



Guidelines for Calculating Emissions from Crematory Operations

April 2023

Crematory operations generate emissions of organic gases, oxides of nitrogen (NO_x), oxides of sulfur (SO_x), carbon monoxide (CO), particulate matter (PM), and Toxic Air Contaminants (TACs) from combustion of assist fuel as well as the cremation of human or animal remains.

1. GENERAL INSTRUCTIONS

Emissions can be estimated in several ways. The simplest way is to estimate emissions from emission factors. The most accurate is to estimate emissions from continual monitoring systems or source tests.

Even if emissions are estimated using a source test, depending on permit conditions, the source test may not include all pollutants. In such cases, default emission factors can be used to supplement the pollutants that were not included in the source test.

Emissions Estimated Using Default Emission Factors

Emissions from fuel combustion, and emissions from remains are reported as two separate processes (e.g., Process P1, and Process P2). Natural gas combustion emissions are reported under the crematorium external combustion device, which is typically permitted by South Coast AQMD. Emissions from the combustion of human or animal remains are reported under the other process category. Each of these methods are detailed below.

Process 1 - Natural Gas Combustion

Facilities can estimate their criteria pollutant and TAC emissions from the combustion of assist fuel using the following equations:

$$E = Q \times EF$$

where,

E = Annual Emissions of VOC, NO_x, SO_x, CO, PM, and TACs

Q = Annual fuel usage (units as shown in Table 1 and 2)

EF = Emission factors from Tables 1 and 2

Default Natural Gas Criteria Pollutant Emission Factors

Table 1: External Combustion Equipment (for all sizes)					
Fuel Type (Fuel unit)	Organic Gases (lb/unit)	Nitrogen Oxides (lb/unit)	Sulfur Oxides (lb/unit)	Carbon Monoxide (lb/unit)	Particulate Matter (lb/unit)
Natural Gas (mmscf) / Boilers Only	5.50	100.00	0.60	84.00	7.60
Natural Gas (mmscf) / Other Equipment	7.00	130.00	0.60	35.00	7.50
LPG, Propane, Butane (1000 gal.)	0.26	12.80	4.60	3.20	0.28
Diesel/Distillate Oil (1000 gal.)	1.32	20.00	0.21	5.00	2.00

¹ <http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/default-combustion-emission-factors.pdf>

Default Natural Gas Toxic Air Contaminant Emission Factors¹

Table 2: Default EF for Natural Gas Combustion - External Combustion Equipment <10MMBtu/Hr			
TAC Code	Pollutant	CAS No	lb/mmscf
2	Benzene	71432	0.0080
12	Formaldehyde	50000	0.0170
19	Total PAHs (excluding Naphthalene)	1151	0.0001
19	Naphthalene	91203	0.0003
29	Acetaldehyde	75070	0.0043
30	Acrolein	107028	0.0027
32	Ammonia*	7664417	18.000
40	Ethyl benzene	100414	0.0095
44	Hexane	110543	0.0063
68	Toluene	108883	0.0366
70	Xylene	1330207	0.0272

* This value corresponds to equipment with selective non-catalytic reduction (SNCR), for equipment with selective catalytic reduction (SCR) substitute listed value using 9.1 lb/mmscf, and for equipment without SNCR or SCR substitute using 3.2 lb/mmscf.

¹ AB2588 Guideline for TACs - http://www.aqmd.gov/docs/default-source/planning/risk-assessment/quadrennial_atir_procedure.pdf

Process 2 - Emissions from the Cremation of Remains (Human or Animal)

Facilities can estimate their criteria pollutant and TAC emissions from the cremation of human or animal remains using the following equations:

$$E = Q \times EF$$

where,

E = Annual Emissions of VOC and Toxic Air Contaminants (TACs)

Q = Annual throughput of human or animal remains in tons

EF = Emission factors for VOC or from Table 3

Default Criteria Pollutant Emissions Factors

Table 3: Cremation of Remains	
Organic Gases (lb/unit)	
5.50	

Default Toxic Air Contaminant Emission Factors

Table 4: Default TAC EF for Cremation of Human and Animal Remains				
TAC Code	Compound	CAS No	Human Cremation (lb/ton)	Animal Cremation (lb/ton)
	Arsenic and Compounds (Inorganic)	7440382	4.00E-04	4.00E-04
	Beryllium and Compounds	7440417	1.84E-05	1.84E-05
	Cadmium and Compounds	7440439	1.46E-03	1.46E-03
	Chromium, hexavalent	18540299	1.91E-04	1.91E-04
	Polychlorinated Dibenzofurans (PCDF)	1080	1.43E-07	1.43E-07
	2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1086	7.74E-08	7.74E-08
	Formaldehyde	50000	2.89E-09	2.89E-09
	Hydrochloric Acid (Hydrogen Chloride)	7647010	1.97E+00	1.97E+00
	Lead and Compounds (Inorganic)	7439921	9.39E-03	9.39E-03
	Nickel and Compounds	7440020	5.09E-04	5.09E-04
	Mercury and Compounds (Inorganic)	7439976	5.32E-03	0.00E+00
	Polycyclic Aromatic Hydrocarbon (PAH)	1151	9.63E-04	9.63E-04

Emissions Estimated Using Continuous Emissions Monitoring Systems or Source Test Data

Emission factors based on source tests may be used for emissions reporting so long as they are submitted for review by South Coast AQMD's Source Test Engineering staff. The review may find that the emission factor from the source test is underreported, or the source test is not acceptable, which will result in an amendment to the submitted emission report(s). For these situations, Rule 301 (e)(10)(E) waves any surcharges for underreported emissions estimated using a source test that was submitted for review prior to or at the time of the official AER submittal due date. The difference or underpayment is required to be paid, but no surcharges will be applied. Facility personnel should verify with South Coast AQMD Compliance staff that their source test was submitted for review prior to using the resulting emission factors for AER.

