	82	86	88	84	70	55	44	41	40	56	52	51	51	55	57	62	69	72	75	62
30	77	79	81	83	77	77	60	48	56	47	34	28	25	22	21	20	22	24	24	25	26	31	35	36	44
31	39	43	43	43	44	46	48	50	45	37	30	26	24	22	21	21	22	23	23	25	26	26	26	29	33
HRAVE	36	37	39	41	43	44	44	45	42	36	29	25	23	21	20	20	21	23	25	26	28	30	32	34	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
AVE	27	17	23	21	20	22	17	15	18	83	77	61	20	26	40	34	29	36	39	30	21	23	25	12	16
MAX	41	30	34	35	28	36	25	19	27	96	100	94	36	38	66	57	44	53	66	53	34	35	47	14	27
MIN	16	10	16	11	12	10	10	10	13	39	43	27	16	17	20	13	16	21	17	14	11	13	10	11	13

DAY	26	27	28	29	30	31
AVE	29	32	33	62	44	33
MAX	45	45	47	88	83	50
MIN	16	22	19	40	20	21

MONTHLY AVERAGE = 31.8 MONTHLY MAXIMUM = 100.0 MONTHLY MINIMUM = 9.7
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Solar Radiation (kw/m2)
DECEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.40	0.54	0.62	0.64	0.59	0.48	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.96
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.41	0.55	0.63	0.65	0.60	0.49	0.33	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.05
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.40	0.54	0.62	0.64	0.59	0.48	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.97
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.39	0.54	0.62	0.64	0.59	0.48	0.32	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.97
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.39	0.53	0.61	0.63	0.58	0.47	0.31	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.89
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.22	0.39	0.53	0.62	0.64	0.59	0.48	0.32	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.95
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.39	0.53	0.62	0.64	0.59	0.49	0.26	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.39	0.52	0.61	0.64	0.52	0.40	0.21	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.64
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.37	0.52	0.60	0.62	0.57	0.47	0.31	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.80
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.06	0.14	0.18	0.17	0.23	0.14	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.31	0.46	0.58	0.55	0.43	0.42	0.33	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.29	0.51	0.57	0.60	0.56	0.45	0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.59
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.21	0.39	0.52	0.61	0.64	0.60	0.31	0.30	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.72
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.29	0.30	0.52	0.44	0.24	0.52	0.31	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.86
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.37	0.52	0.60	0.63	0.58	0.47	0.32	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.84
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.36	0.51	0.60	0.62	0.57	0.47	0.32	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.80
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	0.35	0.50	0.55	0.57	0.41	0.35	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.13
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.36	0.50	0.59	0.62	0.57	0.46	0.31	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.75
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.36	0.51	0.60	0.62	0.58	0.48	0.32	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.36	0.51	0.60	0.63	0.58	0.48	0.33	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.82
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.50	0.60	0.63	0.59	0.49	0.34	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.85
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.34	0.48	0.37	0.57	0.58	0.47	0.33	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.37
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.35	0.51	0.59	0.62	0.58	0.45	0.32	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.71
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.20	0.25	0.30	0.33	0.29	0.22	0.15	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.91
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.13	0.23	0.48	0.59	0.57	0.47	0.33	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.99
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.35	0.49	0.59	0.62	0.58	0.48	0.33	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.78
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.29	0.42	0.59	0.48	0.36	0.23	0.26	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.92
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.28	0.40	0.37	0.45	0.58	0.47	0.32	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.04
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.35	0.47	0.50	0.42	0.33	0.18	0.12	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.66
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.35	0.50	0.60	0.63	0.59	0.49	0.34	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.86
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.26	0.40	0.37	0.24	0.42	0.38	0.17	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.17	0.33	0.47	0.55	0.56	0.52	0.42	0.28	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY AVE, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	3.96	4.05	3.97	3.97	3.89	3.95	3.85	3.64	3.80	1.02	3.38	3.59	3.72	2.86	3.84	3.80	3.13	3.75	3.81	3.82	3.85	3.37	3.71	1.91	2.99
MAX	0.64	0.65	0.64	0.64	0.63	0.64	0.64	0.64	0.62	0.23	0.58	0.60	0.64	0.52	0.63	0.62	0.57	0.62	0.62	0.63	0.63	0.58	0.62	0.33	0.59
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	3.78	2.92	3.04	2.66	3.86	2.50
MAX	0.62	0.59	0.58	0.50	0.63	0.42
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY AVERAGE = 0.1 MONTHLY MAXIMUM = 0.6 MONTHLY MINIMUM = 0.0
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ASARCO Ambient Monitoring Program
ST-10 Meteorological Monitoring Site

Precipitation (Inches)
DECEMBER - 2020

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY TOTAL
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.03	0.11	0.13	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.34
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HRAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DAILY TOT, MAXIMUMS AND MINIMUMS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DAY	26	27	28	29	30	31
TOT	0.00	0.00	0.00	0.05	0.00	0.00
MAX	0.00	0.00	0.00	0.04	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY TOTAL = 0.40 MONTHLY MAXIMUM = 0.13 MONTHLY MINIMUM = 0.00
TOTAL POSSIBLE NUMBER OF OBSERVATIONS = 744 VALID DATA RECOVERY RATE = 100.0% OPERATIONAL RECOVERY RATE = 100.0%
*** IS INVALID OR MISSING CAL IS CALIBRATION CODE

ADEQ
Arizona Department
of Environmental Quality

Appendix D
White Paper: Documentation of GEP Stack Height at Asarco Smelter in Hayden AZ

Air Quality Division
October 3, 2023 Final Version

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WHITE PAPER

DOCUMENTION OF GEP STACK HEIGHT AT ASARCO SMELTER IN HAYDEN, ARIZONA

by
Ron Petersen, PhD, CCM, FASHRAE
CPP, Inc.
2400 Midpoint Drive, Fort Collins, CO, 80525
August 25, 2015

Abstract

In 1983, EPA approved a good engineering practice ("GEP") stack height demonstration for the 1000 foot (305 m) stack at the ASARCO LLC smelter located in Hayden, Arizona based upon a wind tunnel study conducted by Petersen and Cermak (1979). In 1985, EPA revised the GEP stack height regulations that included new definitions for "nearby" terrain and "excessive concentrations." This white paper examines the changes in the 1985 regulations, evaluates the 1979 wind tunnel study results in light of the change in regulations and guidance, and concludes, based on information in the 1979 wind tunnel study and available through current dispersion modeling, that the 1983 GEP stack height determination is consistent with the 1985 regulations and that the 1000 foot (305 m) stack remains an appropriate GEP determination.

Background

Petersen and Cermak (1979) conducted a wind tunnel modeling study to determine whether the 1000 foot (305 m) stack at the ASARCO Hayden smelter is above or below the "good engineering practice" (GEP) stack height established by Congress in Section 123 of the Clean Air Act. The study found that the 1000 foot (305 m) stack is below the GEP stack height and hence, can be used an input for compliance modeling purposes. At the time of the study, the procedures for conducting these wind tunnel modeling studies were in draft form and the 1979 wind tunnel study closely followed the EPA (1979) Draft Guideline.

Based on the results of the 1979 wind tunnel study, EPA proposed that the ASARCO 1000 foot stack be approved as GEP on November 30, 1981 (46 FR 58098-01) after the Arizona Department of Environmental Quality's review and approval in September 1979. EPA then approved the 1000 foot stack as meeting the GEP stack height requirement on January 14, 1983 (48 FR 1717-01). This GEP stack height has been used for all subsequent modeling and compliance purposes through the present date.

CPP, Incorporated
2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA
info@cppwind.com
www.cppwind.com
Tel: +1 970 221 3371
Fax: +1 970 221 3124

This white paper examines the 1979 wind tunnel study that addressed the 1000 foot stack in the context of changes to the GEP regulations in 1985, and demonstrates that the conclusion of that study remains valid today.

Definition of GEP Stack Height According the 1985 Final Rule

In the final (1985) stack height regulation (40 CFR 51.100 (ii)), GEP stack height is defined to be the *greater* of:

"(1) 65 meters, measured from the ground level elevation at the base of the stack;

(2) (i) for stacks in existence on January 12, 1979, and for which the owner or operator had obtained all applicable permits or approvals required under 40 CFR Parts 51 and 52,

$$H_g = 2.5H \quad (1)$$

provided that the owner or operator produces evidence that this equation was actually relied on in establishing an emission limitation:

(ii) for all other stacks,

$$H_g = H + 1.5L \quad (2)$$

where;

H_g = good engineering practice stack height, measured from the ground-level elevation at the base of the stack,

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack,

L = lesser dimension, height or projected width, of nearby structure(s),

provided that the EPA, State, or local control agency may require the use of a field study or fluid model to verify GEP stack height for the source; or

(3) The height demonstrated by a fluid model or a field study approved by the EPA, State, or local control agency, which ensures that the emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures or nearby terrain features."

The ASARCO Hayden smelter is located in the potential downwash zone of a ridge located to the north and east of the smelter. Based on (3), physical modeling is required to determine the GEP stack height for complex terrain situations, such as for the ASARCO Hayden smelter. The demonstration needs to show that excessive concentrations result due to upwind terrain wakes and eddies based on the definition of nearby terrain and excessive concentration.

For the final rule (FR, Vol. 50, No. 130, July 8, 1985), excessive concentration was defined as follows:

CPP, Incorporated
2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA
info@cppwind.com
www.cppwind.com
Tel: +1 970 221 3371
Fax: +1 970 221 3124

> "A maximum concentration due to emissions from a stack due in whole or part to downwash, wakes or eddy effects produced by nearby structures or nearby terrain features which individually is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effect and which contributes to a total concentration due to emissions from all sources that is greater than an ambient air quality standard."

For conducting demonstrations under 51.1 (ii) (3) "nearby" means:

> "not greater than 0.8 km (1/2 mile), except that the portion of a terrain feature may be considered to be nearby which falls within a distance of up to 10 times the maximum height (H_t) of the feature, not to exceed 2 miles if such feature achieves a height (H_t) 0.8 km from the stack that is a least 40 percent of the GEP stack height determined by the formula…."

Based on the definition of excessive concentration, the maximum ground-level concentration from wind-tunnel testing with the terrain present is first compared to NAAQS. For this comparison, the background concentration and impact due to other sources must be added to the impact due to the stack being evaluated. If the total concentration is below NAAQS, a shorter stack must be considered. Once a stack height is found such that a lower stack would result in an exceedance of NAAQS, it is considered GEP if the concentration without nearby terrain present is at least 40 percent less than that with the terrain present (referred to as the 40 percent test). Key in the 40 percent excess concentration demonstration is the method used to model the "terrain-out" test configuration.

The following sections will show that the Petersen and Cermak (1979) study, while conducted following a combination of the 1979 EPA Draft Guideline and 1982 GEP stack height rule (FR, Vol 47, No. 26, 1982), provide results that meet the requirements for demonstrating that the 1000 foot stack is GEP according the final rule (EPA, 1985). The main areas to consider are the definition of an excessive concentration and the definition of "nearby" terrain.

Impact of EPA Guideline Changes Regarding the Definition of an Excessive Concentration

Petersen and Cermak (1979) conducted a wind tunnel modeling study that demonstrated that the 1000 foot stack met the excessive concentration requirements due to adverse upwind terrain wake effects as outlined in the EPA Guideline (1979). The excessive concentration requirement in the 1979 EPA Guideline was:

> "Concentrations in the wake of the structure or terrain obstacle are considered excessive if the ground-level concentrations exceed an ambient air quality standard or PSD increment and are at least 40 percent greater than the maximum in the absence of their influences."

This excessive concentration definition is the same as the final 1985 rule definition and both criteria were demonstrated by Petersen and Cermak (1979). Based on that demonstration, EPA approved the 1000 foot stack as GEP and that height was used for all subsequent compliance modeling

CPP, Incorporated
2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA
info@cppwind.com
www.cppwind.com
Tel: +1 970 221 3371
Fax: +1 970 221 3124

studies. That alone should be sufficient justification for allowing the 1000 foot stack to be classified as GEP for future modeling applications.

The EPA 1979 Draft Guideline was finalized in 1981 followed by the first stack height rule that was published in 1982. The 1981 EPA guideline and 1982 rule relaxed the definition of excessive concentration so that only a 40 percent concentration increase due to upwind terrain wake and eddy effects needed to be demonstrated. This change had no effect on the results of the Petersen and Cermak (1979) study.

The conclusion is that the changes to the definition of excessive concentration have no impact on the Petersen and Cermak (1979) study and their determination that the 1000 foot stack is GEP.

Impact of EPA Guideline and Rule Changes Regarding the Definition of Nearby Terrain

The methodology for determining the GEP stack height is to first conduct testing with all relevant upwind and downwind terrain present in the model. The results from this testing are then first used to determine whether a NAAQS exceedance can be demonstrated.

According to EPA (1985), nearby terrain can be considered for determining the GEP stack height with certain constraints. First, for terrain to be considered nearby, the terrain within 0.8 km (0.5 miles) of the stack must rise to at least 40 percent of the formula GEP stack height for the wind directions being evaluated. The formula GEP stack height for the ASARCO Smelter is 65 m which means the terrain must rise by at least 26 m within 0.8 km of the stack. Figure 1 shows that the height of the terrain, H_t, at 0.8 km is 137 m which is well above the 26 m threshold. Hence, the elevation of the nearby terrain is sufficiently high to qualify for a wind tunnel demonstration study and this part of the 1985 “nearby” definition has no impact on the 1979 wind tunnel study results.

The next step for determining the GEP stack height is to conduct testing without the upwind terrain. The maximum concentration from this testing is then compared to the maximum concentration from testing with all terrain present and if the maximum concentration with terrain present is a least 40% greater than that without the upwind terrain present, the stack is creditable as GEP. For this comparison, Petersen and Cermak (1979) removed all of the upwind terrain as illustrated in Figure 2 which was consistent with EPA 1979 and 1981 Guidance and the 1982 rule.

According to the final rule (1985) and EPA Guidance (1985), the amount of terrain that can be considered nearby for fluid modeling purposes extends out to 10 times the maximum height (H_T) of the terrain feature (10 H_T), not to exceed 3.2 km. For this case, the maximum terrain height is 242 m, which means that the maximum distance that can be considered nearby is 2.4 km (242 m * 10). Beyond that distance, the terrain is not nearby and cannot be removed for wind tunnel modeling purposes.

Figure 3 shows the upwind terrain that should be modeled for the “terrain-out” configuration according EPA (1985) guidance. The figure shows that only the nearby terrain is removed while the terrain that is not nearby remains in the model. This configuration is different than the one used by

CPP, Incorporated
2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA
info@cppwind.com
www.cppwind.com
Tel: +1 970 221 3371
Fax: +1 970 221 3124

Petersen and Cermak (1979) where all upwind terrain was removed (Figure 2). If the study had been conducted using EPA (1985) guidance, the concentrations with upwind terrain removed could increase by some factor due to the terrain that remains in the model.

Petersen and Cermak (1979) found that at the 1000 foot stack height the ratio of maximum concentration with and without the upwind terrain present was 1.68 (68% increase due terrain). For that ratio to decrease to 1.4 (40% increase due terrain), the wind tunnel test results for the "terrain-out" configuration using the EPA (1985) procedure would have to increase by 20% or more.

Figure 3 shows that the highest terrain feature remaining for the EPA (1985) "terrain-out" configuration is about 5200 m upwind with a maximum height of 228 m above stack base. A representative hill height is approximately 200 m or less. Thompson and Snyder (1985) found that a source that is 1.5 hill heights tall positioned 20 hill heights downwind of a steep triangular ridge has maximum concentrations with and without the ridge present that are essentially the same (see Figure 4). Since the Main Stack is ~1.5 hill heights tall and is 23 hill heights, or more, downwind of the terrain feature, this research confirms that the EPA (1985) "terrain-out" procedure will have an insignificant impact on the 68% excessive concentration demonstrated by Petersen and Cermak (1979).

In conclusion, the impact of the change in the definition of "nearby" terrain has no impact on the results in Petersen and Cermak (1979) or the 1000 foot GEP stack height determination.

Impact of the New 1-Hr SO_2 NAAQS

At the time the study was carried out, the NAAQS exceedance requirement for an excessive concentration was demonstrated using the 3-hr SO_2 NAAQS of 1300 ug/m^3. In 2010, a new 1-hr SO_2 NAAQS of 75 ppb (196 µg/m^3) was promulgated. Since the new 1-hr NAAQS is lower than the 3-hr NAAQS, an exceedance of the 1-hr NAAQS is also demonstrated based on the emission rate used in Petersen and Cermak (1979).

Existing SO_2 Emission Rates and NAAQS Exceedance

Even though there is no logical reason why ASARCO should continue justifying the GEP stack height based on the NAAQS exceedance criteria as ASARCO continues to reduce emissions, this section will assess whether an 1-hr NAAQS exceedance can be demonstrated using NSPS emission rates for NSPS sources, as set forth in the 1985 rule, and current emission rates for other contributing sources. To make this demonstration, the results of the past study were re-analyzed. Table 1 shows the relevant stack operating parameters that were simulated in the wind tunnel and the existing operating parameters.

