# CHAPTER 4—DETERMINING AND REPORTING EMISSIONS

This chapter gives general information about required actual emissions data, acceptable emissions determination methodologies, speciating emissions (categorizing emissions by chemical species), and correctly reporting actual annual emissions, ozone season emissions, and emissions due to emissions events and scheduled maintenance, startup, and shutdown activities. For more detailed information about determining emissions from internal and external combustion sources, cooling towers, equipment leak fugitives, flares, and marine operations, and aboveground storage tanks, consult the appropriate technical supplement (Appendix A).

## Required Actual Emissions Data

If a site meets the reporting requirements of 30 TAC 101.10(b)(1) and 40 CFR Part 51, all actual emissions for each regulated pollutant must be reported in the emissions inventory. For the purposes of this document, the term *regulated pollutant* shall include the following:

- any VOC, as defined in 30 TAC 101.1;
- any pollutant subject to federal Clean Air Act (FCAA) Section 111;
- any pollutant listed as a hazardous air pollutant under FCAA Section 112;
- each pollutant a national primary ambient air quality standard has been promulgated for (including carbon monoxide); and
- any other air pollutant subject to requirements under TCEQ rules, regulations, permits, orders of the commission, or court orders.

Non-criteria, regulated pollutants include—but are not limited to—TSP, ammonia, and $H_2S$.

## Acceptable Determination Methodologies

Many different methods exist to determine emissions. In order to promote accuracy and consistency among emissions inventories, the EAS accepts only a limited number of determination methodologies, and further requires that all emissions be determined using the best methodology available. Determination methodologies other than those listed as follows may not be employed without the EAS's prior approval. Depending on the type of emission source, the methodology preference will often vary. The acceptable methodologies are discussed in alphabetical order and are labeled with a relevant heading (for example, stack testing is discussed under "Measured Data").

Preceding each heading is a single letter, such as "A" or "V," the code to be entered on the EIQ when using that emissions determination methodology. These codes should be entered on the "Path Emissions" portion of the EIQ under the heading "Method" for each reported contaminant. Each contaminant listed on the EIQ can only have one corresponding code entered under "Method," and this code should represent how the emissions of that contaminant were determined.

## Source-Specific Determination Methodologies

For information about the preferred emissions determination methodology or methodologies for a specific source type, consult the appropriate technical supplement (Appendix A), or call the EAS help line.

If a preferred method does not apply to a given facility (or source), or its use would misrepresent the source's emissions, contact the EAS for approval of an alternate methodology.

### D: Continuous Emissions Monitoring Systems

Continuous emissions monitoring systems (CEMS) generate real-time emissions data 24 hours per day. (Note that portable analyzers are not CEMS.) If CEMS are properly calibrated and operated they offer the best means of determining a source's emissions. CEMS may be used to determine emissions only if they have been certified according to EPA or TCEQ standards.

Please note that a continuous monitoring system (CMS) that measures the gas composition contained in a process stream (and not the amount of emissions released to the atmosphere) is not a CEMS. Therefore, the emissions determined from CMS would not be coded with a determination methodology of "D" for 'continuous emissions monitoring system.' Instead, a determination methodology of "B" for 'material balance' would be chosen.

Supply a representative set of summary sheets from Relative Accuracy Test Audits performed during the EI calendar year. If $NO_x$ emissions are determined using CEMS, note the molecular weight used in the data logger. Since the calculation is based on NO2 by convention, the logger should use a molecular weight of 46.01 to determine $NO_x$ emissions.

If a CEMS is inoperative for any part of the EI calendar year, other data may be used to determine emissions during CEMS downtime, provided that the data substitution method is well documented in the EI and its supporting documentation.

### H: Highly Reactive Volatile Organic Compound (HRVOC) Monitoring Systems

HRVOC monitoring required by 30 TAC 115.725–26 involves a continuous monitoring system (CMS) that measures the gas composition contained in a process stream (and not the amount of emissions released to the atmosphere).

HRVOC monitoring systems not required by 30 TAC 115.725–26 should not be coded as "H" but as "B" for 'material balance.' Similarly, a CMS for compounds other than HRVOCs should also be coded as "B."

If a CMS is inoperative for any part of the EI calendar year, other data may be used to determine emissions during CMS downtime, provided that the data substitution method is well documented in the EI and the supporting documentation.

### F: Predictive Emissions Monitoring Systems

Predictive emissions monitoring systems (PEMS) predict real-time emissions data continuously. Since correct calibration and operation are critical to system performance, PEMS may be used to determine emissions only if they have been certified according to EPA or TCEQ standards.

Supply a representative set of summary sheets from relative accuracy test audits performed during the EI calendar year. If $NO_x$ emissions are determined using PEMS, provide the molecular weight used in the data logger. As with CEMS, the logger should use a molecular weight of 46.01 to determine $NO_x$ emissions.