If all emissions are estimated by continuous emission monitoring system (CEMS) data or source testing of a single stack that emits both fuel and remains combustion emissions, then all emissions can be reported from a single process.

If fuel combustion emissions and cremation of remains emissions are not combined (e.g., two separate stacks) then emissions from each operation should be reported in separate devices (if permitted separately) or processes (if permitted as one device, e.g., Device ES1 and ES2, or Process P1 and Process P2).

Emissions Estimated Using Source Test and Default Emission Factors

If a mixture of source test and default emission factors are used, then emissions from fuel combustion and emissions from cremation of remains should be reported in separate processes. An example of this is when a stack is only source tested for NO_x emissions. In this case, the default NO_x emission factor from Table 1 may be substituted using the NO_x emission factor from the source test. All other default emission factors should be used for the other criteria and TAC emissions.

2. EXAMPLES SHOWING HOW TO REPORT

Criteria pollutant and TAC emissions must be reported separately for each process; combustion of assist fuel, human remains, and animal remains. This can be done through the following steps:

1. Determine the annual fuel usage and human and animals remains, (Throughput, Q).
2. Collect any approved CEMS or source test reports, if applicable.
3. Enter the information into the AER Reporting Tool.

EXAMPLE 1:

Click **Emission Sources (ES) in the blue Navigation Menu**. The reporting tool displays existing emission sources in the green table as shown at bottom of the image below. If a crematory emission source is not listed, it must be added to the list by clicking on the [Add New Emission Source](#) link.

Guideline for Calculating Emissions from Crematory Operations

AER Home Browse Facilities Access Facility **START HERE**

Ready For Review · Facility ID: 999914 · SOUTH COAST AIR QUALITY MGT DIST(SCAQMD) · Reporting period: 2022

Facility ID: 999914

1. Facility Information
2. Status Update
3. Combustion Fuels
4. Emissions Release Locations
- 5. Emission Sources (ES)**
6. Report Process/Emissions
7. Additional Toxic Substances Production and Usage
8. Perform Data Validation
9. Review Summaries
10. Print Facility Report
11. Report Submission

Emission source has been deleted.

Build Reporting Structure

Emission Sources (ES) Classification

Summary: 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.

Instruction: Add Devices (emissions sources) by clicking "Add New Emission Source". Edit devices by clicking "Profile" under the Emission Source (ES) Column. Add emission data by clicking "Open" under the Emissions column. Upload storage tank data by clicking on link "Click here" below.

Storage Tank Emissions Batch Fill Import - [Click here](#) for more instructions.

[Add New Emission Source](#)

Displaying 0 emission sources.

A/N: Permit NO:
AER Device ID: Permit Device ID:

[Search Emission Sources](#)

Search: [Print Preview](#)

Emission Source (ES)	Emissions	A/N	Permit NO	Permit Device ID	Permit Equipment Description	AER Device ID	ES Name	ES Group Name	Source Category	Has Emissions	Equipment PERP	ES Status
No data available in table												

Showing 0 to 0 of 0 entries [Previous](#) [Next](#)

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Adding Emission Sources

If you need to add an emission source for a crematory follow these directions. If you do not, then skip to Entering Emissions below. Fill out relevant information to the Emission Source by identifying ES Name (example – Human Remains Cremation) and selecting the appropriate [Operating ES Status](#) (typically normal operation), the [Categorize Emission Source](#) button will appear. By clicking this button, the tool will take the user to the next screen for categorizing this emissions source.

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Edit Emission Source

Instruction: Add new emissions sources using information found on permits, manufacturers specifications, or identifying placards. Select the Operating ES Status that best reflect the device's operation for this reporting period. All areas with a Red Asterisk (*) must be addressed. Note: Some devices have been pre-populated, verify that the information is correct.

Permitted ☒

A/N:

PERP Equipment(CARB's Portable Equipment Registration Program) ☐ **Only CARB GHG MRR and Over 250 tons/yr (PTE) facilities must report PERP**

☐ Emissions are not included when calculating emission fees **i**

Permit No:

Permit Device ID:

AER Device ID:

ES Name:

Operating ES Status:

Comment:

Emission Source Category: [Categorize Emission Source](#)

Design Capacity:

[Save](#) or [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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Crematory Operations are comprised of two processes; No. 1 External Combustion Equipment and No. 7 Other Processes (for the combustion of human or animal remains). Click No. 1 and a list of external combustion equipment will appear. Select *Crematorium*. Now, click No. 7 and select *Other process equipment*. See the next two screens for examples for selecting these two processes.