The past wind tunnel results were converted to a normalized concentration of the form CU_{ref}/Q which is related to the maximum ground level concentration as follows based on the Gaussian dispersion equation that is used in the AERMOD:

CPP, Incorporated
2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA
info@cppwind.com
www.cppwind.com
Tel: +1 970 221 3371
Fax: +1 970 221 3124

$$\frac{CU_{ref}}{Q} = \frac{1}{2\pi\sigma_y\sigma_z}\, exp\left[-0.5\left(\frac{h_p}{\sigma_z}\right)^2\right] x\ 10^6$$

where

C	=	SO_2 concentration (ug/m3),
U_{ref}	=	Reference wind speed (m/s) at the reference height of 585.6 m,
Q	=	SO_2 emission rate (g/s),
σ_y, σ_z	=	Horizontal and vertical dispersion coefficients, and
h_p	=	Plume height above ground level (m).

The equation shows that CU_{ref}/Q will only change with plume height (h_p) for a given meteorological condition (i.e., σ_y and σ_z fixed).

Table 2 shows that the ratio of stack exit velocity to wind speed is about 1.5 (R), or less, for the cases simulated in the wind tunnel and the existing configuration. When R is 1.5 or less, the plume will level off close to stack top for all cases shown in Table 2. With constant plume rise, CU_{ref}/Q is a constant value which is best indicated by the average CU_{ref}/Q over all cases observed in the wind tunnel. The average observed value is provided in Table 2 which was also used for the existing configuration. Next, the 1-hr SO_2 concentration was determined by dividing CU_{ref}/Q by U_{ref} and multiplying by Q.

In addition to the Main Stack there are several other sources of SO_2 emissions at the ASARCO smelter: Converter Aisle fugitives, Flash Furnace fugitives, Anode Furnace fugitives, the Anode Furnace baghouse stack, and Slag Pouring. To obtain the impact from these sources an air dispersion modeling analysis was conducted in a manner very similar to that which is described in the recent Hayden SIP Modeling Report entitled "SO_2 Air Dispersion Modeling Analysis for ASARCO, LLC; Hayden, Arizona" (July 2015). Because these additional sources are not NSPS sources, and therefore do not have an NSPS rate unlike the Main Stack, for the purposes of this analysis nearly all of the emissions modeled were conservatively assumed to be actual emissions (as opposed to allowables).

Key aspects of this analysis are as follows:

- Modeling was conducted using AERMOD
- Meteorological data used were taken from the on-site Camera Hill meteorological station (August 16, 2013 through August 15, 2014)
- Emissions for the scenario were modeled as follows:
    - Flash Furnace fugitives: based on fugitive emissions study (same procedure used for annual emissions inventory)
    - Converter Aisle fugitives: based on fugitive emissions study (same procedure used for annual emissions inventory)

CPP, Incorporated
2400 Midpoint Drive, Unit 190
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Tel: +1 970 221 3371
Fax: +1 970 221 3124

- Anode Furnace fugitives: based on anode furnace baghouse permit revision estimated maximum
- Anode Furnace Baghouse Stack: anode furnace baghouse permit revision allowable rate
- Slag Pouring: maximum hourly emission rate, ratioed by monthly slag pouring

Model receptors were placed at a distance of 2895 m from the Main Stack (the distance at which the maximum Main Stack concentrations were calculated from the Wind Tunnel Study), along and very near the 51 degree radial (i.e., to the southwest of the Main Stack).

Because the maximum Main Stack concentration was calculated for a tower wind speed of 4.3 m/s at a wind direction of 51 degrees, the predicted 1-hr SO_2 concentrations from the other sources were examined to identify those which occurred with both a wind speed and wind direction close to these values. While there were many concentrations predicted to occur under conditions very close to those, the concentration that nearly perfectly matched the meteorological conditions associated with the maximum Main Stack concentration was 28.1 ug/m3, which was predicted to occur with a wind speed of 4.4 m/s and a wind direction of 51 degrees.

Therefore, the total 1-hr SO_2 concentration is the sum of these values:

- 171.8 ug/m3 from the Main Stack,
- 28.1 ug/m3 from other sources at the ASARCO smelter, and
- 6.3 ug/m3 for Background (see Section 5.7 of "SO_2 Air Dispersion Modeling Analysis for ASARCO, LLC; Hayden, Arizona" (July 2015).

The total 1-hr SO_2 concentration for the worst case condition is 206.2 ug/m3, which is greater than the 1-hr SO2 NAAQS of 196 ug/m3.

Table 2 shows the calculated 1-hr SO_2 concentrations and supporting information based on the 1979 wind tunnel study. The above discussion and Table 2 show that even using the NSPS emission rates contemplated under the 1985 rule, an exceedance of NAAQS is demonstrated for the 1000 foot stack under the criteria established by the 1985 rule.

Summary

In summary, the 1000 foot stack at the ASARCO Hayden Smelter is GEP for the following reasons:

- It is the taller of 65 m, the formula height or the height determined through physical modeling as prescribed by the 1985 final stack height rule;
- It was approved by EPA as the GEP stack height in 1983;
- It meets the excessive concentration requirements due to upwind terrain wake effects as defined in EPA (1979, 1981 and 1985) based on NAAQS at the time of the wind tunnel study;
- The EPA (1985) change in the definition of "nearby" and how upwind terrain is modeled has no significant effect on the 40% excess concentration demonstration; and
- An exceedance of the 1-hr SO_2 NAAQS can be demonstrated based on emission rates used in Petersen and Cermak (1979) or using the NSPS rates specified in the 1985 rule.

CPP, Incorporated
2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA
info@cppwind.com
www.cppwind.com
Tel: +1 970 221 3371
Fax: +1 970 221 3124

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CPP, Incorporated
2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA

info@cppwind.com
www.cppwind.com

Tel: +1 970 221 3371
Fax: +1 970 221 3124

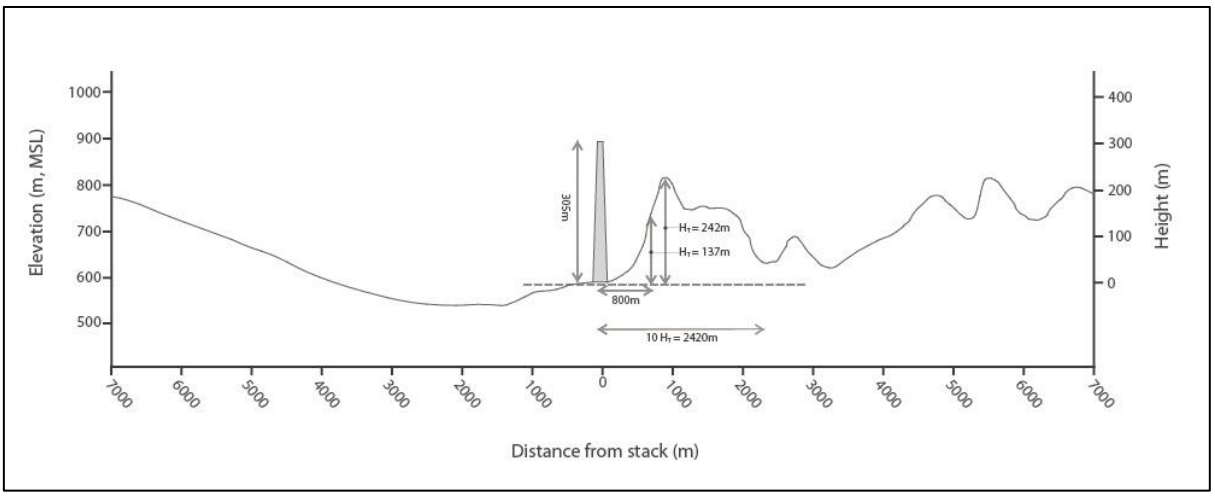


Figure 1. Terrain cross-section (reproduced from Taylor, 1979) for the wind tunnel configuration used for modeling the downwash effect of the upwind hill. Note: a transition ramp was used upwind of the terrain to match the wind tunnel floor to ensure a smooth transition flow.

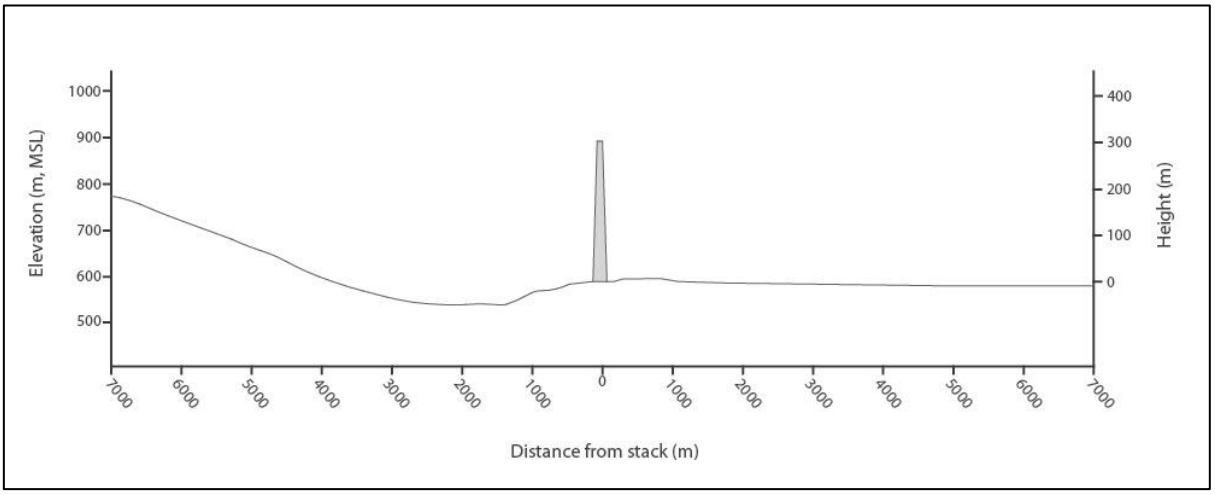


Figure 2. Terrain cross-section (reproduced from Taylor, 1979) for the wind tunnel configuration used for "terrain-out" configuration as defined in the 1979 EPA Guideline document.

CPP, Incorporated
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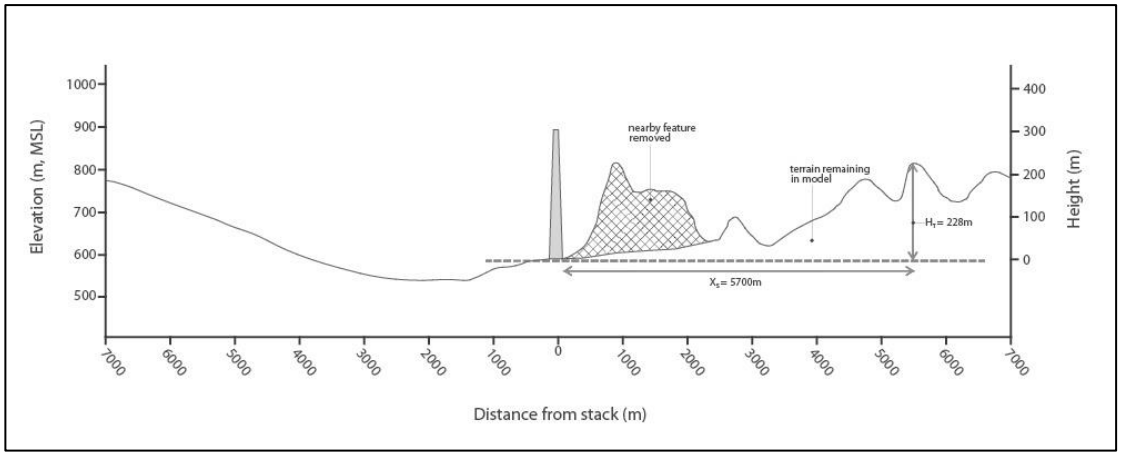


Figure 3. Terrain cross-section (based on Taylor, 1979) for the wind tunnel configuration used for the "terrain-out" configuration as defined in the 1985 EPA Guideline document.

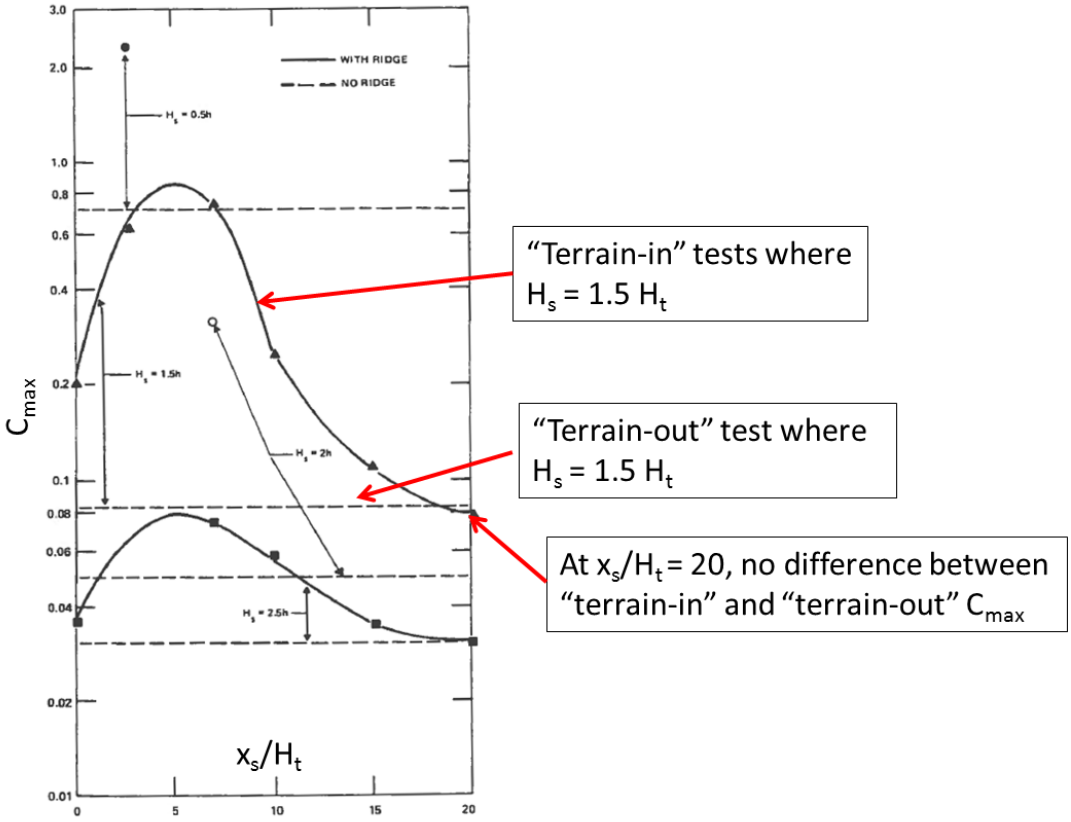


Figure 4. Maximum ground-level concentrations (C_{max}) as a function of source position (x_s) downwind of steep triangular ridge of height H_t (figure copied from Thompson and Snyder, 1985).