If a PEMS is inoperative for any part of the EI calendar year, other data may be used to determine emissions during PEMS downtime, provided that the data substitution method is well documented in the EI and its supporting documentation.

### M: Measured Data (Stack Sampling Data)

Stack testing is a formal, structured event coordinated with the appropriate TCEQ regional office. Testing conducted using a Draeger tube, fuel gas analysis, or fuel flow measurement does not qualify as stack testing because the data obtained from these types of tests produce emission rates that are considered engineering estimates.

While properly performed stack testing can provide valuable information about a facility's operation, improperly performed testing may grossly misrepresent a facility's emissions. For this reason, the EAS requires that all stack-test data used to determine emissions be collected using methods approved by the EPA or the TCEQ.

Test stacks during conditions that reflect the actual routine operation of the unit. If a unit is modified, or its operating conditions or associated

process parameters change significantly, previous stack test results may no longer accurately reflect the unit's emissions and the EAS may require that a more appropriate method be used to recalculate emissions determinations.

Stack test results should be based on process rate data. If the results are reported as a lb/hour rate, use the factor and the process rate at the time of testing to obtain a process-based emissions rate. For example, for combustion sources, divide the lb/hour emission rate by the MMBtu/hour fuel usage rate to obtain a factor with units of lb/MMBtu. Similarly, for cement kilns, divide the lb/hour emission rate by the tons of clinker/hour to obtain a factor with units of lb/ton of clinker.

If identical facilities with similar emissions are located at the same site but stack-test data are available for only one of them, the EAS may approve the use of the tested facility's emission factors to determine emissions from the other identical facilities. The EAS will also consider, case by case, the validity of using stack-test emission factors generated for one site to determine emissions from identical facilities in another site. In these cases, only the tested facility's emissions may be coded as "M" for 'measured.' The other related facilities' emissions must be coded as "estimated" because these facilities were not actually tested.

The EAS prefers that stacks be tested during the EI calendar year. However, the use of historical stack-test data is acceptable, provided that the equipment is operating within the same parameters and under the same conditions that were in place at the time of the test. Stack-test data from a current year should not be used to determine emissions for previous years.

By signing the front page of the Emissions Inventory Questionnaire and submitting the document to the EAS, the owner or operator certifies that all test data used are certified as accurately representing the facility's emissions.

If $NO_x$ emissions are determined from stack sampling data, the tester should use a molecular weight for $NO_x$ of 46.01 when converting from parts per million to a mass emission rate.

### Q: Portable Analyzer Measurement Data

The TCEQ prefers properly performed, representative, periodic emissions measurements using a portable analyzer over vendor or AP-42 factors (see below).

While accurate portable analyzer measurements can provide valuable information about a facility's operation, improper measurements may grossly misrepresent a facility's emissions. For that reason, the EAS requires that all test data used to determine emissions be collected using methods approved by the EPA or the TCEQ.

Portable analyzer measurements should be taken during conditions that reflect the actual routine operation of the unit. If a unit is modified, or its operating conditions or associated process parameters change significantly, previous measurements may no longer accurately reflect the unit's emissions and the EAS may require that a more appropriate method be used to recalculate emissions.

Measurement results should be based on process rate data. If the results are reported in lb/hr, use the factor and the process rate at the time of testing to obtain a process-based emissions rate. For example, for combustion sources, divide the emission rate in lb/hr by the fuel usage rate in MMBtu/hr to obtain a factor with units of lb/MMBtu.

If a source is tested more than once a year (for example if it is tested quarterly), make sure to account for this in the emission determination. Do not apply one test result to the entire year.

By signing the front page of the Emissions Inventory Questionnaire and submitting the document to the EAS, the owner or operator certifies that all measurements included accurately represent the facility's emissions.

When using portable analyzer measurements to determine $NO_x$ emissions, use a molecular weight for $NO_x$ of 46.01 when converting from parts per million to a mass emission rate.

### V: Vendor-Supplied Emissions Factors

Many industrial equipment manufacturers supply emissions information for their products. These data, based on equipment testing, are developed for a particular piece of equipment and, if applicable, for a particular unit size. Vendor data may be used to determine emissions only if they are based on approved stack testing and if no significant changes have been made to the equipment. A change to a facility or its operation, including a significant change in fuel characteristics, may significantly affect the facility's emissions and therefore invalidate the manufacturer's emissions data.

Include a copy of the manufacturer's data with the supporting documentation. In signing the front page of the EIQ and submitting the document to the EAS, the owner or operator certifies that the facility was operated in the same manner in which it was tested.