Categorize Emission Source

Permitted	A/N	Permit No	Permit Device ID	Permit Equipment Description	AFR Device ID	ES Name
Yes					ESnull	Human Remains Cremation

1. External Combustion Equipment (e.g., boiler, dryer, oven, furnace, heater, afterburner, flare, kiln or incinerator) [click here](#) to select one of the following Equipment:

- ☐ Boiler <10 MMBTU/HR
- ☐ Boiler 10-100 MMBTU/HR
- ☐ Boiler >100 MMBTU/HR
- ☐ Oven <10 MMBTU/HR
- ☐ Oven 10-100 MMBTU/HR
- ☐ Oven >100 MMBTU/HR
- ☐ Dryer <10 MMBTU/HR
- ☐ Dryer 10-100 MMBTU/HR
- ☐ Dryer >100 MMBTU/HR
- ☐ Furnace <10 MMBTU/HR
- ☐ Furnace 10-100 MMBTU/HR
- ☐ Furnace >100 MMBTU/HR
- ☐ Heater <10 MMBTU/HR
- ☐ Heater 10-100 MMBTU/HR
- ☐ Heater >100 MMBTU/HR
- ☐ Space/Water heater - not related to a process <10 MMBTU/HR
- ☐ Afterburner <10 MMBTU/HR
- ☐ Afterburner 10-100 MMBTU/HR
- ☐ Afterburner >100 MMBTU/HR
- ☐ Kilns
- ☐ Incinerator
- ☒ Crematorium
- ☐ Flare
- ☐ Charbroiler
- ☐ Deep Fat Fryers

Save Cancel

Categorize Emission Source

- ☐ Furnace <10 MMBTU/HR
- ☐ Furnace 10-100 MMBTU/HR
- ☐ Furnace >100 MMBTU/HR
- ☐ Heater <10 MMBTU/HR
- ☐ Flare
- ☐ Charbroiler
- ☐ Deep Fat Fryers

In addition to burning fuels, if this device processes other materials, make sure box "Other Process Emissions" is checked under Category 7 below.

2. Internal Combustion Equipment (e.g., internal combustion engine (excluding vehicles), turbine or micro turbine) [click here](#) to select one of the following Equipment:

3. Spray Coating/Spray Booth (e.g., coatings, solvents, adhesives, etc.) [click here](#) to select one of the following Equipment:

4. 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:

5. Liquid Storage Tank (e.g. Underground, Aboveground, Small Tanks, Dispensing Systems) [click here](#) to select one of the following Equipment:

6. Fugitive Components (Emission Leaks from Process Components per Rule 462, 1173 and 1176), [click here](#) to select all applicable Equipment:

7. 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

After saving, the user will be returned to the Device page. Click on the Save and proceed to List of Emission Sources button which will navigate you to the Emission Source Page.

Reporting Process Emissions

Click on the ["Open"](#) link in the Emissions column next to the Emission Source for the crematory operations, as shown below.

Guideline for Calculating Emissions from Crematory Operations

AER Home Browse Facilities Access Facility **START HERE**

Ready For Review · Facility ID: 999914 · SOUTH COAST AIR QUALITY MGT DIST(SCAQMD) · Reporting period: 2022

Facility ID: 999914

1. Facility Information
2. Status Update
3. Combustion Fuels
4. Emissions Release Locations
- 5. Emission Sources (ES)**
6. Report Process/Emissions
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Form data is successfully saved.

Build Reporting Structure

Emission Sources (ES) Classification

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Instruction: Add Devices (emissions sources) by clicking "Add New Emission Source". Edit devices by clicking "Profile" under the Emission Source (ES) Column. Add emission data by clicking "Open" under the Emissions column. Upload storage tank data by clicking on link "Click here" below.

Storage Tank Emissions Batch File Import - [Click here](#) for more instructions.

[Add New Emission Source](#)

Displaying 1 emission sources.

A/N: Permit NO:
AER Device ID: Permit Device ID:

[Search Emission Sources](#)

Search: [Print Preview](#)

Emission Source (ES)	Emissions A/N	Permit NO	Permit Device ID	Permit Equipment Description	AER Device ID	ES Name	ES Group Name	Source Category	Has Emissions	Equipment	PERP	ES Status
Profile Open			D1		ES15	Human Remains Cremation		External Combustion, Other Processes	Y	Crematorium	N	Work in progress

Showing 1 to 1 of 1 entries

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The reporting tool adds a new pop-up window that shows processes P1 and P2. Click the hyperlink “[Open](#)” to enter process information: process, throughput, criteria emissions, and TACs.

Process References

A/N	Permit No	Permit Device ID	Permit Equipment Description	AER Device ID	ES Name	ES Group Name	Source Category	Emissions?	Equipment	PERP	ES Status
Open			D1		ES15	Human Remains Cremation		External Combustion, Other Processes	Y	Crematorium	N

	Process ID	Source Group	Process/Material/Fuel Name	Status	Operation Type
Open	P1	External Combustion		Work in progress	routine
Open	P2	Other Process Emissions		Work in progress	routine

[Add Process/Material/Fuel](#) [i](#)

[OK](#)

The hyperlinks “[Open](#)” will take the user to the Process page for that process.

