TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Emissions Inventory: Rule Applicability and What's New?

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Presented to the 2020 Emissions Inventory Workshop
January 30, 2020

Overview

- 30 Texas Administrative Code (TAC) Section 101.10
- Applicability
- Emissions inventory (EI) types
- EI Guidelines updates, clarifications, and reminders
- Fee Rules
  - 30 TAC Section 101.24
  - 30 TAC Section 101.27

30 TAC Section 101.10

EI rule organization

(a) Applicability
(b) Types of inventories
(c) Calculations
(d) Certifying statements
(e) Reporting requirements
(f) Enforcement

Applicability Requirements: Who Needs to Submit an EI?

Need to know:

- **Potential to emit (PTE)** and **actual** emissions for regulated pollutants
- Site location and attainment status of county

Applicability Requirements: Who Needs to Submit an EI? (cont.)

- Any account defined as a major stationary source under 30 TAC Section 116.12
- 30 TAC Section 116.12 also establishes:
  - **PTE** thresholds
  - major source classifications based on the attainment status of county

Applicability Requirements: Who Needs to Submit an EI? (cont.)

- Any account located in an ozone nonattainment area **emitting** 10 tons per year (tpy) or more of volatile organic compounds (VOC), 25 tpy or more of nitrogen oxides (NO_X), or 100 tpy or more of any other contaminant subject to National Ambient Air Quality Standards
- Any account that **emits** 0.5 tpy or more of lead (Pb)
- Any account that **emits** or has the **PTE** 100 tpy or more of any contaminant except for greenhouse gases

Applicability Requirements: Who Needs to Submit an EI? (cont.)

- Any account that **emits** or has the **PTE** 10 tons of any single hazardous air pollutant (HAP) or 25 tons of aggregate HAPs as defined in Federal Clean Air Act, Section 112(a)(1)
- Any source of emissions subject to special inventories under 30 TAC Section 101.10(b)(3)

Reclassification Notice

NEW

- The following counties have been reclassified as **serious** nonattainment under the 2008 ozone standard:
  - 10-county Dallas-Fort Worth (DFW) area
    Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise
  - Eight-county Houston-Galveston-Brazoria (HGB) area
    Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller
- The PTE major source thresholds for these counties have *decreased* from 100 tpy to **50 tpy**.

Affects EI reporting requirements!

Summary of Reporting Year (RY) 2019 Thresholds

RY 2019 Emissions Inventory Reporting Requirements

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

Note: For ozone nonattainment areas, the more stringent or severe classification (where applicable) is used to determine reporting requirements for ozone precursor potential emissions.

County	VOC		NO_x		Other		Individual HAP		Aggregated HAP	
CLASSIFICATION/POLLUTANT	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential
Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller **SERIOUS/OZONE**	10	50	25	50	100	100	10	10	25	25
Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, Wise **SERIOUS/OZONE**	10	50	25	50	100	100	10	10	25	25
Bexar **MARGINAL/OZONE**	10	100	25	100	100	100	10	10	25	25
See county listing** SPECIAL INVENTORY REPORTING THRESHOLDS FOR OZONE PRECURSORS	10	100	25	100	100	100	10	10	25	25
All Other Counties	100	100	100	100	100	100	10	10	25	25
Statewide	**Lead (Pb) Actual**				**Lead (Pb) Potential**					
REPORTING THRESHOLDS FOR LEAD (All counties)	0.5				10					

Applicability Requirements: Example

- Important: If an account (site) meets any of the EI reporting requirements at any time during the calendar year, an updated EI is due.
- Remember, regardless of authorization type or status, this includes:
  - **actual** emissions and/or
  - **potential** emissions.
- Scenario:

  An operational major source voided the site's applicable permits in June 2019.
  - The site met 30 TAC Section 101.10 **PTE** reporting thresholds.
  - The site must submit a 2019 EI.
  - The 2020 EI may not be required if none of the 30 TAC Section 101.10 reporting requirements are met.

Applicability Summary: Things To Know

- What is the attainment status of the county where the site is located?
- What are the site's **actual** emissions for regulated pollutants and HAPs (single and aggregate)?
- What are the site's **PTE** limits for regulated pollutants and HAPs (single and aggregate)?

EI Types

- Initial
- Annual update
- Special

Initial EI

- Sites that have never submitted an inventory
- Required to be submitted through the State of Texas Environmental Electronic Reporting System (STEERS) Annual Emissions Inventory Reporting Web-based system
- *2019 Emissions Inventory Guidelines* (RG-360/19)
  - Chapter 2: "Creating an Initial Emissions Inventory"
  - Chapter 5: "Example Initial Emissions Inventory"
- Due by March 31st

Annual EI Update

- Required every year the reporting criteria are met
- Guidance for annual update
  - *2019 Emissions Inventory Guidelines*, Chapter 6: "Updating an Emissions Inventory Questionnaire"
  - Point Source EI webpage: "Emissions Inventory Checklist"
- Due March 31st unless otherwise directed in writing by the Texas Commission on Environmental Quality (TCEQ)

Special EI

- Special EI reporting requirements only apply to regulated entities that receive a written request from the TCEQ.
- Respond to the letter even if the site does not meet reporting thresholds.
- The current special EI applies to regulated entities that **emitted** at least 10 tpy of VOC or 25 tpy of NO_X emissions during normal operation and that are located in one of the specified counties.

Special EI (cont.)

2019 RY special EI counties for ozone precursors (NO_X and VOC):

Bastrop	**Gregg**	**Henderson**	**Orange**	**Upshur**
Bell	**Guadalupe**	**Hood**	**Rusk**	**Victoria**
Caldwell	**Hardin**	**Jefferson**	**San Patricio**	**Williamson**
Comal	**Harrison**	**McLennan**	**Smith**	**Wilson**
El Paso	**Hays**	**Nueces**	**Travis**	

Inapplicability Notification Letter

- If you receive a notification letter from the TCEQ but the site does not meet any of the reporting thresholds in 30 TAC Section 101.10 or special inventory requirements, a certifying letter instead of a full EI update is acceptable.
- A sample letter is provided in the *2019 Emissions Inventory Guidelines* in Appendix B, or a similarly worded letter can be provided.
- No option currently exists to submit through the web.
- The sample letter provides two options:
  - remain on the mailing list or
  - remove from the mailing list.

Inapplicability Notification Letter (cont.)

- To be removed from the mailing list, submit the inapplicability notification letter with the 'removal from the mailing list' option checked or a similarly worded letter.
- If the last reported emissions in the State of Texas Air Reporting System (STARS) database **exceed** the applicability requirements, a current updated EI with calculations must also be submitted to be **removed** from the mailing list.

Insignificant Change Notification Letter

If changes in emissions for **each** pollutant do not exceed 5% or 5 tpy, whichever is greater, a letter can be submitted.

- The changes can be either increases or decreases.
- The 5% or 5 tpy criteria are based upon 2019 emissions compared to the most recently submitted EI entered into the STARS database.
- If a letter is submitted several years in a row, the EI may need to be updated if the change for a pollutant exceeded 5% or 5 tpy from last submitted EI.
- The emissions from the last submitted EI are copied to current year.
- Sample letter provided in *2019 Emissions Inventory Guidelines*, Appendix B.

Insignificant Change Notification Letter (cont.)

In addition to the Insignificant Change Notification Letter, the following must be provided:

- account information and EI contact information on page 2 of the Emission Inventory Questionnaire (EIQ);
- criteria emissions totals and site quantifiable event totals on page 3 of the EIQ;
- signature of the legally responsible party on page 4 of the EIQ; and
- updates to information about emissions events and/or scheduled maintenance, startup, and shutdown activities (EE/SMSS).
  - If the site experienced EE/SMSS, then provide EE/SMSS updates on the applicable paths emissions pages of the EIQ.
  - If the site experienced no EE, then the EE certification statement on page 4 of the EIQ must be signed.

Who's Responsible and When Is the EI Due?

- The owner or operator of the site at the time the inventory is due is responsible for submitting the EI.
- The due date for sites that submitted an EI the previous year is March 31st unless otherwise directed in writing by the TCEQ.
- The due date for sites that did not submit an EI the previous year but are applicable to reporting requirements is March 31st.

Revising EI Emissions Data

- When is a revision necessary?
  When it's necessary to correct EI emissions previously reported in error.
- When submitting revisions, do not use new methodology or data retroactively.
  For example, if an engine were stack tested in calendar year 2019; those test results can be used starting with the 2019 EI but not for the 2018 EI or any prior years.

Revising EI Emissions Data (cont.)

Inventory Year Revision Requested	Can the revisions be entered in STARS? (subject to TCEQ review and approval)
2019	Yes
2018	Yes
2017	Case-by-case
2016	Case-by-case
2015	Case-by-case
2014 and prior	No. Filed only and noted in the STARS tracking system.

Revising EI Emissions Data (cont.)

- What should be included with the emissions inventory revision request?
  - Signed cover letter describing the nature and reason for the revisions
  - Revised applicable EIQ pages
  - Updated criteria emissions total for the site (found on page 3 of the EIQ)
  - Detailed calculations and supporting documentation for the revised emissions
- All company-initiated revisions requests are subject to the TCEQ's review and approval.

Revising EI Emissions Data (cont.)

- When revising EI emissions, provide notice to other parts of the agency that are impacted by the revisions.
- For example, if a company is submitting EI revisions and is subject to the emissions fee, provide notice to the Air Fees program by submitting a revised fee form or by contacting a fee staff member.

EI Guidance Updates, Clarifications, and Reminders

- The EI due date for RY 2019 is **Tuesday, March 31, 2020.**
- **Reminder**: Inapplicability letters, insignificant change notification letters, and pre-approved paper submissions must be postmarked by the due date.

EI Guidance Updates, Clarifications, and Reminders (cont.)

- **Update:** Chapter 1

  The 10-county DFW and eight-county HGB areas were reclassified as serious nonattainment for the 2008 ozone standard.

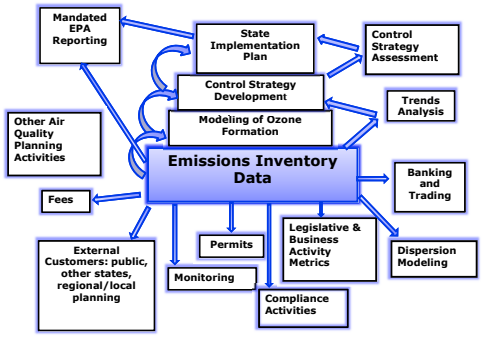
- **Clarification:** Chapter 6
  - For combustion sources, total heat value should include all fuels, including waste gases, liquids, and solids.
  - Emission Point Number profiles cannot be updated in STEERS; use the appropriate add forms.

EI Guidance Updates, Clarifications, and Reminders (cont.)

- **Clarifications:** Technical Supplement 3
  Two questions added regarding how to report fugitive emissions with a weekly physical inspection program in place.

- **Update:** Appendix C
  Updated to include EI mailing address, Emissions Assessment Section (EAS) staff mailing addresses, EAS helpline number, and EAS webpage.

Using EI Data



Two Annual Fees

- The agency assesses two annual air fees.
  - Air Inspection Fee: per 30 TAC Section 101.24
  - Air Emissions Fee: per 30 TAC Section 101.27

- Fees are assessed each fiscal year (FY).
  - The fees FY starts in Sept of one year and ends in Aug the following year.
    Currently in FY20 (Sept 2019-Aug 2020)
  - If operated any time during the fiscal year, the full fee is due.
  - If subject to both fees, only the higher of the two will be assessed.

Air Inspection Fee

Per 30 TAC Section 101.24, a regulated entity operating under one or more of the applicable standard industrial classification (SIC) codes listed in 30 TAC Section 101.24(f) shall be assessed an inspection fee.

- There are **78** specific SIC codes listed.
- If applicable to more than one SIC code, the higher fee SIC code shall be reported and paid.

Air Emissions Fee

- Per 30 TAC Section 101.27, the owner or operator of an account (site) that is required to obtain a federal operating permit as described in 30 TAC Chapter 122 (relating to Federal Operating Permits Program) shall remit to the commission an emissions fee each year.
- These sites are referred to as Title V (TV) sites.

Air Emissions Fee (cont.)

- A site can report the site-level allowable emissions rates **or** actual emissions of all regulated pollutants from all individual emissions points or process units at the site.
  - Include all regulated pollutants as per rule 30 TAC Section 101.27(3).
- Allowable emissions rates are the **PTE** for the site.
  - Add SMSS and EE if any occurred at your site

Air Emissions Fee (cont.)

Actual emissions are calendar-year emissions associated with authorized routine activities, SMSS, and EE.

- Only emissions from a complete and verifiable EI should be submitted.
- This is not the "emissions inventory fee."

Fee Basis Form

- If a site meets any of the fees reporting requirements at any time during the FY, an updated fee basis form must be submitted.
  - The fee basis form is the method used to report information for both air fees.
- Fee basis form should include applicable SIC code, applicable TV emissions (**PTE** or **actual**), and regulated entity information.
- Note: Fee forms and fee schedules are available at: https://www.tceq.texas.gov/airquality/point-source-ei/air-fees.html

Fees Timeline

March 31st: EIs are due (**EI emissions**)

April 1st: Mail Emissions/Inspection fee notification packets

Report applicable SIC code and/or applicable TV emissions (**PTE** or **actual**)

June 1st: Fee basis forms are due (**Fee emissions**)

September: Determine fee rate

November: Invoices mailed; and due at the end of the month

Air Fees: Things to Remember

- Violations for non-submittal fee basis forms will be issued.
- For delinquent accounts:
  - Interest and penalties will accrue on a monthly basis.
  - Permit applications will not be declared administratively complete until all fees/penalties have been paid in full.
- When submitting EI revisions (annual, SMSS, and/or EE), submit a revised fee basis form.

Do I Meet Rule Requirements?

Rule Applicability	Inspection Fee Rule 30 TAC Section 101.24	Emissions Fee Rule 30 TAC Section 101.27
Non-TV site	May be applicable (check the list of 78 SIC codes)	**Not** applicable
TV site	May be applicable (check the list of 78 SIC codes)	**Applicable**

Questions?

Carmen Pedraza:
(512) 239-1008
carmen.pedraza@tceq.texas.gov

Air Fees webpage:
http://www.tceq.texas.gov/airquality/point-source-ei/air-fees.html

EAS helpline:
(512) 239-1773
psinvent@tceq.texas.gov

Point Source EI webpage:
www.tceq.texas.gov/goto/ieas

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Emissions Inventory Fundamentals

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Presented to the 2020 Emissions Inventory Workshop
January 30, 2020

Overview: Part 1 Structure

- Basic Emissions Inventory (EI) structure
- When to add sources
- Shutting down a facility versus deactivating a path
- What can and cannot be updated in the State of Texas Electronic Emissions Reporting System (STEERS)
- Adding an abatement device
- Representing combustive abatement devices

Overview: Part 2 Emissions Determination and Reporting

- Using the best available data
  - Stack tests / portable analyzer
  - Models
- Permit factors
- Speciation
  - Hazardous air pollutants (HAPs)
  - Volatile organic compounds (VOCs)
- Ozone season calculations

Part 1: Structure

Basic EI Structure

- **Structure** is the relationship of emissions sources, emissions points, abatement devices, and related emissions data.
- **Facility** is a stationary source capable of generating emissions.
  - **FIN**: Facility identification number is an alphanumeric label for the facility.
  - For EI purposes, FINs are assigned a **group and profile** based on the type of source.

    Example: Flare should have group/profile of combustion/flare with various characteristics provided about that flare.

Basic EI Structure (cont.)

Emission Point is the physical location where emissions are released into the atmosphere.

- **EPN:** Emission point number is an alphanumeric label for the emissions point.
- For EI purposes, EPNs have either **stack, fugitive, or flare profiles.**

  Example: Engine stack should have profile of stack with various characteristics provided about that stack.

Basic EI Structure (cont.)

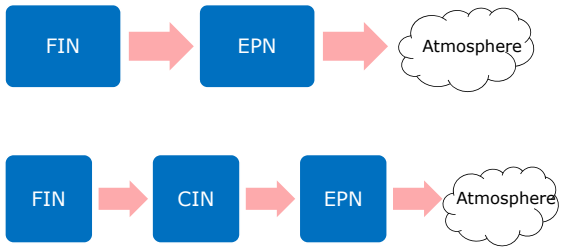
- **Abatement Device** is a device or activity used to control emissions.
  - **CIN:** Control identification number is an alphanumeric label for the abatement device.
  - For EI purposes, CINs are assigned a specific abatement code to define the type of control device.

    Example: The flare abatement code for Flares-Waste Gas, Elevated >30 feet, smokeless is "512".

- **Emission Path** is the route a pollutant takes from its origin, through its abatement device (if applicable), to its release into the atmosphere.

  Path is the association of one FIN, any applicable CIN(s), and one EPN.

Basic EI Structure (cont.)



When to Add Sources

Each emissions source must be added with associated emissions if it meets any of the following criteria:

- It emits 1 ton or more of any regulated pollutant.
- It emits 0.1 ton or more of any toxic chemical or HAP.
- It emits 0.001 ton or more of mercury (Hg) or lead (Pb), or any individual HAP or aggregate HAPs listed in any Texas Commission on Environmental Quality (TCEQ)-enforceable document such as a permit, regulation, or commission order.
- It is separately identified in any TCEQ-enforceable document such as a permit, regulation, or commission order.

Note: "TCEQ-enforceable document" includes permits by rule that have federally enforceable emissions limits.

When to Add Sources (cont.)

