

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

(Adopted December 5, 2008)

RULE 1147. NO_x REDUCTIONS FROM MISCELLANEOUS SOURCES

(a) Purpose and Applicability

The purpose of this rule is to reduce nitrogen oxide emissions from gaseous and liquid fuel fired combustion equipment as defined in this rule. This rule applies to ovens, dryers, dehydrators, heaters, kilns, calciners, furnaces, crematories, incinerators, heated pots, cookers, roasters, fryers, closed and open heated tanks and evaporators, distillation units, afterburners, degassing units, vapor incinerators, catalytic or thermal oxidizers, soil and water remediation units and other combustion equipment with nitrogen oxide emissions that require a District permit and are not specifically required to comply with a nitrogen oxide emission limit by other District Regulation XI rules. This rule does not apply to solid fuel-fired combustion equipment, internal combustion engines subject to District Rule 1110.2, turbines, charbroilers, or boilers, water heaters, thermal fluid heaters and enclosed process heaters subject to District Rules 1109, 1146, 1146.1, or 1146.2 and equipment subject to District Rules 1111, 1112, 1117, 1118, 1121, or 1135.

(b) Definitions

- (1) ANNUAL CAPACITY FACTOR means the ratio of the ANNUAL HEAT INPUT of a unit in a calendar year to the amount of fuel it could have burned if it had operated at the rated heat input capacity for 100 percent of the time during the calendar year.
- (2) ANNUAL HEAT INPUT means the actual amount of heat released by fuels burned in a unit during a calendar year, based on the fuel's higher heating value.
- (3) BTU means British thermal unit or units.
- (4) COMBUSTION MODIFICATION means replacement of a burner(s).
- (5) FOOD OVEN means an oven used to heat or cook food used for human consumption.
- (6) HEATER means any combustion equipment that is fired with gaseous and/or liquid fuels and which transfers heat from combusted fuel to materials or air contained in the unit or in an adjoining cabinet, container or structure. Heater does not include any boiler or PROCESS HEATER designed to transfer heat to water or process streams that is subject to any

NOx emission limits of District Rules 1109, 1146, 1146.1 or 1146.2, and does not include any internal combustion engine or turbine.

- (7) HEAT INPUT means the higher heating value of the fuel to the unit measured as BTU per hour.
- (8) HEAT OUTPUT means the enthalpy of the working fluid output of the unit.
- (9) MAKE-UP AIR HEATER means a UNIT used to heat incoming air in order to maintain the temperature of a spray booth, container, room or other enclosed space where a person is working. A MAKE-UP AIR HEATER is not a burner used to heat an oven, dryer, heater or other unit where workers are not present during heating.
- (10) NOx EMISSIONS means the sum of nitrogen oxide and nitrogen dioxide in the flue gas, collectively expressed as nitrogen dioxide.
- (11) PROCESS HEATER means any equipment that is fired with gaseous and/or liquid fuels and which transfers heat from combusted fuel to water or process streams. PROCESS HEATER does not include any furnace, kiln or oven used for melting, heat treating, annealing, drying, curing, baking, cooking, calcining, or vitrifying; or any unfired waste heat recovery heater that is used to recover sensible heat from the exhaust of any combustion equipment.
- (12) PROTOCOL means a South Coast Air Quality Management District approved test protocol for determining compliance with emission limits for applicable equipment.
- (13) RATED HEAT INPUT CAPACITY means the gross HEAT INPUT of the combustion UNIT specified on a permanent rating plate attached by the manufacturer to the device. If the UNIT has been altered or modified such that its gross HEAT INPUT is higher or lower than the rated HEAT INPUT capacity specified on the original manufacturer's permanent rating plate, the new gross HEAT INPUT shall be considered as the rated HEAT INPUT capacity.
- (14) REMEDIATION UNIT means a device used to capture or incinerate air toxics, VOCs or other combustible vapors extracted from soil or water.
- (15) RESPONSIBLE OFFICIAL means:
 - (A) For a corporation: a president or vice-president of the corporation in charge of a principal business function or a duly authorized

person who performs similar policy-making functions for the corporation; or

(B) For a partnership or sole proprietorship: general partner or proprietor, respectively.