After clicking the “[Open](#)” link, the Process page will open. The following is for the *External Combustion Equipment* process. The process information for *Other Processes* will require additional information which will be discussed later.

Guideline for Calculating Emissions from Crematory Operations

AER Home Browse Facilities Access Facility **START HERE**

Ready For Review · Facility ID: 999914 · SOUTH COAST AIR QUALITY MGT DIST(SCAQMD) · Reporting period: 2022

Facility ID: 999914

1. Facility Information
2. Status Update
3. Combustion Fuels
4. Emissions Release Locations
5. Emission Sources (ES)
6. 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

7. Additional Toxic Substances Production and Usage
8. Perform Data Validation
9. Review Summaries
10. Print Facility Report
11. Report Submission

[Back to Emission Source Process Reference](#)

External Combustion

Please provide specific information for every process associated with your external combustion Emission Sources including usage, emission factor and control efficiency (if any). Combustion fuels must be selected on the combustion fuels page (see 3. Combustion Fuels link in the menu on the left-side) before entering data on this page. Detail 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 #	Equipment	PERP	Fuel	SCC
Open	ES15	D1		P1		Crematorium	No		

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

Step 2: Throughput

Annual Throughput	Criteria/Toxic Throughput
Open	

Step 3: Criteria Emissions (lbs) Use [Default Emission Factors](#) if available.

	Pollutant	EF	Unit	EF Data Source	Emissions
Open	VOC		lbs /		
Open	NOx		lbs /		
Open	SOx		lbs /		
Open	CO		lbs /		
Open	PM		lbs /		

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

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

Click on the “[Open](#)” link in the green table under Step 1, as shown in the screen above. Information can be selected and entered in every field, however only *Fuel* and *Rule #* are required entries as noted by the red asterisk next to those fields. Click [Save](#) button, as shown in the screen below.

Edit Emission Process - External Combustion

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Equipment	PERP	Fuel	SCC
ES15	D1		P1	401	Crematorium	No	Natural Gas	

AER Device ID: ES15 AER Device Name: Human Remains Cremation

PERMITTED Permit Device ID: D1

Process ID: P1 Process Name:

Process Comment:

SCC:

Fuel: Natural Gas *

Rule #: 474 * [Add Rule](#)

Equipment: Crematorium

[Save](#) [Cancel](#)

After saving, the pop-up window for Step 1 closes. Click open on the Step 2 Throughput section. Enter the Fuel Usage (Annual Throughput) and Throughput Type (Input because it is based on the amount of fuel input to the incinerator) and Fuel Usage Comment in the pop-up window, as shown below. Click [Save](#) button.

Edit Throughput Information - External Combustion

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Equipment	PERP	Fuel	SCC
ES15	D1		P1	401	Crematorium	No	Natural Gas	

Annual Throughput Criteria/Toxic Throughput

Fuel Usage (Annual Throughput): 1,000.00000000 * mmscf *

Throughput Type: Input *

Fuel Usage Comment:

[Save](#) [Cancel](#)

Default emission factors are entered into Step 3 and Step 4.

Ready For Review · Facility ID: 999914 · SOUTH COAST AIR QUALITY MGT DIST(SCAQMD) · Reporting period: 2022

Facility ID: 999914

1. Facility Information
2. Status Update
3. Combustion Fuels
4. Emissions Release Locations
5. Emission Sources (ES)
6. 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

7. Additional Toxic Substances Production and Usage

8. Perform Data Validation

9. Review Summaries

10. Print Facility Report

11. Report Submission

← Back to Emission Source Process Reference

External Combustion

Please provide specific information for every process associated with your external combustion Emission Sources including usage, emission factor and control efficiency (if any). **Combustion fuels must be selected on the combustion fuels page (see 3. Combustion Fuels link in the menu on the left-side) before entering data on this page.** Detail 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 #	Equipment	PERP	Fuel	SCC
Open	ES15	D1		P1	401	Crematorium	No	Natural Gas	

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

Step 2: Throughput

	Annual Throughput	Criteria/Toxic Throughput
Open	1,000.00000000 mmscf	1,000.00000000 mmscf

Step 3: Criteria Emissions (lbs) Use [Default Emission Factors](#) if available.

