

# 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 · ABC · Reporting period: 2014

### 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.

**Displaying 1 emission sources.**

A/N	<input type="text"/>	Permit NO	<input type="text"/>
AER Device ID	<input type="text"/>	Permit Device ID	<input type="text"/>

[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
<a href="#" style="border: 1px solid blue; border-radius: 50%; padding: 2px;">Open</a>	123456	G65432			ES1	Flare				Work in progress	

Showing 1 to 1 of 1 entries ◀ Previous   Next ▶

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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  
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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	<input checked="" type="checkbox"/>
A/N	123456 <input type="text" value="123456"/>
Permit No	G65432
Permit Device ID	
Permit Equipment Description	
AER Device ID	ES1
ES Name	<input type="text" value="Flare"/>
Operating ES Status	<input type="text" value="Normal Operation"/>
Comment	<input type="text" value="Flare F1"/>
Emission Source Category	<input type="button" value="Categorize Emission Source"/>
Design Capacity	<input type="text"/>

or  or [Cancel](#)

[Click here to delete](#) this emission source and associated data.

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The following screen will appear:

AER Home   Access Facility   Facility Home

Facility ID: 999116 - ABC - Reporting period: 2014

### 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 by clicking on the “click here” link and check the “Other process equipment” box, “Save” and click on “Save and proceed to Process Reporting”:

AER Home   Access Facility   Facility Home

Facility ID: 999116 · ABC · Reporting period: 2014

**Facility ID: 999116**

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	G85432			ES1	Flare	Other Processes	Y	Other process equipment	Work in progress

Process ID	Source Group	Process Name	Process Status	Operation Type
<a href="#">Open</a>	P1	Other Process Emissions	Work in progress	routine

**OK**

Showing 1 to 1 of 1 entries   Previous   Next

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

AER Home Access Facility Facility Home Calculator Print Home Help

Facility ID: 999116 · ABC · Reporting period: 2014

**Facility ID: 999116**

[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.

**Step 1: Process** Optional: Mark as Completed

	AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity
<a href="#">Open</a>	ES1		123456	P1		

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

**Step 2: Throughput**

Annual Throughput	
<a href="#">Open</a>	

**Step 3: Criteria Emissions (lbs)**

	Pollutant	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
<a href="#">Add New</a>							

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

	TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
<a href="#">Add New</a>								

[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”.

AER Home Access Facility Facility Home Facility ID: 999116 · ABC · Reporting period: 2014

Facility ID: 999116 « Back to Emission Source Process Reference

Facility Information  
 Build Reporting Structure  
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 Report Process/Emission  
 Combustion  
 External Combustion  
 Internal Combustion  
 Use of organics  
 Spray Coating/Spraying Booth  
 Other Use of Organics  
 Storage Tanks  
 Fugitive Component  
**Other Processes**  
 Process Upset  
 Summaries  
 Data Validation  
 Print Facility Report  
 Excel Reports  
 Report Submission

### 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. The operation of the process must be reported and associated to avoid double counting.

**Edit Emission Process - Other Processes**

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

AER Device ID: ES1      AER Device Name: Flare

PERMITTED      Permit Device ID: AN: 123456

Process ID: P1      Process Name:

Process Comment:

Activity Code \*      Sector:

                                  Industry:

                                  Refineries:

                                  Operation:

                                  Permitted Sources:

                                  Process:

                                  Flare:

Rule #      1118      \* [Add Rule](#)

Save Cancel

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

TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
<span style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">Add New</span>							

« Back to Emission Source Process Reference

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 [AER Web Site](#) | 
 [Submit question/comment](#) | 
 [Ecotek Web Site](#) | 
 [Report a Bug](#)

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”:

AER Home Access Facility Facility Home

Facility ID: 999116 - ABC - Reporting period: 2014

Facility ID: 999116

Facility Information  
Build Reporting Structure  
Combustion Fuels  
Emission Sources (ES)  
**Report Process/Emissions**

Combustion  
External Combustion  
Internal Combustion  
Use of organics  
Spray Coating/Spray Booth  
Other U  
Storage T  
Fugitive C  
**Other Pro**  
Process U  
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Excel Report  
Report Subr

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.

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

**Edit Throughput Information - Other Processes**

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity
ES1		123456	P1	1118	Petroleum : Refineries : Permitted Sources : Flare
Annual Throughput					
36,500.00 1000 bbl					
Annual Throughput	36,500.00		* 1000 bbl		*
Throughput Type	Input *				
Throughput Comment					

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 Print Preview

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:

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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):

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

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

AER Home Access Facility Facility Home Facility ID: 999116 • ABC • Reporting period: 2014

Facility ID: 999116 **Other Processes**

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[Emission Sources \(ES\)](#)  
[Report Process/Emissions](#)

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.

**Open Criteria Emission Information - Other Processes**

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

Annual Throughput: 36,500.00 1000 bbl

Pollutant:  \*

Emission Factor (EF):  \* lbs/1000 bbl

Controlled EF value  
(mark checkbox if EF listed represents EF determined after control)

Overall Control Efficiency:

Emission Factor Comment:

Emission Factor Data Source:  \*

Emissions: 18,001.80 lbs

TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
<input type="button" value="Add New"/>							

**Other Process Emissions Process List Overview**

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

Search:

AQMD web site Home | AER Web Site | Submit question/comment | Ecotek Web Site | Report a Bug

The next screen will display the VOC emissions for flare F1. Similarly, calculate EF for NO<sub>x</sub>, SO<sub>x</sub>, 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.

Facility ID: 999116

- [Facility Information](#)
- [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

Fugitive Components

**Other Processes**

- [Process Upset](#)

Summaries

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**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.

**Step 1: Process**

Optional: Mark as Completed

	AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity
<a href="#">Open</a>	ES1		123456	P1	1118	Petroleum : Refineries : Permitted Sources : Flare

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

**Step 2: Throughput**

	Annual Throughput
<a href="#">Open</a>	36,500.00 1000 bbl

**Step 3: Criteria Emissions (lbs)**

	Pollutant	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
<a href="#">Open</a>	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
<a href="#">Add New</a>								

**Other Process Emissions Process List Overview**

[Add New](#)

[Print Preview](#)

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

Search: