ADEQ
Arizona Department of Environmental Quality

# SIP Revision: Marginal Ozone Plan for the Yuma Nonattainment Area

*Air Quality Division*
*May 28, 2020 Draft*

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# 1 INTRODUCTION

## 1.1 Statement of Introduction and Purpose

Pursuant to Section 107(d)(1)(B) of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) designated an area in southwest Yuma County as a "marginal" nonattainment area for the 2015 8-hour Ozone National Ambient Air Quality Standards (NAAQS) in 2018.[1] EPA based its designation on recorded violations of the standard at an ambient monitoring site within the County. [2]

Under the authority granted by the Governor and the State of Arizona, the Arizona Department of Environmental Quality (ADEQ) is responsible for the preparation and submittal of this State Implementation Plan revision.

This document demonstrates that the applicable CAA requirements for marginal ozone areas due two years from the effective date of nonattainment designation have been satisfied for the Yuma Nonattainment area. This includes revisions addressing emissions inventories (required by CAA section 182(a)(1)) and emissions statement regulations (CAA section 182(a)(3)(B)). ADEQ will address nonattainment new source review (NNSR) permit program requirements applicable to the 2015 Ozone NAAQS in a separate submittal. With this submittal, ADEQ requests that EPA approve the enclosed nonattainment plan.

## 1.2 Rules to Be Added to and Removed from the SIP

**Error! Reference source not found.** documents the rule submitted for approval as a component of Arizona's State Implementation Plan (SIP). A Notice of Proposed Rulemaking was published on April 10th, 2020, opening a public comment period for the new rule. The Notice of Final Rulemaking will be published in August of 2020, with an effective date of late 2020.

**Table 1 SIP Rule Revision Details**

| Rule or Statute Added | SIP Rule(s) Replaced | Amended by NFRM? |
|---|---|---|
| Arizona Administrative Code (A.A.C.) R18-2-327 – Emissions Inventory Questionnaire and Emissions Statement | Arizona Administrative Code (A.A.C.) R18-2-327 – Annual Emission Inventory Questionnaire | Yes |

## 1.3 National Ambient Air Quality Standards

Title I of the CAA requires EPA to set NAAQS for those pollutants that are considered harmful to both public health and the environment. EPA sets standards for six air pollutants: ground-level ozone,

[1] 83 FR25,776 (June 4, 2018)
[2] *Id.*

particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. There are two types of NAAQS: primary and secondary. Primary standards are set to protect human health and secondary standards are set to protect public welfare, such as decreased visibility and damage to animals, crops, vegetation, and buildings.[3]

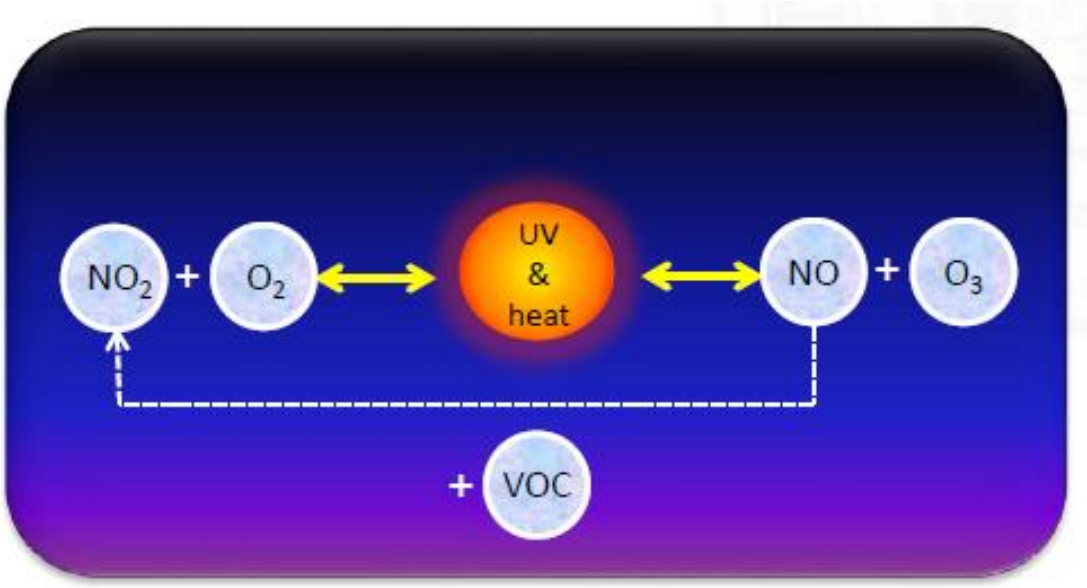
The standard for each pollutant is set at a maximum concentration in either parts per million (ppm) by volume, parts per billion (ppb) by volume, or micrograms per cubic meter of air ($\mu g/m^3$). Each standard also has a distinct averaging time in order to provide the necessary level of protection. These standards are periodically reevaluated and are retained or revised based on review of scientific literature and analyses.[4]