CPP, Incorporated
2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA

info@cppwind.com
www.cppwind.com

Tel: +1 970 221 3371
Fax: +1 970 221 3124

Table 1. Source Parameters

Case	Stack Diameter (m)	Stack Temp Ts (K)	Std Volume Flow (m3/s)	Act Volume Flow (m3/s)	Exit Velocity Ve (m/s)	SO_2 Emission Rate Q (g/s)	SO_2 Emission Rate (lbs/hr)	SO_2 Source Concentration Co (ppm)
Wind Tunnel Study	5.18	380.7	252.1	319.9	15.18	7348.0	58318	8834
NSPS Configuration	8.94	374	309.9	448.1	7.14	458.4	3638	551.1

Zref =	585.6 m	Reference Height
HT =	242 m	Terrain Height
n	0.32	Wind power law exponent as measured in wind tunnel
Ta =	300 K	Ambient Temperature

Table 2. Summary of Calculations Documenting a NAAQS Exceedance

1979 Wind Tunnel Study

WD	Xmax/HT	X_{max} (m)	U_{ref} (m/s)	R V_e/U_{ref}	Tower Speed (51.76m) (m/s)	C_{max} (ppm	$C_{max} U_{ref}/Q$ (ug/g/m^2)	**Max 1 hr- SO_2 C_{max} (ug/m3)**
NE (51°)	15	3630	9.30	1.63	4.28	1.01	3.32	**2626**
NE (51°)	15	3630	15.60	0.97	7.18	0.57	3.15	**1482**
NE (51°)	15	3630	22.10	0.69	10.17	0.51	3.99	**1326**
						Average	3.49	

NSPS Configuration

WD	Xmax/HT	X_{max} (m)	U_{ref} (m/s)	R V_e/U_{ref}	Tower Speed (51.76m) (m/s)	$C_{max} U_{ref}/Q$ (ug/g/m^2)	**1000 ft Stack Max 1 hr- SO2 C_{max} (ug/m3)**	**Other Sources+BG Max 1 hr- SO2 C_{max} (ug/m3)**	**Total Max 1 hr- SO2 C_{max} (ug/m3)**
NE (51°)	15	3630	9.30	0.77	4.28	3.49	**171.8**	**34.4**	**206.2**
NE (51°)	15	3630	15.60	0.46	7.18	3.49	**102.4**	**23.3**	**125.7**
NE (51°)	15	3630	22.10	0.32	10.17	3.49	**72.3**	**24.9**	**97.2**

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2400 Midpoint Drive, Unit 190
Fort Collins, Colorado 80524, USA

info@cppwind.com
www.cppwind.com

Tel: +1 970 221 3371
Fax: +1 970 221 3124

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Arizona Department
of Environmental Quality

Appendix E
EJScreen Report

Air Quality Division
October 3, 2023 Final Version

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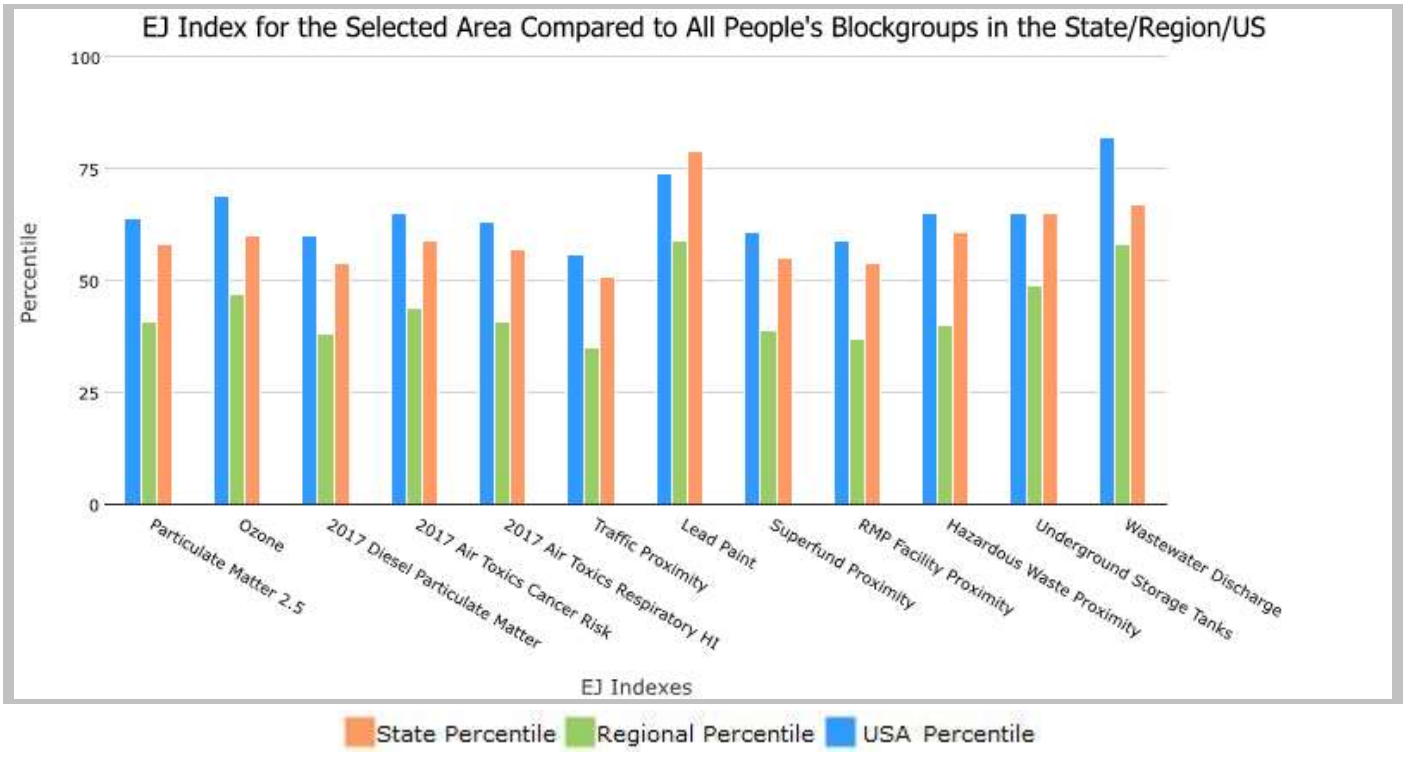
EJScreen Report (Version 2.0)

10 miles Ring Centered at 33.012259,-110.776544, ARIZONA, EPA Region 9

Approximate Population: 4,508

Input Area (sq. miles): 314.03

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	58	41	64
EJ Index for Ozone	60	47	69
EJ Index for 2017 Diesel Particulate Matter*	54	38	60
EJ Index for 2017 Air Toxics Cancer Risk*	59	44	65
EJ Index for 2017 Air Toxics Respiratory HI*	57	41	63
EJ Index for Traffic Proximity	51	35	56
EJ Index for Lead Paint	79	59	74
EJ Index for Superfund Proximity	55	39	61
EJ Index for RMP Facility Proximity	54	37	59
EJ Index for Hazardous Waste Proximity	61	40	65
EJ Index for Underground Storage Tanks	65	49	65
EJ Index for Wastewater Discharge	67	58	82



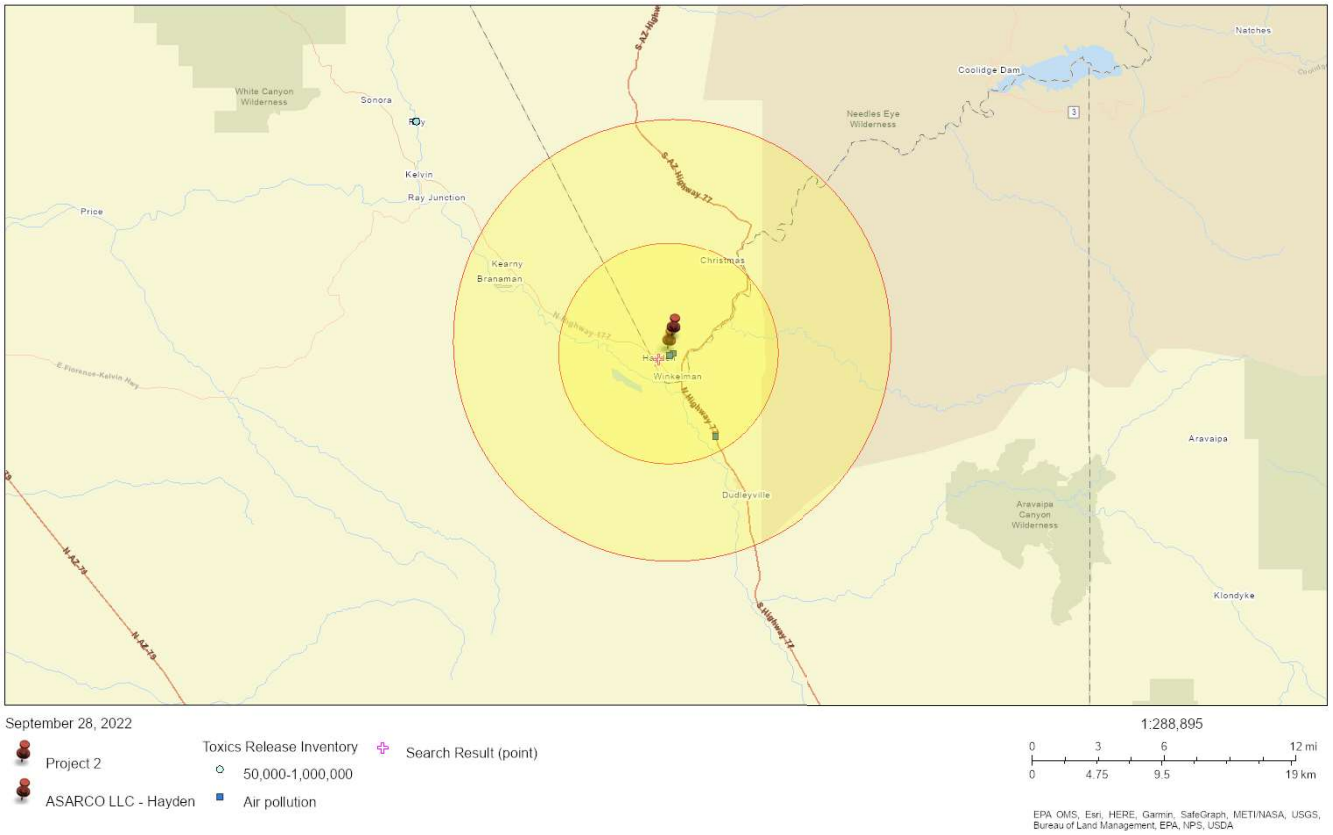
This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJScreen Report (Version 2.0)

10 miles Ring Centered at 33.012259,-110.776544, ARIZONA, EPA Region 9

Approximate Population: 4,508

Input Area (sq. miles): 314.03



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

EJScreen Report (Version 2.0)

10 miles Ring Centered at 33.012259,-110.776544, ARIZONA, EPA Region 9

Approximate Population: 4,508

Input Area (sq. miles): 314.03

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Pollution and Sources							
Particulate Matter 2.5 (µg/m^3)	5.35	7.35	9	10.8	1	8.74	1
Ozone (ppb)	54.5	54.3	48	49.6	63	42.6	91
2017 Diesel Particulate Matter* (µg/m^3)	0.0449	0.327	5	0.33	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	22	32	33	30	<50th	29	<50th
2017 Air Toxics Respiratory HI*	0.2	0.37	18	0.41	<50th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	0.85	550	1	1300	0	710	1
Lead Paint (% Pre-1960 Housing)	0.26	0.084	88	0.23	63	0.28	60
Superfund Proximity (site count/km distance)	0.013	0.08	9	0.15	8	0.13	8
RMP Facility Proximity (facility count/km distance)	0.03	0.65	7	1	1	0.75	1
Hazardous Waste Proximity (facility count/km distance)	0.24	1.5	24	4.4	10	2.2	33
Underground Storage Tanks (count/km^2)	0.27	1.7	37	3.3	28	3.9	30
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.01	6.1	36	59	44	12	69
Socioeconomic Indicators							
Demographic Index	51%	40%	70	46%	60	36%	75
People of Color	60%	45%	70	60%	48	40%	72
Low Income	42%	35%	66	31%	71	31%	72
Unemployment Rate	10%	6%	81	6%	81	5%	84
Linguistically Isolated	1%	4%	48	8%	26	5%	52
Less Than High School Education	17%	13%	70	16%	62	12%	73
Under Age 5	4%	6%	32	6%	29	6%	31
Over Age 64	23%	17%	78	15%	85	16%	83

*Diesel particular matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

For additional information, see: www.epa.gov/environmentaljustice

EJScreen is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJScreen outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

ADEQ
Arizona Department
of Environmental Quality

Appendix F
Public Process Documentation

May 15, 2023 ADEQ Govdelivery Notice
May 15, 2023 ADEQ Webpage
May 15, 2023 Payson Roundup Affidavit of Publication
May 17, 2023 Arizona Silver Belt Affidavit of Publication
June 15, 2023 Hayden SO2 SIP Revision Public Hearing Transcript
June 15, 2023 Public Hearing Sign in Sheet
July 14, 2023 Payson Roundup Affidavit of Publication
July 19, 2023 Arizona Silver Belt Affidavit of Publication
August 14, 2023 Hayden SO2 SIP Revision Public Hearing Transcript
Hayden SO2 Responsiveness Summary

Air Quality Division
October 3, 2023 Final Version

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Gmail

Zachary Dorn <dorn.zachary@azdeq.gov>

Public Hearing & 30-Day Public Comment Period | SIP Revision, Modification of Air Quality Control Permit for ASARCO–Hayden in Gila County, and GEP Demo Study

1 message

Arizona Department of Environmental Quality <AZDEQ@public.govdelivery.com> Tue, May 16, 2023 at 8:16 AM
Reply-To: AZDEQ@public.govdelivery.com
To: dorn.zachary@azdeq.gov

ADEQ Arizona Department of Environmental Quality **PUBLIC NOTICE**

ADEQ welcomes comments on the proposal of three actions:

- Revision to the Arizona State Implementation Plan (SIP) for the Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 National Ambient Air Quality Standards (NAAQS).
- Significant Permit Revision to an Air Quality Control Permit to ASARCO LLC for its Hayden Operations facility located in Gila County, Arizona.
- Revised good engineering practice (GEP) demonstration study.

View Public Notice/Related Documents >

View Public Hearing Details >

ADEQ encourages and values your input and participation.

To view more ADEQ public notices, visit azdeq.gov/notices

About ADEQ

Under the Environmental Quality Act of 1986, the Arizona State Legislature established the Arizona Department of Environmental Quality in 1987 as the state agency for protecting and enhancing public health and the environment of Arizona. For more information, visit azdeq.gov.

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ADEQ Arizona Department of Environmental Quality

QUESTIONS?
Contact Us

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This email was sent to dorn.zachary@azdeq.gov using GovDelivery Communications Cloud on behalf of: Arizona Department of Environmental Quality (ADEQ) · 1110 West Washington Street · Phoenix, AZ 85007 · 1-602-771-2300

GOVDELIVERY

Public Notice

Air Quality

Tuesday, May 16, 2023 - 12:00

On May 16, 2023, the public comment period begins for the proposal of three actions:

- Revision to the Arizona State Implementation Plan (SIP) for the Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 National Ambient Air Quality Standards (NAAQS).
- Significant Permit Revision to an Air Quality Control Permit to ASARCO LLC for its Hayden Operations facility located in Gila County, Arizona.
- Revised good engineering practice (GEP) demonstration study.[1]

The comment period ends June 15, 2023.

Public Notice Information

Permit Revision

Class I Air Quality Permit No. 96410

The facility is subject to the requirements of the Federal Clean Air Act, Code of Federal Regulations, Arizona Revised Statute 49-426, and the Arizona Administrative Code, Title 18, Chapter 2. The facility emits the following air contaminants: coarse particulate matter with diameters 10 micrometers or less (PM_{10}), fine particulate matter with diameters 2.5 micrometers or less ($PM_{2.5}$), volatile organic compounds (VOCs), nitrogen oxides (NO_X), sulfur dioxide (SO_2), carbon monoxide (CO) and hazardous air pollutants (HAPs).

SIP Revision

EPA officially designated the Hayden area as nonattainment on Aug. 5, 2013, for the 2010 NAAQS based on existing monitoring data from 2009-2010. This proposed SIP revision demonstrates that all essential regulatory elements have been met and the Hayden SO_2 Planning Area will attain the 2010 primary SO_2 NAAQS. Additionally, this SIP revision will satisfy any remaining requirements for the 1971 SO2 NAAQS.

GEP Demo Study

In 1983, EPA approved a GEP stack height demonstration for the 1,000-foot (305 m) main stack at the ASARCO - Hayden Smelter located in Hayden, Arizona. At EPA's request in mid-2015 and 2022, the GEP stack height determination was reassessed with respect to the current GEP regulations. This reassessment—included in the proposed SIP revision—confirmed that the original GEP stack height determination is consistent with the 1985 regulations and that the 1,000-foot stack remains an appropriate GEP determination.

Permittee

ASARCO LLC

Facility Information

Hayden Operations
100 N. Hayden Ave.
Hayden, AZ 85135

Review Documents

Original Published Public Notice | View/Download >

Draft Permit | View/Download >

Draft Technical Support Document | View/Download >

Hayden SO_2 Proposed SIP with Appendices | View/Download >

You may also review the above documentation in person at the Town of Hayden, Town Clerk's Office located at 520 Velasco Ave., Hayden, Arizona, or at the ADEQ Record Center | Learn How >

Public Comment Period

Dates: May 16, 2023 – June 15, 2023 *(Comments must be postmarked or received by June 15, 2023)*

Comments on the **SIP revision** and **GEP re-assessment** may be submitted as follows:

By Email | Send Email >

By Mail:

ADEQ
Air Quality Division, Air Quality Improvement Planning
Attn: Zachary Dorn
1110 W. Washington St.
Phoenix, AZ 85007

Comments on the **ASARCO Hayden Operations permit revision** may be submitted as follows:

By Email | Send Email >

By Mail:

ADEQ
Air Quality Division, Air Permits
Attn: Karla Murrieta
1110 W. Washington St.
Phoenix, AZ 85007

Comments may also be offered in-person at a Public Hearing | June 15, 2023, 3 p.m. | View Hearing Information >

People who file comments on the permit will have the right to appeal the final decision as an appealable agency action to the Office of Administrative Hearing (OAH) pursuant to §41.1092.03, and the appeal must be filed within 30 days after the issuance of the final decision. The OAH may sustain, modify or reverse the final decision.

