

Below is an Electronic Version of an Out-of-Print Publication

You can scroll to view or print this publication here, or you can borrow a paper copy from the Texas State Library, 512/463-5455. You can also view a copy at the TCEQ Library, 512/239-0020, or borrow one through your branch library using interlibrary loan.

The TCEQ's current print publications are listed in our catalog at <http://www.tceq.state.tx.us/publications/>.



December 2002
RG-360/02

2002 Emissions Inventory Guidelines

2002 Emissions Inventory Guidelines

Prepared by
Technical Analysis Division
Industrial Emissions Assessment Section
P. O. Box 13087, MC 164
Austin, Texas 78711-3087

RG-360/02
December 2002



Robert J. Huston, *Chairman*
R. B. “Ralph” Marquez, *Commissioner*
Kathleen Hartnett White, *Commissioner*

Margaret Hoffman, *Executive Director*

Authorization to use or reproduce any original material contained in this publication—that is, not obtained from other sources—is freely granted. The commission would appreciate acknowledgment.

Copies of this publication are available for public use through the Texas State Library, other state depository libraries, and the TCEQ Library, in compliance with state depository law. For more information on TCEQ publications, call 512/239-0028 or visit our Web site at:

www.tceq.state.tx.us/publications

Published and distributed
by the
Texas Commission on Environmental Quality
PO Box 13087
Austin TX 78711-3087

The Texas Commission on Environmental Quality was formerly called
the Texas Natural Resource Conservation Commission.

The TCEQ is an equal opportunity/affirmative action employer. The agency does not allow discrimination on the basis of race, color, religion, national origin, sex, disability, age, sexual orientation or veteran status. In compliance with the Americans with Disabilities Act, this document may be requested in alternate formats by contacting the TCEQ at 512/239-0028, Fax 239-4488, or 1-800-RELAY-TX (TDD), or by writing P.O. Box 13087, Austin, TX 78711-3087.

Contents

Chapter 1 — General Information	1
Introduction	1
A Self-Reporting Process	1
What You Will Find in this Book	2
IEAS Objectives	2
Rule 101.10	3
Special Inventory Requirements	3
30 TAC § 101.10. Emissions Inventory Requirements	4
TCEQ Nonattainment Areas and Near-Nonattainment Areas	7
What Constitutes a Complete Submission?	9
Requirements for a New Account	9
Requirements for a Previously Existing Account	9
If Your Site Experienced Insignificant Emissions Changes	10
If a Site Does Not Meet the Requirements of Rule 101.10	10
If a Site Will Not Meet the Requirements of Rule 101.10 in Future Years ..	11
A Note about Confidentiality	11
Chapter 2 — Account Structure	13
Identifying Emission Sources	13
Including Sources in Account Structure: The 10 Percent Guideline ...	13
Representing Emission Sources in the Emissions Inventory	14
Facilities	15
Emission Points	15
Abatement Devices	16
Emission Paths	16
Grouped Sources	17
Representing Combustive Abatement Devices.	18

Appropriate Structural Representation of Common Industrial Processes	19
Cooling Towers	20
Glycol Units and Amine Units	20
Sulfur Recovery Units	22
Loading Operations	23
Surface Coating Operations	23
Aggregate Operations	24
Marine Operations	26
Wastewater Collection and Treatment	29
Chemical Production	29
Modifying Existing Account Structure	29
Adding a New EPN to an Existing FIN	29
Adding a New FIN to an Existing EPN	30
Linking an Existing FIN to an Existing EPN	30
Adding a New Abatement Device (CIN) to an Existing FIN / EPN Path without Changing the EPN	31
Adding a New Abatement Device (CIN) to an Existing FIN and Replacing the Old EPN with the New CIN	31
Adding an Existing Abatement Device (CIN) to an Existing FIN / EPN Path Without Changing the EPN	32
Adding an Existing Abatement Device (CIN) to an Existing FIN and Replacing the EPN With the New CIN / EPN	32
Removing Structure	32
Chapter 3 — Estimating and Reporting Emissions	33
Required Emissions Data	33
Acceptable Determination Methodologies	33
General Order of Preference	37
A Note on Using Factors from a Permit	38
Speciating Emissions	38
VOCs	39
Hazardous Air Pollutants and Other Compounds of Interest	40
Particulate Matter	41

Reporting Emissions (Annual Emissions, Ozone Season Emissions, EE/SMSS)	42
Annual Emissions	42
Ozone Season Emissions	42
Counties for which Ozone Season Daily Rates Must be Reported	43
Emission Events and Scheduled Maintenance, Startup, and Shutdown Activities (EE/SMSS)	44
Chapter 4 — Forms and Instructions	45
Account Information	46
Contact Information	48
Structural Overview	50
Facility Information	52
Non-Flare Combustion Unit	52
Flare	56
Storage Tank	60
Cooling Tower	64
Wastewater Facility	68
Leaking Component Fugitives	72
Other	76
Abatement Device Information	80
Emission Point Information	82
Stack Profile	82
Flare Profile	86
Fugitive Profile	88
Path Emissions	90
Account Emissions	92
Material Throughput	94
Combustion Units	94
Storage and Loading Facilities	96
Printing, Painting and Degreasing Facilities	98
Wastewater Facilities	100

Chapter 5 — Updating an EIQ	103
Updating EIQ Data	103
STARS Group Types, Profiles and Characteristics	105

Appendixes

Appendix A — Technical Supplements	A-1
Combustion Sources	A-3
Cooling Towers	A-11
Equipment Leak Fugitives	A-17
Flares	A-35
Marine Facilities	A-43
Appendix B — Forms	B-1
Account Information	B-3
Contact Information	B-5
Structural Overview	B-7
Facility Information: Non-Flare Combustion Unit	B-9
Facility Information: Flare	B-11
Facility Information: Storage Tank	B-13
Facility Information: Cooling Tower	B-15
Facility Information: Wastewater Facility	B-17
Facility Information: Leaking Component Fugitives	B-19
Facility Information: Other	B-21
Abatement Device Information	B-23
Emission Point Information: Stack Profile	B-25
Emission Point Information: Flare Profile	B-27
Emission Point Information: Fugitive Profile	B-29
Path Emissions	B-31
Account Emissions	B-33
Material Throughput: Combustion Units	B-35
Material Throughput: Storage and Loading Facilities	B-37
Material Throughput: Printing, Painting and Degreasing Facilities	B-39
Material Throughput: Wastewater Facilities	B-41

Appendix C — Sample Letters	C-1
Inapplicability Notification	C-3
Insignificant Change Notification	C-5
Mail List Removal Request	C-7
Appendix D — EPA and TCEQ Resources	D-1
Appendix E — Small Business Information	E-1
Appendix F — Checklist	F-1
Glossary	G-1
How to Contact the IEAS	Back Cover

Chapter 1 — General Information

Introduction

As part of national and state efforts to protect human health and the environment, both federal and state law require companies to prepare and submit an annual emissions inventory (EI) of the air pollutants released at their sites.

In Texas, the Texas Commission on Environmental Quality (TCEQ) is authorized to request the emissions inventories and supporting documentation required by the Federal Clean Air Act, in conjunction with Title 30 of the Texas Administrative Code (TAC), Section (§) 101.10 (also called Rule 101.10) and with Section 382.014 of the Texas Clean Air Act, Texas Health and Safety Code. To meet these regulations' reporting requirements, you will be working with the Industrial Emissions Assessment Section (IEAS) of the TCEQ's Office of Environmental Policy, Analysis and Assessment (OEPAA).

Your emissions inventory data allow the TCEQ to plan pollution control programs, promote compliance with laws and regulations, conduct permit reviews, and supply required data to the Environmental Protection Agency (EPA). In order to meet its goal of protecting human and natural resources, the TCEQ needs your full and complete cooperation.

A Self-Reporting Process

The emissions inventory is a self-reporting process. You are responsible for determining whether Rule 101.10 applies to your site. For any site that meets the applicability requirements of Rule 101.10 or for which a special inventory is requested by the IEAS, the owner must submit an emissions inventory by the appropriate due date. Failure to do so is a violation of Rule 101.10 and may result in agency enforcement action against the company.

Emissions inventory submission requirements are based on site location and on the type and quantity of emissions released. This publication will help you decide whether you must submit an emissions inventory and, if so, how to estimate emissions and how to prepare and submit the required forms.

What You Will Find in this Book

This chapter discusses IEAS objectives, Rule 101.10, and what constitutes a complete emissions inventory submission. This information should help you to understand why the IEAS requires emissions inventories, to determine whether an emissions inventory is required for your site, and to correctly prepare a complete emissions inventory submission. The chapter concludes with a brief discussion of the IEAS confidentiality policy.

Chapter 2 provides information on correct account structure, gives examples for some common industrial processes, and supplies guidance for modifying existing representations.

Chapter 3 presents information about requested emissions data; using acceptable emissions determination methodologies; speciating emissions; and correctly reporting annual emissions, ozone season emissions, and emissions due to emissions events and scheduled maintenance, startup, and shutdown activities.

Chapter 4 presents the emissions inventory add forms and material throughput forms, accompanied by detailed completion instructions.

Chapter 5 contains instructions for updating an emissions inventory questionnaire (EIQ).

The appendices contain technical supplements intended to help you estimate emissions from certain common sources; blank forms that you may use to supply information about your account; sample letters that may help you to address some common situations; information about EPA and TCEQ resources that may assist you in completing your inventory; information about qualifying for small business assistance; and a checklist designed to assist you in determining whether you have included all necessary information with your inventory.

Following the appendices, you will find a specialized terms glossary followed by information on contacting the IEAS.

IEAS Objectives

In order to improve the overall quality of the statewide emissions inventory, the IEAS operates with the following primary objectives:

- to ensure that the data requested in the emission inventory meet the requirements of the Federal Clean Air Act and various other federal and state mandates;
- to collect data in a standard format (approved forms and the EIQ);

- to ensure that companies consistently use the most current and accurate emissions estimation information available;
- to help industry accurately report emissions data, especially by providing assistance through the IEAS Help Line (512/239-1773);
- to maintain data in a standard format using the State of Texas Air Reporting System (STARS) database;
- to supply data to other personnel in the TCEQ; and
- to continually update IEAS publications in order to improve communication with companies submitting emission inventories.

Rule 101.10

This section includes a discussion of the special inventory request, a copy of 30 TAC §101.10, and a map and table entitled “TCEQ Nonattainment Areas and Near-Nonattainment Areas.” The map and table are intended to clarify reporting requirements and do not supersede or replace Rule 101.10. It is your responsibility to read and understand the rule.

Special Inventory Request

The IEAS, under the special inventory provisions of Rule 101.10 (b) (3), is requesting that inventories be completed and submitted for the accounts located in near-nonattainment counties that emitted at least 10 tons of VOCs or 25 tons of NO_x. If your account meets these thresholds and you have received a request from the IEAS, then you must complete and submit the emissions inventory.

Of course, if your account is located in a near-nonattainment county and meets any of the other applicability requirements of Rule 101.10, it is your responsibility to submit a routine emissions inventory.

The near-nonattainment counties are: Bastrop, Bexar, Caldwell, Comal, Ellis, Gregg, Guadalupe, Harrison, Hays, Henderson, Hood, Hunt, Johnson, Kaufman, Nueces, Parker, Rockwall, Rusk, San Patricio, Smith, Travis, Upshur, Victoria, Williamson, and Wilson.

30 TAC § 101.10. Emissions Inventory Requirements

(a) **Applicability.** The owner or operator of an account or source in the State of Texas or on waters that extend 25 miles from the shoreline meeting one or more of the following conditions shall submit emissions inventories and/or related data as required in subsection (b) of this section to the commission on forms or other media approved by the commission:

(1) an account which meets the definition of a major facility/stationary source, as defined in §116.12 of this title (relating to Nonattainment Review Definitions), or any account in an ozone nonattainment area emitting a minimum of ten tons per year (tpy) volatile organic compounds (VOC), 25 tpy nitrogen oxides (NO_x), or 100 tpy or more of any other contaminant subject to national ambient air quality standards (NAAQS);

(2) any account that emits or has the potential to emit 100 tpy or more of any contaminant;

(3) any account which emits or has the potential to emit 10 tons of any single or 25 tons of aggregate hazardous air pollutants as defined in FCAA, §112(a)(1); and

(4) any minor industrial source, area source, non-road mobile source, or mobile source of emissions subject to special inventories under subsection (b)(3) of this section. For purposes of this section, the term “area source” means a group of similar activities that, taken collectively, produce a significant amount of air pollution.

(b) **Types of inventories.**

(1) Initial emissions inventory. Accounts, as identified in subsection (a)(1), (2), or (3) of this section, shall submit an initial emissions inventory (IEI) for any criteria pollutant or hazardous air pollutant (HAP) that has not been identified in a previous inventory. The IEI shall consist of actual emissions of VOC, NO_x, carbon monoxide (CO), sulfur dioxide (SO₂), lead (Pb), particulate matter of less than 10 microns in diameter (PM₁₀), any other contaminant subject to NAAQS, emissions of all HAPs identified in FCAA §112(b), or any other contaminant requested by the commission from individual emission units within an account. For purposes of this section, the term “actual emission” is the actual rate of emissions of a pollutant from an emissions unit as it enters the atmosphere. The reporting year will be the calendar year or seasonal period as designated by the commission. Reported emission activities must include annual routine emissions; excess emissions occurring during maintenance activities, including start-ups and shutdowns; and emissions resulting from upset conditions. For the ozone nonattainment areas, the inventory shall also

include typical weekday emissions that occur during the summer months. For CO nonattainment areas, the inventory shall also include typical weekday emissions that occur during the winter months. Emission calculations must follow methodologies as identified in subsection (c) of this section.

(2) Statewide annual emissions inventory update (AEIU).

Accounts meeting the applicability requirements during an inventory reporting period as identified in subsection (a)(1), (2), or (3) of this section shall submit an AEIU which consists of actual emissions as identified in subsection (b)(1) of this section if any of the following criteria are met. If none of the following criteria are met, a letter certifying such shall be submitted instead:

(A) any change in operating conditions, including start-ups, permanent shut-downs of individual units, or process changes at the account, that results in at least a 5.0% or 5 tpy, whichever is greater, increase or reduction in total annual emissions of VOC, NO_x, CO, SO₂, Pb, or PM₁₀ from the most recently submitted emissions data of the account; or

(B) a cessation of all production processes and termination of operations at the account.

(3) Special inventories. Upon request by the executive director or a designated representative of the commission, any person owning or operating a source of air emissions which is or could be affected by any rule or regulation of the commission shall file emissions-related data with the commission as necessary to develop an inventory of emissions. Owners or operators submitting the requested data may make special procedural arrangements with the Industrial Emissions Assessment Section to submit data separate from routine emission inventory submissions or other arrangements as necessary to support claims of confidentiality.

(c) **Calculations.** Actual measurement with continuous emissions monitoring systems (CEMS) is the preferred method of calculating emissions from a source. If CEMS data is not available, other means for determining actual emissions may be utilized in accordance with detailed instructions of the commission. Sample calculations representative of the processes in the account must be submitted with the inventory.

(d) **Certifying statement.** A certifying statement, required by the FCAA, §182(a)(3)(B), is to be signed by the owner(s) or operator(s) and shall accompany each emissions inventory to attest that the information contained in the inventory is true and accurate to the best knowledge of the certifying official.

(e) **Reporting requirements.** The IEI or subsequent AEIUs shall contain emissions data from the previous calendar year and shall be due on March 31 of each year or as directed by the commission. Owners or operators submitting emissions data may make special procedural arrangements with the Industrial Emissions Assessment Section to submit data separate from routine emission inventory submissions or other arrangements as necessary to support claims of confidentiality. Emissions-related data submitted under a special inventory request made under subsection (b)(3) of this section are due as detailed in the letter of request.

(f) **Enforcement.** Failure to submit emissions inventory data as required in this section shall result in formal enforcement action under the TCAA, §382.082 and §382.088. In addition, the TCAA, §361.2225, provides for criminal penalties for failure to comply with this section.

December 23, 1999

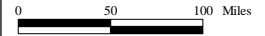
Nonattainment and Near Nonattainment Areas



Protecting Texas by
Reducing and
Preventing Pollution

Texas Commission on Environmental Quality
P.O. Box 13087 (Mail Code 197)
Austin, Texas 78711-3087

December 19, 2002



Texas Statewide Mapping Projection (TSMS)

Scale: 1:6,623,570

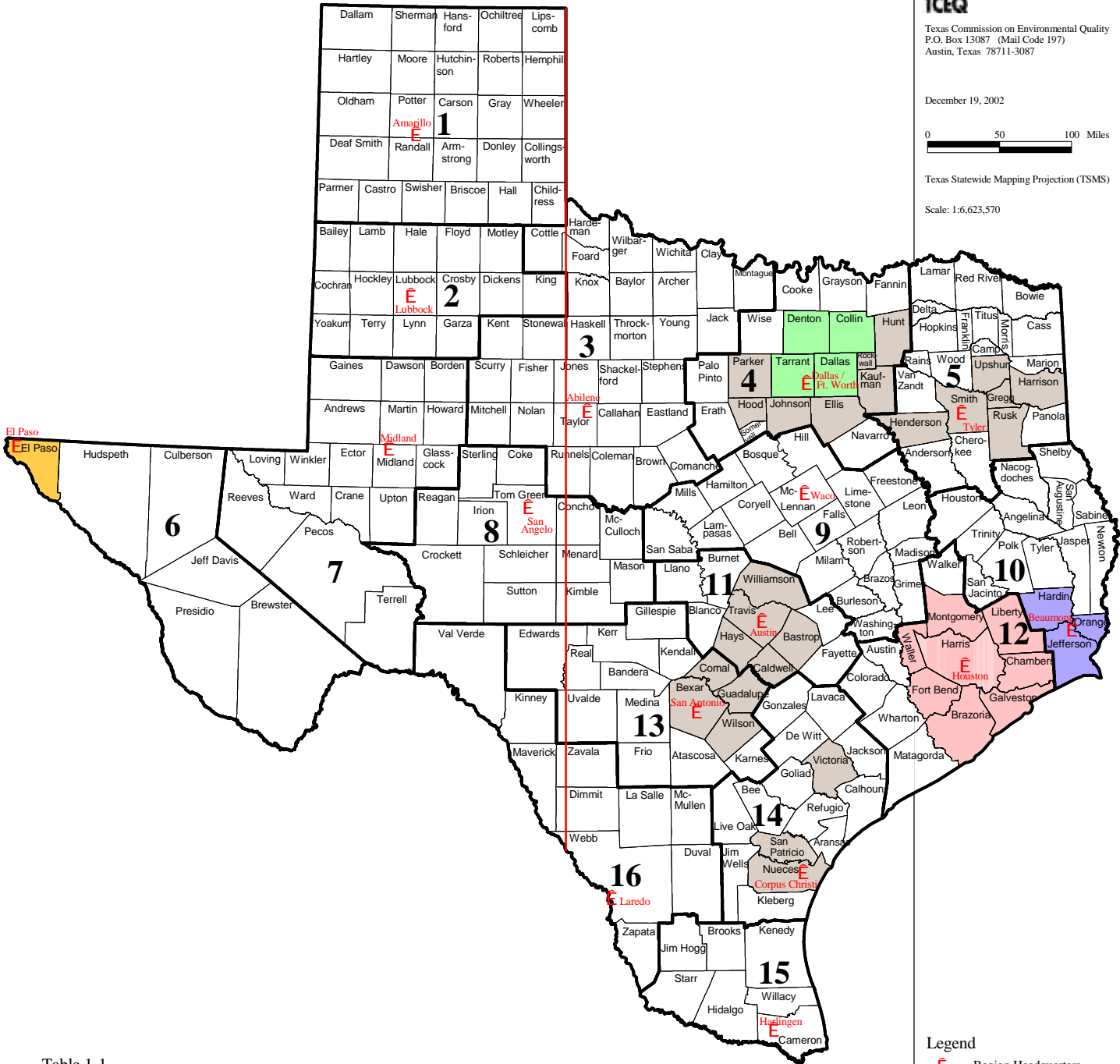


Table 1-1

Summary of Reporting Requirements (tpy) for 30 TAC Section 101.10

County	VOC		NO _x		Other		Individual HAP		Aggregated HAP	
	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential
Brazoria, Chambers, Fort Bend Galveston, Harris, Liberty, Montgomery, Waller SEVERE / OZONE	10	25	25	25	100	100	10	10	25	25
El Paso SERIOUS / OZONE MODERATE / CO & PM10	10	50	25	100	100	100	10	10	25	25
Collin, Dallas, Denton, Tarrant SERIOUS / OZONE	10	50	25	50	100	100	10	10	25	25
Hardin, Jefferson, Orange MODERATE / OZONE	10	100	25	100	100	100	10	10	25	25
NEAR NONATTAINMENT (See Listing Below)	10	100	25	100	100	100	10	10	25	25
All Other Counties	100	100	100	100	100	100	10	10	25	25

Note: If an account's emissions meet or exceed the tons per year (tpy) thresholds listed in this table, an emissions inventory questionnaire must be submitted to the TCEQ. This table is provided as a guidance and is not the actual rule. If a discrepancy exists between the table and rule 30 TAC Section 101.10 and 30 TAC Section 116.12 (Major Source Definition), then the rule will take precedence.

Near Nonattainment Counties: Bastrop, Bexar, Caldwell, Comal, Ellis, Gregg, Guadalupe, Harrison, Hays, Henderson, Hood, Hunt, Johnson, Kaufman, Nueces, Parker, Rockwall, Rusk, San Patricio, Smith, Travis, Upshur, Victoria, Williamson, Wilson

- Legend**
- Region Headquarters
 - Region Number
 - County Boundary
 - Central Meridian

Source: The county boundaries and region headquarters are U.S. Census Bureau 1992 Tiger/Line data (1:100,000). The nonattainment and near nonattainment data is from the TCEQ Office of Policy and Regulatory Development.



This map was generated by the Information Resources Division of the Texas Commission on Environmental Quality. No claims are made to the accuracy or completeness of the data or to its suitability for a particular use. For information concerning the map, contact the Information Resources Division at (512) 239-0800.

Greg Smithhart CRF 021015202

What Constitutes a Complete Submission?

The information required for a complete submission depends in part upon a site's circumstances. Has an emissions inventory ever been completed for this account? Does the site still meet the applicability requirements of Rule 101.10? Have emissions changed significantly as defined in the rule? Might the rule apply to the account in some future year? The answers to these questions will determine the amount and type of information required by the IEAS.

Requirements for a New Account

If a site for which no emissions inventory has previously been submitted meets the applicability requirements of Rule 101.10, then you are required to submit:

- A complete set of forms (see Chapter 4 and Appendix B), including:
 - an Account Information form (if you did not receive an EIQ printout from the IEAS);
 - a Contact Information form;
 - a Structural Overview form;
 - the appropriate Facility Information form for each facility listed on the Structural Overview form;
 - an Abatement Device Information form for each abatement device listed on the Structural Overview form;
 - the appropriate Emission Point Information form for each emission point listed on the Structural Overview form;
 - a Path Emissions form for each path listed on the Structural Overview form; and
 - an Account Emissions form (if you did not receive an EIQ printout from the IEAS).
- Sample calculations representative of the account's processes.
- Flare and fugitive data forms if required by the technical supplements in Appendix A.

Requirements for a Previously Existing Account

If a previously existing account continues to meet the applicability requirements of Rule 101.10, then you are required to submit:

- A properly and thoroughly updated EIQ (see Chapter 5). **You may not substitute a spreadsheet for the EIQ.**
- Any add forms necessary to add or change account structure.
- Sample calculations representative of the account's processes.
- Flare and fugitive data forms if required by the technical supplements in Appendix A.

If Your Site Experienced Insignificant Emissions Changes

If total annual emissions of VOCs, NO_x, CO, SO₂, Pb and PM₁₀ are all within 5 percent or five tons of the most recent total annual emissions reported in the STARS database, then a full emissions inventory submission is not required. Instead, you may request that the most recent annual emissions be “rolled over” for the current year.

If your account experienced no emissions due to emission events and/or scheduled maintenance, startup and shutdown activities (EE/SMSS), then you may request an emissions rollover by submitting:

- a letter similar to the Insignificant Change Notification letter in Appendix C;
- the signed emissions inventory questionnaire cover page; and
- the signed EE/SMSS statement.

If your account did experience emissions due to emission events and/or scheduled maintenance, startup and shutdown activities (EE/SMSS), then you may request an emissions roll-over only for the annual and ozone season emission rates. Submit:

- a letter similar to the Insignificant Change Notification letter in Appendix C; and
- the entire original emissions inventory questionnaire with updated EE/SMSS numbers.

In either case, please be prepared to provide sample calculations and other supporting documentation if these are requested by the IEAS.

If a Site Does Not Meet the Requirements of Rule 101.10

If you believe that your site does not meet the applicability requirements of Rule 101.10, submit:

- a summary of the site’s actual and allowable emission rates; and
- a letter similar to the Rule Inapplicability Notification letter in Appendix C.

Please be prepared to provide sample calculations and other supporting documentation if these are requested by the IEAS.

If a Site Will Not Meet the Requirements of Rule 101.10 in Future Years

If you believe that your site does not currently meet the applicability requirements of Rule 101.10, and if you expect that the site will not meet these requirements in future years, then you may request that the account be removed from the IEAS mailing list. The account owner or operator must sign a letter requesting this action. A sample Mail List Removal Request letter is included in Appendix C of this document.

Please note that emissions inventory requests are based primarily on an account's most recent actual and/or allowable emission rates as they appear in the STARS database. If these rates exceed the rule applicability requirements, then the IEAS cannot remove the account from its mailing list.

A Note about Confidentiality

The IEAS will respect the confidentiality of certain data unless the Texas Attorney General's Office rules that the data are not protected by state law. If you have any special confidentiality concerns, please contact the IEAS. Such concerns do not justify withholding relevant information from the IEAS.

The following information will be kept confidential if clearly marked:

- Material data (as reported on Material Throughput forms)
- Process flow diagrams
- Process rates
- Trade secrets (information that reveals secret processes or methods of manufacture or production)

Information not considered confidential includes:

- Emission rates
- Emissions point data
- Emissions control equipment type
- Emitting equipment type

Under no circumstance should you enter confidential information on the EIQ. Instead, submit confidential information separately, with each page clearly marked "CONFIDENTIAL."

Chapter 2 — Account Structure

The information stored in the STARS database not only provides a basis for future EIQs but also plays a role in a wide variety of airshed modeling and rule-making activities. It is essential that account information be stored in a logical manner that accurately represents site structure. This chapter begins with a section on identifying emission sources and a general discussion of correct account structure. These are followed by examples of common industrial processes and their appropriate structural representation. Finally, the chapter concludes with a section on modifying existing account structure.

Identifying Emission Sources

The first step in the emissions inventory process is identifying all of a site's emission sources. Using all available tools, including plot plans, site maps, comprehensive process flow diagrams, and your knowledge of the site's processes, list all equipment and/or operations that may result in air emissions. Be certain to include the following:

- combustion sources
- storage tanks
- loading operations
- piping component fugitive areas
- wastewater collection and treatment systems
- process areas (for example, process vents or reactors)
- evaporative operations (for example, surface coating or solvent degreasing)
- plant roads

Once you have completed your list, you will need to estimate each source's emissions following the guidance in Chapter 3 and in the technical supplements (Appendix A). You will then be able to determine which sources must be included in your account structure.

Including Sources in Account Structure: The 10 Percent Guideline

After estimating all sources' emissions, you may be able to omit some insignificant sources from your inventory's structure. First, you must determine which of your sources meet all of the following criteria:

- the source emitted less than 1 ton of each criteria pollutant;

- the source emitted less than 0.1 ton of any odorous chemical, toxic chemical, or Hazardous Air Pollutant (HAP);
- the source is not included in a TCEQ air permit; and
- you are not required to include the source in your inventory's structure under any other TCEQ regulation.

It may be possible to omit such sources from your inventory's structure if, for each criteria pollutant, total unreported sources' emissions do not exceed 10 percent of total account-wide emissions.

Example: Suppose that you report an account VOC total of 10 tons from major sources. In addition, you have identified six sources that each emit 0.5 tons of VOCs. These sources meet all of the bulleted criteria listed above. However, because these sources' emissions together total 3 tons, or 30 percent of reported total VOCs, you may not exclude all of them from your account structure.

Instead, you must add four of the six sources to your account structure and report their emissions. Your account VOC total will then reach 12 tons. You may now omit the final two insignificant sources, since their combined one ton of emissions does not exceed 10 percent of the reported emissions.

The 10 Percent Guideline is not intended to be used to reduce site-wide emissions in order to bypass Rule 101.10 reporting requirements. Rule 101.10 applicability is based on the emissions from *all* sources, regardless of the magnitude of their emissions. Please note that the IEAS reserves the right to request that all sources' emissions be listed on the inventory.

If you need assistance in applying the 10 Percent Guideline to your account, please contact the IEAS.

Representing Emission Sources in the Emissions Inventory

Once you have determined which sources must be included in your account structure, you will need to represent each source in a suitable format. To do so, you must first understand facilities, emission points, abatement devices, and the emission paths that link them together.

Facilities

For emissions inventory purposes, the term “facility” refers not to an entire site, but rather to a unique unit, device, structure, or area capable of generating air contaminants. Examples of facilities include:

- a reciprocating engine
- a spray booth
- a chemical storage tank
- a flare
- a process fugitive area

For each facility, you will create a unique alphanumeric code called a facility identification number (FIN), which is limited to 10 characters. Examples of possible FINs for the facilities mentioned above are:

- COMP01
- SPRBTH
- TANK03
- FLR
- FUG

Every FIN in your account will be part of at least one emission path.

Emission Points

An emission point is the spatial location (point) at which emissions enter the air. Examples include:

- an engine exhaust stack
- a spray booth vent
- a process fugitive area

For each emission point, you will create a unique alphanumeric code called an emission point number (EPN), which is limited to 10 characters. Examples of possible EPNs for the points mentioned above are:

- STK1A
- VENT
- FUG

Every EPN in your account will be part of at least one emission path.

Abatement Devices

An abatement device, also called a control device, is a piece of equipment or a recognized operational procedure that limits, controls, or abates emissions. Examples include:

- a flare
- a scrubber
- a condenser
- a vapor recovery unit
- a fugitive Leak Detection and Repair (LDAR) program

You will identify each abatement device in your inventory by a unique alphanumeric code called a control identification number (CIN), limited to 10 characters. Examples of possible CINs for the points mentioned above are:

- FLR
- SCRUB4
- VAPORCOND
- VRU
- LDAR2

Every CIN in your account will be part of at least one emission path.

Please note that some control devices, such as thermal oxidizers and flares, also create emissions and must therefore be represented as both facilities and control devices. For more information on this subject, read “Representing Combustive Abatement Devices” on pages 18-19.

Emission Paths

Once you have identified your account’s facilities, emission points, and abatement devices, you will need to associate the appropriate FINs, EPNs and CINs to represent the site’s emissions paths. Each emission path should represent a unique path that a contaminant may follow from its source (FIN), through any abatement device (CIN), to the atmospheric release point (EPN). Every emission path must include at least a FIN and an EPN.

For clarification, suppose that a site has all of the following:

- a spray booth with a filtered vent
- a two-stack engine without catalytic reduction
- a process fugitive area not subject to an LDAR program

To visualize these sources' structural representations, consider Figure 2-1.

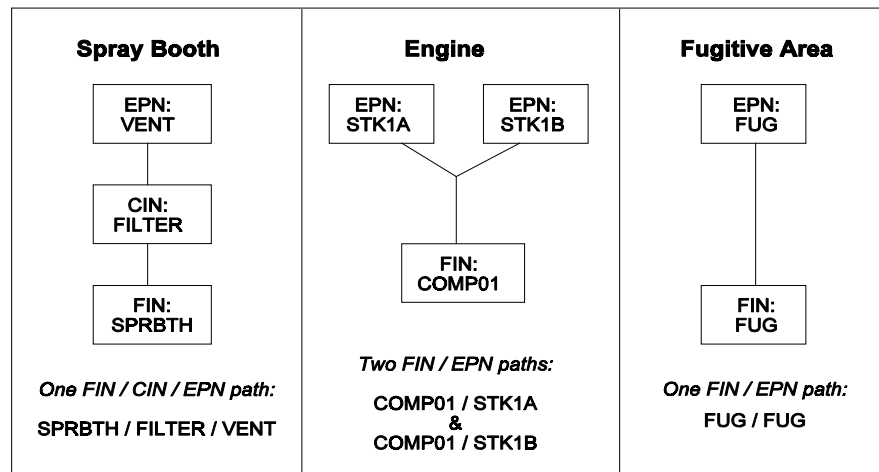


Figure 2-1. Emission paths.

The spray coating emissions originate in the booth (FIN: SPRBTH), pass through the filter (CIN: FILTER), and then enter the air through the vent (EPN: VENT). The correct emissions path for this source is FIN/CIN/EPN: SPRBTH/FILTER/VENT.

The combustion emissions originate in the compressor engine (FIN: COMP01). Some enter the air from stack A (EPN: STK1A), while the remainder enter the air from stack B (EPN: STK1B). The correct two paths in this case are FIN/EPN: COMP01/STK1A and FIN/EPN: COMP01/STK1B.

The fugitive emissions originate at piping components grouped together under one FIN (FUG). They enter the air at the same components, also grouped together under one EPN (FUG). The correct emissions path for this source is FIN/EPN: FUG/FUG.

Grouped Sources

Under certain limited circumstances, you may be able to group several emission sources together under a single FIN with a single EPN. Suppose, for instance, that your site includes four identical diesel tanks, each of which is linked to a carbon adsorber. Basic representation for this situation is shown in Figure 2-2.

Now suppose that each tank's emissions are considered insignificant under the 10 Percent Guideline. Since the tanks are identical and all contain the same material, you may group them under a single FIN as shown in Figure 2-3.

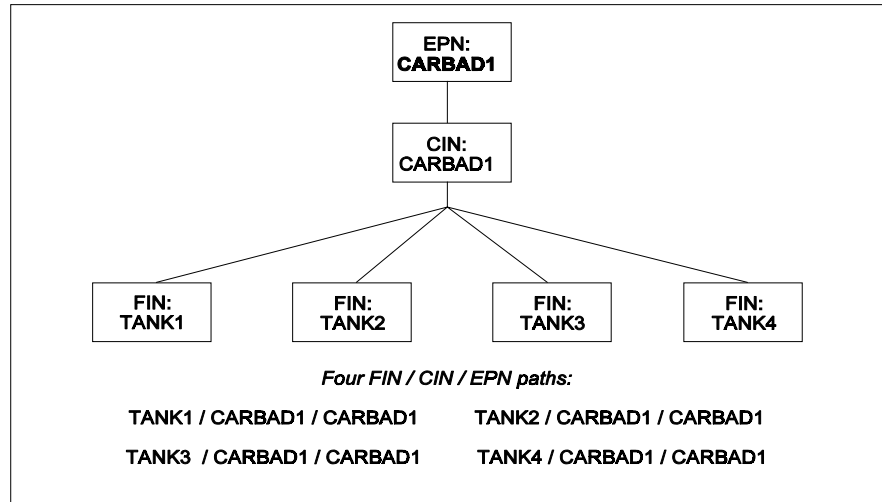


Figure 2-2. Basic tank structure.

Because FIN grouping is a complex matter, we ask that you consult with the IEAS before attempting to group facilities in your emissions inventory.

Representing Combustive Abatement Devices

Most abatement devices do not generate their own emissions and should therefore appear structurally only as CINs. In contrast, combustive abatement devices generate emissions while burning contaminants. Such equipment must therefore appear in account structure both as an abatement device (CIN) and as an emissions source (FIN).

