Guidelines for Reporting Refinery Flare Emissions

Revised December 2022

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. The 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. The following are instructions on how to report criteria polllutant and toxic emissions from petroleum refinery flares using the AER tool.

There are three different sets of formula for the calculations of the criteria pollutant emissions for VENT GAS, NATURAL GAS and PROPANE AND BUTANE GAS on ATTACHMENT B of the RULE 1118 (July 7, 2017).

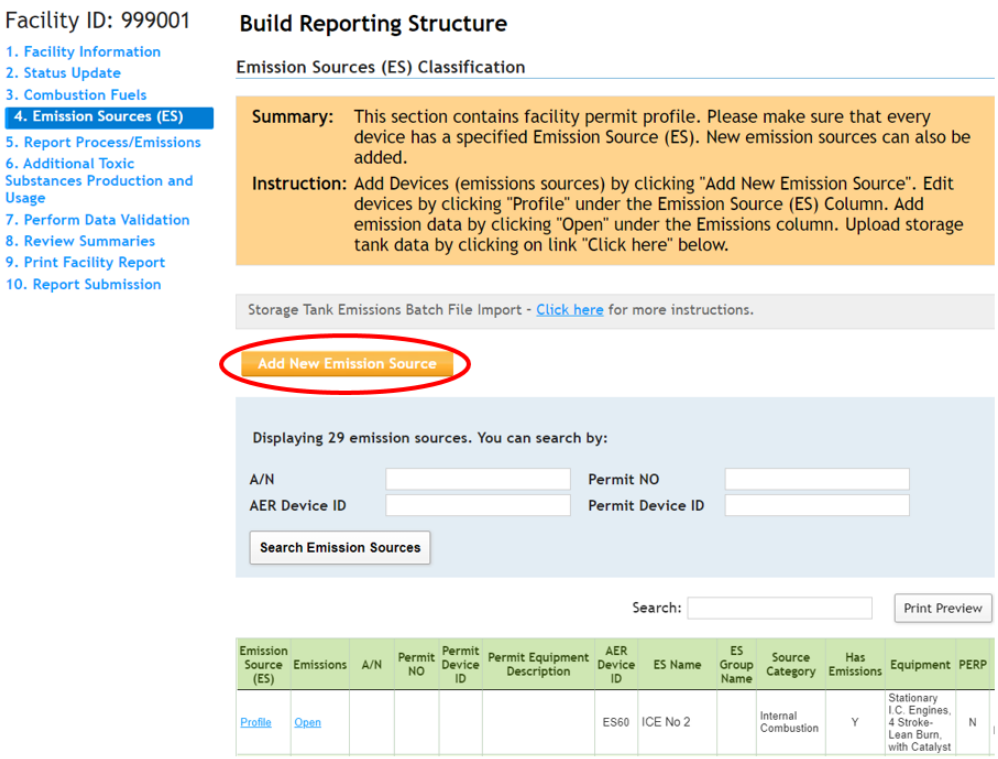
The AER Tool is designed for back calculation of refinery's annual crude oil processed in thousand barrels and the calculated annual criteria pollutants emissions (lbs/year).

The facility must calculate the annual emissions of the criteria pollutant emissions in accordance with the formula in ATTACHMENT B of RULE 1118 (July 7, 2017), and input the calculated annual emissions into the AER Reporting Tool. The emission factors can be back-calculated from the refinery's annual crude oil processed (thousand barrels) and the annual criteria pollutant emissions.