## 1.4 Ozone Formation

Ozone is not a pollutant released directly by any source but is rather a secondary pollutant formed from a complicated process involving precursor pollutants and sunlight. Nitrogen oxides (NOx) and volatile organic compounds (VOCs) are the main precursor pollutants to the formation of ozone, although other molecules are often involved in the formation process. Ozone forms naturally in the earth's troposphere[5] as shown in simplified form in Figure 1. Nitrogen dioxide ($NO_2$) and oxygen ($O_2$) react (i.e. photolyze) under the sun's heat and ultra violet rays to form nitrogen monoxide (NO) and ozone ($O_3$), and vice versa.[6] In a separate reaction, VOCs can oxidize and the resulting free radicals can convert nitrogen monoxide to nitrogen dioxide. This natural VOC reaction disrupts the equal balance of the photocatalytic reaction and allows for a slight accumulation of ozone.[7]

[3] *See* https://www.epa.gov/criteria-air-pollutants/naaqs-table (last visited August 4, 2017).
[4] *See* CAA § 109 (42 U.S.C. 7409 [2015]).
[5] The troposphere is the Earth's lowest atmospheric layer extending "from the earth's surface to about 8 km above polar regions and to about 16 km above tropical regions." EPA, *Air Quality Criteria for Ozone and Related Photochemical Oxidant: Volume II of III*, p. AX2-2 (2006) *available at* https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=149923&CFID=58102340&cftoken=94355181.
[6] *See generally id*. at AX2-3 – AX-2-5; NASA EARTH OBSERVATORY, *Chemistry in the Sunlight*, http://earthobservatory.nasa.gov/Features/ChemistrySunlight/chemistry_sunlight3.php (last visited May 27, 2016).
[7] *See generally id*.

**Figure 1 Ozone Formation**




$NO_x$ and VOCs are naturally emitted compounds (e.g. NOx is emitted from soils, lightning, wildfires, and stratospheric intrusions[8] and VOCs are emitted from live plants, such as pine trees, as byproducts of photosynthesis[9]). However, human activity also produces $NO_x$ and VOCs (anthropogenic). Anthropogenic emitted $NO_x$ sources include fossil fuel combustion such as car engines and industrial boilers (e.g. electric generating stations). Anthropogenic VOCs originate from sources such as paints, coatings, and fossil fuels (e.g. gasoline). As more NOx and VOCs emit into the atmosphere coupled with increasing ambient air temperatures, ozone begins to accumulate and reach concentrations that are unhealthy to humans and the environment.

Accumulation of ozone generally occurs in urban areas where manmade NOx and VOC emissions are high.[10] People living in urban areas are more commonly exposed to the negative effects of ozone, such as reduction in lung function and respiratory inflammation and distress.[11] Ozone can also cause disruptions in environmental ecosystems including, but not limited to, declines in plant growth such as reductions in crop yield.[12]

[8] EPA, *Air Quality Criteria for Ozone and Related Photochemical Oxidant: Volume I of III*, p. 2-20 (2006) *available at* https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=149923&CFID=58102340&cftoken=94355181.
[9] *See id*. at 2-21; D. Ehhalt, M. Prather, et al., *Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report: Climate Change 2001, Working Group I: The Scientific Basis, Chapter 4*, Section 4.2.3.2 *available at* http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/wg1/127.htm (last visited May 27, 2016).
[10] *See* EPA, *Criteria for Ozone, supra* note 8 at E-6 ("The daily maximum 1-h O3 concentrations tend to be much higher in large urban areas or in areas downwind of large urban areas.").
[11] *See generally* EPA, *supra* note 8 at E-10 – E-23.
[12] *See generally* EPA, *supra* note 8 at E-23 – E-30.

## 1.5 U.S. EPA's 2015 8-Hour Ozone NAAQS

On October 1, 2015, EPA revised the NAAQS for ozone, lowering it from 75 ppb to 70 ppb.[13] To attain the NAAQS for the 8-hour ozone standard, an air quality monitor cannot measure levels of ozone exceeding this limit.

The 8-hour primary ozone ambient air quality standard is met at an ambient air quality monitoring site when the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.070 ppm.[14] **Error! Reference source not found.** provides a summary of the ozone NAAQS for each of EPA's review cycles from 1971 through 2015.[15]

**Table 2 Ozone NAAQS History**

| Date | Final Rule Citation | Primary/ Secondary | Averaging Time | Level | Form |
|---|---|---|---|---|---|
| 1971 | 36 FR 8,186 (Apr 30, 1971) | Primary and Secondary | 1-hour | 0.08 ppm | Not to be exceeded more than one hour per year |
| 1979 | 44 FR 8,202 (Feb 8, 1979) | Primary and Secondary | 1 hour | 0.12 ppm | Attainment is defined when the expected number of days per calendar year, with maximum hourly average concentration greater than 0.12 ppm, is equal to or less than 1 |
| 1993 | 58 FR 13,008 (Mar 9, 1993) | EPA decided that revisions to the standards were not warranted at the time | | | |
| 1997 | 62 FR 38,856 (Jul 18, 1997) | Primary and Secondary | 8 hours | 0.08 ppm | Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years |
| 2008 | 73 FR 16,483 (Mar 27, 2008) | Primary and Secondary | 8 hours | 0.075 ppm | Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years |
| 2015 | 80 FR 65,292 (Oct 26, 2015) | Primary and Secondary | 8 hours | 0.070 ppm | Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years |

[13] *See National Ambient Air Quality Standards for Ozone Final Rule*, 80 FR 65,292, 65,435 (Oct. 26, 2015) (standards were promulgated October 1, 2015).
[14] 40 CFR § 50.19.
[15] *See* https://www.epa.gov/criteria-air-pollutants/naaqs-table (last visited January 7, 2020).