For example, suppose that your site uses a process flare to control tank emissions. Then the flare should appear as the CIN and EPN on the tank

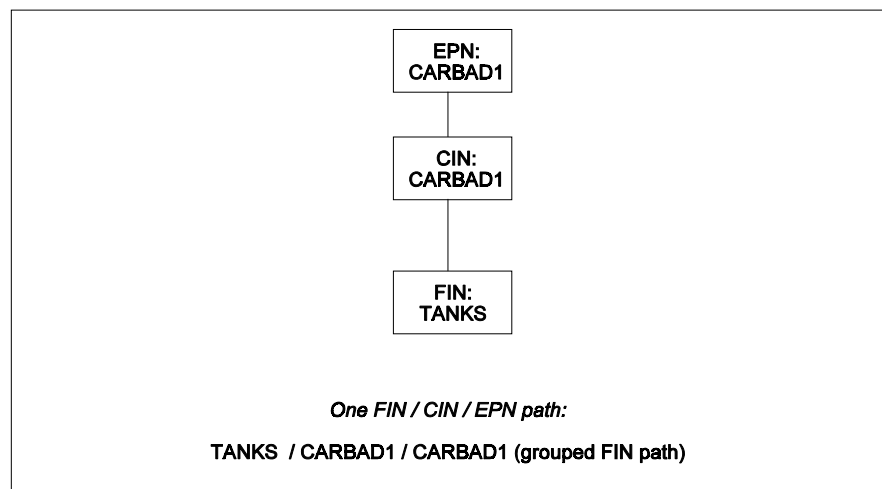


Figure 2-3. Grouped tank structure.

FIN's emission path, where you will report uncombusted VOCs emissions. In addition, since the flare generates NO_x and CO emissions, we must also establish the flare as a FIN (see Figure 2-4).

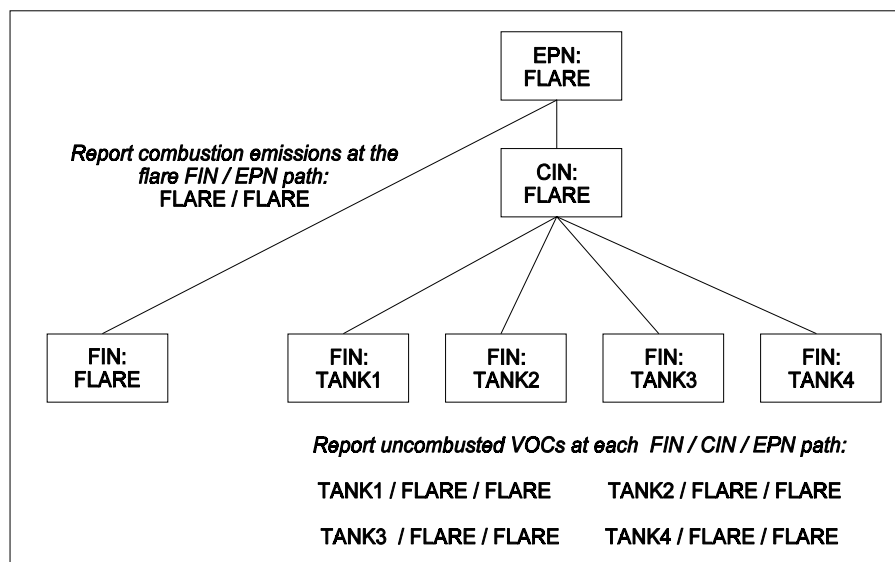


Figure 2-4. Tanks linked to a flare. Note that the flare FIN / EPN path does not include any abatement device, since the flare cannot control the emissions that it creates.

Emergency flare structure is similar to process flare structure, except that you may not need to link an emergency flare to each individual generator FIN. If an emergency flare controls emissions from a large number of sources, then associating it with each FIN would greatly increase the inventory's size without substantially improving its quality. In this case, you may create a single process FIN, link it to the flare, and report all undestroyed VOC emissions, regardless of source, at the FIN / CIN / EPN path: PROCESS / FLARE / FLARE. You will still need to create the FIN / EPN path: FLARE / FLARE and report combustion emissions there.

If you need assistance with establishing correct flare structure, please contact the IEAS.

Appropriate Structural Representation of Common Industrial Processes

This section discusses appropriate structural representation of some common emissions sources. If you need assistance with establishing correct structure for a process, please contact the IEAS.

Cooling Towers

In order to promote data consistency within the STARS database, each cooling tower should be represented as one facility (FIN) with one associated emission point (EPN), regardless of whether it is a natural draft or mechanical draft tower. A mechanical draft tower with multiple cells should also be considered one facility with one emission point; the number of cells should be represented as one of the facility's parameters on the emissions inventory questionnaire.

Cooling towers are designed with drift eliminators. A drift eliminator is part of a cooling tower's basic design and is not considered an abatement device from a structural standpoint.

Glycol Units and Amine Units

For the purposes of establishing account structure, treat an amine unit as you would a glycol unit.

A glycol unit should be represented structurally by two paths: a still path for reporting emissions from the gas stripping process, and a reboiler path for reporting combustion emissions.

If still emissions and reboiler emissions are vented through different stacks, then you will need to represent the unit by two FINs linked to two different EPNs. This structure is demonstrated in Figure 2-5.

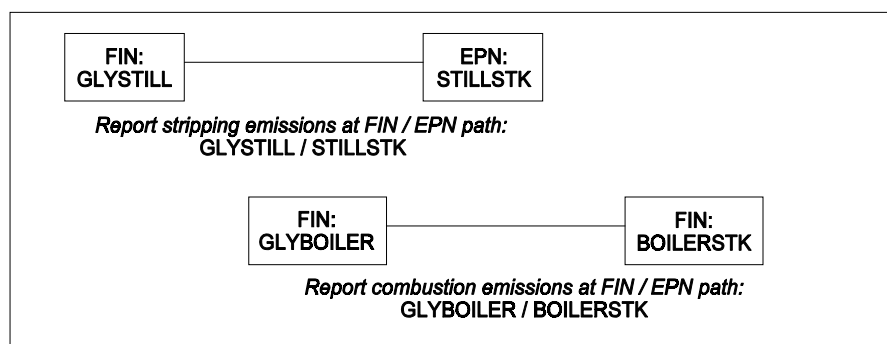


Figure 2-5. Glycol unit structure — separate vents.

If still emissions and reboiler emissions vent through a common stack, then you will need to represent the unit by two FINs linked to a single EPN. This structure is demonstrated in Figure 2-6.

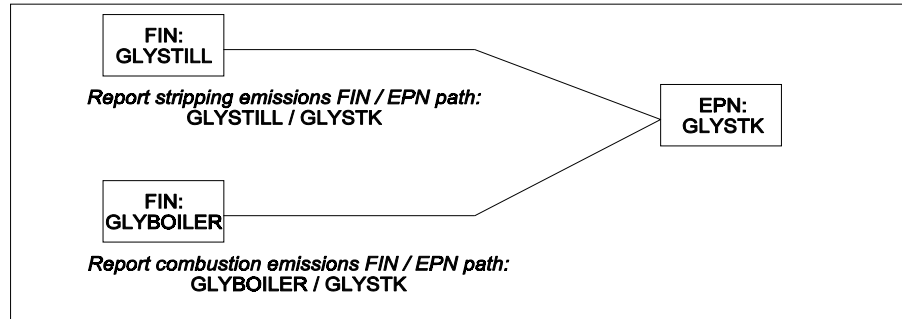


Figure 2-6. Glycol unit structure — common vent.

If glycol dehydrator emissions are routed to a flare, then you should represent the unit as shown in Figure 2-7.

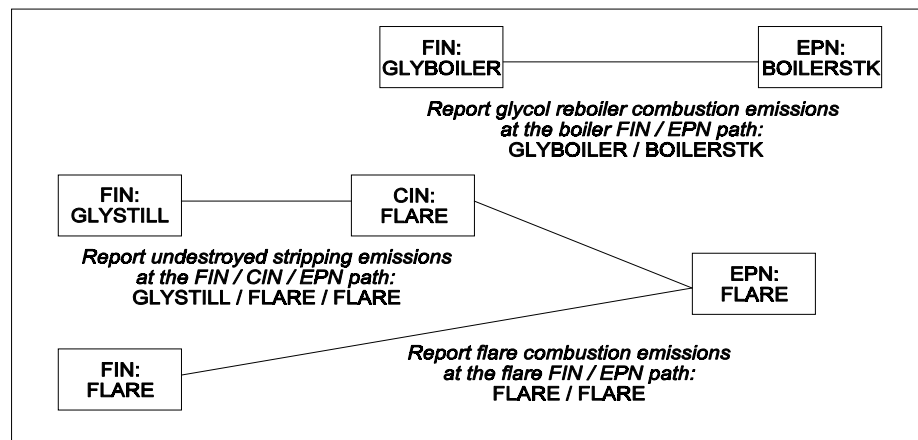


Figure 2-7. Glycol unit structure - flared still emissions.

If glycol still emissions are routed through the reboiler and combusted, then you should represent the unit as shown in Figure 2-8.

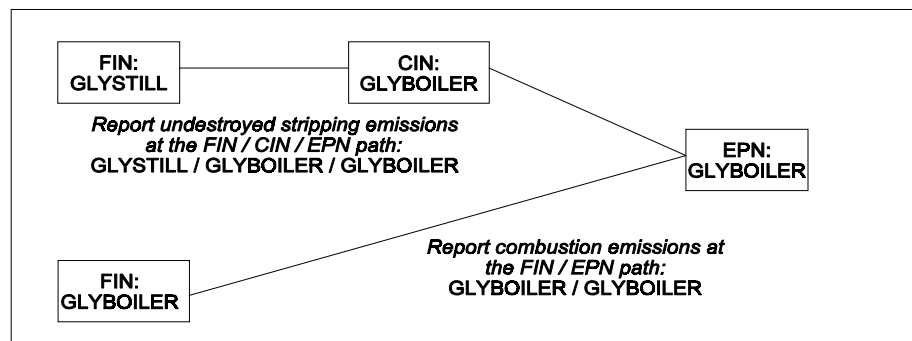


Figure 2-8. Glycol unit structure — still emissions routed through boiler.

Sulfur Recovery Units (SRU)

An SRU is not an abatement device, but rather a unit generating H₂S emissions. Some common SRU structures are shown in Figures 2-9 through 2-12.

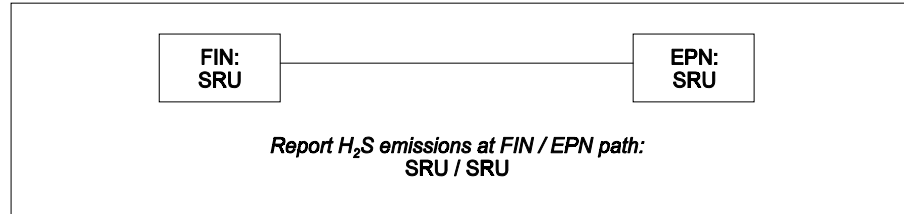


Figure 2-9. Sulfur recovery unit — unabated.

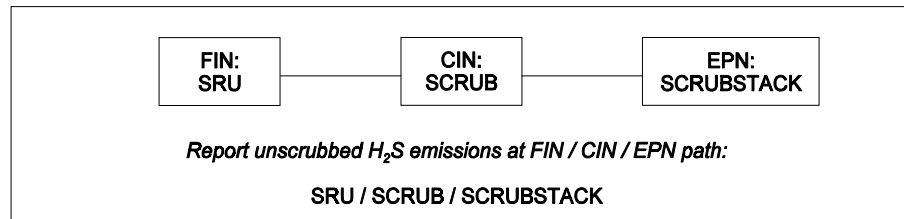


Figure 2-10. Sulfur recovery unit with scrubber.

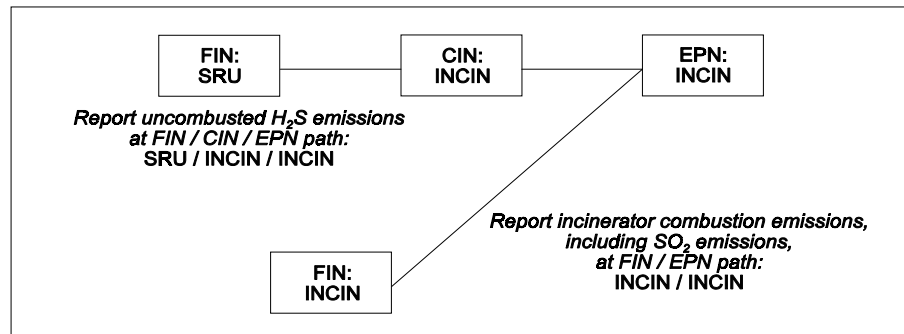


Figure 2-11. Sulfur recovery unit with incinerator.

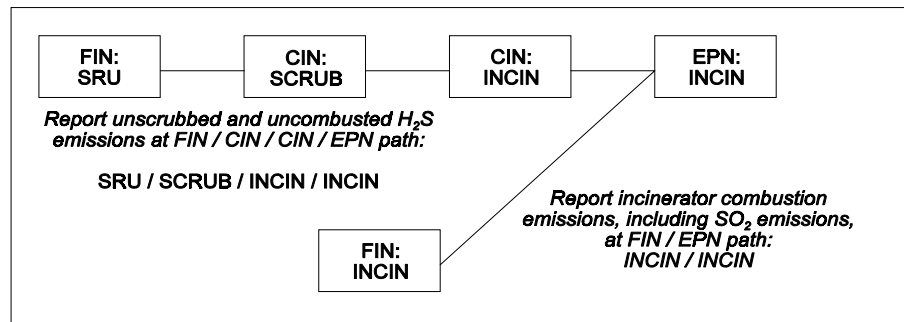


Figure 2-12. Sulfur recovery unit with scrubber prior to incinerator.

Loading Operations

If loading emissions are not routed to an abatement device, then represent each separate loading area by a single FIN linked to a single fugitive-type EPN (Figure 2-13).

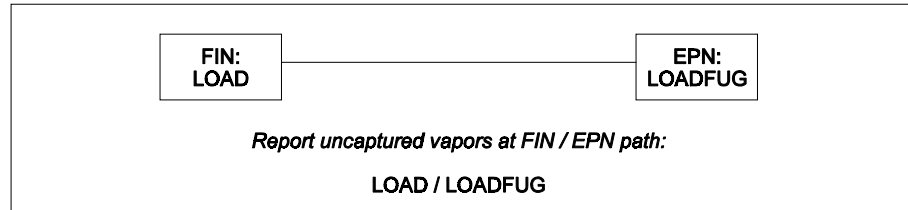


Figure 2-13. Loading area — unabated.

If loading emissions are controlled, then represent the loading operation by a single FIN linked to two EPNs. Report the uncaptured vapors at the fugitive EPN. Report the captured, undestroyed vapors at the abatement device EPN. Figure 2-14 illustrates proper structure for a loading area controlled by a flare.

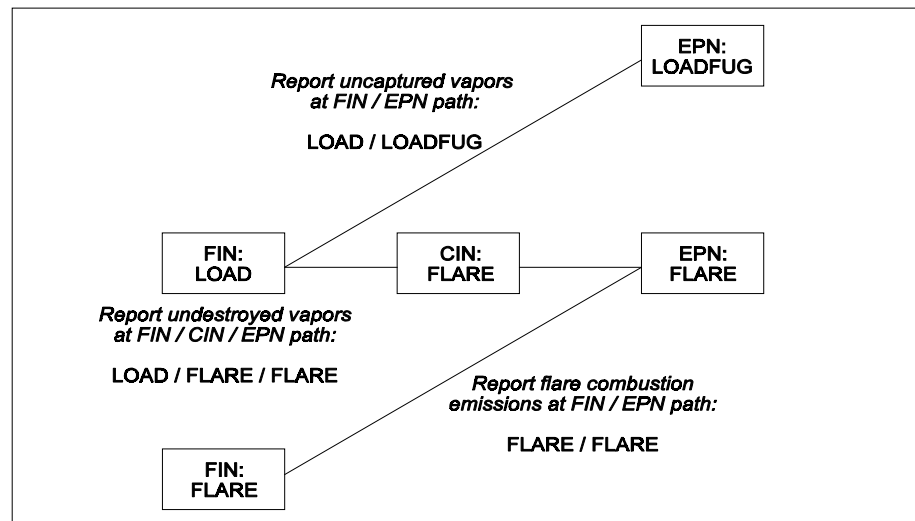


Figure 2-14. Loading area controlled by a flare.

Surface Coating Operations

If emissions from a paint booth are completely uncontrolled, then represent the booth by a single FIN and EPN (Figure 2-15). If emissions are filtered to control particulate emissions, then add a CIN to represent the filter (Figure 2-16). If emissions from the paint booth are routed to an incinerator to control VOC emissions, then represent the booth as shown in Figure 2-17.

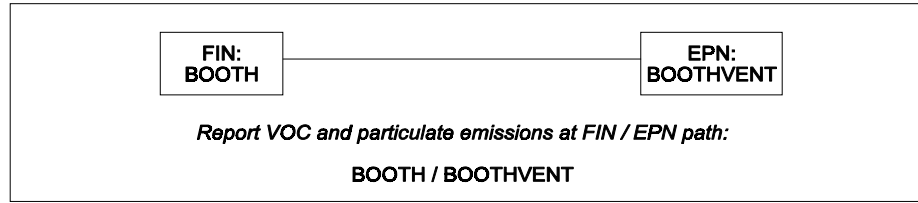


Figure 2-15. Paint booth — unabated.

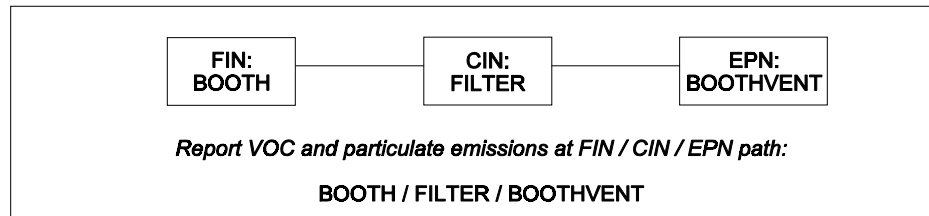


Figure 2-16. Paint booth — particulate emissions abated by filter.

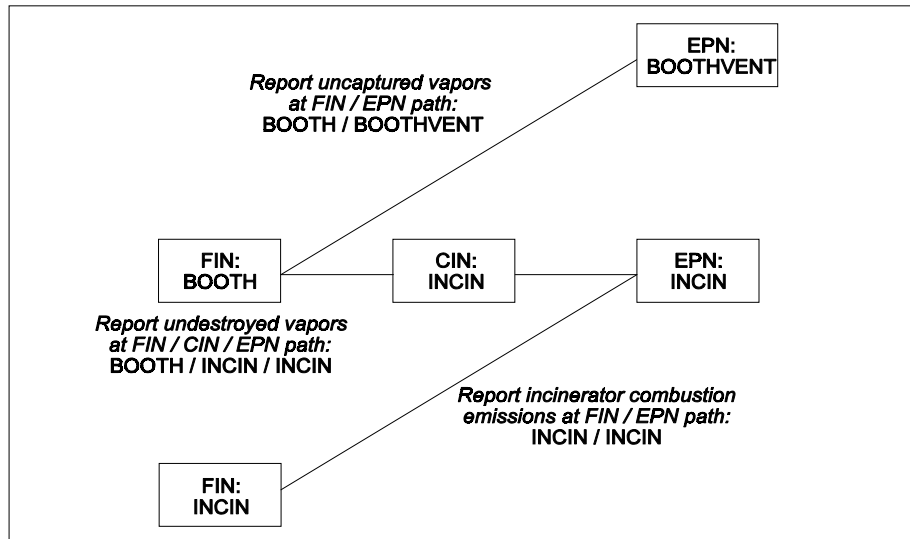


Figure 2-17. Spray booth controlled by an incinerator.

If coated surfaces are heat-dried, be certain to include the drier in the account structure.

Aggregate Operations

Aggregate operation emission sources include storage piles, material transport operations, and material processing operations such as crushing, grinding, milling, mixing, calcinating, and kilning. Represent each step in material storage, transport and processing with a separate path composed of a unique FIN and EPN.

Classify aggregate storage piles by material type and particle size. For example, consider a site using a water spray system to control emissions from a fine-particle pile and a coarse-particle pile, both composed of the same material. Correct structure for this operation is shown in Figure 2-18.

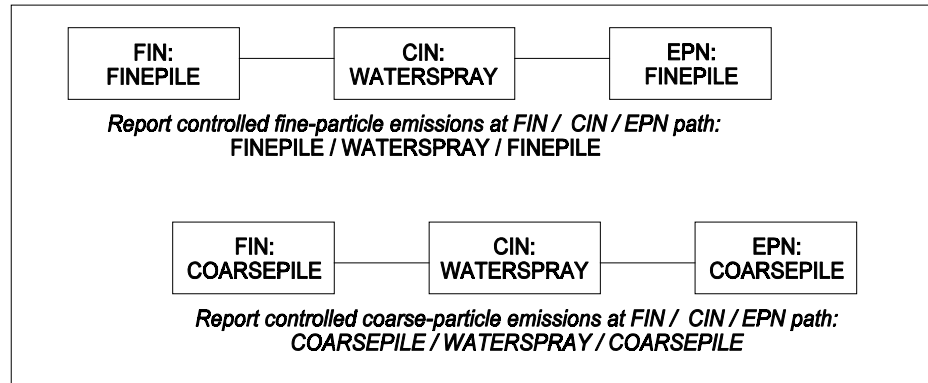


Figure 2-18. Fine and coarse piles — emissions controlled by water spray.

Separate batch material transport operations from continuous material transport operations. For example, consider an operation moving limestone in batches from a quarry to a storage pile, then continuously feeding the limestone into a process stream. Correct structure for this operation is shown in Figure 2-19.

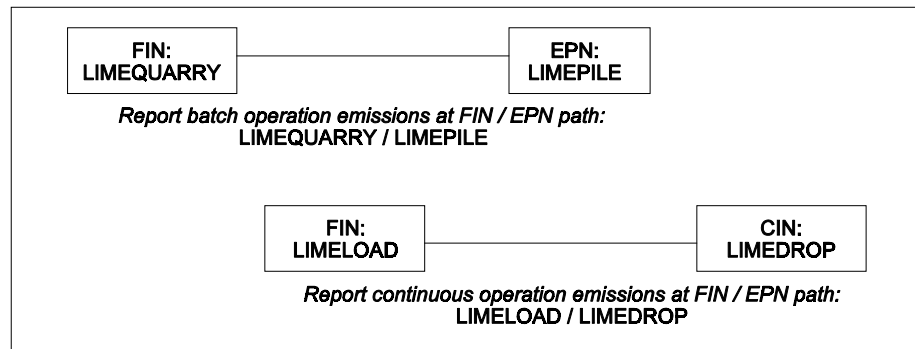


Figure 2-19. Continuous and batch operations separated.

Rather than grouping all conveyor transport operations under a single FIN/EPN path, represent each of the conveyor's interdependent operating systems separately. Suppose, for example, that a conveyor system includes both a fine-particle process line and a coarse-particle process line. You should establish a fine-particle process path to include all conveyor operations related to the fine material, and a coarse-particle process path to include all conveyor operations related to the coarse material. This structure is shown in Figure 2-20.

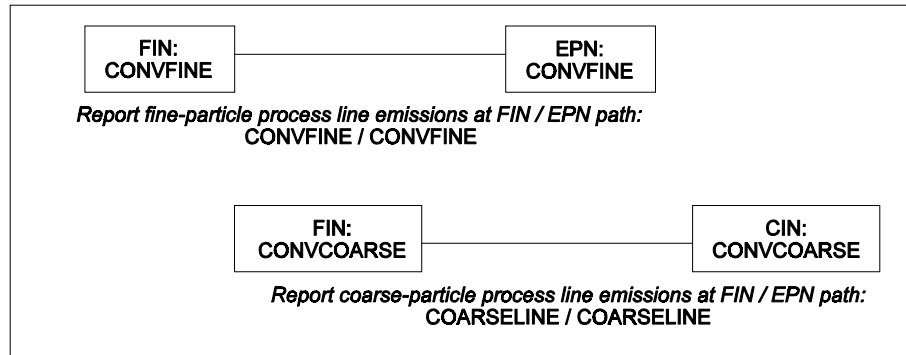


Figure 2-20. Conveyor transport — interdependent systems grouped..

Marine Operations

Rather than reporting all marine losses at a single FIN/EPN path, you should uniquely identify each individual equipment or process type in your inventory. This section addresses correct structure for several common marine operations. Please contact the IEAS if you require additional guidance on representing the structure of your marine facility.

Loading and Unloading Bulk Liquids If loading operations are uncontrolled, then emissions occur at the vessel(s). This structure is shown in Figure 2-21.

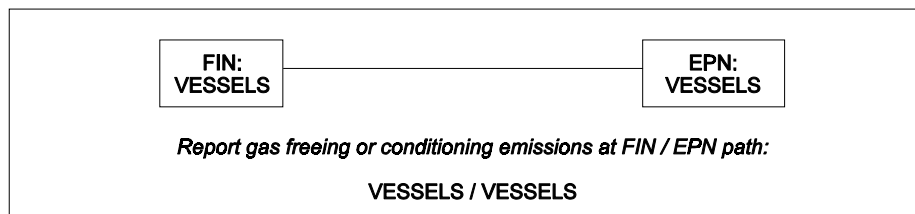


Figure 2-21. Uncontrolled bulk material liquids emissions.

If loading operations utilize a vacuum-assisted vapor recovery, then any uncollected emissions should be reported at the vessel, with the balance of emissions reported at the onshore equipment serving as a control device. Figure 2-22 shows an example of correct structure.

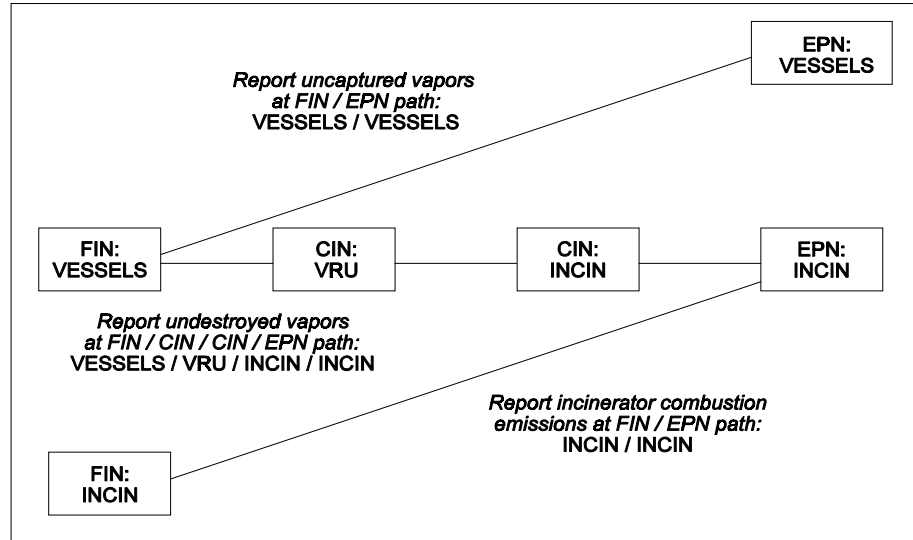


Figure 2-22. Liquid loading controlled by a VRU and then an incinerator.

Loading and Unloading Bulk Liquified Gaseous Materials Since pressurized marine vessel compartments do not normally release to the atmosphere, loading and unloading bulk liquified gaseous materials will generally only generate equipment leak fugitive emissions. These should be reported at the appropriate equipment leak fugitive area on the dock.

If gas freeing or gas conditioning is performed, emissions should be reported at the FIN/EPN path representing the vessel(s). See Figure 2-23.

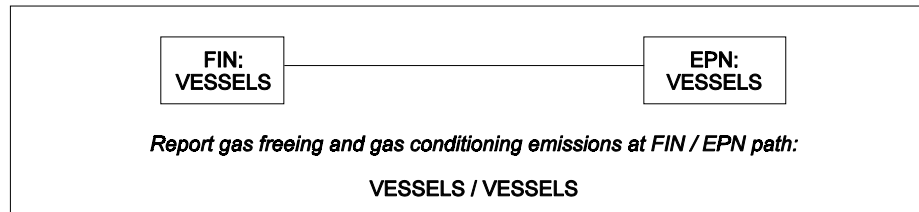


Figure 2-23. Uncontrolled degassing and cleaning emissions.

Loading and Unloading Solid Bulk Materials Although unloading operations are not limited to the use of hoppers or pneumatic systems, these are perhaps the most common methods. Pneumatic systems transfer the material to silos or storage tanks where air is separated from the material and vented to a baghouse or cyclone, which represents the emission point for the operation. An example of this structure is shown in Figure 2-24.

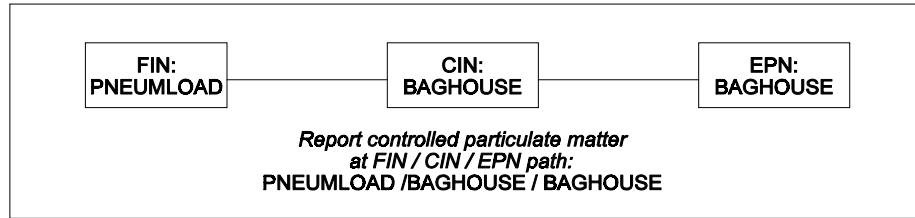


Figure 2-24. Pneumatic transfer of solids controlled by a baghouse.

With hoppers, material is loaded into trucks, railcars, or other mobile units, or onto conveyor belts that transfer the material to stockpiles or other storage units. Emission points in this case may include the handling of material in the marine vessel, material transfer points, drop points (which may occur at hoppers, conveyors, loading operations and stockpile operations), and stockpiles. Please contact the IEAS for assistance with hopper structure.

Degassing and Cleaning Liquid Vessel Compartments

Emissions from liquid vessel cleaning and degassing will occur either from the vessel itself (if the vessel does not have a vapor recovery system) or from the shore-based control equipment. See Figures 2-25 and 2-26.

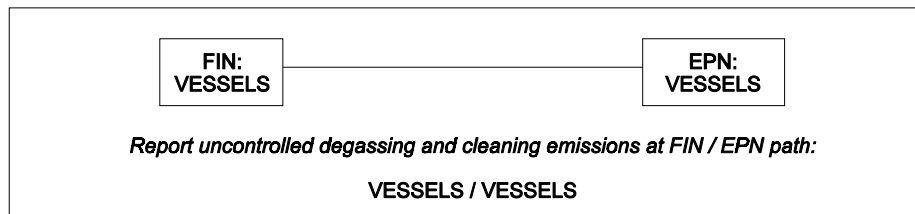


Figure 2-25. Uncontrolled degassing and cleaning emissions.

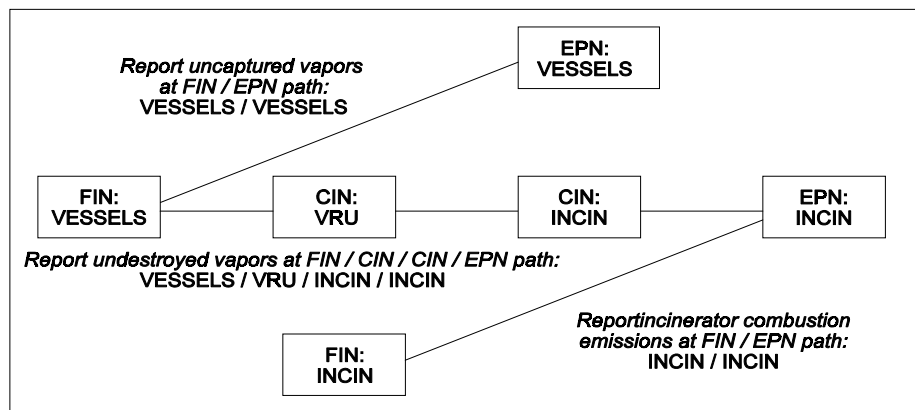


Figure 2-26. Degassing and cleaning emissions captured by a VRU and routed to an incinerator.

Wastewater Collection and Treatment

Because wastewater collection and treatment involves several different processes, you should not represent an entire wastewater collection and treatment system by a single path. Represent each of the system's processes, including the collection process, by a unique FIN/EPN path.

For assistance with establishing or modifying your wastewater plant's structure, contact the IEAS.

Chemical Production

Do not represent an entire chemical plant by a single FIN linked to multiple EPNs. If you wish to group an account's emission sources by plant, you may assign each plant a unique plant identification number. You should assign each source within a plant a unique FIN/EPN path.

Chemical plant structures vary widely. For assistance with establishing or modifying your plant's structure, contact the IEAS.

Modifying Existing Account Structure

If your account's structure is incorrect, or if it has changed because new equipment has been added or existing equipment newly linked, then you will need to modify your account structure by submitting the appropriate forms (see Chapter 4 and Appendix B). The remainder of this chapter provides instructions for making some common structural modifications.

Adding a New EPN to an Existing FIN

To add a new emission point (EPN) to an existing facility (FIN):

- list the new path on one line of the Structural Overview form;
- complete an Emission Point Information form; and
- complete a Path Emissions form, noting in the grey area directly above the FIN box that the FIN is "EXISTING."

Example: If you wish to link a new flare (EPN: FL) to an existing tank (FIN: TK), you will need to enter the new path (TK / FL / FL) on the Structural Overview form; complete an Abatement Device Information form for the flare; complete an Emission Point Information form for the flare, including the form's Flare Profile section; and complete a Path Emissions form for the path (TK / FL / FL), noting in the grey area directly above the FIN box that the FIN is "EXISTING."

In this case, because the flare is also an emissions source (a facility), you must also enter the new path (FL / FL) on the Structural Overview form; complete the Facility Information for Combustion Units form for the flare; complete a Path Emissions form for the path (FL / FL); and complete a Material Throughput for Combustion Units form for the flare.

Adding a New FIN to an Existing EPN

To add a new facility (FIN) to an existing emission point (EPN):

- list the new path on one line of the Structural Overview form;
- complete the appropriate Facility Information form as determined by the nature of the FIN (combustion unit, storage tank, wastewater facility or other);
- complete a Path Emissions form, noting in the grey area directly above the EPN box that the EPN is “EXISTING”; and
- complete the appropriate Material Throughput form.

Example: If you wish to add a new tank (FIN: TK) whose emissions are routed to an existing flare (EPN: FL), you will need to enter the new path (TK / FL / FL) on the Structural Overview form; complete the Facility Information for Storage Tanks form for the tank; complete a Path Emissions form for the path (TK / FL / FL), noting in the grey area directly above the EPN box that the EPN is “EXISTING”; and complete a Material Throughput for Storage Tanks form for the tank.

Linking an Existing FIN to an Existing EPN

To connect an existing facility (FIN) to an existing emission point (EPN):

- list the new path on one line of the Structural Overview form; and
- complete a Path Emissions form, noting in the grey area directly above the FIN and EPN boxes that the FIN and EPN are “EXISTING.”

Example: If an existing tank (FIN: TK) is being connected to an existing flare (EPN:FL), you will need to enter the new path (TK / FL / FL) on the Structural Overview form; and complete a Path Emissions form for the path (TK / FL / FL), noting in the grey area directly above the FIN and EPN boxes that the FIN and EPN “EXISTING.”

Adding a New Abatement Device (CIN) to an Existing FIN / EPN Path without Changing the EPN

To add a new abatement device (CIN) to an existing FIN / EPN path *leaving the EPN unchanged*:

- list the new path on one line of the Structural Overview form;
- complete an Abatement Device Information form; and
- complete a Path Emissions form for the new path, noting in the grey area directly above the FIN and EPN boxes that the FIN and EPN are “EXISTING.”

Example: To add a catalytic converter (CIN:CC) to an existing engine (FIN / EPN path: COMP / STK), you will need to enter the new path (COMP / STK / CC) on the Structural Overview form; complete an Abatement Device Information form for CC; and complete a Path Emissions form for the new path (COMP / STK / CC), noting in the grey area directly above the FIN and EPN boxes that the FIN and EPN “EXISTING.”

Adding a New Abatement Device (CIN) to an Existing FIN and Replacing the Old EPN with the New CIN / EPN

To add a new abatement device (CIN) to an existing FIN path and *replace the old EPN with the new CIN / EPN*:

- list the new path on one line of the Structural Overview form;
- complete an Abatement Device Information form;
- complete an Emission Point Information form for the new EPN; and
- complete a Path Emissions form for the new path, noting in the grey area directly above the FIN box that the FIN is “EXISTING.”