### A: AP-42 and Other EPA- or TCEQ-Approved Factors

One method used to determine emissions is the EPA's *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources* (AP-42), with supplements (updated continually)—available at <www.epa.gov/ttn/chief/ap42/index.html>. AP-42 includes brief discussions of various industrial processes, descriptions of these processes' emissions, and emission factors useful for determining these

emissions. Equipment emission factors have generally been determined by testing a representative population varying in size and age. Since this limits the accuracy of determining emissions of these factors, specific equipment factors are preferable to AP-42 factors.

The EPA is constantly working to improve the quality and quantity of the AP-42 factors. When factors are revised, the new factors wholly replace the older factors. When using a published factor from the EPA or the TCEQ, use the most recent factor as of the end of the calendar year for which the emissions inventory is being prepared. A factor published after the end of the EI calendar year may not be used.

Emissions determined using tools other than AP-42 factors may still be coded with a determination methodology of "A" if the determinations were based on EPA- or TCEQ-approved programs or factors. Examples include emissions determined using the TANKS and WATER9 software programs and fugitive emissions determined using factors taken from EPA-453/R-95-017.

### B: Material Balance

Material balance can only be performed for specific types of facilities whose processes are well understood and relatively simple (for example, surface coating or parts cleaning). Emissions determinations must be based on process rates and material quantity and composition. Guidance on determining emissions from several process types may be found in AP-42 or in various TCEQ guides to air permitting, see Appendix D for a list of helpful EPA and TCEQ resources.

Certain methodologies for determining emissions may be labeled "material balance" even if those methodologies incorporate analytical measurements. A TCEQ-approved program for monitoring cooling towers, an extended inlet gas analysis from a glycol still for use in GRI GlyCalc, or a continuous monitoring system used to determine flow rate and composition of gas routed to a flare measures the physical properties of the process stream and does not measure the emissions released to the atmosphere. Therefore, emissions determination methodologies that use such measurements are labeled "B," since the results of the measurements are used in emissions equations.

### S: Scientific Calculation

For emissions inventory, the use of first-order engineering principles (for example, thermodynamic equations or the ideal gas law) constitutes a scientific calculation. Use of process rate data in conjunction with AP-42 or vendor-supplied emission factors, like simple use of a calculator to multiply or add values, does not constitute a "scientifically calculated" emissions determination.

### E: Estimation

If the EPA or the TCEQ has not published guidance on determining emissions for a particular process, and if a preferable emissions determination method is not available, emissions should be determined using an engineering estimate. Any such estimate must be the best possible, given the available data, and must be accompanied by enough supporting documentation to allow the EAS to logically understand how the estimation was made. If the EAS determines that an estimation is unfounded, then the EAS may require that emissions determinations be recalculated.

### O: Other

If the EPA or TCEQ has not published emissions determination guidance for a particular process, and if a preferable emissions determination method is not available, it may be acceptable to use factors developed by an industry group. When using such factors, code the associated emissions with a determination methodology of "other."

Note that certain industry-published software programs, such as GRI GlyCalc or E&P TANK, use emissions determination methodologies that are more appropriately coded with methodologies besides "O." For example, GRI GlyCalc uses site-specific analytical measurements input into material balance equations to determine glycol still emissions. Therefore, GRI GlyCalc emissions determinations should be coded "B." Similarly, E&P TANK uses EPA-approved equations (that are also contained in AP-42) to determine tank emissions. Therefore, E&P TANK emissions determinations should be coded "A."

When using industry group guidance, carefully check emissions determination methodologies to ensure there is no code more appropriate than "O." Additionally, if the EAS determines that an emissions determination is unfounded, then the EAS may require that emissions be recalculated.

## *Choosing a Determination Methodology when More than One Is Used for a Contaminant*

When more than one methodology is used to determine emissions for a contaminant, use the code that represents the majority of the emissions. When determining emissions from a storage tank with flash emissions for example, if the working and breathing losses are calculated using the TANKS 4.09D software (determination methodology "A") while the flash losses are calculated using the gas/oil ratio method (determination methodology "B"), the total emissions reported in the EI should be coded as "B," assuming the flash losses are greater than the working and breathing losses.

When a control efficiency is applied to an emissions factor, the methodology that corresponds to the emissions factor should be used. For example, if the VOC emissions for a compressor engine are determined using the AP-42 Section 3.2 factor (determination methodology "A") with a vendor control efficiency (determination methodology "V") applied, the total VOC emissions reported in the EI should be coded "A."

### Determining Methodologies for a Hypothetical Source

A turbine has CEMS installed to measure $NO_x$ and CO. Additionally, formal stack testing, conducted in coordination with the appropriate TCEQ regional office, has measured $SO_2$ emission rates for this same turbine. CEMS data must be used to determine $NO_x$ and CO actual annual emissions, and these resulting emissions should be coded on the EIQ with a determination methodology of "D." Since the turbine has no CEMS or PEMS in place to measure $SO_2$, the data from the stack test mentioned previously must be used to determine $SO_2$ actual annual emissions; those resulting emissions should be coded "M." For all other expected contaminants—including, but not limited to, TSP, $PM_{10}$, $PM_{2.5}$, and VOC—the best available determination methodologies should be used, and these emissions coded appropriately. For more information on preferred determination methodologies for turbines, please consult "Technical Supplement 1: Select Combustion Sources" in Appendix A.