EPA Petition Process

This permit is subject to review by the Environmental Protection Agency (EPA) pursuant to 40 CFR 70.8 and Arizona Administrative Code R18-2-307. If EPA does not object to the issuance of this permit, you may petition to EPA within 60 days after the expiration of EPA's 45-day review period. A petition shall be based only on objections to the permit that were raised with reasonable specificity during the public comment period, unless the petitioner demonstrates that it was impracticable to raise such objections within such period, or unless the grounds for such objection arose after such period. Any person who petitions to EPA pursuant to 40 CFR 70.8(d) shall notify ADEQ by certified mail within 10 days after such petition.

Comments may be submitted to EPA according to the process for Title V Petitions | Learn More >

---

[1] 40 Code of Federal Regulations (CFR) § 51.118 | View >

- Publications
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Affidavit of Publication

Payson Roundup

STATE OF ARIZONA 10112695

COUNTY OF GILA 5/16/2023

I, Ann Fowler, do solemnly swear that I am Assistant Bookkeeper of the Payson Roundup, that the same is a newspaper printed, in whole or in part, and published in the COUNTY OF GILA, State of Arizona, and has a general circulation therein; that said newspaper has been published continuously and uninterruptedly in said COUNTY OF GILA for a period of more than fifty-two weeks prior to the first publication of the annexed legal notice or advertisement; that said newspaper has been admitted to the United States mails as second-class matter under the provisions of the Act of March 3, 1879, or any amendments thereof, and that said newspaper is a newspaper duly qualified for publishing legal notices and advertisements within the meaning of the laws of the State of Arizona. That the annexed legal notice or advertisement was published in the regular and entire issue of every number of said daily newspaper for the period of 2.00 consecutive insertions; and that the first publication of said notice was in the issue of said newspaper dated May 16 A.D., 2023, and that the last publication of said notice was in the issue of said newspaper dated May 23 A.D., 2023. In witness whereof I have hereunto set my hand this May 23 A.D., 2023.

A Fowler

Ann Fowler

Subscribed and sworn to before me, a Notary Public in and for the COUNTY OF GILA, State of Arizona May 23 A.D., 2023.

Julie Lynn Williams

Julie Lynn Williams, Notary Public

JULIE LYNN WILLIAMS
NOTARY PUBLIC - ARIZONA
GILA COUNTY
COMMISSION # 640603
MY COMMISSION EXPIRES
MARCH 29, 2027

18793 5/16, 5/23/23

PUBLIC NOTICE

YOU HAVE A VOICE IN AIR POLLUTION CONTROL IN ARIZONA

The Arizona Department of Environmental Quality (ADEQ) proposes three actions through this public notice. First, ADEQ proposes a revision to the Arizona State Implementation Plan (SIP) for the Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 National Ambient Air Quality Standards (NAAQS), which ADEQ will request the U.S. Environmental Protection Agency (EPA) to approve as a revision to the Arizona SIP. Second, ADEQ proposes Significant Permit Revision Number 96410, revision to Air Quality Control Permit Number 39948, to ASARCO LLC - Hayden Operations for the incorporation of the Uptake Improvement Project, Fuming Ladle Control Project, the Anode Furnaces Secondary Hood Project, and the addition of sulfur dioxide (SO2) emission limitations as part of the SIP for the Hayden SO2 Nonattainment Area at the ASARCO - Hayden Smelter, a copper concentrator and smelter facility located at 100 N. Hayden Ave., Hayden, AZ 85135. Third, ADEQ proposes a revised good engineering practice (GEP) demonstration study pursuant to 40 Code of Federal Regulations (CFR) § 51.118.

The mailing address for the facility is P.O. Box 8, Hayden, AZ 85135. The facility is subject to the requirements of the Federal Clean Air Act, CFR, Arizona Revised Statute (A.R.S.) § 49-426, and the Arizona Administrative Code (A.A.C), Title 18, Chapter 2. The facility emits the following air contaminants: coarse particulate matter with diameters 10 micrometers or less (PM10), fine particulate matter with diameters 2.5 micrometers or less (PM2.5), volatile organic compounds (VOCs), nitrogen oxides (NOX), sulfur dioxide (SO2), carbon monoxide (CO) and hazardous air pollutants (HAPs).

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This public notice provides information to help you participate in the decision-making process. You have an opportunity to submit written comments about this permit and SIP revision, and GEP re-assessment. In addition, ADEQ will hold a public hearing on June 15, 2023 at 3:00 PM at Hayden Senior Center, 520 N. Velasco Avenue, Hayden, AZ 85135, where you may comment in person. To submit written comments, include your name, mailing address, signature (and/or your agent or attorney signature) and clearly explain why the permit should or should not be issued. Grounds for comment on the permit are limited to whether the permit meets the criteria for issuance spelled out in the state air pollution control laws or rules.

Affidavit of Publication

Payson Roundup

STATE OF ARIZONA 10112695

COUNTY OF GILA 5/16/2023

I, Ann Fowler, do solemnly swear that I am Assistant Bookkeeper of the Payson Roundup, that the same is a newspaper printed, in whole or in part, and published in the COUNTY OF GILA, State of Arizona, and has a general circulation therein; that said newspaper has been published continuously and uninterruptedly in said COUNTY OF GILA for a period of more than fifty-two weeks prior to the first publication of the annexed legal notice or advertisement; that said newspaper has been admitted to the United States mails as second-class matter under the provisions of the Act of March 3, 1879, or any amendments thereof, and that said newspaper is a newspaper duly qualified for publishing legal notices and advertisements within the meaning of the laws of the State of Arizona. That the annexed legal notice or advertisement was published in the regular and entire issue of every number of said daily newspaper for the period of 2.00 consecutive insertions; and that the first publication of said notice was in the issue of said newspaper dated May 16 A.D., 2023, and that the last publication of said notice was in the issue of said newspaper dated May 23 A.D., 2023. In witness whereof I have hereunto set my hand this May 23 A.D., 2023.

A Fowler

Ann Fowler

Subscribed and sworn to before me, a Notary Public in and for the COUNTY OF GILA, State of Arizona May 23 A.D., 2023.

Julie Lynn Williams

Julie Lynn Williams, Notary Public

JULIE LYNN WILLIAMS
NOTARY PUBLIC - ARIZONA
GILA COUNTY
COMMISSION # 646883
MY COMMISSION EXPIRES
MARCH 29, 2027

The public notice period is in effect from May 16, 2023 to June 15, 2023.
Comments regarding the SIP revision and the GEP re-assessment may be submitted in writing to: Zachary Dorn, Air Quality Improvement Planning, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to dorn.zachary@azdeq.gov.
Comments regarding the permit revision may be submitted in writing to: Karla Murrieta, Air Permits Unit, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to airpermits@azdeq.gov. Comments must be received or postmarked no later than 5:00 PM on June 15, 2023.
The SIP revision, draft permit, GEP re-assessment, and related documentation are available for review online at azdeq.gov/notices by searching for the date of this public notice, or in person at the ADEQ Records Center by scheduling an appointment at least 48 hours in advance. For ADEQ Records Center information, visit azdeq.gov/records-center, call (602) 771-4380 or email recordscenter@azdeq.gov. The documents are also available at the Town of Hayden, Town Clerk's Office located at 520 Velasco Ave, Hayden, AZ 85135.
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This permit is subject to review by the EPA pursuant to 40 CFR 70.8 and A.A.C. R18-2-307. If EPA does not object to the issuance of this permit, you may petition to EPA within sixty (60) days after the expiration of EPA's forty-five (45)-day review period. A petition shall be based only on objections to the permit that were raised with reasonable specificity during the public comment period, unless the petitioner demonstrates that it was impracticable to raise such objections within such period, or unless the grounds for such objection arose after such period. Please refer to epa.gov/title-v-operating-permits/title-v-petitions for additional information. Any person who petitions to EPA pursuant to 40 CFR 70.8(d) shall notify ADEQ by certified mail as soon as possible, but in no case more than 10 days following such petition. The notification shall include the grounds for objection and whether such objections were raised during the public comment period.
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A Fowler

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Julie Lynn Williams

Julie Lynn Williams, Notary Public

JULIE LYNN WILLIAMS
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The Arizona Silver Belt Newspaper
298 N Pine Street
Globe, AZ 85501
Telephone: 928-425-7121

Affidavit of Publication

STATE OF ARIZONA) LE1635
COUNTY OF GILA) ss

I am a citizen of the United States and a resident of the state of Arizona; I am over the age of eighteen years, and not a party to or interested in the entitled matter. I am the principal clerk of the printer and publisher of the ARIZONA SILVER BELT, a newspaper published in the English language in the city of GLOBE, county of GILA, state of ARIZONA and adjudged a newspaper of general circulation.
The Arizona Silver Belt, is a newspaper which is published weekly, is of general circulation and is in compliance with the Arizona Revised Statutes §§ 10-140.34 & 39-201.A & B. (Please note, publication has to be completed within 60 days of filing.). The notice will be/has been published Two (2) weeks in the newspaper listed above on May 17, 2023 and May 24, 2023.

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

T Nixon .

Tina Nixon

Subscribed and sworn to before me, a Notary Public in and for said County and State, this 13th day of June, 2023.

. .

Notary Public

NADINE ALLISON MCGILTON
NOTARY PUBLIC – ARIZONA
GILA COUNTY
Commission Expires May 14, 2026
Commission No. 625109

PUBLIC NOTICE

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First Pub: 05-17-2023
Last Pub: 05-24-2023
LE1635

State Implementation Plan and Permit Revision, and GEP Demonstration for the Hayden SO2 NAA

Oral Proceeding

Public Hearing Transcript

June 15, 2023

Kelly Poole: Thank you for coming. I now open this hearing on the proposed SIP revision for the Hayden SO2 SIP nonattainment area, title V operating permit revision, and good engineering practice (GEP) demonstration.

This proceeding is being recorded and will be preserved for the record.

Today is June 15, 2023 and the time is 3:13 p.m. This hearing is being held at the Hayden Senior Center, located at 520 Velasco Avenue, Hayden, AZ 85135. My name is Kelly Poole, and I have been appointed by the Director of the Arizona Department of Environmental Quality to preside at this proceeding.

The purpose of this oral proceeding is to provide the public an opportunity to:

Hear a summary of the proposed SIP revision, permit revision, and Good Engineering Practice (GEP) demonstration, ask questions, or provide comments if they chose to do so.

The Department's representative for today's hearing is Mariana Mendez Armendariz, Kamran Khan, and Zachary Dorn of the ADEQ's Air Quality Division.

Public notice of the comment period and hearing was published in the Payson Roundup and Arizona Silver Belt on May 16th and May 23rd, 2023, and May 17th and 24th respectively. Copies of the proposal were made available on ADEQ's website, ADEQ Phoenix Records Center, and the Hayden Senior Center starting May 16, 2023 and will remain available until the close of comment period which is 5pm today.

If you wish to make a verbal comment, please fill out a speaker slip, available at the sign-in table, and give it to a Department representative. You may also submit written comments during today's hearing. Comments regarding the SIP revision and the GEP re-assessment may also be

submitted in writing to: Zachary Dorn, Air Quality Improvement Planning, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007, if anyone wants that address we can help you get that you don't have to remember it, or via email to dorn.zachary@azdeq.gov also we can give you that address as well. Comments regarding the permit revision may be submitted in writing to: Karla Murrieta, Air Permits Unit, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to airpermits@azdeq.gov and we can give you those addresses too. Comments must be received or postmarked no later than 5:00 PM on June 15, 2023.

Comments made during the formal comment period are required by law to be considered by the Department when preparing the final submission to the U.S. Environmental Protection Agency. ADEQ will include a responsiveness summary for written and oral comments received during the formal comment period.

The agenda for this hearing is as follows:

First, Zachary will present a brief overview of the proposal regarding the SIP and GEP demonstration. Next Mariana will present a brief overview of the permit revision.

Then I will conduct the oral comment portion. At that time, I will call speakers in the order that the comments were received.

Please be aware that any comments at today's hearing that you want the Department to formally consider must be given either in writing or on the record during this oral proceeding.

At this time, Zachary and Mariana will give a brief overview of the proposal.

_____

Zachary Dorn: Thank you, Kelly.

Hello and thank you for coming. This public hearing is regarding the ADEQ's proposal of three actions. First, ADEQ proposes a revision to the Arizona State Implementation Plan, or SIP, for the Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 National Ambient Air

Quality Standards (NAAQS), which ADEQ will request the U.S. Environmental Protection Agency to approve as a revision to the Arizona SIP. Second, ADEQ proposes Significant Permit Revision Number 96410, revision to Air Quality Control Permit Number 39948, to ASARCO LLC - Hayden Operations for the incorporation of the Uptake Improvement Project, Fuming Ladle Control Project, the Anode Furnaces Secondary Hood Project, and the addition of sulfur dioxide (SO2) emission limitations as part of the SIP for the Hayden SO2 Nonattainment Area at the ASARCO - Hayden Smelter, a copper concentrator and smelter facility located at 100 N. Hayden Ave., Hayden, AZ 85135. Third, ADEQ proposes a revised good engineering practice (GEP) demonstration study pursuant to 40 Code of Federal Regulations (CFR) § 51.118.

On June 22, 2010, EPA replaced the existing annual and 24-hour primary sulfur dioxide NAAQS with a new 1-hour sulfur dioxide standard set at a level of 75 parts per billion (ppb) to better protect public health by reducing public exposure to elevated short-term concentrations of sulfur dioxide.

To bring the area back into attainment and to satisfy CAA requirements, in 2017, ADEQ developed revisions to Arizona's State Implementation Plan for the Hayden SO2 nonattainment area.

However, On November 5, 2020 EPA published a limited approval and limited disapproval of the Hayden Smelter rule A.A.C. R18-2-B1302, submitted to EPA with the ADEQ 2017 SIP. EPA issued its limited disapproval because some rule provisions conflict with the requirements of CAA §§ 110 and 172(c)(6). EPA found:

1)the rule does not contain any numeric emission limits or ongoing monitoring requirements corresponding to the levels of fugitive emissions that were modeled in the 2017 nonattainment SIP;

2) R18-2-B1302(E)(6 [4 revised]) provides an option for alternative sampling points that could undermine the enforceable of the stack emissions limit;

3) R18-2-B1302(E)(6) allows for just under 10% of the total facility SO2 emissions annually to be exempt from continuous emission monitoring system (CEMS) requirement;

4) the rule lacks a method for measuring or calculating emissions from the shutdown ventilation flue, which could compromise the enforceability of the main stack emissions limit;

and 5) the rule lacks a method for calculating hourly SO2 emissions

EPA published its "partial approval and partial disapproval" of the 2017 SIP on November 10, 2020. This final action approved the emissions inventory element under CAA §§ 172(c)(3) and

(4) and affirmed that the State met the new source review requirement for the Hayden SO2 NAA under CAA § 175(c)(5). However, EPA disapproved the attainment demonstration, Reasonably Available Control Measures/Reasonably Available Control Technology, enforceable emissions limitations, reasonable further progress, and contingency measures elements.

The purpose of this SIP revision is to correct these disapproval and to attain the NAAQS, no later than January 31, 2027.

Regarding the GEP demonstration, in 1983, EPA approved a GEP stack height demonstration for the 1,000-foot (305 m) main stack at the ASARCO - Hayden Smelter located in Hayden, Arizona. At EPA's request in mid-2015 and 2022, the GEP stack height determination was reassessed with respect to the current GEP regulations. This re-assessment—included in the proposed SIP revision—confirmed that the original GEP stack height determination is consistent with the 1985 regulations and that the 1,000-foot stack remains an appropriate GEP determination.

I will now pass the presentation to Mariana to provide information regarding the significant permit revision.

* * * * *

Mariana Mendez Armendariz: Thank you Zach, The facility is subject to the requirements of the Federal Clean Air Act, Code of Federal Regulations, Arizona Revised Statute 49-426, and the Arizona Administrative Code, Title 18, Chapter 2. The facility emits the following air contaminants: coarse particulate matter with diameters 10 micrometers or less known as PM10, fine particulate matter with diameters 2.5 micrometers or less known as PM2.5, volatile organic compounds known as VOCs, nitrogen oxides known as NOX, sulfur dioxide known as SO2, carbon monoxide known as CO and hazardous air pollutants known as HAPs.

ADEQ proposes Significant Permit Revision Number 96410, revision to Air Quality Control Permit Number 39948, to ASARCO LLC - Hayden Operations for the incorporation of the Uptake Improvement Project, Fuming Ladle Control Project, the Anode Furnaces Secondary Hood Project, and the addition of sulfur dioxide (SO2) emission limitations as part of the SIP for the Hayden SO2 Nonattainment Area at the ASARCO - Hayden Smelter, a copper concentrator and smelter facility located at 100 N. Hayden Ave., Hayden, AZ 85135.

Kelly Poole: This concludes the overview portion of this proceeding. I now open the oral proceeding to all oral comments.

