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Reporting Emissions from Vehicles on Unpaved Roads

Emissions Inventory Help Sheet

Maricopa County Air Quality Department

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What to Report

Facilities with unpaved roads must report particulate matter (PM) primary and PM₁₀ primary emissions from vehicle travel on unpaved roads in an emission inventory report.

PM primary refers to all particulate matter emissions (filterable and condensable) from an emissions process. PM₁₀ primary refers to all PM primary that measures less than 10 microns in diameter. PM₁₀ primary is a subset of PM primary.

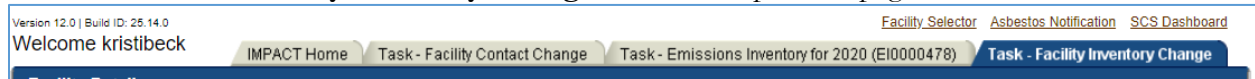
How to Report

This help sheet shows emissions inventory preparers how to accurately report emissions from vehicles on unpaved roads in the AQD Online Portal. First, preparers will use the “Task-Facility Inventory Change” tab to structure the emission units, processes, and control equipment. Then, preparers will use the “Task-Emissions Inventory” tab to enter the operating schedule, throughput, and emissions factors for each process.

Task – Facility Inventory Change

Step 1

Click on the **Task-Facility Inventory Change** tab at the top of the page.



Step 2

Emission Units

There should be one Open Air Fugitive Source (FUG) emission unit for each class of vehicle that travels on unpaved roads at the facility. Include the following text in the company equipment description:

- Heavy duty vehicle travel on unpaved roads
- Medium duty vehicle travel on unpaved roads
- Light duty vehicle travel on unpaved roads

If these emission units are not in the facility inventory tree, click on the **Facility ID** at the top of the **Facility Inventory Tree** on the left side of the page. Click **Create Emission Unit** at the bottom of the page.

Expand Facility Tree

- F038071
 - INC001
 - INC002
 - INC003
 - INC004

Facility Information

Facility ID: F038071
 Facility Name: Facility Creation Request Test 1
 Facility Description:

Facility Class: Minor
 Facility Type: Other (Miscellaneous)

Associated Monitor Group ID:
 Operating Status: Operating AFS:
 Number of Employees:
 Department:

NAICS

NAICS

Add NAICS Printable view Export to excel

NAICS reference information

Edit Validate Submit Download/Print Detail Print Facility Tree

Create Emissions Unit Create Control Equipment Create Release Point

Complete the required Emission Unit Information and click **Save**.

Expand Facility Tree

- F038071
 - INC001
 - INC002
 - INC003
 - INC004

Emissions Unit Information

AQD ID:
 * Emission Unit Type: Open Air Fugitive Source [Help me select the Emission Unit Type](#)

AQD Description:

* Company Equipment ID: VMT HD
 * Company Equipment Description: Heavy duty vehicle travel on unpaved roads

* Operating Status: Operating

* Quantity: 1

Enter a value greater than 1 only in the scenario where you have multiple "identical" emission units that have the same emissions process and whose air flow follows the same path.

Initial Construction Commencement Date:

Initial Operation Commencement Date:

Most Recent Construction/Modification Commencement Date:

Most Recent Operation Commencement Date:

Emission Unit Type Specific Information

Fugitive Emission Type - Fugitive Leaks at Oil and Gas Sites:

Permitted Emissions

This table is populated by AQD staff based on established/permitted emission limits. It is shown here for informational purposes only.

