

PROPOSED RULE 1188. VACUUM TRUCK OPERATIONS

(a) Purpose

The purpose of this rule is to reduce emissions associated with the transfer of materials using vacuum trucks.

(b) Applicability

This rule applies to the transfer of volatile organic compounds using vacuum trucks at refineries, bulk plants, bulk and marine terminals, and organic liquid pipeline facilities. *(Staff is considering feasibility of including additional facility source candidates).*

(c) Definitions

For the purpose of this rule the following definitions shall apply:

- (1) **AIR MOVER** is a specialized type of vacuum truck that uses a combination of vacuum and air flow to load a variety of material types into the truck.
- (2) **AFFECTED FACILITY** is a facility to which this rule applies pursuant to subdivision (b).
- (3) **AVIATION GAS** is gasoline that is suitable for use in piston-driven aircraft.
- (4) **BACKGROUND CONCENTRATION** is the ambient concentration of total organic compounds (TOC) in the air at least one (1) meters upwind from the vacuum truck blower exhaust, as determined by a hydrocarbon analyzer according to test method in paragraph according to the United States Environmental Protection Agency (U.S. EPA) Reference Method 21 using an appropriate analyzer calibrated with methane. The analyzer shall be calibrated before inspection each day.
- (5) **BULK PLANT** is any storage and distribution facility that receives organic petroleum products by pipeline, railcar and delivery vehicles; stores them in stationary tanks and mixes them in blending tanks and loads them into delivery vehicles or transportable containers for delivery to distributors, marketers or any product end user.

- (6) BULK TERMINAL is any primary distributing facility utilized for delivering organic petroleum products to bulk plants, service stations and other distribution points.
- (7) CONTROL EQUIPMENT is any equipment, machinery, apparatus, or device used to collect, store, or reduce VOC emissions from vacuum truck operations prior to their release to the atmosphere.
- (8) CRUDE OIL is a naturally occurring mixture consisting of predominantly hydrocarbons and/or sulfur, nitrogen and oxygen derivatives of hydrocarbons that is removed from the earth in a liquid state or is capable of being so removed.
- (9) GASOLINE is any petroleum distillate or petroleum distillate/alcohol blend or alcohol, except any liquefied petroleum gas (LPG), which has a vapor pressure of 1.5 psia (77.5 mmHG) or greater under actual loading conditions and is used as a fuel for internal combustion engines.
- (10) GASOLINE BLENDING STOCK is any organic liquid used as a component of gasoline, including, but not limited to aromatic or alcohol octane boosters and oxygenates isomerate, reformat, alkylate straight run gasoline, cat gasoline, pyrolysis gasoline, FCC gasoline and light hydrocrackate.
- (11) LOADING EVENT is the loading at a single location within an affected facility of regulated materials into a vacuum truck or other container through a vacuum truck operation. The resumption of loading at the same location after an interruption shall not be considered as a separate loading event.
- (12) MARINE TERMINAL is a facility, equipment or structure constructed to handle the loading or unloading of an organic liquid into or out of marine tank vessels, as defined in Standard Industrial Classification Codes 4226 and 5171.
- (13) NAPHTHA is a general term for a variety of crude oil fractions in the gasoline boiling range that are used as feeds and products, including but not limited to straight run naphtha, coker naphtha, cat cracked naphtha and hydrocracked naphtha.
- (14) ORGANIC LIQUID PIPELINE FACILITY is any pipeline used to transport petroleum, petroleum products or petroleum product blending stock, along with any associated breakout stations.

- (15) POSITIVE DISPLACEMENT PUMP is piece of equipment that for each cycle of operation draws in a constant volume of fluid and then forces that exact volume of fluid into a discharge line. For the purpose of this rule, a diaphragm pump is considered to be a positive displacement pump.
- (16) PUMP is a device used to transport fluids by the addition of energy and includes all associated components used for connecting or sealing purposes.
- (17) REGULATED MATERIAL is any of the following:
 - (A) Gasoline, aviation gasoline, gasoline blending stock, naphtha;
 - (B) Transmix, slop or any other hydrocarbon mixture that includes a material listed in subparagraph (c)(17)(a) if for a mixture without significant water content, the true vapor pressure of the mixture is greater than 25.8 mmHg (0.5 psia) as determined in accordance with paragraphs (h)(2) through (h)(4), or if the mixture contains a significant water content and the water content is less than 90 percent as determined in accordance with paragraph (h)(6).
- (18) SLOP is any mixture of petroleum materials that does not meet product specifications and may not be used or distributed without further processing.
- (19) TOTAL ORGANIC COMPOUNDS (TOC) is the concentration of gaseous organic compounds determined according to the test method specified in paragraph (h)(1).
- (20) TRANSMIX is a mixture of non-identical refined hydrocarbon products that forms after being transported in separate adjacent pipelines and does not meet the specifications for a fuel that can be used or sold.
- (21) VACUUM TRUCK is a portable piece of equipment with an affixed barrel or tank that relies on the creation of a pressure differential, typically through the use of a pump or blower, to pneumatically load materials into the barrel or tank of the equipment.
- (22) VACUUM TRUCK OPERATION is the movement of regulated material into a vacuum truck through the use of gravity feed or an auxiliary pump, to push or pull materials into a vacuum truck.
- (23) VOLATILE ORGANIC COMPOUND (VOC) is as defined in Rule 102.