## 1.6 Regulatory Background

***Ozone Nonattainment Designation***

As noted in the previous section, EPA revised the NAAQS for ozone in 2015 by lowering the standard to 70 ppb. Per CAA § 107(d)(1) the Governor of Arizona submitted initial area boundary recommendations for the Maricopa and Yuma ozone nonattainment areas to the EPA for the purpose of establishing air quality designations for both. On June 4, 2018, EPA established the air quality designations for the Yuma area by concurring and adopting Arizona's boundary recommendation.[16]

## 1.7 Nonattainment Area Description

The following sections describe the boundary of the nonattainment area and provide information on the geography, climate, population, and economy of Yuma County and the ozone nonattainment area.

### 1.7.1 Nonattainment Area Boundary

The Yuma Ozone Nonattainment Area(NAA) is located in the Sonoran Desert region of southwestern Arizona, approximately 157 miles southwest of Phoenix. The total land area of the Yuma ozone NAA is 52 square miles, which comprises approximately 0.94% of the total land area within Yuma County, AZ (5,523 square miles). The boundaries of the Yuma ozone nonattainment area is defined by multiple criteria as codified at 40 CFR 81.303. and **Error! Reference source not found.** below illustrate the location of the area.

**Table 3 Nonattainment Area Description**

| Yuma Marginal Ozone Nonattainment Area[17] |
|---|
| The area within Yuma County as described by the following:<br>1. Bounded on the north and west by the Arizona state line.<br>2. Bounded on the south by the line of latitude at 32° 39' 20" N.<br>3. Bounded on the east by the line of longitude 114° 33' 50" W.<br>4. And excluding the section 10, 11, and 12 of township T9S, R23W and any portion in Indian Country. |

[16] *Supra note* 1.
[17] 40 CFR § 81.303.

**Figure 2 Nonattainment Area**

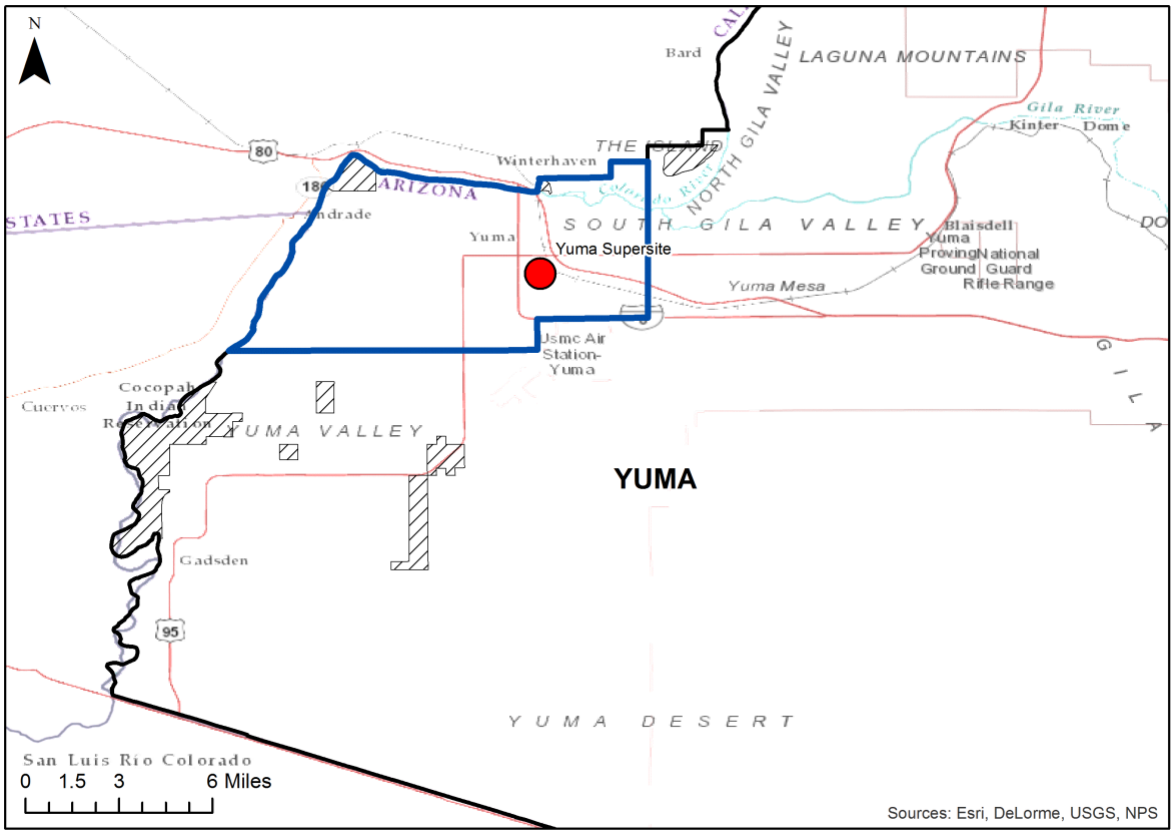
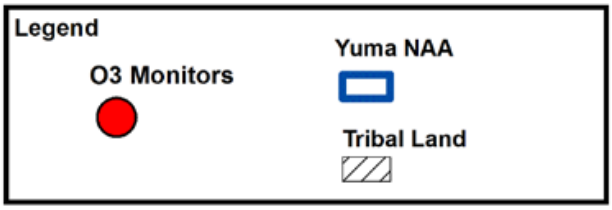