Seeing no comments. Are you sure? Okay. Seeing no comments this concludes the oral comment portion of this proceeding. If you have not already submitted written comments, you may submit them at this time again the comment period was proposal ends today June 15, 2023 at 5pm. Thank you for attending the time is now 3:23PM. I now close this oral proceeding.

Arizona Department of Environmental Quality

DATE:

TIME:

	Name	Organization	Phone	Email
1.	Jeremy Browning	GovGroup Arizona	602 326 4207	Jeremy@govgroupaz.com
2.	Whitney Lemon	ASARCO	520 247 7523	whitney.lemon@asarco.com
3.	Eric Hiser	Hiser Jay	480-505-7900	ehiser@hiserjay.com
4.	Anjali Das		820-247-8328	anjali.das@asarco.com
5.	Sam Reidhead	Asarco	520-356-7811	SReidhead@Asarco.com
6.	James M. Stewart	ASARCO	520-822-6714	jastewart@asarco.com
7.	MARK ALBERTSEN	FM	520-235-7430	MALBERTS@FMI.COM
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11.				
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13.				
14.				
15.				

Affidavit of Publication

Payson Roundup

STATE OF ARIZONA 10113134

COUNTY OF GILA 7/14/2023

I, Ann Fowler, do solemnly swear that I am Assistant Bookkeeper of the Payson Roundup, that the same is a newspaper printed, in whole or in part, and published in the COUNTY OF GILA, State of Arizona, and has a general circulation therein; that said newspaper has been published continuously and uninterruptedly in said COUNTY OF GILA for a period of more than fifty-two weeks prior to the first publication of the annexed legal notice or advertisement; that said newspaper has been admitted to the United States mails as second-class matter under the provisions of the Act of March 3, 1879, or any amendments thereof, and that said newspaper is a newspaper duly qualified for publishing legal notices and advertisements within the meaning of the laws of the State of Arizona. That the annexed legal notice or advertisement was published in the regular and entire issue of every number of said daily newspaper for the period of 2.00 consecutive insertions; and that the first publication of said notice was in the issue of said newspaper dated July 14 A.D., 2023, and that the last publication of said notice was in the issue of said newspaper dated July 21 A.D., 2023. In witness whereof I have hereunto set my hand this July 21 A.D., 2023.

A Fowler

Ann Fowler

Subscribed and sworn to before me, a Notary Public in and for the COUNTY OF GILA, State of Arizona July 21 A.D., 2023.

Julie Lynn Williams

Julie Lynn Williams, Notary Public

JULIE LYNN WILLIAMS
NOTARY PUBLIC - ARIZONA
GILA COUNTY
COMMISSION # 546663
MY COMMISSION EXPIRES
MARCH 29, 2027

18860 7/14, 7/21/23 PUBLIC NOTICE YOU HAVE A VOICE IN AIR POLLUTION CONTROL IN ARIZONA

The Arizona Department of Environmental Quality (ADEQ) proposes two actions through this public notice. First, ADEQ proposes to issue Significant Permit Revision Number 96410 to ASARCO LLC - Hayden Operations which will update fugitive roofline monitoring requirements at the ASARCO - Hayden Smelter. Second, the ADEQ proposes to update the Arizona State Implementation Plan (SIP) for the Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 National Ambient Air Quality Standards (NAAQS) to incorporate the changes to Significant Permit Revision Number 96410.

On May 16, 2023, ADEQ commenced a public comment period on Significant Permit Revision Number 96410, a State Implementation Plan revision for the 1971 and 2010 sulfur dioxide national ambient air quality standard, and a Good Engineering Practice demonstration. ADEQ held a public hearing on June 15, 2023, and received a comment requesting that the permit Condition III.C.2 of Attachment "I" be changed from specifying a Relative Accuracy Test Audit (RATA) to a Cylinder Gas Audit (CGA). ADEQ is only accepting comments on the proposed change from RATA to CGA for fugitive roofline monitoring requirements in the permit condition referenced above and as part of the SIP revision.

The copper concentrator and smelter facility is located at 100 N. Hayden Ave., Hayden, AZ 85135. The mailing address for the facility is P.O. Box 8, Hayden, AZ 85135. The facility is subject to the requirements of the Federal Clean Air Act, Code of Federal Regulations (CFR), Arizona Revised Statutes (A.R.S.) § 49-426, and the Arizona Administrative Code (A.A.C.), Title 18, Chapter 2. The facility emits the following air contaminants: coarse particulate matter with diameters 10 micrometers or less (PM10), fine particulate matter with diameters 2.5 micrometers or less (PM2.5), volatile organic compounds (VOCs), nitrogen oxides (NOX), sulfur dioxide (SO2), carbon monoxide (CO) and hazardous air pollutants (HAPs).

This public notice provides information to help you participate in the decision-making process. You have an opportunity to submit written comments about this permit. In addition, ADEQ will hold a virtual public hearing via GoToWebinar on August 14, 2023 at 2:00 PM. To submit written comments, include your name, mailing address, signature (and/or your agent or attorney signature) and clearly explain why the permit should or should not be issued. Grounds for comment are limited to whether the permit meets the criteria for issuance spelled out in the state air pollution control laws or rules. The public notice period is in effect from July 14, 2023 to August 14, 2023. Comments regarding the SIP revision may be submitted in writing to: Zachary Dorn, Air Quality Improvement Planning, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to dorn.zachary@azdeq.gov. Comments regarding the permit revision may be submitted in writing to: Karla Murrieta, Air Permits Unit, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to airpermits@azdeq.gov. Comments must be received by August 14, 2023.

If you wish to verbally comment on this permit, you may join the virtual public hearing using a computer, tablet or phone that is equipped to meet internet and system requirements. You must register to attend it by using the following registration link:

Affidavit of Publication

Payson Roundup

STATE OF ARIZONA 10113134

COUNTY OF GILA 7/14/2023

I, Ann Fowler, do solemnly swear that I am Assistant Bookkeeper of the Payson Roundup, that the same is a newspaper printed, in whole or in part, and published in the COUNTY OF GILA, State of Arizona, and has a general circulation therein; that said newspaper has been published continuously and uninterruptedly in said COUNTY OF GILA for a period of more than fifty-two weeks prior to the first publication of the annexed legal notice or advertisement; that said newspaper has been admitted to the United States mails as second-class matter under the provisions of the Act of March 3, 1879, or any amendments thereof, and that said newspaper is a newspaper duly qualified for publishing legal notices and advertisements within the meaning of the laws of the State of Arizona. That the annexed legal notice or advertisement was published in the regular and entire issue of every number of said daily newspaper for the period of 2.00 consecutive insertions; and that the first publication of said notice was in the issue of said newspaper dated July 14 A.D., 2023, and that the last publication of said notice was in the issue of said newspaper dated July 21 A.D., 2023. In witness whereof I have hereunto set my hand this July 21 A.D., 2023.

A Fowler

Ann Fowler

Subscribed and sworn to before me, a Notary Public in and for the COUNTY OF GILA, State of Arizona July 21 A.D., 2023.

Julie Lynn Williams

Julie Lynn Williams, Notary Public

JULIE LYNN WILLIAMS
NOTARY PUBLIC - ARIZONA
GILA COUNTY
COMMISSION # 646663
MY COMMISSION EXPIRES
MARCH 29, 2027

https://attendee.gotowebinar.com/register/5019405153517343584. After registering, you will receive a confirmation email containing information about joining the webinar. If you do not wish to verbally comment on this permit, we strongly encourage you to listen in by calling (914) 614-3221, and entering webinar code 610-049-524.
The draft permit, SIP revision, and related documentation are available for review online at azdeq.gov/notices by searching for the date of this public notice, or in person at the ADEQ Records Center by scheduling an appointment at least 48 hours in advance. For ADEQ Records Center information, visit azdeq.gov/records-center, call (602) 771-4380 or email recordscenter@azdeq.gov. The documents are also available at the Town of Hayden, Town Clerk's Office located at 520 N. Velasco Ave., Hayden, AZ 85135.
ADEQ will consider all comments received in making a final decision on the proposed permit. Everyone commenting will receive notification of the final decision. People who file comments on the permit will have the right to appeal the final decision as an appealable agency action to the Office of Administrative Hearing (OAH) pursuant to A.R.S. § 41.1092.03, and the appeal must be filed within thirty (30) days after the issuance of the final decision. The OAH may sustain, modify, or reverse the final decision.
This permit is subject to review by the Environmental Protection Agency (EPA) pursuant to 40 CFR 70.8 and A.A.C. R18-2-307. If EPA does not object to the issuance of this permit, you may petition to EPA within sixty (60) days after the expiration of EPA's forty-five (45)-day review period. A petition shall be based only on objections to the permit that were raised with reasonable specificity during the public comment period, unless the petitioner demonstrates that it was impracticable to raise such objections within such period, or unless the grounds for such objection arose after such period. Please refer to epa.gov/title-v-operating-permits/title-v-petitions for additional information. Any person who petitions to EPA pursuant to 40 CFR 70.8(d) shall notify ADEQ by certified mail as soon as possible, but in no case more than 10 days following such petition. The notification shall include the grounds for objection and whether such objections were raised during the public comment period.
ADEQ will take reasonable measures to provide access to department services to individuals with limited ability to speak, write or understand English and/or to those with disabilities. Requests for language translation, ASL interpretation, CART captioning services or disability accommodations must be made at least 48 hours in advance by contacting the Title VI Nondiscrimination Coordinator, Leonard Drago, at (602) 771-2288 or Drago.Leonard@azdeq.gov. For a TTY or other device, Telecommunications Relay Services are available by calling 711.
ADEQ tomará las medidas razonables para proveer acceso a los servicios del departamento a personas con capacidad limitada para hablar, escribir o entender inglés y/o para personas con discapacidades. Las solicitudes de servicios de traducción de idiomas, interpretación ASL (lengua de signos americano), subtitulado de CART, o adaptaciones por discapacidad deben realizarse con al menos 48 horas de anticipación comunicándose con el Coordinador de Anti-Discriminación del Título VI, Leonard Drago, al (602) 771-2288 o Drago.Leonard@azdeq.gov. Para un TTY u otro dispositivo, los servicios de retrans-

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Payson Roundup

STATE OF ARIZONA 10113134

COUNTY OF GILA 7/14/2023

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A Fowler

Ann Fowler

Subscribed and sworn to before me, a Notary Public in and for the COUNTY OF GILA, State of Arizona July 21 A.D., 2023.

Julie Lynn Williams

Julie Lynn Williams, Notary Public

JULIE LYNN WILLIAMS
NOTARY PUBLIC - ARIZONA
GILA COUNTY
COMMISSION # 646663
MY COMMISSION EXPIRES
MARCH 29, 2027

misión de telecomunicac-
iones están disponible
llamando al 711.

The Arizona Silver Belt Newspaper
298 N. Pine Street
Globe, AZ 85501
Telephone: 928-425-7121

Affidavit of Publication

State of Arizona)
County of Gila) ss

I am a citizen of the United States and a resident of the State of Arizona; I am over the age of eighteen years, and not a party to or interested in the entitled matter. I am the principal clerk of the printer and publisher of the ARIZONA SILVER BELT, a newspaper published in the English language in the city of GLOBE, county of GILA, state of Arizona and adjudged a newspaper of general circulation.

The Arizona Silver Belt, is a newspaper which is published weekly, is of general circulation and is in compliance with the Arizona Revised Statutes §§ 10-140.34 & 39-201.A & B. (Please note, publication has to be completed within 60 days of filing.) The notice has been published two (2) consecutive weeks in the newspaper listed above on July 19, 2023 and July 26, 2023.

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

TNixon

Tina Nixon

Subscribed and sworn to before me, a Notary Public in and for said County and State, this 1st day of August, 2023.

Notary Public
My Commission Expires: 5-14-26

NADINE ALLISON MCGILTON
NOTARY PUBLIC – ARIZONA
GILA COUNTY
Commission Expires May 14, 2026
Commission No. 625109

PUBLIC NOTICE
YOU HAVE A VOICE IN AIR POLLUTION CONTROL IN ARIZONA

The Arizona Department of Environmental Quality (ADEQ) proposes two actions through this public notice. First, ADEQ proposes to issue Significant Permit Revision Number 96410 to ASARCO LLC - Hayden Operations which will update fugitive roofline monitoring requirements at the ASARCO - Hayden Smelter. Second, the ADEQ proposes to update the Arizona State Implementation Plan (SIP) for the Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 National Ambient Air Quality Standards (NAAQS) to incorporate the changes to Significant Permit Revision Number 96410.

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This public notice provides information to help you participate in the decision-making process. You have an opportunity to submit written comments about this permit. In addition, ADEQ will hold a virtual public hearing via GoToWebinar on August 14, 2023 at 2:00 PM. To submit written comments, include your name, mailing address, signature (and/or your agent or attorney signature) and clearly explain why the permit should or should not be issued. Grounds for comment are limited to whether the permit meets the criteria for issuance spelled out in the state air pollution control laws or rules. The public notice period is in effect from July 14, 2023 to August 14, 2023. Comments regarding the SIP revision may be submitted in writing to: Zachary Dorn, Air Quality Improvement Planning, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to dorn.zachary@azdeq.gov. Comments regarding the permit revision may be submitted in writing to: Karla Murrieta, Air Permits Unit, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to airpermits@azdeq.gov. Comments must be received by August 14, 2023.

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The draft permit, SIP revision, and related documentation are available for review online at azdeq.gov/notices by searching for the date of this public notice, or in person at the ADEQ Records Center by scheduling an appointment at least 48 hours in advance. For ADEQ Records Center information, visit azdeq.gov/records-center, call (602) 771-4380 or email recordscenter@azdeq.gov. The documents are also available at the Town of Hayden, Town Clerk's Office located at 520 N. Velasco Ave., Hayden, AZ 85135.

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First Pub:07-19-2023
Last Pub:07-26-2023
LE 1691

State Implementation Plan and Permit Revision, and GEP Demonstration for the Hayden SO2 NAA

Oral Proceeding

Public Hearing Transcript

August 14, 2023

Laura Mirtich. Good afternoon, everyone. Thank you for coming. I now open this hearing on the proposed SIP revision for the Hayden SO2 SIP nonattainment area, title V operating permit revision, and good engineering practice (GEP) demonstration.

This proceeding is being recorded and will be preserved for the record.

Today is August 14, 2023 and the time is 2:01 p.m. This hearing is being held virtually using GoToWebinar software. My name is Laura Mirtch, and I have been appointed by the Director of the Arizona Department of Environmental Quality to preside at this proceeding.

The purpose of this oral proceeding is to provide the public an opportunity to:

Hear a summary of the proposed SIP revision, permit revision, and GEP demonstration, ask questions, or provide comments if they chose to do so.

The Department's representatives for today's hearing are Mariana Mendez Armendariz and Zachary Dorn of the ADEQ's Air Quality Division.

Public notice of the comment period and hearing was published in the Payson Roundup and Arizona Silver Belt on July 14th and July 21st, 2023, and July 19th and 26th respectively. Copies of the proposal were made available on ADEQ's website, ADEQ Phoenix Records Center, and the Hayden Senior Center starting July 14, 2023 and will remain available until the close of comment period. The comment period was set to end at 5:00 PM today. However, due to technical difficulties with the ADEQ website, ADEQ intends to extend the comment period. ADEQ will announce the close of the comment period in a subsequent notice.

If you wish to make a verbal comment, please raise your hand using the GoToWebinar Software and you will be called on during this proceeding. You may also submit written comments during

today's hearing. Comments regarding the SIP revision and the GEP re-assessment may also be submitted in writing to: Zachary Dorn, Air Quality Improvement Planning, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to dorn.zachary@azdeq.gov. Comments regarding the permit revision may be submitted in writing to: Karla Murrieta, Air Permits Unit, ADEQ, 1110 W. Washington St., 3415A-1, Phoenix, AZ 85007 or via email to airpermits@azdeq.gov. Comments must be received or postmarked no later than 5:00 PM on August 14, 2023.

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Then I will conduct the oral comment portion. At that time, I will call speakers in the order that hands raised or comments were received.

Please be aware that any comments at today's hearing that you want the Department to formally consider must be given either in writing or on the record during this oral proceeding.

At this time, Zachary and Mariana will give a brief overview of the proposal.

_____

Zachary Dorn: Thank you, Laura.

Hello and thank you for coming. This public hearing is regarding the ADEQ's proposal of three actions. First, ADEQ proposes a revision to the Arizona State Implementation Plan, or SIP, for the Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 National Ambient Air

Quality Standards (NAAQS), which ADEQ will request the U.S. Environmental Protection Agency to approve as a revision to the Arizona SIP. Second, ADEQ proposes Significant Permit Revision Number 96410, revision to Air Quality Control Permit Number 39948, to ASARCO LLC - Hayden Operations for the incorporation of the Uptake Improvement Project, Fuming Ladle Control Project, the Anode Furnaces Secondary Hood Project, and the addition of sulfur dioxide (SO2) emission limitations as part of the SIP for the Hayden SO2 Nonattainment Area at the ASARCO - Hayden Smelter, a copper concentrator and smelter facility located at 100 N. Hayden Ave., Hayden, AZ 85135. Third, ADEQ proposes a revised good engineering practice (GEP) demonstration study pursuant to 40 Code of Federal Regulations (CFR) § 51.118.