- Small emissions sources must be reported in the EI if the sum of the emissions meets or exceeds 5 tons of any regulated pollutant or 1 ton of aggregate HAPs.
- These sources may be added individually or as a group.

When to Add Sources (cont.)

Small emissions sources can be grouped as a collective source if they meet all of the following criteria:
• Have similar source classification codes (SCC).
• Each emitted < 1 ton of each regulated pollutant.
• Each emitted < 0.1 ton of any toxic chemical or HAP.
• Each emitted < 0.001 ton of Hg or Pb.
Note: If small sources or small facilities are grouped in the regulated entity's air permits, group these sources as collective FINs in a similar manner when adding them to the EI.

When to Add Sources (cont.)

- Do not use existing structure to add brand new sources.
- Create new structure (FIN, EPN, or CIN) for new equipment.

Shutting Down a FIN

The FIN is no longer operating and will never operate again.

- If the equipment still exists, then change the FIN status to shut down **(S)** with an effective date.
- If the equipment has been completely removed from the site, then change the FIN status to demolished **(D)** with an effective date.
- If the equipment is only temporarily shut down, change the FIN status to idle **(I)**.

Deactivating a Path

The FIN is still operating, but the emissions will no longer vent through the current emissions point.

Example: A tank was vented to the atmosphere but was routed to a flare half-way through the year.

- Create a new path FIN: TANK / CIN: FLARE / EPN: FLARE.
- Deactivate the old path FIN: TANK / EPN: TANK.

Shutting Down a FIN Versus Deactivating a Path

- If the FIN was active at any time during the reporting year, the FIN status must be marked as active **(A)**, and emissions must be reported.
- If a path will be deactivated part-way through the year, emissions during the operational period should be reported at that path.
- If a FIN is shut down or a path is deactivated for the entire year, the emissions should be set to zero.

What Can & Can't Be Updated in STEERS

Can update or add:

- Contact information (available to update year-round)
- Emissions
- Methodology codes
- Facility, emission point, and control device attributes
- Coordinates
- Facility operating schedules and status
- New sources and emissions paths

What Can & Can't Be Updated in STEERS (cont.)

- Cannot update:
  - Facility, emission point, and control device labels and names (ex: FIN & FIN name)
  - Standard industrial classification (SIC) and SCC
  - Group / profile
  - Historical emissions data
- Cannot delete existing sources or structure
- Cannot deactivate paths

Path Deactivation Form

Path Deactivation Request
TCEQ Emissions Inventory Year ___

TCEQ Air Emissions Inventory

Page ___ of ___ Path Deactivation Request pages

Company Name:[1]	Site Name:[2]	TCEQ Air Account Number:[3]	RN:[4]

PATH DEACTIVATION REQUEST LIST

Facility Identification Number (FIN)[5]	Emission Point Number (EPN)[6]	Control Identification Number (CIN)[7]	Path Deactivation Date[8] (MM/DD/YYYY)

PATH COMMENTS: REASON(S) FOR PATH DEACTIVATION REQUEST(S)[9]

Adding an Abatement Device

- Include all abatement devices at the appropriate paths.
- If the emissions are still routed to the original emission point, add the CIN to the existing path.
  Example: catalytic oxidizer on an engine
- If the emissions are routed to a different emission point, create a new path (FIN / new CIN / new EPN) and deactivate the original path, if appropriate.
  Example: tank routed to a flare

Representing Combustive Abatement Devices

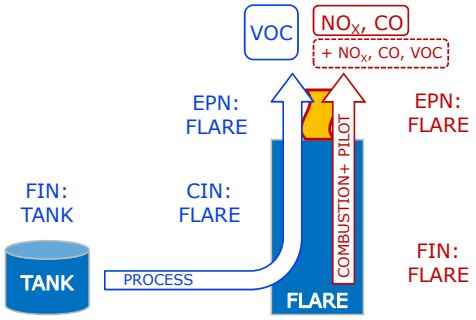
- Devices that generate emissions while burning contaminants
- Examples: flares, thermal oxidizers, vapor combustors, etc.
- Represent as an emissions source and an abatement device

Representing Combustive Abatement Devices (cont.)

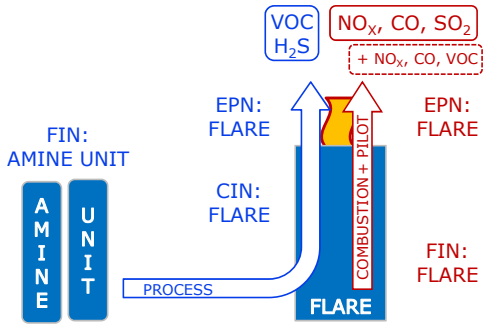
There should be a <u>minimum of two paths</u> in the inventory.

1. **Process path(s)** for reporting undestroyed emissions from the controlled source(s).
   - Common contaminants: VOC or hydrogen sulfide (H_2S)
   - FIN: SOURCE / CIN: FLARE / EPN: FLARE
   - Potential for multiple process paths
2. **Combustion path** for reporting pilot and secondary combustion emissions.
   - Products of combustion: nitrogen oxides (NO_X), carbon monoxide (CO), and sulfur dioxide (SO_2)
   - Contaminants from pilot (minimal): NO_X, CO, SO_2, and VOC
   - FIN: FLARE / EPN: FLARE

Representing Combustive Abatement Devices (cont.)



Representing Combustive Abatement Devices (cont.)



Part 2: Emissions Determination and Reporting

Using the Best Available Data

General Ranking for Emissions Determination Methods (in Descending Order):	
D	Continuous emissions monitoring systems (CEMS)*
H	Highly reactive volatile organic compounds monitoring systems
F	Predictive emissions monitoring systems
M	Measured data (stack sampling data)
Q	Portable-analyzer measurement data
V	Vendor-supplied emissions factors
A	AP-42 and other factors approved by the United States Environmental Protection Agency or TCEQ
B	Material Balance
S	Scientific Calculation
E	Estimation
O	Other

*Note: if properly operated and calibrated CEMS data is available, it must be used to determine emissions per 30 Texas Administrative Code Section 101.10(c).

Using the Best Available Data: Stack Tests / Portable Analyzer

- Use the most recent data.
  (current EI year or before)
- The data must be representative of current operations.
- Do NOT use a lesser preferred method if old test data is available and is still representative of current operations!
  (ex: AP-42 factors)

Using the Best Available Data: Models

Any model is only as good as its inputted data.

- Site-specific inputs are always preferred over default or outdated values.
- Sometimes representative data can be used if certain criteria (found in source-specific TCEQ guidance) are met.

Using the Best Available Data: Models (cont.)

When is an extended gas or liquid analysis necessary?

Examples include:

- Gas Research Institute's GLYCalc software program for glycol dehydrators (taken at inlet to dehydration process)
- American Petroleum Institute Exploration and Production TANK software program for vertical fixed roof tanks
- Gas/oil ratio method for flash emissions from tanks
- When VOC percentage by weight is needed in calculations

Permit Factors

- Do not list a permit as a factor's source. Provide the origin of the factor.
- Sometimes the emissions factor used to obtain a permit should <u>not</u> be used in the EI. Examples include:
  - Permitted emissions are based on outdated emissions factors.
  - CEMS installed or stack testing was conducted after the permit was issued.
  - The permit no longer reflects the conditions of actual operations.

Speciation: Hazardous Air Pollutants

- Report emissions of any HAP ≥ 0.1 tons per year (tpy) at an emissions path.
  This includes all kinds of HAPs, not just VOC.
- Report emissions of Hg and Pb ≥ 0.001 tpy at a path.
- Benzene is a high-profile compound. It is often present in:
  - Upstream oil and gas operations, especially uncontrolled glycol dehydration operations;
  - Gasoline and mid-range distillates; and
  - Loading and cleaning.

Speciation: VOC

- Contaminant code 50001, VOC-unclassified (VOC-u), represents all VOC components that have not been speciated.

  (Total VOC) minus (all speciated VOC) = VOC-u

- Example:
  - An engine emits 5 tpy of VOC, and 1 ton of that total is formaldehyde.
  - Report 1 tpy formaldehyde and 4 tpy VOC-u.

- VOC-u is <u>not</u> total VOC.

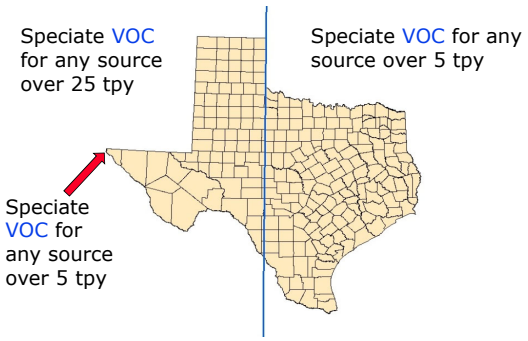
  Exception: If no VOC are speciated at a path, then VOC-u = total VOC.

Speciation: VOC (cont.)

Reporting requirements for VOC speciation:

- If the site is in El Paso County or is located east of the 100º longitude line, speciate VOC to at least 90% for each source that emits at least **5 tpy** of total VOC.
- If the site is west of the 100º longitude line, speciate VOC to at least 90% for each source that emits at least **25 tpy** of VOC.
- Note: This may not be possible for all sources.

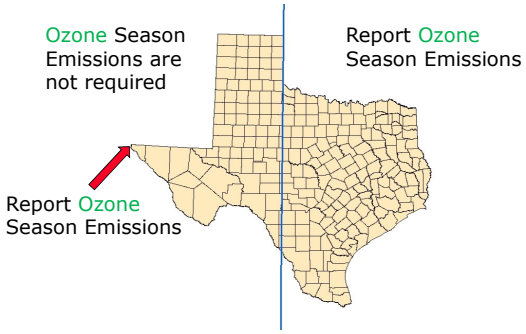
Speciation: VOC (cont.)



Ozone Season Calculations

- "Ozone Season Emissions" are the average daily rate of emissions during the ozone season in pounds per day.
- For EI purposes, the ozone season is May through September (153 days).
- Ozone season emissions should be reported from sites in El Paso County and counties east of 100º longitude.

Ozone Season Calculations (cont.)



Ozone Season Calculations (cont.)

Ozone season emissions = total pounds annual emissions in May through September / 153 days

- Use a denominator of 153 days, regardless of how many days the source actually operated.
- Please update operating hours and seasonal operating percentages in EI every year.

Ozone Season Calculations (cont.)

Example: An emergency generator is tested quarterly but otherwise remains idle. During the one-day July test, the unit emits 1,000 pounds of NO_X. How should ozone season emissions be reported?

$$\cancel{1{,}000\ ppd\ NO_X}$$

$$\frac{1{,}000\ pounds\ NO_X}{153\ days} = 6.5359\ ppd\ NO_X$$

EI Guidelines: References and Resources

- Chapter 2 Creating an Initial EI
  - Understanding EI Structure
- Chapter 3 Emissions Inventory Structure
- Chapter 4 Determining and Reporting Emissions
- Appendix A
  - Technical Supplement 1: Selected Combustion Sources
  - Technical Supplement 4: Flares

EI Guidelines: References and Resources (cont.)

Point Source EI webpage Completing and Submitting a Point Source Emissions Inventory

- EI Guidelines
- Web-based EI Reporting Instructions (PDF) and link to YouTube Videos
- Electronic Emissions Inventory File Specifications & Appendices (PDFs)
- Electronic Emissions Inventory File Specifications Reference Tables
  - Abatement Codes, Contaminant Codes, SIC, SCC

Questions?

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EAS helpline:
(512) 239-1773
psinvent@tceq.texas.gov

Point Source EI webpage:
www.tceq.texas.gov/goto/ieas

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Supporting Documentation

Richard Taglienti
Emissions Inventory Specialist, Air Quality Division

Presented to the 2020 Emissions Inventory Workshop
January 30, 2020

Overview

- Part 1 – Types of supporting documentation
- Part 2 – Guidance for specific source types
- Part 3 – Confidentiality
- Part 4 – General guidance
  - Provide
  - Avoid
  - Additional Resources

Part 1

Types of Supporting Documentation

What Supporting Documents Should Be Submitted with the EI?

- Information about the site and processes
- Sample calculations that support the emissions as reported in the current year's Emissions Inventory (EI)
- Documentation of the sample calculation inputs
- EI comparisons to other databases

Information About the Site and Processes

- Plot plan showing the emission points
- Process information
  - Written description of the site's operations
  - Process flow diagram(s) that illustrate the connections between the facilities/sources and the emission points

Sample Calculations

- Sample calculations are required to be reported per 30 Texas Administrative Code 101.10(c).
- Use the current inventory year's data.
- When available, valid site-specific data should be used rather than defaults provided by AP-42, software program, process simulator or other methodology.
- Update sample calculations with each EI submittal.

Sample Calculations (cont.)

- Reporting the permit limits rather than calculating current totals is not acceptable.
- Submit sample calculations for each different process type in the EI.
- Provide sufficient data so the results can be reasonably verified. Sufficient data includes but is not limited to:
  - process rates;
  - operating hours; and/or
  - emissions factors and their sources.

Sample Calculations (cont.)

Carbon monoxide emissions from an engine:

$$\frac{3.09\ grams\ (g)}{horsepower(hp)-hour(hr)} \times \frac{7655\ hr}{year} \times \frac{1380\ hp}{} \times \frac{\frac{pounds}{(lb)}}{453\ g} \times \frac{ton}{2000\ lb} = 36.03 \frac{ton}{year}$$

vendor factor

current operating hour

actual load

Documentation of the Sample Calculation Inputs

- Extended gas analysis
- Material throughput
- Emissions factors
- Summary reports
- Vendor specifications

Extended Gas Analysis

- Most current analysis available
  At minimum, octanes+/C8+ speciated to include benzene, toluene, ethylbenzene, and xylene; and other applicable hazardous air pollutants
- Applicable to the reporting site
- Particularly important for:
  - Volatile organic compound (VOC) speciation
  - Glycol emission calculations
  - E&P Tank calculations

Material Throughput Forms

- These forms are used to report fuel, feed, and/or production rate for a unit.
- Forms for six specific facility types are located on the Emissions Assessment Section (EAS) webpage: http://www.tceq.texas.gov/airquality/point-source-ei/psei.html.
- A single form may be used to report throughput data for similar source types.
- Company spreadsheets may be submitted in lieu of the form(s).

Emissions Factors

- Identify the source of the factor(s). Examples include:
  - Stack test
  - Vendor/manufacturer data
  - AP-42 (which table or section)
  - American Petroleum Institute factors
  - Chemical manufacturing average factors
  - Portable analyzer data
- Please do not list a permit as the source of an emissions factor.

Summary Reports

All summary reports should include:
- identification of the site;
- identification of the facility/source; and
- report date.

Summary Reports: Some Examples

- Relative accuracy test audits for Continuous Emissions Monitoring Systems and Predictive Emissions Monitoring Systems
  - Hourly output readings
  - Material throughput
  - Date of the test
- Stack test
  - Results summary page with factors and units
  - Date of the test
  - Process rate during the test
  - Correct nitrogen oxide molecular weight (46.01 lb/lb-mol)
- Aggregate Summary Emissions Report

  Gas Research Institute GLYCalc software

Vendor Specifications

Vendor data
- Include summary page of equipment information (specifications) that supports the emissions factor.
- The unit should be operating according to the vendor's specifications.

EI Comparison to TRI

- Toxics reported to the United States Environmental Protection Agency's (EPA) Toxic Release Inventory (TRI) program should match emissions data reported to the EI.
- Always report the most accurate data.
- If data does not match, you may be asked to provide an explanation and/or revise the EI data.

EI Comparison to AEME

- Regulated pollutants reported to Texas Commission on Environmental Quality's Air Emissions & Maintenance Events (AEME) database should match emissions data reported to the EI.
- If data does not match, you may be asked to provide an explanation and/or revise the EI data.
- AEME may include contaminants that are not required to be reported in the EI, only discrepancies for regulated pollutants will be questioned.
- AEME pollutant totals may be less than the EI because the EI includes non-reportable quantities.

Supporting Documentation Summary

- **Submit <u>current</u>, site-specific, and complete supporting data so that the emissions can be verified.**
- Supporting documentation includes:
  - equations;
  - specific sample calculations;
  - activity data;
  - emissions factors;
  - reference sources; and
  - assumptions.

Part 2

Guidance for Specific Source Types

Guidance for Specific Source Types

Common facility/source types:

- Flares
- Storage tanks
- Loading
- Coating and printing
- Glycol dehydrators
- Fugitives (equipment leaks)

Flares

Provide sample calculations for the pilot gas <u>and</u> waste gas, and include the following data:

- heat inputs;
- emissions factors and sources;
- molecular weights;
- VOC composition;
- mole fractions;
- flow rates; and
- destruction efficiencies.

Storage Tanks

- If emissions were determined with a software program, provide the reports.
- If emissions were determined with AP-42, Chapter 7 equations, provide a spreadsheet with formulas and all input data.

  Note: The EPA updated AP-42, Chapter 7 equations.
- Provide site-specific input data for floating roof tanks and flash/separator tanks.