Example: Suppose that all emissions from an existing tank (FIN: TK) are now sent to a new flare (EPN: FL). Then you will need to enter the new path (TK / FL / FL) on the Structural Overview form; complete an Abatement Device Information form for the flare; complete an Emission Point Information form for the flare, completing the form’s Flare Profile section; and complete a Path Emissions form for the path (TK / FL / FL), noting in the grey area directly above the FIN box that the FIN is “EXISTING.”

In this case, because the flare is also an emissions source (a facility), you must also enter the new path (FL / FL) on the Structural Overview form; complete the Facility Information for Combustion Units form for the flare; complete a Path Emissions form for the path (FL / FL); and complete a Material Throughput for Combustion Units form for the flare

Adding an Existing Abatement Device (CIN) to an Existing FIN / EPN Path Without Changing the EPN

To add an existing abatement device (CIN) to an existing FIN / EPN path *leaving the EPN unchanged*:

- list the new path on one line of the Structural Overview form; and
- complete a Path Emissions form for the new path, noting in the grey area directly above the FIN, EPN and CIN boxes that the FIN, EPN and CIN are “EXISTING.”

Adding an Existing Abatement Device (CIN) to an Existing FIN and Replacing the EPN With the New CIN / EPN

To add an existing abatement device (CIN) to an existing FIN and *replace the old EPN by the new CIN / EPN*:

- list the new path on one line of the Structural Overview form;
- complete an Emission Point Information form if the CIN is not already an EPN elsewhere in the account; and
- complete a Path Emissions form for the new path, noting in the grey area directly above the FIN, EPN and CIN boxes that the FIN, EPN and CIN are “EXISTING.”

Removing Structure

For historical reasons, the IEAS does not normally delete structure or emissions records. If a facility has been permanently shut down or removed from an account, simply change its status accordingly and zero all emission rates. Please note that if a facility operated *at any time* during the emissions inventory year, you must list its operating status as “active.”

Chapter 3 — Estimating and Reporting Emissions

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

Required Emissions Data

The IEAS, acting under the authority of 30 TAC §101.10 (b) (1), requests that you report all emissions of any regulated pollutant on your emissions inventory. For the purposes of this document, the term “regulated pollutant” shall include any VOC; any pollutant subject to the Federal Clean Air Act (FCAA), §111; any pollutant listed as a hazardous air pollutant under FCAA, §112; each pollutant for which a national primary ambient air quality standard has been promulgated (including carbon monoxide); and any other air pollutant subject to requirements under commission rules, regulations, permits, orders of the commission, or court orders. Examples of non-criteria, regulated pollutants include, but are not limited to, PM_{2.5}, ammonia, and H₂S.

Acceptable Determination Methodologies

Many different methods exist to estimate emissions. In order to promote accuracy and consistency among emissions inventories, the IEAS accepts only a limited number of estimation methodologies and further requires that all emissions be determined using the best methodology available. Estimation methodologies other than those listed below may not be employed without the IEAS’s prior approval. Because methodology preference will often vary depending on the emissions source, the acceptable methodologies are discussed in alphabetical order. For information about the preferred emissions estimation methodology or methodologies for a specific source type, consult the appropriate technical supplement (Appendix A) or call the IEAS help line.

If you feel that a preferred method does not apply to a given source or that its use would misrepresent the source's emissions, please contact the IEAS for approval to use a less "preferred," but more accurate, methodology.

"A" AP-42 and other EPA- or TCEQ-approved factors

The EPA's *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources* (AP-42), with Supplements A through E (continuously updated), is widely used to estimate emissions. AP-42 includes brief discussions of various industrial processes, descriptions of these processes' emissions, and emission factors useful for estimating these emissions. Equipment emission factors have generally been determined by testing a representative population varying in size and age. Since this limits these factors' emissions estimation accuracy, 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 (EI) is being prepared. A factor published after the end of the EI calendar year may not be used.

Emissions estimated using tools other than AP-42 factors may still be coded with a determination methodology of "A" if the estimates were based on EPA- or TCEQ-approved programs or factors. Examples include emissions estimated using the TANKS and WATER9 software programs, fugitive emissions estimated using factors taken from *EPA-453/R-95-017*, and particulate emissions estimated using the abrasive blast cleaning factors from TCEQ air permits guidance document *Abrasive Blast Cleaning (RG-169)*.

"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 estimates must be based on process rates and material quantity and composition. Guidance on estimating emissions from several process types may be found in AP-42 or in various TCEQ air permits guidance documents.

“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.) The IEAS believes that CEMS, when properly calibrated and operated, provide the best means of determining a source’s emissions. Because correct calibration and operation are critical to system performance, CEMS may be used to estimate emissions only if they have been certified per EPA and/or TCEQ standards.

Please supply a representative set of summary sheets from Relative Accuracy Test Audits (RATAs) performed during the EI calendar year. If NO_x emissions are estimated using CEMS, please provide 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 estimate emissions during CEMS down time, provided that the data substitution method is well documented in your EI submission.

“E” Estimated

If no published EPA or TCEQ emissions estimation guidance exists for a particular process, and if no more preferred emissions estimation method is available, you may make an engineering estimate of emissions. Any such estimate must be the best possible, given the available data, and must be accompanied by enough supporting documentation to allow the IEAS to logically understand how the estimation was made. If the IEAS determines that an estimation is unfounded, then you may be required to use a more preferred method to estimate emissions.

“F” Predictive Emissions Monitoring Systems

Predictive Emissions Monitoring Systems (PEMS) generate predicted real-time emissions data 24 hours per day. Because correct calibration and operation are critical to system performance, PEMS may be used to estimate emissions only if they have been certified per EPA and/or TCEQ standards.

Please supply a representative set of summary sheets from Relative Accuracy Test Audits (RATAs) performed during the EI calendar year. If NO_x emissions are estimated using PEMS, please provide 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 PEMS is inoperative for any part of the EI calendar year, other data may be used to estimate emissions during PEMS down time, provided that the data substitution method is well documented in your EI submission.

“M” Measured Data (Stack Sampling Data)

Stack testing is a formal, structured event coordinated with the appropriate TCEQ regional office. The use of a portable analyzer, draeger tube, fuel gas analysis, or fuel flow measurement does not qualify as stack testing; rather, these data produce emission rates 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 IEAS requires that all stack-test data used to estimate emissions be collected using EPA- or TCEQ-approved methods.

If an account includes several identical facilities but stack-test data are available for only one, then the IEAS may approve the use of the tested facility’s emission factors to estimate emissions from the other identical facilities. The IEAS will also consider, on a case-by-case basis, the validity of using stack-test emission factors generated for one account to estimate emissions from identical facilities in another account. 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 IEAS *prefers* that stack testing be performed 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. You may not use stack-test data from a current year to estimate emissions for previous years.

By signing the front page of the Emissions Inventory Questionnaire (EIQ) and submitting the document to the IEAS, you are certifying that all test data used accurately represent facility emissions.

Please note that if you use stack sampling data to estimate NO_x emissions, you should use a molecular weight of 46.01 when converting from parts per million to a mass emission rate.

“S” Scientifically Calculated

For emissions inventory purposes, 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 estimate.

“V” Vendor-Supplied Emissions Factors

Many industrial equipment manufacturers provide 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 estimate 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.

Please provide a copy of the manufacturer’s data with your supporting documentation. In signing the front page of the EIQ and submitting the document to the IEAS, you are certifying that the facility for which the vendor data were utilized is and has been operated in the manner under which it was tested.

“O” Other

Where no published EPA or TCEQ emissions determination guidance exists for a particular process, 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.” If the IEAS determines that such an estimation is unfounded, then you may be required to use a more preferred method to estimate emissions.

General Order of Preference

If and only if no source-specific order of determination methodology preference exists for a given facility (see technical supplements in Appendix A), you should follow this general order of preference:

General Order of Preference for Emissions Determination Methodologies to be used ONLY in the absence of source-specific guidance
<p>D (Continuous Emissions Monitoring System or CEMs) F (Predictive Emissions Monitoring System or PEMs) M (Measured - Stack 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)</p>

A Note on Using Factors from a Permit

Do *not* list a permit as a factor's source. If you use the same factor to estimate emissions for your inventory as you used to apply for your permit, then tell us where that factor originated (for example, vendor data or AP-42). Please note that you may not use the factor from your permit if either of the following applies:

- If your permit factor came from a document such as AP-42, then you must use the most recent version of that factor. If you believe that a previous factor more accurately represents facility emissions, please explain your reasoning in the cover letter submitted with your emissions inventory. The IEAS will review your request.
- If you have conducted testing or implemented continuous monitoring since your permit was issued, you must use the resulting data. If you believe that the data used to apply for your permit more accurately represent facility emissions, please explain your reasoning in the cover letter submitted with your emissions inventory. The IEAS will review your request.

Please note that reported rates should represent actual emissions, rather than maximum potential emissions.

Speciating Emissions

Once you have estimated the emissions from each facility in your account, you may need to separate the individual chemical substances, or species, within each emission category. This process, known as speciation, is particularly important when reporting volatile organic compound (VOC) emissions. This section will provide 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 IEAS.

about emissions speciation for a particular source, consult the appropriate technical supplement (Appendix A) or contact the IEAS.

VOCs

VOC speciation requirements depend on an account's geographic location. If your account lies in El Paso County or east of 100° longitude (see map on page 7), then speciate the VOCs from each source emitting at least 5 tons of VOCs annually. If your account lies west of 100° longitude (except for El Paso County), then speciate the VOCs from each source emitting at least 25 tons of VOCs annually. In either case, speciate VOC emissions to at least 90 percent; if any speciated contaminant was emitted at a level below 0.1 tons, you may choose to report that contaminant under VOC-u (contaminant code 50001).

Each emitted substance (for example, carbon monoxide or benzene) is 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 *Contaminant and Abatement Codes for the Air Emissions Inventory* (revised November 12, 2002). The IEAS tries to ensure that the contaminant code list is complete and accurate. If you cannot locate a particular contaminant code, please contact the IEAS for assistance. If possible, be prepared to provide the compound's Chemical Abstract Service (CAS) number to aid in identification.

To obtain VOC-u (contaminant code 50001), subtract all speciated VOCs from the total VOC number. Please note that the IEAS 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 100° longitude emitted 10 tons of VOCs. Based on the VOC weight percentages obtained using a site gas analysis, you estimated that the released contaminants were:

- propane (60 percent)
- butane (8 percent)
- iso-butane (7 percent)
- pentane (7 percent)
- iso-pentane (6 percent)
- hexane (4 percent)
- heptane (3 percent)
- individual VOCs occurring in such small amounts that they cannot reasonably be separated (5 percent)

You report these emissions as shown below:

Contam. Code	Contaminant	Actual Emissions (tpy)
50001	VOC-u	0.5
56775	propane	6.0
56725	butane	0.8
56625	iso-butane	0.7
56750	pentane	0.7
56700	iso-pentane	0.6
56600	hexane	0.4
56575	heptane	0.3

Notice that the total VOC emissions of 10 tons are not explicitly shown in your report. 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 above, because STARS will then arrive at a total VOC emission rate of 19.5 tons for this FIN, resulting in an over-reporting of 9.5 tons of emissions.

Hazardous Air Pollutants and Other Compounds of Interest

Please speciate all Hazardous Air Pollutants (HAPs), particularly if they were emitted from any facility at or above 0.1 tons.

If your account is located in a nonattainment county, also speciate each of the following, particularly if they were emitted from any facility at or above 0.1 tons:

- ethylene;
- propylene;
- isoprene;
- all butenes (butylenes);
- all pentenes;
- all trimethylbenzenes; and
- all ethyltoluenes.

For certain contaminants such as condensate or gasoline, you may speciate the HAPS, list each HAP under the appropriate contaminant code, and then report the balance of the emissions under the contaminant code 59090 (for

condensate) or 59003 (for gasoline). For speciation guidance relating to other complex contaminants, please contact the IEAS.

Particulate Matter

When possible, report all speciated particulate emissions under the appropriate 1xxxx contaminant code; list the remaining unspeciated particulate emissions under the 10000 contaminant code. Report the portion of the particulate emissions with an aerodynamic diameter smaller than 10 microns (PM_{10}) under a 2xxxx contaminant code. Report the portion of the particulate emissions with an aerodynamic diameter smaller than 2.5 microns ($PM_{2.5}$) under the 39999 contaminant code. Please note that PM_{10} and $PM_{2.5}$ are subsets of TSP and that representing particulate matter as TSP, PM_{10} and $PM_{2.5}$ does not result in repeated counting of the emissions.

Example: A facility in a given account emitted 10 tons of particulate matter. The matter is estimated to have been mostly phosphorous (75 percent) and zinc (16 percent), with the remaining 9 percent being of unknown composition. The phosphorous and zinc particles are larger than 2.5 microns in aerodynamic diameter 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 follows:

Contam. Code	Contaminant	Actual Emissions (tpy)
10000	part-u	0.9
14460	phosphorous	7.5
14780	zinc	1.6
20000	PM_{10} -u	0
24460	PM_{10} phosphorous	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. Please verify that the sum of the emission rates reported in the entire 1xxxx series of contaminants represents the intended total particulate emission rate and that the sum of the emission rates reported in the entire 2xxxx series of contaminants represents the intended total PM_{10} emission rate.

Reporting Emissions (Annual Emissions, Ozone Season Emissions, EE/SMSS)

Before entering emission rates on the EIQ, you must differentiate annual emissions from those resulting from emission events and/or scheduled maintenance, startup, and shutdown activities. Then, depending on your account's location, you may need to determine the daily emission rates for the summer months. Once you have done all of this, you will be ready to report your emissions in your inventory.

Annual Emissions

These include all of a facility's emissions *except* for those attributable to emission events and/or scheduled maintenance, startup, and shutdown activities.

Ozone Season Emissions

If the account is in El Paso County or east of 100° longitude, then you will need to estimate average daily release rates during the summer months. For emissions inventory purposes, the ozone season is from June 1 through August 31, inclusive.

See Table 3-1 on the next page for a list of counties for which ozone season rates must be reported. Please note that **the IEAS database is no longer capable of automatically calculating ozone rates.**

In the past, ozone season emission rates have often been estimated from the associated annual rates. This practice will no longer be accepted where more specific data are available. If you have any specific information about emissions during the ozone season, use this information to estimate the ozone season emission rates. Specifically, for any source for which annual rates are obtained as a cumulative total, use the data gathered during the summer months to estimate ozone season emission rates.

Counties for Which Ozone Season Daily Rates Must Be Reported

Please note that the IEAS database is no longer capable of automatically calculating ozone rates.

Core Nonattainment and Near-Nonattainment Counties

Dallas/ Fort Worth area	Beaumont/ Port Arthur area	Houston/ Galveston area	El Paso area	Near-Nonattainment Counties	
Collin Dallas Denton Tarrant	Hardin Jefferson Orange	Brazoria Chambers Fort Bend Galveston Harris Liberty Montgomery Waller	El Paso	Bastrop Bexar Caldwell Comal Ellis Gregg Guadalupe Harrison Hays Henderson Hood Hunt Johnson	Kaufman Nueces Parker Rockwall Rusk San Patricio Smith Travis Upshur Victoria Williamson Wilson

Other Counties East of 100 ° Longitude

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

Table 3-1. If your account lies in one of these counties, submit ozone season daily rates.

Emission Events and Scheduled Maintenance, Startup, and Shutdown Activities (EE/SMSS)

In the EIQ column entitled “EE/SMSS,” report the total annual emissions from all releases due to emissions events and/or scheduled maintenance, startup and shutdown activities, *regardless of whether these releases represent reportable or nonreportable quantities and regardless of whether the emissions are ultimately exempted*. For more information, consult 30 TAC § 101.1, § 101.201, and § 101.211.

Chapter 4 — Forms and Instructions

This chapter provides detailed instructions for filling out IEAS forms. We strongly encourage you to review all of the information in this book before attempting to complete these forms.

To establish or modify your account's structure, begin by listing each new path on the Structural Overview form. Then complete the following:

- For each new FIN, complete the appropriate Facility Information form. A different form exists for each of the following facility types:
 - Non-Flare Combustion Unit
 - Flare
 - Storage Tank
 - Cooling Tower
 - Wastewater Facility
 - Leaking Component Fugitives
 - Other

- For each new CIN, complete the Abatement Device Information form.

- For each new EPN, complete the Emission Point Information form. A different form exists for each of the following emission point profile types:
 - Stack
 - Flare
 - Fugitives

- For each new path, complete the Path Emissions form.

Note that you may use the material throughput form to report confidential data. These are the only IEAS forms that you may mark as “confidential.” If you choose to use the Material Throughput forms, please note that you no longer need to use a separate form for each FIN. Instead, you can report material throughput for several FINs on a single page.

Account Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Company Name ¹ : Johnson Gas Company		TCEQ Air Account Number ² : HG6789X
Company Role in Account ³ (Select <u>one</u> below.) <input type="checkbox"/> Owner <input type="checkbox"/> Operator <input checked="" type="checkbox"/> Both	Site Independently Owned? ⁴ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Number of Employees at Site ⁵ : <u>78</u>

SITE INFORMATION			
Site Name ⁶ : Creek Compressor Station		Location Description ⁸ : <u>Two miles southwest of Tyler on FM 2345</u>	
Business Description ⁷ : <u>Natural Gas Compression and</u>			
Transmission Station <u></u>		Near City ⁹ : Houston	County ¹⁰ : Harris

CENTROID GEOGRAPHICAL COORDINATES			SIC CODES		
Latitude and Longitude ¹¹		O R	UTM Coordinates ¹² in NAD of 1983		Primary SIC ¹³ : <u>1311</u> Secondary SIC ¹⁴ : <u></u>
Latitude <u>30</u> deg <u>17</u> min <u>52</u> sec	Longitude <u>97</u> deg <u>48</u> min <u>52</u> sec		Zone <u></u>	East Meters <u></u>	

SITE STATUS AND OPERATING SCHEDULE	
Site Status ¹⁵ (Please select <u>one</u> below.) <input type="checkbox"/> Planned <input type="checkbox"/> Under Construction <input type="checkbox"/> NESHAP Spraying <input checked="" type="checkbox"/> Operational <input type="checkbox"/> Temporarily Shutdown <input type="checkbox"/> NESHAP Renovation <input type="checkbox"/> Seasonal <input type="checkbox"/> Permanently Shutdown <input type="checkbox"/> NESHAP Demolition	Operating Schedule ¹⁶ : <u>24</u> hours/day <u>7</u> days/week <u>52</u> weeks/year Total Annual Operating Time ¹⁷ : <u>8760</u> hours
Seasonal Operating Percentages ¹⁸ (NOTE: Spring % + Summer % + Autumn % + Winter % must equal 100%) Spring : <u>25</u> % Summer : <u>25</u> % Autumn : <u>25</u> % Winter : <u>25</u> %	

INSTRUCTIONS

*Complete the **Account Information** form only if this is the account's first inventory. This form requests general account information that allows the IEAS to correctly identify air accounts.*

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account's identification number, assigned by the appropriate TCEQ Regional Office, consists of seven characters: two letters followed by four digits followed by a letter. If no TCEQ Air Programs Account Number has been assigned, please contact the IEAS for assistance.
3. **Company Role in Account:** Identifies whether the company listed is the account's owner, operator, or both.
4. **Site Independently Owned?:** Mark "YES" if the site is independently owned. If the site is a subsidiary or a part of another company, mark "NO."
5. **Number of Employees at Site:** The number of full-time employees at the operating site.
6. **Site Name:** Self-explanatory.
7. **Business Description:** A description of the primary business carried out at the site.
8. **Location Description:** A street address or verbal description of the site location.
9. **Near City:** The name of the city nearest the site.
10. **County:** The name of the county in which the account is located.
11. **Latitude and Longitude:** The account centroid's latitude and longitude, expressed in degrees, minutes and seconds.
12. **UTM Coordinates:** The account centroid's Universal Transverse Mercator coordinates in North American Datum of 1983.
13. **Primary Standard Industrial Classification (SIC):** A four-digit classification code that best describes the account's primary operations; assigned by the appropriate TCEQ Regional Office upon creation of the account number.
14. **Secondary Standard Industrial Classification (SIC):** A four-digit general classification code that best describes the account's secondary operations.
15. **Site Status:** Describes the site's current operating status.
16. **Operating Schedule:** Describes the account's normal operating schedule.
17. **Total Annual Operating Time:** Describes the site's total annual operating hours.
18. **Seasonal Operating Percentages:** Indicate the percentage of annual operations that occurs during each "season." For EI purposes, "Spring" includes March through May; "Summer," June through August; "Autumn," September through November; "Winter," December through February. Note that the percentages must sum to 100.

Contact Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Company Name ¹ : Johnson Gas Company TCEQ Air Account Number ² : HG6789X

EMISSIONS INVENTORY CONTACT		Title ⁴ (Please select <u>one</u> below.)	
Name ³ : Cody McLain		<input checked="" type="checkbox"/> Engineer	<input type="checkbox"/> Environmental Coordinator
		<input type="checkbox"/> Plant Engineer	<input type="checkbox"/> Plant Manager/Superintendent
		<input type="checkbox"/> Special Unit Engineer	<input type="checkbox"/> Technical Manager
		<input type="checkbox"/> Environmental Engineer	<input type="checkbox"/> E. H. & S. Coordinator
		<input type="checkbox"/> Company President/CEO	
Mailing Address ⁵ : 11783 Canyon Bluff		Telephone Numbers and e-Mail Address ⁷	
City: Austin State : TX ZIP Code : 78753		Business : (512) 555 - 1144 ext : _____	
Business Address ⁶ : _____		Alternate Business : _____ ext : _____	
City: _____ State : _____ ZIP Code : _____		Cellular : _____	
		Fax : (512) 555 - 1515	
		e-Mail Address : cmclain@johnsongas.com	

PLANT OR SITE CONTACT		Title ⁹ (Please select <u>one</u> below.)	
Name ⁸ : Matoaka Johnson		<input type="checkbox"/> Plant Manager/Superintendent	<input checked="" type="checkbox"/> Company President / CEO
Mailing Address ¹⁰ : 11783 Canyon Bluff		Telephone Numbers and e-Mail Address ¹²	
City: Austin State : TX ZIP Code : 78753		Business : (512) 555 - 3736 ext : _____	
Business Address ¹¹ : _____		Alternate Business : _____ ext : _____	
City: _____ State : _____ ZIP Code : _____		Cellular : _____	
		Fax : (512) 555 - 1515	
		e-Mail Address : mjohnson@johnsongas.com	

INSTRUCTIONS

*Complete the **Contact Information** if some or all of the contact information is new or has changed. The information on this form allows the IEAS to contact the appropriate person(s) regarding an account.*

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Name:** The company employee to whom questions about the emissions inventory should be directed and to whom the inventory should be mailed; *this person may not be a consultant.*
4. **Title:** The job title that best fits the Emissions Inventory Contact's position.
5. **Mailing Address:** The address to which the Emissions Inventory will be mailed.
6. **Business Address:** The Emissions Inventory Contact's physical address, if different from Mailing Address.
7. **Telephone Numbers and e-mail Address:** Self-explanatory.
8. **Name:** The name of the person responsible for all of the account's air-related issues.
9. **Title:** The job title that best fits the Plant or Site Contact's position.
10. **Mailing Address:** Self-explanatory.
11. **Business Address:** Self-explanatory.
12. **Telephone Numbers and e-mail Address:** Self-explanatory.

Structural Overview
TCEQ Emissions Inventory 2002

SAMPLE FORM

Page 1 of 1 Structural Overview pages .

Company Name ¹ : Johnson Gas Company

TCEQ Air Account Number ² : HG6789X

PATH LIST

Facility Identification Number (FIN) ³ <i>10 character maximum</i>										Emission Point Number (EPN) ⁴ <i>10 character maximum</i>										Control Identification Number (CIN) ⁵ <i>10 character maximum</i>									
T	A	N	K	1	⁶					F	L	A	R	E	1					F	L	A	R	E	1				
F	L	A	R	E	1	⁶				F	L	A	R	E	1														
T	A	N	K	2	⁶					T	A	N	K	2															
E	N	G	I	N	E	1	⁷			S	T	A	C	K	1	A													
E	N	G	I	N	E	1	⁷			S	T	A	C	K	1	B													
P	A	I	N	T	B	T	H	1	⁸	V	E	N	T	A															
P	A	I	N	T	B	T	H	2	⁸	V	E	N	T	A															
G	R	I	N	D	E	R	5	⁹		V	E	N	T	5						V	E	N	T	U	R	I	4		
G	R	I	N	D	E	R	5	⁹		V	E	N	T	5						B	A	G	H	O	U	S	E	1	

INSTRUCTIONS

List all new paths on the **Structural Overview** form first if you are adding or changing account structure. Proper completion of this form allows the IEAS to ensure that the Emissions Inventory structure accurately reflects an account's processes.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Facility Identification Number (FIN):** A label uniquely identifying a facility; limited to 10 alphanumeric characters. *Example:* TANK1, ENGINE, PAINTBTH2.
4. **Emission Point Number (EPN):** A label uniquely identifying an emission point; limited to 10 alphanumeric characters.
5. **Control Identification Number (CIN):** A label uniquely identifying an abatement device; limited to 10 alphanumeric characters.
6. *Example:* Emissions from TANK1 (FIN) are routed to a flare named FLARE1. FLARE1 controls the VOC emissions (CIN) and also serves as the point at which the unburned VOCs enter the atmosphere (EPN). Hence the first path will be used to report those VOCs that escape destruction at the flare.

FLARE1 is responsible for the products of combustion created during the process described above (FIN) and is also the point at which those products of combustion enter the atmosphere (EPN). Hence the second path will be used to report these emissions.

TANK2 is not attached to any abatement device. All standing, working and flash losses from this tank (FIN) simply enter the atmosphere at the location of the tank itself (EPN). The third path will be used to report these losses.
7. *Example:* A single engine (FIN) has no abatement device attached to it. It has two stacks through which emissions enter the atmosphere (EPNs). These two paths will be used to report the engine's emissions.
8. *Example:* The emissions from each of two paint spray booths (FINs) enter the atmosphere through a single vent (EPN). The emissions generated in the first booth will be reported at the first path, while those generated in the second booth will be reported at the second path.
9. *Example:* Emissions from GRINDER5 (FIN) are abated first by a baghouse (CIN) and then by a Venturi scrubber (CIN) before entering the atmosphere at VENT5 (EPN). This group of paths shows how to properly reflect the structure of a path involving more than one abatement device.

Facility Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Non-Flare Combustion Unit

Company Name ¹ : Johnson Gas Company

TCEQ Air Account Number ² : HG6789X

Plant ID ³ : PROCESSING

FACILITY IDENTIFICATION

FIN ⁴ : ENGINE1

Facility Name ⁵ : COMPRESSOR ENGINE NUMBER 1

SCC ⁶ : 20200254

OPERATING SCHEDULE

Facility Status ⁷ : ACTIVE

Operating Schedule ⁸ Start Time : n/a Hours/Day : 24 Days/Week : 7 Weeks/Year : 52

Seasonal Operating Percentages ⁹ Spring : 20 % Summer : 29 % Autumn : 21 % Winter : 30 %
(**NOTE:** Spring % + Summer % + Autumn % + Winter % **must equal 100%**.)

Annual Operating Hours ¹⁰ : 8760

Percent Max Capacity ¹¹ : 87.3 %

Annual Process Rate ¹² : 14.3 million cubic feet burned

Ozone Season Daily Process Rate ¹³ : 0.045 million cubic feet burned

COMBUSTION DETAIL

Unit Type ¹⁴ (Please check one box below.)

- Boiler Furnace Dryer IC Turbine IC Reciprocating: 4 -cycle, LEAN -burn
 Heater Kiln Stack Incinerator Other : _____

Capacity ¹⁵ : _____ MMBtu/hr

Engine Rating ¹⁶ : 1085 hp

Firing Type ¹⁷ (Please check one box at right.) Front Tangential Opposed Internal Other : _____

FUNCTIONAL DESCRIPTION AND / OR COMMENTS ¹⁸

INSTRUCTIONS

Complete the **Facility Information: Non-Flare Combustion Unit** form to add a combustion unit other than a flare to your account. This form requests information necessary for quality assurance purposes.

- 1. Company Name:** The official name of the company responsible for the account.
- 2. TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
- 3. Plant ID:** The name used to identify a unique unit or process within an account; limited to 10 characters. Please note that a unit or process may include several different facilities and/or operation types. *Example:* PVC Unit or Plant 2
- 4. FIN (Facility Identification Number):** A label *uniquely* identifying a facility; limited to 10 alphanumeric characters. If your account is permitted, the emissions inventory FINs *must* match the permit FINs. *Example:* ENGINE2
- 5. Facility Name:** The plain text name of the FIN; limited to forty characters.
Example: NUMBER 2 COMPRESSOR ENGINE
- 6. SCC (Source Classification Code):** An EPA-developed code used to associate air pollution estimates with unique, identifiable industrial processes. The SCC should describe the FIN as accurately and as precisely as possible.
- 7. Facility Status:** Indicates whether the facility operated during the emissions inventory year. A newly-added facility should be listed as “active” (A), “idle” (I), or “permitted but not built” (N).
- 8. Operating Schedule:** The facility’s actual normal operating schedule during the emissions inventory year, including:
 - Start Time:** For facilities that operate fewer than 24 hours per day, the time at which operations usually commence; based on a 24-hour clock (military time).
 - Hours/Day:** The number of hours per day for which the facility is normally active; between zero and 24.
 - Days/Week:** The number of days per week for which the facility is normally active; between zero and seven.
 - Weeks/Year:** The number of weeks per year for which the facility is normally active; between zero and 52.
- 9. Seasonal Operating Percentages:** The percentage of annual facility operations that occurs during each “season.” For EI purposes, “Spring” includes March through May; “Summer,” June through August; Autumn, September through November; Winter, December through February. Note that the percentages must sum to 100.
- 10. Annual Operating Hours:** Describes the account’s total annual operating hours; between zero and 8,760.

11. **Percent Max Capacity:** The percentage of possible emissions actually released by the FIN:

$$\text{PercentMaxCapacity} = \frac{\text{Emissions}_{\text{actual}}}{\text{Emissions}_{\text{potential}}} \times 100$$

Consult the glossary for a definition of *Emissions_{potential}* (under “potential to emit”).

12. **Annual Process Rate:** The amount of material used by or processed at the facility during the year. Include the process rate units as determined by the facility’s SCC. *Example:* 113 million SCF natural gas burned per year
13. **Ozone Season Daily Process Rate:** The average amount of material used by or processed at the facility during each day of the ozone season (June 1 through August 31); include units. *Example:* 0.2 million SCF natural gas burned per day
14. **Unit Type:** Describes the combustion unit. Check only one box. If the selection is “IC Reciprocating,” fill in the number of cycles (two or four) and the engine type (rich- or lean-burn). If the selection is “Other,” please describe the unit in the space provided.
15. **Capacity:** The unit’s Btu-per-hour rating.
16. **Engine Rating:** The unit’s horsepower rating.
17. **Firing Type:** Describes the burner type. Check only one box. If the selection is “Other,” please describe the firing type in the space provided.
18. **Functional Description and/or Comments:** Describe the facility’s function; provide any clarifying information related to facility activities or parameters.

Facility Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Flare

Company Name ¹ : Johnson Gas Company

TCEQ Air Account Number ² : HG6789X

Plant ID ³ :

FACILITY IDENTIFICATION

FIN ⁴ : FLARE1

Facility Name ⁵ : S - Series Flare

SCC ⁶ : 31000205

OPERATING SCHEDULE

Facility Status ⁷ : Active

Operating Schedule ⁸ Start Time : _____ Hours/Day : 24 Days/Week : 7 Weeks/Year : 52

Seasonal Operating Percentages ⁹ Spring : 25 % Summer : 25 % Autumn : 25 % Winter : 25 %
(**NOTE:** Spring % + Summer % + Autumn % + Winter % must equal 100%.)

Annual Operating Hours ¹⁰ : 8760

Percent Max Capacity ¹¹ : 84.3 %

Annual Process Rate ¹² :

Ozone Season Daily Process Rate ¹³ :

SERVICE TYPE ¹⁴

Routine Process Upset / Maintenance Both

ASSIST TYPE ¹⁵

Steam Assisted Air Assisted Unassisted

FUNCTIONAL DESCRIPTION AND / OR COMMENTS ¹⁶

INSTRUCTIONS

Complete the **Facility Information: Flare** form to add a flare to your account. This form requests information necessary for quality assurance purposes.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Plant ID:** The name used to identify a unique unit or process within an account; limited to 10 characters. Please note that a unit or process may include several different facilities and/or operation types. *Example:* PVC Unit or Plant 2
4. **FIN (Facility Identification Number):** A label *uniquely* identifying a facility; limited to 10 alphanumeric characters. If your account is permitted, the emissions inventory FINs *must* match the permit FINs. *Example:* FLARE1
5. **Facility Name:** The plain text name of the FIN; limited to forty characters. *Example:* ENGINE 2 or S-SERIES FLARE
6. **SCC (Source Classification Code):** An EPA-developed code used to associate air pollution estimates with unique, identifiable industrial processes. The SCC should describe the FIN as accurately and as precisely as possible.
7. **Facility Status:** Indicates whether the facility operated during the emissions inventory year. A newly-added facility should be listed as “active” (A) if it operated *at any time* during the year; “idle” (I) if it was idle for the entire year; or “permitted but not built” (N).
8. **Operating Schedule:** The facility’s actual normal operating schedule during the emissions inventory year; includes the four elements described below:
 - Start Time:** For facilities that operate fewer than 24 hours per day, the time at which operations usually commence; based on a 24-hour clock (military time).
 - Hours/Day:** The number of hours per day for which the facility is normally active; between zero and 24.
 - Days/Week:** The number of days per week for which the facility is normally active; between zero and seven.
 - Weeks/Year:** The number of weeks per year for which the facility is normally active; between zero and 52.
9. **Seasonal Operating Percentages:** The percentage of annual facility operations that occurs during each “season.” For EI purposes, “Spring” includes March through May; “Summer,” June through August; Autumn, September through November; Winter, December through February. Note that the percentages must sum to 100.

10. **Annual Operating Hours:** Describes the account’s total annual operating hours; between zero and 8,760.
11. **Percent Max Capacity:** The percentage of possible emissions actually released by the FIN:

$$PercentMaxCapacity' \frac{Emissions_{actual}}{Emissions_{potential}} \times 100$$

Consult the glossary for a definition of *Emissions_{potential}* (under “potential to emit”).

12. **Annual Process Rate:** The amount of material used by or processed at the facility during the year. Include the process rate units as determined by the facility’s SCC. *Example:* 113 million SCF natural gas burned per year
13. **Ozone Season Daily Process Rate:** The average amount of material used by or processed at the facility during each day of the ozone season (June 1 through August 31); include units. *Example:* 0.2 million SCF natural gas burned per day
14. **Service Type:** Indicate whether this is a process flare, an emergency flare, or both.
15. **Assist Type:** Indicate whether the flare is air-assisted, steam-assisted, or unassisted.
16. **Functional Description and/or Comments:** Describe the facility’s function; provide any clarifying information related to facility activities or parameters.

Facility Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Storage Tank

Company Name ¹ : Johnson Gas Company

TCEQ Air Account Number ² : HG6789X

Plant ID ³ :

FACILITY IDENTIFICATION

FIN ⁴ : TANKOIL4

Facility Name ⁵ : Oil Tank Number 4

SCC ⁶ : 40300102

OPERATING SCHEDULE

Facility Status ⁷ : Active

Operating Schedule ⁸ Start Time : _____ Hours/Day : 24 Days/Week : 7 Weeks/Year : 52

Seasonal Operating Percentages ⁹

Spring : 25 % Summer : 25 % Autumn : 25 % Winter : 25 %
(**NOTE: Spring % + Summer % + Autumn % + Winter % must equal 100%.**)

Annual Operating Hours ¹⁰ : 8760

Percent Max Capacity ¹¹ : 100

Annual Process Rate ¹² :

Ozone Season Daily Process Rate ¹³ :

TANK DETAIL

Tank Type ¹⁴ (Please check one box below.)