Pollutant	Potential Emissions		Allowable Emissions		Comments
	Lbs/Hour	Tons/Year	Lbs/Hour	Tons/Year	

Printable view Export to excel

Save Cancel

Step 3

Emissions Processes

Each emission unit for unpaved road travel should have one emissions process attached (specify the vehicle class, heavy/medium/light duty, in the process description). Use one of the following source classification codes, as applicable:

- 30502504 for sand and gravel, asphalt, and concrete batch facilities
- 50100401 for landfills

Process Information

Process ID: PRC012

Process Name:

Company Process Description: HEAVY DUTY VEHICLES @ 10 MPH ON UNPAVED ROADS

Source Classification Code (SCC): 3-05-025-04

SCC Level 1 Description: 3:Industrial Processes

SCC Level 2 Description: 05:Mineral Products

SCC Level 3 Description: 025:Construction Sand and Gravel

SCC Level 4 Description: 04:Hauling

[SCC reference information](#)

If the emission units for unpaved road travel do not have an emissions process attached, click on the **Emission Unit ID (FUG001)** in the **Facility Inventory Tree** on the left side of the screen. Click **Create Emissions Process** at the bottom of the screen.

Expand Facility Tree

- ⊖ F038071
 - ⊕ **FUG001**
 - ⊖ FUG002
 - ⊖ FUG003
 - ⊖ INC001
 - ⊕ INC002
 - ⊖ INC003
 - ⊖ INC004

Emissions Unit Information

AQD ID: FUG001

Emission Unit Type: Open Air Fugitive Source [Help me select the Emission Unit Type](#)

AQD Description:

Company Equipment ID: HDV

Company Equipment Description:

Enter the **Company Process Description** and the applicable **Source Classification Code** and click Save.

Process Information

Process ID:

Process Name:

Company Process Description:

*** Source Classification Code (SCC):**

Enter as 1-22-333-44 or 12233344

Step 4

Control Equipment

You may account for dust control efforts on haul roads if: (1) you use water or other dust suppressants and (2) if you are in full compliance with Rule 310 (Fugitive Dust) and/or Rule 316 (Nonmetallic Mineral Processing). To account for dust control efforts on unpaved roads, there should be one “Fugitive Dust Suppression (FDS)” control equipment associated with all emissions processes for vehicle travel on unpaved roads.

The FDS control equipment should indicate 90% design control efficiency, 90% operating control efficiency, and 100% capture efficiency for PM primary, PM₁₀ primary, and PM_{2.5} primary.

If the FDS control equipment is not in the facility inventory tree, click on the **Facility ID** at the top of the **Facility Inventory Tree** on the left side of the page. Click **Create Control Equipment** at the bottom of the page.

Expand Facility Tree

- ⊖ F038071
- ⊕ FUG001
- ⊕ FUG002
- ⊕ FUG003
- ⊖ INC001
- ⊖ INC002
- ⊖ INC003
- ⊖ INC004

Facility Information

Facility ID: F038071

Facility Name: Facility Creation Request Test 1

Facility Description:

Facility Class: Minor

Facility Type: Other (Miscellaneous)

Associated Monitor Group ID:

Operating Status: Operating **AFS:**

Number of Employees:

Department:

Complete the **Control Equipment Information** and click **Save**.

Control Equipment Information

AQD ID:

* Control Equipment Type: **Fugitive Dust Suppression**

AQD Description:

* Company Control Equipment ID: **WT**

* Company Control Equipment Description: **Water Trucks - Unpaved Roads and Storage Piles**

* Operating Status: **Operating**

Initial Installation Date:

Manufacturer Name: Model Name and Number:

Control Equipment Type Specific Information

Suppressant Agent Type: **Water**

Method of Application: **Water Trucks**

Application Rate - specify units: number of gallons

Application Frequency - specify units:

Pollutants Controlled

Explanation

*You must specify at least one pollutant in the Pollutants Controlled table

Select All | Select None

Select Pollutant	Design Control Efficiency(%)	Operating Control Efficiency(%)	Capture Efficiency(%)	Total Capture Control(%)
<input type="checkbox"/> PM Primary (includes filterables > 10 microns + condensibles)	90	90	100	
<input type="checkbox"/> PM10 Primary (includes filterables + condensibles)	90	90	100	
<input type="checkbox"/> PM2.5 Primary (includes filterables + condensibles)	90	90	100	

Add Pollutant | Delete Selected Pollutants | Printable view | Export to excel

Save | Cancel

To associate the control equipment, click on the emissions process it controls (**PRC002**), Click **Associate Existing Control Equipment**.

