

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

**RULE 1110.2 - EMISSIONS FROM GASEOUS- AND LIQUID-FUELED
ENGINES**

(Adopted August 3, 1990)(Amended September 7, 1990; August 12, 1994; December 9, 1994; November 14, 1997; June 3, 2005)

(a) Purpose

The purpose of Rule 1110.2 is to reduce Oxides of Nitrogen (NO_x), Volatile Organic Compounds (VOCs), and Carbon Monoxide (CO) from engines.

(b) Applicability

All stationary and portable engines over 50 bhp are subject to this rule.

(c) Definitions

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

- (1) AGRICULTURAL STATIONARY ENGINE is a non-portable engine used for the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. An engine used for the processing or distribution of crops or fowl or animals is not an agricultural engine.
- (2) APPROVED EMISSION CONTROL PLAN is a control plan, submitted on or before December 31, 1992, and approved by the Executive Officer prior to November 14, 1997, describing all actions and alternatives, including a schedule of increments of progress to meet or exceed the requirements or applicable emissions limitations in paragraph (d)(1).
- (3) CERTIFIED SPARK-IGNITION ENGINES mean engines certified by California Air Resources Board (CARB) to meet emission standards in accordance with Title 13, Chapter 9, Article 4.5 of the California Code of Regulations (CCR).
- (4) EMERGENCY STANDBY ENGINE is an engine which operates as a temporary replacement for primary mechanical or electrical power during periods of fuel or energy shortage or while the primary power supply is under repair.

- (5) ENGINE is any spark- or compression- ignited internal combustion engine, not including engines used for self-propulsion.
- (6) EXEMPT COMPOUNDS are defined in District Rule 102 - Definition of Terms.
- (7) FACILITY means any source or group of sources or other air contaminant emitting activities which are located on one or more contiguous properties within the District, in actual physical contact or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control), or an outer continental shelf (OCS) source as determined in Section 55.2 of Title 40, Part 55 of the Code of Federal Regulations (40 CFR Part 55). Such above-described groups, if noncontiguous, but connected only by land carrying a pipeline, shall not be considered one facility. Sources or installations involved in crude oil and gas production in Southern California Coastal or OCS Waters and transport of such crude oil and gas in Southern California Coastal or OCS Waters shall be included in the same facility which is under the same ownership or use entitlement as the crude oil and gas production facility on-shore.
- (8) LOCATION means any single site at a building, structure, facility, or installation. For the purpose of this definition, a site is a space occupied or to be occupied by an engine. For engines which are brought to a facility to perform maintenance on equipment at its permanent or ordinary location, each maintenance site shall be a separate location.
- (9) NON-ROAD ENGINE is any engine, defined under 40 CFR Part 89, that does not remain or will not remain at a location for more than 12 consecutive months, or a shorter period of time where such period is representative of normal annual source operation at a stationary source that resides at a fixed location for more than 12 months (e.g., seasonal operations such as canning facilities), and meets one of the following:
 - (A) Is used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as a mobile crane); or
 - (B) Is used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawn mowers and string trimmers); or

(C) By itself, or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Transportability includes, but is not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting.

(10) PORTABLE ENGINE is an engine that, by itself or in or on a piece of equipment, is designed to be and capable of being carried or moved from one location to another. Indications of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting. The operator must demonstrate the necessity of the engine being periodically moved from one location to another because of the nature of the operation.

An engine is not portable if:

- (A) the engine or its replacement remains or will reside at the same location for more than 12 consecutive months. Any engine, such as a back-up or stand-by engine, that replaces an engine at a location and is intended to perform the same function as the engine being replaced, will be included in calculating the consecutive time period. In that case, the cumulative time of both engines, including the time between the removal of the original engine and installation of the replacement engine, will be counted toward the consecutive time period; or
- (B) the engine remains or will reside at a location for less than 12 consecutive months where such a period represents the full length of normal annual source operations such as a seasonal source; or
- (C) the engine is removed from one location for a period and then it or its equivalent is returned to the same location thereby circumventing the portable engine residence time requirements.

The period during which the engine is maintained at a designated storage facility shall be excluded from the residency time determination.

(11) RATED BRAKE HORSEPOWER (bhp) is the rating specified by the manufacturer, without regard to any derating, and listed on the engine nameplate.