### Minimum Detection Limits

Certain source-specific methods listed in the preceding sections, such as measured data or material balance, use analytical measurements to determine emissions. Analytical test methods can indicate that measurements of a contaminant likely to be present in an emissions stream are below the analytical method's minimum detection limit. However, such a finding is not equivalent to a finding that the contaminant is absent from the emissions stream. Therefore, if measurements of a contaminant likely to be in an emissions stream are below the minimum detection limit (that is, non-detected), then half of the detection limit must be used to determine the emissions of the contaminant, unless otherwise specified by permit condition, TCEQ or federal rule, or commission order.

## *General Order of Preference*

If a source-specific order of preference for determination methodologies does not exist for a given facility (see technical supplements in Appendix A), the general order of preference listed in Table 4-1 should be followed.

**Table 4-1. General Order of Preference for Emissions Determination Methodologies (to Be Used Only in the Absence of Source-Specific Guidance)**

| |
|---|
| **D** (Continuous emissions monitoring system or CEMS) |
| **H** (HRVOC monitoring system) |
| **F** (Predictive emissions monitoring system or PEMS) |
| **M** (Measured—stack test data) |
| **Q** (Portable analyzer test data) |
| **V** (Vendor-supplied emissions factors) |
| **A** (AP-42 and other EPA-approved factors) |
| **B** (Material balance) |
| **S** (Scientifically calculated) |
| **E** (Estimated) |
| **O** (Other) |

### *Using Factors from a Permit*

Do not list a permit as a factor's source. If the same factor is used to determine emissions for the EI as was demonstrated in a permit application, then the EI must disclose the origin of the factor (for example, vendor data or AP-42). The emission factor used to obtain a permit must not be used in estimating the emissions in the inventory, if any of the following applies:

- If the permit factor came from a document such as AP-42 and the factor has been revised—instead, the most recent version of that factor should be used.
- If testing was conducted or continuous monitoring implemented at a site after the TCEQ issued a permit for that site—instead, the resulting data must be used.
- If a facility's permit no longer reflects the conditions of its actual operations.

Rates reported on the EIQ should represent actual emissions, rather than maximum potential emissions.

## Speciating Emissions

Once the emissions from each facility at the site have been determined, the preparer may need to specifically identify and quantify individual chemical substances, or species, within each emission category. This process, known as *speciation*, is particularly important when reporting emissions of volatile organic compounds (VOCs). This section offers only a brief overview of speciation requirements. For more information about emissions speciation for a particular source, consult the appropriate technical supplement (Appendix A), or contact the EAS.

## Speciating VOCs

VOC speciation requirements depend on a site's geographic location. If the site is in El Paso County or east of the 100º longitude line (see map on page 9), the VOCs should be speciated from each source emitting at least 5 tons of VOCs annually. If the site is located west of the 100º longitude line (except for El Paso County), the VOCs should be speciated from each source emitting at least 25 tons of VOCs annually. For each source that meets these requirements, speciate VOC emissions to at least 90 percent of the total VOC emissions reported for each facility. If any speciated contaminant was emitted at a level below 0.1 ton, the emissions should be reported for that contaminant *under VOC—unclassified* (contaminant code *50001*).

Each emitted substance (for example, carbon monoxide or benzene) must be identified by a unique five-digit number known as the contaminant code. It is very important that each emission rate be reported under the most accurate contaminant code available. For example, benzene should be reported under the benzene-specific code (*52420*) rather than under the general VOC code (*50001*).

For a complete list of contaminant codes, consult *2009 Emissions Inventory Forms and Instructions* (TCEQ publication number RG-360B). This document can be found on the EAS Web page at <www.tceq.state.tx.us/goto/ieas>. The EAS attempts to ensure that the contaminant code list is complete and accurate. If a particular contaminant code cannot be located, contact the EAS for assistance. If possible, be prepared to provide the compound's Chemical Abstracts Service (CAS) number to aid in identification. Note that the contaminant code *50000*, unspeciated hydrocarbons, is no longer in use.

To obtain a *VOC—unclassified* (contaminant code *50001*) total, subtract all speciated VOCs from the total VOC number. Note that the EAS no longer requires explicit reporting of total VOC emissions under contaminant code *59999*. The following example should clarify VOC reporting requirements.