On June 22, 2010, EPA replaced the existing annual and 24-hour primary sulfur dioxide NAAQS with a new 1-hour sulfur dioxide standard set at a level of 75 parts per billion (ppb) to better protect public health by reducing public exposure to elevated short-term concentrations of sulfur dioxide.

To bring the area back into attainment and to satisfy CAA requirements, in 2017, ADEQ developed revisions to Arizona's State Implementation Plan for the Hayden Sulfur Dioxide nonattainment area.

However, On November 5, 2020 EPA published a limited approval and limited disapproval of the Hayden Smelter rule A.A.C. R18-2-B1302, submitted to EPA with the ADEQ 2017 SIP. EPA issued its limited disapproval because some rule provisions conflict with the requirements of CAA §§ 110 and 172(c)(6). EPA found:

1)the rule does not contain any numeric emission limitations and emission limits or ongoing monitoring requirements corresponding to the levels of fugitive emissions that were modeled in the 2017 nonattainment SIP;

2) R18-2-B1302(E)(4) provides an option for alternative sampling points that could undermine the enforceable of the stack emissions limit;

3) R18-2-B1302(E)(6) allows for just under 10% of the total facility SO2 emissions annually to be exempt from continuous emission monitoring system (CEMS) requirement;

4) the rule lacks a method for measuring or calculating emissions from the shutdown ventilation flue, which could compromise the enforceability of the main stack emissions limit;

and 5) the rule lacks a method for calculating hourly SO2 emissions

EPA published its "partial approval and partial disapproval" of the 2017 SIP on November 10, 2020. This final action approved the emissions inventory element under CAA §§ 172(c)(3) and

(4) and affirmed that the State met the new source review requirement for the Hayden SO2 NAA under CAA § 175(c)(5). However, EPA disapproved the attainment demonstration, Reasonably Available Control Measures/Reasonably Available Control Technology, enforceable emissions limitations, reasonable further progress, and contingency measures elements.

The purpose of this SIP revision is to correct these disapproval and to attain the NAAQS, no later than January 31, 2027.

Regarding the GEP demonstration, in 1983, EPA approved a GEP stack height demonstration for the 1,000-foot (305 m) main stack at the ASARCO - Hayden Smelter located in Hayden, Arizona. At EPA's request in mid-2015 and 2022, the GEP stack height determination was reassessed with respect to the current GEP regulations. This re-assessment—included in the proposed SIP revision—confirmed that the original GEP stack height determination is consistent with the 1985 regulations and that the 1,000-foot stack remains an appropriate GEP determination.

ADEQ previously noticed this SIP revision, permit revision and GEP demonstration in the Payson Roundup and Arizona Silver Belt on May 16th and May 23rd, 2023, and May 17th and 24th, 2023. On June 15, 2023, ADEQ held a public hearing in Hayden, AZ. During the public hearing and comment period, ADEQ received a comment requesting a change on permit Condition III.C.2 of Attachment "I" from specifying a Relative Accuracy Test Audit (RATA) to a Cylinder Gas Audit (CGA). During this comment period, ADEQ is only accepting comments on the proposed change from RATA to CGA for fugitive roofline monitoring requirements in the permit condition and as part of the SIP revision.

I will now pass the presentation to Mariana to provide information regarding the significant permit revision.

* * * * *

Mariana Mendez Armendariz: Thank you Zach, The facility is subject to the requirements of the Federal Clean Air Act, Code of Federal Regulations, Arizona Revised Statute 49-426, and the Arizona Administrative Code, Title 18, Chapter 2. The facility emits the following air contaminants: coarse particulate matter with diameters 10 micrometers or less (PM10), fine particulate matter with diameters 2.5 micrometers or less (PM2.5), volatile organic compounds (VOCs), nitrogen oxides (NOX), sulfur dioxide (SO2), carbon monoxide (CO) and hazardous air pollutants (HAPs).

ADEQ proposes Significant Permit Revision Number 96410, revision to Air Quality Control Permit Number 39948, to ASARCO LLC - Hayden Operations for the incorporation of the Uptake Improvement Project, Fuming Ladle Control Project, the Anode Furnaces Secondary Hood Project, and the addition of sulfur dioxide (SO2) emission limitations as part of the SIP for the Hayden SO2 Nonattainment Area at the ASARCO - Hayden Smelter, a copper concentrator and smelter facility located at 100 N. Hayden Ave., Hayden, AZ 85135.

* * * * *

Laura Mirtich: This concludes the overview portion of this proceeding.

* * * * *

Laura Mirtich: I now open this proceeding for oral comments.

If you wish to ask a question or make a comment, please press the raise hand icon in the toolbar. We will call on any raised hands during and unmute your line. Alternatively, you can type your comment into the chat.

[45 seconds later]

Laura Mirtich: All right, Wayne Leipold you've been unmuted from our rend so you should be able to turn on your microphone and speak.

Wayne Leipold: I have a question. Since all the smelter has shut down what portion of the requirements for those projects in the facility be expiring current permit, it's being now revised to extend it out five more years. What portion of that has been actually been completed prior to the shutdown?

Wayne: Hello?

Zachary Dorn: Hi just a second. I'm afraid I didn't quite follow the question. Could you repeat it one more time for us?

Wayne Leipold: yeah, I.. seing how the smelter shut down. Oh, wondering what portion of the modifications that were in the old permit actually took place and how they're addressed in the new permit?

Zach: Oh I think I understand the question now. Off the top of my head, I think we'll have to go back and follow up with you later as to what portion of the prior work has already been completed. Because I don't think we have that information on hand at the moment. But with regard to this permit revision it is just with regard to adding the conditions that we discussed here today.

Laura Mirtich: Are there any further questions?

Alright, seeing no comments.

This concludes the oral comment portion of this proceeding.

* * * * *

Laura: If you have not already submitted written comments, you may submit them at this time. Again, ADEQ intends to extend the comment period for this proposal in a subsequent notice.

Thank you for attending.

The time is now 2:15. PM. I now close this oral proceeding.

ADEQ
Arizona Department of Environmental Quality

Hayden SO2 Responsiveness Summary

Air Quality Division
October 3, 2023 Final

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1 Responsiveness Summary

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

AIR QUALITY DIVISION

RESPONSIVENESS SUMMARY
TO
PUBLIC COMMENTS

SIP Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 SO_2 NAAQS
Public Comment Period:
May 16, 2023, to June 15, 2023
&
July 14, 2023, to August 14, 2023

October 3, 2023

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I. Background

This document contains the Arizona Department of Environmental Quality's (ADEQ or "Department") responses to all significant public comments received on ADEQ's proposed SIP Revision: 2023 Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 SO_2 NAAQS. ADEQ held two oral comment proceedings for this SIP revision. The first was held on June 15, 2023 at the Hayden Senior Center, 520 Velasco Avenue, Hayden AZ 85135. The second was held virtually using Go-To-Webinar Software. ADEQ received comments from Asarco, LLC on June 15, 2023 and one verbal question during its August 14, 2023 public hearing.

II. Comments and Questions

To provide context and clarity, ADEQ included direct quotes of Asarco's comments extracted from the original letter. The Department's response to each comment is directly below each comment. ADEQ notes the page numbers referenced in Asarco's comment letter correspond to the numbering of the pdf file, and not the SIP revision's page numbers.

A. Comments

Comment 1: On page 12, second to last line, it should state that "In 2015, the Hayden smelter produced approximately 350 to 400 million pounds of copper annually." On page 13, the Hayden smelter is limited by its air permit to smelting 693,500 tons concentrate/year and not the 720,000 tons/year stated. On page 22, the current Hayden Title V permit also lists NESHAP Subpart EEEEEE as applicable until such time as ASARCO elects treatment as a major source of HAPs and so the table header should state "NESHAP Subpart QQQ/EEEEEE - NESHAPS for Primary Copper Smelting" instead of just Subpart QQQ.

ADEQ Response: ADEQ agrees with the comment and has made the appropriate changes.

Comment 2: On page 48, in section 4.1.5 Peirce-Smith Converters, third paragraph, when secondary hood gases are routed to the secondary hood baghouse they are treated by high surface area lime injection for SO2 control. On page 49, in section 4.1.6, final paragraph, ASARCO believes that the final sentence should read "The baghouse initially exhausted through a dedicated stack, however, the post-CRP configuration routes the exhaust to the 1,000-foot stack center."

ADEQ Response: ADEQ agrees with the comment and has made the appropriate changes.

Comment 3: On page 58, in section 4.4.1, the "anode furnace baghouse stack" no longer exists after the Converter Retrofit Project. It was rerouted to the main stack center as shown in the diagram immediately above the section. Under *Main Stack,* it may be appropriate to add a second sentence stating that "Treated emissions from the acid plant are exhausted through the main stack center." ASARCO recommends deleting the "(new)"

before vent gas baghouse and changing "were vented to the annulus" to "are vented to the main stack annulus."

ADEQ Response: ADEQ agrees with these comments and has made the appropriate changes.

Comment 4: On page 66, ASARCO recommends revising the first full paragraph as follows to describe the control strategy more clearly:

The emission limitation for the Hayden Smelter is a combination of SO2 emissions from the acid plant tail gas stack, secondary and tertiary converter ventilation gases, ~~and the (new)~~ vent gas baghouse (flash furnace matte tapping, slag skimming, and concentrate dryers), and anode primary baghouse. Under A.A.C. R18-2-B1302(C)(l), the emissions limit from the main stack shallnot exceed 1069.1 pounds per hour on a 14-operating day average basis unless 1518 pounds or less is emitted during each hour of the 14-operating day period.[67] As will be discussed below in Section 4.5.3, this SIP revision is proposing to change this from the dual limit described above to a single 1069.1 lb/hr, 14-operating day average limit. A summary of the attainment modeling demonstration supporting the emissions limit will be discussed in Chapter 5, with the full documentation in Appendix C.

ADEQ Response: ADEQ agrees with these comments and has made the appropriate changes.

Comment 5: On page 71, in section 4.5.3.7 Compliance/Implementation Schedule, ASARCO believes that ADEQ has inadvertently maintained earlier language. ASARCO believes that the following language more accurately sets forth the implementation schedule:

The compliance/limitation schedule is defined in Appendix A. The operational controls and limitations in Condition II of the permit revision shall be implemented upon smelter restart or the time specified in Condition II, whichever is later.71 The requirements of Condition II are federally enforceable upon restart. The SO2 limitations in Condition Ill (Sulfur Dioxide Emissions Limitations) of the proposed permit revision shall become effective 60 days after the Hayden smelter achieves maximum production after restart or 180 days after restart, whichever occurs first, ~~or upon the Administrator's action approving Condition Ill as part of the state implementation plan for sulfur dioxide control, whichever occurs last~~. The requirements of Condition Ill are state enforceable only until the effective date of the EPA Administrator's action approving them as part of the SIP revision for sulfur dioxide control.

ADEQ Response: ADEQ agrees with these comments and has made the appropriate changes.

Comment 6: On page 73, top, ASARCO believes a bit more detail about the proposed compliance demonstration would assist EPA review. ASARCO proposes adding the following:

Requirements for the compliance demonstration are contained in the proposed permit revision.[75] This provides two compliance demonstrations, with the first being for main stack compliance.[76] The second, is the fugitive limit compliance demonstration.[77] Compliance with the main stack limit will be demonstrated by summing the emissions from each of the emission points CEMS, including the acid plant tail gas (flash furnace and converter blowing emissions), vent gas baghouse (flash furnace fugitives plus matte tapping and slag skimming emissions), secondary hood baghouse (converter secondary emissions, uptake improvement project and fuming ladle control emissions), converter tertiary hoods (converter tertiary emissions), anode furnace baghouse and anode secondary hood baghouse and calculating a new 14-operating day average each operating day to compare to the 1069.1 lb/hr 14-operating day main stack limit. For the fugitive sources, compliance would be demonstrated by comparing the hourly emissions from each area (flash furnace, converter aisle, and anode aisle) gathered by the roofline monitoring system to their respective limit.

ADEQ Response: ADEQ agrees with these comments and has made the appropriate changes.

Comment 7: On page 75, section 5 Attainment Demonstration and Reasonable Further Progress, ASARCO believes that in the second paragraph ADEQ meant to state that "ADEQ appointed ASARCO's modeling consultant, Blue Sky Modeling, to perform the attainment demonstration for the Hayden SO2 nonattainment area SIP, while ADEQ used its expertise in an oversight and review capacity." The current reference is to FMMI and AMEC.

ADEQ Response: ADEQ agrees that the reference to FMMI and AMEC was inadvertent. ADEQ agrees with the comment and has made the appropriate changes.

Comment 8: On page 77, section 5.1.2, ASARCO relies on security patrolling and cameras in addition to fencing and steep/rough terrain. Fencing is in place in all areas where the smelter abuts the Town of Hayden.

ADEQ Response: ADEQ agrees with the comment and has made the appropriate changes.

Comment 9: On page 98, section 9.9 Air Toxics, ADEQ states that "the Hayden smelter has the potential to emit more than 25 tons of hazardous air pollutants (HAP) and is a major source of HAPs emissions, and is therefore subject to National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Primary Copper Smelting Major Sources, 40 CFR 63, Subpart QQQ." This statement is erroneous, lacks any foundation in the record of this SIP proceeding, and contradicts ADEQ's own air permit issued to the Hayden smelter, which establishes effective limits that preclude the Hayden smelter from being an area source if its potential to emit were to exceed 10 tons/year of any HAP or 25 tons/year of any combination of HAPs, which ASARCO denies has been the case. *See* Air Quality Permit No. 39948, Attachment "B", Condition II.A. (limiting total

HAP to less than 10 tons of any single HAP on a rolling 12-month basis and 25 tons of all HAPs on a rolling 12-month basis). These conditions are made enforceable by a comprehensive monitoring, testing, recordkeeping and compliance tracking program set forth in Conditions II.C through D. The Hayden smelter has not exceeded those limits. The SIP discussion is in error and must be corrected.

ADEQ Response: ADEQ agrees with these comments and has made the appropriate changes.

B. Questions

Below is a summary of verbal question ADEQ received during its August 14, 2023 public hearing and ADEQ's response

Question 1: One commenter asked if the improvements to the smelter from the 2017 SIP revision and permit revision had been completed.

ADEQ Response: As detailed in Section 5.5.1 of the SIP revision, Asarco's Converter Retrofit Project for the Hayden Smelter Operations was completed in 2018.

III. Revisions

Based on comments received by ADEQ, the Department has made the following revisions to the final version of ADEQ's *2023 Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 SO_2 NAAQS.*

1. On page 11, changed the "mine" to "smelter" in the second paragraph of Section 1.6.4. On page, changed 720,000 ton/year to 693,500 ton/year. On page 21, added Subpart EEEEEE to the list of NESHAPs in table 1-10.

2. On page 43, added the sentence "Secondary hood gases routed to the secondary hood baghouse are treated by high surface area lime injection for SO2 control" to Section 4.1.5. On page 44, amended the last sentence of 4.1.6 to read, "The baghouse initially exhausted through a dedicated stack, however the post-CRP configuration routes the exhaust to the 1,000-foot stack center"

3. On page 52, removed "anode furnace baghouse stack" from the first sentence of Section 4.4.1. On page 52, added a sentence to read, "Treated emissions from the acid plant are exhausted through the main stack center." Also, on page 52, ADEQ deleted the "(new)" before vent gas baghouse and changed "were vented to the annulus" to "are vented to the main stack annulus."

4. On page 59, made the changes recommended in Asarco's comment 4 to Section 4.5.2.4.7.

5. On page 64 removed the phrase "or upon the Administrator's action approving Condition III as part of the state implementation plan for sulfur dioxide control, whichever occurs last" from Section 4.5.3.7.

6. On page 66, added the following language to the Compliance Demonstration section of 4.5.3.9:

a. Compliance with the main stack limit will be demonstrated by summing the emissions from each of the emission points CEMS, including the acid plant tail gas (flash furnace and converter blowing emissions), vent gas baghouse (flash furnace fugitives plus matte tapping and slag skimming emissions), secondary hood baghouse (converter secondary emissions, uptake improvement project and fuming ladle control emissions), converter tertiary hoods (converter tertiary emissions), anode furnace baghouse and anode secondary hood baghouse and calculating a new 14-operating day average each operating day to compare to the 1069.1 lb/hr 14-operating day main stack limit. For the fugitive sources, compliance would be demonstrated by comparing the hourly emissions from each area (flash furnace, converter aisle, and anode aisle) gathered by the roofline monitoring system to their respective limit.

7. On page 68, corrected the second paragraph of Chapter 5 to read "ADEQ appointed Asarco's modeling consultant, Blue Sky Modeling,"

8. On page 70, in Section 5.1.2, added two sentences to read, "Asarco relies on security patrolling and cameras in addition to fencing and steep/rough terrain. Fencing is in place where the smelter abuts the Town of Hayden."