Truck Loading

Include:

- Throughput
- Vapor pressure
- Molecular weight
- Temperature, especially for heated materials
- Equation used to determine emissions
- Speciation profile (not from flash gas analysis)
- Collection or destruction efficiency of a control device, and the basis for the collection or destruction efficiency

Coating and Printing

Include:

- Material throughput including the type and amount of material used, and VOC content
- Material balance formulas used to determine VOC and particulate matter emissions
- Material safety data sheets for the materials most frequently used
- Control or capture efficiencies

Glycol Dehydrators

Include:

- Actual glycol flow rate and actual gas throughput for current year (not permitted values)
- Regenerator control device information
- *Extended* wet gas analysis (composition upstream of absorber), *not* a sales gas analysis

Fugitives (Equipment Leaks)

Include:

- Representative sample calculations for each fugitive area
- VOC content of the gas/vapor and/or light liquid stream
- Breakdown of emissions between monitored and non-monitored components
- For monitored components:
  - Sample calculations for one leaking and one pegged component for each component type
  - Concentration readings throughout the year, the dates of the readings, and the calculated emissions

Sample Calculation Templates

Sample calculation templates are available on the point source EI webpage for the following common emission sources:

- glycol dehydration;
- internal combustion engine;
- marine vessel loading;
- railcar and truck loading; and
- storage tanks.

Part 3

Confidentiality

Public EI Data

- The data contained in the EI is available to the public.
- Emissions data should not be marked confidential.

Public EI Data (cont.)

- Emissions rates (actual, ozone season, emissions events, or maintenance, startup, or shutdown events)
- Emissions factors
- Emissions control equipment type and associated control efficiencies
- Determination methods
- Release point location
- Characteristic data about the emission sources

Confidential Data

Examples of potentially confidential information:

- Material throughputs
- Process flow diagrams
- Process rates
- Production
- Trade secrets (information that reveals secret process or methods of manufacture or production)

Confidential Data (cont.)

- Clearly label each page or compact disc (CD) "confidential."
- Provide confidential information as a paper hard-copy or on CD through the mail.
- Do not send confidential information through email or using the web reporting document attachment function.

How to Submit Confidential Supporting Documentation

- United States Postal Service (USPS)

  Emissions Inventory Data, MC 166
  Texas Commission on Environmental Quality
  P.O. Box 13087
  Austin, TX 78711-3087

- Overnight service (FedEx, UPS, courier, or hand delivery)

  Emissions Inventory Data, MC 166
  Texas Commission on Environmental Quality
  12100 Park 35 Circle, Bldg. E., Third Floor
  Austin, TX 78753

How to Submit Non-Confidential Supporting Documentation

- Attach documents to the State of Texas Electronic Emissions Reporting System (STEERS) submission.
- Supporting documents cannot be submitted via STEERS **after** the EI has been submitted.
- Mail hard copies via USPS or overnight service (see previous slide for addresses).

Part 4

General Guidance:

Provide

Avoid

Additional Resources

Provide

Review of items already mentioned:

- Detailed sample calculations for the current year
- Relevant summary reports from software programs, testing data, vendor data, etc.
- Equations and input data
- Explanation for TRI/AEME and EI discrepancies

Provide (cont.)

- Summary spreadsheets listing emissions totals per path
- Explanations for significant changes (increases and/or decreases) in emissions
- Legible documents:
  - Font size of at least 10 when using paper
  - Readable scanned and emailed PDFs

Provide (cont.)

For software programs:

- Reports that list all input parameters and values
- Explanation of equations/calculations used
- Other relevant data to reproduce emissions estimates

Avoid

Using internal labels for facility identification numbers (FIN) and/or emission point numbers (EPN) that do not match the FINs and EPNs in the EI

Example:

- Caterpillar Engine 3616TALE = (Facility Identification Number) FIN:ENG3616 in the EI
- Internally, Caterpillar 3616TALE is referred to as "Unit 3"
- Do not refer to "FIN:Unit 3" in the supporting documents, instead, refer to "FIN:ENG3616"

Avoid (cont.)

- Listing the permit as the source of an emissions factor
  - Provide the origin of the factor used for the permit
- Using average annual data instead of actual ozone season data when calculating ozone season emissions
- Including supporting documentation for other sites
  - Only provide site-specific data

Additional Resources

Available Resources:

- Sample calculation templates for common sources are available on the EAS webpage: http://www.tceq.texas.gov/airquality/point-source-ei/psei.html.
- The "Emissions Inventory Checklist" is located on the EAS webpage just below the *2019 Emissions Inventory Guidelines*.

Additional Resources (cont.)

Additional notes:

- Organize documents with a table of contents and page numbers.
- Consolidate electronic documents rather than sending multiple small PDFs.
- Provide Excel spreadsheets electronically so that formulas can be easily reviewed.

Questions?

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EAS helpline:
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Point Source EI webpage
www.tceq.texas.gov/goto/ieas

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Web-Emissions Inventory Reporting: State of Texas Environmental Electronic Reporting System

Adam Bullock and Tim Vinciguerra
Technical Specialist and Emissions Inventory Specailist, Air Quality Division

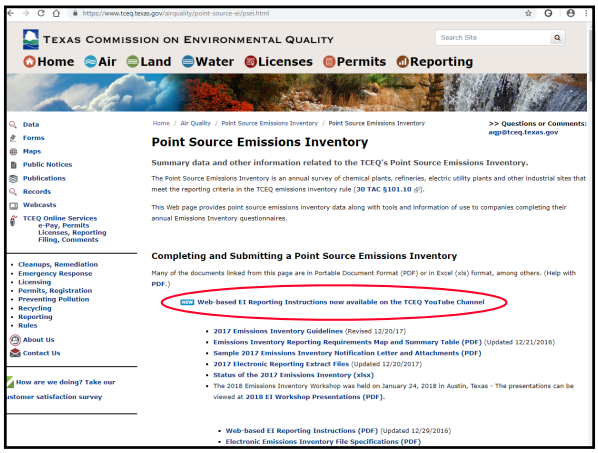
Presented to the 2020 Emission Inventory Workshop
January 30, 2020

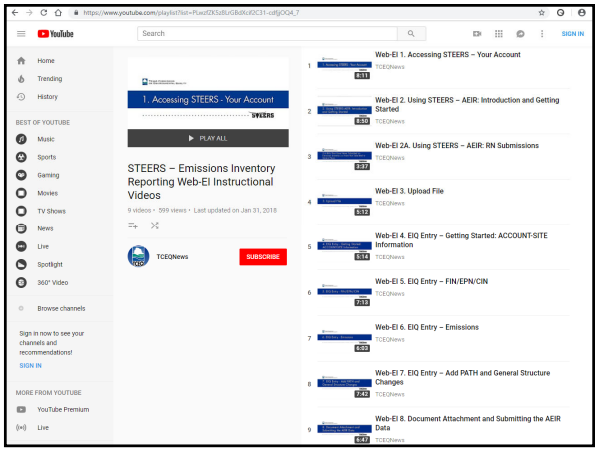
Live Demo Overview

- State of Texas Environmental Electronic Reporting System (STEERS)
- Creating/Updating a STEERS Account
- Program Access - Levels of Authority
  - Access
- STEERS Participation Agreement
  - When to submit
- Two web-reporting options
  - Emissions Inventory (EI) entry
  - Delta File Process
- Common Questions and Items to Note

Web-EI YouTube Videos

- YouTube videos available for the STEERS Web-EI reporting process
  - First video covers STEERS Account
- Link to videos available on point source EI webpage





Questions?

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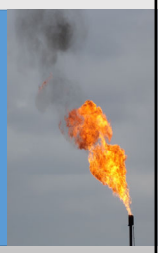
tim.vinciguerra@tceq.texas.gov
adam.bullock@tceq.texas.gov

Emissions Assessment Section helpline:
(512) 239-1773
psinvent@tceq.texas.gov

STEERS (non web-EI questions):
(512) 239-6925
steers@tceq.texas.gov

Emissions Events (EE) and Maintenance Startup Shutdown (MSS) Reporting

Texas Commission on Environmental Quality



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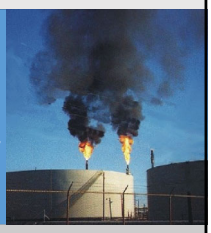
Air Emissions Maintenance Events (AEME) Reporting not Annual Emissions Inventory Report (AEIR)



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Presentation Outline

1. Background and Definitions
2. Recording and Reporting Emissions Events
3. Regional Review
   - Excessive Emissions Events
   - Affirmative Defense
4. Situations – Frequently Ask Questions

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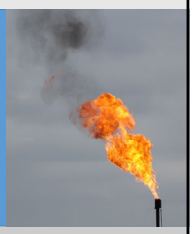
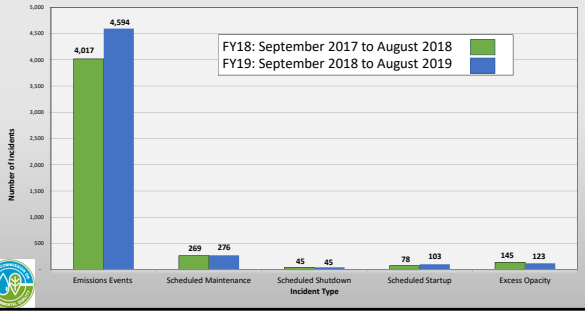
General Background



Emission Events, Why the Concern?

Total Number of Incidents Reported Statewide



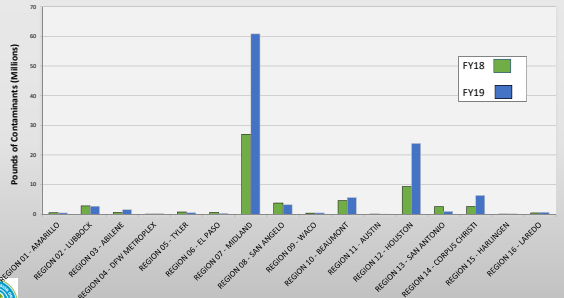
Total Number of Incidents Reported Statewide – FY19

Region	Emissions Events	Scheduled Maintenance	Scheduled Shutdown	Scheduled Startup	Excess Opacity	Total
REGION 01 - AMARILLO	56	6	2	5	3	72
REGION 02 - LUBBOCK	176	13	0	0	1	190
REGION 03 - ABILENE	41	8	2	0	3	54
REGION 04 - DFW	36	128	0	1	13	178
REGION 05 - TYLER	42	4	0	2	31	79
REGION 06 - EL PASO	12	5	0	0	0	17
REGION 07 - MIDLAND	3,287	41	6	4	1	3,339
REGION 08 - SAN ANGELO	110	1	2	0	2	115
REGION 09 - WACO	35	2	0	0	1	38
REGION 10 - BEAUMONT	160	3	3	17	17	200
REGION 11 - AUSTIN	18	0	0	0	0	18
REGION 12 - HOUSTON	364	27	3	17	39	450
REGION 13 - SAN ANTONIO	72	2	0	2	7	83
REGION 14 - CORPUS CHRISTI	139	24	27	55	5	250
REGION 15 - HARLINGEN	8	1	0	0	0	9
REGION 16 - LAREDO	38	11	0	0	0	49
Total	4,594	276	45	103	123	5,141

Incidents Reported by Industry Classification – FY19

NAICS	Emissions Events	Scheduled Maintenance	Scheduled Startup	Scheduled Shutdown	Excess Opacity	Total
211111: Crude Petroleum and Natural Gas Extraction	2,411	28	2	2	2	2,445
211112: Natural Gas Liquid Extraction	597	20	16	3	4	640
324110: Petroleum Refineries	223	11	14	3	14	265
325199: Basic Organic Chemical Manufacturing	160	15	44	29	9	257
324122: Asphalt Shingle and Coatings Manufacturing	2	120	0	0	1	123
48621 and 486210: Pipeline Transportation of Natural Gas	86	9	0	0	1	96
325181: Alkalies and Chlorine Manufacturing	26	7	0	0	24	57
211120: Crude Petroleum Extraction	56	0	0	0	0	56
325211: Plastics Material and Resin Manufacturing	47	2	0	0	0	49
221122: Electric Power Distribution	39	1	0	0	2	42

Total Quantity of Emissions Reported Statewide – FY19



Definitions

30 TAC Chapter 101.1. Definitions

(28) Emissions event--Any upset event or unscheduled maintenance, startup, or shutdown activity, from a common cause that results in unauthorized emissions of air contaminants from one or more emissions points at a regulated entity.

30 TAC Chapter 101.1. Definitions - Upset

(110) Upset event--An unplanned and unavoidable breakdown or excursion of a process or operation that results in unauthorized emissions. A maintenance, startup, or shutdown activity that was reported under §101.211 of this title (...), but had emissions that exceeded the reported amount by more than a reportable quantity due to an unplanned and unavoidable breakdown or excursion of a process or operation is an upset event.

30 TAC Chapter 101.1. Definitions – Unauthorized emissions

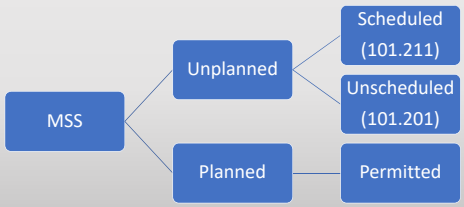
(108) Unauthorized emissions--Emissions of any air contaminant except water, nitrogen, ethane, noble gases, hydrogen, and oxygen that exceed any air emission limitation in a permit, rule, or order of the commission or as authorized by Texas Health and Safety Code, §382.0518(g).

Texas Clean Air Act: Health and Safety Code: Chapter 382, Section 382.003(2) "Air contaminant" means particulate matter, radioactive material, dust, fumes, gas, mist, smoke, vapor, or odor, including any combination of those items, produced by processes other than natural.

30 TAC Chapter 101.1. Definitions – Emissions Events

(28) Emissions event--Any upset event or unscheduled maintenance, startup, or shutdown activity, from a common cause that results in unauthorized emissions of air contaminants from one or more emissions points at a regulated entity.

Maintenance/Startup/Shutdown



Recording and Reporting

Requirements

- No later than 24 hours after discovery of an emissions event, owner/operator must:
  - Determine if the event is a reportable emissions event
  - Notify the region and local air pollution control agencies

30 TAC §101.1(88) Reportable emissions event--Any emissions event that in any 24-hour period, results in an unauthorized emission from any emissions point equal to or in excess of the reportable quantity as defined in this section.

Reportable Quantity (RQ)

- 40 CFR 302, Table 302.4 – Hazardous Substances and RQ
  Example: benzene – 10 pounds
- 40 CFR 355 – Extremely Hazardous Substances
  Example: hydrogen sulfide – 100 pounds
- 30 TAC 101.1 (89) – Texas Specific Compounds/Mixture RQs
  Example: oxides of nitrogen - 200 pounds in ozone nonattainment, ozone maintenance, early action compact areas, Nueces County, and San Patricio County, and 5,000 pounds in all other areas of the state, which should be used instead of the RQs for nitrogen oxide and nitrogen dioxide provided in 40 CFR Part 302, Table 302.4, the column "final RQ";
- Default = 100 lbs. (if not listed in one of the 3 lists above)

What about emissions events that don't exceed a RQ?

The owner or operator of a regulated entity experiencing an emissions event shall create a final record of all reportable and non-reportable emissions events as soon as practicable, but no later than two weeks after the end of an emissions event.

When Should You Report an Excess Opacity Event?

- As soon as practicable, but not later than 24 hours after the discovery of an excess opacity event,…, where the owner or operator was not already required to provide an initial 24-hour notification under subsection (a)(2) or (3) of this section,….
- What substance caused the opacity? Is it authorized or not? If unauthorized then this would be an emission event for that substance(s), not an excessive opacity event.
- If it is an excess opacity event then the opacity should be at least 15 additional percentage points above an opacity limit to be reported.

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The Initial STEERS Notification

- Submit the initial notification via the State of Texas Environmental Electronic Reporting System (STEERS).
- Meet the notification requirements of 30 TAC §101.201(a).
- Regulated Entity number, common name of unit/area/facility involved, date and time of discovery, duration, best know cause of the event, pollutants involved and amounts that equaled or exceeded a RQ, actions taken, etc.

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The Final STEERS Report

- Due two weeks after the end of the event.
- Meet the reporting requirements of 30 TAC §101.201(b)
- If a final is not submitted within two weeks after the end of the event, the initial becomes the final.
- No final report for excessive opacity events is required.
- Include all pollutants from all emissions points as a result of the event.
- The quantity value required to be reported is the quantity above zero, not the quantity above any applicable limit that may be imposed through rule or permit.

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After I file my initial notification and final report, what happens?

Initial Regional Review

- Verify the initial notification meets the requirements of 30 TAC §101.201(a)
- Check to see if pollutants exceeded a RQ above permitted limits, rules, or orders
- Determine if an immediate on-site investigation is warranted: citizen complaints or impact to immediate surrounding.

Final Report Review

- Verify that the report is a Reportable Emissions Event
- Meets the reporting requirements of 30 TAC §101.201
- Verify that emissions are speciated by compound descriptive type of all individually listed compounds or mixtures as allowed in the RQ definition
- Evaluate emissions event to determine if it is considered an Excessive Emissions Event, if not then evaluate for Affirmative Defense

Excessive Emissions Events

Excessive Emissions Events

Region decides if an emissions event is excessive based on the six criteria found in 30 TAC §101.222(a)

(1) - frequency of the facility's emissions events – how and why. Past emissions events that occurred within one year prior to this event. Causes of previous incidents and whether the prior incidents were from a related cause and the overall time period that the events occurred.

(2) - cause of the emissions event – how and why. Malfunctioning equipment, operator error, poor maintenance, a scheduled activity that became an emissions event.

(3) - the quantity and impact on human health or the environment of the emissions event. Any Federal or State standards that were exceeded, such as, NAAQS, MACT, NSPS, etc.; whether any ambient effects were documented from the emissions event including any modeling performed.

Excessive Emissions Events

(4) - Duration of the emissions event- duration based on the facility's annual operating hours and the percentage of time the emissions event impacted the facility's operating hours

(5) - Percentage of the facility's total annual operating hours during which emissions events occur - how and why -the percentage per facility identification number; if reviewing more than one emissions event, the percentage for all the events.

