

**SAN DIEGO COUNTY  
AIR POLLUTION CONTROL DISTRICT**

**DRAFT PROPOSED NEW  
RULE 69.7 – LANDFILL GAS FLARES**

**WORKSHOP REPORT**

The San Diego County Air Pollution Control District (District) held a virtual public workshop on December 20, 2022, to discuss and receive input on draft proposed new Rule 69.7 – Landfill Gas Flares. A meeting notice was mailed to all owners or operators of municipal solid waste (MSW) landfills in San Diego County, which included the four facilities that the proposed new rule may apply to. Additionally, a meeting notice was posted on the District’s website, on social media, and distributed to interested parties via the District’s electronic mail service.

The virtual workshop was attended by 18 people. A summary of the comments and District responses are provided below:

**1. WORKSHOP COMMENT**

If a MSW landfill site does not fall under the California Landfill Methane Rule (LMR), is a source test still required to comply with draft proposed new Rule 69.7?

**DISTRICT RESPONSE**

Yes. Draft proposed new Rule 69.7 would apply to a MSW landfill where the aggregate actual or potential emissions from the landfill gas flares are at or above the federal major stationary source threshold for nitrogen oxides (NO<sub>x</sub>), even if the source is not subject to the LMR. Currently, the San Diego Air Basin’s federal major stationary source threshold, as a Severe Nonattainment area, is 25 tons of NO<sub>x</sub> per year.

**2. WORKSHOP COMMENT**

What are the next steps if the draft proposed new rule is approved by the San Diego County Air Pollution Control District Governing Board (Governing Board)? What is the role of the California Air Resources Board (CARB) and/or the Environmental Protection Agency (EPA) upon rule approval by the Governing Board?

**DISTRICT RESPONSE**

If approved by the Governing Board, draft proposed new Rule 69.7 would be submitted to CARB for approval with a request to forward the rule to EPA for approval and inclusion in the State Implementation Plan (SIP). The rule will be in effect upon the date of adoption by the Governing Board.

**3. CARB COMMENT**

CARB has no official comments at this time.

**4. EPA COMMENT**

Section (d) Standards is not enforceable for open flares. The District should consider clarifying that the standards in proposed new Rule 69.7 are only for enclosed flares. Optionally, the District should explain how emission standards can be enforced for open flares.

**DISTRICT RESPONSE**

The District agrees and has added language in Section (d) Standards to clarify that NO<sub>x</sub> and Carbon Monoxide (CO) standards would only apply to enclosed landfill gas flares. Currently, there are no open flares operating at MSW landfills in San Diego County. Additionally, language in Section (b) Exemptions has been added to clarify that Sections (d) Standards, (h) Test Methods, and (i) Source Test Requirements of proposed new Rule 69.7 would not apply to existing open landfill gas flares.

**5. EPA COMMENT**

EPA recommends including an explanation of how the District set emission limits contained in Section (d) of proposed new Rule 69.7. EPA recently approved South Coast Air Quality Management District (SCAQMD) Rule 1118.1 and San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 4311, both with landfill gas flare emission limits that go beyond what is considered to be Reasonably Available Control Technology (RACT).

**DISTRICT RESPONSE**

The District proposes to adopt new Rule 69.7 to satisfy federal RACT requirements. RACT requirements extend to major sources of NO<sub>x</sub> pursuant to Clean Air Act (CAA) Section 182(f). Cost-effectiveness criteria for NO<sub>x</sub> emission reductions are utilized to determine what is considered RACT, as well as if other air districts have adopted similar emission limits.

The District considers EPA's RACT guidance in adopting NO<sub>x</sub> controls for RACT, using a threshold of \$5,000 per ton of NO<sub>x</sub> reduced (i.e., \$2.50 per pound), which exceeds EPA's inflation adjusted threshold found in the RACT guidance. The District also considers a local cost-effectiveness threshold of \$12,000 per ton of NO<sub>x</sub> reduced (i.e. \$6 per pound) when adopting all rules to control emissions from existing sources. The District evaluated existing facility data for MSW landfills with flares subject to proposed new Rule 69.7, and determined that all existing flares already comply with the proposed NO<sub>x</sub> and CO emission limits in Section (d). Therefore, proposed new Rule 69.7 is cost-effective to implement, and satisfies EPA RACT guidance and District rule development thresholds. Cost-effectiveness for proposed new Rule 69.7, with a NO<sub>x</sub> emission standard of 0.06 pounds per million BTU of heat input (lbs/MMBtu), is estimated to be

\$0.31 per pound of NO<sub>x</sub> reduced. At the time the Governing Board considers the proposed rule for adoption, the District will include additional cost-effectiveness information in the Incremental Cost-Effectiveness Analysis.