(C) For a government agency: a duly authorized person

(16) TENTER FRAME DRYER is a cloth dryer that holds the edges of the material as it is dried in order to control shrinkage.

(17) THERM means 100,000 BTU.

(18) UNIT means any oven, dryer, dehydrator, heater, kiln, calciner, furnace, crematory, incinerator, heated pot, cooker, roaster, fryer, heated tank and evaporator, distillation unit, afterburner, degassing unit, vapor incinerator, catalytic or thermal oxidizer, soil or water remediation units and other combustion equipment with nitrogen oxide emissions requiring a District permit and not specifically required to comply with a NOx emission limit by other District Regulation XI rules. UNIT does not mean any solid fuel fired combustion equipment, internal combustion engine subject to District Rule 1110.2, turbine, charbroiler, or boiler, water heater, thermal fluid heaters or enclosed process heater subject to District Rules 1109, 1146, 1146.1, or 1146.2 or equipment subject to District Rules 1111, 1112, 1117, 1118, 1121, or 1135.

(19) VAPOR INCINERATOR means a furnace, afterburner, or other device for burning and destroying air toxics, VOCs or other combustible vapors in gas or aerosol form in gas streams.

(c) Requirements

(1) On or after January 1, 2010 any person owning or operating a unit subject to this rule shall not operate the unit in a manner that exceeds the applicable nitrogen oxide emission limit specified in Table 1 at the time a District permit is required for operation of a new, relocated or modified unit or, for in-use units, in accordance with the compliance schedule in Table 2, or at the time of a combustion modification.

Table 1 – NO_x Emission Limit

Equipment Category(ies)	NO _x Emission Limit		
	PPM @ 3% O ₂ , dry or Pound/mmBtu heat input		
	Process Temperature		
Gaseous Fuel-Fired Equipment	≤ 800°F	> 800 ° F and < 1200° F	≥ 1200 °F
Asphalt Manufacturing Operation	40 ppm	40 ppm	
Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator ¹	30 ppm or 0.036 lb/mmBtu	60 ppm or 0.073 lb/mmBtu	60 ppm or 0.073 lb/mmBtu
Evaporator, Fryer, Heated Process Tank, or Parts Washer	60 ppm or 0.073 lb/mmBtu	60 ppm or 0.073 lb/mmBtu	
Metal Heat Treating, Metal Melting Furnace, Metal Pot, or Tar Pot	60 ppm or 0.073 lb/mmBtu	60 ppm or 0.073 lb/mmBtu	60 ppm or 0.073 lb/mmBtu
Oven, Dehydrator, Dryer, Heater, Kiln, Crematory, Incinerator, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank	30 ppm or 0.036 lb/mmBtu	30 ppm or 0.036 lb/mmBtu	60 ppm or 0.073 lb/mmBtu
Make-Up Air Heater or other Air Heater located outside of building with temperature controlled zone inside building	30 ppm or 0.036 lb/mmBtu		
Tenter Frame or Fabric or Carpet Dryer	30 ppm or 0.036 lb/mmBtu		
Other Unit or Process Temperature	30 ppm or 0.036 lb/mmBtu	30 ppm or 0.036 lb/mmBtu	60 ppm or 0.073 lb/mmBtu
Liquid Fuel-Fired Equipment	≤ 800°F	> 800 ° F and < 1200° F	≥ 1200 °F
All liquid fuel-fired Units	40 ppm or 0.053 lb/mmBtu	40 ppm or 0.053 lb/mmBtu	60 ppm or 0.080 lb/mmBtu

1. Emission limit applies to burners in units fueled by 100% natural gas that are used to incinerate air toxics, VOCs, or other vapors; or to heat a unit. The emission limit applies solely when burning 100% fuel and not when the burner is incinerating air toxics, VOCs, or other vapors. The unit shall be tested or certified to meet the emission limit while fueled with natural gas.