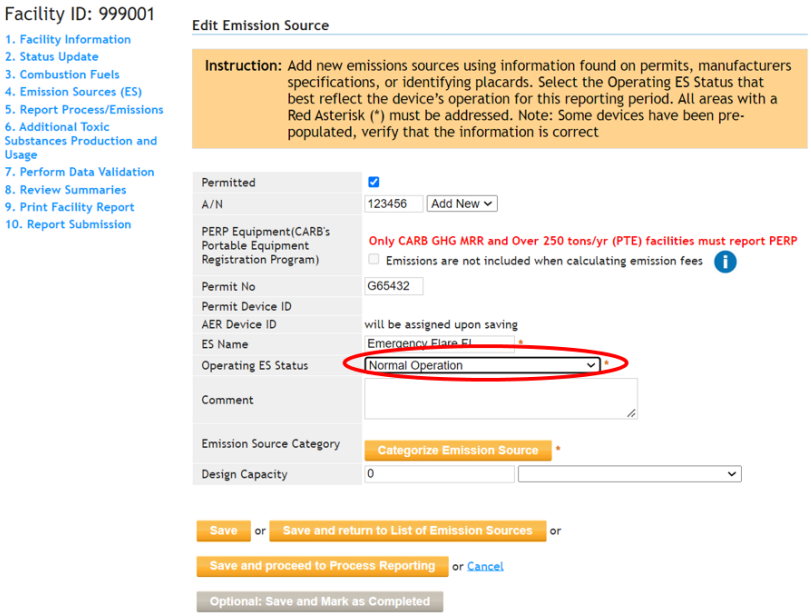
For this example, let's assume that facility ABC, ID 999001, is a petroleum refinery equipped with an emergency flare, F1, application number (A/N) 123456, Permit to Operate (P/O) G65432, is reporting emissions for the date year (DY) 2022 and is designated as Device ID ES61.

If you used the Import from Last Year function, or if the permitted flare was uploading by South Coast AQMD staff, the ES Device ID should appear in the table with green headers and you can jump to Step 5 of this document. If the flare is not already in your profile and you would like to add it, you may start with Step 1.

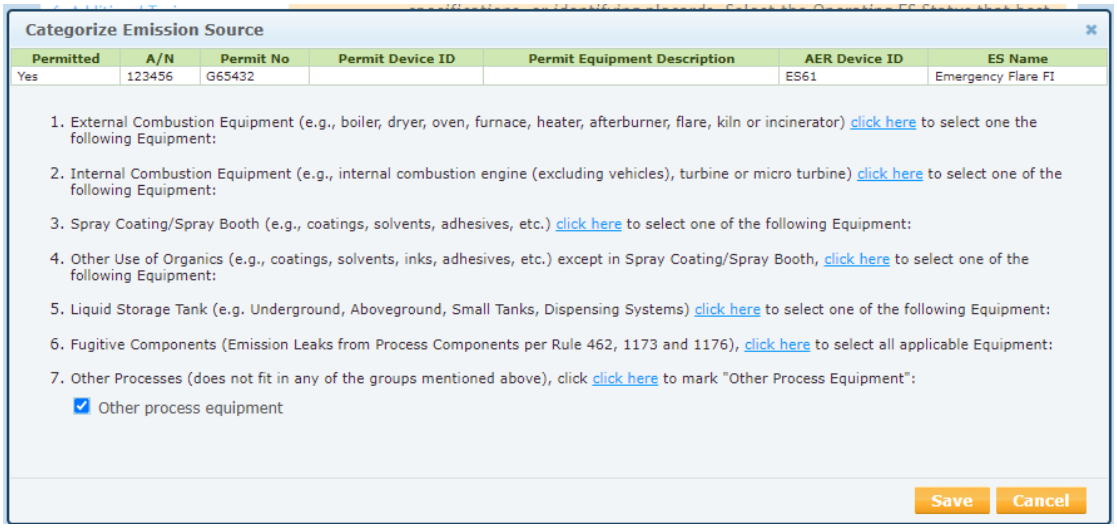
1. If you are adding a new ES click on the orange "Add New Emission Source" button seen below.