	Pollutant	EF	Unit	EF Data Source	Emissions
Open	VOC	7.00000000e+0	lbs / mmscf	AQMD default	7.00000000e+3
Open	NOx	1.30000000e+2	lbs / mmscf	AQMD default	1.30000000e+5
Open	SOx	6.00000000e-1	lbs / mmscf	AQMD default	6.00000000e+2
Open	CO	3.50000000e+1	lbs / mmscf	AQMD default	3.50000000e+4
Open	PM	7.50000000e+0	lbs / mmscf	AQMD default	7.50000000e+3

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

	TAC/ODC Group	CAS #	EF	Unit	EF Data Source	Emissions
Open	Benzene	71432	8.00000000e-3	lbs / mmscf	AQMD default	8.00000000e+0
Open	Formaldehyde	50000	1.70000000e-2	lbs / mmscf	AQMD default	1.70000000e+1
Open	PAHs [PAH, POM]	1151	1.00000000e-4	lbs / mmscf	AQMD default	1.00000000e-1
Open	PAHs [PAH, POM]	91203	3.00000000e-4	lbs / mmscf	AQMD default	3.00000000e-1
Open	Acetaldehyde	75070	4.30000000e-3	lbs / mmscf	AQMD default	4.30000000e+0
Open	Acrolein	107028	2.70000000e-3	lbs / mmscf	AQMD default	2.70000000e+0
Open	Ammonia	7664417	1.80000000e+1	lbs / mmscf	AQMD default	1.80000000e+4
Open	Ethyl benzene	100414	9.50000000e-3	lbs / mmscf	AQMD default	9.50000000e+0
Open	Hexane	110543	6.30000000e-3	lbs / mmscf	AQMD default	6.30000000e+0
Open	Toluene	108883	3.66000000e-2	lbs / mmscf	AQMD default	3.66000000e+1
Open	Xylenes	1330207	2.72000000e-2	lbs / mmscf	AQMD default	2.72000000e+1

[Add New](#)

If you would like to change the emission factors by substituting using results from a source test, click on the “[Open](#)” link next to the pollutant that has the emission factor you would like to replace. In the pop-up window, click the Use Default checkbox to uncheck the box. Enter the new emission factor. Enter the reference for the emission factor. If it is a source test, enter the South Coast AQMD Source Test ID. As noted previously, only source tests that have been either approved or submitted for review can be used for emission reporting in AER. If your source test does not have a South Coast AQMD Source Test ID, contact the South Coast AQMD inspector for your facility. Select the appropriate Emission Factor Data Source from the dropdown menu. Click the save button.

Guideline for Calculating Emissions from Crematory Operations

Combustion

External Combustion

Internal Combustion

Use of organics

Spray Coating/Spray Booth

Other Use of Organics

Storage Tanks

Fugitive Components

Other Processes

Process Upset

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Step 1: Process

Optional: Mark as Completed

	AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Equipment	PERP	Fuel	SCC
Open	ES15	D1		P1	401	Crematorium	No	Natural Gas	

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

Step 2: Throughput

	Annual Throughput	Criteria/Toxic Throughput
Open	1,000.00000000 mmscf	1,000.00000000 mmscf

Step 3: Criteria Emissions (lbs)

Use [Default Emission Factors](#) if available.

	Pollutant	EF	Unit	EF Data Source	Emissions
Open	VOC	7.00000000e+0	lbs / mmscf	AQMD default	7.00000000e+3
Open	NOx	1.30000000e+2	lbs / mmscf	AQMD default	1.30000000e+5
Open	SOx	6.00000000e-1	lbs / mmscf	AQMD default	6.00000000e+2
Open	CO	3.50000000e+1	lbs / mmscf	AQMD default	3.50000000e+4
Open	PM	7.50000000e+0	lbs / mmscf	AQMD default	7.50000000e+3

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

	TAC/ODC Group	CAS #	EF	Unit	EF Data Source	Emissions
Open	Benzene	71432	8.00000000e-3	lbs / mmscf	AQMD default	8.00000000e+0
Open	Formaldehyde	50000	1.70000000e-2	lbs / mmscf	AQMD default	1.70000000e+1
Open	PAHs [PAH, POM]	1151	1.00000000e-4	lbs / mmscf	AQMD default	1.00000000e-1
Open	PAHs [PAH, POM]	91203	3.00000000e-4	lbs / mmscf	AQMD default	3.00000000e-1
Open	Acetaldehyde	75070	4.30000000e-3	lbs / mmscf	AQMD default	4.30000000e+0
Open	Acrolein	107028	2.70000000e-3	lbs / mmscf	AQMD default	2.70000000e+0
Open	Ammonia	7664417	1.80000000e+1	lbs / mmscf	AQMD default	1.80000000e+4
Open	Ethyl benzene	100414	9.50000000e-3	lbs / mmscf	AQMD default	9.50000000e+0
Open	Hexane	110543	6.30000000e-3	lbs / mmscf	AQMD default	6.30000000e+0
Open	Toluene	108883	3.66000000e-2	lbs / mmscf	AQMD default	3.66000000e+1
Open	Xylenes	1330207	2.72000000e-2	lbs / mmscf	AQMD default	2.72000000e+1

Add New

Open Criteria Emission Information - External Combustion

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Equipment	PERP	Fuel	SCC
ES15	D1		P1	401	Crematorium	No	Natural Gas	

Annual Throughput: 1,000.00000000 mmscf

Criteria/Toxic Throughput: 1,000.00000000 mmscf

Throughput used to calculate emissions: 1,000.00000000 mmscf

Pollutant: VOC - Volatile Organic Compounds

Emission Factor (EF): 6.50000000e+0 * lbs/mmscf

☐ Use default

Emission Factor Comment:

If not using **AQMD default** emission factor please provide detailed references in the Emission Factor Comment box above or upload file with the information. Processes without this information are subject to audit.