Table 2 – Compliance Schedule for In-Use Units

Equipment Category(ies)	Compliance Date
Remediation UNIT Upon combustion modification or change of location for units manufactured prior to 1998	Beginning January 1, 2011
Tar Pot Permit Application for Change of Ownership or New Equipment	Beginning January 1, 2012
Afterburner, degassing unit, catalytic oxidizer, thermal oxidizer, vapor incinerator, evaporator, food oven, fryer, heated process tank, parts washer or spray booth make-up air heater manufactured prior to 1998	July 1, 2013
Other UNIT manufactured prior to 1986	July 1, 2010
Other UNIT manufactured prior to 1992	July 1, 2011
Other UNIT manufactured prior to 1998	July 1, 2012
Any UNIT manufactured after 1997	July 1 of the year the unit is 15 years old

- (2) Unit age shall be based on the original date of manufacture and determined by:
 - (A) Original manufacturer's identification or rating plate permanently fixed to the equipment. If not available, then;
 - (B) Invoice from manufacturer for purchase of equipment. If not available, then;
 - (C) Information submitted to AQMD with prior permit applications for the specific unit. If not available, then;
 - (D) Unit is deemed by AQMD to be 20 years old.
- (3) Owners or operators of units operating with flue gas oxygen concentrations greater than 18% shall use a District approved test protocol to determine compliance with the emission limit specified in Table 1. The test protocol shall be submitted to the District at least 90 days prior to the scheduled test and approved by the District Source Testing Division.
- (4) Notwithstanding the requirements of paragraph (c)(1), units with combustion modifications completed prior to December 5, 2008 and after January 1, 2000 that resulted in replacement of more than 75% of the rated heat input capacity shall comply with the applicable emission limit specified in Table 1 of paragraph (c)(1) ten years from the date the modification was performed.

- (5) The date a combustion modification, as specified in paragraphs (c)(1) and (c)(4), is performed; shall be determined according to subparagraph (c)(2)(B), if not available, then subparagraph (c)(2)(C).
- (6) Notwithstanding the requirements of paragraph (c)(1), a unit with a District permit to construct or permit to operate, and with a permit emission limit of one pound per day or less of nitrogen oxides on July 1, 2009, shall comply with the applicable emission limit specified in Table 1 of paragraph (c)(1) five years later than the applicable compliance date in Table 2 of (c)(1).
- (7) On or after January 1, 2010, any person owning or operating a unit subject to this rule shall perform combustion system maintenance in accordance with the manufacturer's schedule and specifications as identified in the manual and other written materials supplied by the manufacturer or distributor. The owner or operator shall maintain on site at the facility where the unit is being operated a copy of the manufacturer's and/or distributor's written instructions and retain a record of the maintenance activity for a period of not less than three years. The owner or operator shall maintain on site at the facility where the unit is being operated a copy of the District certification or District approved source test reports, conducted by an independent third party, demonstrating the specific unit complies with the emission limit. The source test report(s) must identify that the source test was conducted pursuant to a District approved protocol. The model and serial numbers of the specified unit shall clearly be indicated on the source test report(s). The owner or operator shall maintain on the unit in an accessible location a permanent rating plate. The maintenance instructions, maintenance records and the source test report(s) or District certification shall be made available to the Executive Officer upon request.
- (8) On or after January 1, 2011, any person owning or operating a unit subject to this rule shall install and maintain in service non-resettable, totalizing, fuel and time meters for each unit's fuel(s). Owners or operators of a unit with a combustion system that operates at only one firing rate shall install a non-resettable, totalizing, time or fuel meter for each fuel.
- (9) Meters specified in paragraph (c)(8) that require electric power to operate shall be provided a permanent supply of electric power that cannot be unplugged, switched off, or reset except by the main power supply circuit

for the building and associated equipment or the unit's safety shut-off switch. Any person operating a unit subject to this rule shall not shut off electric power to a unit meter unless the unit is not operating and is shut down for maintenance or safety.