(6) - Need for startup, shutdown, and maintenance activities- how and why -whether start up, shut down, or maintenance activities could have prevented the cause of one or more of the events.

- The event is reviewed by the TCEQ EEE Review Team.
- If an EEE, then company must submit a Corrective Action Plan.

Affirmative Defense

Depending on the type of Emissions Event, all of the relevant demonstration criteria in 30 TAC §101.222 have to be met to qualify for the Affirmative Defense

- Submit notifications and reports as required
- Emissions were caused by sudden, unavoidable breakdown of equipment, beyond the control of the owner/operator
- Activity/event could not have been foreseen and avoided or planned for and could not have been avoided by better operation and maintenance or technically feasible design
- Equipment was maintained and operated in a manner consistent with good practice for minimizing emissions and reducing the number of emissions events
- Prompt action was taken to achieve compliance and repairs were made as expeditiously as practicable
- The amount and duration of emissions and any bypass of control equipment were minimized and all possible steps were taken to minimize the impact of the unauthorized emissions on ambient air quality

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Affirmative Defense (cont.)

- All emission monitoring systems were kept in operation if possible
- Actions in response to the event were documented by operation logs
- Emissions were not part of a frequent or recurring pattern indicative of inadequate design, operation, or maintenance
- Percentage of a facility's total annual operating hours during which emissions event occurred was not unreasonably high
- The emissions did not cause or contribute to an exceedance of the national ambient air quality standards, prevention of significant deterioration increments, or to a condition of air pollution

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Maintaining Affirmative Defense Eligibility

- Know RQs & Process Stream Composition
- MSS reasonable / defendable estimates
- If in doubt submit Initial Notification
- Final Report within 14 days of event end
- Be prepared with FAX as backup

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Frequently Asked Questions (FAQ)

Q: What do I do if STEERS reporting is not available (off-line)?

A: Fax your emissions event report to the region.

- Reportable Event/Activity Notification/Reporting Form https://www.tceq.texas.gov/assets/public/compliance/field_ops/fod_forms/upset/form_10360.pdf
- TCEQ Guidance – Form 10360 https://www.tceq.texas.gov/assets/public/compliance/field_ops/fod_forms/upset/eefguide.pdf
- Electronic notification and reporting is not required for small businesses.

FAQ

Q: Once I report an EE in STEERS, am I done?

A: No, other reporting requirements may apply such as the emissions inventory (see 30 TAC §101.10) and deviation reporting (see 30 TAC §122). Also, create a final record of the event within two weeks.

FAQ #2

Q: Do I only report unauthorized emissions?

A: No, report total emissions.

FAQ #3

Q: How are non-reportable EE handled during Title V investigations?

A: A portion are reviewed against recordkeeping requirements and to ensure the event didn't exceed an RQ.

FAQ #4

Q: Are the only emission limits that apply to emissions events those in New Source Review lb/hr limits?

A: No, emission limits may be in permits, rules, or orders (remember the definition of unauthorized emissions we discussed at the start).

FAQ #5

- Q: What about fugitive components and heat exchangers
- A: Fugitive components may be the subject of an emissions event. Emissions from a fugitive component that are considered "leaks" are authorized under conditions of a permit or rules for leak detection and repair (LDAR). A complete failure of a component is not considered a leak under LDAR permit conditions or rules and would be considered upset emissions and subject to the emissions events rules.
- Like fugitive components, heat exchangers may suffer a catastrophic failure. When this occurs, the facility owner or operator will follow the requirements for emissions events, including claims for affirmative defense.

FAQ #6

Q: If an investigator determines an event met the affirmative defense criteria, can a violation still be cited?

A: Yes. The emissions event affirmative defense criteria apply to state permits, rules, orders; violations may be cited for federal rules.

FAQ #7

- Q: Weather (heavy rains, high winds, drought or freeze, etc.) caused an upset that resulted in a reportable emissions event. Does the event meet the affirmative defense?
- A: It depends, facilities should be designed and operated to withstand typical weather extremes for the area.

FAQ #8

- Q: A divestiture separated two production units into two companies that share a flare. Who reports emissions events when the flare is the EPN?
- A: The company that holds the permit for the flare is responsible for reporting emissions from the EPN.

FAQ #9

- Q: The process flare was observed smoking. What documentation is required?
- A: If the smoking event was due to an emissions event note that the flare was smoking as part of the recordable / reportable documentation.
  If the smoking was for more than 5 minutes in a 2-hour period estimate the quantities of air contaminates released and document accordingly.

FAQ #10

Questions

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Reporting Emissions Events and Maintenance Startup Shutdown in the Emissions Inventory

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Presented to the 2020 Emissions Inventory Workshop
January 30, 2020

Overview

- Part 1: Basics
  - Definitions
  - Emissions Events (EE) and Maintenance Startup Shutdown (MSS) reporting in the emissions inventory (EI): the number and the emissions
- Part 2: Advanced
  - MSS permit structure vs EI structure
  - Case study
  - Options for representing permitted MSS emissions in EI Structure

Part 1: Basics

Basic EI Structure

- **Structure** is the relationship of emissions sources, emissions points, abatement devices, and related emissions data.
- **Facility** is a stationary source capable of generating emissions.
  - **FIN**: The facility identification number is an alphanumeric label for the facility.
- **Emissions Point** is the physical location where emissions are released into the atmosphere.
  - **EPN:** The emissions point number is an alphanumeric label for the emissions point

Basic EI Structure (cont.)

- **Abatement Device** is a device or activity used to reduce emissions.
  - **CIN:** The control identification number is an alphanumeric label for the abatement device.
- **Emissions Path** is the route a pollutant takes from the origin, through the abatement device(s) (if applicable), to the release point into the atmosphere.
  - Path is the association of one FIN, any applicable CIN(s), and one EPN.
  - Important note: emissions are reported at a path level

Four Emissions Categories in the EI

1. **Annual** emissions in tons per year (tpy)
2. **Ozone season** emissions in pounds per day
3. **Scheduled maintenance, startup, shutdown emissions (SMSS)** in tpy
4. **EE** in tpy

Annual (Routine)

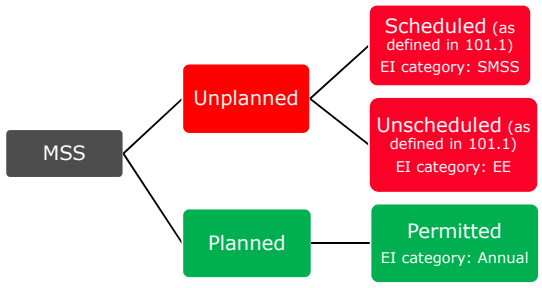
- All routine (normal) emissions
  - Not permit allowables
- Permitted **MSS** emissions
  - Authorized through either a new source review permit or permit by rule
- Unauthorized emissions from routine operations
  - Unauthorized facilities
  - Emissions that exceed an authorized limit*

*other than emissions defined in 30 Texas Administrative Code (TAC) 101.1 as **EE** or **SMSS**

EE and SMSS

- EE as defined in 30 TAC Section 101.1 (28)
  - Unauthorized emissions, unplanned, not scheduled
- SMSS as defined in 30 TAC Section 101.1 (91)
  - Not authorized by permit

Categorizing MSS Activities



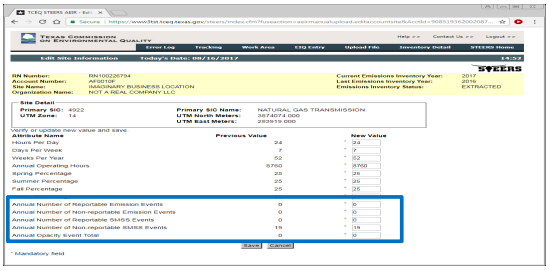
EE and SMSS Reporting in the EI

What is reported in the EI?

- The **number** of site-wide reportable and non-reportable EE, SMSS, and excess opacity events
- The **emissions** on a path-level, from reportable and non-reportable EE, and SMSS

EE and SMSS Reporting in the EI: The Number

Report the **site-wide number** of reportable, non-reportable EE, SMSS, and excess opacity events in the Site Quantifiable Event Totals section.



Attribute Name	Previous Value	New Value
Hours Per Day	24	* 24
Days Per Week	7	* 7
Weeks Per Year	52	* 52
Annual Operating Hours	8760	* 8784
Annual Operating Hours must be between 0 and 8760.		
Spring Percentage	25	* 25
Summer Percentage	25	* 25
Fall Percentage	25	* 25
Winter Percentage	25	* 25
Annual Number of Reportable Emission Events	0	* 0
Annual Number of Non-reportable Emission Events	0	* 0
Annual Number of Reportable SMSS Events	0	* 0
Annual Number of Non-reportable SMSS Events	19	* 19
Annual Opacity Event Total	0	* 0

Save Cancel

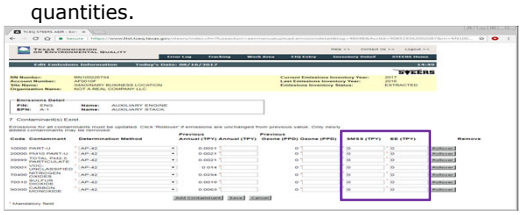
* Mandatory field

EE and SMSS Reporting in the EI: The Number (cont.)

- Site Quantifiable Events section: include the **number of events** from MSS activities that resulted in emissions that *exceeded* the authorized amounts.
- Exception for the Site Quantifiable Events section: Do NOT include the **number of events** from MSS activities that are *authorized* by a permit or permit by rule.
  - When authorized, these are considered routine operations.

EE and SMSS Reporting in the EI: The Emissions

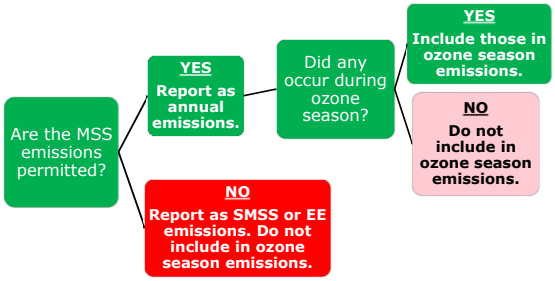
- Report the **path-level emissions** from SMSS and EE.
- Remember—there is no de minimums for EE or SMSS reporting!
- Report both the reportable and non-reportable quantities.



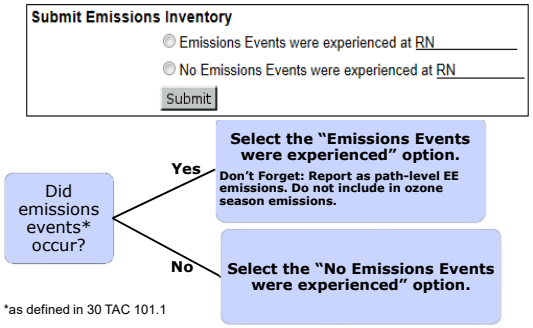
Reporting Emissions Related to Excess Opacity Events in the EI

- Quantify and report the emissions that occurred during the excess opacity event.
- Report the emissions at the **path-level** as a mass quantity under the appropriate emissions category.

Permitted MSS Emissions Reporting in the EI



EE Certification and Reporting



*as defined in 30 TAC 101.1

Part 2: Advanced

EI Structure

- EI structure should ideally match the configuration of the site.
- Two flares are located at a site. How are those represented in the EI structure?

FIN	FIN Group/Profile	EPN	EPN Profile
FLARE1	COMBUSTION/FLARE	FLARE1	FLARE
VOCPROCESS1	VOC PROCESS/OTHER	FLARE1	FLARE
TANK	TANK/INTERNAL FLOATING ROOF	FLARE1	FLARE
FLARE2	COMBUSTION/FLARE	FLARE2	FLARE
VOCPROCESS2	VOC PROCESS/OTHER	FLARE2	FLARE

MSS in a Permit

- MSS can be represented in a variety of configurations in a permit, including but not limited to:
  - New MSS EPN(s);
  - Grouped MSS EPN(s) for common source types;
  - Grouped site-wide MSS EPN; and/or
  - New MSS FIN(s).
- Why can't the **permitted MSS** emissions be reported in the **SMSS** emissions category in the EI?
  - All permitted emissions must be reported as annual emissions in the EI.

MSS Permits Structure vs. EI Structure Duplication Issues

Case Study: MSS permit action added an MSS EPN

- There is only one flare located at this site.
- **Routine** emissions from the flare were already permitted as EPN FLARE1.
- The same flare is represented in the EI as EPN FLARE1 to report those routine emissions.
  - (FIN) FLARE1 / (EPN) FLARE1
  - FIN Group/Profile is Combustion/Flare
  - EPN Profile is Flare
  - Combustion emissions from routine operations reported as annual tpy

MSS Permits Structure vs. EI Structure Duplication Issues (cont.)

- Case Study: MSS permit action added a MSS EPN (cont.)
  - MSS permit authorizes the MSS emissions from the same flare as EPN FLARE1MSS.
  - Company adds the new path (FIN and EPN) to their EI to report their permitted MSS emissions.
    - (FIN) FLARE1MSS / (EPN) FLARE1MSS
    - FIN Group/Profile is Combustion/Flare
    - EPN Profile is Flare
    - Permitted MSS emissions are reported as annual tpy
- So, what's the problem?

MSS Permits Structure vs. EI Structure Duplication Issues (cont.)

Case Study: MSS permit action added a MSS EPN (cont.)

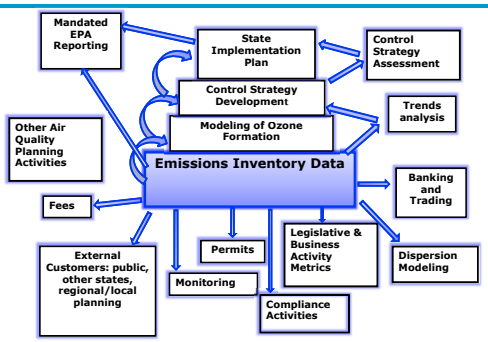
According to the EI, how many flares are at this site?

- Based on the EI structure, there are two flares at this site:

FIN	FIN GROUP/PROFILE	EPN	EPN GROUP/PROFILE
FLARE1	COMBUSTION/FLARE	FLARE1	FLARE
FLARE1MSS	COMBUSTION/FLARE	FLARE1MSS	FLARE

- Is that correct? No. There is only one flare at the site.

How Inventories Are Used



MSS Permits Structure vs. EI Structure Solutions

- How can EI duplication issues be remedied while still representing the permitted MSS emissions in the EI?
- **Five options** for representing permitted MSS emissions in the EI:
  - No structure change
  - New MSS EPN
  - Grouped MSS EPN for common source types
  - Site-wide MSS EPN
  - New MSS FIN
- **Important to note:** For these options, it's assumed that the MSS sources were already represented in the EI.

MSS Permits Structure vs. EI Structure Solutions (cont.)

- The option you chose will be based on how MSS is permitted.
- Some duplication issues will continue to exist until a more permanent database solution can be implemented.
- **The goal is to maintain consistency on how permitted MSS structure is represented in the EI.**

Option 1: No Structure Change

- Permitted MSS emissions are reported in the annual tpy column of the existing path.
- The emissions from routine and MSS are added together and reported at the same path.

Existing or New EI Path	FIN	EPN	Emissions
Existing Path	VOCPROCESS1	FLARESTK	Report routine and permitted MSS emissions from undestroyed VOC as annual tpy
Existing Path	FLARE	FLARESTK	Continue to report flare combustion emissions as annual tpy

Option 2: New MSS EPN

- Create a new path by adding a new MSS EPN to the existing source (FIN).
  - Report permitted MSS emissions at this path.
- Routine emissions would continue to be reported at the existing path.
- In the EPN Name (limited to 50 alpha numeric characters), include "MSS for EPN X".
  - Helps identify this path as a duplicate of an existing source.

Option 2: New MSS EPN (cont.)

Existing or New EI Path	FIN	EPN	Emissions
Existing Path	TANK1	TANK1	Continue to report routine emissions as annual tpy
New Path: **Existing FIN linked to new EPN**	TANK1	TANK1MSS	Report permitted MSS emissions as annual tpy

Option 3: New MSS Group FIN and EPN

- Create a new path by grouping common source types into a new path.
  - Never group flares.
- New path would have a new grouped FIN and new grouped EPN.
  - Grouped FINs should have a generic Group/Profile and Source Classification Code.
  - Grouped EPNs should have either a fugitive or stack profile.
  - Use representative information for the characteristics.
- Routine emissions would continue to be reported at the existing paths.

Option 3: New MSS Group FIN and EPN (cont.)

Existing or New EI Path	FIN	EPN	Emissions
Existing Path	TANK1	TANK1	Continue to report routine VOC emissions generated by each tank as annual tpy
Existing Path	TANK2	TANK2	Continue to report routine VOC emissions generated by each tank as annual tpy
Existing Path	TANK3	TANK3	Continue to report routine VOC emissions generated by each tank as annual tpy
New Path **New FIN linked to new EPN**	MSSTANKGRP	MSSTANKGRP	Report permitted MSS emissions for tanks 1, 2, and 3 as annual tpy

Option 4: Site-Wide MSS Path

- Create a new path to report all permitted MSS emissions from the entire site.
- New path would have a new grouped FIN and new grouped EPN.
  - Grouped FIN should have a generic Group and Profile and source classification code.
  - Grouped EPN should have either a fugitive or stack profile.
  - Use representative information for the characteristics.
- Routine emissions would continue to be reported at the existing paths.