- Horizontal Fixed Roof
- Vertical Fixed Roof
- Internal Floating Roof
- Pressure Tank

- External Floating Roof: Double Deck, Single Seal
- External Floating Roof: Double Deck, Double Seal
- External Floating Roof: Pontoon, Single Seal
- External Floating Roof: Pontoon, Double Seal

- Domed External Floating Roof: Double Deck
- Domed External Floating Roof: Pontoon
- Underground Tank
- Other : _____

Fill Method ¹⁵ (Check one box .)

- Submerged
- Splash
- Bottom

Vapor Space Height ¹⁶ : 10 ft

Tank Dimensions ¹⁷

Height/Length : 25 ft Diameter : 10 ft Capacity : 58.72 M gallons

Shell Characteristics ¹⁸

Construction : W Color/Shade : LG Paint Condition : G Internal Shell Condition : G

Roof Characteristics ¹⁹

Color/Shade : LG Paint Condition : G Slope (cone) : 0.0625 ft/ft Radius (dome) : _____ ft

Breather Vent Settings ²⁰

Vacuum : -0.03 psig Pressure : 0.03 psig

Floating Roof Tank Construction and Rim-Seal System ²¹

Primary Seal : _____ Secondary Seal : _____

Internal Floating Roof Tank Column Information (roof not self-supporting) ²²

Number of Columns : _____ Effective Column Diameter (if known) : _____

Internal Floating Roof Tank Deck Characteristics ²³

Deck Type : _____ Deck Fitting Category : _____ Construction : _____ Deck Seam : _____ Deck Seam Length : _____ feet

FUNCTIONAL DESCRIPTION AND / OR COMMENTS ²⁴

INSTRUCTIONS

Complete the **Facility Information: Storage Tank** form to add a tank to your account. This form requests information necessary for quality assurance purposes.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Plant ID:** The name used to identify a unique unit or process within an account; limited to 10 characters. Please note that a unit or process may include several different facilities and/or operation types. *Example:* PVC Unit or Plant 2
4. **FIN (Facility Identification Number):** A label *uniquely* identifying a facility; limited to 10 alphanumeric characters. If your account is permitted, the emissions inventory FINs *must* match the permit FINs. *Example:* TANKOIL4
5. **Facility Name:** The plain text name of the FIN; limited to forty characters. *Example:* OIL TANK NUMBER 4
6. **SCC (Source Classification Code):** An EPA-developed code used to associate air pollution estimates with unique, identifiable industrial processes. The SCC should describe the FIN as accurately and as precisely as possible.
7. **Facility Status:** Indicates whether the facility operated during the emissions inventory year. A newly-added facility should be listed as “active” (A) if it operated *at any time* during the year; “idle” (I) if it was idle for the entire year; or “permitted but not built” (N).
8. **Operating Schedule:** The facility’s actual normal operating schedule during the emissions inventory year; includes the four elements described below:
 - Start Time:** For facilities that operate fewer than 24 hours per day, the time at which operations usually commence; based on a 24-hour clock (military time).
 - Hours/Day:** The number of hours per day for which the facility is normally active; between zero and 24.
 - Days/Week:** The number of days per week for which the facility is normally active; between zero and seven.
 - Weeks/Year:** The number of weeks per year for which the facility is normally active; between zero and 52.
9. **Seasonal Operating Percentages:** The percentage of annual facility operations that occurs during each “season.” For EI purposes, “Spring” includes March through May; “Summer,” June through August; Autumn, September through November; Winter, December through February. Note that the percentages must sum to 100.
10. **Annual Operating Hours:** Describes the account’s total annual operating hours; between zero and 8,760.

11. **Percent Max Capacity:** The percentage of possible emissions actually released by the FIN:

$$\text{PercentMaxCapacity}' \frac{\text{Emissions}_{\text{actual}}}{\text{Emissions}_{\text{potential}}} \times 100$$

Consult the glossary for a definition of *Emissions_{potential}* (under “potential to emit”).

12. **Annual Process Rate:** The amount of material used by or processed at the facility during the year. Include the process rate units as determined by the facility’s SCC. *Example:* 113 million SCF natural gas burned per year *or* 1,234 thousand gallons of gasoline loaded per year
13. **Ozone Season Daily Process Rate:** The average amount of material used by or processed at the facility during each day of the ozone season (June 1 through August 31); include units. *Example:* 0.2 million SCF natural gas burned per day *or* 0.06 tons of coating applied per day.
14. **Tank Type:** Self-explanatory. Check only one box. If the selection is “Other,” please describe the tank type in the space provided.
15. **Fill Method:** Self-explanatory. Check only one box.
16. **Vapor Space Height:** The average vapor space height, in feet.
17. **Tank Dimensions:** The tank height (if vertical) or length (if horizontal); tank diameter; and tank capacity.
18. **Shell Characteristics:** The tank’s exterior paint color and shade, exterior paint condition, and internal shell condition. The available choices for each are:
- Construction:** **W** (welded) or **R** (riveted)
 - Paint Color:** **WH** (white), **LG** (light gray), **MG** (medium gray), **AS** (aluminum: specular or reflective), **AD** (aluminum: diffuse or non-reflective), **OT** (other)
 - Paint Condition:** **G** (good) or **P** (poor)
 - Internal Shell Condition:** **G** (good) or **P** (poor)
19. **Roof Characteristics:** The tank roof’s paint color and shade; roof paint condition; and roof slope (cone) or roof radius (dome). The available choices for roof color and condition are:
- Paint Color:** **WH** (white), **LG** (light gray), **MG** (medium gray), **AS** (aluminum/specular or reflective), **AD** (aluminum/diffuse or non-reflective), **OT** (other)
 - Paint Condition:** **G** (good) or **P** (poor)
20. **Breather Vent Settings:** The vacuum and pressure settings, in psig.
21. **Floating Roof Tank Construction and Rim-Seal System:** For floating-roof tanks, describe the construction and rim-seals. The available choices are:
- Primary Seal:** **MS** (mechanical shoe), **LM** (liquid-mounted), or **VR** (vapor rim).
 - Secondary Seal:** **N** (none), **SM** (shoe-mounted), **RM** (rim-mounted), **WS** (weather shield)

- 22. Internal Floating Roof Tank Column Information:** For non-self-supporting internal floating roof tanks, the number of columns and effective column diameter.
- 23. Internal Floating Roof Tank Deck Characteristics:** For internal floating roof tanks, the deck type, fitting category, construction and seam. The choices for each are:
- Deck Type:** **W** (welded) or **B** (bolted)
 - Deck Fitting Category:** **T** (typical) or **D** (detail)
 - Construction:** **S** (sheet) or **P** (panel)
 - Deck Seam:** **5 x 7.5 ft** or **5 x 12 ft** (for panel construction)
5 ft, 6 ft, or 7 ft (for sheet construction)
- 24. Functional Description and/or comments:** Describe the facility's function; provide any clarifying information related to facility activities or parameters.

Facility Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Cooling Tower

Company Name ¹ : Johnson Gas Company

TCEQ Air Account Number ² : HG6789X

Plant ID ³ :

FACILITY IDENTIFICATION

FIN ⁴ : CT3

Facility Name ⁵ : Unit 3 Cooling Tower

SCC ⁶ : 38500101 (Mechanical Draft)
 38500102 (Natural Draft)

OPERATING SCHEDULE

Facility Status ⁷ : Active Operating Schedule ⁸ Start Time : _____ Hours/Day : 24 Days/Week : 7 Weeks/Year : 52

Seasonal Operating Percentages ⁹ Spring : 25% Summer : 25% Autumn : 25% Winter : 25%
(**NOTE:** Spring % + Summer % + Autumn % + Winter % **must equal** 100%.)

Annual Operating Hours ¹⁰ : 8760

Percent Max Capacity ¹¹ : 42.7 %

Annual Process Rate ¹² :

Ozone Season Daily Process Rate ¹³ :

DESIGN INFORMATION

Draft Design Type ¹⁴ : Natural Draft Mechanical Draft Number of Cells ¹⁵ : 1 Design Flow Rate ¹⁶ : _____ Mmgal/day (maximum)

VOC SAMPLING DATA

Sampled for VOC? ¹⁷ No Yes Describe : VOCs are sampled using Method 8260B

Sampling Schedule ¹⁸ : Daily Weekly Monthly Other : _____

Are sampling data used to calculate emissions? ¹⁹ _____

FUNCTIONAL DESCRIPTION AND / OR COMMENTS ²⁰

INSTRUCTIONS

Complete the **Facility Information: Cooling Tower** form to add a cooling tower to your account. This form requests information necessary for quality assurance purposes.

- 1. Company Name:** The official name of the company responsible for the account.
- 2. TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
- 3. Plant ID:** The name used to identify a unique unit or process within an account; limited to 10 characters. Please note that a unit or process may include several different facilities and/or operation types. *Example:* PVC Unit or Plant 2
- 4. FIN (Facility Identification Number):** A label uniquely identifying a facility; limited to 10 alphanumeric characters. If your account is permitted, the emissions inventory FINs must match the permit FINs. *Example:* CT4
- 5. Facility Name:** The plain text name of the FIN; limited to forty characters. *Example:* UNIT 4 COOLING TOWER
- 6. SCC (Source Classification Code):** An EPA-developed code used to associate air pollution estimates with unique, identifiable industrial processes. Select the appropriate SCC for your cooling tower.
- 7. Facility Status:** Indicates whether the facility operated during the emissions inventory year. A newly-added facility should be listed as “active” (A), “idle” (I), or “permitted but not built” (N).
- 8. Operating Schedule:** The facility’s actual normal operating schedule during the emissions inventory year; includes the four elements described below:
 - Start Time:** For facilities that operate fewer than 24 hours per day, the time at which operations usually commence; based on a 24-hour clock (military time).
 - Hours/Day:** The number of hours per day for which the facility is normally active; between zero and 24.
 - Days/Week:** The number of days per week for which the facility is normally active; between zero and seven.
 - Weeks/Year:** The number of weeks per year for which the facility is normally active; between zero and 52.
- 9. Seasonal Operating Percentages:** The percentage of annual facility operations that occurs during each “season.” For EI purposes, “Spring” includes March through May; “Summer,” June through August; Autumn, September through November; Winter, December through February. Note that the percentages must sum to 100.

10. **Annual Operating Hours:** Describes the account's total annual operating hours; between zero and 8,760.
11. **Percent Max Capacity:** The percentage of possible emissions actually released by the FIN:

$$\text{PercentMaxCapacity}' \frac{Emissions_{actual}}{Emissions_{potential}} \times 100$$

Consult the glossary for a definition of *Emissions_{potential}* (under “potential to emit”).

12. **Annual Process Rate:** The amount of material used by or processed at the facility during the year. Include the process rate units as determined by the facility's SCC. *Example:* 113 million SCF natural gas burned per year or 1,234 thousand gallons of gasoline loaded per year
13. **Ozone Season Daily Process Rate:** The average amount of material used by or processed at the facility during each day of the ozone season (June 1 through August 31); include units. *Example:* 0.2 million SCF natural gas burned per day or 0.06 tons of coating applied per day.
14. **Design Draft Type:** Indicates whether the tower is designed with natural or mechanical draft.
15. **Number of Cells** (Mechanical Draft towers only): Indicates the number of cells that comprise the cooling tower facility.
16. **Design Flow Rate:** Indicates the maximum flow rate, in MMgal/day, that the tower is designed to accommodate.
17. **Sampled for VOCs?:** Where sampling is conducted, indicates whether the samples are tested for VOC content.
18. **Sampling Schedule:** Indicates the sampling schedule: daily, weekly, monthly or other. If “other,” please specify.
19. **Are sampling data used to calculate emissions?:** Where sampling is conducted, answer “yes” or “no” to indicate whether emissions are estimated using the test results.
20. **Functional Description and/or Comments:** Describe the facility's function; provide any clarifying information related to facility activities or parameters. If samples are tested for VOCs, describe the test method here.

Facility Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Wastewater Facility

Company Name ¹: Johnson Wastewater Company TCEQ Air Account Number ²: HG6788X Plant ID ³: TREATMENT1

FACILITY IDENTIFICATION

FIN ⁴: POND1 Facility Name ⁵: HOLDING POND NUMBER 1 SCC ⁶: 30600519

OPERATING SCHEDULE

Facility Status ⁷: ACTIVE Operating Schedule ⁸ Start Time : n/a Hours/Day : 24 Days/Week : 7 Weeks/Year : 52

Seasonal Operating Percentages ⁹ Spring : 20 % Summer : 29 % Autumn : 21 % Winter : 30 % Annual Operating Hours ¹⁰ : 8760
(NOTE: Spring % + Summer % + Autumn % + Winter % must equal 100%.) Percent Max Capacity ¹¹ : 87.6 %

Annual Process Rate ¹²: Ozone Season Daily Process Rate ¹³:

WASTEWATER DETAIL

Flow Model ¹⁴: Flowthrough Disposal Aeration ¹⁵: Diffused Air Mechanical None Depth ¹⁸: 5 feet Surface Area ¹⁹: 10000 feet²
Biodegradation Mechanism ¹⁶: Biodegradation Activity Activated Sludge Activity None Flow Rate ²⁰: 10 million gallons per day
Device Type ¹⁷: Surface Impoundment Subsurface Impoundmnt Other (specify) : _____ Prestripping Performed? ²¹: Yes No

COLLECTION SYSTEM COMPONENT COUNTS ²²

Drains (p-leg seal) : _____ Drains (water pot seal) : _____ Drains (no water seal) : _____ Dedicated sewer vents : _____ Manholes : _____
Covered lift stations : _____ totaling _____ square feet Uncovered lift stations : _____ totaling _____ square feet Weirs : _____ totaling _____ square feet
Covered junction boxes : _____ totaling _____ square feet Uncovered junction boxes : _____ totaling _____ square feet
Covered Trenches : _____ totaling _____ linear feet Uncovered Trenches : _____ totaling _____ linear feet

FUNCTIONAL DESCRIPTION AND / OR COMMENTS ²³

INSTRUCTIONS

Complete the **Facility Information: Wastewater Facility** form to add a wastewater facility to your account. This form requests information necessary for quality assurance purposes.

- 1. Company Name:** The official name of the company responsible for the account.
- 2. TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
- 3. Plant ID:** The name used to identify a unique unit or process within an account; limited to 10 characters. Please note that a unit or process may include several different facilities and/or operation types. *Example:* PVC Unit or Plant 2
- 4. FIN (Facility Identification Number):** A label uniquely identifying a facility; limited to 10 alphanumeric characters. If your account is permitted, the emissions inventory FINs must match the permit FINs. *Example:* WWPOND
- 5. Facility Name:** The plain text name of the FIN; limited to forty characters. *Example:* 10000 SQUARE FOOT WASTEWATER POND
- 6. SCC (Source Classification Code):** An EPA-developed code used to associate air pollution estimates with unique, identifiable industrial processes. The SCC should describe the FIN as accurately and as precisely as possible. If this field is left blank, the IEAS will assign an SCC.
- 7. Facility Status:** Indicates whether the facility operated during the emissions inventory year. A newly-added facility should be listed as “active” (A), “idle” (I), or “permitted but not built” (N).
- 8. Operating Schedule:** The facility’s actual normal operating schedule during the emissions inventory year; includes the four elements described below:
 - Start Time:** For facilities that operate fewer than 24 hours per day, the time at which operations usually commence; based on a 24-hour clock (military time).
 - Hours/Day:** The number of hours per day for which the facility is normally active; between zero and 24.
 - Days/Week:** The number of days per week for which the facility is normally active; between zero and seven.
 - Weeks/Year:** The number of weeks per year for which the facility is normally active; between zero and 52.
- 9. Seasonal Operating Percentages:** The percentage of annual facility operations that occurs during each “season.” For EI purposes, “Spring” includes March through May; “Summer,” June through August; Autumn, September through November; Winter, December through February. Note that the percentages must sum to 100.

10. **Annual Operating Hours:** Describes the account’s total annual operating hours; between zero and 8,760.
11. **Percent Max Capacity:** The percentage of possible emissions actually released by the FIN:

$$PercentMaxCapacity' \frac{Emissions_{actual}}{Emissions_{potential}} \times 100$$

Consult the glossary for a definition of *Emissions_{potential}* (under “potential to emit”).

12. **Annual Process Rate:** The amount of material used by or processed at the facility during the year. Include the process rate units as determined by the facility’s SCC. *Example:* 200 MM gallons per year
13. **Ozone Season Daily Process Rate:** The average amount of material used by or processed at the facility during each day of the ozone season (June 1 through August 31); include units. *Example:* 0.8 MM gallons per day.
14. **Flow Model:** Describes whether the facility receives wastewater for ultimate disposal (“disposal”) or continuously receives wastewater feed and discharges treated water (“flowthrough”).
15. **Aeration:** Self-explanatory. Check only one box.
16. **Biodegradation Mechanism:** Self-explanatory. Check only one box.
17. **Device Type:** Self-explanatory. Check only one box.
18. **Depth:** The facility depth, in feet.
19. **Surface Area:** The facility surface area, in square feet.
20. **Flow Rate:** The flow rate through the facility, in million gallons per day.
21. **Prestripping Performed?:** Indicates whether the wastewater is prestripped.
22. **Collection System Component Counts:** The elements of this section should be self-explanatory. Enter the quantity of each device and, where appropriate, the associated total surface area in square feet.
23. **Functional Description and/or Comments:** Describe the facility function; provide any clarifying information related to facility activities or parameters.

Facility Information
TCEQ Emissions Inventory 2002

Leaking Component Fugitives

Company Name ¹ : Johnson Gas Company

TCEQ Air Account Number ² : HG6789X

Plant ID ³ :

FACILITY IDENTIFICATION

FIN ⁴ : FUG1

Facility Name ⁵ : Fugitive Area Number 1

SCC ⁶ : 31088801

OPERATING SCHEDULE

Facility Status ⁷ : Active

Operating Schedule ⁸ Start Time : _____ Hours/Day : 24 Days/Week : 7 Weeks/Year : 52

Seasonal Operating Percentages ⁹ Spring : 25 % Summer : 25 % Autumn : 25 % Winter : 25 %
(NOTE: Spring % + Summer % + Autumn % + Winter % *must equal 100%*.)

Annual Operating Hours ¹⁰ : 8760

Percent Max Capacity ¹¹ : 99.9 %

Annual Process Rate ¹² :

Ozone Season Daily Process Rate ¹³ :

EMISSIONS ESTIMATION METHODOLOGY ¹⁴ (Check ONE. If more than one methodology is used, then create separate FINs.)

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Oil and Gas Factors | <input type="checkbox"/> SOCFMI Average Factors | <input type="checkbox"/> SOCFMI Leak / No Leak Factors |
| <input type="checkbox"/> Refinery Factors | <input type="checkbox"/> SOCFMI with Ethylene Factors | <input type="checkbox"/> Correlation Equations |
| <input type="checkbox"/> Petroleum Marketing Terminal Factors | <input type="checkbox"/> SOCFMI without Ethylene Factors | <input type="checkbox"/> Other (explain) : _____ |

LEAK DETECTION AND REPAIR (LDAR) PROGRAM ¹⁵ (Check ONE. If more than one LDAR program is used, then create separate FINs.)

- None
 28M
 28RCT
 28VHP
 28MID
 28LAER

This LDAR program is ¹⁶ (check one): Voluntary Required by Permit or Rule

FUNCTIONAL DESCRIPTION AND / OR COMMENTS ¹⁷

Complete the Fugitive Data form in Appendix A, Technical Supplement 4.

INSTRUCTIONS

Complete the *Facility Information: Leaking Component Fugitives* form for each FIN representing a component fugitive area. This form requests a detailed count of piping components. The IEAS uses this information for quality assurance purposes.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Plant ID:** The name used to identify a unique unit or process within an account; limited to 10 characters. Please note that a unit or process may include several different facilities and/or operation types. *Example:* PVC Unit or Plant 2
4. **FIN (Facility Identification Number):** A label uniquely identifying a facility; limited to 10 alphanumeric characters. If your account is permitted, the emissions inventory FINs must match the permit FINs. *Example:* FUG2
5. **Facility Name:** The plain text name of the FIN; limited to forty characters. *Example:* FUGITIVE AREA 2
6. **SCC (Source Classification Code):** An EPA-developed code used to associate air pollution estimates with unique, identifiable industrial processes. The SCC should describe the FIN as accurately and as precisely as possible.
7. **Facility Status:** Indicates whether the facility operated during the emissions inventory year. A newly-added facility should be listed as “active” (A) if it operated at any time during the year; “idle” (I) if it was idle for the entire year; or “permitted but not built” (N).
8. **Operating Schedule:** The facility’s actual normal operating schedule during the emissions inventory year; includes the four elements described below:
 - Start Time:** For facilities that operate fewer than 24 hours per day, the time at which operations usually commence; based on a 24-hour clock (military time).
 - Hours/Day:** The number of hours per day for which the facility is normally active; between zero and 24.
 - Days/Week:** The number of days per week for which the facility is normally active; between zero and seven.
 - Weeks/Year:** The number of weeks per year for which the facility is normally active; between zero and 52.
9. **Seasonal Operating Percentages:** The percentage of annual facility operations that occurs during each “season.” For EI purposes, “Spring” includes March through May; “Summer,” June through August; Autumn, September through November; Winter, December through February. Note that the percentages must sum to 100.

10. **Annual Operating Hours:** Describes the account’s total annual operating hours; between zero and 8,760.
11. **Percent Max Capacity:** The percentage of possible emissions actually released by the FIN:

$$PercentMaxCapacity' \frac{Emissions_{actual}}{Emissions_{potential}} \times 100$$

Consult the glossary for a definition of *Emissions_{potential}* (under “potential to emit”).

12. **Annual Process Rate:** The amount of material used by or processed at the facility during the year. Include the process rate units as determined by the facility’s SCC.
Example: 113 million SCF natural gas processed per year
13. **Ozone Season Daily Process Rate:** The average amount of material used by or processed at the facility during each day of the ozone season (June 1 through August 31); include units. *Example:* 0.2 million SCF natural gas processed per day
14. **Emissions Estimation Methodology:** Select the group to which the facility belongs. If the selection is “Component Fugitives,” fill out a Component Count for Fugitive Emissions form. If the selection is “Other,” please elaborate in the space provided.
15. **Leak Detection and Repair (LDAR) Program:** If the fugitive area is subject to an LDAR program, specify the program.
16. **This LDAR Program is:** Indicate whether monitoring is voluntary or required by a rule or permit.
17. **Functional Description and/or Comments:** Describe the facility function; provide any clarifying information related to facility activities or parameters.

Facility Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Other

Company Name ¹: Johnson Gas Company

TCEQ Air Account Number ²: HG6789X

Plant ID ³:

FACILITY IDENTIFICATION

FIN ⁴: LOADING

Facility Name ⁵: LOADING RACK

SCC ⁶:

OPERATING SCHEDULE

Facility Status ⁷:
ACTIVE

Operating Schedule ⁸ Start Time: n/a Hours/Day: 24 Days/Week: 7 Weeks/Year: 52

Seasonal Operating Percentages ⁹

Spring: 20% Summer: 29% Autumn: 21% Winter: 30%

(NOTE: Spring % + Summer % + Autumn % + Winter % must equal 100%.)

Annual Operating Hours ¹⁰: 8760

Percent Max Capacity ¹¹: 87.6 %

Annual Process Rate ¹²:

Ozone Season Daily Process Rate ¹³:

GENERATING GROUP ¹⁴ (Check one.)

Loading Losses

Other (describe): _____

FUNCTIONAL DESCRIPTION AND / OR COMMENTS ¹⁵

INSTRUCTIONS

Complete the **Facility Information: Other** form to add a facility that is not a combustion unit (including a flare), a storage tank, a cooling tower, a wastewater facility, or a leaking component fugitive area. This form requests information necessary for quality assurance purposes.

- 1. Company Name:** The official name of the company responsible for the account.
- 2. TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
- 3. Plant ID:** The name used to identify a unique unit or process within an account; limited to 10 characters. Please note that a unit or process may include several different facilities and/or operation types. *Example:* PVC Unit or Plant 2
- 4. FIN (Facility Identification Number):** A label uniquely identifying a facility; limited to 10 alphanumeric characters. If your account is permitted, the emissions inventory FINs must match the permit FINs. *Example:* LOADING
- 5. Facility Name:** The plain text name of the FIN; limited to forty characters. *Example:* TANK CAR LOADING
- 6. SCC (Source Classification Code):** An EPA-developed code used to associate air pollution estimates with unique, identifiable industrial processes. The SCC should describe the FIN as accurately and as precisely as possible.
- 7. Facility Status:** Indicates whether the facility operated during the emissions inventory year. A newly-added facility should be listed as “active” (A) if it operated at any time during the year; “idle” (I) if it was idle for the entire year; or “permitted but not built” (N).
- 8. Operating Schedule:** The facility’s actual normal operating schedule during the emissions inventory year; includes the four elements described below:
 - Start Time:** For facilities that operate fewer than 24 hours per day, the time at which operations usually commence; based on a 24-hour clock (military time).
 - Hours/Day:** The number of hours per day for which the facility is normally active; between zero and 24.
 - Days/Week:** The number of days per week for which the facility is normally active; between zero and seven.
 - Weeks/Year:** The number of weeks per year for which the facility is normally active; between zero and 52.

9. **Seasonal Operating Percentages:** The percentage of annual facility operations that occurs during each “season.” For EI purposes, “Spring” includes March through May; “Summer,” June through August; Autumn, September through November; Winter, December through February. Note that the percentages must sum to 100.
10. **Annual Operating Hours:** Describes the account’s total annual operating hours; between zero and 8,760.
11. **Percent Max Capacity:** The percentage of possible emissions actually released by the FIN:

$$PercentMaxCapacity' \frac{Emissions_{actual}}{Emissions_{potential}} \times 100$$

Consult the glossary for a definition of *Emissions_{potential}* (under “potential to emit”).

12. **Annual Process Rate:** The amount of material used by or processed at the facility during the year. Include the process rate units as determined by the facility’s SCC. *Example:* 113 million SCF natural gas loaded per year
13. **Ozone Season Daily Process Rate:** The average amount of material used by or processed at the facility during each day of the ozone season (June 1 through August 31); include units. *Example:* 0.2 million SCF natural gas loaded per day
14. **Generating Group:** If the facility is a loading operation, check “Loading Losses.” Otherwise, check “Other” and elaborate in the space provided.
15. **Functional Description and/or Comments:** Describe the facility function; provide any clarifying information related to facility activities or parameters.

Abatement Device Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

You may use this one form to add up to two new CINs to your account.

Company Name¹: Johnson Gas Company

TCEQ Air Account Number²: HG6789X

ABATEMENT DEVICE INFORMATION

CIN ³ : FLARE1	Control Device Name ⁴ : S-SERIES FLARE	Abatement Code ⁵ : 511	Number of Units ⁶ : 1
Annual Operation ⁷ 8760 hours	Percent Time Offline ⁸ 4.25 %	Inspection and Maintenance Schedule ⁹ (Please select <u>one</u> box below.) <input type="checkbox"/> Annually <input type="checkbox"/> Biannually <input type="checkbox"/> Quarterly <input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Weekly <input type="checkbox"/> Daily <input type="checkbox"/> Hourly <input type="checkbox"/> Continuous	

CONTROL EFFICIENCY (Please check all contaminants controlled by this abatement device and enter the control efficiency in the space provided.)

Volatile Organic Compounds : 95 %
 Nitrogen Oxides : _____ %
 Carbon Monoxide : _____ %
 Sulfur Dioxide : _____ %
 Inorganic Compounds : 98 %
 Total Suspended Particulates : _____ %
 PM 10 (particulates less than 10 microns in diameter) : _____ %

ABATEMENT DEVICE INFORMATION

CIN ³ : CATCONV5A	Control Device Name ⁴ : ENGINE 5A CATALYTIC CONVERTER	Abatement Code ⁵ : 631	Number of Units ⁶ : 1
Annual Operation ⁷ 8760 hours	Percent Time Offline ⁸ 4.25 %	Inspection and Maintenance Schedule ⁹ (Please select <u>one</u> box below.) <input type="checkbox"/> Annually <input type="checkbox"/> Biannually <input type="checkbox"/> Quarterly <input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Weekly <input type="checkbox"/> Daily <input type="checkbox"/> Hourly <input type="checkbox"/> Continuous	

CONTROL EFFICIENCY (Please check all contaminants controlled by this abatement device and enter the control efficiency in the space provided.)

Volatile Organic Compounds : _____ %
 Nitrogen Oxides : 65 %
 Carbon Monoxide : 40 %
 Sulfur Dioxide : _____ %
 Inorganic Compounds : _____ %
 Total Suspended Particulates : _____ %
 PM 10 (particulates less than 10 microns in diameter) : _____ %

INSTRUCTIONS

Complete the *Abatement Device Information* form to add a control device to your account. The form requests information necessary for quality assurance purposes.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
- **Control Identification Number (CIN):** A label uniquely identifying an abatement device; limited to 10 alphanumeric characters. *Example:* FL1 or BAGHOUSE2
4. **Control Device Name:** The plain text name of the CIN; limited to forty characters
Example: S-SERIES FLARE or UNIT 2 BAGHOUSE
5. **Abatement Code:** A two- or three- digit code used to accurately and precisely describe an abatement device. A list of Abatement Codes is available under the heading “Tools for Completing the Point Source Emissions Inventory Questionnaires” on the IEAS Web site. A hard copy of the list is available in *Contaminant and Abatement Codes for the Air Emissions Inventory*.
6. **Number of Units:** The number of individual devices grouped together under this CIN. *Example:* If CIN: FILTER represents a series of five filters, enter “five.”
7. **Annual Operation:** The annual operating hours of the abatement device.
8. **Percent Time Offline (PTO):** The percentage of total Annual Operation time during which the abatement device did not operate or operated improperly.

$$PTO = \frac{\text{HoursOffline}}{\text{NormalAnnualOperatingHours}} \times 100$$

Example: FLARE1, which normally operates 8,760 hours per year, was off for 288 hours and malfunctioned for 83 hours. The Percent Time Offline for FLARE1 is:

$$PTO = \frac{288+83}{8760} \times 100 = 4.24$$

9. **Inspection and Maintenance Schedule:** Self-explanatory. Check only one.
10. **Control Efficiency:** Indicate which emissions are abated by the control device. Check all that apply. For each selected contaminant, use the space provided after the contaminant name to indicate the control efficiency claimed.

Example: A flare reduces VOC emissions by 95%. It also converts 98% of hydrogen sulfide to sulfur dioxide. Check the box beside Volatile Organic Compounds and enter “95”. Then check the box beside Inorganic Compounds and enter “98.” (See “FLARE1” on the sample form.)

Emission Point Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Stack Profile

Company Name¹: Johnson Gas Company TCEQ Air Account Number²: HG6789X

EMISSION POINT IDENTIFICATION

EPN³: TANK2 Point Name⁴: OIL TANK NUMBER 2

GEOGRAPHICAL COORDINATES *Fill in ONE section below.*

Latitude and Longitude ⁵		O R	UTM Coordinates ⁶ <i>in NAD of 1983</i>	
Lat : ___ deg ___ min ___ sec	Long : ___ deg ___ min ___ sec		Zone <u>15</u>	E <u>347693</u> meters

STACK PROFILE

Diameter⁷: 3 feet Height⁸: 15 feet Velocity⁹: 0.01 feet / second
 Temperature¹⁰: 67.9 degrees Farenheit Moisture¹¹: 0 % Horizontal Discharge?¹² Yes No

NOTES

Cooling Tower (Natural Draft or Mechanical Draft)¹³

Diameter = diameter of tower top (natural draft); of fan (mechanical draft); or of one fan (multicell tower)
Height = tower height
Velocity = air exit velocity at tower top (natural draft); or velocity of the fan-propelled air under normal operating conditions (mechanical draft); or velocity of one fan (multicell tower)
Temperature = air temperature at tower top (if unknown, assume 10-15° warmer than ambient temperature)
Moisture = NOT zero; generally 5-10 %; you may wish to use a psychometric chart
Horizontal Discharge? = "no," except possibly for crossflow towers

Tank with No Abatement Device¹⁴

Diameter = 3 feet
Height = tank height
Velocity = 0.01 feet / second
Temperature = average ambient temperature at the account location
(do NOT enter the word "ambient")

INSTRUCTIONS

Complete the **Emission Point Information: Stack Profile** form for each new stack-type EPN. This form requests information necessary for quality assurance purposes.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Emission Point Number (EPN):** A label uniquely identifying an emission point; limited to 10 alphanumeric characters. *Example:* STACK1B or VENT5
4. **Point Name:** The plain text name of the EPN; limited to forty characters. *Example:* ENGINE 1 STACK B or GRINDER 5 VENT NO 1.
5. **Latitude and Longitude:** The EPN's latitude and longitude, expressed in degrees, minutes and seconds.
6. **UTM Coordinates:** The EPN's Universal Transverse Mercator coordinates in North American Datum of 1983.
7. **Diameter:** The stack's diameter.
8. **Height:** The stack's height.
9. **Velocity:** The exhaust's exit velocity, measured in feet per second.
10. **Temperature:** The exhaust's exit temperature, measured in degrees Fahrenheit.
11. **Moisture:** The exit gas stream's moisture content, designated as a percentage.
12. **Horizontal Discharge?:** Indicates the stack's discharge direction. Check "No" if the stack has an unobstructed vertical discharge; otherwise, check "Yes." Check only one box.
13. **Notes for a Cooling Tower:**
 - Height :** The height (in feet) from ground level to the top of the tower.
 - Diameter :** For a natural draft tower, the diameter (in feet) at the top of the tower. For a mechanical draft tower, the diameter (in feet) of the fan. For a multi-celled mechanical draft tower, the diameter of any one fan.
 - Velocity :** For a natural draft tower, the velocity (in feet/second) of the air exiting the top of the tower. For a mechanical draft tower, the velocity (in feet/second) of the fan-propelled air under normal operating conditions. For a multi-celled mechanical draft tower, the velocity from any one fan. If velocity is not directly known, divide the volumetric air flow rate (in ft³/second) from one fan by the cross sectional area of that fan (in ft²).
 - Temperature :** The temperature (in °F) of the air exiting the top of the tower. If this temperature is not measured, it may be assumed to be 10 to 15 degrees higher than the ambient air temperature.

Moisture : The high humidity of the air exiting the cooling tower indicates that the percent moisture is not zero. Generally, one might expect this value to be between five and 10 percent. Note that a psychrometric chart may be used to determine the amount of water in saturated air at a given temperature.

Horizontal Discharge : With the possible exception of crossflow towers, cooling towers should not have horizontal discharge.

14. Notes for a *Tank* not linked to any abatement device:

Height : The height (in feet) of the tank.

Diameter : Use the default value of 3 feet.

Velocity : Use the default value of 0.01 feet per second.

Temperature : The account location's average annual ambient temperature, in degrees Fahrenheit. *Please do not enter the word "ambient."*

Emission Point Information
TCEQ Emissions Inventory 2002

SAMPLE FORM

Flare Profile

Company Name ¹: Johnson Gas Company TCEQ Air Account Number ²: HG6789X

EMISSION POINT IDENTIFICATION

EPN ³: FLARE1 Point Name ⁴: S - Series flare

GEOGRAPHICAL COORDINATES *Fill in ONE section below.*

Latitude and Longitude ⁵		O R	UTM Coordinates ⁶ <i>in NAD of 1983</i>		
Lat : ____ deg ____ min ____ sec	Long : ____ deg ____ min ____ sec		Zone <u>15</u>	E <u>347693</u> meters	N <u>1756493</u> meters

FLARE PROFILE

Height ⁷ : _____ feet	Inside Tip Diameter ⁸ : _____ feet	Number of Pilots ⁹ : _____	Adiabatic Flame Temperature ¹⁰ : _____ °F
Average Flow Rate ¹¹ : _____ Mscf / minute	Low Heating Value ¹² : _____ Btu / scf	Molecular Weight ¹³ : _____ lb / lb- mole	

FLOW DETERMINATION ¹⁴
(Check the ONE that describes how volumetric flow to the flare is determined.)

Continuous Measurement (by a flow meter at the flare header) One-time performance test Engineering Estimate

COMPOSITION DETERMINATION ¹⁵
(Check the ONE that describes how flared gas composition is determined.)