To determine whether the proposed NO<sub>x</sub> emission limit in proposed new Rule 69.7 is RACT, the District evaluated landfill flare rules found in various air districts in California, including SCAQMD Rule 1118.1 and SJVAPCD Rule 4311, as well as documentation for a proposed landfill gas flare rule in Bay Area Air Quality Management District (BAAQMD). For both SCAQMD and SJVAPCD rules, both air districts have set a “low-NO<sub>x</sub>” level for non-refinery flares at 0.025 lbs/MMBtu. The District evaluated a low-NO<sub>x</sub> standard for proposed new Rule 69.7, but determined the threshold was not yet cost-effective to implement in San Diego County. Preliminary incremental cost-effectiveness estimates determined controlling emissions at the low-NO<sub>x</sub> level in San Diego County would result in costs of up to \$21 per pound of NO<sub>x</sub> reduced. This significantly exceeds both EPA’s RACT guidance threshold, as well as the local District rule development threshold. Furthermore, both the SCAQMD and SJVAPCD rule emission limits are considered to be “technology-forcing” and have yet to be adopted in nonattainment areas that are not classified as an extreme nonattainment area for federal ozone standards. Additionally, documentation from BAAQMD in 2017 for enclosed biogas flares similarly concluded a NO<sub>x</sub> emission limit of 0.06 lbs/MMBtu was considered to be RACT level of control.<sup>1</sup> As such, staff determined the low-NO<sub>x</sub> emission limit to exceed RACT level of emission control for existing landfill gas flares in San Diego County. However, new landfill gas flares that are installed in San Diego County in the future would be subject to New Source Review permit requirements including Best Available Control Technology (BACT), and thus would need to meet the established low-NO<sub>x</sub> limit.

## **6. POST-WORKSHOP CLARIFICATION**

The District has amended the language in Section (a) Applicability to clarify that draft proposed new Rule 69.7 would apply to all enclosed flares at a MSW landfill if the combined actual or potential emissions from such flares are at or above the federal major stationary source threshold for NO<sub>x</sub>. Currently, the San Diego Air Basin’s federal major stationary source threshold, as a Severe Nonattainment area, is 25 tons of NO<sub>x</sub> per year.

## **7. POST-WORKSHOP CLARIFICATION**

The District has amended the language in Subsection (c)(10), definition of “Landfill Gas Flare”, to clarify that flares subject to the rule are those that combust landfill gas. Additionally, unnecessary language regarding energy recovery was removed since landfill gas flares operate independently from energy recovery plant(s).

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<sup>1</sup> “Spare The Air – Cool the Climate. A Blueprint for Clean Air and Climate Protection in the Bay Area. Final 2017 Clean Air Plan.” Volume 2 – Stationary Source Sector. Stationary Source Control Measure #SS23. Page SS-76. Adopted April 19, 2017.

**8. POST-WORKSHOP CLARIFICATION**

For the purposes of the District's emission inventory, the current emission factor for landfill gas flares in San Diego County will be revised should proposed new Rule 69.7 be adopted by the Governing Board. NOx emissions from landfill gas flares are currently estimated using a default emission factor of 0.08 lbs/MMBtu. This emission factor would be revised to 0.06 lbs/MMBtu to reflect the NOx emission limit found in the proposed rule.

NC:MS;jlm  
02/03/23

**RULE 69.7 LANDFILL GAS FLARES** (Adopted and Effective *(date of adoption)*)

(a) **APPLICABILITY**

This rule shall apply to all landfill gas flares at any a municipal solid waste (MSW) landfill gas flare, or collection of landfill gas flares, that is itself a where the aggregate actual or potential emissions, from such flares, are at or above the federal major stationary source threshold of for nitrogen oxides (NO<sub>x</sub>).

(b) **EXEMPTIONS**

Sections (d) Standards, (h) Test Methods, and (i) Source Test Requirements of this rule shall not apply to existing open landfill gas flares.