Collapse Facility Tree

- F038071
 - FUG001
 - PRC002**
 - FUG002
 - PRC003
 - FUG003
 - PRC004
 - INC001
 - INC002
 - PRC001
 - INC003
 - INC004
 - Disassociated CEs
 - FDS001

Process Information

Process ID: PRC002

Process Name:

Company Process Description: HDV

Source Classification Code (SCC): 3-05-025-04

SCC Level 1 Description: 3:Industrial Processes

SCC Level 2 Description: 05:Mineral Products

SCC Level 3 Description: 025:Construction Sand and Gravel

SCC Level 4 Description: 04:Hauling

SCC reference information

Edit | Delete

Create and Associate Control Equipment | Create and Associate Release Point

Associate Existing Control Equipment | Associate Existing Release Point

Disassociate Control Equipment | Disassociate Release Point

Select the **Control Equipment ID** and click **Save**.

Select Control Equipment to Associate

* AQD Control Equipment ID: **FDS001**

Save | Cancel

Task – Emissions Inventory for Reporting Year

Step 1

Click on the **Task-Emissions Inventory** tab at the top of the page.



Step 2

Click on the process attached to the FUG emission unit for unpaved roads (**PRC002**) in the **Emissions Inventory Tree** on the left side of the screen and click **Edit Material/Schedule/Seasons** in the middle of the screen.

Helpful Hint – Click on the triangle next to PRC002 at the top of the page to see the Company Process Description (this will tell you which vehicle class is reported under each process). In this example, emissions from heavy-duty vehicles on unpaved roads are reported under PRC002.

Process & Emissions Detail

PRC002: Source Classification Code (SCC) is 3-05-025-04

SCC Level 1: 3:Industrial Processes
 SCC Level 2: 05:Mineral Products
 SCC Level 3: 025:Construction Sand and Gravel
 SCC Level 4: 04:Hauling

Process Name:
 Company Process Description: HDV

Material Information, Annual Average Operating Schedule & Throughput Percent

Maximum Hours Per Day:	24	Winter (Jan-Feb, Dec)%:	25
Maximum Days Per Week:	7	Spring (Mar-May)%:	25
Maximum Weeks Per Year:	52	Summer (Jun-Aug)%:	25
Actual Hours:		Fall (Sep-Nov)%:	25

Variable Amount in Vehicle Units & Meaning
 The variables table is empty because there are no variables in this process.

Material Action | **Throughput Confidential Units**

Vehicle	Travelled	pending	<input type="checkbox"/>	MILES
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Explanation

To complete emissions reporting for this process, you have to provide values above for **Schedule, Season Percents** and **Material Throughput** in the units specified by **Units**. If there is a choice of more than one **Material**, you must select which is most appropriate, otherwise no action is needed on your part. The word pending appears each place a value is needed.

[Edit Material/Schedule/Seasons](#)

1. Enter the **maximum number of hours per day**, **maximum number of days per week**, and the **maximum number of weeks per year** the facility operated.
2. Enter the **actual hours** of operation for the facility during the reporting year.
3. Calculate and enter the total vehicle miles travelled (VMT) for each vehicle class (VMT for each vehicle class will be entered under a different emissions process). For vehicles that only travel on unpaved roads within the facility, VMT can be measured using the odometer. For haul trucks and passenger vehicles that leave the facility:

$$VMT = \text{length of haul road (miles)} \times \text{number of vehicle trips}$$

4. Enter the **percentage** of the vehicle miles travelled during each season.
5. Click **Save**.

▼ PRC002: Source Classification Code (SCC) is 3-05-025-04

SCC Level 1: 3:Industrial Processes
 SCC Level 2: 05:Mineral Products
 SCC Level 3: 025:Construction Sand and Gravel
 SCC Level 4: 04:Hauling