(d) Requirements

(1) Emission Control Standards

Effective *(12 months following adoption)*, for any loading event, the owner or operator of a facility subject to this rule shall control emissions to meet the following requirements:

- (A) The VOC concentration shall not exceed 500 ppm above background concentration, when measured at the exhaust outlet of a vacuum truck operation or if an auxiliary control device is used to control emissions from a vacuum truck operation at the exhaust outlet of the control equipment.
- (B) TOC (or VOC) emissions are controlled with control equipment with control efficiency of at least 95 percent.

(2) Liquid and Vapor Leak Standards

- (A) Effective *(12 months following adoption)* for any loading event, the owner or operator of a facility subject to this rule shall not use a vacuum truck or associated equipment that leaks liquid at a rate in excess of three drops per minute unless the leak is discovered by the operator and eliminated within three (3) minutes after discovery or unless the loading event is shut down within three (3) minutes after discovery of the leak by the operator.
- (B) Effective *(12 months following adoption)* for any loading event, the owner or operator of a facility subject to this rule shall not use a vacuum truck or associated equipment that leaks VOCs vapors at a rate in excess of 500 ppm above background concentration, unless the leak is discovered by the operator and minimized to a concentration below 500 ppm above background concentration within three (3) minutes after discovery or unless the loading event is shut down within three (3) minutes after discovery of the leak by the operator.

(e) Emissions Monitoring Requirements

- (1) Effective *(12 months following adoption)*, except as provided by paragraph (e)(2) the owner or operator of an affected facility using a vacuum truck shall monitor and record the following:

- (A) When controlling emissions from a vacuum truck operation with technology other than a carbon adsorption system, emission

concentrations from the control device measured using the method specified in paragraph (h)(1) and recorded as follows:

- (i) If the vacuum truck is less than 20 percent full prior to the loading event, conduct one measurement for each loading event before the vacuum truck is 20 percent full and an additional measurement after the vacuum truck is 20 percent full but before the vacuum truck is 60 percent full.
 - (ii) If the vacuum truck is 20 percent or more full prior to the loading event, conduct an initial concentration measurement immediately after the start of the loading event and an additional measurement before the vacuum truck is approximately 60 percent full.
 - (iii) If the vacuum truck is 60 percent or more full prior to the loading event, conduct one measurement immediately after the start of the loading event.
- (B) When controlling emissions from a vacuum truck operation with a carbon adsorption system, emission concentrations from the control device measured using the method specified in paragraph (h)(1) and recorded as follows:
- (i) Measure VOC concentrations within two minutes of each loading event and obtain additional measurements approximately every 10 minutes, thereafter during the loading event.
 - (ii) When the VOC stream is switched to a back-up or replacement carbon vessel, a new VOC emission measurement shall be conducted within two minutes of the replacement.
- (C) To demonstrate compliance with subparagraph (d)(1)(B) the owner or operator of vacuum truck control equipment shall perform a source test verifying the abatement efficiency during the vacuum truck operation, or for abatement devices that combust emissions to achieve the required efficiency, the owner or operator may instead show that a source test was completed within the 12 months prior to the commencement of the vacuum truck operation.
- (2) An owner or operator of an affected facility may submit an alternative monitoring and recording plan for the approval of the Executive Officer.