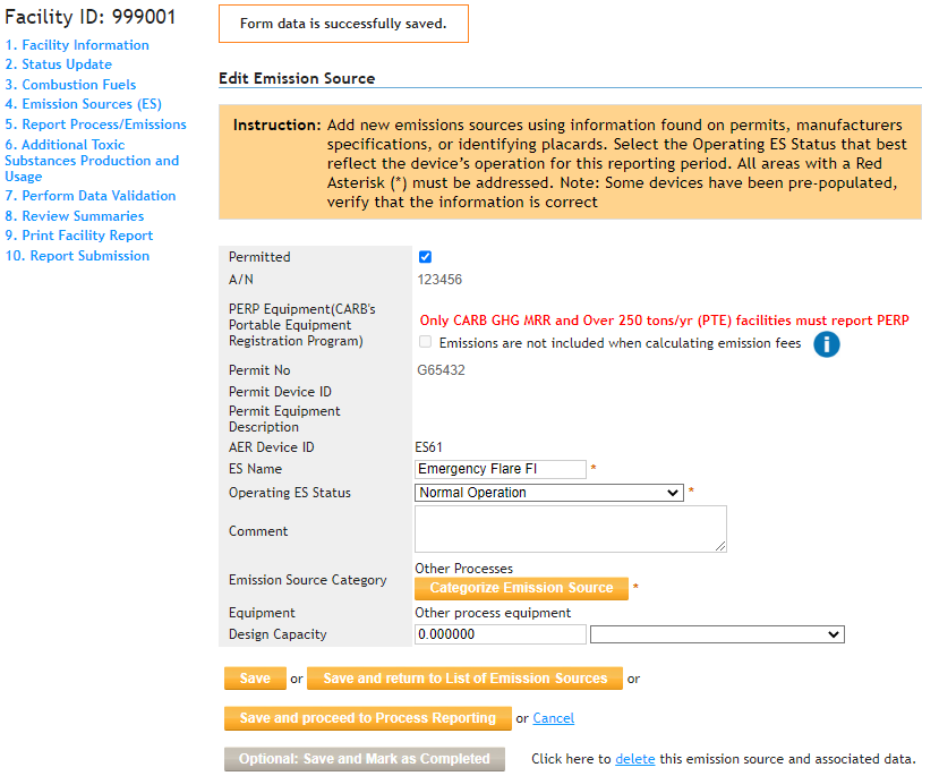
2. Click on the “Permitted” check box and add the Application Number by clicking on the drop-down menu and choosing the “Add New” option. Add the “Permit No” and “ES Name.” For this example, we will select the “Normal Operation” option from the “Operating ES Status” drop-down menu. The orange “Categorize Emission Source” button will appear.



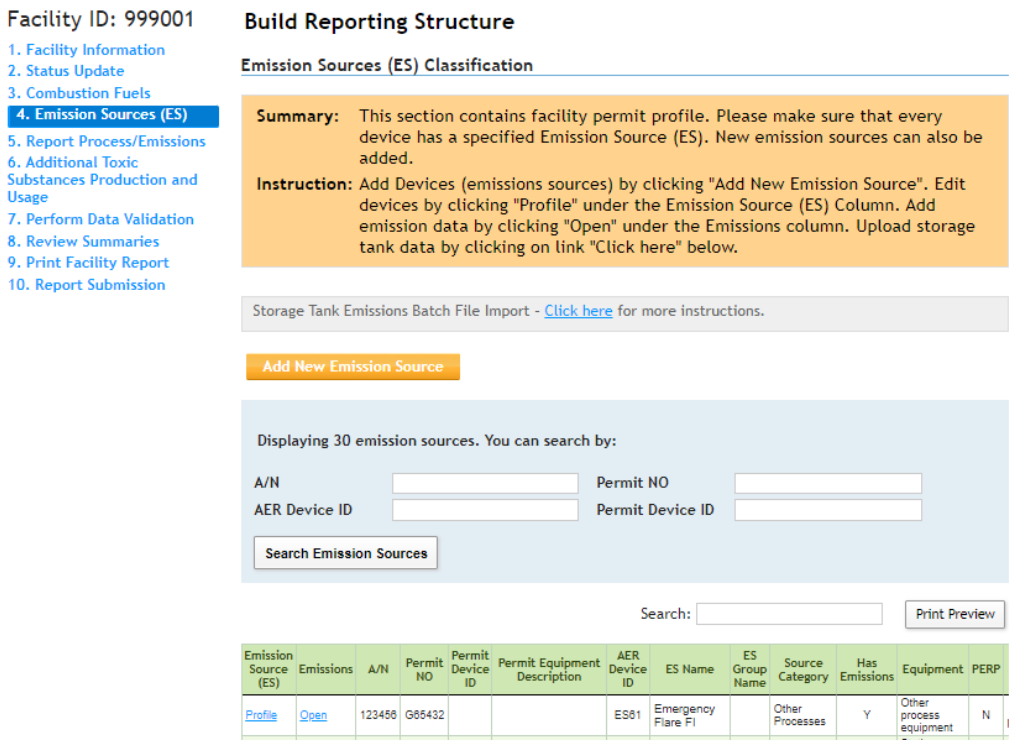
3. Click on the orange “Categorize Emission Source” button. The pop-up shown below will appear. Click on the click here in Option 7 Other Processes. Click on the “Other process equipment” check box that appears. Click on the orange “Save” button. This facility already has 60 emission sources, therefore the new ES we just added was assigned as Device ID ES61.