Process Name:
 Company Process Description: HDV

▼ Material Information, Annual Average Operating Schedule & Throughput Percent

Maximum Hours Per Day:	12
Maximum Days Per Week:	6
Maximum Weeks Per Year:	51
* Actual Hours:	3400

* Winter (Jan-Feb, Dec)%:	24
* Spring (Mar-May)%:	26
* Summer (Jun-Aug)%:	27
* Fall (Sep-Nov)%:	23

Material Action	Throughput	Confidential	Units
Vehicle Travelled	6000	<input type="checkbox"/>	MILES

Variable Amount in Vehicle Units & Meaning
 The variables table is empty because there are no variables in the for process.

▼ Explanation

To complete emissions reporting for this process, you have to provide values above for **Schedule, Season Percents** and **Material Throughput** in the units specified by **Units**. If there is a choice of more than one **Material**, you must select which is most appropriate, otherwise no action is needed on your part. The word pending appears each place a value is needed.

Save Reset Schedule/Seasons Cancel

Step 3

Click **Edit Emissions** at the bottom of the screen.

pollutant	Method Used	Uncontrolled	Units (LBS/Hour)	Amount	Amount	Total Units	Explanation
Printable view Export to excel							
Edit Emissions							

Reporting Criteria Air Pollutant Emissions

1. Use the chart below to identify Uncontrolled Emissions Factors (lb/VMT) for PM primary and PM₁₀ primary, depending on the average speed of each class of vehicle.

Vehicle Type	PM Primary and PM ₁₀ Primary Emissions Factors (lb/VMT)									
	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	
Heavy-Duty Vehicles (e.g., haul trucks, cranes)	2.13	3.2	4.27	5.33	6.4	7.47	8.53	9.6	10.67	
Medium-Duty Vehicles (e.g., front end loaders, forklifts)	0.57	0.86	1.14	1.43	1.71	2.0	2.28	2.57	2.85	
Light-Duty Vehicles (e.g., pickup trucks)	0.29	0.44	0.59	0.74	0.88	1.03	1.18	1.33	1.47	

Reference: U.S. EPA, 1997. *Compilation of Air Pollutant Emissions Factors AP-42*, Volume I: Stationary Point and Area Sources, fifth ed. Section 13.2.2.

If you do not want to use these emissions factors, please contact MCAQD at 602-506-6790 for parameters that can be used to calculate emissions factors. Upload your calculation documentation as an attachment to the emissions inventory.

2. Enter the **Uncontrolled Emissions Factors** for each pollutant. Enter zero (0) for all pollutants other than PM primary and PM₁₀ primary.
3. If the facility was in continuous compliance with the stabilization standards in Rule 310 (Fugitive Dust) and/or Rule 316 (Nonmetallic Mineral Processing, then hours uncontrolled will equal zero (0) for PM primary and PM₁₀ primary.

The screenshot shows the 'Process Emissions' interface. It features a table with columns for 'Criteria Air Pollutants/Other', 'Method Used', 'Hours Uncontrolled', 'Uncontrolled Emissions Factor (Lbs/Throughput Units)', 'Time-based Factor (LBS/Hour)', 'Emissions Reported' (Fugitive Amount, Stack Amount, Total), and 'Units'. The 'Hours Uncontrolled' and 'Uncontrolled Emissions Factor' columns are highlighted with a red box. Below the table, there are buttons for 'Printable view' and 'Export to excel'. At the bottom of the form, there are buttons for 'Add Emission', 'Delete Selected Emission(s)', 'Printable view', 'Export to excel', 'Save', and 'Cancel'.

Step 4

Click **Save** at the bottom of the screen. The AQD Online Portal will calculate emissions based on the operational information, the emissions factors provided, and the control efficiencies provided.