*Example:* A fugitive area located east of 100º longitude emitted 10 tons of VOCs. Based on the VOC weight percentages obtained using a site gas analysis, the released contaminants are determined to be:

- propane (60%)
- butane (8%)
- isobutane (7%)
- pentane (7%)
- isopentane (6%)
- hexane (4%)
- heptane (3%)

- individual VOCs occurring in such small amounts that they cannot reasonably be separated (5%)

Table 4-2 shows how to report these emissions.

**Table 4-2. Example of Speciated VOC Emissions**

| Contaminant Code | Contaminant | Actual Emissions (tpy) |
|---|---|---|
| 50001 | VOC—unclassified | 0.5 |
| 56775 | propane | 6.0 |
| 56725 | butane | 0.8 |
| 56625 | isobutane | 0.7 |
| 56750 | pentane | 0.7 |
| 56700 | isopentane | 0.6 |
| 56600 | hexane | 0.4 |
| 56575 | heptane | 0.3 |

Notice that the total VOC emissions of 10 tons are not explicitly shown in the EIQ. The STARS database will automatically sum the reported VOCs for each source to obtain the total VOC number (previously reported under contaminant code 59999). Do not report the total 10 tons of VOC emissions under contaminant code 50001 and then report the speciated emissions shown in Table 4-2, because STARS will then arrive at a total VOC emission rate of 19.5 tons for this facility, resulting in an overreporting of 9.5 tons of emissions.

## *Speciating Hazardous Air Pollutants and Other Compounds of Interest*

### Hazardous Air Pollutants (HAPs)

HAPs are air pollutants designated as hazardous by the EPA and are identified in Federal Clean Air Act 115(b). Speciate all HAPs, particularly if they were emitted from any facility (source) at or above 0.1 ton per year.

### Chemical Mixtures

For certain chemical mixtures such as condensate or gasoline, quantify and speciate the HAPs, list each HAP under the appropriate contaminant code, and report the balance of the emissions under the chemical mixture's contaminant code, such as 59090 (for condensate) or 59003 (for gasoline). For speciation guidance on other complex contaminants, contact the EAS.

### Toxic Compounds

Toxic compounds are chemicals that are designated as toxic by the EPA. Toxic chemicals are identified in 40 CFR 372.65. Speciate all toxic compounds, particularly if they were emitted from any facility (source) at or above 0.1 ton per year.

Toxic compounds reported in the Toxics Release Inventory (TRI) should be reported in the EI. If there are discrepancies in reporting between the TRI and EI, please include an explanation in the supporting documentation.

### Lead and Mercury

Give special consideration to determining and reporting lead and mercury emissions. The TCEQ is requesting that all regulated entities report lead and mercury emissions from any facility (or source), especially those whose emissions exceed 0.001 ton of either lead or mercury per year.

### Highly Reactive Volatile Organic Compounds (HRVOCs) and Compounds of Interest (COIs) for Nonattainment Counties

In a nonattainment county, speciate each of the following chemicals, particularly if they were emitted from any facility at or above 0.1 ton:

- ethylene
- propylene
- isoprene
- 1,3-butadiene
- all isomers of butene (all isomers of butylene)
- all isomers of pentene
- all isomers of trimethylbenzene
- all isomers of xylene
- all isomers of ethyltoluene

## *Speciating Particulate Matter*

### TSP, $PM_{10}$, and $PM_{2.5}$

*Particulate matter* is a collective term used for any material, except uncombined water, that exists as a solid or liquid in the atmosphere or in a gas stream at standard conditions. While individual particles cannot be seen with the naked eye, collectively they can appear as black soot, dust clouds, or gray hazes.

Total suspended particulate (TSP) matter refers to all particulate matter except uncombined water. Since a particle's transport characteristics and its potential health effects may depend on its size, the EPA has promulgated national primary and secondary air quality standards concerning two subsets of fine (small) particulate matter: $PM_{10}$ and $PM_{2.5}$. Thus, emissions of $PM_{10}$ and $PM_{2.5}$ are required to be reported in the EI. This section will assist in reporting $PM_{10}$ and $PM_{2.5}$ emissions on the EIQ.

$PM_{10}$ is defined as the portion of TSP that has an aerodynamic diameter less than or equal to 10 microns. Therefore, $PM_{10}$ is a subset of TSP by

definition. Most TSP emissions are composed of a certain percentage of $PM_{10}$; that is, a certain percentage of TSP emissions comprises particles less than or equal to 10 microns in diameter, while the remaining percentage comprises larger particles. Therefore, when reporting TSP emissions, also report $PM_{10}$ emissions, unless the facility can document that all TSP emissions are greater than 10 microns in diameter.

$PM_{2.5}$ is defined as the portion of TSP that has an aerodynamic diameter less than or equal to 2.5 microns. Therefore, $PM_{2.5}$ is a subset of TSP and $PM_{10}$ by definition. For many sources, $PM_{2.5}$ constitutes a certain percentage of TSP emissions. For example, sources that combust natural gas emit particulate matter less than 1 micron in diameter. Thus, all particulate matter emitted from natural gas combustion is not only $PM_{2.5}$ (since it is smaller than 2.5 microns in diameter), but also TSP and $PM_{10}$, since $PM_{2.5}$ is a subset of TSP and $PM_{10}$ by definition.