(c) **DEFINITIONS**

For the purposes of this rule, the following definitions shall apply:

- (1) **“Btu”** means British thermal unit.
- (2) **“Calendar Year”** means the same as defined in Rule 2 – Definitions.
- (3) **“CFR”** means Code of Federal Regulations.
- (4) **“Enclosed Flare”** means a flare composed of multiple gas burners that are grouped in an enclosure, which operates at a wide range of flow rates and constant limited peak temperature.
- (5) **“Existing Flare”** means a flare which commenced operation on or before *(date of adoption)*.
- (6) **“Federal Major Stationary Source”** means the same as defined in Rule 20.1 – New Source Review – General Provisions.
- (7) **“Flare Maintenance Event”** means a regularly scheduled course of procedure designed to prevent equipment failure or decline of equipment function.
- (8) **“Gas Mover Equipment”** means the equipment (e.g., fan, blower, compressor) used to transport landfill gas through the header system.
- (9) **“Landfill Gas”** means any gas derived through a natural process from the decomposition of waste deposited in a landfill.

(10) **“Landfill Gas Flare”** means a combustion device that oxidizes combustible landfill gases or vapors, where the combustible landfill gases or vapors being destroyed are routed ~~directly~~ into the burner ~~without energy recovery~~. Types of landfill gas flares include open and enclosed flares.

(11) **“Municipal Solid Waste (MSW) Landfill”** means an entire disposal facility in a contiguous geographical space, publicly or privately owned, where household waste is placed in or on land. Portions of an MSW landfill may be separated by access roads. An MSW landfill may also receive other types of Resource Conservation and Recovery Act (RCRA) Subtitle D (40 CFR Parts 257 and 258) wastes such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste.

(12) **“New Flare”** means a flare which commenced operation after (*date of adoption*).

(13) **“Open Flare”** means a flare without enclosure or shroud.

(14) **“Pilot”** means an auxiliary burner used to ignite the vent gas routed to a flare.

(d) **STANDARDS**

A person shall not install and/or operate ~~a~~ an enclosed landfill gas flare subject to this rule unless:

(1) Emissions of NO<sub>x</sub>, calculated as nitrogen dioxide, do not exceed 0.06 pounds per million Btu of heat input.

(2) Emissions of carbon monoxide (CO) do not exceed 0.20 pounds per million Btu of heat input.

(e) **OPERATIONAL REQUIREMENTS**

(1) The landfill gas flare shall be properly maintained and operational at all times when the collected landfill gas is routed to the flare.

(2) In the event the landfill gas collection system or landfill gas flare is inoperable, the gas mover equipment shall be shut down and all valves in the collection system and flare contributing to venting of the gas to the atmosphere shall be closed within one hour.

(3) An enclosed flare shall be:

(i) Equipped with automatic dampers, an automatic shutdown device, a flame arrester, and continuous-recording temperature sensors.

(ii) Operated within the parameter ranges established during the initial or most recent source test.

(4) An open flare shall be:

(i) Equipped with a heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the flare pilot flame or the flare flame itself to indicate the continuous presence of a flame. The heat-sensing device shall be maintained and calibrated in accordance with the manufacturer's specifications and recommendations.

(ii) Operated in accordance with Title 17, California Code of Regulations, Subsection 95464(b)(2)(B).

**(f) MONITORING REQUIREMENTS**

An owner or operator of any landfill gas flare shall install and maintain in good working order the following:

(1) A gas flow rate measuring device to monitor, display, and record the landfill gas flow rate to each flare at least once every 15 minutes. The gas flow rate measuring device shall be calibrated at least once per calendar year in accordance with the manufacturer's specifications and recommendations.

(2) For an enclosed flare: a gas temperature measuring device equipped with a continuous recorder which has an accuracy of  $\pm 1\%$  of the temperature being measured. The gas temperature measuring device shall be calibrated in accordance with the manufacturer's specifications and recommendations.

(3) For an open flare: a heat device to continuously monitor for the presence of a flare pilot flame or flare flame using an ultraviolet beam sensor or thermocouple, and any additional monitoring requirements as specified by the Air Pollution Control Officer.

**(g) RECORD KEEPING REQUIREMENTS**

An owner or operator of a landfill gas flare shall maintain, at a minimum, the following:

(1) Records of the landfill gas flow rate.

(2) Records of all landfill gas flow rate-measuring device calibrations pursuant to Subsection (f)(1).

(3) Records of the landfill gas throughput in standard cubic feet, which shall be recorded based on actual readings of the landfill gas flow rate-measuring device.

(4) Records of all periods when the flare is non-operational.

(5) Records of all flare maintenance events, including dates maintenance was performed and the nature of the maintenance.

(6) Records of any source test as conducted in accordance with Section (i) Source Test Requirements.