Emission Factor Data Source: Source Test *

Emissions: 6.50000000e+3 lbs

Save Cancel

If you are satisfied with all the information entered in the Process page, click on the <<Back to Emission Source Process Reference button on the bottom of the page, as shown in the screen below.

Guideline for Calculating Emissions from Crematory Operations

Ready For Review · Facility ID: 999914 · SOUTH COAST AIR QUALITY MGT DIST(SCAQMD) · Reporting period: 2022

Facility ID: 999914

1. Facility Information
2. Status Update
3. Combustion Fuels
4. Emissions Release Locations
5. Emission Sources (ES)
6. 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

7. Additional Toxic Substances Production and Usage

8. Perform Data Validation

9. Review Summaries

10. Print Facility Report

11. Report Submission

Back to Emission Source Process Reference

External Combustion

Please provide specific information for every process associated with your external combustion Emission Sources including usage, emission factor and control efficiency (if any). Combustion fuels must be selected on the combustion fuels page (see 3. Combustion Fuels link in the menu on the left-side) before entering data on this page. Detail 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 #	Equipment	PERP	Fuel	SCC
Open	ES15	D1		P1	401	Crematorium	No	Natural Gas	

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

Step 2: Throughput

	Annual Throughput	Criteria/Toxic Throughput
Open	1,000.00000000 mmscf	1,000.00000000 mmscf

Step 3: Criteria Emissions (lbs) Use [Default Emission Factors](#) if available.

	Pollutant	EF	Unit	EF Data Source	Emissions
Open	VOC	7.00000000e+0	lbs / mmscf	AQMD default	7.00000000e+3
Open	NOx	1.30000000e+2	lbs / mmscf	AQMD default	1.30000000e+5
Open	SOx	6.00000000e-1	lbs / mmscf	AQMD default	6.00000000e+2
Open	CO	3.50000000e+1	lbs / mmscf	AQMD default	3.50000000e+4
Open	PM	7.50000000e+0	lbs / mmscf	AQMD default	7.50000000e+3

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

	TAC/ODC Group	CAS #	EF	Unit	EF Data Source	Emissions
Open	Benzene	71432	8.00000000e-3	lbs / mmscf	AQMD default	8.00000000e+0
Open	Formaldehyde	50000	1.70000000e-2	lbs / mmscf	AQMD default	1.70000000e+1
Open	PAHs [PAH, POM]	1151	1.00000000e-4	lbs / mmscf	AQMD default	1.00000000e-1
Open	PAHs [PAH, POM]	91203	3.00000000e-4	lbs / mmscf	AQMD default	3.00000000e-1
Open	Acetaldehyde	75070	4.30000000e-3	lbs / mmscf	AQMD default	4.30000000e+0
Open	Acrolein	107028	2.70000000e-3	lbs / mmscf	AQMD default	2.70000000e+0
Open	Ammonia	766417	1.80000000e+1	lbs / mmscf	AQMD default	1.80000000e+4
Open	Ethyl benzene	100414	9.50000000e-3	lbs / mmscf	AQMD default	9.50000000e+0
Open	Hexane	110543	6.30000000e-3	lbs / mmscf	AQMD default	6.30000000e+0
Open	Toluene	108883	3.66000000e-2	lbs / mmscf	AQMD default	3.66000000e+1
Open	Xylenes	1330207	2.72000000e-2	lbs / mmscf	AQMD default	2.72000000e+1

[Add New](#)

Click the “[Open](#)” link next to Process 2 *Other Process Emissions* in the Process References pop-up box.

Process References

A/N	Permit No	Permit Device ID	Permit Device Description	AER Device ID	ES Name	ES Group Name	Source Category	Emissions?	Equipment	PERP	ES Status
Open			D1		ES15	Human Remains Cremation		External Combustion, Other Processes	Y	Crematorium	N

Process ID	Source Group	Process/Material/Fuel Name	Status	Operation Type
Open	P1	External Combustion	Work in progress	routine
Open	P2	Other Process Emissions	Work in progress	routine

[Add Process/Material/Fuel](#) [i](#)

[OK](#)

Click on the “[Open](#)” link in the green table under Step 1. Identify the Process Name and fill out the Activity Code by selecting the appropriate information from the drop-down menu from each box. The example below shows entries for the correct sector, industry, operation, process, and rule for crematory operations. Click [Save](#) button.

Edit Emission Process - Other Processes

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity	SCC
ES15	D1		P2	401	Miscellaneous Operations and Services : Cremation : Commercial / Institutional : Single Chamber / Animal Remains	

AER Device ID
PERMITTED

AER Device Name
Human Remains Cremation

Process ID
P2

Permit Device ID
D1

Process Name

Process Comment

SCC

Activity Code *

Sector:
Miscellaneous Operations and Services

Industry:
Cremation

Operation:
Commercial / Institutional

Process:
Single Chamber / Animal Remains

Rule #

401

* [Add Rule](#)

Save

Cancel

After saving, the pop-up window for Step 1 closes. Click open on the Step 2 Throughput section. Enter the Throughput Type (for this example, the second process would be throughput of remains in tons), as shown below. Click [Save](#) button.