### Particle-Size Distribution

The percentages of $PM_{10}$ and $PM_{2.5}$ that constitute a source's TSP emissions are often referred to as a particle-size distribution. Source-specific, EPA-approved testing is the best method available to determine particle size distribution for a particular emissions source (facility). If test data are not available, process knowledge—including manufacturers' data—may help determine a source's particle-size distribution. AP-42 also contains particle-size distributions for certain sources.

### Reporting and Speciating Particulate Matter

**All** particulate matter emissions must be reported regardless of size as TSP under the *1xxxx* series of contaminant codes. Since TSP is defined as all particulate matter (that is, there are no size restrictions on TSP), even the portion of TSP that is $PM_{10}$ and $PM_{2.5}$ should be reported under the *1xxxx* contaminant code series. Similarly, all particles with an aerodynamic diameter less than or equal to 10 microns should be reported as $PM_{10}$ under the *2xxxx* contaminant code series, even if a portion of these particles can be considered $PM_{2.5}$. Note that, since $PM_{10}$ and $PM_{2.5}$ are subsets of TSP, representing particulate matter as TSP, $PM_{10}$, and $PM_{2.5}$ does not result in repeated counting of the emissions.

To speciate particulate matter, follow these guidelines:

- report all speciated particulate emissions under the appropriate *1xxxx* contaminant code,
- list the remaining unspeciated particulate emissions under the contaminant code *10000*,
- report the portion of the particulate emissions with an aerodynamic diameter of 10 microns or less ($PM_{10}$) under a *2xxxx* contaminant code,

- list the remaining unspeciated $PM_{10}$ emissions under contaminant code *20000*, and
- report the portion of the particulate emissions with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) under contaminant code *39999*.

*Example:* A facility emitted 10 tons of particulate matter. The matter is determined to have been mostly phosphorus (75 percent) and zinc (16 percent), with the remaining 9 percent of unknown composition. The phosphorus and zinc particles are larger than 2.5 microns, but smaller than 10 microns, in aerodynamic diameter. The other 9 percent of particles are believed to be larger than 10 microns in aerodynamic diameter. The emissions in this example should be reported as shown in Table 4-3.

**Table 4-3. Example of Speciated Particulate Matter Emissions**

| Contaminant Code | Contaminant | Actual Emissions (tpy) |
|---|---|---|
| 10000 | Part—unclassified | 0.9 |
| 14460 | phosphorus | 7.5 |
| 14780 | zinc | 1.6 |
| 20000 | $PM_{10}$—unclassified | 0 |
| 24460 | $PM_{10}$ phosphorus | 7.5 |
| 24780 | $PM_{10}$ zinc | 1.6 |
| 39999 | total $PM_{2.5}$ | 0 |

Notice that the total particulate number (10 tons) and the total $PM_{10}$ number (9.1 tons) are not explicitly listed in this report. Once again, the STARS database will sum all of the appropriate individual contaminants to obtain these numbers. Verify that the sum of the emission rates reported in the entire 10000 series of contaminants represents the intended total particulate emission rate, and that the sum of the emission rates reported in the entire 20000 series of contaminants represents the intended total $PM_{10}$ emission rate.

## *Speciation Criteria Summary*

Table 4-4 summarizes the criteria for speciating emissions.

# Reporting Emissions

Before entering emission rates on the EIQ, the annual emissions and the emissions resulting from emissions events or scheduled maintenance, startup, and shutdown activities must be determined. Depending on the site's location, the daily emission rates for the summer months may need to be determined. Then the emissions are reported in the EI.

## *Annual Emissions*

These include all of a facility's emissions, including authorized emissions from maintenance, startup, and shutdown activities. It does not include emissions that are defined in 30 TAC 101.1 as emissions events or

scheduled maintenance, startup, and shutdown activities. Determine and speciate annual emissions according to the guidance in this chapter and the technical supplements.