9. On Page 89, in Section 9.9, ADEQ amended the section to read:
Copper smelters are required to comply with the National Emission Standards to Hazardous Air Pollutants (NESHAP) for Primary Copper Smelting. The applicable NESHAPs for primary copper smelters are 40 CFR Part 63, Subpart QQQ (for major sources) and Subpart EEEEEE (for area sources). The Hayden smelter's permit establishes effective limits that precludes it from being an area source if its potential to emit 10 tons/year of any HAP or 25 tons/year of any combination of HAPs, which Asarco denies has been the case. *See* Air Quality Permit 39948, Attachment "B" Condition II.A (limiting total HAP to less than 10 tons of any single HAP on a rolling 12-month basis and 25 tons of all HAPs on a rolling 12-month basis). These conditions are made enforceable by a comprehensive monitoring, testing, recordkeeping and compliance tracking program set forth in Conditions II.C. through D. Asarco asserts that the Hayden smelter has not exceeded those limits. Therefore, ADEQ concludes that this SIP revision will not interfere with any applicable air toxics requirements of the CAA.

2 Compilation of Public Comments

ADEQ received the following public comments during its public comment period for the *2023 Hayden Sulfur Dioxide Nonattainment Area for the 1971 and 2010 SO_2 NAAQS* which ran from May 16, 2023 to June 15, 2023. As stated above, the only public comment ADEQ received was from Asarco, LLC dated June 15, 2023. A copy of this comment letter attached to this Appendix. The question received is transcribed in the August 14, 2023 hearing transcript contained in Appendix F.

ADEQ
Arizona Department
of Environmental Quality

Appendix G
Authorizing Statutes and Delegation of Authority

A.R.S. §§ 49-104, 49-106, 49-402, 49-404, 49-406, 49-425, 49-426, Delegation of Authority.

Air Quality Division
October 3, 2023 Final Version

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VIEW DOCUMENT

The Arizona Revised Statutes have been updated to include the revised sections from the 55th Legislature, 2nd Regular Session. Please note that the next update of this compilation will not take place until after the conclusion of the 56th Legislature, 1st Regular Session, which convenes in January 2023.

DISCLAIMER

This online version of the Arizona Revised Statutes is primarily maintained for legislative drafting purposes and reflects the version of law that is effective on January 1st of the year following the most recent legislative session. The official version of the Arizona Revised Statutes is published by Thomson Reuters.

49-104. Powers and duties of the department and director

A. The department shall:

1. Formulate policies, plans and programs to implement this title to protect the environment.

2. Stimulate and encourage all local, state, regional and federal governmental agencies and all private persons and enterprises that have similar and related objectives and purposes, cooperate with those agencies, persons and enterprises and correlate department plans, programs and operations with those of the agencies, persons and enterprises.

3. Conduct research on its own initiative or at the request of the governor, the legislature or state or local agencies pertaining to any department objectives.

4. Provide information and advice on request of any local, state or federal agencies and private persons and business enterprises on matters within the scope of the department.

5. Consult with and make recommendations to the governor and the legislature on all matters concerning department objectives.

6. Promote and coordinate the management of air resources to ensure their protection, enhancement and balanced utilization consistent with the environmental policy of this state.

7. Promote and coordinate the protection and enhancement of the quality of water resources consistent with the environmental policy of this state.

8. Encourage industrial, commercial, residential and community development that maximizes environmental benefits and minimizes the effects of less desirable environmental conditions.

9. Ensure the preservation and enhancement of natural beauty and man-made scenic qualities

9. Ensure the preservation and enhancement of natural beauty and man-made scenic qualities.

10. Provide for the prevention and abatement of all water and air pollution including that related to particulates, gases, dust, vapors, noise, radiation, odor, nutrients and heated liquids in accordance with article 3 of this chapter and chapters 2 and 3 of this title.

11. Promote and recommend methods for the recovery, recycling and reuse or, if recycling is not possible, the disposal of solid wastes consistent with sound health, scenic and environmental quality policies. The department shall report annually on its revenues and expenditures relating to the solid and hazardous waste programs overseen or administered by the department.

12. Prevent pollution through the regulation of the storage, handling and transportation of solids, liquids and gases that may cause or contribute to pollution.

13. Promote the restoration and reclamation of degraded or despoiled areas and natural resources.

14. Participate in the state civil defense program and develop the necessary organization and facilities to meet wartime or other disasters.

15. Cooperate with the Arizona-Mexico commission in the governor's office and with researchers at universities in this state to collect data and conduct projects in the United States and Mexico on issues that are within the scope of the department's duties and that relate to quality of life, trade and economic development in this state in a manner that will help the Arizona-Mexico commission to assess and enhance the economic competitiveness of this state and of the Arizona-Mexico region.

16. Unless specifically authorized by the legislature, ensure that state laws, rules, standards, permits, variances and orders are adopted and construed to be consistent with and no more stringent than the corresponding federal law that addresses the same subject matter. This paragraph does not adversely affect standards adopted by an Indian tribe under federal law.

17. Provide administrative and staff support for the oil and gas conservation commission.

B. The department, through the director, shall:

1. Contract for the services of outside advisers, consultants and aides reasonably necessary or desirable to enable the department to adequately perform its duties.

2. Contract and incur obligations reasonably necessary or desirable within the general scope of department activities and operations to enable the department to adequately perform its duties.

3. Utilize any medium of communication, publication and exhibition when disseminating information, advertising and publicity in any field of its purposes, objectives or duties.

4. Adopt procedural rules that are necessary to implement the authority granted under this title, but that are not inconsistent

4. Adopt procedural rules that are necessary to implement the authority granted under this title, but that are not inconsistent with other provisions of this title.

5. Contract with other agencies, including laboratories, in furthering any department program.

6. Use monies, facilities or services to provide matching contributions under federal or other programs that further the objectives and programs of the department.

7. Accept gifts, grants, matching monies or direct payments from public or private agencies or private persons and enterprises for department services and publications and to conduct programs that are consistent with the general purposes and objectives of this chapter. Monies received pursuant to this paragraph shall be deposited in the department fund corresponding to the service, publication or program provided.

8. Provide for the examination of any premises if the director has reasonable cause to believe that a violation of any environmental law or rule exists or is being committed on the premises. The director shall give the owner or operator the opportunity for its representative to accompany the director on an examination of those premises. Within forty-five days after the date of the examination, the department shall provide to the owner or operator a copy of any report produced as a result of any examination of the premises.

9. Supervise sanitary engineering facilities and projects in this state, authority for which is vested in the department, and own or lease land on which sanitary engineering facilities are located, and operate the facilities, if the director determines that owning, leasing or operating is necessary for the public health, safety or welfare.

10. Adopt and enforce rules relating to approving design documents for constructing, improving and operating sanitary engineering and other facilities for disposing of solid, liquid or gaseous deleterious matter.

11. Define and prescribe reasonably necessary rules regarding the water supply, sewage disposal and garbage collection and disposal for subdivisions. The rules shall:

(a) Provide for minimum sanitary facilities to be installed in the subdivision and may require that water systems plan for future needs and be of adequate size and capacity to deliver specified minimum quantities of drinking water and to treat all sewage.

(b) Provide that the design documents showing or describing the water supply, sewage disposal and garbage collection facilities be submitted with a fee to the department for review and that no lots in any subdivision be offered for sale before compliance with the standards and rules has been demonstrated by approval of the design documents by the department.

12. Prescribe reasonably necessary measures to prevent pollution of water used in public or semipublic swimming pools and bathing places and to prevent deleterious conditions at those places. The rules shall prescribe minimum standards for the design of and for sanitary conditions at any public or semipublic swimming pool or bathing place and provide for abatement as public nuisances of premises and facilities that do not comply with the minimum standards. The rules shall be developed in cooperation

nuisances of premises and facilities that do not comply with the minimum standards. The rules shall be developed in cooperation with the director of the department of health services and shall be consistent with the rules adopted by the director of the department of health services pursuant to section 36-136, subsection I, paragraph 10.

13. Prescribe reasonable rules regarding sewage collection, treatment, disposal and reclamation systems to prevent the transmission of sewage borne or insect borne diseases. The rules shall:

(a) Prescribe minimum standards for the design of sewage collection systems and treatment, disposal and reclamation systems and for operating the systems.

(b) Provide for inspecting the premises, systems and installations and for abating as a public nuisance any collection system, process, treatment plant, disposal system or reclamation system that does not comply with the minimum standards.

(c) Require that design documents for all sewage collection systems, sewage collection system extensions, treatment plants, processes, devices, equipment, disposal systems, on-site wastewater treatment facilities and reclamation systems be submitted with a fee for review to the department and may require that the design documents anticipate and provide for future sewage treatment needs.

(d) Require that construction, reconstruction, installation or initiation of any sewage collection system, sewage collection system extension, treatment plant, process, device, equipment, disposal system, on-site wastewater treatment facility or reclamation system conform with applicable requirements.

14. Prescribe reasonably necessary rules regarding excreta storage, handling, treatment, transportation and disposal. The rules may:

(a) Prescribe minimum standards for human excreta storage, handling, treatment, transportation and disposal and shall provide for inspection of premises, processes and vehicles and for abating as public nuisances any premises, processes or vehicles that do not comply with the minimum standards.

(b) Provide that vehicles transporting human excreta from privies, septic tanks, cesspools and other treatment processes shall be licensed by the department subject to compliance with the rules. The department may require payment of a fee as a condition of licensure. The department may establish by rule a fee as a condition of licensure, including a maximum fee. As part of the rulemaking process, there must be public notice and comment and a review of the rule by the joint legislative budget committee. The department shall not increase that fee by rule without specific statutory authority for the increase. The fees shall be deposited, pursuant to sections 35-146 and 35-147, in the solid waste fee fund established by section 49-881.

15. Perform the responsibilities of implementing and maintaining a data automation management system to support the reporting requirements of title III of the superfund amendments and reauthorization act of 1986 (P.L. 99-499) and article 2 of this chapter.

16. Approve remediation levels pursuant to article 4 of this chapter.

17. Establish or revise fees by rule pursuant to the authority granted under title 44, chapter 9, article 8 and chapters 4 and 5 of this title for the department to adequately perform its duties. All fees shall be fairly assessed and impose the least burden and cost to the parties subject to the fees. In establishing or revising fees, the department shall base the fees on:

(a) The direct and indirect costs of the department's relevant duties, including employee salaries and benefits, professional and outside services, equipment, in-state travel and other necessary operational expenses directly related to issuing licenses as defined in title 41, chapter 6 and enforcing the requirements of the applicable regulatory program.

(b) The availability of other funds for the duties performed.

(c) The impact of the fees on the parties subject to the fees.

(d) The fees charged for similar duties performed by the department, other agencies and the private sector.

18. Appoint a person with a background in oil and gas conservation to act on behalf of the oil and gas conservation commission and administer and enforce the applicable provisions of title 27, chapter 4 relating to the oil and gas conservation commission.

C. The department may:

1. Charge fees to cover the costs of all permits and inspections it performs to ensure compliance with rules adopted under section 49-203, except that state agencies are exempt from paying those fees that are not associated with the dredge and fill permit program established pursuant to chapter 2, article 3.2 of this title. For services provided under the dredge and fill permit program, a state agency shall pay either:

(a) The fees established by the department under the dredge and fill permit program.

(b) The reasonable cost of services provided by the department pursuant to an interagency service agreement.

2. Monies collected pursuant to this subsection shall be deposited, pursuant to sections 35-146 and 35-147, in the water quality fee fund established by section 49-210.

3. Contract with private consultants for the purposes of assisting the department in reviewing applications for licenses, permits or other authorizations to determine whether an applicant meets the criteria for issuance of the license, permit or other authorization. If the department contracts with a consultant under this paragraph, an applicant may request that the department

expedite the application review by requesting that the department use the services of the consultant and by agreeing to pay the department the costs of the consultant's services. Notwithstanding any other law, monies paid by applicants for expedited reviews pursuant to this paragraph are appropriated to the department for use in paying consultants for services.

D. The director may:

1. If the director has reasonable cause to believe that a violation of any environmental law or rule exists or is being committed, inspect any person or property in transit through this state and any vehicle in which the person or property is being transported and detain or disinfect the person, property or vehicle as reasonably necessary to protect the environment if a violation exists.

2. Authorize in writing any qualified officer or employee in the department to perform any act that the director is authorized or required to do by law.

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49-106. Statewide application of rules

The rules adopted by the department apply and shall be observed throughout this state, or as provided by their terms, and the appropriate local officer, council or board shall enforce them. This section does not limit the authority of local governing bodies to adopt ordinances and rules within their respective jurisdictions if those ordinances and rules do not conflict with state law and are equal to or more restrictive than the rules of the department, but this section does not grant local governing bodies any authority not otherwise provided by separate state law.

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49-402. State and county control

A. The department shall have original jurisdiction over such sources, permits and violations that pertain to:

1. Major sources in any county that has not received approval from the administrator for new source review under the clean air act and prevention of significant deterioration under the clean air act.

2. Smelting of metal ore.

3. Petroleum refineries.

4. Coal fired electrical generating stations.

5. Portland cement plants.

6. Air pollution by portable sources.

7. Air pollution by mobile sources for the purpose of regulating those sources as prescribed by article 5 of this chapter and consistent with the clean air act.

8. Sources that are subject to title V of the clean air act and that are located in a county for which the administrator has disapproved that county's title V permit program if the department has a title V program that has been approved by the administrator. On approval of that county's title V permit program by the administrator, the county shall resume jurisdiction over those sources.

B. Except as specified in subsection A of this section, the review, issuance, administration and enforcement of permits issued pursuant to this chapter shall be by the county or multi-county air quality control region pursuant to the provisions of article 3 of this chapter. After the director has provided prior written notice to the control officer describing the reason for asserting jurisdiction and has provided an opportunity to confer, the county or multi-county air quality control region shall relinquish

jurisdiction and has provided an opportunity to confer, the county or multi-county air quality control region shall relinquish jurisdiction, control and enforcement over such permits as the director designates and at such times as the director asserts jurisdiction at the state level. The order of the director which asserts state jurisdiction shall specify the matters, geographical area, or sources over which the department shall exercise jurisdiction and control. Such state authority shall then be the sole and exclusive jurisdiction and control to the extent asserted, and the provisions of this chapter shall govern, except as provided in this chapter, until jurisdiction is surrendered by the department to such county or region.

C. Portable sources under jurisdiction of the department under subsection A, paragraph 6 of this section may be required to file notice with the director and the control officer who has jurisdiction over the geographic area that includes the new location before beginning operations at that new location.

D. Notwithstanding any other law, a permit issued to a state regulated source shall include the emission standard or standard of performance adopted pursuant to section 49-479, if such standards are more stringent than those adopted by the director and if such standards are specifically identified as applicable to the permitted source or a component of the permitted source. Such standards shall be applied to sources identified in subsection A, paragraph 2, 3, 4 or 5 of this section only if the standard is formally proposed for adoption as part of the state implementation plan.

E. The regional planning agency for each county which contains a vehicle emissions control area shall develop plan revisions containing transportation related air quality control measures designed to attain and maintain primary and secondary ambient air quality standards as prescribed by and within the time frames specified in the clean air act. In developing the plan revisions, the regional planning agency shall consider all of the following:

1. Mandatory employee parking fees.

2. Park and ride programs.

3. Removal of on-street parking.

4. Ride share programs.

5. Mass transit alternatives.

6. Expansion of public transportation systems.

7. Optimizing freeway ramp metering.

8. Coordinating traffic signal systems.

9. Reduction of traffic congestion at major intersections.

10. Site specific transportation control measures.

11. Reversible lanes.

12. Fixed lanes for buses and carpools.

13. Encouragement of pedestrian travel.

14. Encouragement of bicycle travel.

15. Development of bicycle travel facilities.

16. Employer incentives regarding ride share programs.

17. Modification of work schedules.

18. Strategies for controlling the generation of air pollution by nonresidents of nonattainment or maintenance areas.

19. Use of alternative fuels.

20. Use of emission control devices on public diesel powered vehicles.

21. Paving of roads.

22. Restricting off-road vehicle travel.

23. Construction site air pollution control.

24. Other air quality control measures.

F. Each regional planning agency shall consult with the department of transportation to coordinate the plans developed pursuant to subsection E of this section with transportation plans developed by the department of transportation pursuant to any other law.

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49-404. State implementation plan

A. The director shall maintain a state implementation plan that provides for implementation, maintenance and enforcement of national ambient air quality standards and protection of visibility as required by the clean air act.

B. The director may adopt rules that describe procedures for adoption of revisions to the state implementation plan.

C. The state implementation plan and all revisions adopted before September 30, 1992 remain in effect according to their terms, except to the extent otherwise provided by the clean air act, inconsistent with any provision of the clean air act, or revised by the administrator. No control requirement in effect, or required to be adopted by an order, settlement agreement or plan in effect, before the enactment of the clean air act in any area which is a nonattainment or maintenance area for any air pollutant may be modified after enactment in any manner unless the modification insures equivalent or greater emission reductions of the air pollutant. The director shall evaluate and adopt revisions to the plan in conformity with federal regulations and guidelines promulgated by the administrator for those purposes until the rules required by subsection B are effective.