Figure 3 Map Key

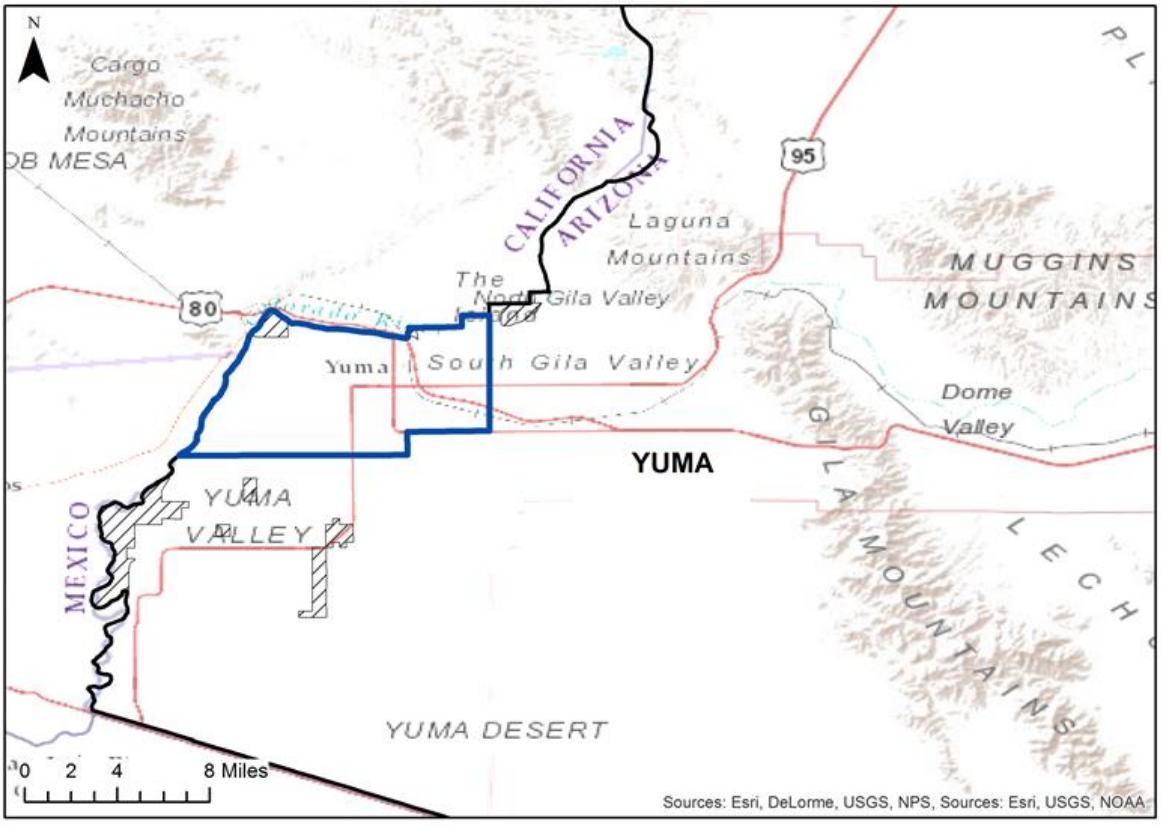



### 1.7.2 Geography and Climate

Yuma is located along Interstate 8 where the Gila River meets the Colorado River in the Yuma Desert, which is a low elevation section of the Sonoran Desert in the southwestern most corner of Arizona. The Yuma Desert has several masses of sand dunes, south and southeast of the city and near the border, which contain very little vegetation. However, much of the land in the City of Yuma area, I-8 corridor, extending into both Mexico and California is used for agricultural purposes.

Yuma's borders include California and the Colorado River to the west, Mexico to the south,, the Gila Mountain Range to the east and the Laguna Mountains to the Northeast. The Gila Mountains are approximately 26 miles long, 5 miles wide, peaking at 3,156 feet, and run south from the Gila River to fade into the Tinajas Atlas Mountains, which follow the same vector south to the Mexican border. The Laguna Mountains are a circular mountain range north of the City of Yuma, north of the Gila River, ranging approximately 7 miles by 7 miles, peaking at approximately 1,080 feet, and bordered on the west by the Colorado River. An overall topographic view of the area is provided in Figure 4 below.