(12) STATIONARY ENGINE is an engine which is either attached to a foundation or if not so attached, does not meet the definition of a portable

or non-road engine and is not a motor vehicle as defined in Section 415 of the California Vehicle Code.

- (13) TIER 2 AND TIER 3 DIESEL ENGINES mean engines certified by CARB to meet Tier 2 or Tier 3 emission standards in accordance with Title 13, Chapter 9, Article 4 of the CCR.
- (14) VOLATILE ORGANIC COMPOUND (VOC) is as defined in Rule 102.

(d) Requirements

(1) Stationary Engine Emission Limits:

- (A) Operators of stationary engines with an amended Rule 1110.1 Emission Control Plan submitted by July 1, 1991, or an Approved Emission Control Plan, designating the permanent removal of engines or the replacement of engines with electric motors, in accordance with subparagraph (d)(1)(B), shall do so by December 31, 1999, or not operate the engines on or after December 31, 1999 in a manner that exceeds the emission concentration limits listed in Table I:

TABLE I ALTERNATIVE TO ELECTRIFICATION CONCENTRATION LIMITS		
NO_x	VOC	CO
(ppm) ¹	(ppm) ^{1,2}	(ppm) ¹
11	30	70

¹ Corrected to 15% oxygen on a dry basis and averaged over 15 minutes.

² Measured as carbon.

- (B) The operator of any other stationary engine subject to this rule shall
 - (i) Remove such engine permanently from service or replace the engine with an electric motor, or
 - (ii) Not operate the engine in a manner that exceeds the emission concentration limits listed in TABLE II.

TABLE II CONCENTRATION LIMITS		
NO _x	VOC	CO
(ppm) ¹	(ppm) ^{1,2}	(ppm) ¹
36	250	2000

¹ Corrected to 15% oxygen on a dry basis and averaged over 15 minutes.

² Measured as carbon.

(C) Notwithstanding the provisions in subparagraph (d)(1)(B), the operator of any stationary engine described in Table III shall not operate the engine in a manner that exceeds an emission concentration of 2000 ppm by volume of CO corrected to 15 percent oxygen on a dry basis and averaged over 15 minutes, or the emission concentration limits for VOC as carbon or NO_x specified by the following formula:

CONCENTRATION LIMIT FORMULA			
Concentration Limit	=	Reference Limit	x $\frac{\text{EFF}}{25\%}$

Where:

Concentration Limit = the allowable NO_x, or VOC emission limit (ppm by volume) corrected to 15 percent oxygen on a dry basis, and averaged over 15 consecutive minutes.

Reference Limit = the NO_x or VOC emission limit (ppm by volume) corrected to 15 percent oxygen on a dry basis. The reference limits for various bhp ratings (continuous rating by the manufacturer) are listed in TABLE IV.

TABLE III STATIONARY ENGINES DESCRIPTION
For electric power generation
Fired by landfill gas
Fired by sewage digester gas
Used to drive a water supply or conveyance pump except for aeration facilities
Fired by oil field-produced gas
For integral engine-compressor applications operating less than 4000 hours per calendar year
Fired by liquefied petroleum gas (LPG)

TABLE IV REFERENCE LIMITS, ppm		
Bhp Rating	NO _x	VOC
500 and greater	36	250
Greater Than 50 and Less Than 500	45	250

And,

EFF = the demonstrated percent efficiency at full load when averaged over 15 consecutive minutes of the engine only without consideration of any downstream energy recovery from the actual heat rate, in Btu/kW-hr, corrected to the HHV (higher heating value) of the fuel; or the manufacturer's continuous rated percent efficiency (manufacturer's rated efficiency) of the engine after correction from LHV (lower heating value) to the HHV of the fuel, whichever efficiency is higher. The value of EFF shall not be less than 25 percent. Engines with lower efficiencies will be assigned a 25-percent efficiency for this calculation.

$$EFF = \frac{3413 \times 100\%}{\text{Actual Heat Rate at HHV of Fuel (Btu/kW-hr)}}$$

or

$$\text{EFF} = (\text{Manufacturer's Rated Efficiency at LHV}) \times \frac{\text{LHV}}{\text{HHV}}$$

(D) The operator of any new engine subject to subparagraph (e)(2)(B) shall:

- (i) Comply with the requirements of Best Available Control Technology in accordance with Regulation XIII if the engine requires a District permit; or
- (ii) Not operate the engine in a manner that exceeds the emission concentration limits in TABLE I if the engine does not require a District permit.