- (10) On or before the compliance date, the owner or operator of a unit shall demonstrate compliance with the applicable emission limit in Table 1 pursuant to the provisions of subdivisions (d) or (e).

- (11) Compliance by Certification

For units that do not allow adjustment of the fuel and combustion air for the combustion system by the owner or operator, and upon approval by the Executive Officer, an owner or operator may demonstrate compliance with the emission limit and demonstration requirement of this subdivision by certification granted to the manufacturer for any model of equipment sold for use in the District. Any unit certified pursuant to subdivision (e) shall be deemed in compliance with the emission limit in Table 1 and demonstration requirement of this subdivision, unless a District source test shows non-compliance.

- (12) Identification of Units

- (A) New Manufactured Units

The manufacturer shall display the model number and the rated heat input capacity of the unit complying with subdivision (c) on the shipping container and permanent rating plate. The manufacturer shall also display the District certification status on the shipping container and on the unit when applicable.

- (B) Modified Units

The owner or operator of a unit with a modified combustion system (new or modified burners) shall display the new rated heat input capacity on a new permanent supplemental rating plate installed in an accessible location. The gross heat input shall be based on the maximum fuel input corrected for fuel heat content, temperature and pressure. Gross heat input shall be demonstrated by a calculation based on fuel consumption recorded by an in-line fuel meter.

- (13) The owner or operator shall maintain on site a copy of all documents identifying the unit's rated heat input capacity for as long as the unit is retained on-site. The rated heat input capacity shall be identified by a

manufacturer's or distributor's manual or invoice and a permanent rating plate attached to the unit. If a unit is modified, the rated heat input capacity shall be calculated pursuant to subparagraph (c)(12)(B). The documentation of rated heat input capacity for modified units shall include the name of the company and person modifying the unit, a description of all modifications, the dates the unit was modified and calculation of rated heat input capacity. The documentation for modified units shall be signed by the highest ranking person modifying the unit.

(14) Alternate Compliance Plan

Owners or operators of facilities with five or more in-use units with permit emission limits greater than one pound per day NO_x that will require burner modifications may submit an alternate compliance plan by July 1, 2009 to phase-in compliance of all units starting January 1, 2010 and ending before January 1, 2015. At least one unit shall be modified to comply with the applicable emission limit of this rule by January 1, 2010. Each year thereafter, up to a maximum of four years, a minimum of 20 percent of additional units shall comply with the applicable emission limit. All units must comply with the applicable emission limit of this rule by January 1, 2015.

(d) Compliance Determination

(1) All emission determinations shall be calculated:

- (A) Using a District approved test protocol averaged over a period of at least 15 and no more than 60 consecutive minutes;
- (B) At least 15 minutes after unit start up; and
- (C) In the unit's as-found operating condition.

Each time an emission determination is required by this rule, an additional emission determination shall be made using a heat input of less than 25% of the rated heat input capacity for any Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer, Vapor Incinerator, Make-Up Air Heater, other Air Heater located outside of process building, Oven, Dehydrator, Dryer, Tenter-Frame Dryer, Fabric Dryer, Carpet Dryer, Heater, Kiln, Crematory, Incinerator, Calciner, Cooker, Roaster, non-metallurgical Furnace, or Heated Storage Tank that

operates with variable heat input that falls below 50% rated heat input capacity during normal operation.

For emission determinations after the initial approved test, the operator is not required to resubmit a protocol for approval if: there is a previously approved protocol and the unit has not been altered in a manner that requires a permit alteration; and rule or permit emission limits have not changed since the previous test.