**Figure 4 Yuma Area Topography**




### 1.7.3 Population

Yuma County is located in the southwestern corner of Arizona. It is bordered by Imperial County, California and Baja California, Mexico to the west and Sonora, Mexico to the south. The Yuma County population is concentrated in the southwestern portion of the county around the border cities of Yuma, Somerton, and San Luis, the Cocopah Indian Reservation, and several large military installations. This region is a gateway between southern California and Arizona by way of I-8 as well as a thoroughfare for international ground transportation, which occurs at the two San Luis ports of entry.

The County seat is Yuma, which lies approximately 157 miles southwest of Phoenix and contains nearly half of the county's population. Other communities in Yuma County include cities of San Luis, Somerton, and the Town of Wellton. Population estimates for the Yuma ozone NAA are presented in Table 4.

**Table 4 Yuma NAA Population**

| | 2010 Population | 2017 Projected Population |
|---|---|---|
| Yuma Ozone NAA Population | 87,348 | 98,904 |

### 1.7.4 Economy

The economy in Yuma is largely supported by agriculture activity, which contributes about $2.5 billion of the local GDP for the Yuma area.[18] Yuma is home to the US Army Yuma Proving Grounds as well as the Marine Corp Air Defense Station, which is used by both the US Navy and Marine Corp to train combat pilots.[19] As a result, the military also plays a crucial role and is the second largest provider of income into the Yuma economy[18]. The local economy is also driven by some industrial manufacturing and small private businesses operating throughout the county.

The Yuma Ozone Nonattainment area hosts one of the busiest sections of interstate in Arizona, the I-8, which connects Arizona to Southern California. This busy arterial roadway exposes the nonattainment area to plenty of NOx and VOC emissions associated with engine combustion and vehicle operation. Because the diverse economy is located in such a hot, arid environment the opportunity for ozone formation is high, and results in an ozone season in Yuma that begins in late spring, around March in Arizona, and continues on into September.

## 1.8 General SIP Approach

Yuma was designated nonattainment for the 2015 Ozone NAAQS in August 2018.[20] According to CAA § 182(a) and the *Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area State Implementation Plan Requirements* rule, Marginal Nonattainment Area SIP Revisions require a baseline emission inventory (EI) followed by periodic EI updates, a New Source Review (NSR) Program, and a Major Source Emissions Statement.[21]

The following sections explain the approach taken by ADEQ to effectively organize and implement planning requirements established by the CAA.

### 1.8.1 Clean Air Act Requirements for Nonattainment Areas

#### 1.8.1.1 General

The CAA contains a requirement for states to submit a revision to their SIP, requiring owners and operators of stationary sources of oxides of nitrogen ($NO_x$) and volatile organic compounds (VOC) to submit annual emission statements detailing the actual emissions from that source.

Arizona does not currently have a rule that meets the requirements of CAA § 182(a)(3)(B). ADEQ is currently undertaking a rulemaking to amend Arizona Administrative Code (A.A.C.) R18-2-327 *Annual Emissions Inventory Questionnaire* to include requirements for stationary sources who emit ozone precursors in ozone nonattainment areas to submit annual emission statements to ADEQ, ADEQ plans to submit this rule with the SIP revision to meet the applicable requirements of CAA § 182(a)(3)(B)(i).

[18] Yuma Chamber of Commerce, Business & Economy, available at https://www.yumachamber.org/business-and-economy.html (last accessed May 22, 2020)
[19] U.S. Marine Corp, Marine Corp Air Station Yuma, available at https://www.mcasyuma.marines.mil/ (last accessed May 22, 2020).
[20] 83 FR 25,776 (June 4, 2018).
[21] 83 FR 62,998 (Dec. 6, 2018).

Additionally, this section describes the three major required sections of a Marginal Nonattainment SIP submittal: 1) the emissions inventory; 2) the permits and NSR program; and 3) the emissions statement

#### 1.8.1.2 Emissions Inventory

CAA § 182(a)(1) requires a state to submit a comprehensive, accurate, and current inventory of actual emissions from all sources of relevant pollutant(s). The department intends to meet this requirement by submitting a 2017 base inventory as detailed in ADEQ's 2019 Yuma Ozone Nonattainment Area Inventory Preparedness Plan (IPP). The inventory will utilize the 2017 NEI, the agencies internal point source database, and other available data sources.

#### 1.8.1.3 Permits and NSR Program

CAA § 182(a)(2)(C)(i) requires permits for construction and operation of new or modified stationary sources located in the area. A state may satisfy this requirement by having a completely approved permit program.

All new sources and modifications to existing sources in Arizona are subject to state requirements for preconstruction review and permitting pursuant to Arizona Administrative Code (A.A.C.), Title 18, Chapter 2, Articles 2, 3, and 4 or relevant county rules. All new major sources and major modifications to existing major sources in Arizona are also subject to the nonattainment New Source Review (NSR) provisions of these rules or Prevention of Significant Deterioration (PSD) for attainment areas.