**Table 4-4. Summary of Speciation Criteria**

| Contaminant | Applicable Counties | If the emissions at the FIN/EPN path satisfy the tpy limit listed below, report or speciate the actual emissions. |
|---|---|---|
| Lead (Pb) | All counties | ≥ 0.001 |
| Mercury (Hg) | All counties | ≥ 0.001 |
| HAPs[a] | All counties | ≥ 0.1 |
| Toxics[b] | All counties | ≥ 0.1 |
| HRVOCs[c] | Nonattainment counties | ≥ 0.1 |
| COIs[d] | Nonattainment counties | ≥ 0.1 |
| Total VOCs[e] | East of 100º latitude, El Paso | ≥ 5, 90% speciation required |
| | West of 100º latitude | ≥ 25, 90% speciation required |
| TSP, PM10 | All counties | Speciate particulate classes when possible. |
| Chemical Mixtures | All counties | Use the most specific contaminant code possible for chemical mixtures such as condensate (*59090*), crude oil (*59001*) and gasoline (*59003*). When using chemical mixtures, speciate HAPs and other species first, then report the unspeciated remainder under the applicable code. |
| IC Engines | All counties | Report all HAPs ≥ 0.1 tpy<br>*Note:* formaldehyde is typically ≥ 0.1 tpy when the total VOCs are ≥ 2 tpy. |

[a] HAP—*Hazardous air pollutants* as identified at federal Clean Air Act 115(b).

[b] Toxic—*Toxic air pollutants* as identified at 40 CFR 372.65.

[c] HRVOC—*Highly reactive volatile organic compounds* are, for inventory purposes, 1,3-butadiene, ethylene, propylene, and all isomers of butene.

[d] COI—Compounds of interest are, for inventory purposes: isoprene, all isomers of pentene, all isomers of trimethylbenzene, and all isomers of ethyltoluene.

[e] VOC—*Volatile organic compounds* as defined in 30 TAC 101.1.

## *Ozone Season Emissions*

If the regulated entity is located in El Paso County or east of the 100º longitude line (see Table 4-5 for those counties), the average daily release rates during the ozone season—June 1 through August 31—must be determined. The ozone season emissions should be reported in pounds per day (ppd) under the "Ozone" heading on the Path Emissions portion of the EIQ. The EAS database can no longer automatically calculate ozone rates.

For each FIN/EPN path, use actual process and/or emissions data gathered during the summer months to determine total ozone season emission rates. For example, for a combustion source, determine total ozone season emissions contaminant by contaminant from the amount of fuel burned from June 1 through August 31. For sources (facilities) equipped with

CEMS, determine total ozone season emissions from CEMS data gathered from June 1 through August 31.

For each FIN/EPN path, quantify every contaminant's total ozone season emissions (in pounds). Do not include emissions events or scheduled maintenance, startup, and shutdown emissions in total ozone season emissions. However, authorized maintenance, startup, and shutdown emissions that are included in the annual emissions rate should be accounted in the total ozone season emissions. Next, for each FIN/EPN path, determine how many days the facility emitted through this emission point during the ozone season. Then use the following equation to determine the FIN/EPN path's ppd emissions rates:

$$E_{ozone\ rate} = \frac{E_{ozone\ total}\ \text{(lbs)}}{Operation\ \ Days_{ozone}}$$

Where:

$E_{ozone\ rate}$ = ppd (pounds per day) ozone rate for one contaminant

$E_{ozone\ total}$ = total ozone season emissions for one contaminant, in lb

$Operation\ Days_{ozone}$ = number of days FIN/EPN path operated during ozone season; not to exceed 92

Depending on the type of source, there may be many ways to determine $E_{ozone\ total}$ in the equation above. Use the method that gives the most accurate estimate of the actual emissions during the ozone season. Make sure to take into account parameters that may cause emissions to vary in the ozone season such as fuel usage, chemical vapor pressures, operating schedule, and material usage.

$Operation\ Days_{ozone}$ in the above formula will vary, depending upon a facility's operating schedule. If the associated facility has a consistent weekly operating schedule, then ozone emissions can be calculated using the actual number of days operated during the ozone season. Ensure that the facility's operating schedule on the EIQ has been updated with data for the current year.

*Please note:* Use caution when using a pound-per-hour rate to determine ozone season emissions. The pound-per-hour rate should not be multiplied by 24 hours a day unless the source actually operated each day for 24 hours. That would be equivalent to reporting the maximum ozone season rate versus an actual average ozone season emission rate.

If a facility does not operate consistently during the summer months, then ozone season emissions data should be averaged over 92 days (that is, enter "92" for $Operation\ Days_{ozone}$ in the above formula) to avoid unusually large ozone emissions.

> For example, an emergency generator or fire pump is tested quarterly but otherwise remains idle. During the one-day July test,

the unit emits 1,000 pounds of $NO_x$. However, those emissions should **not** be reported as 1000 pounds per day. Rather, they should be averaged over 92 days, resulting in ozone season emissions of 10.87 pounds per day.

If a facility's inconsistent operating schedule produces unusually large ozone season emissions, or if an EIQ source operated during the summer months, but specific ozone season emissions data are not available to determine ppd rates, please contact the EAS for assistance.

## *Emissions Events (EE)*

Report emissions events separately under the "EE" column on the "Path Emissions" portion of the EIQ. Include the annual emissions in tons from all releases due to emissions events, regardless of whether those releases represent reportable or nonreportable quantities and regardless of whether an affirmative defense is claimed for those emissions. For more information, consult 30 TAC 101.1 and 101.201.