Edit Throughput Information - Other Processes

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity	SCC
ES15	D1		P2	401	Miscellaneous Operations and Services : Cremation : Commercial / Institutional : Single Chamber / Animal Remains	

Annual Throughput

1,000.00000000

* tons

Throughput Type

Input

Throughput Comment

Save

Cancel

Default emission factors are entered into Step 3 and Step 4.

Guideline for Calculating Emissions from Crematory Operations

Facility ID: 999914

1. Facility Information
 2. Status Update
 3. Combustion Fuels
 4. Emissions Release Locations
 5. Emission Sources (ES)
 6. 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
 7. Additional Toxic Substances Production and Usage
 8. Perform Data Validation
 9. Review Summaries
 10. Print Facility Report
 11. Report Submission

Device ID	Device ID	R/N	ID	#	ACTIVITY	SLC
Open	ES15	D1	P2	401	Miscellaneous Operations and Services : Cremation : Commercial / Institutional : Single Chamber / Animal Remains	

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

Step 2: Throughput

Annual Throughput	
Open	1,000.00000000 tons

Step 3: Criteria Emissions (lbs) Use [Default Emission Factors](#) if available.

Pollutant	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Open	VOC	2.00000000e+0	lbs / tons	No	AQMD default	2.00000000e+3
Add New						

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

	TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Open	Arsenic and Compounds (inorganic)	7440382	4.00000000e-4	lbs / tons	No	AQMD default		4.00000000e-1
Open	Beryllium	7440417	1.84000000e-5	lbs / tons	No	AQMD default		1.84000000e-2
Open	Cadmium	7440439	1.46000000e-3	lbs / tons	No	AQMD default		1.46000000e+0
Open	Chromium, hexavalent (and compounds)	18540299	1.91000000e-4	lbs / tons	No	AQMD default		1.91000000e-1
Open	Chlorinated dibenzofurans, without individual isomers reported	1080	1.43000000e-7	lbs / tons	No	AQMD default		1.43000000e-4
Open	Chlorinated dioxins, without individual isomers reported	1086	7.74000000e-8	lbs / tons	No	AQMD default		7.74000000e-5
Open	Formaldehyde	50000	2.89000000e-9	lbs / tons	No	AQMD default		2.89000000e-6
Open	Hydrochloric acid	7647010	1.97000000e+0	lbs / tons	No	AQMD default		1.97000000e+3
Open	Lead compounds (inorganic)	7439921	9.39000000e-3	lbs / tons	No	AQMD default		9.39000000e+0
Open	Nickel	7440020	5.09000000e-4	lbs / tons	No	AQMD default		5.09000000e-1
Open	PAHs [PAH, POM]	1151	9.63000000e-4	lbs / tons	No	AQMD default		9.63000000e-1
Add New								

If you would like to change the emission factors, for example replace them with source tested values, click on the “[Open](#)” link next to the pollutant that has the emission factor you would like to replace. In the pop-up window, click the Use Default checkbox to uncheck the box. Enter the new emission factor. Enter the reference for the emission factor. If it is a source test, enter the South Coast AQMD Source Test ID. As noted previously, only source tests that have been either approved or submitted for review can be used for emission reporting in AER. If your source test does not have a South Coast AQMD Source Test ID contact the South Coast AQMD inspector for your facility. Select the appropriate Emission Factor Data Source from the drop-down menu. Click the save button. The following screenshots show an example of how to substitute a default emission factor for beryllium with one from a source test.

Guideline for Calculating Emissions from Crematory Operations

Facility ID: 999914

reported here; however, it must be substantiated to avoid double reporting. Detailed instructions are available by clicking on Help icon in the tool bar.

1. Facility Information
2. Status Update
3. Combustion Fuels
4. Emissions Release Locations
5. Emission Sources (ES)
6. 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
7. Additional Toxic Substances Production and Usage
8. Perform Data Validation
9. Review Summaries
10. Print Facility Report
11. Report Submission

Optional: Mark as Completed

Step 1: Process

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity	SCC
Open	ES15	D1	P2	401	Miscellaneous Operations and Services : Cremation : Commercial / Institutional : Single Chamber / Animal Remains	

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

Step 2: Throughput

Annual Throughput
Open

1,000.00000000 tons

Step 3: Criteria Emissions (lbs)

Use [Default Emission Factors](#) if available.