On April 28, 2017, ADEQ submitted an NSR SIP revision that will bring the state SIP for areas under the jurisdiction of ADEQ into compliance with the nonattainment NSR and PSD requirements of CAA § 110(a)(2)(C) and 40 CFR Part 51, Subpart I, with the exception of the requirements pertaining to greenhouse gases (GHGs). ADEQ is currently administering the NSR requirements for GHGs under a delegation agreement with EPA. On May 4, 2018 EPA took final action to approve Arizona's NSR regulatory revisions which included a conditional approval of ADEQ's NSR program with respect to the CAA requirements related to ammonia as a precursor to fine particulate matter ($PM_{2.5}$) under the nonattainment NSR (NA-NSR) program requirements in CAA section 189(e).[22] Effective June 4, 2018, ADEQ has an approved PSD program for areas under its CAA permitting jurisdiction, except for ammonia as a precursor to $PM_{2.5}$ and greenhouse gases, under CAA §§ 160-165.[23]

#### 1.8.1.4 Emissions Statement

As required by the CAA § 182 (a)(3)(b), a marginal SIP submittal must contain an Emissions Statement:

> A State shall submit a revision to the State implementation plan to require that the owner or operator of each stationary source of oxides of nitrogen or volatile organic compounds provide the State with a statement, in such form as the Administrator may prescribe (or accept an equivalent alternative developed by the State), for classes or categories of sources, showing the actual emissions of oxides of nitrogen and volatile organic compounds from that source.
>
> CAA § 182(a)(3)(b).

[22] *See* 83 FR 19,631 (May 4, 2018); 40 CFR § 52.144(C).
[23] *Id.*

In this SIP revision, ADEQ provides an Emissions Statement in the concluding section certifying that all information provided in this SIP and affiliated appendices is true and accurate to the best of ADEQ's knowledge.

### 1.8.2 EPA Guidance

The guidance documents utilized in the preparation of this plan include:

- *Reasonable Further Progress, Attainment Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standard*. Memorandum from John S. Seitz, U.S. Environmental Protection Agency. May 10, 1995.
- *State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990*. U.S. Environmental Protection Agency. 57 FR13,498 (Apr. 16, 1992).
- *State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Supplemental*. U.S. Environmental Protection Agency. 57 FR 18,070 (Apr. 28, 1992).
- *Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area State Implementation Plan Requirements. 40 CFR Part 51;* 83 FR 62,998 (Dec. 6, 2018).

## 1.9 Stakeholder Process

A public notice regarding the production of this SIP, notifying the public and any other interested parties, was published in the Arizona Republic on May 29th, 2020. The general public and local businesses were made aware of the SIP production process, and invited to provide feedback on the subject of Ozone production in the area, as well as comment on any details of the SIP document itself before it was submitted to EPA for final approval. A public hearing was held on July 1st, 2020 at ADEQ located at 1110 W. Washington St. Phoenix, AZ 85009 to allow such comments or concerns to be voiced in person to the ADEQ staff developing the SIP.

### 1.9.1 Intergovernmental Participation and Consultation

ADEQ consulted and worked with the Yuma Metropolitan Planning Association (YMPO) throughout the development of this SIP, in addition to the rule revision associated with its submission.. Working with local municipalities is not only a requirement of the CAA when developing a SIP document, it also is a useful way to understand the issues being faced by the community in which the SIP will impact, as well as create a SIP that contains the most effective strategy for protecting their air quality using methods tailor made for needs of the community.

# 2 AMBIENT AIR QUALITY MONITORING

## 2.1 Description of Monitoring Network and Quality Assurance Procedures

ADEQ operates a network of seven Ozone monitors throughout Arizona, in addition to one located in San Luis, Mexico. Monitors located at Tonto National Monument, JLG Supersite, Queen Valley, and Yuma Supersite all recorded violations of the current 0.070 ppm $O_3$ NAAQS.

The minimum monitoring requirements for $O_3$ are based on population of the area and design values. Maricopa, Pinal, and Pima Counties have delegated authority for their monitoring networks and AQS reporting. The following table demonstrates the minimum monitoring requirements for municipalities varying in population size:

**Table 5 Yuma Monitoring and Population Details**

| Population | Most Recent 3 Year 8-Hour Design Value ≥ 85% of NAAQS (0.0595 ppm) | Most Recent 3 Year 8-Hour Design Value <85% NAAQS (0.0595 ppm) or no Design Value Available |
|---|---|---|
| >10 Million | 4 monitors | 2 monitors |
| 4-<10 Million | 3 monitors | 1 monitor |
| 350,000 - < Million | 2 monitors | 1 monitor |
| 50,000 - <350,000 | 1 monitor | 0 monitors |

## 2.2 Historical Data Summary (Ambient Data Trends)

The Yuma NAA has demonstrated historical ozone concentration increases annually, primarily during the late spring through early fall months. Intense annual spring and summer temperatures regularly exceeding 115 °F accompanied with the large volume of vehicle traffic and agricultural activities in the nonattainment area make for ideal ambient ozone production conditions. Prior to the 2015 NAAQS revision, the Yuma area was still within range of violating the previous NAAQS of 75 µg/$m^3$ with a design value of 70 µg/$m^3$

## 2.3 Current NAAQS Compliance

ADEQ currently operates one ozone monitor in the Yuma area that is located at the Yuma Super Site. This site is located on the southeast corner of the Rural Metro Administration Facility property. The

surrounding area is commercial and industrial, with a dirt lot adjacent to the south, and Interstate 8 just 1 km to the northeast.