- (2) All parts per million emission limits specified in subdivision (c) are referenced at 3 percent volume stack gas oxygen on a dry basis.
- (3) Compliance with the NO_x emission limits of subdivision (c) and determination of stack-gas oxygen and carbon dioxide concentrations for this rule shall be determined according to the following procedures:
 - (A) District Source Test Method 100.1 – Instrumental Analyzer Procedures for Continuous Gaseous Emission Sampling (March 1989); or
 - (B) District Source Test Method 7.1 – Determination of Nitrogen Oxide Emissions from Stationary Sources (March 1989); or
 - (C) ASTM Method D6522-00 – Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers; or
 - (D) United States Environmental Protection Agency Conditional Test Method CTM-030 – Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions from Natural Gas-Fired Engines, Boilers and Process Heaters Using Portable Analyzers; and
 - (E) District Source Test Method 10.1 – Carbon Monoxide and Carbon Dioxide by Gas Chromatograph/Non-Dispersive Infrared Detector (GC/NDIR) – Oxygen by Gas Chromatograph-Thermal Conductivity (GC/TCD) (March 1989); or
 - (F) Any alternative test method determined approved before the test in writing by the Executive Officers of the District, the California Air Resources Board and the United States Environmental Protection Agency.

- (4) For any operator who chooses the pound per million Btu of heat input compliance option of subdivision (c), NO_x emissions in pounds per million Btu of heat input shall be calculated using procedures in 40 CFR Part 60, Appendix A, Method 19, Sections 2 and 3.
 - (5) Records of source tests shall be maintained for ten years and made available to District personnel upon request. Emissions determined to exceed any limits established by this rule through the use of any of the test methods specified in subparagraphs (d)(3)(A) through (d)(3)(F) shall constitute a violation of this rule.
 - (6) All emission determinations shall be made using an independent contractor to conduct the source testing that is approved by the Executive Officer under the Laboratory Approval Program for the necessary test methods.
- (e) Certification
- (1) Unit Certification
For units that do not allow adjustment of the fuel and combustion air for the combustion system by the owner or operator, any manufacturer or distributor that distributes for sale or sells units or burner systems for use in the District may elect to apply to the Executive Officer to certify such units or burner systems as compliant with subdivision (c).
 - (2) Manufacturer Confirmation of Emissions
Any manufacturer's application to the Executive Officer to certify a model of equipment as compliant with the emission limit and demonstration requirement of subdivision (c) shall obtain confirmation from an independent contractor that is approved by the Executive Officer under the Laboratory Approval Program for the necessary test methods prior to applying for certification that each unit model complies with the applicable requirements of subdivision (c). This confirmation shall be based upon District approved emission tests of standard model units and a District approved protocol shall be adhered to during the confirmation testing of all units subject to this rule. Emission testing shall comply with the requirements of paragraphs (d)(1) through (d)(5) except emission determinations shall be made at 100% rated heat input capacity and an additional emission determination shall be made using a heat input of less

than 25% of the rated heat input capacity for any Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer, Vapor Incinerator, Make-Up Air Heater, other Air Heater located outside of process building, Oven, Dehydrator, Dryer, Tenter-Frame Dryer, Fabric Dryer, Carpet Dryer, Heater, Kiln, Crematory, Incinerator, Calciner, Cooker, Roaster, non-metallurgical Furnace, or Heated Storage Tank.

- (3) When applying for unit(s) certification, the manufacturer shall submit to the Executive Officer the following:
 - (A) A statement that the model is in compliance with subdivision (c). The statement shall be signed and dated by the manufacturer's responsible official and shall attest to the accuracy of all statements;
 - (B) General Information
 - (i) Name and address of manufacturer,
 - (ii) Brand name, if applicable,
 - (iii) Model number, as it appears on the unit rating plate; and
 - (iv) Rated Heat Input Capacity, gross output of burner(s) and number of burners;
 - (C) A description of each model being certified; and
 - (D) A source test report verifying compliance with the applicable emission limit in subdivision (c) for each model to be certified. The source test report shall be prepared by the confirming independent contractor and shall contain all of the elements identified in the District approved Protocol for each unit tested. The source test shall have been conducted no more than ninety (90) days prior to the date of submittal to the Executive Officer.
- (4) When applying for unit certification, the manufacturer shall submit the information identified in paragraph (e)(3) no more than ninety (90) days after the date of the source test identified in subparagraph (e)(3)(D) and at least 120 days prior to the date of the proposed sale and installation of any District certified unit.
- (5) The Executive Officer shall certify a unit model which complies with the provisions of subdivision (c) and of paragraphs (e)(2), (e)(3), and (e)(4).
- (6) Certification status shall be valid for four years from the date of approval by the Executive Officer. After the fourth year, recertification shall be

