

# Class I Compressor Station Emission Inventory Guidance

This document has been prepared by the Arizona Department of Environmental Quality (ADEQ) to provide guidance on the best practices to use during preparation of annual emissions inventory (EI) reports for pipeline gas compressor stations which submit their reports to ADEQ via EPA's Combined Air Emissions Reporting System (CAERS). If you have questions or suggestions about this guidance or EI reporting in general, please email us at [EmissionInventory@azdeq.gov](mailto:EmissionInventory@azdeq.gov). For technical troubleshooting in CAERS, please email [NodeHelpDesk@epacdx.net](mailto:NodeHelpDesk@epacdx.net).

## 1. Types of Emissions & Associated Processes

This section includes the various types of emissions found at compressor stations and their associated processes. These emissions and processes are provided in Table 1 below. If a process listed in Table 1 is not included at your facility, then that process's corresponding emission type is not applicable and should not be reported in the facility's annual emissions inventory.

*Table 1. Types of Emissions and Associated Processes*

Type of Emission	Description
Engines	Internal combustion emissions from generators or motors other than turbines.
Evaporation	Chemical evaporation from storage tanks and other locations, including condensate storage/recovery, mist eliminators, and fuel dispensing.
Leaks	Routine fugitives from pipelines parts (valves, joints, flanges, meters, etc.).
Turbines	Combustion emissions from turbines.

If your ADEQ air permit addresses any additional emissions sources, or if you are aware of any other emissions sources on-site that routinely emit more than 1 ton of regulated air pollutants per year, please include them in the report. If you are unsure how to include those emissions in the report or how to estimate them, please contact ADEQ at [EmissionInventory@azdeq.gov](mailto:EmissionInventory@azdeq.gov).

## 2. Preferred Source Classification Codes (SCCs)

This section includes the preferred SCCs for each type of process found at compressor stations. The Environmental Protection Agency (EPA) maintains an updated list of SCCs on their website:

<https://sor-scc-api.epa.gov/sccwebservices/sccsearch/>.

The preferred SCCs for each type of emission are listed in Table 2, below, accompanied by SCCs that have historically been used by compressor station facilities. If your facility is using an SCC listed in the 'Original SCC' column, please consider remapping it to one of the preferred SCCs for that process type.

Please note that SCCs beginning with the first three values of "310" should only represent oil and gas production/processing, not transportation, and are therefore **not** applicable to compressor station processes. Additionally, SCCs specifying "Commercial/Institutional" should **not** be used to represent industrial sites, when possible. If you and your team find different SCC's that are more accurate or

applicable to describe your process emissions please provide justification in the comment section of that unit process in your CAERS emission report.

Table 2: Remapped SCCs by Emission Type

Original SCCs	Preferred SCC	Preferred SCC Description
<b>Leaks</b>		
31000220, 31088811 <i>See note a</i>	40688801	Chemical Evaporation   Transportation and Marketing of Petroleum Products   Fugitive Emissions   All Not Elsewhere Classified
	30600811	Industrial Processes   Petroleum Industry   Fugitive Emissions   Pipeline Valves: Gas Streams
<b>Engines</b>		
20100202, 20300201, 31000305	20200251	Internal Combustion Engines   Industrial   Natural Gas   2-cycle Rich Burn
	20200252	Internal Combustion Engines   Industrial   Natural Gas   2-cycle Lean Burn
	20200253	Internal Combustion Engines   Industrial   Natural Gas   4-cycle Rich Burn
	20200254	Internal Combustion Engines   Industrial   Natural Gas   4-cycle Lean Burn
<b>Turbines</b>		
20300202, 20300209, 31000309	20200201	Internal Combustion Engines   Industrial   Natural Gas   Turbine
<b>Evaporation</b>		
N/A	40400311	Chemical Evaporation   Petroleum Liquids Storage (non-Refinery)   Oil and Gas Field Storage and Working Tanks   Fixed Roof Tank, Condensate, Working + Breathing + Flashing Losses
	49099998	Chemical Evaporation   Organic Solvent Evaporation   Miscellaneous Volatile Organic Compound Evaporation   Miscellaneous
	40600199	Chemical Evaporation   Transportation and Marketing of Petroleum Products   Tank Cars and Trucks   Other Not Elsewhere Classified

a. None of the currently available SCCs is a perfect fit for pipeline gas leaks, and EPA is working on adding a new SCC for those fugitives. In the meantime, EPA suggests using SCCs that begin with 306008 rather than 310.