(f) Recordkeeping Requirements

- (1) Effective *(12 months following adoption)*, the following records shall be maintained by the owner or operator of affected facilities for a period of at least two years for all vacuum truck operations and shall be made available to the Executive Officer upon request:
 - (A) All monitoring and source test results obtained in accordance with paragraph (e).
 - (B) The date, time of commencement and duration of the loading event.
 - (C) The type and volume of the regulated materials loaded.
 - (D) Documentation to indicate whether the loading activity was completed using vacuum, positive displacement pump or gravity.
 - (E) If a vacuum truck control equipment or external control equipment is used, record of the make, model and serial number of the device used to measure the VOC concentrations.
 - (F) The make and model of the pump if loading was completed using a positive displacement pump.
 - (G) The daily volume of crude oil and oil recovered from centrifuging that is loaded into vacuum trucks.
 - (H) Any true vapor pressure analysis or a percent volume analysis that is performed to determine whether the loaded material is a regulated material pursuant to paragraph (a)(16).

(g) Reporting Requirements

- (1) Effective *(12 months following adoption)*, an owner or operator of a facility subject to this rule shall electronically or in hard copy, submit a list of loading events scheduled to be conducted within thirty (30) days to the Executive Officer upon request. The list shall be submitted within three (3) working days prior to the start of scheduled loading events and any changes to the schedule shall be reported no less than 24 hours prior to a loading event.
- (2) Effective *(12 months following adoption)*, an owner or operator of a facility subject to this rule shall provide the following information for each loading event to the Executive Officer upon request:
 - (A) Loading event start date and time.

- (B) Facility name, plant number (if applicable), source number (if applicable), tank, pipeline or reservoir address and equipment location.
- (C) Name of vacuum truck company, telephone number and name of owner or operator.
- (D) Control equipment company name, control equipment type, operator's name and telephone number if the control equipment is operated by someone other than the vacuum truck owner/operator.
- (E) Tank, pipeline, box, container or reservoir capacity, the estimated volume and type of material to be loaded.

(h) Test Methods

The following test methods and procedures shall be used to determine compliance with this rule. Alternative test methods may be used if they are determined to be equivalent and approved in writing by the Executive Officer, the California Air Resources Board, and the U.S. Environmental Protection Agency (U.S. EPA).

- (1) Measurements of VOC concentrations for determining compliance with the limits set forth in subparagraphs (d)(1)(A) and (d)(1)(B) shall be conducted according to the U.S. EPA Reference Method 21 using an appropriate analyzer calibrated with methane. The analyzer shall be calibrated before inspection on the day of inspection.
- (2) Organic liquids that are stored at ambient temperatures with true vapor pressures greater than 5 mm Hg (0.1 psi) absolute under actual storage conditions shall be determined as those with individual flash points of less than 100 °F as determined by ASTM Method D-93 – 10a – Flash Point by Pensky-Martens Closed Cup Tester.
- (3) Organic liquids that are stored above ambient temperatures with true vapor pressures greater than 5 mm Hg (0.1 psi) absolute under actual storage conditions shall be determined as those whose volume percent evaporated is greater than ten percent at an adjusted temperature T_{Adj} as determined by ASTM Method D-86 – 11a - Distillation of Petroleum Products at Atmospheric Pressure of:

$$T_{Adj} = 300^{\circ}\text{F} + T_1 - T_a$$

where:

T_1 = Liquid Storage Temperature ($^{\circ}\text{F}$)

T_a = Ambient Temperature ($^{\circ}\text{F}$) = 70°F

- (4) Organic liquids with a true vapor pressure of greater than or equal to 3 psia shall be determined by ASTM Method D-323 for Reid vapor pressure and converted to true vapor pressure using applicable nomographs in EPA AP-42 or District and EPA approved nomographs. The actual storage temperature used for determining true vapor pressure shall be 70 degrees F for organic liquids that are stored at ambient temperatures, and actual storage temperatures for organic liquids that are stored at above ambient temperatures.
- (5) Control efficiency of an emission control system, on a mass emissions basis, and the VOC concentrations in the exhaust gases shall be determined by U.S. EPA Test Methods 25, 25A; District Test Method 25.1 – Determination of Total Gaseous Non-Methane Organic Emissions as Carbon; or District Method 25.3 – Determination of Low Concentration Non-Methane Non Ethane Organic Compound Emissions from Clean Fueled Sources, as applicable.
- (6) Materials sampled pursuant to subparagraph (c)(17)(B) shall be analyzed in accordance with ASTM Method D96: Test Methods for Water and Sediment in Crude Oil by Centrifuge Method (Field Procedure), ASTM Method D1796: Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure) or ASTM D6304: Karl Fischer Water in Petroleum Products. Alternatively, percent water volume may be observed and calculated from a mixed, representative sample collected as specified by ASTM D4057: Standard Practice for Manual Sampling of Petroleum and Petroleum Products and allowed to settle in a graduated cylinder.