

Guidelines for Reporting Refinery Flare Emissions

February 2015

The South Coast Air Quality Management District (SCAQMD) Rule 301 (e) requires facilities operating under SCAQMD permit to annually report their emissions from all equipment (permitted and non-permitted) as part of SCAQMD's Annual Emissions Reporting (AER) Program. Following are specific instructions for reporting emissions from flares.

SPECIFIC INSTRUCTIONS

This guideline is intended only for flares subject to SCAQMD Rule 1118 operating at petroleum refineries. As such, for AER purpose, petroleum refinery flare emissions shall be reported in the manner specified below. For flares operating at other facilities, such as hydrogen plants, landfills, etc., emissions should be reported as for external combustion equipment. Following are instructions on how to report criteria and toxic emissions from petroleum refinery flares using the new AER tool.

For this example, let's assume that facility ABC, ID #999116, is a petroleum refinery equipped with an emergency flare, F1, application number (A/N) 123456, Permit to Operate (P/O) G65432, is reporting emissions for the year 2014. In the web tool, the flare appears as a line item under emission source ES1:

AER Home Access Facility Facility Home

Facility ID: 999116

Facility Information
Build Reporting Structure
Combustion Fuels
Emission Sources (ES)
Report Process/Emissions
Summaries
Data Validation
Print Facility Report
Excel Reports
Report Submission

Form data is successfully saved.

Build Reporting Structure

Emission Sources (ES) Classification

This section contains facility permit profile. Please make sure that every device has a specified Emission Source (ES). New emission sources can also be added.

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Displaying 1 emission sources.

A/N Permit NO
AER Device ID Permit Device ID

[Search Emission Sources](#)

[Add New Emission Source](#)

Search: [Print Preview](#)

Action	A/N	Permit NO	Permit Device ID	Permit Equipment Description	AER Device ID	ES Name	Source Category	Has Emissions	Equipment	ES Status	Process Reference
Open	123456	G65432			ES1	Flare				Work in progress	

Showing 1 to 1 of 1 entries

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Start by clicking on the “Open” link, select “Normal Operation” under “Operating ES Status” if the flare was operating during the reporting year, then click “Categorize Emission Source” button (make sure to fill out all mandatory fields marked with an asterisk):

Facility ID: 999116

Facility Information
Build Reporting Structure
Combustion Fuels
Emission Sources (ES)
Report Process/Emissions Summaries
Data Validation
Print Facility Report
Excel Reports
Report Submission

Facility ID: 999116 · ABC · Reporting period: 2014

Edit Emission Source

Providing correct information and proper selection categories would help to classify emission source.

Permitted

A/N 123456

Permit No G65432

Permit Device ID

Permit Equipment Description

AER Device ID ES1

ES Name Flare

Operating ES Status Normal Operation *

Comment Flare F1

Emission Source Category **Categorize Emission Source ***

Design Capacity

Save and return to List of Emission Sources or Save and proceed to Process Reporting or Cancel

Optional: Save and Mark as Completed Click here to [delete](#) this emission source and associated data.

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The following screen will appear:

Categorize Emission Source

Permitted	A/N	Permit No	Permit Device ID	Permit Equipment Description	AER Device ID	ES Name
Yes	123456	G65432			ES1 (ESG model)	Flare

- External Combustion Equipment (e.g., boiler, dryer, oven, furnace, heater, afterburner, flare, kiln or incinerator) [click here](#) to select one of the following Equipment:
- Internal Combustion Equipment (e.g., internal combustion engine (excluding vehicles), turbine or micro turbine) [click here](#) to select one of the following Equipment:
- Spray Coating/Spray Booth (e.g., coatings, solvents, adhesives, etc.) [click here](#) to select one of the following Equipment:
- Other Use of Organics (e.g., coatings, solvents, inks, adhesives, etc.) except in Spray Coating/Spray Booth, [click here](#) to select one of the following Equipment:
- Liquid Storage Tank (e.g. Underground, Aboveground, Small Tanks, Dispensing Systems) [click here](#) to select one of the following Equipment:
- Fugitive Components (Emission Leaks from Process Components per Rule 462, 1173 and 1176), [click here](#) to select all applicable Equipment:
- Other Processes (does not fit in any of the groups mentioned above), click [click here](#) to mark "Other Process Equipment":
 - Other process equipment

Save Cancel

Save and return to List of Emission Sources or Save and proceed to Process Reporting or Cancel

Optional: Save and Mark as Completed Click here to [delete](#) this emission source and associated data.

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Select option #7 and check the “Other process equipment” box. Either clicking on the “click here” link or “Save” and click on “Save and proceed to Process Reporting”:

Facility ID: 999116

Facility Information
Build Reporting Structure
Combustion Fuels
Emission Sources (ES)
Report Process/Emissions
Summaries
Data Validation
Print Facility Report
Excel Reports
Report Submission

Form data is successfully saved.

Build Reporting Structure

Emission Sources (ES) Classification

This section contains facility permit profile. Please make sure that every device has a specified Emission Source (ES). New emission sources can also be added.

EPA TANKS Software DATA IMPORT - [Click here](#) for more instructions.

Process References

A/N	Permit NO	Permit Device ID	Permit Device Description	AER Device ID	ES Name	Source Group	Emissions?	Equipment	ES Status
123456	G65432			ES1	Flare	Other Processes	Y	Other process equipment	Work in progress

Process ID	Source Group	Process Name	Process Status	Operation Type
P1	Other Process Emissions		Work in progress	routine

[Open](#)

[Add Process](#)

Showing 1 to 1 of 1 entries

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Click “Open” under Process ID P1 to report the emissions for flare F1 on the next worksheet:

Facility ID: 999116

Facility Information
Build Reporting Structure
Combustion Fuels
Emission Sources (ES)
Report Process/Emissions
Combustion
Use of organics
Fugitive Components
Other Processes
Summaries
Data Validation
Print Facility Report
Excel Reports
Report Submission

Back to Emission Source Process Reference

Other Processes

This reporting screen is for reporting activity data for other processes used in your facility which were not covered in previous reporting screens. Please provide specific information for every associated emission source. You must select Activity and throughput units before reporting emissions. If the operation of such sources involves burning fuels, make sure emissions generated from burning fuels are reported separately. Combined emissions can also be reported here; however, it must be substantiated to avoid double reporting. Detailed instructions are available by clicking on Help icon in the tool bar.

Optional: Mark as Completed

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity
Open ES1		123456	P1		

[Click here to delete this process.](#)

Step 2: Throughput

[Open](#)

Step 3: Criteria Emissions (lbs)

Pollutant	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Add New						

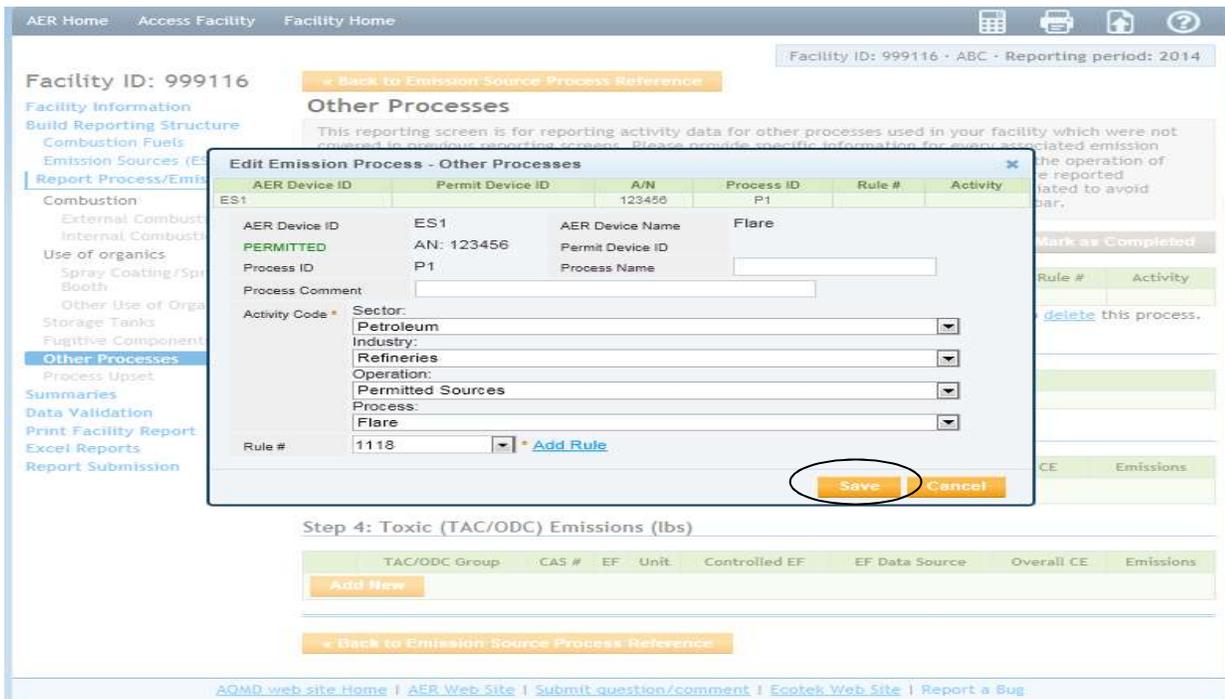
Step 4: Toxic (TAC/ODC) Emissions (lbs)

TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Add New							

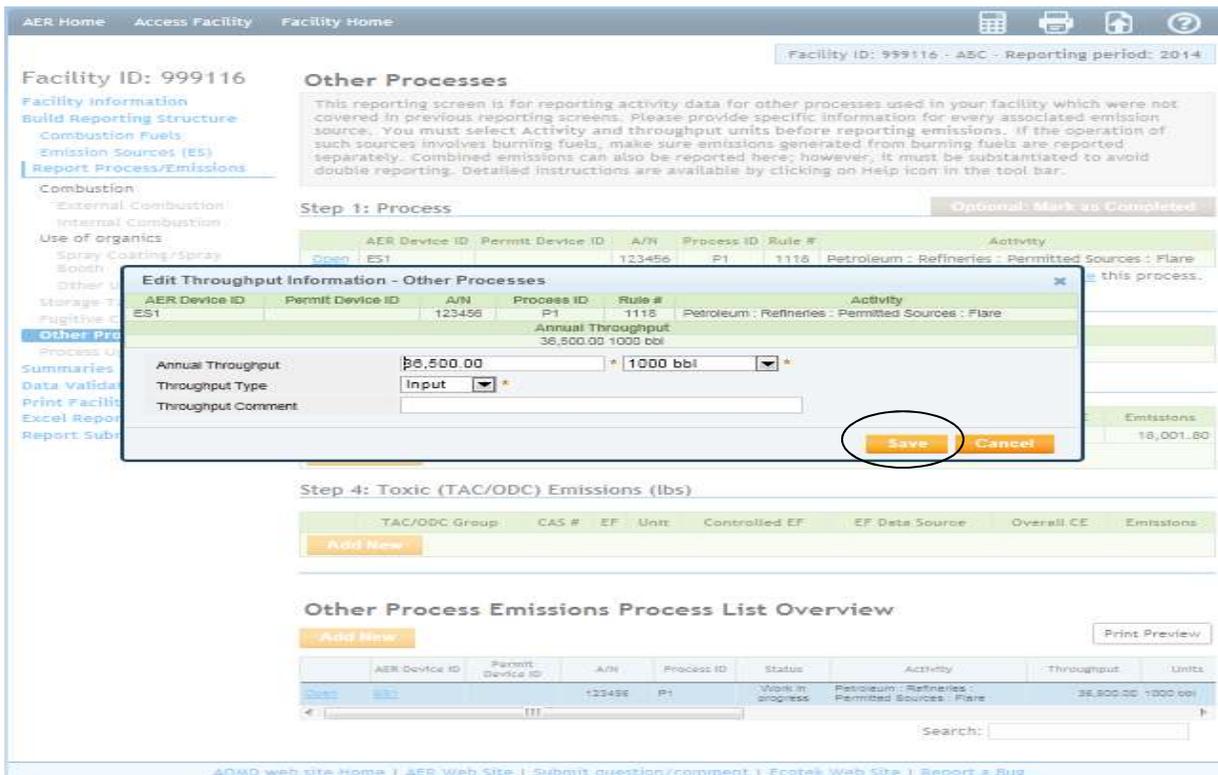
Back to Emission Source Process Reference

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Start by opening “Step 1 – Process”, fill out the mandatory fields marked with an asterisk in the pop-up window, then click “Save”.