The design value recorded at that site for the 2016-2018 demonstration period is 71 reflexive of 0.071 ppm being the total average recorded during that time as demonstrated in the table below.[24] Additionally, the average design value recorded from 2017 through 2019 was 70 ppb, complying with the 2015 NAAQS.

**Table 6 Yuma Design Value[25]**

| AQS Site ID | Site | Current Operating Schedule | 2016-2018 Design Value (ppm) |
|---|---|---|---|
| 04-005-1008 | Flagstaff Middle School | January - December | 0.065 |
| 04-007-0010 | Tonto National Monument | January - December | **0.074** |
| 04-012-8000 | Alamo Lake | January - December | 0.068 |
| 04-013-9997 | JLG Supersite | January - December | **0.075** |
| 04-021-8001 | Queen Valley | January - December | **0.074** |
| 04-025-8034 | Prescott Pioneer Park | January - December | 0.067 [1] |
| 04-027-8011 | Yuma Supersite | January - December | **0.071** |
| 80-026-8012 | San Luis Rio Colorado Well 10 | January - December | N/A[2] |

[24] State of Arizona Annual Monitoring Network Plan 2019.
[25] Yuma Marginal Ozone SIP TSD and IPP

# 3 EMISSIONS INVENTORY

This section provides an ozone emission inventory for the major sources within the Yuma NAA. The technical details regarding how ADEQ derived the emission values can be found in **Appendix A**. ADEQ created this emission inventory to demonstrate the most significant sources of ozone precursors produced throughout the Yuma NAA. Ambient ozone data from the ozone design value concentration at Yuma Supersite for 2016-2018 is 71 ppb. In addition, preliminary ozone design value concentration for 2017-2019 is 70 ppb, which meets the 2015 ozone NAAQS.

## 3.1 Overview of Emissions Inventory

All emission data for this inventory came from version 1 of EPA's 2017 National Emissions Inventory (NEI) for Yuma County.[26] The NEI is a comprehensive and detailed estimate of air emissions of both criteria air pollutants and hazardous air pollutants from all air emissions sources. The NEI is prepared every three years by EPA. The NEI is based primarily upon emission estimates and emission model inputs provided by State, Local, and Tribal air agencies for sources in their jurisdictions, and supplemented by data developed by the EPA.

## 3.2 Point Sources

Point sources account for stationary sources of emissions, such as industrial processes, electrical generating units, petroleum product storage and transfer facilities.

There are several industrial power generation facilities located in the Yuma ozone NAA that contribute to concentrations of ozone precursor pollutants. There are also local product manufacturing companies, which contribute to ambient concentrations of ozone precursors, although at lower percentages than power facilities.

There are four predominant point source facilities located in the Yuma ozone NAA, including the YUCCA Power Plant (owned and operated by Arizona Public Service), the International Paper Manufacturer facility, the Yuma Regional Medical Center, and Yuma Cogeneration Power. These facilities contribute approximately 200 tons of ozone precursor pollutants every year as demonstrated below in Table 7.

**Table 7 Point Source Emissions in Yuma NAA**

| Source | Annual Emissions (ton/yr) | | Ozone Season Day (OSD) Emissions | |
|---|---|---|---|---|
| | NOx | VOC | NOx | VOC |

[26] U.S. EPA, Air Quality System, available at https://www.epa.gov/aqs (last accessed May 22, 2020).

| | | | | |
|---|---|---|---|---|
| APS- YUCCA Power Plant | 176.15 | 8.51 | 965.21 | 46.61 |
| International Paper | 4.44 | 11.3 | 24.31 | 60.42 |
| Yuma Cogeneration Associates | 8.12 | 0.31 | 44.51 | 1.71 |
| Yuma Regional Medical Center | 12.62 | 0.57 | 69.14 | 3.13 |
| **Total** | **201.33** | **20.42** | **1103.17** | **111.88** |

## 3.3 Nonpoint Sources

Nonpoint emission sources in the Yuma ozone NAA are numerous and widespread throughout the county, making them difficult to record. For this reason ADEQ was required to estimate the total emissions concentrations from nonpoint sources using a bottom-up and top-down approach, to ensure all potential emitters were accounted for.

For this purpose, ADEQ relied on permits, annual emission reports, and other local activity data, as well as 2017 NEI county-level emissions to allocate the appropriate emissions values to the ozone NAA by population, area, employment, or other scaling methods.

The following table demonstrates the yearly averaged emission totals of precursor emissions produced by sources of nonpoint emissions throughout the Yuma ozone NAA.