Helpful Hint – for vehicles on unpaved roads, the calculated emissions for PM primary and PM₁₀ primary will be the same because all of the PM emitted is assumed to be less than 10 microns in diameter.

Step 5

Verify that the results match emission records from the facility. Repeat this process (Steps 1 – 5) for each emissions process for vehicle use on unpaved roads.

Step 6

Refer to other process specific help sheets or the Emissions Inventory Instructions to report emissions from other types of processes at the facility. When emissions have been reported for each process, refer to Task 5 on page 26 of the Emissions Inventory Instructions to validate and submit the emissions inventory. The process specific help sheets and the Emissions Inventory Instructions are available at maricopa.gov/5628.

Example

Emissions from heavy duty vehicles

Length of unpaved road = 0.6 miles

Number of heavy duty vehicle trips = 6375

VMT heavy duty = 0.6 x 6375 = **3825**

Average speed = 10 miles per hour

Emissions factor = **2.13 lb/VMT**

Process & Emissions Detail

▼ PRC022: Source Classification Code (SCC) is 3-05-025-04

SCC Level 1: 3 Industrial Processes
 SCC Level 2: 05 Mineral Products
 SCC Level 3: 025 Construction Sand and Gravel
 SCC Level 4: 04 Hauling

Process Name: Heavy Duty Vehicles
 Company Process Description: Heavy Duty Vehicles on Unpaved Roads

▼ Material Information, Annual Average Operating Schedule & Throughput Percent

Maximum Hours Per Day: 10
 Maximum Days Per Week: 5
 Maximum Weeks Per Year: 51
 Actual Hours: 2,550.00

Winter (Jan-Feb, Dec)%: 25
 Spring (Mar-May)%: 25
 Summer (Jun-Aug)%: 25
 Fall (Sep-Nov)%: 25

Material Action: Throughput Confidential Units
 Vehicle Travelled: 3825 MILES

Variable Amount in Vehicle Units & Meaning
 The variables table is empty because there are no variables in the formula associated with the FIRE rpts for this process.

▼ Process Emissions

Criteria Air Pollutants/Other	Method Used	Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units)	Time-based Factor (LBS/Hour)	Emissions Reported		
					Fugitive Amount	Stack Amount	Total Units
Pollutant							
PM Primary (includes filterables > 10 microns + condensibles)	Throughout-based factor	0	2.13	0.407363	0	0.407363 TONS	
PM10 Primary (includes filterables + condensibles)	Throughout-based factor	0	2.13	0.407363	0	0.407363 TONS	
PM2.5 Primary (includes filterables + condensibles)	Throughout-based factor	0	0	0	0	0 TONS	
CO - Carbon Monoxide	Throughout-based factor	0	0	0	0	0 TONS	
NOx - Nitrogen Oxides	Throughout-based factor	0	0	0	0	0 TONS	
SO2 - Sulfur Dioxide	Throughout-based factor	0	0	0	0	0 TONS	
VOC - Volatile Organic Compounds	Throughout-based factor	0	0	0	0	0 TONS	
Ammonia	Throughout-based factor	0	0	0	0	0 TONS	

Questions

If you have questions or are experiencing issues with the AQD Online Portal, please contact 602-506-6790 or EmissionsInventory@maricopa.gov. Please provide a brief explanation of the question or problem you are encountering and include a screenshot if contacting us via email. If you are encountering errors or malfunctions in the portal, include the following information in your message: the date and time when the error occurred, the browser you were using when the error occurred, and the type of device you were using when the error occurred (i.e., computer, tablet, phone, etc.).

Additional Resources

How to create a Shared CROMERR Services (SCS) electronic signature to access the AQD Online Portal: maricopa.gov/DocumentCenter/View/56270

Emissions inventory instructions and other process specific help sheets:
www.maricopa.gov/5628

Instructions for permit applications, compliance reports, asbestos notifications, performance test protocols, and other documents that can be submitted through the AQD Online portal:
www.maricopa.gov/1820