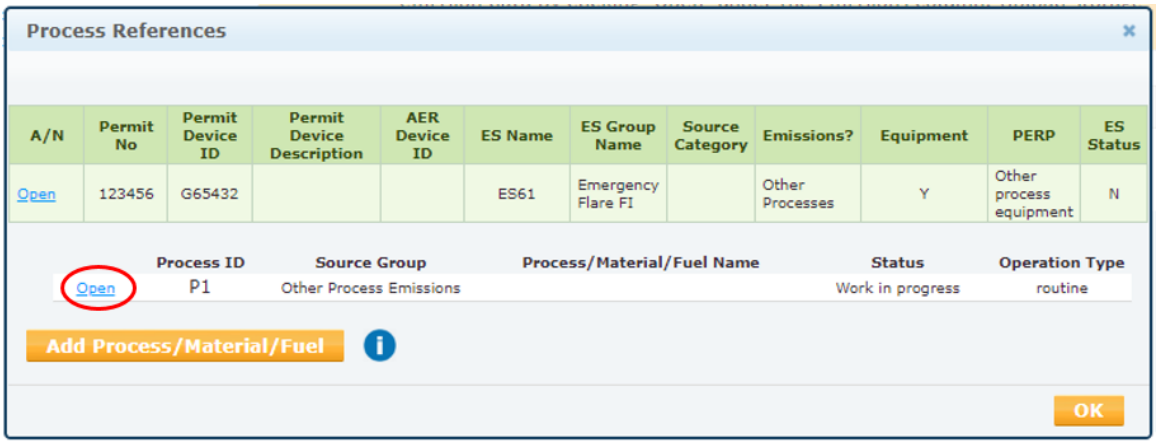
4. Now that you have added all the emission source information for the Flare, you can click on the orange “Save and return to List of Emission Sources” button.



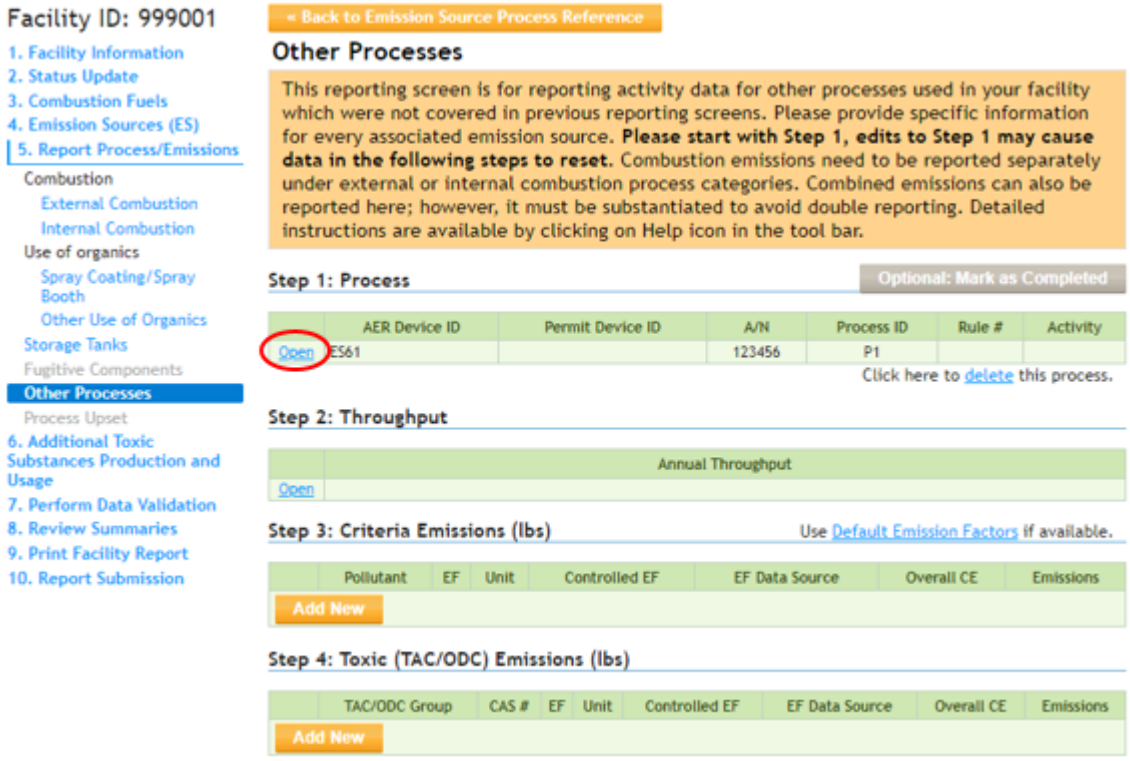
5. Click the “Open” link next to the Device ID you want to edit. In this example, the Open next to Device ID ES61.