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49-406. Nonattainment area plan

A. For any ozone, carbon monoxide or particulate nonattainment or maintenance area the governor shall certify the metropolitan planning organization designated to conduct the continuing, cooperative and comprehensive transportation planning process for that area under 23 United States Code section 134 as the agency responsible for the development of a nonattainment or maintenance area plan for that area.

B. For any ozone, carbon monoxide or particulate nonattainment or maintenance area for which no metropolitan planning organization exists, the department shall be certified as the agency responsible for development of a nonattainment or maintenance area plan for that area.

C. For any ozone, carbon monoxide or particulate nonattainment or maintenance area, the department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall, by November 15, 1992, and from time to time as necessary, jointly review and update planning procedures or develop new procedures.

D. In preparing the procedures described in subsection C of this section, the department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall determine which elements of each revised implementation plan will be developed, adopted, and implemented, through means including enforcement, by the state and which by local governments or regional agencies, or any combination of local governments, regional agencies or the state.

E. The department, the planning agency certified pursuant to subsection A of this section on behalf of elected officials of affected local government, the county air pollution control department or district, and the department of transportation shall enter into a memorandum of agreement for the purpose of coordinating the implementation of the procedures described in subsection C and D of this section

D of this section.

F. At a minimum, the memorandum of agreement shall contain:

1. The relevant responsibilities and authorities of each of the coordinating agencies.

2. As appropriate, procedures, schedules and responsibilities for development of nonattainment or maintenance area plans or plan revisions and for determining reasonable further progress.

3. Assurances for adequate plan implementation.

4. Procedures and responsibilities for tracking plan implementation.

5. Responsibilities for preparing demographic projections including land use, housing, and employment.

6. Coordination with transportation programs.

7. Procedures and responsibilities for adoption of control measures and emissions limitations.

8. Responsibilities for collecting air quality, transportation and emissions data.

9. Responsibility for conducting air quality modeling.

10. Responsibility for administering and enforcing stationary source controls.

11. Provisions for the timely and periodic sharing of all data and information among the signatories relating to:

(a) Demographics.

(b) Transportation.

(c) Emissions inventories.

(d) Assumptions used in developing the model.

(e) Results of modeling done in support of the plan.

(f) Monitoring data.

G. Each agency that commits to implement any emission limitation or other control measure, means or technique contained in the implementation plan shall describe that commitment in a resolution adopted by the appropriate governing body of the agency. The resolution shall specify the following:

1. Its authority for implementing the limitation or measure as provided in statute, ordinance or rule.

2. A program for the enforcement of the limitation or measure.

3. The level of personnel and funding allocated to the implementation of the measure.

H. The state, in accordance with the rules adopted pursuant to section 49-404, and the governing body of the metropolitan planning organization shall adopt each nonattainment or maintenance area plan developed by a certified metropolitan planning organization. The adopted nonattainment or maintenance area plan shall be transmitted to the department for inclusion in the state implementation plan provided for under section 49-404.

I. After adoption of a nonattainment or maintenance area plan, if on the basis of the reasonable further progress determination described in subsection F of this section or other information, the control officer determines that any person has failed to implement an emission limitation or other control measure, means or technique as described in the resolution adopted pursuant to subsection G of this section, the control officer shall issue a written finding to the person, and shall provide an opportunity to confer. If the control officer subsequently determines that the failure has not been corrected, the county attorney, at the request of the control officer, shall file an action in superior court for a preliminary injunction, a permanent injunction, or any other relief provided by law.

J. After adoption of a nonattainment or maintenance area plan, if, on the basis of the reasonable further progress determination described in subsection F of this section or other information, the director determines that any person has failed to implement an emission limitation or other control measure, means or technique as described in the resolution adopted pursuant to subsection G of this section, and that the control officer has failed to act pursuant to subsection I of this section, the director shall issue a written finding to the person and shall provide an opportunity to confer. If the director subsequently determines that the failure has not been corrected, the attorney general, at the request of the director, shall file an action in superior court for a preliminary injunction, a permanent injunction, or any other relief provided by law.

K. Notwithstanding subsections A and B of this section, in any metropolitan area with a metropolitan statistical area population of less than two hundred fifty thousand persons, the governor shall designate an agency that meets the criteria of section 174 of the clean air act and that is recommended by the city that causes the metropolitan area to exist and the affected county. That agency shall prepare and adopt the nonattainment or maintenance area plan. If the governor does not designate an agency, the department shall be certified as the agency responsible for the development of a nonattainment or maintenance area plan for that area.

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49-425. Rules; hearing

A. The director shall adopt such rules as the director determines are necessary and feasible to reduce the release into the atmosphere of air contaminants originating within the territorial limits of the state or any portion thereof and shall adopt, modify and amend reasonable standards for the quality of and emissions into the ambient air of the state for the prevention, control and abatement of air pollution. Additional standards shall be established for particulate matter emissions, sulfur dioxide emissions and other air contaminant emissions determined to be necessary and feasible for the prevention, control and abatement of air pollution. In fixing such ambient air quality standards, emission standards or standards of performance, the director shall give consideration but shall not be limited to the relevant factors prescribed by the clean air act.

B. No rule may be enacted or amended except after the director first holds a public hearing after thirty days' notice of such hearing. The proposed rule, or any proposed amendment of a rule, shall be made available to the public at the time of notice of such hearing.

C. The department shall enforce the rules adopted by the director.

D. All rules enacted pursuant to this section shall be made available to the public at a reasonable charge on request.

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49-426. Permits; duties of director; exceptions; applications; objections; fees

A. A permit shall:

1. Be issued by the director in compliance with the terms of this section.

2. Be required for any person seeking a compliance extension pursuant to section 49-426.03, subsection B, paragraph 3 and section 112(a)(5) of the clean air act and for any person beginning actual construction of or operating any source, except as prescribed in subsection B of this section or section 49-426.01.

B. The provisions of this section shall not apply to motor vehicles, to agricultural vehicles or agricultural equipment used in normal farm operations, or to fuel burning equipment which, at a location or property other than a one or two family residence, is rated at less than one million British thermal units per hour. The director may establish by rule additional sources or classifications of sources for which a permit is not required and pollutant-emitting activities and emissions units at permitted sources that are not required to be included in the permit. The director shall not adopt such rules unless the director makes a written finding with supporting facts that the exempted source, class of sources, pollutant-emitting activities or emissions units will have an insignificant adverse impact on air quality. In adopting these rules, the director may consider any rule that is adopted by the administrator pursuant to section 502 of the clean air act and that exempts one or more source categories from the requirement to obtain a permit under title V of the clean air act.

C. Every application for a permit shall be filed in the manner and form prescribed by the director, and shall contain all the information necessary to enable the director to make the determination to grant or deny such application. The director shall establish by rule requirements for permit applications, including the standard application form for title V sources. The director shall establish by rule requirements for applications for general permits. An application for a permit issued pursuant to title V of

the clean air act shall include a compliance plan that describes how the applicant will comply with all of the applicable requirements of this chapter and the clean air act, including a schedule of compliance and a schedule under which progress reports will be submitted to the director at least every six months. The director may require that such application include all sources that are used or to be used by the applicant in a certain process or a single facility or location. Before acting on an

sources that are used or to be used by the applicant in a certain process or a single facility or location. Before acting on an application for a permit, the director may require the applicant to furnish further information or further plans or specifications. The director shall act, within a reasonable time, on such application and shall notify the applicant in writing of the proposed approval or denial of such application, except that the director may have a reasonable period of time in which to gather information, inspect premises, and issue such permits. The director shall adopt rules that establish procedures for determining when applications are complete, for processing applications and for reviewing permit actions. The director shall also establish by rule criteria for determining reasonable times for processing permit applications. Rules adopted pursuant to this subsection for permits issued pursuant to title V of the clean air act shall conform to the requirements of section 505(a) of the clean air act.

D. The director shall give notice of a proposed permit for a source required to obtain a permit pursuant to title V of the clean air act once each week for two consecutive weeks in two newspapers of general circulation in the county in which the source is or will be located. The notice shall describe the proposed permit and air contaminants to be emitted and shall state that any person may submit comments on the proposed permit and may request a public hearing. The director shall require the applicant at the time of the first notice to post the site where the source is or may be located. If permitted by federal, state and local law, the posting shall be prominently placed at a site that is under the applicant's legal control and that is adjacent to the nearest public roadway. The posting shall be visible to the public using the public roadway and shall contain the information in the notice that is published by the director. If a public hearing is requested, the director shall require the applicant to place an additional posting that provides notice of the public hearing. A posting shall be maintained until the public comment period on the proposed permit is closed. The director shall make available to the public notices of proposed permits. Each public notice that is issued under this chapter shall be mailed to the permit applicant, to the affected federal, state and local agencies and to those persons who have requested in writing copies of proposed permit action notices. During the public comment period, any person may submit a request to the department to conduct a public hearing for the purpose of receiving oral or written comments on the proposed permit. A written comment shall state the name and mailing address of the person, shall be signed by the person, his agent or his attorney and shall clearly set forth reasons why the permit should or should not be issued. Grounds for comment are limited to whether the proposed permit meets the criteria for issuance prescribed in this section or in section 49-427. The department shall consider and prepare written responses to all comments received during the public comment period including comments made at a public hearing conducted by the department. At the time a final permit decision is made, copies of the department's responses shall be made available to the applicant and any person who commented on the proposed permit.

E. Permits or revisions issued pursuant to this section or section 49-426.01 may be issued subject to such terms and conditions as are consistent with the requirements of this article, article 1 of this chapter and the clean air act and are found by the director to be necessary, following public notice and an opportunity for a public hearing as provided in subsection D or H of this section or in section 49-426.01, and subject to payment of a reasonable fee to be determined as follows:

1. For a source that is required to obtain a permit pursuant to title V of the clean air act, the director shall establish by rule a system of fees that is consistent with and equivalent to that prescribed by section 502 of the clean air act. These rules shall prescribe procedures for increasing the fee each year by the percentage if any by which the consumer price index for the immediately preceding calendar year exceeds the consumer price index for calendar year 1989.

2. For a facility that is required to obtain a permit pursuant to this chapter but that is not required to obtain a permit pursuant to title V of the clean air act, the director shall determine a fee based on the total actual cost of processing the permit application

title V of the clean air act, the director shall determine a fee based on the total actual cost of processing the permit application, but not exceeding twenty-five thousand dollars.

The director shall establish an annual inspection fee, not to exceed the average cost of inspection. The director shall adopt, by rule, criteria for determining fees and for public hearings.

F. Permits issued pursuant to this section shall be issued for a period of five years.

G. Except as provided in subsection H of this section, any person burning used oil, used oil fuel, hazardous waste or hazardous waste fuel in any machine, incinerator or device shall first obtain a permit from the director. Any permit issued by the director under this subsection shall contain, at a minimum, conditions governing:

1. Limitations on the types, amounts and feed rates of used oil, used oil fuel, hazardous waste or hazardous waste fuel which may be burned.

2. The frequency and types of fuel testing to be conducted by the person.

3. The frequency and type of emissions testing or monitoring to be conducted by the person.

4. Requirements for record keeping and reporting.

5. Numeric emission limitations expressed in pounds per hour and tons per year for air contaminants to be emitted from the facility burning off-specification used oil fuel, hazardous waste or hazardous waste fuel.

H. The director may issue a general permit for a defined class of facilities if the class contains a large number of facilities that are substantially similar in nature and that have substantially similar emissions and if the following conditions are met:

1. A general permit shall comply with all of the requirements for permits prescribed by this section except for the requirements of subsection D of this section and shall be consistent with the clean air act.

2. The director shall give notice of the proposed general permit once each week for two consecutive weeks in a newspaper of general circulation in each county. The notice shall describe the proposed general permit, the general class of sources that would be subject to the proposed permit and the air contaminants to be emitted. The notice shall also state that any person may submit comments on the proposed general permit and may request a public hearing. A written comment shall state the name of the person and the person's agent or attorney and shall clearly set forth reasons why the general permit should or should not be issued. Grounds for comment are limited to whether the proposed general permit meets the criteria for issuance prescribed in this section or section 49-427.

3. On issuance of a general permit any person seeking to permit a source under this subsection shall submit an application pursuant to subsection C of this section.

4. If the director approves an application to be permitted under a general permit, the director shall provide notice of the approval

4. If the director approves an application to be permitted under a general permit, the director shall provide notice of the approval in a newspaper of general circulation in the county in which the source is or will be located.

5. If a person violates a general permit, the director may require the source to obtain a permit pursuant to subsection A of this section.

6. A general permit may be revoked or revised at any time by the director if necessary to comply with this chapter. If the director revokes or revises a general permit, the director shall notify all persons whose sources are affected by the revocation or revision and shall include notice of procedures to obtain a permit pursuant to subsection A of this section or notice of procedures for compliance with the revisions.

7. The director by rule shall adopt procedures for the issuance of general permits.

8. The director may adopt conditions in a general permit applicable to sources located in a specified geographic area either independently of or upon petition by a county air pollution control officer.

I. Permits issued pursuant to this section for a source required to obtain a permit under title V of the clean air act shall contain all of the following:

1. Conditions reflecting all applicable requirements of this article and rules adopted pursuant to this article.

2. Enforceable emission limitations and standards.

3. A schedule for compliance, if applicable.

4. The requirement to submit at least every six months the results of any required monitoring.

5. Any other conditions that are necessary to assure compliance with this article and the clean air act, including the applicable implementation plan.

J. The director may refuse to issue any permit to any source subject to the requirements of title V of the clean air act if the administrator objects to its issuance in a timely manner as prescribed under title V of the act.

K. If an applicant has submitted a timely and complete application for a permit required under this section, but final action has not been taken on that application, failure to obtain a permit shall not be a violation of this chapter unless the delay in final action is due to the failure of the applicant to submit information required or requested to process the application. This subsection does not apply to any person required to obtain a permit before commencing construction of a source as required under this section or any person seeking a permit revision as provided under section 49-426.01.

L. The director may issue a single permit authorizing emissions from similar operations at multiple temporary locations, if the permit includes conditions that will assure compliance with all applicable requirements of this chapter and the clean air act at all locations. Any permit issued pursuant to this subsection shall require the applicant to notify the director in advance of each change in location. In issuing a single permit, the director may require a separate permit fee for operations at each location.

change in location. In issuing a single permit, the director may require a separate permit fee for operations at each location.

M. In the case of a permit with a term of three or more years issued pursuant to the requirements of title V of the clean air act to a major source, the director shall require revisions to the permit to incorporate applicable standards and regulations adopted by the administrator pursuant to the clean air act after the issuance of the permit. The director shall require any revisions as expeditiously as practicable, but not later than eighteen months after the promulgation of such standards and regulations. No permit revision shall be required if the effective date of standards and regulations is after the expiration of the permit. Any permit revision required pursuant to this subsection shall be treated as a permit renewal.

N. Any permit issued pursuant to the requirements of this article and title V of the clean air act to a unit subject to the provisions of title IV of the clean air act shall include conditions prohibiting all of the following:

1. Annual emissions of sulfur dioxide in excess of the number of allowances to emit sulfur dioxide held by the owners or operators of the unit or by the designated representative of the owners or operators.

2. Amounts in excess of applicable emission rates.

3. The use of any allowance prior to the year for which it was allocated.

4. Contravention of any other provision of the permit.

O. The director shall adopt a rule specifying the notice, public participation requirements and other permit issuance procedures for permits that are not issued pursuant to title V of the clean air act.

P. In determining whether a permitting threshold established pursuant to this section applies to an existing source, the director shall exclude particulate matter that is not subject to a national ambient air quality standard under the clean air act.

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ADEQ Arizona Department of Environmental Quality

Memorandum

Date: February 28, 2023
To: Daniel Czecholinski, Air Quality Division Director
From: Karen Peters, Director
Subject: Air Quality Division Delegation of Authority

Under A.R.S. §49-104 (D) (2), I authorize you, Daniel Czecholinski, Division Director, Air Quality Division, Arizona Department of Environmental Quality, to perform any act, including execution of any pertinent documents, which I, as Director of the Arizona Department of Environmental Quality, am authorized or required to do by law with Respect to A.R.S Title 49, Chapters 1 and 3 and any other acts related to air quality including personnel actions.

This authority shall remain in effect until it is revoked or upon your separation from the Arizona Department of Environmental Quality. You may further delegate this authority in the best interest of the agency, however, those delegations must be in writing and you must forward a copy of any further delegations to me.

This delegation is effective as of February 28, 2023, and revokes all earlier delegations. I ratify all acts performed by you as Air Quality Division Director concerning the duties and functions in this delegation memorandum.

DocuSigned by:
Karen Peters
72DC0E312D684BF...

Karen Peters
Director

3/1/2023
Date