Option 4: Site-wide MSS Path (cont.)

Existing or New EI Path	FIN	EPN	Emissions
New Path **New FIN linked to new EPN**	SITEMSS	SITEMSS	Report permitted MSS emissions for the entire site as annual tpy

Option 5: New MSS FIN
NOT PREFERRED—LAST RESORT

- Create a new path by adding a new MSS FIN to an existing EPN.
  - Report permitted MSS emissions at this path.
- Routine emissions would continue to be reported at the existing path.
- In the FIN Name (limited to 50 alpha numeric characters), include "MSS for FIN X."
  - Helps identify this path as a duplicate of an existing source that represents only permitted MSS emissions.

Option 5: New MSS FIN (cont.)

Why is this option the least preferred?

Because of how the EI database is structured and how data is retrieved, it's more likely to incorrectly duplicate EI structure.

Existing or New EI Path	FIN	EPN	Emissions
Existing Path	FLARE	FLARESTK	Continue to report combustion emissions as annual tpy
New Path **New FIN linked to existing EPN**	FLAREMSS	FLARESTK	Report permitted MSS emissions as annual tpy

Which Option Is Right for My Site?

Ask yourself the following questions:

- Do the permitted MSS sources exist in the EI already?
- How were the MSS emissions represented in the permit?
- Is a structure change to the EI necessary?
- Is my site okay with simply reporting routine and permitted MSS at the same path in the EI?
- Can I group the permitted MSS structure in the EI (either by common source type or site-wide)?
- Can I add a new MSS EPN to the EI and link to an existing FIN?

Questions?

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Determining Emissions from Storage Tanks for the 2019 Emissions Inventory

Mark Muldoon
Technical Specialist, Air Quality Division

Presented to the 2020 Emissions Inventory Workshop
January 30, 2020

Overview: Storage Tanks

- Review of common emissions mechanisms
- Emissions Inventory (EI) guidance for estimating storage tank emissions
- Case studies
- Clarifications for 2019

Common Emissions Mechanisms

- Working and breathing
- Tank roof landing
- Flashing
- Degassing and cleaning
- Miscellaneous loss mechanisms
  - Mixing/stirring, sparging
  - Blending (adding another chemical to the tank)

Working and Breathing Losses

- **Breathing losses** are the evaporative emissions from stored liquid, typically due to temperature changes.
- **Working losses** are the evaporative emissions generated by changes in stored liquid level.

Working and Breathing Losses (cont.)

- Use Compilation of Air Pollutant Emissions Factors (AP-42), Chapter 7 equations to determine emissions.
- The United States Environmental Protection Agency (EPA) has finalized updates to the AP-42, Chapter 7 emissions determination equations. (Nov. 2019)
- What about the EPA TANKS 4.09d program?
  - The program is not necessarily compatible with modern computer operating systems.
  - When the software does function, EPA TANKS 4.09d does not determine monthly emissions accurately, among other issues.

Working and Breathing Losses (cont.)

What about the EPA TANKS 4.09d program (cont.)?

- The EPA is no longer supporting or updating the EPA TANKS 4.09d software program.
- Because the EPA has finalized updates to AP-42, Chapter 7, the current version of EPA TANKS 4.09d will no longer be an acceptable emissions determination method for EI purposes, in the future, after a phase out period.

Reminder

Working and Breathing Losses (cont.)

When can EPA TANKS 4.09d be used to estimate EI emissions?

- For the 2019 reporting year (RY), EPA TANKS 4.09d can be used to estimate *annual* emissions from unheated tanks that store ambient temperature products, and do not have significant throughput variation.
- See **caveats** for use of the EPA TANKS 4.09d program on the following slide.

Working and Breathing Losses (cont.)

- What are the **caveats** for using the EPA TANKS 4.09d program to estimate EI emissions for the 2019 RY?
  - For annual emissions, choose "Monthly" time basis (instead of "Annual") and select all 12 months of the year to obtain the best possible emissions estimates.
  - Never use default information unless it is representative of the tank and contents.
  - Use the "detailed" option for tank fittings.
- What about calculating ozone season emissions?

  Use AP-42, Chapter 7 equations to determine ozone season emissions.

Working and Breathing Losses: Heated Tanks

- Typically located at sites handling heavy hydrocarbons, including:
  - Refineries
  - Certain terminals
  - Asphalt plants/processing sites
- Examples of products:
  - Fuel oils
  - Heavy gas oils
  - Asphalt
- Heater types
  - Immersed
  - External

Working and Breathing Losses: Heated Tanks (cont.)

- Heat sources
  - Electricity
  - Heat transfer media:
    - Steam
    - Oil
    - Glycol
- Circulation
  - Heat induced
  - Mixer, such as a propeller

Working and Breathing Losses: Hot Product Tanks

- Tanks that are at ambient temperature (i.e., no heating elements).

  Products received in the tank are warmer than ambient temperature.
- Examples:
  - Tanks receiving product from a process unit (e.g., refinery, chemical plants).
  - Tanks receiving product from a separator or a flash distillation unit (e.g., transmix processing at a terminal).

Working and Breathing Losses: Heated & Hot Product Tank Emissions

- Use AP-42, Chapter 7 equations to determine working and breathing emissions for heated tanks or tanks storing liquids above ambient temperature (hot products).
- EPA TANKS 4.09d program <u>cannot</u> be used because it underestimates emissions.

Working and Breathing Losses: Insulated Heated Tanks

- Historically, only *working* loss emissions have been estimated for insulated, heated tanks.
- *Breathing* losses can also be generated.
  - Normal diurnal cycles appear to cause temperature fluctuations in the vapor space of insulated tanks.
  - Tank contents do not appear to always be heated evenly resulting in variable product temperatures.

Working and Breathing Losses: Insulated Heated Tanks (cont.)

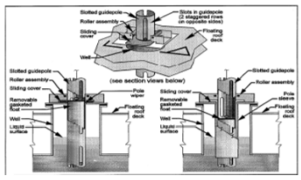
- If the tank roof is **insulated**:
  - Modify AP-42, Chapter 7 standing loss equations to determine *breathing* emissions.
    - Replace 365 days with the number of annual heating cycles.
    - Clarification Replace the daily ambient temperature range ("ΔT_A") with the product's temperature range.
  - Don't forget *working* emissions!
- More details are available in the *2019 Emissions Inventory Guidelines* Appendix A, Technical Supplement 6.

Working and Breathing Losses: Uninsulated Heated Tanks

- If the tank roof is **uninsulated**:
  - Use AP-42, Chapter 7 to determine annual and ozone season *breathing* emissions.
  - Don't forget *working* emissions!
- More details are available in the *2019 Emissions Inventory Guidelines* Appendix A, Technical Supplement 6.

Working and Breathing Losses: Tank Fittings

- Do not use the default or typical number and type of fittings found in AP-42 or EPA TANKS 4.09d.
- Use tank-specific information from operations data.



Working and Breathing Losses: Chemical Data

- Use vapor pressure, molecular weight, and other chemical and physical data specific to the liquid stored in the tank.
- If tank contents change during the year, ensure the calculations accurately account for the chemical being stored.

  For example, if a pipeline tank stores summer gasoline for four months and winter gasoline for eight months:
  - determine summer and winter gasoline emissions individually using the appropriate vapor pressure, ambient temperatures, and storage time; and
  - add the resulting emissions to determine annual emissions.

Working and Breathing Losses: Chemical Data (cont.)

- Do not use the default chemical data found in AP-42/EPA TANKS 4.09d unless it is representative of the tank contents.

  Note: The default chemical data in EPA TANKS 4.09d for fuel oil number 6 should not be used to estimate storage tank emissions for the EI.
- Use site-specific data to account for blend stock used to thin or cut the fuel oil.

Working and Breathing Losses: Chemical Data (cont.)

- American Society for Testing and Materials method D 2879 is suitable for determining vapor pressure for heavy liquids.
- American Petroleum Institute (API) data may be used if site-specific data is not available.

Case Study: Heated Tank Emissions

- Parameters can impact storage tank working and breathing loss emissions.
- Example heated fuel oil tank parameters:
  - Fixed roof tank
  - Heated to 150° Fahrenheit (°F)
  - Diameter: 150 feet (ft)
  - Height: 48 ft
  - Average liquid height: 40 ft
  - Volume: 6,345,000 gallons
  - Throughput: 10 turnovers
  - Location: Port Arthur, Texas

Case Study: Heated Tank Emissions (cont.)

Comparing:

1. Emissions determined using EPA TANKS 4.09d default residual oil number 6 data.

to:

2. Emissions determined using AP-42, Chapter 7 equations and actual residual oil number 6 parameters, including vapor pressure.

Contents	Method	Monthly sum over 12 months pounds (lbs)
Default Residual Oil Number 6	TANKS	55
Residual Oil Number 6	AP-42, Chapter 7	208

Working and Breathing Losses: Cutter Stock

Reminder

- If a stored product is "cut" with another material, the "cutter stock" must be accounted for in the emissions.
  - Cutter stock will impact the liquid's:
    - composition and
    - vapor pressure at the stored temperature.
  - Process records should indicate amount of cutter stock added.
- Cutter stock emissions must be speciated.

  Process records should provide detail about the cutter stock composition.

Case Study: Impact of Cutter Stock

- Same heated fuel oil tank, but temperature is 100°F and product has been cut with diesel.
- *Comparing*:

  1. Emissions determined using EPA TANKS 4.09d default residual oil number 6 data.

  to:

  2. Emissions determined using AP-42, Chapter 7 equations and the actual vapor pressure of the residual oil number 6 cut with 25 percent (%) diesel.

Contents	Method	Monthly sum over 12 months (lbs)
Default Residual Oil Number 6	TANKS	55
Cut Residual Oil (75% Residual Oil Number 6/25% Diesel)	AP-42, Chapter 7	1,033

Case Study: Impact of Cutter Stock (cont.)

- Same heated fuel oil tank, temperature now at 150°F and same composition as previous slide.
- *Comparing*:

  1. Emissions determined using TANKS 4.09d default residual oil number 6 data.

  to:

  2. Emissions determined using AP-42, Chapter 7 equations and the actual vapor pressure of the residual oil number 6 cut with 25% diesel.

Contents	Method	Monthly sum over 12 months (lbs)
Default Residual Oil Number 6	TANKS	55
Cut Residual Oil (75% Residual Oil Number 6/25% Diesel)	AP-42, Chapter 7	3,511

Working and Breathing Losses: Site-Specific Versus Default Data

- Crude oils in Texas have a Reid vapor pressure (RVP) range from 2 to 10, and shale oils can be even higher.
- The TANKS 4.09d default for crude oil is RVP 5, so it is not necessarily representative for many Texas crude oils, as indicated in the example below.

Table 2. Properties of Representative Crude Oils

Distillate Fractions in percent (percentage)

Crude Oil	API°	RVP	Condensate %
Eagle Ford	47.7 - 58.8	6.5 - 9.3	1.13

Source: Grace Catalyst Technologies, *Processing shale oils in FCC: Challenges and Opportunities* (Table 1). Capline Pipeline, Most Current Approve Assay List http://www.caplinepipeline.com/Reports1.aspx. Platts, *Methodology and Specification Guide—The Eagle Ford marker: Rational and Methodology.*

Case Study: Site-Specific Versus Default Data

- Floating-roof tank located in Port Arthur, Texas.
  - Compares EPA TANKS 4.09d default crude (RVP 5) profile emissions to emissions determined using EPA TANKS 4.09d but with user-entered, site-specific crude oil data.
  - Note: site-specific crude oil has higher RVP than the default value.
- Always use physical and chemical properties specific to the tank and its contents.

Contents	Method	Monthly sum over 12 months (lbs)
Default Crude Oil Data	TANKS	2,357
Site-specific Crude Oil Data	TANKS	3,637

Working and Breathing Losses: Nitrogen Blanketing

- Nitrogen can be pumped into the vapor space of a storage tank to displace air and reduce risk of fire, corrosion, or water absorption.
- Nitrogen blanketing does *not* reduce tank emissions.
- No modifications are necessary to use AP-42 Chapter 7 equations to determine emissions.

Working and Breathing Losses: Internal Floating Roof Tanks

- If an internal floating roof tank has a *closed* vent system, be aware that AP-42, Chapter 7 assumes an *open* vent system.
  - For most situations, the emissions difference is typically less than 10%; therefore, Chapter 7 equations can be used with a default 5% reduction.
- API Technical Report (TR) 2569 can be used to determine breathing and working losses.
  - In general, this approach results in significant emissions determination differences only for small diameter tanks storing high volatility liquids with infrequent turnover.

Reminder

Working and Breathing Losses: Variable Vapor Space Tanks

- These tanks use an expandable vapor space to control losses.
- Loss of vapor occurs when the tank's vapor storage capacity is exceeded.
- Use AP-42, Chapter 7 to determine working losses.
  - This equation may not accurately determine emissions for all situations, such as vapor balancing.
  - Tanks that rely on either a flexible diaphragm or a flexible coated fabric seal will have additional losses to the extent that vapors leak through or past the membrane used for the diaphragm or seal.

Reminder

Working and Breathing Losses: Splash Loading

- Be aware that AP-42, Chapter 7 equations were designed for *submerged* loading and not *splash* loading.
- If tanks are splash loaded, working loss emissions calculations should be adjusted for the change in loading.

Working and Breathing Losses: Low Pressure Tanks

- Low pressure tanks have pressure in the range of just above atmospheric to 15 lbs per square inch gauge.
- Emissions are a function of the vent set pressure and are accounted for in the equations for vertical fixed roof breathing and working losses.
- Use AP-42, Chapter 7, equations to determine breathing and working losses from low pressure tanks.
- EPA TANKS 4.09d should not be used to estimate emissions from low pressure tanks.

Clarification

Landing Losses

http://www.castagra.com/2014/01/three-risky-storage-tank-jobs/

Landing Loss Emissions

- Landing loss emissions are specific to floating roof tanks.
- Landings occur when the tank roof is resting on its supports and is no longer a control.
  - This creates a vapor space above the liquid.
- Emissions will vary depending on the following:
  - external versus internal floating roof; and
  - whether a full or partial liquid heel remains in the tank, or the tank drains dry; and
  - use caution when classifying a tank as "drain dry."

Landing Loss Emissions (cont.)

- Use AP-42, Chapter 7 equations to determine landing loss emissions.
- EPA TANKS 4.09d should not be used because it does not account for landing loss emissions.

Degassing and Cleaning

Acceptable determination methods:

- Must determine using site-specific process and product knowledge
- Degassing:
  - API TR 2568, "Evaporative Loss from the Cleaning of Storage Tanks" (drain-dry fixed-roof)
  - API TR 2567, "Evaporative Loss from Storage Tank Floating Roof Landings" (drain-dry floating-roof)
- Cleaning: API TR 2568
- AP-42, Chapter 7

Reminder

Degassing and Cleaning (cont.)

- For fixed- or floating-roof tanks with a liquid heel, the emissions from the heel must be accounted for when determining degassing emissions.

  This includes the initial vapor space purge and continued forced ventilation.
- Emptying is accounted for in the working loss equations but don't forget to make a few tweaks to the equations:
  - turnover resulting from tank emptying and
  - the change in average tank liquid height.

Clarifications

Sludge Handling

- When sludge is removed from the bottom of the tank, the tank may be flooded with a light distillate liquid to assist with cleaning.
- Ensure any new material introduced into the tank during cleaning is properly accounted for in the liquid and vapor properties of the tank heel.

Clarifications

Flash Emissions

- Flashing losses occur when a liquid with entrained gases experiences a pressure drop or temperature increase.
- The emissions are proportional to:
  - the magnitude of pressure drop and
  - quantity of compounds that are gaseous at final temperature and pressure.
- The methods used to determine emissions depend on what is being stored.
- AP-42, Chapter 7 and EPA TANKS 4.09d do not account for flash emissions and should not be used.

Flash Emissions: Preferred Emissions Determination Methods

- Direct measurement of emissions (code as "M")
- Process simulator models (code as "S")
- Exploration and Production (E&P) TANK program (code as "O")
- Vasquez-Beggs or Rollins, McCain, and Creeger correlations (code as "O")
  - For liquid hydrocarbons with an API gravity of less than 40 degrees
- Gas/oil ratio (GOR) method (code as "B")

Flash Emissions Determination Methods (cont.)

- Direct measurement of emissions
  - Requires both flow rate data and extended hydrocarbon speciation analyses
  - Ensure testing period captures separator liquid transfer to storage tank
- Process simulator models
  - Only as accurate as input data
  - May only estimate flash emissions
  - May require use of another method to estimate breathing and working loss emissions

Flash Emissions Determination Methods (cont.)

GOR method

- Uses pressurized sample collected upstream of tank
- Many different lab methods exist
- Ensure extended hydrocarbon analysis performed to specifically identify emitted compounds

E&P TANK

- API publishes and sells E&P TANK.

Reminder

- Must input a site-specific extended analysis to achieve accurate emissions and emissions speciation.

  When the "Low Pressure Oil" or "High Pressure Oil" option is chosen, be aware the program will use a default analysis unless site-specific data is entered.

E&P TANK (cont.)

The "Low Pressure Gas" option can be used to determine emissions if the following site-specific measurements and related data are available:

- lab analysis of gas sample from low pressure separator;
- lab analysis of GOR;
- lab analysis of hydrocarbon liquid produced (to obtain API gravity, RVP, and C_7 – C_{10}+ characteristics); and
- tank specifications and geographical location.

E&P TANK (cont.)

Documentation to support the GOR and other measurements should be included with the EI.