(2) Portable Engines:

(A) The operator of any portable engine subject to this rule shall:

- (i) By December 31, 1999, not operate the engine in a manner that exceeds the emission concentration limits of TABLE V for spark-ignition engines, or the emission requirements of TABLE VI for compression-ignition engines;
- (ii) By January 1, 2010, meet the most stringent emissions standard which is the applicable emissions standard in effect and set forth in Title 13 of the CCR for that engine rating. If no emissions standard exists under the CCR, then the applicable emissions standard set forth in 40 CFR Part 89 shall apply. If no standard exists under the CCR and 40 CFR Part 89, then the applicable requirements of TABLE V for spark-ignition engines or TABLE VI for compression-ignition engines shall apply; and
- (iii) Submit to the Executive Officer a letter certifying that the engine is in compliance with the provisions of the subparagraph, in accordance with the compliance schedule in paragraph (e)(2).

TABLE V		
PORTABLE SPARK-IGNITION ENGINE CONCENTRATION LIMITS		
NO_x	VOC	CO
80 ppm ³ (1.5 g/bhp-hr)	240 ppm ³ (1.5 g/bhp-hr)	176 ppm ³ (2.0 g/bhp-hr)

³ Corrected to 15% oxygen on a dry basis and averaged over 15 minutes.

TABLE VI	
PORTABLE COMPRESSION-IGNITION ENGINE EMISSION REQUIREMENTS	
Rated Brake Horsepower	Requirements
Greater Than 50 And Less Than 117	770 ppm ⁴ NO _x (10.0 g/bhp-hr), or turbocharger and 4-degree injection timing retard
Greater Than or Equal To 117 And Less Than 400	550 ppm ⁴ NO _x (7.2 g/bhp-hr), or turbocharger and aftercooler/intercooler and 4-degree injection timing retard
Greater Than or Equal To 400	535 ppm ⁴ NO _x (7.0 g/bhp-hr), or turbocharger and aftercooler/intercooler and 4-degree injection timing retard

⁴ Corrected to 15% oxygen on a dry basis and averaged over 15 minutes.

- (B) The operator of any portable engine generator subject to this rule shall not use the portable generator for:
- (i) Power production into the electric grid, except to maintain grid stability during an emergency event or other unforeseen event that affects grid stability; or
 - (ii) Primary or supplemental power to a building, facility, stationary source, or stationary equipment, except during unforeseen interruptions of electrical power from the serving utility, maintenance and repair operations, and

remote operations where grid power is unavailable. For interruptions of electrical power, the operation of a portable generator shall not exceed the time of the actual interruption of power.

This subparagraph shall not apply to a portable generator that complies with emission concentration limits of Table I and the other requirements in this rule applicable to stationary engines.

(e) Compliance

(1) Portable Engines:

The owner/operator of portable engines subject to the provisions of subparagraph (d)(2) shall:

- (A) For engines for which engine modification or add-on control is used to comply with the applicable requirements of TABLE V for spark-ignition engines, or TABLE VI for compression-ignition engines:
 - (i) By April 30, 1998, submit applications for permit to construct and permit to operate engines;
 - (ii) By September 30, 1999, initiate engine modification or control equipment installation; and
 - (iii) By December 31, 1999, have engines in compliance with the applicable requirements of TABLE V for spark-ignition engines, or TABLE VI for compression-ignition engines.
- (B) For engines for which engine modification or add-on control is used to comply with the most stringent emissions standard as set forth in clause (d)(2)(A)(ii):
 - (i) By April 30, 2008, submit applications for permit to construct and permit to operate engines;
 - (ii) By September 30, 2009, initiate engine modification or control equipment installation; and
 - (iii) By December 31, 2009, have engines in compliance with the most stringent emissions standard.
- (C) By December 31, 2009, if the engines are in compliance with the most stringent emissions standard, submit to the Executive Officer

a letter certifying that the engines are in compliance with the emissions standard.