### 3. Acceptable Calculation Methods

This section defines the acceptable calculation methods for emissions estimations.

In general, note that Arizona Administrative Code R18-2-327(C)(1) requires the following order of preference for estimating any given emissions total in the report, as follows. Engineering judgement is **not** a preferred method for any emissions calculations. First, valid Continuous Emissions Monitoring (CEMS) readings or else emission factors (EFs) derived from recent, valid on-site performance test results should be used. If test data is not available, it is best practice to use a US EPA- or Vendor-developed EFs. In the event that such EFs are not available, EFs that are approved by the EPA or other reputable sources (peer-reviewed journals, etc.) should be employed to reliably estimate emissions. As a last resort, it may be acceptable to estimate emissions via models including mass balance equations. With that being said, supporting calculations and references should accompany **all** non-EPA EFs so that the calculation methodology can be easily understood and verified. Complete this by including calculation demonstrations in your required attachment on your CAERS report. Note that the calculation methods available within a given process are likely to vary by pollutant.

#### a. Using EFs vis-à-vis Controls

For estimates derived using EFs, a CAERS report must note whether the EF already incorporates the impact of all applicable controls. Please be cautious as the phrasing here differs from that used in SLEIS.

- a. If the EF does not incorporate the impact of all applicable controls, please select the calculation method that identifies the EF as having “(no control efficiency used)”, thus enabling the “Overall Control %” field. Then enter the impact of any remaining controls in that field (or leave it blank if there are no controls in play for the given emissions). If you are unsure how to derive this percentage, please email ADEQ. Note that this option corresponds to the SLEIS EF calculation methods that included the phrase “pre-control”.
- b. If the EF already incorporates all applicable controls’ impacts, please select a calculation method that classifies the EF as “(pre-control) plus control efficiency”. Despite the use of the phrase “pre-control”, this option corresponds to the “post-control” EF calculation methods that were available in SLEIS.

If both EF types are available for a given situation, then all other things (EF applicability, quality rating, etc.) being equal, ADEQ would prefer that you use option a and enter the Overall Control % explicitly.

#### b. Particulate Matter (PM) EFs

CAERS accommodates numerous PM pollutant categories, but there are 5 that ADEQ generally expects to see in the report for any process that has PM emissions: condensable PM (PM-CON), filterable PM10 (PM10-FIL), filterable PM2.5 (PM25-FIL), primary PM10 (PM10-PRI, which is the total consisting in PM-CON plus PM10-FIL), and primary PM2.5 (PM25-PRI, similarly PM-CON plus PM25-FIL). Here, “PM10” denotes particles whose equivalent aerodynamic diameters are less than or equal to 10µm, and similarly “PM2.5” (sometimes encoded as “PM25”) denotes the subset of those less than or equal to 2.5µm. Since PM-CON is assumed to be under 1µm, it always counts towards both PM2.5 and PM10.

Although there is redundancy and overlap in these categories, you should still provide all of them, if possible, as described below. ADEQ will not double-count your emissions.

Whenever EPA’s *AP-42* compendium of EFs provides an EF for any of these PM emissions types, it usually provides more than one. For example, *AP-42* may provide PM10-PRI, PM10-FIL, and PM-CON EFs for a given type of emissions process. It may also include a note which allows you to infer some other EF values. For example, a table note might indicate that all of the PM emissions are assumed to be fine (i.e., that PM10-PRI = PM25-PRI and PM10-FIL = PM25-FIL) or all coarse (i.e., that PM10-PRI = PM10-FIL and that PM25-PRI = PM25-FIL = PM-CON = 0).

Note that CAERS will not allow an EF value of 0, so if for example 100% of the PM10 emissions from a given process are filterable, you may omit the condensable subtotal rather than explicitly specifying a 0 estimate. Otherwise, please include all of the available PM EFs in your report.