For guidance on interpreting rules concerning emissions events, contact the TCEQ's Air Section manager for the region where the regulated entity is located.

### Excess Opacity Events

Emissions that occur during excess opacity events need to be quantified and reported in the EI. However, the excess opacity event itself cannot be reported in terms of percent opacity in the EI. Rather, the emissions associated with the event must be calculated and reported in the "Emissions Event" column as a mass quantity (in terms of tons), using the best emissions determination method available, such as process knowledge, past engineering analysis, or testing.

### Certification Statement

Under Texas Health and Safety Code 382.015(f), an owner or operator of a regulated entity that experienced no emissions events during the relevant calendar year and that is required to submit an annual EI must include as part of the inventory a signed statement that the regulated entity experienced no emissions events during the reporting year.

However, if the owner or operator notified the TCEQ in accordance with 30 TAC 101.201 about only an excess opacity event which had no emissions associated with it, he or she must sign the EE certification.

**Table 4-5. Ozone Season Daily Rates Are Required from Sites in These Counties**

*Note:* The EAS database is no longer capable of automatically calculating ozone rates.

| | | | |
|---|---|---|---|
| Anderson | Duval | Karnes | Red River |
| Angelina | Eastland | Kaufman | Refugio |
| Aransas | El Paso | Kendall | Robertson |
| Archer | Ellis | Kenedy | Rockwall |
| Atascosa | Erath | Kerr | Runnels |
| Austin | Falls | Kimble | Rusk |
| Bandera | Fannin | Kleberg | Sabine |
| Bastrop | Fayette | Knox | San Augustine |
| Baylor | Foard | La Salle | San Jacinto |
| Bee | Fort Bend | Lamar | San Patricio |
| Bell | Franklin | Lampasas | San Saba |
| Bexar | Freestone | Lavaca | Shackelford |
| Blanco | Frio | Lee | Shelby |
| Bosque | Galveston | Leon | Smith |
| Bowie | Gillespie | Liberty | Somervell |
| Brazoria | Goliad | Limestone | Starr |
| Brazos | Gonzales | Live Oak | Stephens |
| Brooks | Grayson | Llano | Tarrant |
| Brown | Gregg | Madison | Taylor |
| Burleson | Grimes | Marion | Throckmorton |
| Burnet | Guadalupe | Mason | Titus |
| Caldwell | Hamilton | Matagorda | Travis |
| Calhoun | Hardeman | McCulloch | Trinity |
| Callahan | Hardin | McLennan | Tyler |
| Cameron | Harris | McMullen | Upshur |
| Camp | Harrison | Medina | Uvalde |
| Cass | Haskell | Menard | Van Zandt |
| Chambers | Hays | Milam | Victoria |
| Cherokee | Henderson | Mills | Walker |
| Clay | Hidalgo | Montague | Waller |
| Coleman | Hill | Montgomery | Washington |
| Collin | Hood | Morris | Webb |
| Colorado | Hopkins | Nacogdoches | Wharton |
| Comal | Houston | Navarro | Wichita |
| Comanche | Hunt | Newton | Wilbarger |
| Concho | Jack | Nueces | Willacy |
| Cooke | Jackson | Orange | Williamson |
| Coryell | Jasper | Palo Pinto | Wilson |
| Dallas | Jefferson | Panola | Wise |
| DeWitt | Jim Hogg | Parker | Wood |
| Delta | Jim Wells | Polk | Young |
| Denton | Johnson | Rains | Zapata |
| Dimmit | Jones | Real | Zavala |

## *Scheduled Maintenance, Startup, and Shutdown (SMSS) Activities*

Report emissions from scheduled maintenance, startup, and shutdown activities separately under the "SMSS" column on the "Path Emissions" portion of the EIQ. Report the annual emissions in tons from all releases

due to scheduled maintenance, startup, and shutdown activities that are not authorized by a new source review permit or permit by rule in the "SMSS" column, regardless of whether those releases represent reportable or nonreportable quantities and regardless of whether an affirmative defense is claimed for those emissions. For more information, consult 30 TAC 101.1 and 101.211.

*Note:* Emissions from maintenance, startup, and shutdown activities that are authorized under a permit or permit by rule should be reported in the "Annual" column and not included in the "SMSS" column.

For guidance on interpreting rules concerning scheduled maintenance, startup, and shutdown activities, contact the TCEQ's Air Section manager in the region where the regulated entity is located.

## *Special Note: "EE/SMSS" Column*

As outlined in the previous section, emissions from emissions events and SMSS activities must be reported in either the "EE" or the "SMSS" column, as appropriate. A regulated entity that reports emissions in the "EE/SMSS" (totals) column must also report emissions in the "EE" or "SMSS" column (or both), as appropriate.