(2) Agricultural Stationary Engines:

(A) The operator of any agricultural stationary engine subject to this rule and installed or issued a permit to construct prior to June 3, 2005 shall comply with paragraph (d)(1)(B) and the other applicable provisions of this rule in accordance with the compliance schedules in Table VII:

Table VII COMPLIANCE SCHEDULES FOR STATIONARY AGRICULTURAL ENGINES		
Action Required	Tier 2 and Tier 3 Diesel Engines, Certified Spark-Ignition Engines, and All Engines at Facilities with Actual Emissions Less Than the Amounts in the Table of Rule 219(c)	Other Engines
Submit notification of applicability to the Executive Officer	January 1, 2006	January 1, 2006
Submit to the Executive Officer applications for permits to construct engine modifications, control equipment, or replacement engines	March 1, 2009	September 1, 2007
Initiate construction of engine modifications, control equipment, or replacement engines	September 30, 2009, or 30 days after the permit to construct is issued, whichever is later	March 30, 2008, or 30 days after the permit to construct is issued, whichever is later
Complete construction and comply with applicable requirements	January 1, 2010, or 60 days after the permit to construct is issued, whichever is later	July 1, 2008, or 60 days after the permit to construct is issued, whichever is later
Complete initial source testing	March 1, 2010, or 120 days after the permit to construct is issued, whichever is later	September 1, 2008, or 120 days after the permit to construct is issued, whichever is later

The notification of applicability shall include the following for each engine:

- (i) Name and mailing address of the operator.
- (ii) Address of the engine location.
- (iii) Manufacturer, model, serial number, and date of manufacture of the engine.
- (iv) Application number
- (v) Engine type (diesel, rich-burn spark-ignition or lean-burn spark-ignition)
- (vi) Engine fuel type
- (vii) Engine use (pump, compressor, generator, or other)
- (viii) Expected means of compliance (engine replacement, control equipment installation, or electrification)

(B) The operator of any new agricultural stationary engine that is not subject to the compliance schedule of subparagraph (e)(2)(A) for existing engines shall comply with the requirements of subparagraph (d)(1)(D) immediately upon installation.

(3) Agricultural Portable Engines:

(A) The operator of any agricultural portable engine subject to this rule shall comply with paragraph (f)(2) by January 1, 2006.

(f) Monitoring, Testing and Recordkeeping

(1) Stationary engines:

The operator of any engine subject to the provisions of paragraph (d)(1) of this rule shall meet the following requirements:

(A) Continuous Emission Monitoring

- (i) For engines of 1000 bhp and greater, and operating more than two million bhp-hr per calendar year, install, operate and maintain in calibration a NO_x continuous emission monitoring system (CEMS) to demonstrate compliance with the emission limits of this rule. CEMS shall meet the requirements described in 40 CFR Part 60, particularly those in Appendix B, Spec. 2 and Appendix F, as well as the reporting requirements of 40 CFR Part 60 Sections 60.7(c), 60.7(d), and 60.13, and shall include equipment

that measures and records NO_x exhaust gas concentrations, corrected to 15 percent oxygen on a dry basis.

- (ii) The operator of an engine that is required to install CEMS may request the Executive Officer to approve an alternative monitoring device (or system components) to demonstrate compliance with the emission limits of this rule. The applicant shall demonstrate to the Executive Officer that the proposed alternative monitoring device is at a minimum equivalent in relative accuracy, precision, reliability, and timeliness to a CEMS for that engine, according to the criteria specified in 40 CFR Part 75 Subpart E. In lieu of the criteria specified in 40 CFR Part 75 Subpart E, substitute criteria is acceptable if the applicant demonstrates to the Executive Officer that the proposed alternative monitoring device is at minimum equivalent in relative accuracy precision, reliability, and timeliness to a CEMS for that engine. Upon approval by the Executive Officer, the substitute criteria shall be submitted to the federal Environmental Protection Agency (EPA) as an amendment to the State Implementation Plan (SIP).

If the alternative monitoring device is denied or fails to be recertified, a CEMS shall be required.

- (iii) The monitoring system shall have data gathering and retrieval capability approved by the Executive Officer.

(B) Elapsed Time Meter

The engine shall have an operational non-resettable totalizing time meter to determine the engine elapsed operating time.

(C) Source Testing

- (i) Provide source test information regarding the exhaust gas, specifically for NO_x, VOC reported as carbon, and CO concentrations (concentrations in ppm by volume, corrected to 15 percent oxygen on dry basis) at least once every 3 years. Relative accuracy tests required by Rule 218.1 or 40 CFR Part 75 Subpart E will satisfy this requirement for those pollutants monitored by a CEMS. If

the engine has not been operated within three months of the date a source test is required, the source test shall be conducted when the engine resumes operation for a period longer than either seven consecutive days or 15 cumulative days of operation. The operator of the engine shall keep sufficient operating records to demonstrate that it meets the requirements for extension of the source testing deadlines.