Continuous Measurement Periodic Testing One-time performance test Engineering Estimate

Be certain to complete and submit a Flare Data form. You will find this form in Appendix A, Technical Supplement 3.

INSTRUCTIONS

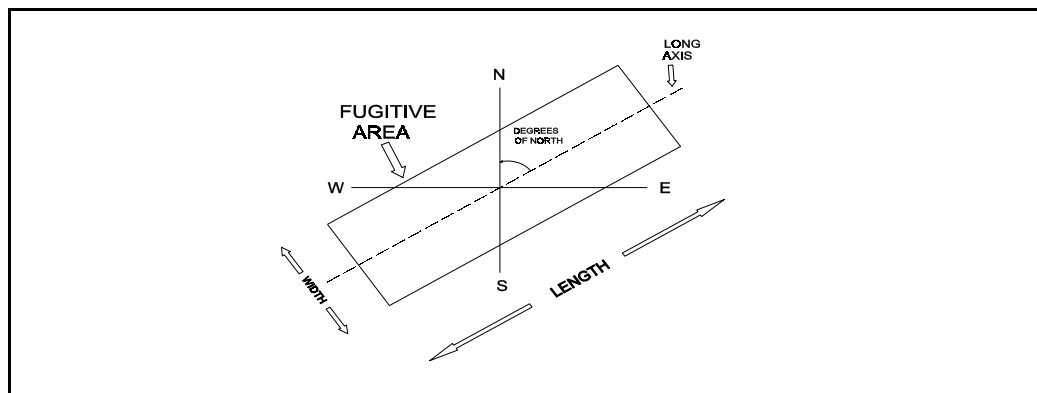
Complete the *Emission Point Information: Flare Profile* form for each new flare-type EPN. This form requests information necessary for quality assurance purposes.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Emission Point Number (EPN):** A label uniquely identifying an emission point; limited to 10 alphanumeric characters. *Example:* FLARE1
4. **Point Name:** The plain text name of the EPN; limited to forty characters. *Example:* S-SERIES FLARE
5. **Latitude and Longitude:** The EPN's latitude and longitude, expressed in degrees, minutes and seconds.
6. **UTM Coordinates:** The EPN's Universal Transverse Mercator coordinates in North American Datum of 1983.
7. **Height:** The flare's elevation, measured in feet above ground level.
8. **Inside Tip Diameter:** Self-explanatory.
9. **Number of Pilots:** Self-explanatory.
10. **Adiabatic Flame Temperature:** Self-explanatory.
11. **Average Flow Rate:** Provide the average flow rate of flared gas, measured in thousand standard cubic feet per minute.
12. **Low Heating Value:** Provide the low heating value of flared gas, measured in British thermal units per standard cubic foot.
13. **Molecular Weight:** Provide the average molecular weight of flared gas, measured in pounds per pound-mole.
14. **Flow Determination:** Indicate how the amount of product sent to the flare is determined.
15. **Composition Determination:** Indicate how the flared gas stream composition is determined.

INSTRUCTIONS

Complete the **Emission Point Information: Fugitive Profile** form for each new fugitive-type EPN. This form requests information necessary for quality assurance purposes.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Emission Point Number (EPN):** A label uniquely identifying an emission point; limited to 10 alphanumeric characters. *Example:* FUGITIVES1
4. **Point Name:** The plain text name of the EPN; limited to forty characters. *Example:* FUGITIVE AREA NO 1.
5. **Latitude and Longitude:** The EPN's latitude and longitude, expressed in degrees, minutes and seconds.
6. **UTM Coordinates:** The EPN's Universal Transverse Mercator coordinates in North American Datum of 1983.
7. **Length:** The fugitive area's length, in feet.
8. **Width:** The fugitive area's width, in feet.
9. **Height:** The fugitive area's height, in feet. If the fugitive area is at or below ground level, as in the case of a trench or impoundment, enter "3."
10. **Orientation:** The fugitive area's long axis direction, measured in degrees of rotation from true north. The orientation may be measured in degrees East of North or degrees West of North. In the figure below, the orientation could be described as 60 degrees East of North or 120 degrees West of North.



Orientation of a Fugitive Area: The orientation here is 60° East or 120° West of North.

Path Emissions
TCEQ Emissions Inventory 2002

SAMPLE

Company Name¹: Johnson Gas Company

TCEQ Air Account Number²: HG6789X

CREATE A PATH

FIN³: ENGINE1

EPN⁴: STACK1A

CIN(s)⁵:

Path Comment(s)⁶: _____

REPORT EMISSIONS FROM THIS PATH

Contaminant Name ⁷	Contaminant Code ⁸	Annual Emissions ⁹ (tons / year)	Ozone Season Emissions ¹⁰ (pounds / day)	Determination Methodology ¹¹	EE / SMSS ¹² (tons / year)
TSP unspeciaded	10000	0.3021	1.6416	A	0
PM10 unspeciaded	20000	0.3021	1.6416	A	0
PM2.5 total	39999	0.3021	1.6416	A	0
VOC unspeciaded	50001	6.3590	34.5546	A	0
Acetaldehyde	51620	0.2866	1.5574	A	0
Acrolein	51640	0.1762	0.9575	A	0
Formaldehyde	51680	1.8102	9.8366	A	0
Propane	56775	1.4365	7.8059	A	0
Nitrogen Oxides	70400	12.9884	70.5890	V	0.01
Sulfur Dioxide	70510	0.0502	0.2728	A	0
Carbon Monoxide	90300	16.0089	87.0051	V	0.01

INSTRUCTIONS

Complete the **Path Emissions** form to add a new path and report the path's emissions. Recall that a path consists of at least a *FIN* and an *EPN*; if emissions are abated, then the path also includes a *CIN*.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **FIN:** The path's facility.
4. **EPN:** The path's emission point.
5. **CIN(s):** The path's abatement device(s), if applicable. If the path includes more than one abatement device, please list the primary abatement device first.
6. **Path Comments:** Provide any clarifying information related to the newly-created path.

For each contaminant associated with the newly-created path, use one line to provide all of the following information.

7. **Contaminant Name:** The name of the contaminant being reported.
8. **Contaminant Code:** The five-digit code associated with the contaminant. A list of Contaminant Codes is available under the heading "Tools for Completing the Point Source Emissions Inventory Questionnaires" on the IEAS Web site. A hard copy of this list is available in *Contaminant and Abatement Codes for the Air Emissions Inventory*.
9. **Annual Emissions:** Total contaminant emission rate for the year, measured in tons. Actual annual emissions should not include emissions from emission events or scheduled maintenance, startup or shutdown activities.
10. **Ozone Season Emissions:** Average contaminant emission rate during the ozone season, measured in pounds per day. Recall that ozone season is defined as the ninety-two days from June 1 to August 31, inclusive. This information is mandatory for all accounts in El Paso County and for all accounts in any county east of the Central Meridian. A list of these counties is provided in the table on page 43. Please note that ozone season rates can no longer be automatically calculated by the IEAS database.
11. **Determination Methodology:** The method used to estimate the reported emissions. Acceptable methods are described in Chapter 3 and, for certain source types, in Appendix A.
12. **EE/SMSS:** Emissions from emission events and/or scheduled maintenance, startup or shutdown activities.

Account Emissions
TCEQ Emissions Inventory 2002

SAMPLE

Company Name ¹: Johnson Gas Company

TCEQ Air Account Number ²: HG6789X

REPORT TOTAL EMISSIONS FOR THIS ACCOUNT

CONTAMINANT	ANNUAL (tons/year) ³	OZONE (pounds/day) ⁴	EE/SMSS (tons/year)
Volatile Organic Compounds ⁵	44.2613	240.5505	9.8762
Nitrogen Oxides ⁶	220.9090	1200.5924	5.6482
Sulfur Dioxide ⁷	143.6177	780.5310	14.3051
Carbon Monoxide ⁸	138.4900	752.6630	6.3791
Lead ⁹	0	0	0
PM ₁₀ ¹⁰	4.0700	22.1196	0

EE/SMSS CERTIFICATION ¹¹

Pursuant to Texas Health and Safety Code 382.0215(f) I do hereby certify that no emissions events were experienced at this account during the emissions inventory reporting calendar year. *(Sign here if and only if you reported no emissions from emission events.)*

Signature: _____

SIGNATURE OF LEGALLY RESPONSIBLE PARTY

I do hereby certify that information reported in this inventory is true, accurate, and fully represents the emissions that occurred during the emissions inventory reporting calendar year.

Signature ¹²: I. M. Boss

Printed Name ¹³: I. M. Boss

Title ¹⁴: Plant Manager

Date ¹⁵: March 7, 2002

INSTRUCTIONS

Complete an **Account Emissions** form only if no EIQ has previously been submitted for your account.

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **Tons per Year:** Required for all accounts. Report the account-wide emissions for each of the six listed contaminants.
4. **Pounds per Day (Ozone Season):** Required for all accounts located in El Paso County or east of the Central Meridian. Report the daily ozone season account-wide emissions for each of the seven listed contaminants
5. **Volatile Organic Compounds:** Sum all of the volatile organic compound emissions reported on any Path Emissions form.
6. **Nitrogen Oxides:** Sum all of the nitrogen oxides emissions reported on any Path Emissions form.
7. **Sulfur Dioxide:** Sum all of the sulfur dioxide emissions reported on any Path Emissions form.
8. **Carbon Monoxide:** Sum all of the carbon monoxide emissions reported on any Path Emissions form.
9. **Lead:** Sum all of the lead emissions reported on any Path Emissions form
10. **PM₁₀ (particulate matter less than 10 microns in diameter):** Sum all of the PM₁₀ emissions reported on any Path Emissions form.
11. **EE/SMSS Certification:** Sign after this statement if and only if you experienced and reported no emissions from emission events.
12. **Signature:** The signature of the individual legally responsible for certifying that the inventory is, to the best of her or his knowledge, accurate and complete.
13. **Printed Name:** The signer's name, clearly printed.
14. **Title:** The signer's title.
15. **Date:** The date of signature.

Material Throughput
TCEQ Emissions Inventory 2002

SAMPLE FORM

Combustion Units

Company Name ¹ : Johnson Gas Company

TCEQ Air Account Number ² : HG6789X

MATERIAL DETAIL

FIN ³	Fuel/Waste Name ⁴	Quantity ⁵	Units ⁶	Heat Value ⁷	% Ash ⁸	% Sulfur ⁹	Usage Start Date ¹⁰	Usage End Date ¹¹
GASBOILER	Natural Gas	3,426,610	MMSCF	1006.47 Btu/SCF	0	0.0006	01 / 01 / 01	12 / 31 / 01
	Fuel Oil Number 5	19,824	Gallons	141,582 Btu/gal	0	0.130	01 / 01 / 01	2 / 3 / 01
	Fuel Oil Number 5	29,736	Gallons	141,582 Btu/gal	0	0.130	11 / 17 / 01	12 / 31 / 01
COALBOILER	Coal	2,716,581	tons	8415 Btu/lb	5.36	0.39	01 / 01 / 01	12 / 31 / 01
	Oil	673.55	M gallons	140,117 Btu/gal	0	0.06	01 / 01 / 01	12 / 31 / 01
LIGBOILER	Lignite	2,340,260	tons	1.327E+07 Btu/ton	15.4	0.7455	01 / 01 / 01	12 / 31 / 01
	Natural Gas	195.85	MMSCF	1028 Btu/SCF	0	0.0006	01 / 01 / 01	12 / 31 / 01
ENGINE1	Natural Gas	84.239	MMSCF	1006.47 Btu/SCF	0	0.0006	01 / 01 / 01	12 / 31 / 01
RBLR1	Natural Gas	38.840	MMSCF	1006.47 Btu/SCF	0	0.0006	01 / 01 / 01	12 / 31 / 01
GEN1EMER	Diesel	72	Gallons	137,000 Btu/gal	0	0.4	01 / 01 / 01	12 / 31 / 01
FLARE1	Methane	23.785	MMSCF	1012 Btu/SCF	0	0.0006	01 / 01 / 01	12 / 31 / 01

INSTRUCTIONS

Use the *Material Throughput for Combustion Units* form to report fuel usage at all FINs that are combustion units. You may use a single form for multiple FINs. *You may mark this form “CONFIDENTIAL.”*

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **FIN:** Enter the FIN of the combustion unit for which you are reporting material usage.
4. **Fuel/Waste Name:** Enter the name of the fuel or waste burned.
5. **Quantity:** Enter the quantity of fuel or waste burned.
6. **Units:** Enter the units in which the quantity was reported in 5 above.
7. **Heat Value:** Enter the lower heating value, measured in British thermal units, of the fuel or waste burned.
8. **% Ash:** For solid fuels, enter the concentration of ash produced by the fuel, expressed as a percentage of total weight.
9. **% Sulfur:** Enter the concentration of sulfur in the fuel, expressed as a percentage of total weight.
10. **Usage Start Date:** The date on which burning of the fuel or waste began.
11. **Usage End Date:** The date on which burning of the fuel or waste ended.

Material Throughput
TCEQ Emissions Inventory 2002

SAMPLE FORM

**Storage and Loading
Facilities**

Company Name ¹ : Johnson Storage Company

TCEQ Air Account Number ² : HG6789Y

MATERIAL DETAIL

FIN ³	Material Name ⁴	Vapor Molecular Weight ⁵ (pounds/pound-mole)	Density ⁶ (pounds/gallon)	Monthly Throughput ⁷ (thousand gallons)	Total Vapor Pressure ⁸ (psia)	Average Annual Temperature ⁹ (deg Farenheit)	Usage Start Date ¹⁰	Usage End Date ¹¹
OILTANK213	Distillate Oil No 2	130.000	0.0002	536.64	0.0089	67.9125	01 / 01 / 01	12 / 31 / 01
TRUCKLOAD	Gasoline (RVP 6)	69	5.6	128.9733	4.3783	81.579	01 / 01 / 01	12 / 31 / 01
	Gasoline (RVP 7)	68	5.6	86.9786	5.2	81.579	01 / 01 / 01	12 / 31 / 01
	Gasoline (RVP 13)	62	5.6	79.8671	9.9	81.579	03 / 04 / 01	05 / 05 / 01
TANK108016	Acetone	58.08	6.628	70.1715	3.713	67.9125	01 / 01 / 01	08 / 17 / 01
	Ethyl Acrylate	100.11	7.75	53.8796	0.599	67.9125	08 / 27 / 01	12 / 31 / 01
ACETANK	Acetone	58.08	6.628	30.25	3.713	67.9125	01 / 01 / 01	06 / 30 / 01
	Acetone	58.08	6.628	70.1715	3.713	67.9125	07 / 01 / 01	08 / 15 / 01
	Acetone	58.08	6.628	30.25	3.713	67.9125	08 / 16 / 01	12 / 31 / 01

INSTRUCTIONS

Use a **Material Throughput for Storage and Loading Facilities** form to report fuel usage at all FINs that are storage or loading facilities. You may use a single form for multiple FINs. *You may mark this form “CONFIDENTIAL.”*

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **FIN:** Enter the FIN of the storage or loading facility for which you are reporting material throughput.
4. **Material Name:** Enter the name of the material for which you are reporting throughput.
5. **Vapor Molecular Weight:** Enter the vapor molecular weight, measured in pounds per pound-mole, of the material.
6. **Density:** Enter the density, measured in pounds per gallon, of the material.
7. **Monthly Throughput:** Enter the monthly throughput, measured in thousands of gallons, of the material. For operations experiencing seasonal variations or peak months, one may either compute monthly throughput by averaging annual throughput over twelve months or report the exceptional usage on a separate line. (See ACETANK entry on the sample form.)
8. **Total Vapor Pressure:** Enter the true vapor pressure, measured in psia, of the liquid at the average annual storage/loading temperature.
9. **Average Annual Temperature:** Enter the average annual temperature, in degrees Fahrenheit, at which the material is stored or loaded.
10. **Usage Start Date:** The date on which storage or loading began.
11. **Usage End Date:** The date on which storage or loading ended.

Material Throughput
TCEQ Emissions Inventory 2002

SAMPLE FORM

**Printing, Painting and
Degreasing Facilities**

Company Name ¹ : Johnson Storage Company

TCEQ Air Account Number ² : HG6789Y

MATERIAL DETAIL								
FIN ³	Material Name ⁴	Quantity ⁵	Units ⁶	Density ⁷ (pounds/gallon)	% Weight of Solvents ⁸	% Weight of Solids ⁹	Usage Start Date ¹⁰	Usage End Date ¹¹
PAINTBTH16	Basecoat	676.38	Gallons	11.78	5.62	56.59	01 / 01 / 01	12 / 31 / 01
	Glaze	2030.39	Gallons	9.23	11.02	30.53	01 / 01 / 01	12 / 31 / 01
	Texture	197.81	Gallons	15.45	2.24	94.13	01 / 01 / 01	12 / 31 / 01
	Topcoat	46.07	Gallons	8.51	8.84	33.09	01 / 01 / 01	12 / 31 / 01
PRINTSTA3C	Ink	753.1	Gallons	7.84	13.94	38.73	01 / 01 / 01	12 / 31 / 01
SOLV2	Solvent	1346.91	Gallons	0.94	100	0	01 / 01 / 01	12 / 31 / 01

INSTRUCTIONS

Use a **Material Throughput for Printing, Painting and Degreasing Facilities** form to report fuel usage at all FINs that are printing, surface coating or degreasing facilities. You may use a single form for multiple FINs. *You may mark this form "CONFIDENTIAL."*

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **FIN:** Enter the FIN of the printing, painting or degreasing facility for which you are reporting material usage.
4. **Material Name:** Enter the name of the material for which you are reporting usage.
5. **Quantity:** Enter the quantity of material used.
6. **Units:** Enter the units in which the quantity was reported in 5 above.
7. **Density:** Enter the density, measured in pounds per gallon, of the material.
8. **% Weight of Solvents:** Enter the concentration of solvents in the material, expressed as a percentage of total weight.
9. **% Weight of Solids:** Enter the concentration of solids in the material, expressed as a percentage of total weight.
10. **Usage Start Date:** The date on which usage of the material began.
11. **Usage End Date:** The date on which usage of the material ended.

Company Name ¹ : Johnson Gas Company

TCEQ Air Account Number ² : HG6788X

MATERIAL DETAIL

FIN ³	Material Name ⁴	Contaminant Code ⁵	Inlet Concentration ⁶ (ppm)	Outlet Concentration ⁷ (ppm)
POND1	toluene	52490	6.50	2.10
POND1	xylene	52510	8.59	4.18
POND1	benzene	52420	2.10	0.18
POND1	hexane	56660	1.20	0.006
POND1	crude oil	59001	4.90	4.0
POND1	maleic acid	51200	3.18	1.01
POND1	parafins	59330	0.25	0.18
POND1	ethyl benzene	52450	0.98	0.63
POND1	VOC mixture	50001	18.0	12.03
POND1	butadiene	55150	0.76	0.021

INSTRUCTIONS

Use a **Material Throughput for Wastewater Facilities** form to report fuel usage at all FINs that are wastewater facilities. You may use a single form for multiple FINs. *You may mark this form “CONFIDENTIAL.”*

1. **Company Name:** The official name of the company responsible for the account.
2. **TCEQ Air Programs Account Number:** The account number as assigned by the appropriate TCEQ Regional Office.
3. **FIN:** Enter the FIN of the wastewater facility for which you are reporting material throughput.
4. **Material Name:** Enter the name of the material for which you are reporting throughput.
5. **Contaminant Code:** Enter the contaminant code of the material.
6. **Inlet Concentration:** Enter the concentration, measured in parts per million, of the influent material.
7. **Outlet Concentration:** Enter the concentration, measured in parts per million, of the effluent material.

Chapter 5 — Updating an EIQ

This chapter provides instructions for updating an Emissions Inventory Questionnaire. Review all of the information in this book before attempting to update these forms.

Be certain to review all data on your EIQ printout for accuracy. Any items left unchanged, including emission rates, will be assumed to be correct for 2002 and will be entered into the STARS database as part of your 2002 inventory.

Updating EIQ Data

Account Information

General account information is printed at the top of the EIQ's first page. For a detailed description of the items in this section, please consult the previous chapter's instructions for completing an Account Information form.

To update or correct any of this information, notify Central Registry of the desired changes and send a copy of the notification to the IEAS.

Emissions Inventory and Account Contact Information

For a detailed description of the emissions inventory contact and account contact information, please consult the previous chapter's instructions for completing a Contact Information form.

To update this information, please complete and submit the Contact Information form (Appendix C).

Criteria Emissions Totals

This section contains three columns: Annual, Ozone, and EE/SMSS. The columns consist of six rows, each one representing a criteria pollutant. For a thorough discussion of the elements of this section, please consult the previous chapter's instructions for completing a Account Emissions form.

The printed number reflects the total submitted on the most recent inventory. In the blank to the right of that number, you should enter the total for the current inventory.

'Emissions Events' Certifying Signature

Sign after this statement if and only if you experienced and reported no emissions from emission events.

Signature of Legally Responsible Party

A complete inventory requires the signature of the individual responsible for certifying that the inventory is, to the best of her or his knowledge, accurate and complete. Fill in all of the blanks.

Facility Information

Descriptions of most of the items in this section, along with information on accepted values, may be found in the instructions for completing the relevant Facility Information form. The discussion here focuses on FIN status changes and on updating FIN groups, profiles, and characteristics.

If you need to make corrections to any of the information in this section, please do so in the blanks provided.

Status/Status Date: If you wish to change the facility's status, enter the appropriate letter and enter the date on which the status changed. Status options are:

A (ACTIVE): If the facility operated **at any time** during the year.

I (IDLE): If the facility was idle for the entire year.

S (SHUTDOWN): If the facility has been permanently shut down and will no longer operate. Please note that if the facility operated **at any time** during the EI calendar year, its status may not be changed to "S" until the following year.

D (DEMOLISHED): If the facility has been removed from the site. Please note that if the facility operated **at any time** during the EI calendar year, its status may not be changed to "D" until the following year.

N (PERMITTED BUT NEVER BUILT): Self-explanatory.

O (OWNERSHIP TRANSFERRED TO A NEW OWNER): If the facility has been sold or if responsibility for it has been transferred to another owner. Please provide the new owner's TCEQ Air Account Number, if known.

Group Type, Profile and Characteristics: If the FIN's group type or profile appears incorrect, consult the table on the following page.

STARS Group Types, Profiles and Characteristics

Group	Profile	Characteristics
Combustion	Flare	Design Capacity Assist Type (Steam, Air, or None) Service Type (Process, Emergency, or Both) Flare Stream Amount Basis
	I. C. Engine	Number of Cycles (Two or Four) Burn Type (Rich or Lean) Design Capacity <i>or</i> Engine Rating
	Boiler, Dryer, Furnace, Heater, Kiln, Oven, Turbine, Other	Design Capacity Firing Type
Cooling Tower	n/a	Design Flow Rate Draft Design Type (Natural or Mechanical) Number of Cells Sampling Schedule Sample Tested for VOCs? Sampling Data Used to Calculate Emissions?
Equipment Leak Fugitives	n/a	If you need to change a facility's group type to Equipment Leak Fugitives, complete the <i>Facility Information for Leaking Component Fugitives</i> form. Note on the form that you are submitting data for an existing FIN.
Tanks	Horizontal Fixed Roof Vertical Fixed Roof Internal Floating Roof Pressure Tank Underground Tank External Floating Roof: Double Deck, Single Seal External Floating Roof: Double Deck, Double Seal External Floating Roof: Pontoon, Single Seal External Floating Roof: Pontoon, Double Seal Domed External Floating Roof: Double Deck Domed External Floating Roof: Pontoon Other	If you need to change a facility's group type to Tanks or if you need to change a tank's profile, complete the <i>Facility Information for Storage Tanks</i> form. Note on the form that you are submitting data for an existing FIN.
Wastewater	n/a	Flow Model (Flowthrough or Disposal) Aeration (Diffused Air, Mechanical or None) Biodegradation Mechanism (Biodegradation, Activated Sludge, or None) Design Type (Surface, Subsurface, or Other) Depth Surface Area Flow Rate
Other	n/a	n/a

Control Device Information

Descriptions of the items in this section, along with information on accepted values, may be found in the instructions for completing the Abatement Device Information Form.

If you need to make corrections to any of the information in this section, please do so in the blanks provided.

Emission Point Information

Descriptions of most of the items in this section, along with information on accepted values, may be found in the previous chapter's instructions for completing the relevant Emission Point Information form.

If the EPN profile is incorrect, please complete and submit the appropriate Emission Point Information form from the previous chapter.

If you need to make corrections to any of the other information in this section, please do so in the blanks provided.

Emission Factors

In the spaces provided, give the emission factors that were used to estimate the emissions for this FIN/EPN path. In the far right column, enter the source from which the factor was taken.

Updating Reported Emissions

Detailed discussion of the items in this section may be found in the previous chapter's instructions for completing the Path Emissions form.

The printed number reflects the emission rate submitted on the most recent inventory. Enter the new rate in the space provided. If an emission rate did not change, you may simply circle the printed rate. To report emissions of a contaminant not printed on the form, simply add the contaminant below the last printed entry.

Appendix A — Technical Supplements

Technical Supplement 1: Internal and External Combustion Sources addresses common problems and concerns regarding internal combustion engines (turbines, reciprocating engines, and gasoline and diesel industrial engines); external combustion sources burning natural gas; and combined cycle turbines with heat recovery steam generators.

Technical Supplement 2: Cooling Towers will help you to determine the nature of the emissions from your cooling tower system, to identify some of the methods that may be used to quantify those emissions, and to correctly report the emissions on the annual emissions inventory.

Technical Supplement 3: Equipment Leak Fugitives discusses emissions from piping components at industrial facilities emitted as the result of leaking seals or connections.

Technical Supplement 4: Flares clarifies how elevated flare emissions should be estimated and reported.

Technical Supplement 5: Marine Emissions discusses stationary emissions from vessel cleaning, material transfer, and dockside sources such as particulate stockpiles, silos, VOC collection units, loading racks and abatement devices, which must be reported in the dock owner's emissions inventory.

Technical Supplement 1: Some Combustion Sources

Technical Disclaimer

This technical supplement is intended to help you accurately estimate and correctly report emissions from combustion sources. It does not supersede or replace any state or federal law, regulation, or rule.

Recent scientific studies have indicated a need to improve the emissions inventory estimation methods to more accurately reflect actual operations. As a first step in making these improvements, the TCEQ is providing specific estimation guidance for some combustion sources. This guidance, which reflects our current understanding of how combustion sources work and how they generate emissions, how they are monitored or tested, and what data are available for emissions estimation, may change over time as we continue our scientific studies and as new information becomes available. We welcome any data, information or feedback that may improve our understanding of combustion emissions and thereby further improve emissions inventory emission estimates.

The represented calculation methods are intended as an emissions calculation aid; alternate calculation methods may be equally acceptable if they are based upon, and adequately demonstrate, sound engineering assumptions or data. If you have a question regarding the acceptability of a given method, please contact the Industrial Emissions Assessment Section at 512-239-1773.

Introduction

This technical supplement addresses common problems and concerns regarding internal combustion engines (turbines, reciprocating engines, and gasoline and diesel industrial engines); external combustion sources burning natural gas; and combined cycle turbines with heat recovery steam generators. For more information about these sources, or for information about combustion sources not covered in this chapter, consult the appropriate TCEQ NSR guidance documents and/or AP-42.

Internal Combustion Engines

Expected Contaminants Reported engine emissions should include all of the following:

TSP	(contaminant code 10000)
PM ₁₀	(contaminant code 20000)
PM _{2.5}	(contaminant code 39999)
VOCs	(contaminant codes 50001 through 59998)
NO _x	(contaminant code 70400)
SO ₂	(contaminant code 70510)
CO	(contaminant code 90300)

Emissions Determination Methodologies The appropriate emission determination methodologies for internal combustion engines are, in order of preference:

- D** (Continuous Monitoring System or CEMs)
- F** (Predictive Monitoring System or PEMs)
- M** (Measured - Stack Test Data)
- V** (Vendor-supplied emissions factors)
- A** (AP-42 factors)

If you feel that none of these methodologies will accurately represent a source's emissions, please contact the IEAS for further assistance.

SO₂ Emissions Please note that if *any* sulfur is present in a source's inlet gas, then the source will emit sulfur dioxide as a product of combustion.

Particulate Emissions Estimating and reporting particulate emissions has caused some confusion in previous years. Please read the information in this section carefully.

Combustion sources emit particulate matter. Furthermore, particulate matter emitted from internal combustion engines is expected to have an aerodynamic diameter smaller than 2.5. Hence, all particulate emissions from these sources should be reported as TSP, PM₁₀ and PM_{2.5}.

In the past, some confusion has arisen from AP-42's representation of three particulate emission factors: PM₁₀(filterable), PM_{2.5}(filterable) and PM(condensable). These factors must be used together to accurately represent particulate emissions. To calculate particulate emissions, use the factor obtained by summing the PM₁₀(filterable) and the PM(condensable) factors. Report the emission rate thus obtained as total particulate (contaminant code 10000), as PM₁₀ (contaminant code 20000), and as PM_{2.5}.

Example: Suppose that AP-42 shows the following emission factors for particulate matter from a certain engine type:

$$PM_{10}(\text{filterable}) = 0.0095 \text{ lb/MMBtu}$$

$$PM_{2.5}(\text{filterable}) = 0.0095 \text{ lb/MMBtu}$$

$$PM(\text{condensable}) = 0.00991 \text{ lb/MMBtu}$$

Then the correct particulate emission factor for this engine type would be 0.01941 lb/MMBtu. If the engine consumed 35,000 MMBtu of fuel during the year, then its particulate emissions would be:

$$\frac{0.0194 \text{ lb}}{\text{MMBtu}} \times \frac{35,000 \text{ MMBtu}}{\text{year}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.3395 \text{ tons}$$

The correct way to report these emissions is shown in the following table:

Contaminant Code	Contaminant	Annual Emissions
10000	part - u	0.3395 tons
20000	PM ₁₀ - u	0.3395 tons
39999	total PM _{2.5}	0.3395 tons

VOC Emissions Estimating, speciating and reporting VOC emissions has caused some confusion in previous years. Please read the information in this section carefully. VOC emissions may be estimated using stack test data, vendor data, and/or AP-42 factors. Each methodology is discussed separately below, followed by speciation instructions.

Stack Test Data. When using stack test data to estimate VOC emissions, verify that the test measured VOCs rather than total hydrocarbons. If it did, then use the test data to estimate emissions; code the emissions with a determination methodology of “M”. If the test measured instead for total hydrocarbons, then you will need to adjust for this by multiplying the hydrocarbon factor by the following ratio: AP-42 VOC factor / AP-42 TOC factor. Code the emissions with a determination methodology of “S”.

Vendor Data. When using vendor data to estimate VOC emissions, verify that the factor refers to VOCs rather than total hydrocarbons. If it does, then use it to estimate emissions; code the emissions with a determination methodology of “V”. If the factor refers instead to total hydrocarbons, then you will need to adjust for this by multiplying the hydrocarbon factor by the following ratio: AP-42 VOC factor / AP-42 TOC factor. Code the emissions with a determination methodology of “S”.

AP-42 Factors. AP-42 provides both VOC and TOC factors. Because complex oxidation reactions in the combustion chamber significantly alter the emissions composition, **it is unacceptable to apply the inlet gas stream's VOC percentage to the AP-42 TOC factor to obtain a VOC emission factor.**

When using an AP-42 factor to estimate emissions, use the most recent VOC factor. Code emissions with a determination methodology of "A".

Speciation. To determine whether or not you need to speciate VOC emissions from an internal combustion engine, see *2002 Emissions Inventory Guidance*, Chapter 3.

If you have any source-specific information about the VOC emissions composition for a source, then you should use it to speciate the emissions. Supply the data and related information with your Emissions inventory.

If you do not have any source-specific information about the VOC emissions composition, then you should speciate the emissions using the AP-42 Trace Organic Compounds factors that are graded C or better. Divide each trace organic factor by AP-42's VOC factor to obtain the contaminant's speciation ratio. Multiply the source's total VOC emissions by each ratio to obtain that compound's emission rate. You need only report speciated emissions of at least 0.1 tons; smaller rates may be reported under VOC-u (contaminant code 50001). If you used stack test data or vendor data to estimate total VOC emissions, then code the speciated emissions with a determination methodology of "S" for "scientifically calculated"; the VOC-u emissions will be coded as "M" or "V". If you used an AP-42 factor to estimate total VOC emissions, then code all VOC emissions with a determination methodology of "A".

Example: Using a vendor-supplied factor, you have estimated emissions from a four-cycle lean burn compressor at 11.2 tons. You have no information about the composition of the exhaust VOCs. You do have an inlet gas analysis, but because complex oxidation reactions in the combustion chamber alter the emissions composition significantly, you know that you cannot use these data to speciate the VOC emissions. You therefore turn to AP-42.

In AP-42, you find that one of the Trace Organic Compounds factors graded C or better is for formaldehyde: 0.0528 lb/MMBtu. The total VOC emission factor in AP-42 is 0.118 lb/MMBtu. To obtain formaldehyde's speciation ratio, you divide the formaldehyde factor by the total VOC factor: $0.0528 \text{ lb per MMBtu} / 0.118 \text{ lb per MMBtu} = 0.44746$

Now you multiply the engine's total VOC emissions by this ratio to estimate the formaldehyde emissions:

$$11.2 \text{ tons VOC} * 0.44746 = 5.0115 \text{ tons formaldehyde}$$

If you perform a similar calculation for each Trace Organic Compound with a factor graded C or better, you will obtain 27 speciated emission rates. However, only eight of these exceed the 0.1 ton threshold. You should report the speciated emissions for these eight compounds and report the balance of VOC emissions under VOC-u, as shown below.

Contaminant Code	Contaminant	Annual Emissions
50001	VOC - u	0.2240 tons
51620	acetaldehyde	0.7935 tons
51640	acrolein	0.4879 tons
51680	formaldehyde	5.0115 tons
51530	methanol	0.2373 tons
56150	methylcyclohexane	0.1167 tons
56600	n-hexane	0.1054 tons
56750	n-pentane	0.2468 tons
56775	propane	3.9769 tons

External Combustion Sources Burning Natural Gas

Expected Contaminants Reported boiler emissions should include all of the following:

TSP	(contaminant code 10000)
PM ₁₀	(contaminant code 20000)
PM _{2.5}	(contaminant code 39999)
VOCs	(contaminant codes 50001 through 59998)
NO _x	(contaminant code 70400)
SO ₂	(contaminant code 70510)
CO	(contaminant code 90300)

Emissions Determination Methodologies The appropriate emission determination methodologies for boilers are, in order of preference:

- D** (Continuous Monitoring System or CEMs)
- F** (Predictive Monitoring System or PEMs)
- M** (Measured - Stack Test Data)
- V** (Vendor-supplied emissions factors)
- A** (AP-42 factors)

If you feel that none of these methodologies will accurately represent a source's emissions, please contact the IEAS for further assistance.

SO₂ Emissions Please note that if *any* sulfur is present in a source's inlet gas, then the source will emit sulfur dioxide as a product of combustion.

Particulate Emissions Estimating and reporting particulate emissions has caused some confusion in previous years. Please read the information in this section carefully.

Combustion sources emit particulate matter. Furthermore, all of the particulate matter emitted from boilers has an aerodynamic diameter smaller than 2.5. Hence, all particulate emissions from these sources should be reported as TSP, PM₁₀ and PM_{2.5}.

Please note that AP-42 provides three particulate emission factors: PM(Total), PM(Condensable), and PM(Filterable). Use the PM(Total) factor, obtained by summing the PM(Condensable) and PM(Filterable) factors, to estimate boiler particulate emissions. Report these emissions as TSP (contaminant code 10000), as PM₁₀ (contaminant code 20000), and as PM_{2.5} (contaminant code 39999).

VOC Emissions Estimating, speciating and reporting VOC emissions has caused some confusion in previous years. Please read the information in this section carefully. Emissions may be estimated using stack test data and/or AP-42 factors. Each methodology is discussed separately below, followed by speciation instructions.