- A vapor sample of the sales gas is not a valid way to determine either a GOR or the compositional analysis of either the separator liquid or separator gas stream.
- The GOR and measurement data should be site-specific.
- The "Geographical Database" calculation option does not contain site-specific composition data and will not be accepted for known separator stream information.

E&P TANK (cont.)

- When the "AP-42" model option is selected for working and standing losses, enter detailed information for:

  tank size, shape, liquid bulk temperature, and ambient temperatures.
- The "RVP Distillation Column" model option does not allow these specifications.
- E&P TANK determines annual rates, not ozone season rates.
- Refer to *2019 Emissions Inventory Guidelines* Appendix A, Technical Supplement 6 to determine ozone season emissions using E&P TANK.

Other Types of Storage Tank Emissions

Emissions from the following activities should be determined using process simulators and/or engineering calculations and reported in the EI.

- Stirring or mixing of tank contents, including steam or air sparging in heated tanks, can increase evaporation of volatile product components.
- Blending of two or more chemicals and/or mixtures inside the storage tank could lead to chemical reactions, increased vapor pressures, or evaporative loss of lighter components in the mixture.

Questions?

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Equipment Leak Fugitive Sources: Common Emissions Reporting Methodologies

Steve O'Neal
Emissions Inventory Specialist, Air Quality Division

Presented to the 2020 Emissions Inventory Workshop
January 30, 2020

Overview

- Fugitive emissions defined
- Expected emissions
- Guidance and emission factor resources
- Component types
- Fugitive data form elements
- Types of leak detection and repair (LDAR) programs
- Emissions inventory (EI) requirements for determining emissions
  - Monitored
  - Unmonitored
  - Special Considerations

What are Fugitive Emissions?

Fugitive Definition

30 Texas Administrative Code (TAC) Chapter 101.1(39) defines fugitive emission as:

"Any gaseous or particulate contaminant entering the atmosphere that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening designed to direct or control its flow".

Expected Emissions

Fugitive emissions from piping components may include organic or inorganic compounds in a gaseous or liquid state, depending upon the composition of streams flowing through the associated piping components.

Guidance & Emission Factors Resources

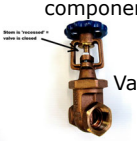
- *RG-360/19, 2019 EI Guidelines*, Appendix A, Technical Supplement 3: Fugitive Emissions from Piping Components
- "Emissions factors for Equipment Leak Fugitive Components" Emissions Assessment Section's (EAS) webpage
- "Protocol for Equipment Leak Emissions Estimates" (EPA-453/R-95-017)

Guidance & Emission Factors Resources (cont.)

- "Preferred and Alternative Methods for Estimating Fugitive Emissions from Equipment Leaks" (Emissions Inventory Improvement Program Document Series, Volume II, Chapter 4, November 1996)
- TCEQ Air Permits Technical Guidance for Chemical Sources-Fugitive Guidance

Traditional Components

Traditional Components refer to those component types traditionally reported as sources of fugitive emissions from piping components:



Valves

Pumps

Flanges

This also includes compressor seals, connectors, pressure relief valves, sampling connections, process drains, and open-ended lines.

Nontraditional Components

Nontraditional Components refer to those components traditionally not treated as sources of fugitive emissions, but identified as such by recent scientific studies.

Screw fittings

Liquid relief valves

Agitators

This includes heat exchanger heads, site glasses, bolted manways and hatches, blind flanges, caps and plugs, compression fittings, and metal-to-metal seals.

Nontraditional Components (cont.)

To determine this nontraditional component's emissions…	…use this factor
Agitator	Light liquid pump
Blind flange	Flange
Bolted manway or hatch	Flange
Cap or plug	Flange
Compression fitting	Flange
Heat exchanger head: unmonitored	Open-ended line
Heat exchanger head: monitored	Flange correlation equation

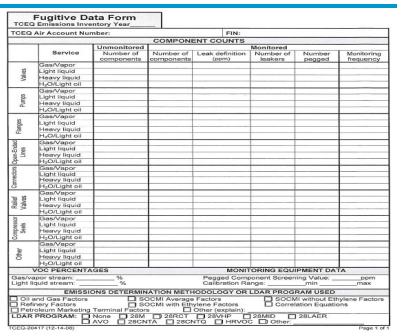
RG-360/19, *2019 EI Guidelines*,
Technical Supplement 3, Table A-6

Nontraditional Components (cont.)

To determine this nontraditional component's emissions…	…use this factor
Liquid relief valve	Light liquid value
Metal-to-metal seal	Flange
Screwed fitting	Flange
Site glass	Flange times two
Pressurized railcar loading arm: threaded connection	0.0214 pound (lb)/hour (hr)/component
Pressurized railcar loading arm: quick-connect coupler	0.0055 lb/hr/component

RG-360/19, *2019 EI Guidelines*,
Technical Supplement 3, Table A-6

Fugitive Data Form



Fugitive Data Form
TCEQ Emissions Inventory Year_____

TCEQ Air Account Number: FIN:

COMPONENT COUNTS

	Service	Unmonitored Number of components	Monitored Number of components	Leak definition (ppm)	Monitored Number of leakers	Monitored Number pegged	Monitored Monitoring frequency
Valves	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Pumps	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Flanges	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Open-Ended Lines	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Connectors	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Relief Valves	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Compressors	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Other	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						

VOC PERCENTAGES
Gas/vapor stream: _____ %
Light liquid stream: _____ %

MONITORING EQUIPMENT DATA
Pegged Component Screening Value: _____ppm
Calibration Range: _____min _____max

EMISSIONS DETERMINATION METHODOLOGY OR LDAR PROGRAM USED
☐ Oil and Gas Factors ☐ SOCMI Average Factors ☐ SOCMI without Ethylene Factors
☐ Refinery Factors ☐ SOCMI with Ethylene Factors ☐ Correlation Equations
☐ Bulk Gasoline Loading Terminal (Stage I Vapor Recovery)
LDAR PROGRAM: ☐ None ☐ 28M ☐ 28RCT ☐ 28VHP ☐ 28MID ☐ 28LAER
☐ AVO ☐ 28GNTA ☐ 28GNTG ☐ HRVOC ☐ Other

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https://www.tceq.texas.gov/assets/public/implementation/air/ie/pseiforms/EIF_21.pdf

Fugitive Data Form (cont.)

Fugitive Data Form
TCEQ Emissions Inventory Year_____

TCEQ Air Account Number:	FIN:

COMPONENT COUNTS							
	Service	Unmonitored	Monitored				
		Number of components	Number of components	Leak definition (ppm)	Number of leakers	Number pegged	Monitoring frequency
Valves	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Pumps	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Flanges	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Open-Ended Lines	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Connectors	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						

Fugitive Data Form (cont.)

Relief Valves	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Compressor Seals	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						
Other	Gas/Vapor						
	Light liquid						
	Heavy liquid						
	H_2O/Light oil						

VOC PERCENTAGES	MONITORING EQUIPMENT DATA
Gas/vapor stream: _____ %	Pegged Component Screening Value: _____ppm
Light liquid stream: _____ %	Calibration Range: _____min _____max

EMISSIONS DETERMINATION METHODOLOGY OR LDAR PROGRAM USED

☐ Oil and Gas Factors ☐ SOCMI Average Factors ☐ SOCMI without Ethylene Factors
☐ Refinery Factors ☐ SOCMI with Ethylene Factors ☐ Correlation Equations
☐ Petroleum Marketing Terminal Factors ☐ Other (explain): _____

LDAR PROGRAM: ☐ None ☐ 28M ☐ 28RCT ☐ 28VHP ☐ 28MID ☐ 28LAER
☐ AVO ☐ 28CNTA ☐ 28CNTQ ☐ HRVOC ☐ Other: _____

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How Do We Keep These Fugitives in Their Cells?

Types of LDAR Programs

- Two basic types of LDAR programs
  - Instrument monitoring
  - Physical inspection
- Main reasons for LDAR programs
  - Regulation (state or federal)
  - Best available control technology (BACT)
  - Reductions for impacts or netting

LDAR: Instrument Monitoring

- 28 M – BACT for fugitives >10 tons per year (tpy)
- 28 RCT – if subject to 30 TAC Chapter 115.352
- 28 VHP – BACT for fugitives >25 tpy
- 28 MID – used primarily for impact purposes
- 28 LAER – used in nonattainment areas
- 28 CNTA – connectors inspected annually
- 28 CNTQ – connectors inspected quarterly

https://www.tceq.texas.gov/permitting/air/guidance/newsourcereview/fugitives/nsr_fac_eqfug.html

LDAR, AVO, and Other: Physical Inspection

- 28 PI – physical inspection
- 28 PET – petroleum marketing
- 28 NG – natural gas (has been replaced by 28 PI)
- 28 AVO – Audio Visual Odorous and readily detected compounds: ammonia, chlorine, hydrogen sulfide, hydrogen fluoride, hydrogen cyanide, and mercaptans

Determining Equipment Leak Fugitive Emissions

Sites with instrument monitoring programs should use the mandatory data for EI reporting.

- Most LDAR programs require retention of monitoring data (i.e., screening values) for individual components.
- Use actual monitoring data in conjunction with correlation equations.

Determining Equipment Leak Fugitive Emissions (cont.)

- Monitored components
  - Routinely monitored
  - Intermittently monitored
- Unmonitored components
  - Average emissions factors
  - Monitoring program credits to reduce emissions not allowed, with few exceptions
- Special considerations

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Monitored Components

- The use of unit-specific correlation equations is preferred.
- If those are not available, use United States Environmental Protection Agency (EPA) correlation equations for appropriate industry type.
  - Synthetic Organic Chemical Manufacturing Industry (SOCMI) components
  - Petroleum industry components (e.g., refineries, marketing terminals)

Monitored Components (cont.)

- Multiple monitoring periods typically occur during a year.
- For each monitoring period determine emissions using that period's component information and screening data.
  - Sum the emissions from each monitoring period to determine annual emissions.

Using Monitoring Data to Determine Component Emissions

- Each screening value obtained will be relative to the compound used to calibrate the instrument.
  - Adjust the screening values by the instrument response factor (obtained either through testing or by reference).
  - Refer to Method 21, applicable regulations, and the EPA protocol for more information.
- Substitute EPA default zero leak factors for screening values of zero.

Using Monitoring Data to Determine Component Emissions (cont.)

- Do not average screening values obtained over the course of a calendar year.
- For leaking components, assume component was leaking for at least half of the monitoring period's duration.

Clarification

- Components in a monitoring program area that are not instrument monitored should use average factors.
  - If a weekly physical inspection program is in place, a 30% emissions reduction credit can be applied to the average factors.

Using Monitoring Data to Determine Component Emissions (cont.)

- If the instrument can quantify screening values above 100,000 part per million (ppm), use those readings in the correlation equations.
- For each pegged screening value, use the EPA default 100,000 ppm pegged leak rate factor.
  - If the instrument cannot quantify screening values between 10,000 and 100,000 ppm, use the default 100,000 ppm pegged leak rate factor.

Screening value	Determine emissions using …
Zero	The default zero leak rate factor
Nonzero and nonpegged	The screening value in the applicable correlation equation
Pegged	The default 100,000 ppm pegged leak rate factor

Using Monitoring Data to Determine Component Emissions (cont.)

- Certain regulations or site-specific permit conditions may authorize certain components to be monitored intermittently (e.g., once every four years) instead of routinely (e.g., quarterly).
  - These may include difficult-to-monitor components.
- For intermittently monitored components, use correlation equations and the most recent available screening values.
- If the component was found to be leaking, account for the leak when determining emissions.

Monitoring Programs that Do Not Use Instruments

- Odorous or toxic inorganic compounds that cannot be monitored by instrument may be required to have an AVO inspection program.
- AVO programs are different than a weekly walk-through or physical inspection.
  - Typically performed once per shift versus once per week
  - Reduction credits are different
- For these units, determine emissions using average factors with AVO reduction credits applied.

Unmonitored Components

- Can be present at either:
  - site that monitors components (i.e., components are exempt from monitoring requirements) or
  - site not subject to equipment leak fugitive monitoring regulations
- Use EPA or Texas Commission on Environmental Quality (TCEQ) average emissions factors for appropriate industry type:
  - SOCMI
  - oil and gas production
  - refinery
  - petroleum-marketing terminal

Unmonitored Components (cont.)

- Within each industry type, factors vary depending upon industry subcategory (if applicable), component type, and service type.
- Service types include:
  - heavy liquid (vapor pressure ≤ 0.044 lbs per square inch absolute [psia] at 68°F);
  - light liquid (vapor pressure > 0.044 psia at 68°F);
  - water/light liquid;
  - gas/vapor.
- Component types are generally self-explanatory.

  If "other" component type is best fit, check TCEQ's nontraditional component factor list for guidance on determining emissions from these components.

Unmonitored Components (cont.)

Industry subcategories include:

- SOCMI factors
  - Average: stream contains between 11% and 85% ethylene by weight (wt% ethylene)
  - Without ethylene: stream contains < 11 wt% ethylene
  - With ethylene: stream contains >85 wt% ethylene
- Oil and gas factors
  - Natural gas
  - Heavy oil (less than 20° American Petroleum Institute [API] gravity)
  - Light oil (greater than 20° API gravity)
  - Water/light oil (light oil streams with 50% to 99% water by weight)
- Petroleum marketing terminal
  - Requires monthly walk-through inspection program
  - If inspection is not performed, use refinery factors

Special Considerations: Unmonitored Component Emissions

- Use of average emissions factors with monitoring program reduction credits generally not allowed.
- There are exceptions for AVO monitoring program (see earlier slide) and connector monitoring programs.
  - For a weekly physical inspection program where no instrument monitoring is performed, a 30% emissions reduction credit applied to average factors is allowed.
- Hours of operation used in average factor calculations must be 8,760 unless lines are purged.
  - Emissions will occur whenever material is present in the line.

Special Considerations: Unmonitored Component Emissions (cont.)

- Use most appropriate industry type when determining emissions.
- Different process units present at a site may require the use of factors from more than one industry type.
  - Example: For a refinery with a methyl tert-butyl ether (MTBE) production unit use refinery factors for the refinery units and SOCMI factors for the MTBE units.

Special Considerations: Unmonitored Component Emissions (cont.)

Petroleum marketing terminal factors are used to determine emissions from components at gasoline distribution facilities that are one step removed from local gasoline stations.

- Pipeline breakout stations in crude oil and refined product service **can** use these factors.
- Other types of terminals, loading racks at other sites, and upstream oil and gas sites **should not** use these factors.

Special Considerations: All Component Types

- How do we handle exempt components?
  - Some components can be exempt from monitoring due to size, vapor pressure, location, or other reasons.
  - Regardless of monitoring status, determine and report emissions for these components in the EI.
- Lookout for software programs designed to calculate emissions using screening data from monitored components inadvertently *excluding* non-monitored components.

Special Considerations: All Component Types (cont.)

- Controls

  Although monitoring program credits are typically not allowed, 100% control credit can be claimed for relief valves, pumps, valves, connectors, and compressors; and double mechanical seals can take 75% control that:
  - meet certain design specifications or
  - vent to a control device.
- Quantify emissions from nontraditional components.

  These could include blind flange, heat exchanger head, and/or site glass.

Special Considerations: Insulated Components

Emissions from insulated components will eventually escape to the atmosphere and should be included in the EI.

- If they are monitored use correlation equations.
- If they are **not** monitored use average factors.
- For weekly physical inspection, a 30% reduction can be applied if the leak can be pinpointed to the component and insulation removed to repair the leak.

Emission Determination Methodologies

- Unit-specific correlation equations (Code as "M")

  Note: Developed using bagging data in accordance with EPA guidelines

- EPA correlation equations (Code as "A")

  Note: Uses screening values from LDAR program

- AVO (Code as "A")

- EPA industry average factors (Code as "A")

  Four categories: SOCMI, oil and gas production, refinery, and petroleum marketing terminals

Fugitive Data Form

TCEQ Emissions Inventory Year 2018

TCEQ Air Account Number: HGXXXX FIN: OLD-LEAKY

COMPONENT COUNTS

	Service	Unmonitored Number of components	Unmonitored Number of components	Leak definition (ppm)	Monitored Number of leakers	Number pegged	Monitoring frequency
Valves	Gas/Vapor	27	1248	500	10	0	Q
	Light liquid	40	3808	500	23	0	Q
	Heavy liquid	1338	4	500	0	0	AVO
	H_2O/Light oil	-	-	-	-	-	-
Pumps	Gas/Vapor	1	0	500	0	0	M
	Light liquid	59	19	500	0	0	M
	Heavy liquid	38	1	500	0	0	AVO
	H_2O/Light oil	-	-	-	-	-	-
Flanges	Gas/Vapor	58	1855	500	7	0	Q
	Light liquid	211	4218	500	3	0	Q
	Heavy liquid	1598	1	500	1	0	AVO
	H_2O/Light oil	-	-	-	-	-	-
Open-Ended Lines	Gas/Vapor	-	-	-	-	-	-
	Light liquid	-	-	-	-	-	-
	Heavy liquid	-	-	-	-	-	-
	H_2O/Light oil	-	-	-	-	-	-
Connectors	Gas/Vapor	11	512	500	4	0	Q
	Light liquid	49	2273	500	16	0	Q
	Heavy liquid	814	1	500	0	0	AVO
	H_2O/Light oil	-	-	-	-	-	-
Relief Valves	Gas/Vapor	84	9	500	0	0	Q
	Light liquid	25	6	500	0	0	Q
	Heavy liquid	14	0	500	0	0	AVO
	H_2O/Light oil	-	-	-	-	-	-
Compressor Seals	Gas/Vapor	-	-	-	-	-	-
	Light liquid	-	-	-	-	-	-
	Heavy liquid	-	-	-	-	-	-
	H_2O/Light oil	-	-	-	-	-	-
Other	Gas/Vapor	307	111	500	3	0	Q
	Light liquid	1288	107	500	5	0	Q
	Heavy liquid	539	1	500	1	0	AVO
	H_2O/Light oil	-	-	-	-	-	-

VOC PERCENTAGES

Gas/vapor stream: 62 %

Light liquid stream: 88 %

MONITORING EQUIPMENT DATA

Pegged Component Screening Value: 100,000 ppm

Calibration Range: 0 min 10,000 max

EMISSIONS DETERMINATION METHODOLOGY OR LDAR PROGRAM USED

☐ Oil and Gas Factors ☒ SOCMI Average Factors ☐ SOCMI without Ethylene Factors

☐ Refinery Factors ☐ SOCMI with Ethylene Factors ☒ Correlation Equations

☐ Petroleum Marketing Terminal Factors ☐ Other (explain):

LDAR PROGRAM: ☐ None ☐ 28M ☐ 28RCT ☐ 28VHP ☐ 28MID ☐ 28LAER

☒ AVO ☐ 28CNTA ☐ 28CNTG ☐ HRVOC ☐ Other

Summary

- Fugitive emissions defined
- Expected emissions
- Guidance and emission factors resources
- Component types
- Fugitive data form elements
- Types of LDAR programs
- EI requirements for determining emissions
  - Monitored
  - Unmonitored
  - Special Considerations

Questions?