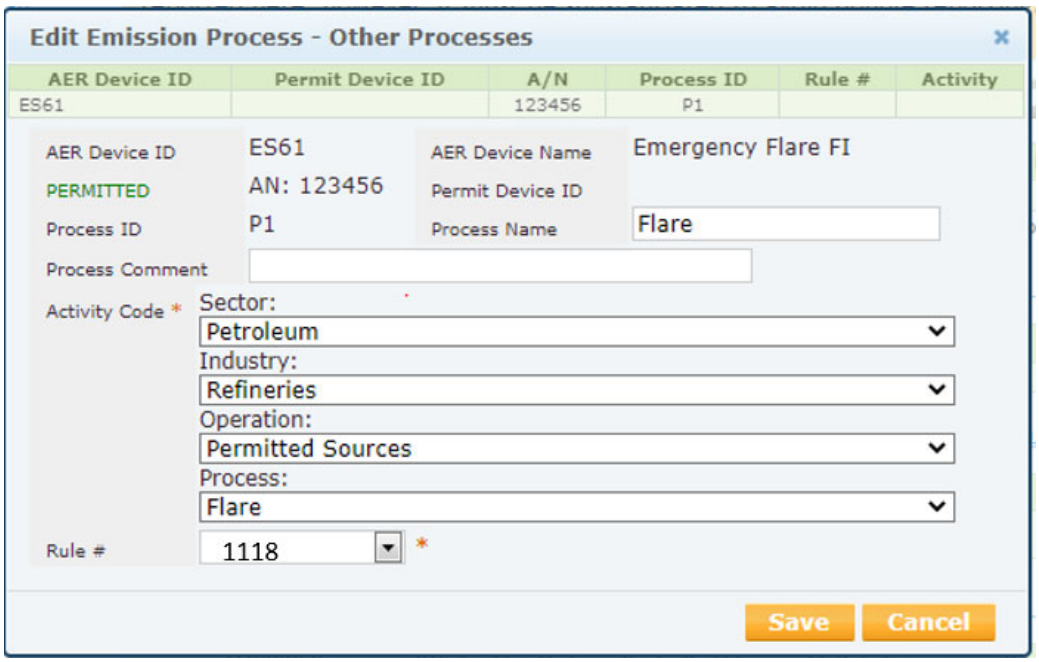
6. Click the “Open” link under Process ID P1 to report the emissions for flare F1 on the next worksheet:



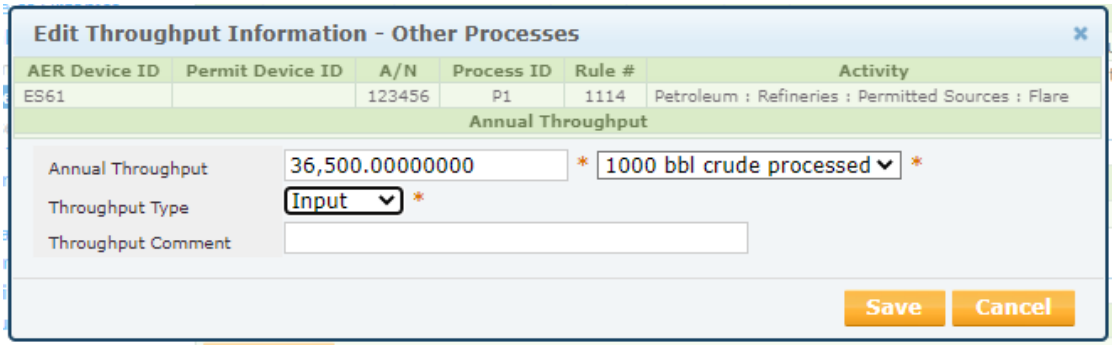
7. Start by clicking the “Open” link under the “Step 1: Process” section.



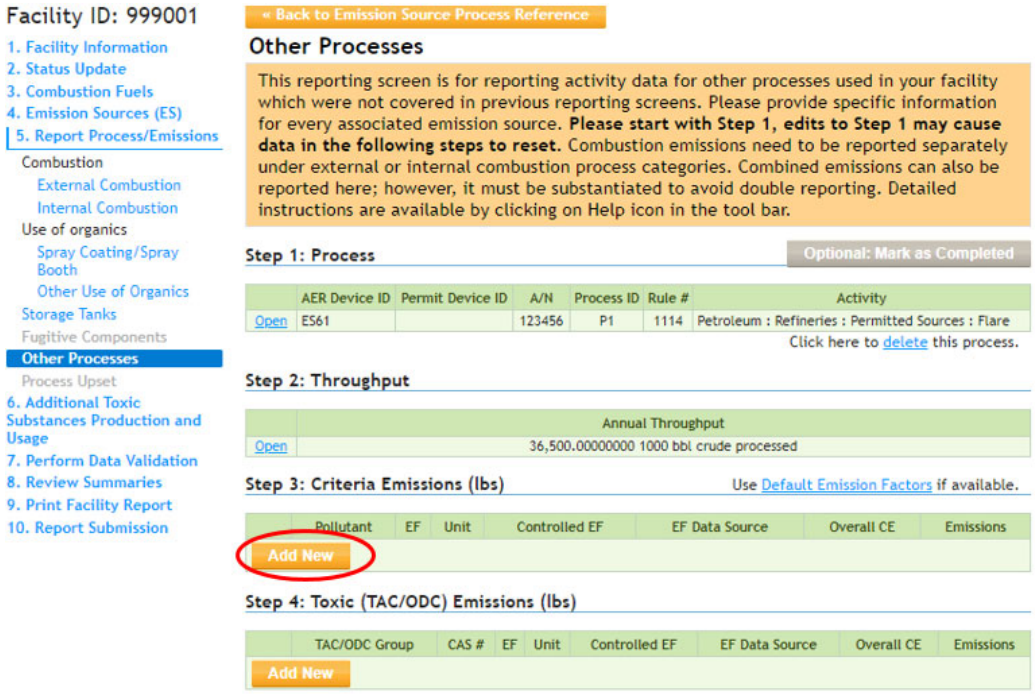
8. Fill out the mandatory fields marked with an asterisk in the pop-up window, then click the “Save” button.



9. Once finished with "Step 1: Process" continue to "Step 2: Throughput" and click the "Open" link. Enter the total amount of crude oil processed in thousands of barrels (thousand bbl or 1000 bbl) 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 thousand bbl per day. Therefore, the annual throughput is 36,500 thousand bbl (100 thousand bbl x 365 days/year). Fill out the respective fields, click "Save".



10. Click the orange "Add New Button" under "Step 3: Criteria Pollutants" to add new criteria pollutants to your Process page.