Stack Test Data. When using stack test data to estimate VOC emissions, verify that the test measured VOCs rather than total hydrocarbons. If it did, then use the test data to estimate emissions; code the emissions with a determination methodology of "M". If the test measured instead for total hydrocarbons, then you will need to adjust for this by multiplying the hydrocarbon factor by the following ratio: AP-42 VOC factor / AP-42 TOC factor. Code the emissions with a determination methodology of "S".

AP-42 Factor. AP-42 provides both VOC and TOC factors. Because complex oxidation reactions in the combustion chamber significantly alter the emissions composition, **it is unacceptable to apply the inlet gas stream's VOC percentage to the AP-42 TOC factor to obtain a VOC emission factor.**

When using an AP-42 factor to estimate emissions, use the most recent factor. Code all emissions with a determination methodology of "A".

Speciation. To determine whether or not you need to speciate VOC emissions from a source, consult *2002 Emissions Inventory Guidance*, Chapter 3.

If you have any source-specific information about the VOC emissions composition for a source, then you should use it to speciate the emissions. Supply the data and related information with your emissions inventory.

If you do not have any source-specific information about the VOC emissions composition, then you should speciate the emissions using the AP-42 Speciated Organic Compounds factors for formaldehyde, toluene, and benzene. Divide each of these factors by the AP-42 VOC factor to obtain the contaminant's speciation ratio. Multiply the source's VOC emissions total by each ratio to obtain that compound's emission rate. Report the emissions balance as "alkanes-u" (contaminant code 51810). If you used stack test data to estimate total VOC emissions, then code the speciated emissions with a determination methodology of "S" for "scientifically calculated"; the VOC-u emissions will be coded as "M". If you used an AP-42 factor to estimate total VOC emissions, then code all VOC emissions with a determination methodology of "A".

Example: Using a stack test data, you have estimated VOC emissions from a boiler at 43 tons. You have no information about the composition of the exhaust VOCs. You do have an inlet gas analysis, but because complex oxidation reactions in the combustion chamber alter the emissions composition significantly, you know that you cannot use these data to speciate the VOC emissions. You therefore turn to AP-42.

In AP-42, you find that one of the Speciated Organic Compounds factors graded C or better is for formaldehyde: 0.075 lb/MMBtu. The total VOC emission factor in AP-42 is 5.5 lb/MMBtu. To obtain formaldehyde's speciation ratio, you divide the formaldehyde factor by the total VOC factor: $0.075 \text{ lb per MMBtu} / 5.5 \text{ lb per MMBtu} = 0.0136$

Now you multiply the boiler's total VOC emissions by this ratio to estimate the formaldehyde emissions:

$$43 \text{ tons VOC} * 0.0136 = 0.5864 \text{ tons formaldehyde}$$

Perform similar calculations for benzene and toluene. Report the boiler's VOC emissions as shown below.

Contaminant Code	Contaminant	Annual Emissions
50001	VOC - u	0 tons
51680	formaldehyde	0.5864 tons
51810	alkanes - u	42.3706 tons
52420	benzene	0.0164 tons
52490	toluene	0.0266 tons

Combined Cycle Turbines with Heat Recovery Steam Generators

Expected Contaminants Reported emissions from these facilities should include all of the following:

TSP	(contaminant code 10000)
PM ₁₀	(contaminant code 20000)
PM _{2.5}	(contaminant code 39999)
VOCs	(contaminant codes 50001 through 59998)
NO _x	(contaminant code 70400)
SO ₂	(contaminant code 70510)
CO	(contaminant code 90300)
NH ₃	(contaminant code 70050)

Emissions Determination Methodologies The appropriate emission determination methodologies for combined cycle turbines are, in order of preference:

- D** (Continuous Monitoring System or CEMs)
- F** Predictive Monitoring System or PEMS)
- M** (Measured - Stack Test Data)
- V** (Vendor-supplied emissions factors)
- A** (AP-42 factors)

If you feel that none of these methodologies will accurately represent a source's emissions, please contact the IEAS for further assistance.

NO_x and CO Emissions NO_x and CO emissions from these sources are typically continuously monitored. In this case, emissions reporting is straightforward. If, however, you use stack test data to estimate emissions from a combined cycle turbine equipped with a duct burner, you should have and use two data sets: one representing emissions with the duct burner on, the other representing emissions with the duct burner off. If you do not have two separate data sets, or if you are using another method to estimate emissions, then contact the IEAS for guidance.

Particulate, VOC, and SO₂ Emissions For guidance on estimating and speciating these emissions, see the first section of this supplement.

Technical Supplement 2: Cooling Towers

Technical Disclaimer

This technical supplement is intended to help you accurately estimate and correctly report cooling tower emissions. It does not supersede or replace any state or federal law, regulation, or rule.

Recent scientific studies have indicated a need to improve the emissions inventory estimation methods to more accurately reflect actual operations. As a first step in making these improvements, the TCEQ is providing specific flare emissions estimation guidance. This guidance, which reflects our current understanding of how cooling towers work and how they generate emissions, how they are monitored or tested, and what data are available for emissions estimation, may change over time as we continue our scientific studies and as new information becomes available. We welcome any data, information or feedback that may improve our understanding of cooling tower emissions and thereby further improve emissions inventory emission estimates.

The represented calculation methods are intended as an emissions calculation aid; alternate calculation methods may be equally acceptable if they are based upon, and adequately demonstrate, sound engineering assumptions or data. If you have a question regarding the acceptability of a given method, please contact the Industrial Emissions Assessment Section at 512-239-1773.

Document Purpose

This technical supplement provides recommended methods for more accurately estimating cooling tower emissions. Although we understand that the necessary information and data may not be available for this year, we will appreciate any effort to apply this guidance in your 2002 emissions inventory.

Because our regulatory control strategies for federal air quality standards are based on emissions inventory data, and because accurate data allow us to improve emissions estimates, access to the information discussed in this supplement will become increasingly important in the coming years.

Introduction

This technical supplement provides guidance on identifying, quantifying, and correctly reporting cooling tower emissions on the annual emissions inventory. It does not address devices such as fin-fan coolers and the cooling towers used exclusively in HVAC systems.

This document does not address cooling tower structural representation in the inventory. For guidance on this topic, consult *2002 Emissions Inventory Guidelines*, Chapter 2.

Definition of Terms

In this document, “cooling tower” refers to the equipment that, through the process of direct contact with atmospheric air, reduces the temperature of water used to cool either process equipment or process fluid streams. “Cooling tower heat exchange system” refers to the cooling tower and all associated heat exchangers, pumps, and ancillary equipment where water is used a cooling medium to which the heat from process fluids is transferred.

Expected Emissions

Cooling towers operate in such a manner that they may emit any particulate matter, dissolved solids, or chemicals entrained in the cooling water. Cooling tower emissions fall into three categories: particulate matter, inorganic compounds, and volatile organic compounds (VOCs). Any tower has the potential to emit all three of these emissions types in varying amounts, depending on the cooling tower’s service.

Particulate Matter Particulate emissions result from the presence of minerals or any dissolved or suspended solids in the cooling water. Air flowing through the tower can entrain water droplets and carry them out of the cooling tower in a process referred to as drift. Once these drift droplets leave the tower and evaporate, they deposit any dissolved or suspended solids as fine particulate matter (PM₁₀ or smaller).

Cooling towers are generally designed with drift eliminators, which are typically mesh or a series of angled slates placed above the water inlet. Please note that, despite its name, a drift eliminator will reduce drift but will not eliminate it.

Inorganic Compounds Inorganic emissions may result from inorganic process fluids leaking into the cooling water or from water treatment chemicals or other additives used in the cooling water system. The air flowing through the tower may strip these inorganic compounds from the water, resulting in their emission. Typical inorganic emissions may consist of chlorinated compounds, brominated compounds, or any other inorganic substance present in the cooling water.

Volatile Organic Compounds Although some VOC emissions may result from the stripping of organic water treatment chemicals, the primary sources of VOC emissions are hydrocarbon-containing process fluids leaked into the cooling water by components of the cooling tower heat exchange system. Once the hydrocarbon-contaminated cooling water reaches the tower, the VOCs either flash out of the water or are stripped out by the tower's air flow. This may result in many tons of VOC emissions.

Emission Determination

The process serviced by the cooling tower will largely determine how emissions should be estimated and reported. For each contaminant type, determination methods and special concerns are discussed below.

Particulate Matter Some manufacturers provide drift factors that may help you to estimate particulate emissions. If you use a vendor-supplied drift factor, code the associated emissions with a determination methodology of "V" for "vendor data".

If no drift data are available from the manufacturer, estimate particulate emissions using the appropriate factor from AP-42, Chapter 13. Code the associated emissions with a determination methodology of "A".

Inorganic Compounds Very little research has focused on inorganic compound emissions from cooling towers. Emissions due to water additives may be estimated based on the additive's chemical characteristics, the amount of additive used, the total cooling water volume, and a scientifically-based assumption about the percentage of additive stripped from the cooling water at the tower. Code the associated emissions with a determination methodology of "E" for "estimated".

Volatile Organic Compounds If cooling water is used to cool VOC process streams, emissions will result from process fluid leaks into the cooling water, with one exception. If the cooling water is maintained at a pressure at least 5 psi greater than the process fluid pressure throughout the entire cooling tower heat exchange system, then any leak in the heat exchanger will result in water leaking into the process fluid. For such systems, heat exchanger leaks do not generate VOC emissions from the cooling tower. For all other cooling tower heat exchange systems, where the cooling water is *not* maintained at a pressure at least 5 psi greater than the process fluid pressure throughout the entire cooling tower heat exchange system, use the following guidelines to estimate emissions.

When available, emissions estimates based on actual measured cooling water VOC concentrations and flow rate data are preferred. When using such data to estimate emissions, assume that VOCs were present at the measured concentration for the entire period between samples.

Because these methods measure the amount of pollutant contained in the cooling water rather than the amount of pollutant released to the atmosphere, the emissions are **not** to be coded with a determination methodology of “M” for “measured”. The appropriate determination methodology will depend upon whether data are gathered following an approved monitoring and control program plan on file with the TCEQ Engineering Services Team (EST). If so, you should code the associated emissions with a determination methodology of “B” for “material balance”. If not, code them with a determination methodology of “E” for “estimated”. Please note that, in the case of cooling towers, such “estimates” are still preferred to the use of AP-42 factors.

If cooling water VOC concentration is measured, but a large leak occurs between sampling events and no monitoring data are available for the period of the leak, then use the AP-42 “uncontrolled” emission factor to estimate emissions for the leak period. If you do not know when the leak began, assume that it began immediately after the previous sampling event. If the majority of annual emissions are estimated using the measured data, then code them as described in the preceding paragraph.

If VOC emissions are estimated using a factor from Section 5.1 of AP-42, the “uncontrolled” emission factor (6 lb/MMgal) must be used. According to AP-42, use of the “controlled” factor (0.7 lb/MMgal) is contingent upon the use of applicable control technology to minimize hydrocarbon leaks into the cooling water system and the monitoring of cooling water for hydrocarbons. If a monitoring system is sufficient to provide such “control”, then the associated data should be sufficiently detailed to allow for the derivation of an emission rate. If the monitoring system is insufficient to provide data for determining emissions, then the system is insufficient to provide reliable “control” and so the “uncontrolled” VOC emission factor is appropriate. If you estimate emissions in this manner, code them with a determination methodology of “A”.

Note that the information from devices such as Lower Explosive Limit detectors, chlorine residual measurements, and total carbon measurements do not qualify as adequate monitoring or control technology and therefore do not allow use of the “controlled” VOC emission factor from AP-42.

Annual and Ozone Season Rates

If measured data are available for a cooling tower, then the reported emissions should be calculated using actual, rather than average, test data. Use test data from each sampling event to determine emissions released since the prior sampling event. Sum the different sampling periods' emissions to obtain the annual total.

For example, suppose that weekly tests are performed to determine a cooling tower's VOC emission rate. Using the test results from each week and the associated water flow for the seven days preceding the sample time, one would calculate the total emissions for each seven-day period during the year, then sum these weekly emissions to arrive at the annual total.

To obtain ozone season emission rates, average over 92 days the total emissions during the months of June, July, and August.

Speciation

If samples were tested for VOCs, then use the measured data to speciate emissions. For more information on speciation requirements, see *2002 Emissions Inventory Guidance*, Chapter 3.

Supporting Documentation

You should provide documentation with your emissions inventory that supports and validates the emissions reported in the inventory. The relevant supporting documentation for cooling towers includes, but may not be limited to, representative samples of the following types of data:

- VOC test results, especially from times when leaks were discovered;
- cooling water and process fluid pressure reading data for systems that maintain cooling water at a pressure at least 5 psi greater than the process fluid pressure throughout the entire cooling tower heat exchange system;
- annual water treatment chemical usage data for all chlorinated or brominated chemicals;
- annual and daily cooling water flow rate data; and
- emission rate calculations from measured data.

Frequently Asked Questions

1. What if I share a cooling tower with another company?

The answer to this question depends upon the business decision for a site. Please call the IEAS for guidance in your particular situation.

2. Are there any circumstances under which I may use the AP-42 controlled VOC factor?

No. According to AP-42, use of the “controlled” factor (0.7 lb/MMgal) is contingent upon the use of applicable control technology to minimize hydrocarbon leaks into the cooling water system and the monitoring of cooling water for hydrocarbons. If a monitoring system is sufficient to provide such “control”, then the associated data should be sufficiently detailed to allow for the derivation of an emission rate. If the monitoring system is insufficient to provide data for determining emissions, then the system is insufficient to provide reliable “control” and so the “uncontrolled” VOC emission factor is appropriate.

3. Must I report particulate matter emissions?

Yes. While drift eliminators greatly reduce cooling tower drift, the drift droplets that do escape are so small and of such little mass that they can remain airborne for some time and travel a significant distance.

4. My cooling tower’s emissions point is currently shown as a fugitive area. Must I change this?

Yes. Your cooling tower’s emissions point should be shown as a stack. For more information, see the instructions for completing the Emissions Point Information: Stack Profile form in *2002 Emissions Inventory Guidance*.

References

Robert H. Perry, et al., *Perry's Chemical Engineers' Handbook 7th edition*, McGraw-Hill, New York, 1997.

Compilation of Air Pollutant Emission Factors, Volume I. Stationary Point and Area Sources 5th edition, AP-42, U. S. Environmental Protection Agency, Research Triangle Park, North Carolina, 1995.

Air Permits Technical Guidance for Chemical Sources: Cooling Towers, Draft RG-108.

Technical Supplement 3: Equipment Leak Fugitives

Technical Disclaimer

This technical supplement is intended to help you accurately estimate and correctly report equipment leak fugitive emissions. It does not supersede or replace any state or federal law, regulation, or rule.

Recent scientific studies have indicated a need to improve the emissions inventory estimation methods to more accurately reflect actual operations. As a first step in making these improvements, the TCEQ is providing specific equipment leak fugitive emissions estimation guidance. This guidance, which reflects our current understanding of how piping components work and how they generate emissions, how they are monitored or tested, and what data are available for emissions estimation, may change over time as we continue our scientific studies and as new information becomes available. We welcome any data, information or feedback that may improve our understanding of equipment leak fugitive emissions and thereby further improve emissions inventory emission estimates.

The represented calculation methods are intended as an emissions calculation aid; alternate calculation methods may be equally acceptable if they are based upon, and adequately demonstrate, sound engineering assumptions or data. If you have a question regarding the acceptability of a given method, please contact the Industrial Emissions Assessment Section at 512-239-1773.

Document Purpose

This technical supplement provides recommended methods for more accurately estimating equipment leak fugitive emissions. Although we understand that the necessary information and data may not be available for this year, we will appreciate any effort to apply this guidance in your 2002 emissions inventory.

Because our regulatory control strategies for federal air quality standards are based on emissions inventory data, and because accurate data allow us to improve emissions estimates, access to the information discussed in this supplement will become increasingly important in the coming years.

Introduction

This technical supplement provides guidance for identifying, estimating, and correctly reporting equipment leak fugitive emissions from piping components and associated equipment at industrial facilities. It does not address emissions from cooling towers, oil/water separators, material stockpiles, loading operations or other sources not related to piping components.

Please note that this document does not address equipment leak fugitive area structural representation in the inventory. For guidance on this topic, consult *2002 Emissions Inventory Guidelines*, Chapter 2.

Definition of Terms

In this document, the phrase “traditional component types” will refer to those component types that have traditionally been considered and reported as sources of equipment leak fugitive emissions. These sources include valves, connectors, pumps, compressor seals, relief valves, sampling connections, process drains, and open-ended lines. “Non-traditional component types” will refer to component types that have not traditionally been treated as sources of equipment leak fugitive emissions, but which recent scientific studies have identified as such. The nontraditional components are: screwed fittings, liquid relief valves, agitators, heat exchanger heads, site glasses, bolted manways/hatches, blind flanges, caps/plugs, connectors, compression fittings, and metal-to-metal seals.

Expected Emissions

Equipment leak fugitive emissions may include organic or inorganic compounds in gaseous or liquid state, depending upon the composition of the stream(s) flowing through the associated piping components.

Quantifying Equipment Leak Fugitive Emissions

Equipment leak fugitive emissions are estimated using emission factors or equations statistically developed from component- and industry-specific sampling data. Estimates may be based on correlation equations, on leak/no leak factors, or on average emission factors with or without LDAR reduction credits. The EPA document *Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017)*, and the TCEQ document *Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives* (Draft dated October, 2000) provide detailed information on all available emission factors, calculation methods, and LDAR programs.

This section provides guidance on appropriate estimation methodologies, emission factors, reduction credits, emissions inventory reporting, and special considerations to be made when estimating emissions. Specifically, the topics addressed are:

- quantifying emissions for non-traditional component types
- quantifying emissions of odorous or toxic inorganic compounds;
- quantifying emissions using average emission factors;
- quantifying emissions using average factors with emission reduction credits;
- quantifying emissions using leak / no leak factors;
- quantifying emissions using correlation equations; and
- special considerations for hours of operation and specially-designed equipment.

Quantifying Emissions for Non-Traditional Components

Please note that beginning with the 2002 emissions inventory cycle, emissions from non-traditional piping sources should be calculated and included in all emissions inventories. While these sources have not historically been included in the emissions inventory process, recent scientific studies and equipment monitoring have indicated that these sources do release emissions.

Although component-specific factors do not exist for non-traditional components, the TCEQ has identified appropriate substitute factors based on component, leak potential, and leak mechanism similarity. These factors are listed in Table 1.

To estimate this non-traditional component's emissions...	... use this factor.
Agitator	Light Liquid Pump
Blind Flange	Flange
Bolted Manway / Hatch	Flange
Cap / Plug	Flange
Compression Fitting	Flange
Connector	Flange
Heat Exchanger Head : Unmonitored Monitored	Open-Ended Line Flange without LDAR Credit
Liquid Relief Valve	Light Liquid Valve
Metal-to-Metal Seal	Flange
Screwed Fitting	Flange
Site Glass	Flange times two

Table 1. Appropriate substitute factors for non-traditional components.

Quantifying Emissions of Odorous or Toxic Inorganic

Compounds For odorous or toxic inorganic compounds like chlorine (Cl₂), ammonia (NH₃), hydrogen sulfide (H₂S), hydrogen fluoride (HF), and hydrogen cyanide (HCN), calculate uncontrolled fugitive emissions using the industry-specific factors discussed below. Although these VOC emission factors were not developed specifically for use with inorganic compounds, they are presently the best tool available for estimating inorganic fugitive emissions.

Quantifying Emissions Using Average Factors Average emission factors are divided into five categories: Synthetic Organic Chemical Manufacturing Industry (SOCMI) factors, oil and gas production operations factors, refinery factors, petroleum marketing terminal factors, and derived factors used for specific compounds. Within each category, factors vary depending upon specific component type (connectors, valves, pumps, etc.) and material in service (light liquid, heavy liquid, or gas/vapor). For components in liquid service, you may need to choose between a “heavy liquid” factor and a “light liquid” factor. Use the “heavy liquid” factor if the stream’s vapor pressure is less than or equal to 0.044 psia at 68°F. If the stream’s vapor pressure is greater than 0.044 psia at 68°F, use the appropriate “light liquid” factor.

SOCMI Factors *Table 2* Use the SOCMI factors to estimate emissions from chemical plants or chemical processes within refineries. SOCMI factors are divided into three sets: SOCMI average factors, “SOCMI with ethylene” factors, and “SOCMI without ethylene” factors.

Use the SOCMI average factors, which were developed to represent fugitive emission rates from all chemical plants, for streams containing between 11 percent and 85 percent ethylene. For streams containing more than 85 percent ethylene, use the “SOCMI with ethylene” factors. For streams containing less than 11 percent ethylene, use the “SOCMI without ethylene” factors.

Oil and Gas Production Factors *Table 3* The oil and gas production factors are based on oil and gas production equipment leak emissions data gathered by the American Petroleum Institute (API) and evaluated by the EPA. The oil and gas production factors include four different equipment service categories: gas, heavy oil (less than 20° API gravity), light oil (greater than 20° API gravity), and water / light oil (water streams in light oil service with a water content between 50 percent and 99 percent).

Note that the gas factors estimate total hydrocarbon emissions. Therefore, for gas streams only, you should multiply the calculated emission rates by the gas stream’s weight percentage of C3+ compounds to estimate total VOC emissions.

Equipment/Service	SOCMI Average ¹ Factors taken from EPA document EPA-453/R-95-017; November, 1995; pp. 2-12.	SOCMI Without C₂ ¹ TCEQ- derived factors.	SOCMI With C₂ ¹ TCEQ- derived factors.	SOCMI Non-Leaker ¹ AVO walk-through inspection required. Control credit is included in the factor; no additional control credit may be applied.
Valves: Gas/Vapor	0.0132	0.0089	0.0258	0.00029
Light Liquid	0.0089	0.0035	0.0459	0.00036
Heavy Liquid	0.0005	0.0007	0.0005	0.0005
Pumps: Light Liquid	0.0439	0.0386	0.144	0.0041
Heavy Liquid	0.019	0.0161	0.0046	0.0046
Flanges/Connectors : Gas/Vapor	0.0039	0.0029	0.0053	0.00018
Light Liquid	0.0005	0.0005	0.0052	0.00018
Heavy Liquid	0.00007	0.00007	0.00007	0.00018
Compressors	0.5027	0.5027	0.5027	0.1971
Relief Valve (Gas/Vapor)	0.2293	0.2293	0.2293	0.0986
Open-ended Lines ²	0.0038	0.004	0.0075	0.0033
Sampling Connections ³	0.033	0.033	0.033	0.033

- Notes:
1. All factors are in units of (lb/hr)/component, except for the Sampling Connections factor. See note 3 below.
 2. The 28 Series quarterly LDAR programs require open-ended lines to equipped with a cap, blind flange, plug, or a second valve. If so equipped, open-ended lines may be given a 100% control credit.
 3. Use the SOCMI Sampling Connection factor for Non-Leaker. Emission factor is in terms of (lb/hr)/sample taken.

Table 2. SOCMI Emission Factors

Equipment/ Service	Petroleum Marketing Terminal ¹	Oil and Gas Production Operations ²				Refinery ³
		Gas	Heavy Oil <20° API	Light Oil >20° API	Water/ Light Oil	
Valves		0.00992	0.0000185	0.0055	0.000216	
Gas/Vapor	0.0000287					0.059
Light Liquid	0.0000948					0.024
Heavy Liquid	0.0000948					0.00051
Pumps		0.00529	0.00113	0.02866	0.0000529	
Light Liquid	0.00119					0.251
Heavy Liquid	0.00119					0.046
Flanges/Connectors		0.00086	0.00000086	0.000243	0.00000617	0.00055
Gas/Vapor	0.000092604					
Light Liquid	0.00001762					
Heavy Liquid	0.0000176					
Compressors		0.0194	0.0000683	0.0165	0.0309	1.399
Relief Valve Gas/Vapor		0.0194	0.0000683	0.0165	0.0309	0.35
Open-ended Lines ⁴		0.00441	0.000309	0.00309	0.00055	0.0051
Sampling Connections ⁵						0.033
Connectors		0.00044	0.0000165	0.000463	0.000243	
Other ⁶		0.0194	0.0000683	0.0165	0.0309	
Gas/Vapor	0.000265					
Light/heavy Liquid	0.000287					
Process Drains		0.0194	0.0000683	0.0165	0.0309	0.07

Table 3. Petroleum Marketing Terminal, Oil and Gas Production Operations, and Refinery Factors

All factors are in units of (lb/hr)/component.

1. Control credit is included in the factor; no additional control credit may be applied to these factors. Monthly AVO inspection required.
2. Factors give the total organic compound emission rate. Multiply by the weight percent of non-methane, non-ethane organics to get the VOC emission rate.
3. Factors are taken from EPA Document EPA-453/R-95-017, November 1995, Page 2-13.
4. The 28 Series quarterly LDAR programs require open-ended lines to equipped with a cap, blind flange, plug, or a second valve. If so equipped, open-ended lines may be given a 100% control credit.
5. Emission factor for Sampling Connections is in terms of pounds per hour per sample taken.
6. For Petroleum Marketing Terminals, "Other" includes any component except fittings, pumps, and valves. For Oil & Gas Production Operations, "Other" includes diaphragms, dump arms, hatches, instruments, meters, polished rods, and vents.

Refinery Factors Table 3 Use refinery factors to estimate fugitive emissions from a refinery process. For a chemical process located within a refinery but not specifically considered a refinery process (e.g., an MTBE production unit), use the SOCFI factors rather than the refinery factors to calculate emissions.

Petroleum Marketing Terminal Factors Table 3 Use the petroleum marketing terminal factors to estimate fugitive emissions at gasoline distribution facilities that are one step removed from local gasoline stations and other end-users. Do not use these factors to estimate fugitive emissions from loading racks at chemical plants and refineries; instead, use the appropriate SOCFI or refinery factors.

Petroleum marketing terminal factor use must be accompanied by an Audio/Visual/Olfactory (AVO) program performed on a monthly basis. To claim credit for this program, you must be able to produce, upon request,

Equipment/ Service	Ethylene Oxide ¹	Phosgene ²	Butadiene ³
Valves : Gas/Vapor	0.000444	0.00000216	0.001105
Valves : Light Liquid	0.00055	0.00000199	0.00314
Pumps	0.042651	0.0000201	0.05634
Flanges/Connectors	0.000555	0.00000011	0.000307
Compressors	0.000767		0.000004
Relief Valve (Gas/vapor)	0.000165	0.0000162	0.02996
Open-ended Lines ⁴	0.001078	0.00000007	0.00012
Sampling Connections ⁵	0.000088		0.00012

Notes: All factors are in units of (lb/hr)/component.

1. Monitoring must occur at a leak definition of 500 ppmv. No additional control credit may be applied to these factors. Emission factors are from EOIC Fugitive Emission Study, Summer 1988.
2. Monitoring must occur at a leak definition of 50 ppmv. No additional control credit may be applied to these factors. Emission factors are from Phosgene Panel Study, Summer 1988.
3. Monitoring must occur at a leak definition of 100 ppmv. No additional control credit may be applied to these factors. Emission factors are from Randall, J. L., et al., Radian Corporation. *Fugitive Emissions from the 1,3-butadiene Production Industry: A Field Study*. Final Report. Prepared for the 1,3-Butadiene Panel of the Chemical Manufacturers Association. April 1989.
4. The 28 Series quarterly LDAR programs require open-ended lines to be equipped with a cap, blind flange, plug, or a second valve. If so equipped, open-ended lines may be given a 100% control credit.

Table 4. Derived Emission Factors for Ethylene Oxide, Phosgene, and Butadiene

documentation that all elements of the program are in place and were followed. Because the petroleum marketing terminal factors include the appropriate reduction credit for the AVO inspection, no additional reductions may be taken.

If a monthly AVO inspection was not performed, use the refinery factors to estimate emissions.

Derived Factors Used for Specific Compounds: Phosgene, Butadiene, and Ethylene Oxide Table 4 Use these factors to estimate fugitive emissions from components in phosgene, butadiene, or ethylene oxide service. Note that the components must be monitored as specified in the notes for Table 4.

Quantifying Emissions Using Average Factors with

Emission Reduction Credits Data indicate that the implementation of a Leak Detection and Repair (LDAR) program results in lower fugitive emission rates. The TCEQ currently recognizes five instrument-assisted LDAR programs (28M, 28RCT, 28VHP, 28MID, and 28LAER), each of which allows for different emission reduction credits for instrument-monitored components and for the physical (AVO) inspection of connectors. To estimate emissions, use average factors to calculate uncontrolled emissions; then obtain the controlled emission rate by applying the appropriate LDAR program reduction credit. Note that the amount of any reduction credit depends upon the LDAR program or equipment used, and that the credits are allowed only where the components are actually inspected and only for compounds for which the LDAR program could result in emission reductions. To claim credit for an LDAR program, you must be able to produce, upon request, documentation that all elements of the program are in place and were followed.

For components in liquid stream service, you may need to choose between a “heavy liquid” reduction credit and a “light liquid” reduction credit. Use the “heavy liquid” reduction credit if the stream’s vapor pressure is less than or equal to 0.044 psia at 68°F. If the stream’s vapor pressure is greater than 0.044 psia at 68°F, use the appropriate “light liquid” reduction credit.

The various LDAR reduction credits are outlined in Table 5. The following paragraphs discuss specific concerns associated with emission reduction credits where LDAR programs are in place.

Components Exempt from Monitoring Applying reduction credits to a set of components implies that all of those components were monitored. Some components may be exempt from monitoring requirements based on size, physical location at a facility, or low vapor pressure. Exempt components’ emissions, like those from unmonitored components, MUST

Equipment/Service	28M	28RCT	28VHP	28MID	28LAER	A/V/O ¹
Valves : Gas/Vapor	75%	97%	97%	97%	97%	97%
Light Liquid	75%	97%	97%	97%	97%	97%
Heavy Liquid ²	0% ³	0% ³	0% ³	0% ³	0% ³	97%
Pumps : Light Liquid	75%	75%	85%	93%	93%	93%
Heavy Liquid ²	0% ⁴	0% ⁴	0% ⁴	0% ⁵	0% ⁵	93%
Flanges/Connectors : Gas/Vapor ⁶	30%	30%	30%	30%	75%	97%
Light Liquid ⁶	30%	30%	30%	30%	75%	97%
Heavy Liquid	30%	30%	30%	30%	30%	97%
Compressors	75%	75%	85%	95%	95%	95%
Relief Valve (Gas/Vapor)	75%	97%	97%	97%	97%	97%
Open-ended Lines ⁷	75%	97%	97%	97%	97%	97%
Sampling Connections	75%	97%	97%	97%	97%	97%

- Notes:
1. Audio, visual, and olfactory walk-through inspections are applicable for inorganic/odorous and low vapor pressure compounds.
 2. Monitoring components in heavy liquid service is not required by any of the 28 Series LDAR programs.
 3. Valves in heavy liquid service may be given a 97% reduction credit if monitored at 500 ppmv, provided that the concentration at saturation is greater than 500 ppmv.
 4. Pumps in heavy liquid service may be given an 85% reduction credit if monitored at 2,000 ppmv, provided that the concentration at saturation is greater than 2,000 ppmv..
 5. Pumps in heavy liquid service may be given a 93% reduction credit if monitored at 500 ppmv, provided that the concentration at saturation is greater than 500 ppmv.
 6. If an applicant decides to monitor their connectors using an organic vapor analyzer (OVA) at the same leak definition as valves, then the applicable valve credit may be used instead of the 30%. If this option is chosen, the company shall continue to perform the weekly physical inspections in addition to the quarterly OVA monitoring.
 7. The 28 Series quarterly LDAR programs require open-ended lines to be equipped with a cap, blind flange, plug, or a second valve. If so equipped, open-ended lines may be given a 100% control credit.

Table 5. Leak Detection and Repair Credits

be calculated and reported. Since these components are not monitored, their associated emissions should be calculated based on average factors with no emission reduction credit. When calculating emission rates, non-accessible components and other non-monitored components must be clearly identified and separated from monitored components.

Audio/Visual/Olfactory (AVO) Walk-Through Inspection For odorous or toxic inorganic compounds, an AVO walk-through inspection may be required by TCEQ rule, commission order, or permit condition. Generally, an AVO inspection program may only be applied to inorganic compounds that cannot be monitored by instrument. In limited instances, the AVO inspection program may be applied to extremely odorous organic compounds such as mercaptans. To claim credit for this program, you must be able to produce, upon request, documentation that all elements of the program are in place and were followed.

Reduction Credit for Connector Monitoring Because connector monitoring is not usually required, emission reductions are not typically claimed for these components. However, if a connector monitoring program is in place, then the appropriate reduction credit may be claimed. In particular:

- 28CNTA, which requires annual instrument monitoring of connectors at a 500 ppmv leak detection limit, allows for a 75 percent emission reduction credit.
- 28CNTQ, which requires quarterly instrument monitoring of connectors at a 500 ppmv leak detection limit, allows for a 98 percent emission reduction credit.
- A weekly physical inspection allows for a 30 percent emission reduction credit.

To claim credit for any such program, you must be able to produce, upon request, documentation that all elements of the program are in place and were followed.

Quantifying Emissions Using Leak / No-Leak Factors The leak / no-leak factors were developed to allow emissions estimates to be based on a site-specific leak fraction rather than on a statistically developed industry average leak fraction. In this approach, components are classified according to equipment type, service type, and leak status. Then different factors are applied to leakers (components with screening values above 10,000 ppm) and non-leakers (components with screening values below 10,000 ppm). No LDAR emission reduction credits are taken with these factors because all appropriate emission reductions are accounted for in the site-specific leak fraction.

Since a component's leak status may vary from one monitoring period to another, emissions for each monitoring period should be based upon each component's leak status for that period. These period-specific emission rates should then be summed to obtain an annual emission rate. For example, if components are monitored quarterly, one should determine each component's quarterly leak status, estimate its quarterly emissions, and then sum the quarterly emission rates to obtain the component's annual emission total.

You will find the leak / no-leak factors in *Protocol for Equipment Leak Emission Estimates*.

Quantifying Emissions Using Correlation Equations

Correlation equations use an instrument-measured VOC concentration screening value to produce a component-specific emission estimate. The EPA has approved separate correlation equation sets for SOCOMI, refinery, and oil and gas components.

The TCEQ accepts the use of correlation equations for screening values between zero and 100,000 parts per million (ppm). To estimate emissions using correlation equations, you must consider each component's screening value as described below:

- For each component with a non-zero screening value, enter the screening value into the correlation to determine a mass emission rate. Sum the individual mass emission rates to determine a total leak rate. Please note that each individual screening value must be entered into the correlation to predict a component's leak rate. Averaged screening values may not be used to estimate emissions.
- For each component with a screening value of zero, please note that although the correlations predict a leak rate of zero for screening values of zero, the EPA data suggest that this prediction is incorrect. To account for screening values of zero, the EPA has established a default zero leak rate which should be applied to each component whose screening value was zero.
- For each component with a screening value above 100,000 ppm, use a default 100,000 ppm pegged leak rate. Note that if a pegged value of 10,000 ppm is indicated (e.g., a dilution probe was not used to quantify the screening value between 10,000 ppm and 100,000 ppm), then the default 100,000 ppm pegged leak rate must be used. The default 10,000 ppm pegged leak rate may not be used.

Since a component's screening concentration may vary from one monitoring period to another, emissions for each monitoring period should be based upon each component's screening concentration for that period. These period-specific emission rates should then be summed to obtain an annual emission rate. For example, if components are monitored quarterly, one should determine each component's quarterly screening value, estimate quarterly emissions, and then sum the quarterly emission rates to obtain the component's annual emission total.

Please note that when estimating a component's leak duration, it would be most conservative to assume that the component was leaking at the measured concentration for the entire monitoring period. An acceptable engineering estimate would be that the component was leaking at the measured concentration for half of the monitoring period plus the time of repair. The TCEQ must approve any other leak time estimation method prior to its use.

You will find the correlation equations in *Protocol for Equipment Leak Emission Estimates*.

Special Considerations when Quantifying Emissions It is important to keep in mind the following special considerations when estimating fugitive emissions.

Hours of Operation Fugitive emission factors are independent of process unit throughput. Because emissions occur if material is in the line, regardless of process activity or downtime, all streams should be in service for 8760 hours annually. Any exception to this service time would require that the lines be purged during process downtime.