(D) Operating Log

Maintain a monthly engine operating log that includes:

- (i) Total hours of operation;
- (ii) Type of liquid and/or type of gaseous fuel;
- (iii) Fuel consumption (cubic feet of gas or gallons of liquid);
and
- (iv) Cumulative hours of operation since the last source test required in subparagraph (f)(1)(C).

Facilities subject to Regulation XX may maintain a quarterly log for engines that are designated as a process unit on the facility permit.

(2) Portable engines:

The operator of any portable engine shall maintain a monthly engine operating log that includes:

- (i) Total hours of operation;
- (ii) Type of liquid and/or type of gaseous fuel; and
- (iii) Fuel consumption (cubic feet of gas or gallons of liquid).

Facilities subject to Regulation XX may maintain a quarterly log for engines that are designated as a process unit on the facility permit.

(3) Recordkeeping for All Engines

All data, logs, test reports and other information required by this rule shall be maintained for at least five years and made available for inspection by the Executive Officer.

(g) Test Methods

Testing to verify compliance with the applicable requirements shall be conducted in accordance with the test methods specified in TABLE VIII, or any test methods approved by CARB and EPA, and authorized by the Executive Officer.

TABLE VIII	
TESTING METHODS	
Pollutant	Method
NO _x	District Method 100.1
CO	District Method 100.1
VOC	District Method 25.1* or District Method 25.3*

* Excluding ethane and methane

A violation of any standard of this rule established by any of the specified test methods, or any test methods approved by the CARB or EPA, and authorized by the Executive Officer, shall constitute a violation of this rule.

(h) Exemptions

The provisions of subdivision (d) shall not apply to:

- (1) All orchard wind machines powered by an internal combustion engine.
- (2) Emergency standby engines as approved by the Executive Officer, which operate 200 hours or less per year as determined by an elapsed operating time meter.
- (3) Engines used for fire-fighting and flood control.
- (4) Laboratory engines used in research and testing purposes.
- (5) Engines operated for purposes of performance verification and testing of engines.
- (6) Engines operating in the Eastern portion of Riverside County not within the South Coast Air Basin or the Salton Sea Air Basin..
- (7) Auxiliary engines used to power other engines or gas turbines during start-ups.
- (8) Supplemental engines which operate between November 1 of one year and April 15 of the following year for the manufacture of snow and/or operation of ski lifts.
- (9) Portable engines that are registered under the state registration program pursuant to Title 13, Article 5 of the CCR.
- (10) Nonroad engines, with the exception that subparagraph (d)(2)(B) shall apply to portable generators.
- (11) Engines operating on San Clemente Island.
- (12) Agricultural stationary engines provided that:

- (A) The operator submits documentation to the Executive Officer by the applicable date in Table VII when permit applications are due that the applicable electric utility has rejected an application for an electrical line extension to the location of the engines, or the Executive Officer determines that the operator does not qualify, due to no fault of the operator, for funding authorized by California Health and Safety Code Section 44229; and
- (B) The operator replaces the engines, in accordance with the compliance schedule of Table IX, with engines certified by CARB to meet the Tier 4 emission standards of 40 CFR Part 1039 Section 1039.101, Table 1. These Tier 4 replacement engines shall be considered to comply with Best Available Control Technology; and
- (C) The operator does not operate the engines in a manner that exceeds the not-to-exceed standards of 40 CFR Section 1039.101, Paragraph (e), as determined by the test methods of subdivision (g) of this rule.

Table IX COMPLIANCE SCHEDULE FOR INSTALLATION OF NEW TIER 4 STATIONARY AGRICULTURAL ENGINES	
Action Required	
Submit to the Executive Officer applications for permits to construct engine modifications, control equipment, or replacement engines	March 1, 2013
Initiate construction of engine modifications, control equipment, or replacement engines	September 30, 2013, or 30 days after the permit to construct is issued, whichever is later
Complete construction and comply with applicable requirements	January 1, 2014, or 60 days after the permit to construct is issued, whichever is later
Complete initial source testing	March 1, 2014, or 120 days after the permit to construct is issued, whichever is later