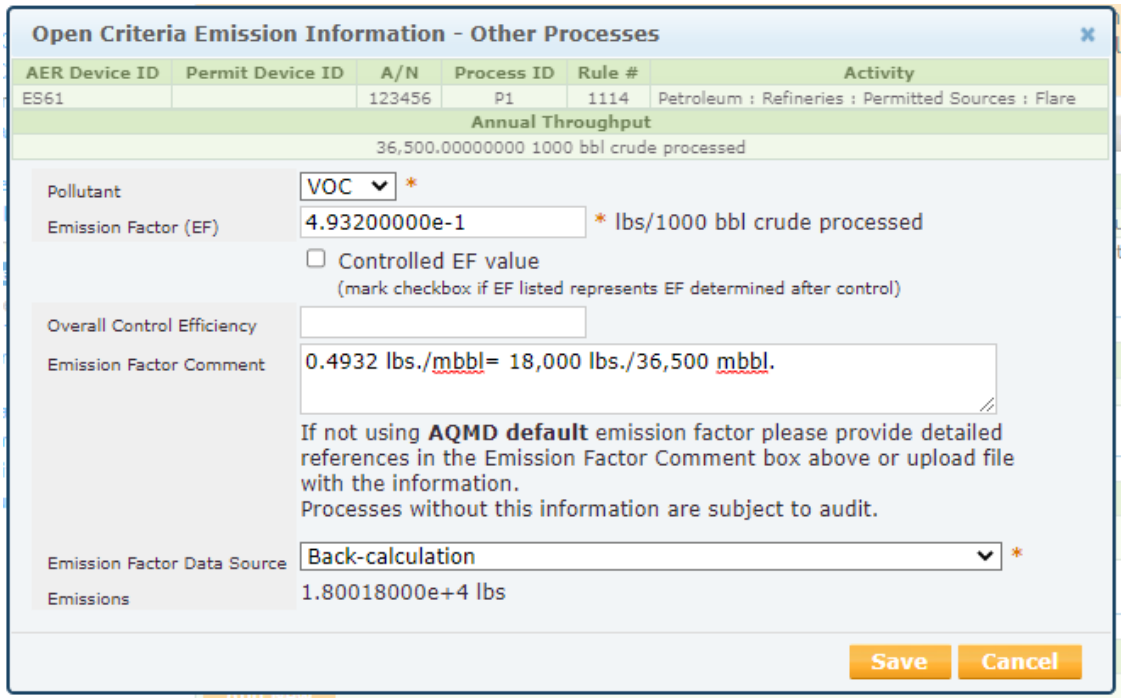
Per Rule 1118 requirements, refinery ABC calculated the annual criteria pollutant emissions for flare F1 by summing up data from the quarterly emission reports. For reporting individual criteria pollutant emissions in the AER Reporting tool, the emission factors (EF) for each pollutant need to be back 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 (thousand bbl):

EF_{VOC} = 18,000 lbs / 36,500 thousand bbl = 0.4932 lb/ thousand bbl

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

11. Once you clicked on the "Open" link underneath "Step 3: Criteria Emissions (lbs)" the below "Open Criteria Emission Information- Other Process" pops-up. For this example, lets add VOC emissions and select it from the drop-down menu for "Pollutant". Add the emission factor (EF_{VOC}) just calculated and a short description to the "Emission Factor Comment" box. Select the "Back-calculation" option as the EF data source, then click "Save".



12. The next screen will display the VOC emissions calculated by the Tool for flare F1. Similarly, calculate EF for NOx, SOx, 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 similar methodology to what was used for criteria pollutant emissions.

Facility ID: 999001

1. Facility Information
2. Status Update
3. Combustion Fuels
4. Emission Sources (ES)
5. 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
6. Additional Toxic Substances Production and Usage
7. Perform Data Validation
8. Review Summaries
9. Print Facility Report
10. 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. **Please start with Step 1, edits to Step 1 may cause data in the following steps to reset.** Combustion emissions need to be reported separately under external or internal combustion process categories. 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	ES61		123456	P1	1114	Petroleum : Refineries : Permitted Sources : Flare

Click here to delete this process.

Step 2: Throughput

	Annual Throughput
Open	36,500.00000000 1000 bbl crude processed

Step 3: Criteria Emissions (lbs)

Use Default Emission Factors if available.

	Pollutant	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Open	VOC	4.93200000e-1	lbs / 1000 bbl crude processed	No	Back-calculation		1.80018000e+4

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