Equipment Design Specifications Certain facility design specifications may eliminate or minimize fugitive emissions. If components are designed as described below, you may apply the stated emissions reduction credit.

Relief Valves : 100 percent control may be assumed if either of the following conditions is met

- relief valve vents are routed to an operating control device; or
- relief valves are equipped with a rupture disc and pressure sensing device (between the valve and disc) to monitor for disc integrity.

Pumps : The following pump types are designed to be “leakless” and are eligible for a 100 percent control credit:

- canned pumps
- magnetic drive pumps
- diaphragm
- pumps with double mechanical seals and the use of a barrier fluid at a higher pressure than the process fluid pressure
- pumps with double mechanical seals and that vent the barrier fluid seal pot to a control device

Valves : A 100 percent control credit may be taken for the following met

- bellows valves with bellows welded to both the bonnet and stem
- diaphragm-type valves
- seal-welded, magnetically actuated, packless, hermetically sealed control valves.

Connectors : A 100 percent control credit may be taken if the connections are welded together around their circumference so that the flanges cannot be unbolted.

Compressors : A 100 percent control credit may be taken if a compressor is designed with enclosed distance pieces and if the crankcase vents to a control device.

Double Mechanical Seals : A 75 percent control credit may be taken for any component employing double mechanical seals. Apply the appropriate monitoring credit if the seals are monitored.

Speciation

Use current gas and/or liquid analysis to speciate equipment leak fugitive emissions. For more information about speciation requirements for the emissions inventory, see *2002 Emissions Inventory Guidance*, Chapter 3.

Supporting Documentation

So that QA staff may verify reported fugitive emissions, include representative sample calculations for each fugitive area, including the following:

- a list of the components to which a 100 percent control credit has been applied with a footnote describing the specific control method; and
- a footnote describing the specific reason for a reduction credit wherever one is applied.

In addition, if a fugitive area emitted more than 5 tons during the year, please complete and submit a Leaking Component Fugitives Data form, which you will find at the end of this supplement.

Frequently Asked Questions

1. May I put the whole plant's fugitives under one FIN and EPN?

In a relatively small plant, such as a natural gas compressor station or a petroleum marketing terminal, the entire plant's fugitive emissions may be represented by one FIN/EPN path. For larger plants, however, it is generally more appropriate to report fugitive emissions under more than one FIN.

There are two main items to consider when breaking fugitive areas into multiple FINs. First, if different process areas within a plant follow different Leak Detection and Repair (LDAR) programs, each area should be represented by a separate path to avoid confusion. Second, since stream composition may differ greatly between processes and may necessitate the use of different calculation methodologies, fugitive emissions from separate processes should be reported under separate FINs. Consider, for instance, a refinery with a process area for MTBE production. Emissions estimates for the MTBE process area should use the SOCFI average emission factors or correlation equations, as they are more appropriate than the refinery factors. Separate FIN/EPN paths should represent the MTBE process area fugitives and the refinery fugitives.

2. Do I have to report emissions from components that are exempt from monitoring (such as components less than 2 inches in diameter)?

Yes. All components' emissions must be estimated and reported, regardless of monitoring exemptions based on size, physical location, or low vapor pressure. Since these components are exempt from monitoring, an average factor estimation approach will typically be used and no reduction credits from monitoring may be applied.

3. I have a unit that was shut down part of the year. Must I estimate fugitives for the entire year or just for the part of the year when the unit was operating?

Fugitive emissions should be estimated for the entire year (8760 hours) unless the unit's lines were purged during the downtime.

4. I've been using SOCFI stratified factors for my plant, but now I see that they're not part of the emission factor table. What happened to them, and should I still use them?

The SOCFI stratified factors were originally used for facilities operating under the 28MID program. You may use the SOCFI average factors with 28MID control efficiencies applied provided that the 28MID LDAR protocols are being followed.

5. I want to use the correlation equations to estimate fugitive emissions. May I get screening values for a certain percentage of components and use the average value to represent all other components?

No. If correlation equations are used, screening values must be determined for all components. If screening values are not determined for certain components, you must use a different calculation methodology.

6. I have a crude oil storage and loading facility. May I use the Bulk Terminal emission factors?

No. The Bulk Terminal factors were developed specifically for gasoline and gasoline product loading operations. For crude oil storage and loading, the Oil and Gas Production factors would be more appropriate.

7. If I want to take the valve reduction credit for my flanges, do I have to monitor all of them? How frequently should the flanges be monitored?

To take a flange reduction credit, all flanges must be monitored regardless of exemptions. You may apply the appropriate valve credit to flanges provided that the flanges are monitored quarterly and at the same leak definition as the valves. For flanges monitored annually at a 500 ppm leak detection limit, you may claim a 75 percent reduction credit.

8. I have an LDAR program. Is there any way to represent this on my emissions inventory?

Yes. For fugitive facilities with an LDAR program, add a CIN with abatement code 800. You do not need to give a control efficiency for this type of CIN.

9. How do I find out if any new fugitive factors have been developed or approved by the TCEQ?

To find out if new factors have been approved by the TCEQ, contact the IEAS help line. Please note that *Air Permits Technical Guidance for Chemical Sources: Equipment Leak Fugitives* was updated in October of 2000. While the document's guidance may have been updated, the EPA emission factors in the document (taken from *EPA-453/R-95-017*) have not changed.

10. Do I have to report emissions of non-reactive compounds?

Non-reactive compounds like methylene chloride and acetone are still considered air contaminants and should be reported. This is particularly important if a non-reactive compound has an associated allowable emission rate. Non-reactive fugitive emissions should be calculated in the same way as VOC fugitive emissions.

11. My permit does not require an LDAR program. May I still take LDAR reduction credits through a voluntary LDAR program?

Yes. As long as the monitoring frequency and leak definition of the 28M, 28MID, 28RCT, 28VHP, or 28LAER programs are followed, the applicable reduction credits may be applied. To claim credit for an LDAR program, you must be able to produce, upon request, documentation that all elements of the program are in place and were followed.

References

Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017.

Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives (Draft dated October 2000).

Fugitive Data Form TCEQ Emissions Inventory 2002

TCEQ Air Account Number : _____ FIN : _____

COMPONENT COUNTS						
	Service	Non-Monitored	Monitored			
		# components <i>(1)</i>	# components	leak definition (ppm)	# leakers <i>(2)</i>	# pegged <i>(2)</i>
Valves	Gas/Vapor					
	Light liquid					
	Heavy liquid					
	H ₂ O/Light oil <i>(4)</i>					
Pumps	Gas/Vapor					
	Light liquid					
	Heavy liquid					
	H ₂ O/Light oil <i>(4)</i>					
Flanges	Gas/Vapor					
	Light liquid					
	Heavy liquid					
	H ₂ O/Light oil <i>(4)</i>					
Open-Ended Lines	Gas/Vapor					
	Light liquid					
	Heavy liquid					
	H ₂ O/Light oil <i>(4)</i>					
Connectors	Gas/Vapor					
	Light liquid					
	Heavy liquid					
	H ₂ O/Light oil <i>(4)</i>					
Relief Valves	Gas/Vapor					
	Light liquid					
	Heavy liquid					
	H ₂ O/Light oil <i>(4)</i>					
Compressor Seals	Gas/Vapor					
	Light liquid					
	Heavy liquid					
	H ₂ O/Light oil <i>(4)</i>					
Other <i>(3)</i>	Gas/Vapor					
	Light liquid					
	Heavy liquid					
	H ₂ O/Light oil <i>(4)</i>					

(1) If an LDAR program is in place, include components exempt from monitoring in the "Non-Monitored" Column.
(2) Count each component once for each period it leaked. For example, a valve monitored quarterly and found to be leaking each time should be counted as four leakers. A similar rule applies when counting pegged components.
(3) "Other" includes compressors, process drains, diaphragms, dump arms, hatches, instruments, meters, polished rods, and vents.
(4) Oil and Gas Industry only.

VOC Percentages	Monitoring Equipment Data
Gas / vapor stream : _____ %	Calibration range : _____ to _____ ppm
Light liquid stream : _____ %	"Pegged" components' screening value : _____ ppm

Instructions for Completing the Flare Data Form

Component Counts: Enter the number of each component type (valves, flanges, etc.) in each service (gas/vapor, light liquid, etc.). Be certain to fill in all columns.

Non-Monitored # Components: For each component type, enter the number of non-monitored components in the fugitive area. If an LDAR program is in place, include components exempt from monitoring in this column.

Monitored # Components: For each component type, enter the number of monitored components in the fugitive area.

Leak Definition: For each monitored component type, enter the leak definition level measured in parts per million.

Leakers: For each monitored component type, enter the number of components that leaked at or above the leak definition threshold. Count each component once for each period during which it leaked. For example, if a valve monitored quarterly was found to be leaking each time, it should be counted as four leakers.

Pegged: For each monitored component type, enter the number of components that leaked at or above the “pegged” screening value. Count each component once for each period during which it leaked at or above the pegged rate. For example, if a valve monitored quarterly was found to be leaking above the pegged rate each time, it should be counted as four pegged valves.

VOC Percentages: Enter the average VOC percentages for the gas/vapor stream and the light liquid stream.

Monitoring Equipment Data: Entered the equipment’s screening value range and the “pegged” components’ screening value.

Technical Supplement 4: Flares

Technical Disclaimer

This technical supplement is intended to help you accurately estimate and correctly report flare emissions. It does not supersede or replace any state or federal law, regulation, or rule.

Recent scientific studies have indicated a need to improve the emissions inventory estimation methods to more accurately reflect actual operations. As a first step in making these improvements, the TCEQ is providing specific flare emissions estimation guidance. This guidance, which reflects our current understanding of how flares work and how they generate emissions, how they are monitored or tested, and what data are available for emissions estimation, may change over time as we continue our scientific studies and as new information becomes available. We welcome any data, information or feedback that may improve our understanding of flare emissions and thereby further improve emissions inventory emission estimates.

The represented calculation methods are intended as an emissions calculation aid; alternate calculation methods may be equally acceptable if they are based upon, and adequately demonstrate, sound engineering assumptions or data. If you have a question regarding the acceptability of a given method, please contact the Industrial Emissions Assessment Section at 512-239-1773.

Document Purpose

This technical supplement provides recommended methods for more accurately estimating flare emissions. Although we understand that the necessary information and data may not be available for this year, we will appreciate any effort to apply this guidance in your 2002 emissions inventory.

Because our regulatory control strategies for federal air quality standards are based on emissions inventory data, and because accurate data allow us to improve emissions estimates, access to the information discussed in this supplement will become increasingly important in the coming years.

Introduction

This technical supplement provides guidance on identifying, quantifying, and correctly reporting elevated flare emissions on the annual emissions inventory.

This document does not address flare structural representation in the inventory. For guidance on this topic, consult *2002 Emissions Inventory Guidelines*, Chapter 2.

Definition of Terms

In this document, the term “waste gas” will refer to gas streams produced in the process unit and routed to the flare for destruction. “Supplemental fuel” will refer to the gas that mixes with waste gas prior to its arrival at the flare tip, ensuring the combustibility of the total gas stream. “Flared gas” will refer to the combination of waste gas and supplemental fuel. “Pilot gas” will refer to the gas routed to the flare tip to ensure flared gas ignition

Expected Emissions

Flare emissions will include, at a minimum, nitrogen oxides (NO_x), carbon monoxide (CO), and uncombusted flared gas compounds. In addition, if the flared gas contains sulfur-bearing compounds, emissions will also include hydrogen sulfide (H₂S) and sulfur dioxide (SO₂).

Products of Combustion Products of combustion include NO_x, CO and SO₂. The heat output of both the flared gas and the pilot gas impact emission rates of NO_x and CO. Flared gas and pilot gas sulfur content determine SO₂ emissions.

Compounds from Uncombusted Flared Gas The flare’s destruction efficiency determines what fraction of the flared gas remains uncombusted. The uncombusted flared gas compounds are generally volatile organic compounds (VOCs), but may also include H₂S, CO, ammonia and other organic and inorganic compounds present in the flared gas.

Emission Determination

Generally, flare emission calculations should be consistent with *Air Permits Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers (RG-109)*. However, if actual flare operation deviates from the specific operating conditions assumed in permit guidance, then it may not be appropriate to use the guidance in *RG-109* to calculate emissions. Exceptions for actual operation will be identified below.

All flare emission calculations depend upon the flared gas flow rate and composition. Therefore, before specific emission calculations are discussed, the preferred methods for obtaining the actual flared gas flow rate and composition data will be addressed.

Flared Gas Flow Rate and Composition To obtain the most accurate emissions estimate, base your calculations on the actual flow rate and the specific composition of the gas routed to the flare. The generally preferred methods of obtaining flared gas flow rate and composition data are, in order of preference:

1. Continuous monitoring with quality assured instruments
2. Continuous monitoring with instruments that may not meet all quality assurance tests
3. Periodic testing with instruments and laboratory analytical methods
- 4-a. Engineering estimates based on detailed process evaluation
- 4-b. One time performance test conducted during the inventory year

Selection of the most accurate method may sometimes require exercising scientific judgement. For example, when using the results of a one-time performance test, the test conditions should be compared to the flare's actual operating conditions during the inventory year to determine whether the test accurately represents the flare's performance. If test conditions do not accurately model flare operation, then engineering estimates based on detailed process evaluation may provide the best data.

NO_x and CO Emissions To calculate NO_x and CO emissions, one must first know the net heating value of the flared gas. Using the actual short-term flared gas composition and flow rate data for the inventory year, calculate the net heating value of the flared gas and the total heat release for each short time period. Use these total heat release data, in conjunction with the appropriate emission factors from *Air Permits Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers (RG-109)*, to estimate NO_x and CO emissions for each time segment. Since the calculated net heating value of the gas and the assist gas type will determine the appropriate NO_x and CO emission factors from *RG-109*, you must carefully select the correct factors for each flare.

One should calculate emissions using the most accurate gas flow rate and composition data available. (See *Flared Gas Flow Rate and Composition* above for more information on preferred data.) Regardless of the data's source, code NO_x and CO emissions with a determination methodology of "A" for "TCEQ-approved factor".

Uncombusted Flared Gas Emissions Uncombusted flared gas emissions usually include VOCs and/or H₂S. Emissions calculations for these contaminants are based on flared gas flow rate, flared gas composition, and the appropriate destruction efficiency, which depends upon the actual flare operation. Flare destruction efficiency varies with flame stability, operating conditions, flare tip size and design, specific compounds being combusted, and gas composition. The EPA has determined operating limits, provided in 40 CFR 60.18, that result in stable flare flame operation. Therefore, emission estimates may vary depending on whether the criteria of 40 CFR 60.18 are satisfied.

If the flare's operation is consistent with 40 CFR 60.18, then use the appropriate destruction efficiencies provided in *Air Permits Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers (RG-109)*. Note that in order for flare operation to be considered consistent with 40 CFR 60.18, it should:

- meet the flared gas heating value and flare exit tip velocity limitations;
- be equipped with proper liquid knockout and ignition systems; and
- operate smokelessly.

If the flare's operation is not consistent with 40 CFR 60.18, then the flare is likely to be operating at or near unstable flame mode. If specific destruction efficiency data are available for the flare tip and design, compounds being combusted, gas composition, and operating conditions of the flare in question, these may be used to estimate emissions in such cases. Otherwise, it will be necessary to use the destruction efficiency described in the following paragraph.

Although only limited test data are available for flares operating with unstable flame, EPA test data indicate that destruction efficiencies generally range from 85 to 97 percent in such cases. The median destruction efficiency for the EPA data set appears to be approximately 93 percent. Although other data suggest that efficiencies may be even lower during unstable flame operations, one may assume a 93 percent destruction efficiency for flare operating conditions that do not satisfy 40 CFR 60.18.

Of course, if the flare flame is ever extinguished, one should assume no destruction for the period during which the flame was out.

Code uncombusted flared gas emissions with a determination methodology of "B" for "material balance".

SO₂ Emissions SO₂ emission calculations are based on the amount of sulfur-bearing compounds in the flared gas and on the appropriate destruction efficiency as discussed above.

For example, assume that 100 pounds per hour of flared gas, composed of 80 percent butane and 20 percent H₂S, is burned in a flare that satisfies 40 CFR 60.18. The hourly uncombusted flared gas emissions would be 1.6 pounds of butane and 0.4 pounds of H₂S. In addition, the flare creates SO₂ from the H₂S. Estimate the SO₂ emissions as follows:

$$\frac{20 \text{ lb H}_2\text{S}}{\text{hour}} \times 0.98 \times \frac{\text{lb-mole}}{34 \text{ lb H}_2\text{S}} \times \frac{64 \text{ lb SO}_2}{\text{lb-mole}} = 36.9 \text{ lb/hr SO}_2$$

Note that, as the criteria of 40 CFR 60.18 were met, a 98 percent destruction efficiency was assumed.

Code SO₂ emissions with a determination methodology of “B” for “material balance”.

Annual and Ozone Season Rates

Typically, flared gas flow rate and composition are highly variable; therefore, it is important that flare emissions calculations take this variability into consideration. In general, emission estimates should not be based on annual average conditions. Instead, calculate emissions for short time segments during which flare flow rate and composition are relatively constant, and then sum those short-term emissions to obtain the annual total. For example, if hourly flow rates and composition data are available, then calculate hourly emissions (lb/hr) and sum all hourly rates to obtain the annual total. If only weekly data are available, then calculate weekly average emissions and sum these to obtain the annual total. This calculation guidance is especially important for ozone season emission calculations. The actual short-term emissions calculated for the months of June, July, and August should be used to develop the daily average ozone season emissions.

If no flow rate or composition data are available, then engineering estimates should account for annual process variations that might affect flared gas.

Uncombusted Flared Gas Compound Speciation

Depending on the flare service, uncombusted flared gas emissions could include carbon, nitrogen, and sulfur compounds.

At this time, the composition of the uncombusted flared gas is assumed to remain unchanged. Although complex oxidation reactions in the flare flame may alter the emissions composition, no definitive method exists to identify those new compounds. Thus, emission estimates should assume no change in the composition of the uncombusted gas.

For example, consider a flared gas flow rate of 100 pounds per hour of VOC with a composition of 20 percent toluene, 60 percent xylene and 20 percent butane by weight. If the flare satisfies 40 CFR 60.18 performance criteria with this flow rate and composition, then a 98 percent destruction efficiency may be used. Based on the flow rate, composition, and destruction efficiency, total VOC emissions would be 2 pounds per hour. Since these are assumed to be 20 percent toluene, 60 percent xylene and 20 percent butane by weight, speciated VOCs would be reported as 0.4 pounds per hour toluene, 1.2 pounds per hour xylene and 0.4 pounds per hour butane.

Supporting Documentation

Estimated emissions depend heavily on a flare's destruction efficiency. Please provide the following supporting documentation with your inventory:

- sample calculations showing the basis of flare emission estimates; and
- a completed Flare Data form providing flare operating information for the times during which the year's maximum and minimum hourly flow rates occurred.

In addition, IEAS staff may request data for those times during which the flare did not satisfy 40 CFR 60.18 criteria. These data include, but may not be limited to:

- the date and time of the period;
- the flare EPN;
- waste gas and supplemental fuel flow rate in scfm;
- waste gas and supplemental fuel composition in volumetric percentages
- the Btu/scf value for each component of the waste gas and supplemental fuel
- the flare tip diameter; and
- the steam/air assist gas rate.

References

Air Permits Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, RG-109.

A report on Flare Efficiency Study, Volume 1. Prepared by Engineering Science for the Chemical Manufacturers' Association, March 1983.

Evaluation of the Efficiency of Industrial Flares: Test Results. (EPA report number 600/2-84-095) Prepared by Energy and Environmental Research Corporation for Industrial and Environmental Research Lab, May 1984.1983.

Evaluation of the Efficiency of Industrial Flares: Flare Head Design and Gas Composition. (EPA report number 600/2-85-106) Prepared by Energy and Environmental Research Corporation for the Environmental Protection Agency, September 1985.

Flare Data Form
TCEQ Emissions Inventory 2002

TCEQ Air Account Number :

Flare FIN :

Flare CIN :

Flare EPN :

Minimal Flow Data

Provide the requested information for the period during which flow rate to the flare was lowest.

Minimal Flow Rate : _____ M scf / minute

Gross Heating Value : _____ Btu/scf

Tip Velocity : _____ feet / second

Net Heating Value : _____ Btu/scf

Maximal Flow Data

Provide the requested information for the period during which flow rate to the flare was highest.

Minimal Flow Rate : _____ M scf / minute

Gross Heating Value : _____ Btu/scf

Tip Velocity : _____ feet / second

Net Heating Value : _____ Btu/scf

Technical Supplement 5: Marine Facilities

Technical Disclaimer

This technical supplement is intended to help you accurately estimate and correctly report marine facility emissions. It does not supersede or replace any state or federal law, regulation, or rule.

Recent scientific studies have indicated a need to improve the emissions inventory estimation methods to more accurately reflect actual operations. As a first step in making these improvements, the TCEQ is providing specific marine facility emissions estimation guidance. This guidance, which reflects our current understanding of how marine facilities work and how they generate emissions, how they are monitored or tested, and what data are available for emissions estimation, may change over time as we continue our scientific studies and as new information becomes available. We welcome any data, information or feedback that may improve our understanding of marine facility emissions and thereby further improve emissions inventory emission estimates.

The represented calculation methods are intended as an emissions calculation aid; alternate calculation methods may be equally acceptable if they are based upon, and adequately demonstrate, sound engineering assumptions or data. If you have a question regarding the acceptability of a given method, please contact the Industrial Emissions Assessment Section at 512-239-1773.

Document Purpose

This technical supplement provides recommended methods for more accurately estimating marine facility emissions. Although we understand that the necessary information and data may not be available for this year, we will appreciate any effort to apply this guidance in your 2002 emissions inventory.

Because our regulatory control strategies for federal air quality standards are based on emissions inventory data, and because accurate data allow us to improve emissions estimates, access to the information discussed in this supplement will become increasingly important in the coming years.

Introduction

This technical supplement provides guidance on identifying, quantifying, and correctly reporting marine facility emissions on the annual emissions inventory. Marine facility emissions must be reported as part of the annual routine emissions inventory. The onshore facilities' owner or operator does not own or operate the marine vessel itself, but does operate most of the activities resulting in vessel emissions while the vessel is docked. Therefore, the onshore facilities' owner or operator is responsible for reporting dock and dockside marine vessel emissions in the annual emission inventory. This is consistent with the longstanding approach of reporting truck loading and cleaning emissions in the truck terminal or cleaning facility owner's inventory.

There are several categories of facilities associated with marine operations, including:

- onshore process units or equipment performing a function associated with dockside marine vessels (e.g., solid material stockpiles, silos, tanks, and abatement devices)
- the dock and all of its associated equipment (e.g., conveying lines, piping, valves, pumps, hoses, and blowers); and
- dockside marine vessel loading and unloading, cleaning and degassing, and abrasive blasting and painting. (A marine vessel is considered dockside if it is in any way connected to the shore. This includes vessels connected to the dock, connected to a vessel that is connected to the dock, or connected directly to the land.)

Because onshore process units and equipment are addressed elsewhere in *2002 Emissions Inventory Guidelines*, this technical supplement addresses only dock and dockside marine vessel emissions.

This document does not address marine operations structural representation in the inventory. For guidance on this topic, consult *2002 Emissions Inventory Guidelines*, Chapter 2.

Expected Emissions

Emissions associated with the dock and the dockside marine vessels, except for emissions from marine vessel engines, should be estimated and reported in the annual emission inventory. Please note that this includes any emissions from marine vessel to marine vessel transfers (i.e., lightering or barging).

A marine facility's emissions depend on the activity performed and the material(s) handled or used.

Dock emissions may include:

- fugitive particulate matter from conveying lines; and
- fugitive VOCs from equipment leak fugitives.

Dockside marine vessel emissions may include:

- VOCs from loading or unloading liquid bulk materials;
- VOCs from loading or unloading liquified gaseous materials;

- particulate matter from loading or unloading solid bulk materials (including lightering or barging at the dock);
- VOCs from degassing and cleaning liquid vessel compartments; and
- particulate matter and VOCs from abrasive blasting and surface coating.

Emission Determination

For primary guidance on estimating marine emissions, consult the air permit draft guidance document *Dockside Vessel Emissions*. In particular, Section 2 of this document addresses each dockside activity discussed below, providing background information, specific calculation guidance, and references to other specific air permits guidance documents that may also be helpful. The following addresses the key points related to the emission inventory.

Loading/Unloading Bulk Liquid Materials Loading and unloading emissions bulk liquid materials may result in emissions at the dock and at the vessel. Dock emissions result from equipment leak fugitives, while vessel emissions result from vapor displacement during liquid loading.

Estimate dock emissions from equipment leak fugitives following the guidance in *Technical Supplement 4: Equipment Leak Fugitive Emissions*. Code the emissions with a determination methodology of “A”. Please note that equipment leak fugitives should be estimated for the entire period when VOCs are present in the dock piping.

Estimate vessel emissions from liquid material loading and unloading using the techniques in the TCEQ air permits draft guidance document *Loading Operations*. Code the associated emissions with a determination methodology of “A”.

If loading emissions are collected and abated, some emissions will escape collection and some collected emissions will escape destruction. The air permits “Loading Operations” document provides guidance on estimating uncollected emissions, which should be coded with a determination methodology of “A”. The collected emissions that escape destruction at the abatement device should be estimated using an appropriate destruction efficiency. Code these emissions with a determination methodology of “B”.

During unloading operations, the receiving storage tank’s vapor space is displaced, resulting in emissions. These emissions should be reported at the storage tank using storage tank emission calculations and following the general guidance.

Loading/Unloading Bulk Liquified Gaseous Materials

Loading and unloading liquified gasses will result in VOC emissions from dock equipment leak fugitives, and may also result in vessel emissions from gas freeing and vessel conditioning.

When liquified gaseous materials are transferred to or from a pressurized marine vessel compartment, emissions usually come only from dock piping component. For guidance on estimating these emissions, consult *Technical Supplement 4: Equipment Leak Fugitive Emissions*. Code the associated emissions with a determination methodology of “A”. Please note that equipment leak fugitive emissions should be estimated for the entire period when VOCs are present in the dock piping.

Emissions from a pressurized marine vessel compartment may result from two processes used to ensure safety and product quality: gas freeing and gas conditioning. Gas freeing is the evacuation of residual liquid (“heel”) and vapor after unloading and prior to loading a new material. Gas conditioning displaces residual nitrogen pad from the marine vessel compartment and saturates the vapor space with product vapor prior to loading. Calculate gas freeing or gas conditioning emissions using the ideal gas law and the actual pressure, concentration and vessel volume data. Since the ideal gas law is a first-order scientific principle, code the associated emissions with a determination methodology of “S” for “scientifically calculated”.

Loading/Unloading Solid Bulk Materials Emissions from solid bulk material loading and unloading result from dock fugitives and from solids entrainment during displacement of the vessel compartment air space during loading.

Material transfer methods determine where and how particulate matter is emitted. Emissions from such transfer methods as pneumatic systems, clam shell buckets, drag chains, belt conveyors, manual operations, or a combination of these methods should be estimated following the detailed guidance in the air permits document *Dockside Vessel Emissions*.

If a material type is explicitly addressed in air permits guidance, then code the associated emissions with a determination methodology of “A”. If the material type is not explicitly addressed, use the method for the most closely related material and code the emissions with a determination methodology of “E” for “estimated”.

Degassing/Cleaning Liquid Vessel Compartments Cleaning operations remove residual material from vessel compartments prior to change of service, maintenance, or repair. Depending on the vessel compartment’s condition, as many as three steps in the process may result in emissions: degassing, deheeling, and cleaning. The air permits document *Dockside Vessel Emissions* explains the emission calculation method for degassing, deheeling, and

cleaning. It also references the TCEQ document for estimating uncontrolled vessel degassing and cleaning emissions, *Tank Truck and Rail Car Cleaning (RG-106)*. Since these techniques use the ideal gas law, code the associated emissions with a determination methodology of “S” for “scientifically calculated”.

Abrasive Blasting and Surface Coating Building or repairing marine vessels and offshore platforms may involve abrasive blasting and painting operations. Abrasive blasting results in particulate matter emissions of the abrasive material and the old paint. Painting results in emissions of the VOCs that volatilize from the paint as it cures and particulate matter resulting from paint overspray. Estimate these emissions using the TCEQ documents *Abrasive Blast Cleaning (RG-169)* and *Surface Coating Operations* (Draft dated April, 2001).

Since particulate emissions from abrasive blasting are calculated based on the abrasive material usage and the emission factors in the abrasive blast cleaning guidance, code the emissions with a determination methodology of “A”.

Since VOC and particulate emissions from coatings are estimated based on the coating composition and the application equipment’s transfer efficiency, code the emissions with a determination methodology of “B” for “material balance”.

Annual and Ozone Season Emission Rates

If the same material is handled throughout the year, then use annual material throughput to determine emissions. If materials vary, estimate emissions from each individual operation using the following information:

- the amount and type of material processed;
- speciation of any VOC or particulate emissions;
- temperature, vapor pressure, molecular weight, and any other data necessary to estimate emissions.

Report the sum of these emission rates as the annual total. Do not use “average” or “typical” operations data to estimate annual emissions.

To obtain an ozone season emission rate, sum the emissions from each time segment during the ozone season and average this total over 92 days to arrive at a pounds-per-day rate.

VOC and Particulate Speciation

Speciation should follow the guidance in *2002 Emissions Inventory Guidelines*. In general:

- Emissions from bulk liquids and liquified gaseous materials loading and unloading will be VOC with a composition corresponding to that of the material loaded or unloaded.
- Vessel gas freeing and conditioning emissions will be VOC with a composition corresponding to that of the previously loaded material and/or the material being loaded.
- Solid bulk material loading emissions will be particles of the material loaded.
- Degassing and cleaning emissions will be VOCs with a composition corresponding to that of the material previously held in the vessel compartment.
- Abrasive blasting results in particulate matter emissions of the abrasive material and the old paint. Painting results in emissions of the VOCs that volatilize from the paint as it cures and particulate matter resulting from paint overspray.

Supporting Documentation

So that QA staff may verify reported emissions, include representative sample calculations with your emissions inventory submission. Provide the data used in these sample calculations, including:

- the amount and type of material processed during each operation, including the type and amount of material transferred between vessels at the docks;
- the date and time of the activity;
- temperature, vapor pressure, molecular weight, and other factors upon which emission estimates depend;
- material composition data, if the associated emissions (total or speciated) depend upon them; and
- all other information necessary to estimate emissions.

Frequently Asked Questions

1. May I omit my marine emissions from the annual inventory? Aren't these emissions accounted for in the area source inventory?

No. The area source inventory only includes emissions from ships in transit. Once a ship is docked, it is considered a stationary source. All non-engine emissions from a docked vessel should be reported in the point source inventory.

2. Since I don't own the marine vessel, why am I required to report its emissions in my inventory?

Because the marine vessel is at your site supporting your business, the associated emissions should be reported in your inventory. This is similar to the situation for truck loading or unloading inside a plant.

3. What if I share a marine loading facility with another company?

The answer to this question depends upon the business decision for a site. Please call the IEAS for guidance in your particular situation.

4. Should I report emissions generated when materials are transferred from one marine vessel to another while docked? (This is sometimes also called lightering or barging.)

Yes. All emissions from vessels at the dock should be reported by the dock owner or operator.

References

Air Permits Technical Guidance for Loading Operations

Air Permits Technical Guidance for Grain Elevators, RG-053.

Air Permits Technical Guidance for Rock Crushing Facilities, RG-058.

Air Permits fact sheet *Bulk Material Handling Emission Estimates*

Air Permits Technical Guidance for Dockside Vessel Emissions (Draft dated September, 2001), including the memorandum *Marine Unloading/Loading Particulate Emission Factors*.

Air Permits Technical Guidance for Tank Truck and Rail Car Cleaning, RG-106.

Air Permits Technical Guidance for Abrasive Blast Cleaning, RG-169.

Air Permits Technical Guidance for Surface Coating Operations (Draft dated April, 2001).

Appendix B — Forms

This appendix contains blank IEAS forms. Thorough instructions for completing the forms are available in Chapter 4.

Account Information : Provide general account information; *for new accounts only*.

Contact Information : Provide contact information; *for all accounts adding or changing contact information*.

Structural Overview : List all new paths; *for all accounts adding or changing account structure*.

Facility Information : Provide information about a new facility (FIN); *for accounts adding a new FIN to account structure*. Different forms are available for different facility types. Select the appropriate form for each new FIN, depending upon whether it is a:

- Non-Flare Combustion Unit;**
- Flare;**
- Storage Tank;**
- Cooling Tower;**
- Wastewater Facility;**
- Leaking Component Fugitives;** or
- Other.**

Abatement Device Information : Provide information about a new CIN; *for accounts adding a new CIN to account structure*.

Emission Point Information : Provide information about a new emission point (EPN); *for accounts adding a new EPN to account structure*. Different forms are available for different profile types. Select the appropriate form for each new EPN, depending upon whether it has a:

- Stack Profile;**
- Flare Profile;** or
- Fugitive Profile.**

Path Emissions : Create a new emissions path and report the new path's emissions; *for accounts adding a new emissions path to account structure*.

Account Emissions : Report total account emissions; *for new accounts only*.