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Point Source EI webpage:
www.tceq.texas.gov/goto/ieas

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Combustion Sources

Ryan Underhill
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Presented to the 2020 Emissions Inventory Workshop
January 30, 2020

Overview

- Combustion sources
  - Required data
  - Abatement device structure
  - Expected emissions
- Determination methodologies
  - Continuous emissions monitoring system (CEMS)
  - Stack test
  - Portable analyzer
  - Vendor data
- Emissions reporting
  - Particulate matter (PM)
  - Volatile organic compounds (VOCs)
  - Nitrogen oxides (NO_X)
  - Sulfur dioxide (SO_2)
  - Flare emissions

Unit Abbreviations

Btu	British thermal unit
dscf	dry standard cubic foot
g	grams
hp-hr	horsepower-hour
hr	hour
lb	pound
lb-mol	pound-mole
MM	one million
ppm	parts per million
scf	standard cubic foot
tpy	tons per year
yr	year

Combustion Sources

Common combustion sources: engines, heaters, boilers, flares, thermal oxidizers (TOs), and vapor combustion units (VCUs)

Combustion Sources (cont.)

- Were NO_X emissions factors (EFs) reported in the emissions inventory (EI)?
- Were annual aggregate heat input totals in MMBtu/yr reported in the EI?

EI Structure: Abatement Devices

- An emissions path is the association of one facility identification number (FIN), any applicable control identification numbers (CINs), and one emissions point number (EPN).
- Was each abatement device used to control emissions represented in EI structure with a CIN?
  - Flares, TOs, VCUs, etc.
    Add CIN to the <u>process stream</u> path
    e.g. FIN TANK1 / CIN FL1 / EPN FL1
  - Engine catalysts
    Add CIN to the <u>combustion</u> path
    e.g. FIN COMP1 / CIN CAT1 / EPN COMP1

Emissions

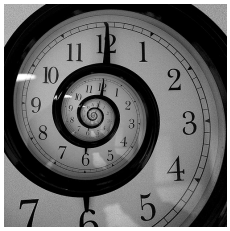
- Expected emissions are products of combustion.
  - NO_X
  - CO (carbon monoxide)
  - SO_2
  - PM
  - PM ≤ 10 microns in diameter (PM_{10})
  - PM ≤ 2.5 microns in diameter ($PM_{2.5}$)
  - VOCs
  - Hazardous air pollutants
    - Reporting threshold: ≥0.1 tpy
    - Example: formaldehyde from engines
- Water and carbon dioxide are **not** required to be reported in the EI.

Determination Methodologies

- Combustion source determination methodologies below are in order of preference.
  - D (CEMS)
  - F (predictive emissions monitoring system, or PEMS)
  - M (measured: stack test data)
  - Q (portable analyzer test data)
  - V (vendor supplied emissions factor)
  - A (AP-42 or other EPA-approved factor)
  - B (material balance)
  - S (scientifically calculated)
  - E (estimated)
- Rarely, there are exceptions to the order of preference, which are documented in the *Emissions Inventory Guidelines*.

Determination Methodologies (cont.)

Data (e.g. stack test) from a year subsequent to an EI year must not be used to revise emissions.



CEMS

- Operate according to the United States Environmental Protection Agency (EPA) or the Texas Commission on Environmental Quality (TCEQ) standards.
- Account for emissions during CEMS downtime.

CEMS (cont.)

- Provide a representative set of summary sheets from relative accuracy test audits.
- Differences between CEMS and continuous monitoring system (CMS):
  - CEMS (method code "D") generates real-time emissions data 24 hours a day and
  - CMS (method code "B") measures the gas composition of a process stream and does not quantify emissions released to the atmosphere.

Stack Test

- A stack test should be representative of routine operations and processes.
- Ensure that the correct units are used when calculating emissions.
- Use the process-based emissions factor (lb/MMBtu), not the (lb/hr) emissions factor.
- Provide stack test summary pages from the testing company.
  - EI staff may request the full stack test report on a case-by-case basis.
  - Ensure summary pages clearly identify the FIN or EPN.

Stack Test (cont.)

- The most recent stack test taken during or prior to the reporting year should be used.
- If multiple stack tests were performed in the same calendar year, average the test results.

Stack Test (cont.)

- Typically, stack tests performed over multiple years are NOT averaged.
- If there are identical units at a site, but stack-test data is only available for one of them, the TCEQ may approve the use of the stack-test data for the identical units which weren't tested.
  - Code as "E" for estimated in the EI.
  - This method is typically preferred when no CEMS, PEMS, or stack tests exist for the untested units.

Portable Analyzer Test

- A portable analyzer test should be representative of routine operations and processes.
- If a combustion source is tested quarterly, apply quarterly results to determine emissions for each quarter.

  Averaging may or may not be appropriate, depending on the source operation.
- Provide quarterly reports, identifying combustion sources by FIN or EPN.

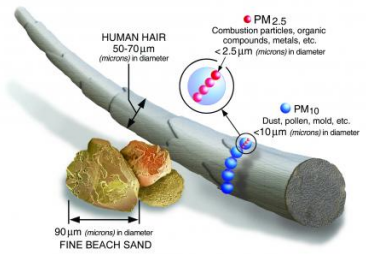
Vendor Data

- Ensure there have been no major modifications to the equipment or significant changes in fuel characteristics that would invalidate the factors.
- If a source is equipped with a catalyst, be sure to apply the appropriate reductions guaranteed by the catalyst vendor.
- Provide vendor specification sheets in the supporting documentation.

Emissions Reporting

PM: Official Definitions

PM emissions are defined in 30 Texas Administrative Code Section 101.1 (76) and (77) as both filterable and condensable particulate matter.

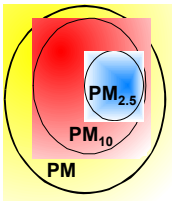


PM: Filterable + Condensable

- What do these definitions mean for EI reporting?
  - Both the filterable (front-half) and condensable (back-half) emissions must be added together and reported as PM, PM_{10}, and $PM_{2.5}$ emissions.
  - If condensable emissions were not tested, then an alternative method must be used to determine condensable PM emissions.
- Specific PM, PM_{10}, and $PM_{2.5}$ reporting guidance can be found in the *Emissions Inventory Guidelines.*
  - "Chapter 4: Determining and Reporting Emissions"
  - "Technical Supplement 1: Selected Combustion Sources"

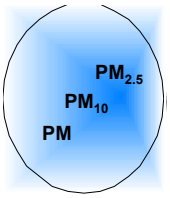
PM, PM_{10}, and $PM_{2.5}$

- PM total is PM filterable (front-half) plus PM condensable (back-half).
- PM_{10} is the subset of PM less than or equal to 10 micrometers in size.
- $PM_{2.5}$ is the subset of PM and PM_{10} less than or equal to 2.5 micrometers in size.
- Reporting emissions as PM, PM_{10}, and $PM_{2.5}$ does not result in triple counting of emissions.



PM: Natural Gas Combustion

- For natural gas combustion, all particulate matter is less than 1 micrometer in diameter, so PM = PM_{10} = $PM_{2.5}$.
- Report total PM emissions under each contaminant code.
  - 10000 (PM-unclassified)
  - 20000 (PM_{10})
  - 39999 ($PM_{2.5}$)



PM: Natural Gas Combustion (cont.)

- For a natural gas-fired reciprocating engine, add the respective AP-42 Section 3.2 PM condensable factor to the filterable factor to obtain a total PM factor.
- For external combustion sources, AP-42 Section 1.4 provides a total PM factor in addition to filterable and condensable factors.

PM: Natural Gas Combustion (cont.)

Example: Using AP-42 Section 3.2 emissions factors, determine the PM emissions factor for a 4-cycle rich burn (4CRB) engine.

- PM (condensable) = 0.00991 lb/MMBtu
  PM_{10} (filterable) = 0.0095 lb/MMBtu
  $PM_{2.5}$ (filterable) = 0.0095 lb/MMBtu
- Add the PM condensable factor to either the PM_{10} or $PM_{2.5}$ filterable factor to obtain a total PM factor.
  0.00991 lb/MMBtu + 0.0095 lb/MMBtu = 0.01941 lb/MMBtu
- The summed 0.01941 lb/MMBtu is the 4CRB emissions factor for PM, PM_{10}, and $PM_{2.5}$.

VOC Emissions

- Only use the AP-42 VOC factor to calculate total VOC emissions when no better methodology (e.g. stack test, vendor data) is available.
- Occasionally, stack test or vendor data provides total hydrocarbons (THC) or Total Organic Compounds (TOC) instead of VOC.
  - Determine VOC emissions by multiplying the THC or TOC emissions factor by the appropriate AP-42 ratio.

$$\text{TOC EF} \times \frac{\text{AP-42 VOC emissions factor}}{\text{AP-42 TOC emissions factor}}$$

  - Do not apply the inlet gas VOC percentage to the THC factor to obtain a VOC factor.
  - Code emissions as "S" for scientifically calculated.

VOC Emissions (cont.)

Example: Using the AP-42 ratio method, determine a VOC emissions factor if given a 5 g/hp-hr TOC stack test factor for a 4CRB engine.

- AP-42 VOC emissions factor / AP-42 TOC emissions factor

$$\frac{0.296\ \text{lb/MMBtu}}{0.358\ \text{lb/MMBtu}} = 0.827$$

- TOC stack test factor × AP-42 ratio = VOC factor

$$5\ \text{g/hp–hr} \times 0.827 = \boxed{4.13\ \text{g/hp–hr}}$$

- Emissions coded "S" for scientifically calculated

VOC Speciation

To speciate VOC emissions with a <u>total</u> VOC factor, use the following steps.

- Locate AP-42 "Trace Organic Compound" emissions factors rated "C" or better (i.e. "A", "B", or "C").
- Divide each AP-42 trace organic factor by the AP-42 VOC emissions factor to obtain contaminant speciation ratios.
- Multiply the total VOC emissions by each speciation ratio to obtain speciated compound emissions.
- Code speciated compound emissions as "S" for scientifically calculated.
- Report remainder VOC as VOC-unclassified (50001) and code as either "M" for stack test or "V" for vendor data.

VOC Speciation (cont.)

Example: Speciate VOC emissions (1.2 tpy) for a 4-cycle lean burn (4CLB) engine when only a <u>total</u> VOC vendor factor is provided.

- Formaldehyde is rated "A" for a 4CLB.
- Determine the contaminant speciation ratio for formaldehyde.

$$\frac{0.0528\ \text{lb/MMBtu}}{0.118\ \text{lb/MMBtu}} = 0.447$$

- Multiply the total VOC emissions by the speciation ratio.
  1.2 tpy of VOC × 0.447 = 0.536 tpy of formaldehyde (coded "S")
- Calculate the remainder VOC.
  1.2 tpy of VOC – 0.536 tpy = 0.664 tpy of VOC-unclassified (coded "V")

VOC Speciation (cont.)

Watch Out

- More complicated scenarios exist when a stack test or vendor formaldehyde factor is provided and/or the VOC factor excludes formaldehyde.
- Specific VOC speciation guidance can be found in "Technical Supplement 1: Selected Combustion Sources" of the *Emissions Inventory Guidelines*.

NO_X Emissions

The EPA and TCEQ defined NO_X molecular weight of 46.01 lb/lb-mole must be used when converting from ppm to determine a mass emissions rate.

NO_X ppm × Fuel Factor (dscf/MMBtu) ×

$$\left(\frac{\text{lb-mol}}{385\ \text{scf}}\right) \times \left(\frac{46.01\ \text{lb NO}_X}{\text{lb-mol}}\right) \times \left(\frac{20.9}{20.9 - \text{O}_2\%}\right) = \frac{\text{lb NO}_X}{\text{MMBtu}}$$

NO_X Emissions (cont.)

Example: Determine the NO_X emissions rate given a concentration of 300 ppm NO_X, a fuel factor of 8400 dscf/MMBtu, and excess oxygen at 4%.

$$\left(\frac{300}{1{,}000{,}000}\right) \times \left(\frac{8400\ \text{dscf}}{\text{MMBtu}}\right) \times \left(\frac{\text{lb-mol}}{385\ \text{scf}}\right) \times$$

$$\left(\frac{46.01\ \text{lb NO}_X}{\text{lb-mol}}\right) \times \left(\frac{20.9}{20.9 - 4}\right) = \frac{0.372\ \text{lb NO}_X}{\text{MMBtu}}$$

SO_2 Emissions

- If higher order methods such as CEMS or representative stack test data are not available, emissions should be determined using a material balance (method code "B") based on the sulfur content of the fuel.
- If the unit burns <u>only</u> pipeline quality sweet natural gas, vendor or AP-42 factors can be used.
- For flares, use a material balance and apply the destruction removal efficiency (DRE) of the flare to determine emissions.

SO_2 Emissions (cont.)

Example: Determine hydrogen sulfide (H_2S) and SO_2 emissions if 10 MMscf was flared, the gas composition is 0.1% H_2S by volume, and the flare's DRE is 98%.

–H_2S flared:

10 MMscf × 0.001 = 0.01 MMscf H_2S

$$0.01 \text{ MMscf } H_2S \times \left(\frac{10^6 \text{ scf}}{\text{MMscf}}\right) \times \left(\frac{\text{lb-mol}}{379.3 \text{ scf}}\right) \times \left(\frac{34.1 \text{ lbs}}{\text{lb-mol}}\right) = 899 \text{ lbs } H_2S$$

–H_2S emitted:

$$899 \text{ lbs } H_2S \times 0.02 = \boxed{17.98 \text{ lbs } H_2S}$$

–SO_2 emitted:

$$899 \text{ lbs } H_2S \times 0.98 \times \left(\frac{\text{lb-mol}}{34.1 \text{ lb } H_2S}\right) \times \left(\frac{64.1 \text{ lb } SO_2}{\text{lb-mol}}\right) = \boxed{1{,}656 \text{ lbs } SO_2}$$

Flare Emissions

- To calculate emissions, heat release in MMBtu must be determined using the flow and composition of the waste gas stream.
- NO_X and CO emissions factors (method code "A") are found in "Technical Supplement 4: Flares" of the *Emissions Inventory Guidelines.*
  - Choose the appropriate factors based on assist type and waste gas stream net heating value.
  - If a waste gas stream's net heating value varied between high Btu (>1000 Btu/scf) and low Btu (192-1000 Btu/scf), calculate heat release under each operating scenario and then apply the appropriate factors.
- TCEQ flare factors are preferred over AP-42 Section 13.5 flare factors for EI reporting.

Flare Emissions (cont.)

- Waste gas that escapes destruction by the flare should be reported on the process stream path.
  - e.g. Report VOC and H_2S on:
    FIN AMINE1 / CIN FL1 / EPN FL1
- Products of combustion created from the destruction of waste gas should be reported on the combustion path.
  - e.g. Report NO_X, CO, and SO_2 on:
    FIN FL1 / EPN FL1

Combustion Sources: Things to Remember

- Remember to update the EI every year.
- Use the best available methodology for each source and contaminant for the given year.
- References can be found in the *Emissions Inventory Guidelines*.
  - "Chapter 4: Determining and Reporting Emissions"
  - "Technical Supplement 1: Selected Combustion Sources"
  - "Technical Supplement 4: Flares"

Questions?

Ryan Underhill:
(512) 239-4087
ryan.underhill@tceq.texas.gov

EAS helpline:
(512) 239-1773
psinvent@tceq.texas.gov

Point Source EI webpage:
www.tceq.texas.gov/goto/ieas

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Emissions Banking and Trading (EBT) STEERS Applications

Emissions Banking and Trading
Air Quality Division

January 30, 2020

Acronym List

Acronym	Meaning
DERC	Discrete Emission Reduction Credit
EBT	Emissions Banking and Trading
EBTA	Emissions Banking and Trading of Allowances
EBT-CERT	Emissions Banking and Trading Certification
EF	Emission Factor
ERC	Emission Reduction Credit
HECT	Highly Reactive Volatile Organic Compounds Cap and Trade
LOA	Level of Activity
MECT	Mass Emissions Cap and Trade
STEERS	State of Texas Environmental Electronic Reporting System

EBT Programs

Mandatory cap and trade programs

- MECT, HECT, and EBTA
- Enforceable emission caps on affected sources

Voluntary emission reduction credit programs

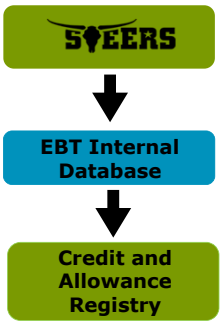
- ERC and DERC
- Credits for reducing emissions below required limits

EBT and Emissions Inventory

- The amount of emissions reported to EI affects the amount of ERCs or DERCs the site is eligible to generate.
- Using best available quantification methods in EI reporting is advantageous if you plan to participate in EBT programs.