Next, go to “Step 2 – Throughput” and click “Open”. Enter the total amount of crude oil processed in thousands of barrels (mdbl) during this reporting period. In this example, let’s assume that the amount of crude oil processed by refinery ABC is 100,000 barrels or 100 mdbl per day. Therefore, the annual throughput is 36,500 mdbl (100 mdbl x 365 days/year). Fill out the respective fields, click “Save”, then go to “Step 3 – Criteria Emissions”:



Per Rule 1118 requirements, refinery ABC calculated the annual criteria pollutant emissions for flare F1 by summing up data from the quarterly emission reports. For reporting individual criteria pollutant emissions in the new tool, the emission factors (EF) for each pollutant need to be back calculated, by dividing the individual pollutant annual emissions, in pounds, by the refinery’s annual crude oil processed, in thousand barrels. Let’s assume that refinery ABC annual flare VOC emission compiled from the quarterly flare reports is 18,000 lbs. Next, calculate the VOC EF by dividing the VOC emissions (lbs) by the annual crude throughput (mdbl):

$$EF_{VOC} = 18,000 \text{ lbs} / 36,500 \text{ mdbl} = 0.4932$$

(Note: Show your calculation in Emission Factor Comment field in screen below)

Go to “Step 3 – Criteria Emissions (lbs)” and click “Open”. Click “Add New”, as shown in last screen on page 6, select VOC from the drop down menu and input the EF_{VOC} just calculated. Select “Back-calculation” as EF data source, then click “Save”.

The screenshot displays the 'Open Criteria Emission Information - Other Processes' dialog box within the AER web application. The dialog box is titled 'Open Criteria Emission Information - Other Processes' and contains the following information:

- AER Device ID:** ES1
- Permit Device ID:** 123456
- A/N:** P1
- Process ID:** 1118
- Activity:** Petroleum: Refineries: Permitted Sources: Flare
- Annual Throughput:** 36,500.00 1000 bbl
- Pollutant:** VOC
- Emission Factor (EF):** 0.4932 lbs/1000 bbl
- Controlled EF value:** (mark checkbox if EF listed represents EF determined after control)
- Overall Control Efficiency:** [Empty field]
- Emission Factor Comment:** 0.4932 lbs / mdbl = 18,000 lbs / 36,500 mdbl. Where, 18,000 lbs is total from quarterly flare reports and 36,500 mdbl is the throughput.
- Emission Factor Data Source:** Back-calculation
- Emissions:** 18,001.80 lbs

The 'Save' button is circled in red, indicating the next step in the process. Below the dialog box, the 'Other Process Emissions Process List Overview' table is visible, showing the process details for the selected activity.

TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Add New							

Other Process Emissions Process List Overview							
Add New							
AER Device ID	Permit Device ID	A/N	Process ID	Status	Activity	Throughput	Units
Open	ES1	123456	P1	Work in progress	Petroleum: Refineries: Permitted Sources: Flare	36,500.00	1000 bbl

Search: [Empty search box]

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The next screen will display the VOC emissions for flare F1. Similarly, calculate EF for NO_x, SO_x, CO and PM EF and report the flare criteria pollutant emissions by clicking the “Add new” button in Step 3. Finally, go to “Step 4 – Toxics (TAC and ODC) Emissions (lbs)”, click “Add new” and report all TAC emissions for the flare by using a similar methodology as for criteria pollutants.

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Facility ID: 999116 · ABC · Reporting period: 2014

Facility ID: 999116

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[Build Reporting Structure](#)

[Combustion Fuels](#)

[Emission Sources \(ES\)](#)

[Report Process/Emissions](#)

Combustion

[External Combustion](#)

[Internal Combustion](#)

Use of organics

[Spray Coating/Spray Booth](#)

[Other Use of Organics](#)

[Storage Tanks](#)

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Other Processes

[Process Upset](#)

Summaries

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Other Processes

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Step 1: Process Optional: Mark as Completed

	AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity
Open	ES1		123456	P1	1118	Petroleum : Refineries : Permitted Sources : Flare

Click here to [delete](#) this process.

Step 2: Throughput

	Annual Throughput
Open	36,500.00 1000 bbl

Step 3: Criteria Emissions (lbs)

	Pollutant	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Open	VOC	0.4932	lbs / 1000 bbl	No	Back-calculation		18,001.80
Add New							

Step 4: Toxic (TAC/ODC) Emissions (lbs)

	TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Add New								

Other Process Emissions Process List Overview

[Add New](#)
[Print Preview](#)

	AER Device ID	Permit Device ID	A/N	Process ID	Status	Activity	Throughput	Units
Open	ES1		123456	P1	Work In progress	Petroleum : Refineries : Permitted Sources : Flare	36,500.00	1000 bbl

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