(7) A manual of recommended maintenance as provided by the flare manufacturer, or other maintenance procedures as approved in writing by the Air Pollution Control Officer.

(8) For an enclosed flare:

(i) Records of all 3-hour periods of operation during which the average temperature difference was more than 82°F (28°C) below the average combustion temperature during the most recent source test at which compliance with Title 17, California Code of Regulations, Sections 95464(b)(2) and 95464(b)(3)(A) was determined.

(ii) Records of the flare temperature, expressed in °F or °C.

(iii) Records of all flare temperature-measuring device calibrations pursuant to Subsection (f)(2).

(9) For an open flare:

(i) Records of the flare pilot flame or flare flame continuous monitoring.

(ii) Records of all periods of operation during which the flare pilot flame or the flare flame is absent.

All records shall be retained in electronic and/or hardcopy format on-site for at least five calendar years and made available to the District upon request.

(h) **TEST METHODS**

When more than one test method or set of test methods are specified in this section, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of this rule.

(1) Measurement of NO<sub>x</sub> and CO emissions in pounds per million Btu of heat input shall be determined using the emission concentrations measured in accordance with Subsection (h)(2) and the gas composition of the total gas or vapor combusted in the landfill gas flare measured in accordance with Subsection (h)(3), and calculated using the procedures in 40 CFR Part 60, Appendix A, Method 19 (Determination of Sulfur Dioxide Removal Efficiency and Particulate, Sulfur Dioxide and Nitrogen Oxides Emission Rates).



(2) Measurement of NO<sub>x</sub>, CO and oxygen content of the exhaust gas shall be determined in accordance with the San Diego County Air Pollution Control District Test Method 100 (Test Procedures for the Determination of Nitrogen Oxides, Carbon Monoxide and Diluent Gases by Continuous Emission Monitoring), May 1995, or its most current version approved by the U.S. Environmental Protection Agency (EPA).

(3) Landfill gas composition shall be determined in accordance with the following methods:

(i) ASTM D3588-98(2017)e1 (Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels), or its most current version; and

(ii) ASTM D1945-14(2019) (Standard Test Method for Analysis of Natural Gas by Gas Chromatography), or its most current version; or

(iii) EPA Method 25C (Determination of Nonmethane Organic Compounds (NMOC) in Landfill Gases).

(4) Other test methods which are determined to be equivalent to the test methods specified in this rule and approved in writing by the Air Pollution Control Officer, the California Air Resources Board, and EPA may be used in place of the test methods specified in this rule.

**(i) SOURCE TEST REQUIREMENTS**

Source tests for enclosed landfill gas flares shall be conducted according to the following:

(1) For initial compliance determination with Section (d) Standards, a landfill gas flare shall be source tested under the following conditions:

(i) For an existing flare: at typical operating conditions according to the facility specifications. An initial compliance determination is required if source test documentation demonstrating compliance with Subsections (d)(1) and/or (d)(2) is older than three calendar years.

(ii) For a new flare: at typical operating conditions according to the facility specifications and at maximum temperature and maximum fuel flow according to the manufacturer's specifications.

(2) After initial compliance has been determined, any landfill gas flare shall be source tested under typical operating conditions according to the facility specifications, and with the following frequency:

(i) For an existing flare: in accordance with the current compliance schedule pursuant to Title 17, California Code of Regulations, Section 95464 (b)(4)(A), or

(ii) For a new flare: in accordance with Title 17, California Code of Regulations, Section 95464 (b)(4)(A).

(3) Measurement of NO<sub>x</sub> and CO emission concentrations shall be based on a continuous sampling period of 15 minutes or more, and not to exceed 60 minutes. For the purpose of averaging, a minimum of five data sets with averaging intervals no greater than three minutes shall be used.

(4) Emissions source testing shall be conducted using the test methods specified in Section (h) Test Methods and a source test protocol approved in writing by the Air Pollution Control Officer prior to testing.

(j) **COMPLIANCE SCHEDULE**

(1) All new landfill gas flares shall comply with all applicable requirements of this rule upon initial startup.

(2) The owner or operator of an existing enclosed landfill gas flare shall:

(i) By *(6 months after date of adoption)*, submit to the Air Pollution Control Officer current documentation which demonstrates that the flare is in compliance with Section (d) Standards emission limits, or

(ii) By *(12 months after date of adoption)*, conduct a source test in accordance with Subsections (i)(1)(i), (i)(3), and (i)(4), and submit to the Air Pollution Control Officer documentation which demonstrates that the flare is in compliance with all applicable requirements of this rule.