What is EBT STEERS?

- TCEQ online reporting system
- Not all aspects controlled by EBT
- Electronic EBT applications
- Submitted applications available on EBT registry



What Can I Submit Through STEERS?

Trades*	Annual Reports	Credit Generation
• MECT • HECT • EBTA • ERC • DERC	• MECT • HECT • EBTA	• ERC • DERC

Update facility and contact information

*No permanent allocation (stream) trades

When are Applications Due?

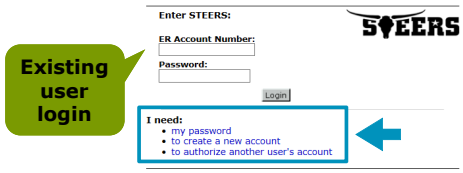
Application Type	Due Date
MECT and HECT trades	January 30
MECT and HECT annual reports	March 31
EBTA trades	June 1
EBTA annual reports	June 30
ERC generations	2 years after reduction date (some exceptions)
DERC generations	90 days after generation period (generation period ≤ 12 months)

Before You Start…

- Internet Explorer or Firefox (avoid Chrome)
- STEERS account for each user
- EBT portfolio
  - Portfolio Number = "P" + 4 digits (P1234)
  - No portfolio? Email us at ebt@tceq.texas.gov

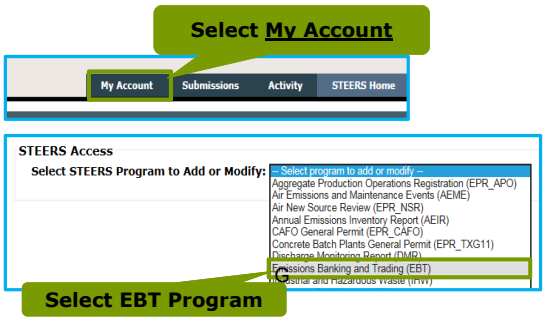
Setting Up Your Account

STEERS web page



New user: follow instructions to create new account

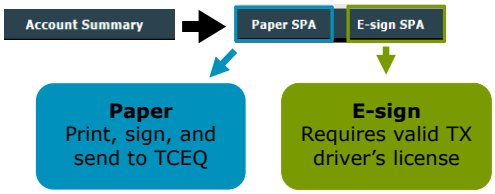
Adding the EBT Program



Adding the EBT Program (cont.)

Program Status	• Read only • Edit (prepares application) • Sign and Submit
Authorization	• Facility (site) • Parent company • Other
Add Portfolio(s)	• Enter EBT portfolio number(s) • Example: P1234 • Contact EBT Team for help

STEERS Participation Agreement



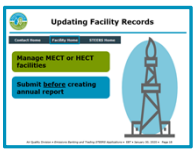
Account will be on Probation until SPA is submitted.

Updating Contact Information

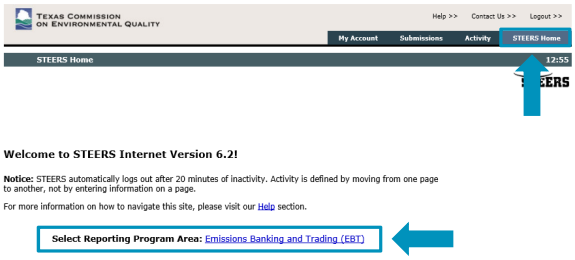
Authorized Account Representative (AAR)	• Required • Site's Responsible Official or designee • "Sign and Submit" access
Alternate AAR	• Optional • Site's Responsible Official or designee • "Sign and Submit" access
Technical Contacts	• Optional • Assists with technical questions • "Read and Edit" or "Read Only" access

Contact Home Demonstration

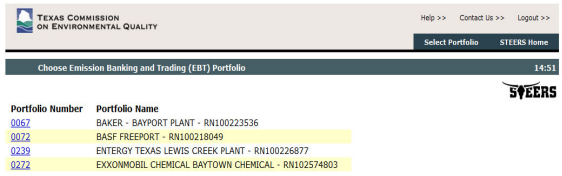
Next up:



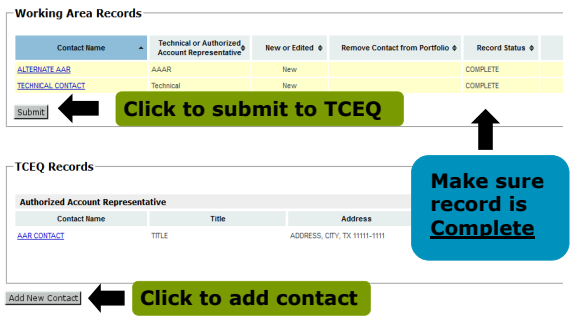
Contact Example



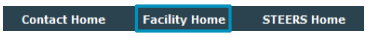
Contact Example (cont.)



Contact Example (cont.)

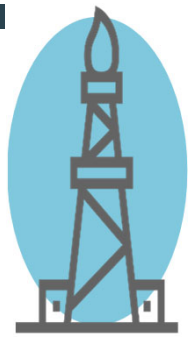


Updating Facility Records



Manage MECT or HECT facilities

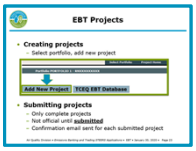
Submit <u>before</u> creating annual report



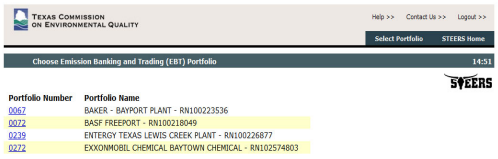
Facility Home Demonstration

STEERS

Next up:



Facility Home Example



Facility Home Example (cont.)

Facility Home Example (cont.)

STEERS

Portfolio Detail

Portfolio Number: P0067
Customer Name: BAKER PETROLITE LLC
Customer Reference Number: CN600127195
Regulated Entity Name: BAYPORT PLANT
Regulated Entity Reference Number: RN100223536
Account Number: HG0564L

Working Area Records

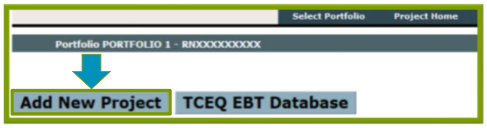
	Program	FIN	FIN Name	EPN	EPN Name	Facility Type	Facility Status	Record Status	New or Edited	

TCEQ Records

Program	FIN	FIN Name	EPN	EPN Name	Facility Type
MECT	B-601	UTILITIES BOILER NO. 1-7352	B-601	B-601	BOILER
MECT	B-602	UTILITIES BOILER NO. 2-7353	B-602	B-602	BOILER
MECT	H-601	HOT OIL HEATER-417	H-601	H-601	PROCESS HEATER

EBT Projects

- **Creating projects**
  - Select portfolio, add new project



- **Submitting projects**
  - Only complete projects
  - Not official until **submitted**
  - Confirmation email sent for each submitted project

Trade Projects

Allowance Trades	Credit Trades
MECT, HECT, and EBTA	ERCs and DERCs
Single-year current or vintage trades only	Traded by certificate
Deadlines MECT/HECT: January 30 EBTA: June 1	Credits in portfolio before use (trade completed)—use before expiration

Seller's AAR must submit trades

Annual Reports

MECT, HECT, and EBTA Programs

MECT and HECT: go to Facility Home first

MECT and HECT reports due by March 31

EBTA reports due by June 30

Credit Generation

ERC and DERC Sources

- Point Sources
- Area Sources
- Mobile Sources

Application deadlines in 30 TAC Division 1 (ERC) and Division 4 (DERC)

EBT-CERT

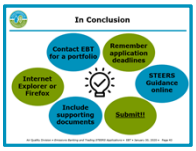
EBT-CERT

- Sent to AAR after EBT reviews project
- AAR must certify through STEERS
- Generator must comply with all EBT-CERT conditions
- Non-compliance is a violation and could result in enforcement action

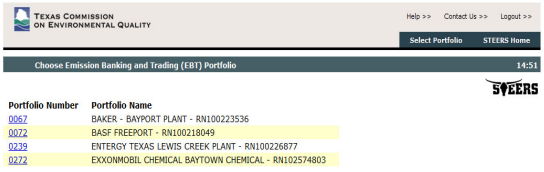
Projects Demonstration

STEERS

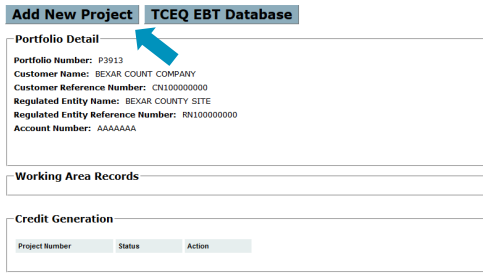
Next up:



Creating a Trade Project



Creating a Trade Project (cont.)



Creating a Trade Project (cont.)

Work Area | **TCEQ EBT Database**

Portfolio Detail

Portfolio Number: P3913
Customer Name: BEXAR COUNT COMPANY
Customer Reference Number: CN100000000
Regulated Entity Name: BEXAR COUNTY SITE
Regulated Entity Reference Number: RN100000000
Account Number: AAAAAAA

Create New Annual Compliance Report

Program: Select Program
Reporting Year:
Create New Report

Select the Program

Create New Trade Project

Program: Select Program
Create New Trade

Creating a Trade Project (cont.)

Project Information

Pollutant Code: NOX
Control Period: 2017
Trade Details:

	Ton Amount	Dollars/Ton
CURRENT		
VINTAGE		

Select the Buyer's portfolio number or enter the portfolio number if it is not listed:

Select Buyer Portfolio: Select Portfolio

---------- or ----------

Enter Buyer Portfolio:

Project Note: Enter a note (up to 255 characters) to provide any additional information about this trade.
If the Dollars/Ton value is $0.00 a Project Note is required.

Creating an Annual Report

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Help >> Contact Us

Select Portfolio | Project Home | Contact Home | Facility Home

Portfolio BAKER - BAYPORT PLANT - RN100223536

Add New Project | **TCEQ EBT Database**

Portfolio Detail

Portfolio Number: P0067
Customer Name: BAKER PETROLITE LLC
Customer Reference Number: CN600127195
Regulated Entity Name: BAYPORT PLANT
Regulated Entity Reference Number: RN100223536
Account Number: HG0564L

Working Area Records

Annual Report Example (cont.)

Work Area | **TCEQ EBT Database**

Portfolio Detail

Portfolio Number: P3913
Customer Name: BEXAR COUNT COMPANY
Customer Reference Number: CN100000000
Regulated Entity Name: BEXAR COUNTY SITE
Regulated Entity Reference Number: RN100000000
Account Number: AAAAAAA

Select the Program

Create New Annual Compliance Report

Program: Select Program
Reporting Year:

Create New Report

Create New Trade Project

Program: Select Program

Create New Trade

MECT Report Example

MECT Annual Compliance Report

FIN: BOILER	Fin Name: BOILER-11123				EPN:	CEMS/PEMS: No
LOA	LOA Units	LOA Citation	EF	EF Units	EF Citation	Tons Reported
19428.000000	MMBTU	117.2035(a)(1)	0.053000	LB/MMBTU	117.340(o)	0.51

FIN: ENGINE	Fin Name: ENGINE-11118				EPN:	CEMS/PEMS: No
LOA	LOA Units	LOA Citation	EF	EF Units	EF Citation	Tons Reported
70241.000000	HP-HR	117.2035(a)(1)	0.098000	G/HP-HR	117.340(o)	0.01

FIN: HEATER	Fin Name: HEATER-11119				EPN:	CEMS/PEMS: Yes
LOA	LOA Units	LOA Citation	EF	EF Units	EF Citation	Tons Reported
68714.000000	MMBTU	117.2035(a)(1)	not applicable	SELECT UNIT	117.340(c),(f)	1.30

TOTAL TONS 1.9

Total tons round <u>up</u> to the tenth of a ton for MECT and HECT

Credit Generation Project

Texas Commission on Environmental Quality

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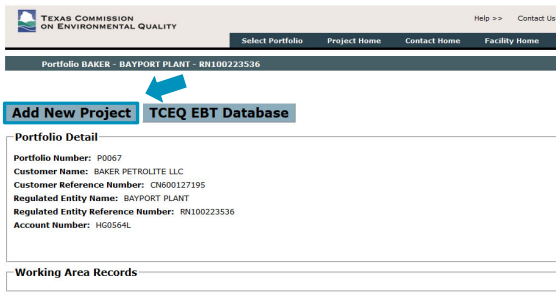
Select Portfolio | STEERS Home

Choose Emission Banking and Trading (EBT) Portfolio 14:51

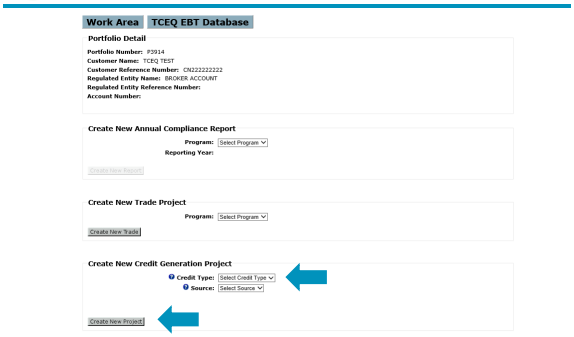
STEERS

Portfolio Number	Portfolio Name
0067	BAKER - BAYPORT PLANT - RN100223536
0072	BASF FREEPORT - RN100218049
0239	ENTERGY TEXAS LEWIS CREEK PLANT - RN100226877
0272	EXXONMOBIL CHEMICAL BAYTOWN CHEMICAL - RN102574803

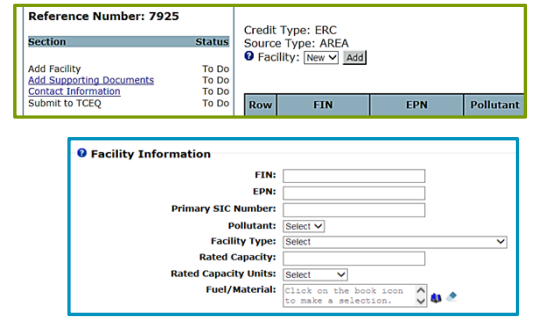
Credit Generation Example (cont.)



Credit Generation Example (cont.)



ERC Generation Example (cont.)



ERC Generation Example (cont.)

Applicable Regulations

Permit Authorization Type: Click on the book icon to make a selection.

Permit Number:

Cap and Trade Programs: Click on the book icon to make a selection.

30 TAC Chapter 115: Click on the book icon to make a selection.

30 TAC Chapter 117: Click on the book icon to make a selection.

State Regulations:

40 CFR Part 60: Click on the book icon to make a selection.

ERC Generation Example (cont.)

Pollutant: NOX
Reduction Strategy: PERMANENT SHUTDOWN
Reduction Date: 09/01/2017
County Name: BRAZORIA
Are emissions shifting?: YES ○ NO ◉

	Historical Year 1	Historical Year 2	SIP Year
Calendar Year	2014	2015	2014
Emissions (tons)	10.00	10.00	10.00
Emissions Quantification Protocol	30 TAC CHAPTER 106 PROTOCOLS	30 TAC CHAPTER 106 PROTOCOLS	30 TAC CHAPTER 106 PROTOCOLS
Adjusted Emissions (tons)	5.00	5.00	5.00
Reason for Adjustment	AUTHORIZED LIMIT (e.g., PERMIT OR PBR)	AUTHORIZED LIMIT (e.g., PERMIT OR PBR)	AUTHORIZED LIMIT (e.g., PERMIT OR PBR)

Historical Adjusted Emissions (tons):	SIP Emissions (tons):	Baseline Emissions (tons):	Strategic Emissions (tpy):	Potential ERCs (tpy):
5.00	5.00	5.00	0.00	5.0

EBT-CERT Example

Select Portfolio | Project Home | Contact Home

Working Area Records

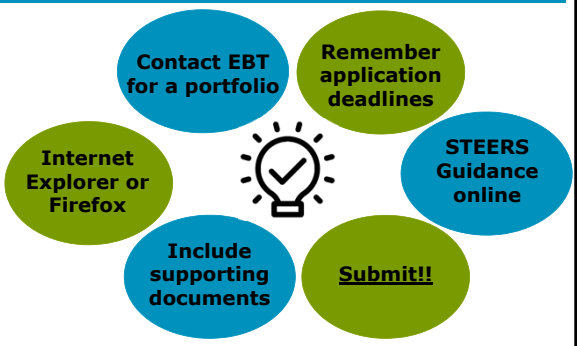
Reference Number	Control Period	Program	Project Type
7922	2016	MECT	REPORT
7924		MECT	TRADE

Credit Generation

Project Number	Status	Action
412251	TCEQ REVIEWED	Review EBT-CERT

Email sent when EBT-CERT is ready for review

In Conclusion



Contact Us

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Visit the **EBT Web page** for additional program guidance and application tools

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