required by the Executive Officer according to the requirements of paragraphs (e)(2), (e)(3), and (e)(4).

(f) Enforcement

- (1) The Executive Officer may inspect certification records and unit installation, operation, maintenance, repair, combustion modification and test records of owners, operators, manufacturers, distributors, retailers, and installers of units located in the District, and conduct such tests as are deemed necessary to ensure compliance with this rule. Tests shall include emission determinations, as specified in paragraph (d)(1) to (d)(4), of a random sample of any category of units subject to this rule.
- (2) An emission determination specified under paragraph (f)(1) that finds emissions in excess of those allowed by this rule or permit conditions shall constitute a violation of this rule.

(g) Exemptions

- (1) The provisions of this rule shall not apply to units:
 - (A) subject to the nitrogen oxide limits of District Rules 1109, 1110.2, 1111, 1112, 1117, 1121, 1134, 1135, 1146, 1146.1, or 1146.2; or
 - (B) located at RECLAIM facilities.
- (2) The provisions of this rule shall not apply to charbroilers.
- (3) The provisions of this rule shall not apply to:
 - (A) Flares subject to District Rule 1118;
 - (B) Flares, afterburners, degassing units, thermal or catalytic oxidizers or vapor incinerators in which a fuel, including but not limited to natural gas, propane, butane or liquefied petroleum gas, is used only to maintain a pilot for vapor ignition or is used for five minutes or less to bring a unit up to operating temperature;
 - (C) Municipal solid waste incinerators with a District permit operating before December 5, 2008;
 - (D) An afterburner or vapor incinerator with a District permit operating before December 5, 2008 that has an integrated heat exchanger that captures heat from an oven or furnace exhaust in order to reduce fuel consumption by the afterburner or vapor incinerator; or
 - (E) A flare, afterburner, degassing unit, remediation unit, thermal oxidizer, catalytic oxidizer or vapor incinerator process in which a

fuel, including but not limited to natural gas, propane, butane or liquefied petroleum gas, is mixed with air toxics, VOCs, landfill gas, digester gas or other combustible vapors prior to incineration in the unit, in order to maintain vapor concentration above the upper explosion limit or above a manufacturer specified limit in order to maintain combustion or temperature in the unit. This exemption does not apply to a burner with a separate fuel line used to heat up or maintain temperature of a unit or incinerate air toxics, VOCs or other combustible vapors in a gas stream moving past the burner flame.

- (4) New afterburners, degassing units, thermal oxidizers, catalytic oxidizers, vapor incinerators, and spray booth make-up air heaters installed for use at a specific facility after December 5, 2008 and before January 1, 2011, are exempt from the emission limit in Table 1 until July 1 of the year the unit is 15 years old.
- (5) New or relocated remediation units installed after December 5, 2008 and before January 1, 2011, are exempt from the emission limit in Table 1 until a combustion modification or change of location on or after January 1, 2011.
- (6) New food ovens, fryers, heated process tanks, parts washers, and evaporators installed after December 5, 2008 and operating before January 1, 2013, are exempt from the emission limit in Table 1 until July 1 of the year the unit is 15 years old.
- (7) Remediation units are exempt from the applicable emission limit in Table 1 while fueled with propane, butane or liquefied petroleum gas in a location where natural gas is not available. Remediation units must comply with the emission limit when natural gas is available and while fueled with natural gas.