Pollutant	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Open	VOC	2.00000000e+0 lbs / tons	No	AQMD default		2.00000000e+3

Add New

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

TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Open	Arsenic and Compounds (inorganic)	7440382	4.00000000e-4 lbs / tons	No	AQMD default		4.00000000e-1
Open	Beryllium	7440417	1.84000000e-5 lbs / tons	No	AQMD default		1.84000000e-2
Open	Cadmium	7440439	1.46000000e-3 lbs / tons	No	AQMD default		1.46000000e+0
Open	Chromium, hexavalent (and compounds)	18540299	1.91000000e-4 lbs / tons	No	AQMD default		1.91000000e-1
Open	Chlorinated dibenzofurans, without individual isomers reported	1080	1.43000000e-7 lbs / tons	No	AQMD default		1.43000000e-4
Open	Chlorinated dioxins, without individual isomers reported	1086	7.74000000e-8 lbs / tons	No	AQMD default		7.74000000e-5
Open	Formaldehyde	50000	2.89000000e-9 lbs / tons	No	AQMD default		2.89000000e-6
Open	Hydrochloric acid	7647010	1.97000000e+0 lbs / tons	No	AQMD default		1.97000000e+3
Open	Lead compounds (inorganic)	7439921	9.39000000e-3 lbs / tons	No	AQMD default		9.39000000e+0
Open	Nickel	7440020	5.09000000e-4 lbs / tons	No	AQMD default		5.09000000e-1
Open	PAHs [PAH, POM]	1151	9.63000000e-4 lbs / tons	No	AQMD default		9.63000000e-1

Add New

Open Toxic (TAC/ODC) Emission Information - Other Processes

AER Device ID	Permit Device ID	A/N	Process ID	Rule #	Activity	SCC
ES15	D1		P2	401	Miscellaneous Operations and Services : Cremation : Commercial / Institutional : Single Chamber / Animal Remains	

Annual Throughput
1,000.00000000 tons

TAC/ODC Toxic Pollutants / Ozone Depleting Compounds

TAC Group
3 - Beryllium

CAS # (Pollutant)
7440417 - Beryllium

Emission Factor (EF)
1.53000000e-5 * lbs/tons

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

Overall Control Efficiency

Emission Factor Comment

If not using **AQMD default** emission factor please provide detailed references in the Emission Factor Comment box above or upload file with the information.
Processes without this information are subject to audit.

Emission Factor Data Source
Source Test *

Emissions
1.53000000e-2 lbs

Save Cancel

Guideline for Calculating Emissions from Crematory Operations

Facility ID: 999914

1. Facility Information
 2. Status Update
 3. Combustion Fuels
 4. Emissions Release Locations
 5. Emission Sources (ES)
 - 6. Report Process/Emissions**
 7. Additional Toxic Substances Production and Usage
 8. Perform Data Validation
 9. Review Summaries
 10. Print Facility Report
 11. Report Submission
- Combustion
 - External Combustion
 - Internal Combustion
 - Use of organics
 - Spray Coating/Spray Booth
 - Other Use of Organics
 - Storage Tanks
 - Fugitive Components
 - Other Processes**
 - Process Upset

Open	VOC	2.00000000e+0	lbs / tons	No	AQMD default		2.00000000e+3
Add New							

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

	TAC/ODC Group	CAS #	EF	Unit	Controlled EF	EF Data Source	Overall CE	Emissions
Open	Arsenic and Compounds (inorganic)	7440382	4.00000000e-4	lbs / tons	No	AQMD default		4.00000000e-1
Open	Beryllium	7440417	1.84000000e-5	lbs / tons	No	AQMD default		1.84000000e-2
Open	Cadmium	7440439	1.46000000e-3	lbs / tons	No	AQMD default		1.46000000e+0
Open	Chromium, hexavalent (and compounds)	18540299	1.91000000e-4	lbs / tons	No	AQMD default		1.91000000e-1
Open	Chlorinated dibenzofurans, without individual isomers reported	1080	1.43000000e-7	lbs / tons	No	AQMD default		1.43000000e-4
Open	Chlorinated dioxins, without individual isomers reported	1086	7.74000000e-8	lbs / tons	No	AQMD default		7.74000000e-5
Open	Formaldehyde	50000	2.89000000e-9	lbs / tons	No	AQMD default		2.89000000e-6
Open	Hydrochloric acid	7647010	1.97000000e+0	lbs / tons	No	AQMD default		1.97000000e+3
Open	Lead compounds (inorganic)	7439921	9.39000000e-3	lbs / tons	No	AQMD default		9.39000000e+0
Open	Nickel	7440020	5.09000000e-4	lbs / tons	No	AQMD default		5.09000000e-1
Open	PAHs [PAH, POM]	1151	9.63000000e-4	lbs / tons	No	AQMD default		9.63000000e-1
Add New								

Step 5: Process Release Locations

Emission Release Locations need to be added before they can be linked to processes. If you do not see your emission release location for this process, please add it in the [Emissions Release Locations](#) page.

Release Location ID	Release Name	Release Type	Stack Configuration	Latitude	Longitude	Stack Height Above Ground (ft)	Stack Exit Gas Temperature (°F)	Stack Exit Gas Diameter (ft)	Stack Exit Gas Velocity (ft/min)	Stack Exit Gas Flow Rate (Actual CFM)	Action
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Link Emissions Release Locations to this Process

<< Back to Emission Source Process Reference

[AQMD web site Home](#) | [AER Web Site](#) | [Submit question/comment](#) | [Report a Bug](#)

Clicking the << Back to Emission Source Process Reference_button on the bottom of the Process page, returns the user to the Process References pop-up box, if changes need to be made to Process 1. Clicking on the Emission Sources (ES) link on the Navigation Menu on the left side of the page, returns the user to the Emission Sources page, where the next Emission Source, if any, can be accessed.