If just a single PM EF is provided, then and only then might it be appropriate to develop your own EFs to fill in the blanks for the various subtotals, based on a speciation profile. When in doubt, email ADEQ.

## 4. Expected Pollutant(s)

For each of the processes at your facility, please report emissions for the expected criteria air pollutants (CAPs) and hazardous air pollutants (HAPS) provided in Table 3 below. A shaded cell indicates that the

pollutant should typically be included for that type of emissions source. However, a question mark indicates that the availability of EFs for that pollutant may vary depending on engine type.

Table 3: Expected Pollutants by Emission Type

Pollutant		Type of Emissions			
Code	Name	Leaks	Engines	Turbines	Evaporation
VOC	Volatile Organic Compound				
CO	Carbon Monoxide				
NOX	Nitrogen Oxides				
SO2	Sulfur Dioxide				
PM10-FIL	Filterable PM10				
PM10-PRI	Total primary PM10				
PM25-FIL	Filterable PM2.5				
PM25-PRI	Total primary PM2.5				
PM-CON	Condensible PM				
67561	Methyl alcohol				
110543	n-Hexane				
50000	Formaldehyde				
71432	Benzene				
75070	Acetaldehyde				
107028	Acrolein				
108883	Toluene				
1330207	Xylenes				

If site-specific emissions factors for additional HAP species are available, please include them.

As outlined in Section 3.0, if neither CEMS nor performance test data are available for a pollutant, please first reference EPA's AP-42 to find an EF that is applicable to your facility and process. If the AP-42 assumptions appear to be unsound or the necessary EF is absent, consult applicable equipment specifications. If they are not available or do not provide sufficient information to estimate EFs, EPA's WebFIRE database may then be utilized to find an appropriate EF. Unlike AP-42, EFs in WebFIRE can be gathered efficiently by filtering the search according to SCC and pollutant name. The links to both of these resources are provided below.

**EPA's AP-42 Turbine and Engine Chapter:** <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-fifth-edition-volume-i-chapter-3-stationary-0>

**EPA's Protocol for Equipment Leak Emission Estimates:**  
[https://www.epa.gov/sites/default/files/2020-09/documents/protocol\\_for\\_equipment\\_leak\\_emission\\_estimates.pdf](https://www.epa.gov/sites/default/files/2020-09/documents/protocol_for_equipment_leak_emission_estimates.pdf)

**EPA's AP-42 Liquid Storage Tanks Chapter:** <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-fifth-edition-volume-i-chapter-7-liquid-storage-0>

**EPA's WebFIRE search:** <https://cfpub.epa.gov/webfire/SearchEmissionFactor/searchpage.cfm>

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## 5. Frequently Asked Questions (FAQs)

**1. What calculation code should be used when deriving an EF from a parametric equation found in EPA's AP-42?**

**A:** It is preferable to label EFs derived from parametric equations in AP-42 using an EPA EF calculation method code (8 or 28), even if the parameter values used are site-specific. However, if CAERS generates an error in this case, you may have to use a site-specific EF calculation method code (10 or 30) instead. Email ADEQ if you are unsure.

**2. Is it okay to calculate PM-CON and PM-FIL as a subset of PM-PRI?**

**A:** If CEMS data, test reports, AP-42, or other authoritative sources provide estimates or EFs for condensable and filterable subtotals, it is best practice to use them. However, if only the primary total or EF is provided, then deriving your own filterable and condensable subtotals may be appropriate. Similarly, for fine vs coarse subtotals. Email ADEQ if you are unsure.

**3. If the calculation methods used in the previous year's annual emission inventory do not match those of the permit application, which is the more appropriate calculation method to use?**

**A:** Use the calculation method that is most representative of the current state at the facility. If you are ever unsure of which calculation method to use or are having trouble reproducing emissions estimates with the original calculation method, always reach out to ADEQ for guidance.

**4. Who should I reach out to for help with my facility's emissions inventory?**

**A:** Please direct your questions to [emissioninventory@azdeq.gov](mailto:emissioninventory@azdeq.gov). Inventory preparers are always encouraged to contact ADEQ for questions and assistance with their emissions inventory.