**Table 8 Yuma Precursor Non Point Sources**

| Source Category | NOx Emissions (ton/yr) | VOC Emissions (ton/yr) |
|---|---|---|
| Industrial Fuel Combustion | 23.92 | 1.57 |
| Commercial Fuel Combustion | 12.56 | 0.68 |
| Residential Fuel Combustion | 19.70 | 22.54 |
| Commercial Cooking | | 6.59 |
| Solvent Utilization | - | 1236.13 |
| Dry Cleaning | 0.0831 | 0.0045 |
| Agricultural Pesticides | - | 51.6 |
| Commercial Portable Fuel Containers | - | 13.98 |
| Bulk Plants | - | 0.03 |
| Bulk Terminals | - | 43.82 |
| Gasoline Service Stations | - | 148.62 |
| Gasoline Stations Underground Tanks, Breathing/Emptying | - | 22.9 |
| Gasoline Tank Trucks | - | 1.46 |

| Source Category | NOx Emissions (ton/yr) | VOC Emissions (ton/yr) |
|---|---|---|
| Pipeline Gasoline | - | 10.89 |
| Open Burning | 6.26 | 105.96 |
| Wastewater Treatment Plant | - | 0.77 |
| Composting | - | 6.76 |
| Agricultural Field Burning | 1.13 | 4.84 |
| Residential Grilling | 0.36 | 1.38 |
| Human Cremation | 0.0658 | 0.0055 |
| Wildfires | 1.82 | 10.87 |

## 3.4 Mobile Sources

Mobile sources in the Yuma NAA are numerous and contribute a significant volume of precursor emissions into the ambient environment. The primary producer of VOCs and NOx emissions in the nonattainment area are Passenger Trucks, which is likely the result of the nonattainment area being located adjacent to a major trucking and travel corridor. As noted in Chapter 1, Interstate 8 connects Arizona to Southern California and goes through the city of Yuma as well as the ozone NAA. Where the I-8 crosses the Colorado River and connects the two states, the average daily traffic count varies between 17,000 vehicles per day to 27,000 vehicles per day traveling in either direction.[27]

## 3.5 Summary

Mobile sources in the Yuma NAA contribute 4,489.99 tons/yr of VOCs and 2,892.69 tons/yr of NOx. Being located so close to such a major transit corridor that hosts close to 30,000 vehicles of all engine and fuel types, on-road sources significantly affect the concentrations of ozone observed in the Yuma NAA. Additionally, Yuma is one of the nation's largest agricultural hubs, moving products in and out of the area contributes heavily to the total tons per year of precursor emissions.

[27] https://ympo.org/maps-more/traffic-counts/

# 4 EMISSION STATEMENT

CAA §182(a)(3)(b) requires that:

> a State shall submit a revision to the State implementation plan to require that the owner or operator of each stationary source of oxides of nitrogen or volatile organic compounds provide the State with a statement…..showing the actual emissions of oxides of nitrogen and volatile organic compounds from that source."

ADEQ determined that, as shown in Table 9, area sources are the largest source of VOC emissions. Area sources comprise approximately 53% of total VOC emissions. About 73% of area source VOC emissions come from solvent utilization. The second largest source of VOC in the NAA are on-road mobile vehicles with 26% of total emissions. The largest source of NOx emissions in the NAA are on-road mobile vehicles with 72% of total emissions. The second largest source of NOx in the NAA are non-road mobile sources with 16% of total emissions.

**Table 9 Emission Summary**

| Source Type | Annual Emissions (ton/yr) | | OSD Emissions (lb/day) | |
|---|---|---|---|---|
| | VOC | NOx | VOC | NOx |
| Point | 20.42 | 201.33 | 111.88 | 1103.17 |
| Area | 1706.53 | 65.90 | 15007.04 | 1275.17 |
| Mobile On-road | 814.71 | 1694.72 | 4817.10 | 9673.58 |
| Non-road Mobile | 282.81 | 380.73 | 1549.66 | 2086.19 |
| Biogenics | 366.74 | 5.91 | 2009.54 | 40.55 |
| **Total** | **3191.21** | **2348.59** | **23495.22** | **14178.66** |

# 5 CONCLUSION

This SIP revision satisfies that the applicable CAA requirements for marginal ozone areas have been satisfied for the Yuma Nonattainment area. This includes revisions addressing emissions inventories and emissions statement regulations (CAA § 182(a)(3)(B)) as described in the preceding chapters.

On June 4, 2018, EPA designated a portion of Yuma County "nonattainment" for the 2015 Ozone NAAQS, classifying the area as "marginal." Under CAA § 182, states with areas designated nonattainment have two years from the effective date of the designation to submit emission inventory reporting regulations under CAA § 182(a)(3)(B). As such, ADEQ submits this SIP revision, including amended R18-2-327 to require annual emissions statements for stationary sources located in ozone nonattainment areas that emit ozone precursors, to fulfill these requirements. This SIP revision and included rule revision will help to retain state primacy and avoid the promulgation of a Federal Implementation Plan (FIP). This revision requires all stationary sources located in ozone nonattainment areas that emit ozone precursors to submit annual emission statements to the Director of ADEQ.

Additionally, this SIP revision provides the required Emissions Inventory and a Major Source Summary Statement. Therefore, ADEQ fulfilled the required SIP elements as prescribed in the CAA.

Please note ADEQ will address new source review permit program requirements applicable to the 2015 Ozone NAAQS in a future SIP revision submittal to EPA.