Material Throughput : Report material throughput information; *for all accounts*. Different forms are available for these different facility types:

- Combustion Units;**
- Storage and Loading Facilities;**
- Printing, Painting, and Degreasing Facilities;** and
- Wastewater Facilities.**

Account Information
TCEQ Emissions Inventory 2002

Company Name :		TCEQ Air Account Number :
Company Role in Account (Select <u>one</u> .) <input type="checkbox"/> Owner <input type="checkbox"/> Operator <input type="checkbox"/> Both	Site Independently Owned? <input type="checkbox"/> Yes <input type="checkbox"/> No	Number of Employees at Site : _____

SITE INFORMATION

Site Name :	Location Description : _____	
Business Description : _____	_____	
	Near City :	County :

CENTROID GEOGRAPHICAL COORDINATES

SIC

Latitude and Longitude		O R	UTM Coordinates <i>in NAD of 1983</i>			Primary SIC : _____ Secondary SIC : _____
Latitude ____ deg ____ min ____ sec	Longitude ____ deg ____ min ____ sec		Zone	East Meters	North Meters	

SITE STATUS AND OPERATING SCHEDULE

Site Status (Please select <u>one</u> below.) <input type="checkbox"/> Planned <input type="checkbox"/> Under Construction <input type="checkbox"/> NESHAP Spraying <input type="checkbox"/> Operational <input type="checkbox"/> Temporarily Shutdown <input type="checkbox"/> NESHAP Renovation <input type="checkbox"/> Seasonal <input type="checkbox"/> Permanently Shutdown <input type="checkbox"/> NESHAP Demolition	Operating Schedule : _____ hours/day _____ days/week _____ weeks/year Total Annual Operating Time ¹⁷ : _____ hours
Seasonal Operating Percentages (NOTE: Spring % + Summer % + Autumn % + Winter % must equal 100%.) Spring : _____% Summer : _____% Autumn : _____% Winter : _____%	

Contact Information
TCEQ Emissions Inventory 2002

Company Name: _____	TCEQ Air Account Number: _____
----------------------------	---------------------------------------

EMISSIONS INVENTORY CONTACT	Title (Please select <u>one</u> below.)
Name: _____	<input type="checkbox"/> Engineer <input type="checkbox"/> Environmental Coordinator <input type="checkbox"/> Environmental Engineer <input type="checkbox"/> Plant Engineer <input type="checkbox"/> Plant Manager/Superintendent <input type="checkbox"/> E. H. & S. Coordinator <input type="checkbox"/> Special Unit Engineer <input type="checkbox"/> Technical Manager <input type="checkbox"/> Company President/CEO

Mailing Address : _____ _____ City: _____ State : _____ ZIP Code : _____ Business Address : _____ _____ City: _____ State : _____ ZIP Code : _____	Telephone Numbers and e-Mail Address Business : _____ ext : _____ Alternate Business : _____ ext : _____ Cellular : _____ Fax : _____ e-Mail Address : _____
---	---

PLANT OR SITE CONTACT	Title (Please select <u>one</u> below.)
Name: _____	<input type="checkbox"/> Plant Manager/Superintendent <input type="checkbox"/> Company President / CEO

Mailing Address : _____ _____ City: _____ State : _____ ZIP Code : _____ Business Address : _____ _____ City: _____ State : _____ ZIP Code : _____	Telephone Numbers and e-Mail Address Business : _____ ext : _____ Alternate Business : _____ ext : _____ Cellular : _____ Fax : _____ e-Mail Address : _____
---	---

Facility Information
TCEQ Emissions Inventory 2002

Non-Flare Combustion Unit

Company Name : _____ TCEQ Air Account Number : _____ Plant ID : _____

FACILITY IDENTIFICATION

FIN : _____ Facility Name: _____ SCC : _____

OPERATING SCHEDULE

Facility Status : _____ Operating Schedule Start Time : _____ Hours/Day : _____ Days/Week : _____ Weeks/Year : _____

Seasonal Operating Percentages Spring : _____ % Summer : _____ % Autumn : _____ % Winter : _____ % Annual Operating Hours : _____
 (NOTE: Spring % + Summer % + Autumn % + Winter % must equal 100%.) Percent Max Capacity : _____ %

Annual Process Rate : _____ Ozone Season Process Rate : _____

COMBUSTION DETAIL

Unit Type (Please check one box below.) Capacity : _____ MMBtu/hr
 Boiler Furnace Dryer IC Turbine IC Reciprocating: _____ -cycle, _____ -burn
 Heater Kiln Stack Incinerator Other : _____ Engine Rating : _____ hp
 Firing Type (Check one..) Front Tangential Opposed Internal Other: _____

FUNCTIONAL DESCRIPTION AND / OR COMMENTS

Facility Information
TCEQ Emissions Inventory 2002

Flare

Company Name : _____ TCEQ Air Account Number : _____ Plant ID : _____

FACILITY IDENTIFICATION

FIN : _____ Facility Name: _____ SCC : _____

OPERATING SCHEDULE

Facility Status : _____ Operating Schedule Start Time : _____ Hours/Day : _____ Days/Week : _____ Weeks/Year : _____

Seasonal Operating Percentages Spring : _____ % Summer : _____ % Autumn : _____ % Winter : _____ %
(**NOTE:** Spring % + Summer % + Autumn % + Winter % **must equal 100%.**)

Annual Operating Hours : _____

Percent Max Capacity : _____ %

Annual Process Rate : _____ Ozone Season Daily Process Rate : _____

SERVICE TYPE

ASSIST TYPE

Routine Process Upset / Maintenance Both

Steam Assisted Air Assisted Unassisted

FUNCTIONAL DESCRIPTION AND / OR COMMENTS

Facility Information
TCEQ Emissions Inventory 2002

Storage Tank

Company Name : _____ TCEQ Air Account Number : _____ Plant ID : _____

FACILITY IDENTIFICATION

FIN : _____ Facility Name: _____ SCC : _____

OPERATING SCHEDULE

Facility Status : _____ Operating Schedule Start Time : _____ Hours/Day : _____ Days/Week : _____ Weeks/Year : _____

Seasonal Operating Percentages Spring : _____ % Summer : _____ % Autumn : _____ % Winter : _____ % Annual Operating Hours : _____
(NOTE: Spring % + Summer % + Autumn % + Winter % must equal 100%.) Percent Max Capacity : _____ %

Annual Process Rate : _____ Ozone Season Daily Process Rate : _____

TANK DETAIL

Tank Type (Check one.)
 Horizontal Fixed Roof External Floating Roof: Double Deck, Single Seal Domed External Floating Roof: Double Deck
 Vertical Fixed Roof External Floating Roof: Double Deck, Double Seal Domed External Floating Roof: Pontoon
 Internal Floating Roof External Floating Roof: Pontoon, Single Seal Underground Tank
 Pressure Tank External Floating Roof: Pontoon, Double Seal Other : _____

Fill Method (Check one.)
 Submerged Splash
 Bottom

Vapor Space Ht: _____ ft

Tank Dimensions Height/Length : _____ ft Diameter : _____ ft Capacity : _____ M gallons
Shell Characteristics Construction : _____ Color/Shade : _____ Paint Condition : _____ Internal Shell Condition : _____

Roof Characteristics Color/Shade : _____ Paint Condition : _____ Slope (if cone) : _____ ft/ft Radius (if dome) : _____ ft
Breather Vent Settings Vacuum : _____ psig Pressure : _____ psig

Floating Roof Tank Construction and Rim-Seal System Primary Seal : _____ Secondary Seal : _____
Non- Self Supporting Internal Floating Roof Tank Column Information Number of Columns : _____ Effective Column Diameter (if known) : _____

Internal Floating Roof Tank Deck Characteristics Deck Type : _____ Deck Fitting Category : _____ Construction : _____ Deck Seam : _____ Deck Seam Length : _____ feet

FUNCTIONAL DESCRIPTION AND / OR COMMENTS

Facility Information
TCEQ Emissions Inventory 2002

Cooling Tower

Company Name :

TCEQ Air Account Number :

Plant ID :

FACILITY IDENTIFICATION

FIN :

Facility Name:

SCC : 38500101 (Mechanical Draft)
 38500102 (Natural Draft)

OPERATING SCHEDULE

Facility Status :

Operating Schedule Start Time : _____ Hours/Day : _____ Days/Week : _____ Weeks/Year : _____

Seasonal Operating Percentages Spring : _____% Summer : _____% Autumn : _____% Winter : _____
(**NOTE:** Spring % + Summer % + Autumn % + Winter % **must equal 100%.**)

Annual Operating Hours :

Percent Max Capacity : _____ %

Annual Process Rate :

Ozone Season Daily Process Rate :

DESIGN INFORMATION

SAMPLING DATA

Design Flow Rate : _____ Mmgal/day (maximum)

Sampling Schedule : Daily Weekly Monthly Other : _____

Draft Design Type : Natural Draft Mechanical Draft

Sampled for VOC? No
 Yes (*Describe sampling in Functional Description section.*)

Number of Cells : _____

Sampling Data Used to Calculate Emissions? No Yes

FUNCTIONAL DESCRIPTION AND / OR COMMENTS

Facility Information
TCEQ Emissions Inventory 2002

Wastewater Facility

Company Name : _____ **TCEQ Air Account Number :** _____ **Plant ID :** _____

FACILITY IDENTIFICATION

FIN : _____ **Facility Name:** _____ **SCC :** _____

OPERATING SCHEDULE

Facility Status : _____ **Operating Schedule** Start Time : _____ Hours/Day : _____ Days/Week : _____ Weeks/Year : _____

Seasonal Operating Percentages Spring : _____% Summer : _____% Autumn : _____% Winter : _____%
(**NOTE:** Spring % + Summer % + Autumn % + Winter % **must equal** 100%.) **Annual Operating Hours :** _____
Percent Max Capacity : _____%

Annual Process Rate : _____ **Ozone Season Process Rate :** _____

WASTEWATER DETAIL

Flow Model : Flowthrough Disposal **Aeration :** Diffused Air Mechanical None Depth: ___ ft Surface Area: ___ ft²

Biodegradation Mechanism : Biodegradation Activity Activated Sludge Activity None Flow Rate: _____

Device Type Surface Impoundment Subsurface Impoundment Other (specify): _____ Prestripping Performed? Yes No

COMPONENT COUNTS

Drains (p-leg seal) : _____ **Drains** (water pot seal) : _____ **Drains** (no water seal) : _____ **Dedicated sewer vents :** _____ **Manholes :** _____
Covered lift stations : _____ totaling _____ ft² **Uncovered lift stations :** _____ totaling _____ ft² **Weirs :** _____ totaling _____ ft²
Covered junction boxes : _____ totaling _____ ft² **Uncovered junction boxes :** _____ totaling _____ ft²
Covered trenches : _____ totaling _____ linear feet **Uncovered trenches :** _____ totaling _____ linear feet

FUNCTIONAL DESCRIPTION AND / OR COMMENTS

Facility Information
TCEQ Emissions Inventory 2002

Leaking Component Fugitives

Company Name : _____ TCEQ Air Account Number : _____ Plant ID : _____

FACILITY IDENTIFICATION

FIN : _____ Facility Name: _____ SCC : _____

OPERATING SCHEDULE

Facility Status : _____ Operating Schedule Start Time : _____ Hours/Day : _____ Days/Week : _____ Weeks/Year : _____

Seasonal Operating Percentages Spring : _____ % Summer : _____ % Autumn : _____ % Winter : _____
(NOTE: Spring % + Summer % + Autumn % + Winter % must equal 100%.)

Annual Process Rate : _____ Annual Operating Hours : _____
Ozone Season Daily Process Rate : _____ Percent Max Capacity : _____ %

EMISSIONS ESTIMATION METHODOLOGY (Check one. If more than one methodology is used, then create separate FINs.)

- Oil and Gas Factors
- Refinery Factors
- Petroleum Marketing Terminal Factors
- SOCMi Average Factors
- SOCMi with Ethylene Factors
- SOCMi without Ethylene Factors
- SOCMi Leak / No Leak Factors
- Correlation Equations
- Other (explain) : _____

LEAK DETECTION AND REPAIR (LDAR) PROGRAM (Check one. If more than one LDAR program is used, then create separate FINs.)

None 28M 28RCT 28VHP 28MID 28LAER

This LDAR program is (check one): Voluntary Required by Permit or Rule

FUNCTIONAL DESCRIPTION AND / OR COMMENTS

Complete the Fugitive Data form in Appendix A, Technical Supplement 4.

Facility Information
TCEQ Emissions Inventory 2002

Other

Company Name :

TCEQ Air Account Number :

Plant ID :

FACILITY IDENTIFICATION

FIN :

Facility Name:

SCC :

OPERATING SCHEDULE

Facility Status :

Operating Schedule Start Time : _____ Hours/Day : _____ Days/Week : _____ Weeks/Year : _____

Seasonal Operating Percentages Spring : _____ % Summer : _____ % Autumn : _____ % Winter : _____ %
(**NOTE:** Spring % + Summer % + Autumn % + Winter % **must equal 100%.**)

Annual Operating Hours :

Percent Max Capacity : _____ %

Annual Process Rate :

Ozone Season Daily Process Rate :

GENERATING GROUP (Check one.)

Loading Losses Other (describe) : _____

FUNCTIONAL DESCRIPTION AND / OR COMMENTS

Abatement Device Information
TCEQ Emissions Inventory 2002

You may use this one form to add up to two new CINs to your account.

Company Name :

TCEQ Air Account Number :

ABATEMENT DEVICE INFORMATION

CIN :

Control Device Name :

Abatement Code :

Number of Units :

Annual Operation
hours

Percent Time Offline
%

Inspection and Maintenance Schedule (Select one.)

Annually Biannually Quarterly Monthly Weekly Daily Hourly Continuous

CONTROL EFFICIENCY (Please check all contaminants controlled by this abatement device and enter the control efficiency in the space provided.)

Volatile Organic Compounds : _____ % Nitrogen Oxides : _____ % Carbon Monoxide : _____ % Sulfur Dioxide : _____ %
 Inorganic Compounds : _____ % Total Suspended Particulates : _____ % PM 10 (particulates less than 10 microns in diameter) : _____ %

ABATEMENT DEVICE INFORMATION

CIN :

Control Device Name :

Abatement Code :

Number of Units :

Annual Operation
hours

Percent Time Offline
%

Inspection and Maintenance Schedule (Select one.)

Annually Biannually Quarterly Monthly Weekly Daily Hourly Continuous

CONTROL EFFICIENCY (Please check all contaminants controlled by this abatement device and enter the control efficiency in the space provided.)

Volatile Organic Compounds : _____ % Nitrogen Oxides : _____ % Carbon Monoxide : _____ % Sulfur Dioxide : _____ %
 Inorganic Compounds : _____ % Total Suspended Particulates : _____ % PM 10 (particulates less than 10 microns in diameter) : _____ %

Emission Point Information
TCEQ Emissions Inventory 2002

Stack Profile

Company Name :	TCEQ Air Account Number :
-----------------------	----------------------------------

EMISSION POINT IDENTIFICATION

EPN :	Point Name :
--------------	---------------------

GEOGRAPHICAL COORDINATES *Fill in ONE section below.*

Latitude and Longitude		O R	UTM Coordinates <i>in NAD of 1983</i>	
Lat : ____ deg ____ min ____ sec	Long : ____ deg ____ min ____ sec		Zone ____	E _____ meters

STACK PROFILE

Diameter : ____ feet	Height : ____ feet	Velocity : ____ feet / second
Temperature: ____ degrees Fahrenheit	Moisture: ____ %	Horizontal Discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No

NOTES

Cooling Tower (Natural Draft or Mechanical Draft)
<p>Diameter = diameter of tower top (natural draft); of fan (mechanical draft); or of one fan (multicell tower)</p> <p>Height = tower height</p> <p>Velocity = air exit velocity at tower top (natural draft); or velocity of the fan-propelled air under normal operating conditions (mechanical draft); or velocity of one fan (multicell tower)</p> <p>Temperature = air temperature at tower top (if unknown, assume 10-15^o warmer than ambient temperature)</p> <p>Moisture = NOT zero; generally 5-10 %; you may wish to use a psychometric chart</p> <p>Horizontal Discharge? = "no," except possibly for crossflow towers</p>

Tank with No Abatement Device
<p>Diameter = 3 feet</p> <p>Height = tank height</p> <p>Velocity = 0.01 feet / second</p> <p>Temperature = average ambient temperature at the account's location <i>(do NOT enter the word "ambient")</i></p>

Emission Point Information
TCEQ Emissions Inventory 2002

Flare Profile

Company Name :	TCEQ Air Account Number :
----------------	---------------------------

EMISSION POINT IDENTIFICATION

EPN :	Point Name :
-------	--------------

GEOGRAPHICAL COORDINATES *Fill in one section below.*

Latitude and Longitude		O R	UTM Coordinates <i>in NAD of 1983</i>		
Lat : ____ deg ____ min ____ sec	Long : ____ deg ____ min ____ sec		Zone ____	E _____ meters	N _____ meters

FLARE PROFILE

Height : _____ feet	Inside Tip Diameter : _____ feet	Number of Pilots : _____	Adiabatic Flame Temp : _____ °F
Average Flow Rate : _____ Mscf / minute	Low Heating Value : _____ Btu / scf	Molecular Weight : _____ lb / lb- mole	

FLOW DETERMINATION
(Check the ONE that describes how volumetric flow to the flare is determined.)

<input type="checkbox"/> Continuous Measurement (by a flow meter at the flare header)	<input type="checkbox"/> One-time performance test	<input type="checkbox"/> Engineering Estimate
---	--	---

COMPOSITION DETERMINATION
(Check the ONE that describes how flared gas composition is determined.)

<input type="checkbox"/> Continuous Measurement	<input type="checkbox"/> Periodic Testing	<input type="checkbox"/> One-time performance test	<input type="checkbox"/> Engineering Estimate
---	---	--	---

Be certain to complete and submit a Flare Data form. You will find this form in Appendix A, Technical Supplement 3.

Account Emissions
TCEQ Emissions Inventory 2002

Company Name :

TCEQ Air Account Number :

REPORT TOTAL EMISSIONS FOR THIS ACCOUNT

CONTAMINANT	ANNUAL (tons/year)	OZONE (pounds/day)	EE/SMSS (tons/year)
Volatile Organic Compounds			
Nitrogen Oxides			
Sulfur Dioxide			
Carbon Monoxide			
Lead			
PM ₁₀			

EE/SMSS CERTIFICATION

Pursuant to Texas Health and Safety Code 382.0215(f) I do hereby certify that no emissions events were experienced at this account during the emissions inventory reporting calendar year. *(Sign here if and only if you reported no emissions from emission events.)*

Signature: _____

SIGNATURE OF LEGALLY RESPONSIBLE PARTY

I do hereby certify that information reported in this inventory is true, accurate, and fully represents the emissions that occurred during the emissions inventory reporting calendar year.

Signature : _____ Printed Name : _____

Title : _____ Date : _____

Appendix C — Sample Letters

The following sample letters, offered for guidance and general reference only, demonstrate the information required for prompt handling of accounts that

- do not meet the applicability requirements of Rule 101.10;
- have experienced an insignificant emissions change; or
- are not expected to meet the applicability requirements of Rule 101.10 in future years and that the company therefore wishes to have removed from the IEAS mailing list.

Inapplicability Notification

Mr. Paul W. Henry, P.E., Manager
Industrial Emissions Assessment Section
Texas Commission on Environmental Quality
P. O. Box 13087 MC-166
Austin, Texas 78711-3087

Re: Emissions Inventory for the 2002 Texas Commission on Environmental Quality (TCEQ)
Air Program Account Number _____

Dear Mr. Henry:

Pursuant to Section 382.014 of the Texas Clean Air Act and 30 Texas Administrative Code (TAC) § 101.10, the TCEQ has requested that a 2002 Air Emission Inventory be submitted for my plant site. Upon reviewing the applicability requirements as presented in 30 TAC § 101.10, I do not believe that the requirements apply to my account.

The following table lists the total actual emissions and the potential to emit (PTE), both in tons per year (TPY), for all criteria and hazardous air pollutants (HAPs). The values in the table are representative of the calendar year 2002 operations at this plant site.

Plant wide Emissions Totals (TPY)

Pollutant	VOC	NO _x	CO	SO ₂	PM ₁₀	Any Individual HAP	Aggregate HAPs
PTE							
Actual							

Upon request from the IEAS, I am prepared to submit supporting documentation. This may include, but may not be limited to, representative sample calculations; stack test results; copies of continuous emissions monitoring system reports; and copies of applicable permit maximum allowable emission rate tables (MAERTs) or, for sources not listed on any MAERT, the calculations used in PTE determination.

If you have questions concerning the determination of this account's status or the calculation methodologies employed to make this determination, please contact me via telephone at _____ or via e-mail at _____.

Sincerely,

Insignificant Change Notification

Mr. Paul W. Henry P.E., Manager
Industrial Emissions Assessment Section
Texas Commission on Environmental Quality
P. O. Box 13087 MC-166
Austin, Texas 78711-3087

Re: 2002 Emissions Inventory TCEQ Air Program Account Number _____ .

Dear Mr. Henry:

Pursuant to Section 382.014 of the Texas Clean Air Act and 30 Texas Administrative Code (TAC) § 101.10, the TCEQ has requested that a 2002 Air Emission Inventory be submitted for my account. The purpose of this letter is to inform the TCEQ that this account has not undergone operational or process changes to produce a significant change in actual emission rates for any one of the six criteria pollutants. Annual emission totals for VOCs, NO_x, CO, SO₂, Pb, and PM₁₀ are each within 5 percent or five tons of the most recently reported annual total, as detailed in 30 TAC § 101.10 (b) (2) (A).

Please note that (*check one*):

- because my account experienced no emissions due to emission events and/or scheduled maintenance, startup and shutdown activities (EE/SMSS), I am submitting:
 - the signed emissions inventory questionnaire cover page; and
 - the signed EE/SMSS statement.
- because my account did experience emissions due to emission events and/or scheduled maintenance, startup and shutdown activities (EE/SMSS), I am submitting:
 - the entire original emissions inventory questionnaire with only EE/SMSS numbers updated; and
 - the signed emissions inventory questionnaire cover page.

Upon request from the IEAS, I am prepared to submit supporting documentation. This may include, but may not be limited to, representative sample calculations, stack test results, and copies of continuous emissions monitoring system reports.

If you have questions concerning the determination of this account's status or the calculation methodologies employed to make this determination, please contact me via telephone at _____ or via e-mail at _____.

Sincerely,

Mail List Removal Request

Mr. Paul W. Henry P.E., Manager
Industrial Emissions Assessment Section
Texas Commission on Environmental Quality
P. O. Box 13087 MC-166
Austin, Texas 78711-3087

Re: TCEQ Air Program Account Number _____
Emissions Inventory Calendar Year 2002
Company Name _____
Site Name _____

The referenced account's actual and potential emissions fell below the reporting threshold of 30 Texas Administrative Code (TAC) §101.10 for the referenced emissions inventory reporting calendar year. Furthermore, my company believes that this account will fail to meet current rule applicability requirements in future years. I therefore request that this account be removed from the Industrial Emissions Assessment Section's annual emissions inventory mailing list.

I understand that:

- if the referenced account meets the reporting requirements of 30 TAC §101.10 in the future, then it is my company's responsibility to submit an annual emissions inventory update; and
- if emission fees apply to the referenced account, then future fees may be assessed based on the account's most recently submitted emissions data on file with the Industrial Emissions Assessment Section (IEAS).

Owner or Owner's Authorized

Representative
(print) _____

Title
(print) _____

Signature _____

Date
Signed _____

Note: If your account's current emissions as shown in the State of Texas Air Reporting System (STARS) database exceed rule applicability requirements, you must submit a current emissions inventory showing an emissions reduction below the applicability requirements of 30 TAC §101.10. The IEAS will review the submitted information and update the emissions data in STARS. If, after this is done, the referenced account no longer meets the rule applicability requirements, then the IEAS will remove the account from the annual emissions inventory mailing list.

Appendix D — EPA and TCEQ Resources

This appendix includes information about some helpful EPA and TCEQ resources.

EPA Resources

Air CHIEF The EPA's Clearing House for Inventories and Emission Factors (CHIEF) contains the most up-to-date emissions information and factors, including most of the tools listed below. CHIEF is available online at www.epa.gov/ttn/chief/ The CD-ROM (Version 9.0) is available by calling the Info CHIEF Help Desk at (919)541-1000, or by sending an email to info.chief@epa.gov

AP-42 (5th Ed., Vol. 1, January 1995, Supplements A-F) AP-42 is discussed in the Emissions Estimation chapter of this document. It is included in Air CHIEF.

FIRE (Factor Information RETrieval (FIRE) Data System (Version 6.23) is a database containing EPA's recommended emission estimation factors for criteria and hazardous air pollutants. FIRE is available online at www.epa.gov/ttnchie1/software/fire/index.html

TANKS is a Windows-based computer software program that estimates volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions from storage tanks. TANKS, which is based on the emission estimation procedures from Chapter 7 of AP-42, is available online at www.epa.gov/ttnchie1/software/tanks/index.html

To learn more about CHIEF, you can visit their Web site, contact their Help Desk at (919)541-1000, or write to:

Info CHIEF
Emission Factor and Inventory Group (MD-14)
U. S. Environmental Protection Agency
Research Triangle Park, NC 27711

The EPA's Green Book (Nonattainment Areas for Criteria Pollutants) provides up-to-date information on non-attainment status. The Green Book is available online at <http://www.epa.gov/oar/oaqps/greenbk/>

Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017) may be downloaded from the EPA Web site at www.epa.gov/ttn/chief/publications.html

TCEQ Resources

2002 Forms and Instructions: www.tnrcc.state.tx.us/air/aqp/psei.html#tools

Tools for Completing the EI: www.tnrcc.state.tx.us/air/aqp/psei.html#tools

EI Account Mailing Status: www.tnrcc.state.tx.us/air/aqp/psei.html#tracking

Air Permits Guidance Documents (may be helpful for estimating emissions):
www.tnrcc.state.tx.us/permitting/airperm/nsr_permits/guidedoc.htm

IEAS Help Line: 512.239.1773

Appendix E — Small Business Information

The Small Business Policy encourages small businesses to comply with TCEQ. This appendix contains information that will help you determine whether yours qualifies for small business assistance for emissions inventory purposes. It also includes a form that small businesses may use to request help with understand how Rule 101.10 applies and how to estimate emissions.

Application for Small Business Emissions Inventory Assistance

Please print or type

If your business:

- has 100 or fewer full time employees;
- is independently owned and operated;
- is a first time reporter of emissions inventory or has completed past inventories in good faith; and
- owns or operates the account for which the E.I. is due, then you may request help with your emissions inventory by completing this form.

Company Name : _____

TCEQ Air Account Number : _____

Business Type : _____

Site Location : _____

Contact Person & Title : _____

Telephone Number : (_____) _____ – _____ Number of Employees at Site : _____

An independently owned and operated company is self-operated, managed and owned, and is not a subsidiary or controlled by a corporation with multiple holdings. Is this business independently owned and operated? _____

Please describe, as accurately as possible, the type of assistance that you require.

Notes: If emissions at your account meet or exceed the reporting thresholds described in Chapter 1 of this book, you must submit an emissions inventory. You will be required to supply emission rates and other required data in the approved format. You must meet all applicable deadlines for emissions reporting.

If you do not have the data necessary to determine whether emissions at your account meet or exceed the reporting thresholds, or if you need clarification of the requirements or information about the reporting format, contact the IEAS at 512/239-1773.

Return this form to: Emissions Inventory Data, MC 166
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, Texas 78711-3087

Appendix F — Checklist

This list is intended to assist you in ensuring that you have provided at least the minimal information required so that the IEAS may adequately review your emissions inventory.

You are not required to submit this form to the IEAS.

2002 EMISSIONS INVENTORY COMPLETION CHECKLIST

*The following list is intended to assist you in ensuring that you have provided at least the minimal information required so that the IEAS may adequately review your emissions inventory.
You are not required to submit this form to the IEAS.*

Account Number: _____ **Company:** _____

- 1) Are all required signatures provided?
- 2) Are you returning all EIQ pages?
- 3) Did the contact information change? If so, are you submitting a completed Contact Information form?
- 4) If the file includes additions, did you submit complete information using the appropriate add forms?
- 5) Did you review all SCCs? Did you correct any erroneous SCCs?
- 6) Did you review the operating schedule? Did you correct any incorrect data on the EIQ?
- 7) Did you identify zero UTM coordinates and non-zero UTM outliers? Did you correct all incorrect coordinates on the EIQ?
- 8) Did you review all EPN parameters? Did you correct any incorrect parameters on the EIQ?
- 9) Cooling Towers: Are you submitting all data requested in Technical Supplement 2: Cooling Towers?
- 10) Flares: Are you submitting a Flare Data form for each flare in the account? (This form may be found in Technical Supplement 3: Flares.)
- 11) Fugitive Areas: Are you submitting a Fugitive Data form for each fugitive area emitting more than five tons? (This form may be found in Technical Supplement 4: Equipment Leak Fugitives.)
- 12) Are speciation requirements met? (See *2002 Emissions Inventory Guidance*, Chapter 3.)
- 13) Are tank emissions speciated?
- 14) Have you included thorough supporting documentation for all NO_x sources emitting more than 100 tons and for all VOC sources emitting more than 25 tons?
- 15) Do the front page totals indicate any large increases or decreases? Did you explain these in your cover letter?
- 16) Do front-page seasonal percentages add up to 100%?
- 17) Do the seasonal operating percentages for each FIN add up to 100%?
- 18) Is all Facility Status information correct? Is there a date for "S," "D," or "O"?
- 19) Is all Facility Parameter Information accurate and correct?
- 20) Did you supply all necessary sample calculations and supporting documentation?
- 21) Did you supply representative material data for tanks, loading, and material balance calculations?
- 22) Did you use acceptable emissions factors?
- 23) Are you submitting vendor data, stack test results, and/or CEMS data?
- 24) For control devices, are abatement efficiencies accurate? Are all relevant data present, including I/M?
- 25) Were all emissions reported at the appropriate link?
- 26) Are all determination methodologies correct?
- 27) Is the overall account structure representative of actual operations?
- 28) Have you included Plot Plans and/or Process Flow Diagrams?

Glossary

The definitions provided in this glossary are intended to assist you in understanding matters related to the annual emissions inventory. The information provided here does not supersede or replace any information in any state or federal law, regulation, or rule. In the case of any discrepancy between information provided here and information provided in a state or federal law, regulation, or rule, the information in the law, regulation, or rule takes precedence.

Abatement Device — A piece of equipment or recognized operational procedure that serves to limit, control, or abate emissions of certain contaminants associated with a process or processes. Examples include baghouses, flares, scrubbers, condensers, vapor recovery units and component fugitive Inspection and Maintenance programs. Synonymous with Control Device.

Account — (See 30 TAC 101.1) For those sources required to be permitted under Chapter 122 of 30 TAC (relating to Federal Operating Permits), all sources which are aggregated as a site. For all other sources, any combination of sources under common ownership or control and located on one or more contiguous properties, or properties contiguous except for intervening roads, railroads, rights-of-way, waterways, or similar divisions.

Account Structure — The way in which an account's equipment is represented in the emissions inventory.

Attainment County — Any county not classified as either “nonattainment” or “near-nonattainment.” (See Near Nonattainment County and Nonattainment County below.)

Chemical Abstract Service (CAS) Number — A unique number assigned to a substance. Although the IEAS identifies each substance with a Contaminant Code rather than with its CAS number, you should include the CAS number when adding a new contaminant to your emissions inventory. This additional information will be used for quality assurance purposes.

CIN — See “Control Identification Number”.

Compounds of Interest — A group of 12 VOCs that are of particular interest for airshed modeling purposes. The compounds of interest are: propylene, ethylene, formaldehyde, acetaldehyde, isoprene, all butenes (butylenes), 1,3-butadiene, toluene, all pentenes, all trimethylbenzenes, all xylenes, and all ethyltoluenes.

Contaminant — A substance emitted into the air.

Contaminant Code — A contaminant's five-digit identifying code. A list of contaminant codes is available in *Contaminant and Abatement Codes for the Air Emissions Inventory*.

Control Device — See Abatement Device above.

Control Identification Number (CIN) — A label that uniquely identifies an abatement device; limited to 10 alphanumeric characters. Please note that no two separate abatement devices within an account may share the same CIN.

Emissions — Air contaminants generated by a facility. See also Contaminant above.

Emissions Inventory Forms — The forms used to add new structural information to an account or to supply material usage data. Blank forms are available in Appendix B of this document. Instructions for completing the forms are found in Chapter 4.

Emissions Inventory Questionnaire (EIQ) — A computer printout showing an account's most recent emissions inventory records; used to submit data to the IEAS. For information about making changes to the EIQ, see Chapter 4.

Emission Point — The geographical location (point) at which emissions enter the air. An emission point is described by its group, profile and characteristics. Each emission point in the emissions inventory is uniquely identified by an Emission Point Number (EPN).

Emissions Point Number (EPN) — A label that uniquely identifies a given emission point; limited to 10 characters. Please note that no two distinct emission points in an account may share the same EPN. If your account is permitted, the EPNs on your EIQ must match those on your permit.

EPN — See "Emission Point Number".

Facility — A unit, device, structure or area capable of generating air contaminants. Each facility in the emission inventory is uniquely named by a facility identification number (FIN). For purposes of the emissions inventory for the State of Texas, the term "facility" does not refer to the entire account, but rather to an individual process unit in the account.

Facility Identification Number (FIN) — A label that uniquely identifies a given facility; limited to 10 alphanumeric characters. Please note that no two distinct facilities may share the same FIN. If your account is permitted, the FINs on your EIQ must match those on your permit.

FIN — See “Facility Identification Number”.

Hazardous Air Pollutant (HAP) — An air pollutant designated a “HAP” by the EPA. All HAPs should be listed individually (speciated) in your emissions inventory.

Near Nonattainment County — Any county included in the following list: Bastrop, Bexar, Caldwell, Comal, Ellis, Gregg, Guadalupe, Harrison, Hays, Henderson, Hood, Hunt, Johnson, Kaufman, Nueces, Parker, Rockwall, Rusk, San Patricio, Smith, Travis, Upshur, Victoria, Williamson, and Wilson.

Nonattainment County — A county where air pollution levels persistently exceed National Ambient Air Quality Standards. For information on a county’s nonattainment status, consult the EPA’s Green Book.

Nonreactive Organic Compounds — A group of organic compounds that do not significantly contribute to ozone formation.

Path — Formerly known as a link, a path consists of a facility (FIN) that generates emissions; an associated emission point (EPN) where emissions enter the atmosphere; and any abatement devices (CINs) with which emissions are controlled. All paths must consist of at least a FIN and an EPN. If emissions produced at a FIN are not abated before entering the atmosphere at the associated EPN, then the path consists only of a FIN and an EPN. If, however, an abatement device controls emissions between the FIN and the EPN, then the associated path consists of a FIN a CIN and an EPN.

Potential To Emit — The maximum capacity of a facility/stationary source to emit a pollutant under its physical and operational design. Any physical or enforceable operational limitation on the capacity of the facility/ stationary source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, should be treated as part of its design only if the limitation or the effect it would have on emissions is federally enforceable. Secondary emissions, as defined in 40 CFR 51.165(a)(1)(viii), do not count in determining a stationary source’s potential to emit.

Regulated Pollutant — This term shall include any VOC; any pollutant subject to the Federal Clean Air Act (FCAA), §111; any pollutant listed as a hazardous air pollutant under FCAA, §112; each pollutant for which a national primary ambient air quality standard has been promulgated (including carbon monoxide); and any other air pollutant subject to requirements under commission rules, regulations, permits, orders of the commission, or court orders.

Speciation — Categorization of the individual chemical substances, or species, within an emission. For speciation requirements, see Chapter 3.

STARS (State of Texas Air Reporting System) — The database in which emissions inventory data are stored.

Structure — The representation, in the TNRCC database, of the paths (formerly “links”) in an account. Correct account structure, which should reflect the account processes as shown on the site process flow diagram, is essential. For more information on proper account structure, consult the appropriate sections of this book.

Volatile Organic Compounds (VOCs) — A group of compounds that photochemically react in the atmosphere to form ozone. The official definition of a VOC as found in 30 TAC §101.1 is:

“Any compound of carbon or mixture of carbon compounds excluding methane; ethane; 1,1,1-trichloroethane (methyl chloroform); methylene chloride (dichloromethane); perchloroethylene (tetrachloroethylene); trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (HCFC-22); trifluoromethane (HFC-23); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113); 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114); chloropentafluoroethane (CFC-115); 1,1,1-trifluoro-2,2-dichloroethane (HCFC-123); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124); pentafluoroethane (HFC-125); 1,1,2,2-tetrafluoroethane (HFC-134); 1,1,1,2-tetrafluoroethane (HFC-134a); 1,1-dichloro-1-fluoroethane (HCFC-141b); 1-chloro-1,1-difluoroethane (HCFC-142b); 1,1,1-trifluoroethane (HFC-143a); 1,1-difluoroethane (HFC-152a); parachlorobenzotrifluoride (PCBTF); cyclic, branched, or linear completely methylated siloxanes; acetone; 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca); 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb); 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee); difluoromethane (HFC-32); ethylfluoride (HFC-161); 1,1,1,3,3,3-hexafluoropropane (HFC-236fa); 1,1,2,2,3-pentafluoropropane (HFC-245ca); 1,1,2,3,3-pentafluoropropane (HFC-245ea); 1,1,1,2,3-pentafluoropropane (HFC-245eb); 1,1,1,3,3-pentafluoropropane (HFC-245fa); 1,1,1,2,3,3-hexafluoropropane (HFC-236ea); 1,1,1,3,3-pentafluorobutane (HFC-365mfc); chlorofluoromethane (HCFC-31); 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a); 1-chloro-1-fluoroethane (HCFC-151a); 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxybutane;

2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane; 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane; 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane; methyl acetate; carbon monoxide; carbon dioxide; carbonic acid; metallic carbides or carbonates; ammonium carbonate; and perfluorocarbon compounds which fall into these classes:

- (A) cyclic, branched, or linear, completely fluorinated alkanes;
- (B) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
- (C) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
- (D) sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.”

Contacting the IEAS

Emissions Inventory Mailing Addresses

It is essential that you send your emissions inventory to the correct address. *Failure to do so may delay or prevent delivery of your letter or package.*

Send correspondence via the United States Postal Service (e.g., Overnight Mail, Priority Mail, Certified Mail) to:

Emissions Inventory Data, MC 166
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, Texas 78711-3087

Send correspondence via special overnight carrier (e.g., Airborne, Federal Express, United Parcel Service) to:

Emissions Inventory Data, MC 166
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. E., Third Floor
Austin, Texas 78753

Staff Mailing Addresses

To send mail to a particular IEAS staff member, please use the appropriate address from above, replacing “Emissions Inventory Data, MC166” by: “*Staff Member’s Name*, MC 164.”

IEAS Help Line

For general questions concerning forms or emissions calculation methodology, call the IEAS Help Line at (512) 239-1773.