

ANTELOPE VALLEY AIR QUALITY MANAGEMENT DISTRICT

**RULE 1110.2 - EMISSIONS FROM STATIONARY, NON-ROAD & PORTABLE  
INTERNAL COMBUSTION ENGINES**

*(Adopted: 08/03/90; Amended: 09/07/90; 08/12/94; 12/09/94;  
5/15/01; 01/21/03)*

(A) General

(1) Purpose

- (a) To limit emissions of Oxides of Nitrogen (NO<sub>x</sub>), Volatile Organic Compounds (VOCs) and Carbon Monoxide (CO) from Stationary or Portable Internal Combustion Engines.

(2) Applicability

- (a) This rule is applicable to all Stationary ICEs over 50 bhp and all portable engines over 100 bhp.

(B) Definitions

- (1) “Air Pollution Control Officer (APCO)” – The person appointed to the position of Air Pollution Control Officer of the District pursuant to the provisions of California Health & Safety Code §40750, and his or her designee.

- (2) “Emergency Engine” – Any engine which operates:

- (a) 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; and
- (b) Less than 200 hours per calendar year as evidenced by an installed and operating engine-hour meter and log of operating hours per Subsections (F) and (G) of this rule.

- (3) “Exempt Compounds” – Compounds listed in 40 CFR 51.100(s)(1).

- (4) “Facility” – Any building, structure, emissions unit(s) or installation which emits or may emit a Regulated Air Pollutant and which is:

- (a) Located on one or more contiguous or adjacent properties within the District; and
- (b) Under the control of the same person (or by persons under common control); and

- (c) Belong to the same industrial grouping, as determined by being within the same two-digit Standard Industrial Classification Code (SICC).
  - (d) For the purpose of this regulation, such above-described grouping, remotely located but connected only by land carrying a pipeline, shall not be considered one Facility.
- (5) “Internal Combustion Engine (ICE)” – Any spark- or compression-ignited internal combustion engine, not including ICEs used for self-propulsion.
- (6) “Location” – Any single site at a building, structure, facility, or installation. For engines that perform maintenance on equipment at its permanent or ordinary location, each maintenance site shall be a separate location.
- (7) “Non-road Internal Combustion Engine (Non-road ICE)” – Any ICE defined under 40 CFR Part 89, which meets the specified emissions limits therein, and that does not remain or will not remain at a location for more than twelve (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 or more than twelve (12) months (e.g., seasonal source or operation such as canning facilities, ski resort snow making equipment) and meets any 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 an off highway 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. Portable means designed to be and capable of being carried or moved from one location to another. Transportable includes, but is not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting.
- (8) “Portable Internal Combustion Engine (Portable ICE)” – Any ICE designed and capable of being carried or moved from one location to another. Indicia of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. For the purposes of this rule, dredge ICEs on a boat or barge are considered portable ICE. The ICE is not portable if any of the following are true:
- (a) Is attached to a foundation at a single location; or
  - (b) Remains or will remain at a single location for more than 12 consecutive months; or
  - (c) Is a replacement ICE for a specific application which remains or is intended to remain for twelve (12) consecutive months; or

- (d) Is a seasonal or other source that normally operates less than twelve (12) consecutive months as its normal operational year.
  - (e) Any period during which the ICE is not operated and is maintained at a designated storage facility shall be excluded from the residency time determination.
- (9) “Rated Brake Horsepower (bhp)” – The rating specified by the manufacturer, without regard to any derating, and listed on the ICE’s nameplate.
- (10) “Reactive Organic Compound (ROC)” – Any compound containing carbon, which participates in atmospheric photochemical reactions, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate and those compounds listed in 17 California Code of Regulations §94508(a)(90)(1-2).
- (11) “Regulated Air Pollutant” – Any of the following Air Pollutants:
- (a) Any Air Pollutant, and its Precursors, for which an Ambient Air Quality Standard has been promulgated.
  - (b) Any Air Pollutant that is subject to a standard under 42 U.S.C. §7411, Standards of Performance for New Stationary Sources (Federal Clean Air Act §111) or the regulations promulgated thereunder.
  - (c) Any substance which has been designated a Class I or Class II substance under 42 U.S.C. §7671a (Federal Clean Air Act §602) or the regulations promulgated thereunder.
  - (d) Any Air Pollutant subject to a standard or other requirement established pursuant to 42 U.S.C. §7412, Hazardous Air Pollutants (Federal Clean Air Act §112) or the regulations promulgated thereunder.
- (12) “Stationary Internal Combustion Engine (Stationary ICE)” – Any ICE which is not a Portable ICE or any ICE registered in the State-wide Portable Equipment Program.
- (13) “Volatile Organic Compound (VOC)” – Any volatile compound containing the element carbon which participates in atmospheric photochemical reactions, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate and those compounds listed in 40 CFR 51.100(s)(1).

## (C) Requirements

- (1) General Emissions Limits
  - (a) The owner or operator of any Stationary ICE subject to this rule shall:

- (i) Replace any such ICE with an electric motor; or
- (ii) Remove the ICE from service, permanently; or
- (iii) Ensure that the emissions from such ICE do not exceed the emission limits of TABLE I.

<b>Table I</b>		
<b>GENERAL ICE EMISSIONS LIMITS</b>		
<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>
36 ppm*	250 ppm*	2000 ppm*

\* Corrected to 15% oxygen on a dry gas basis and averaged over a 15-minute interval.

(2) Alternative Emission Limits for NO<sub>x</sub> and VOC

- (a) Notwithstanding the provisions of subsection (C)(1) above the owner or operator of any of the following:
  - (i) An electric-power-generating engine,
  - (ii) A landfill-gas- or sewage-digester-gas-fueled engine,
  - (iii) An engine used to drive a water supply or conveyance pump except for aeration facilities,
  - (iv) An oil field-produced-gas-fired engine,
  - (v) An integral engine-compressor application operating less than 4000 hours per calendar year, or
  - (vi) A liquefied petroleum gas (LPG)-fueled engine
- (b) May, in lieu of compliance with subsection (C)(1)(c) above;
  - (i) Ensure that the emissions from such ICE do not exceed the emissions limits of carbon monoxide (CO) of Table I, and
  - (ii) Ensure that the emissions of oxides of nitrogen (NO<sub>x</sub>), and VOC (measured as methane from such engines) do not exceed the Alternate Compliance Limit calculated as follows:

$$\text{Alternate Compliance Limit} = \text{Reference Limit} \times \text{EEF}/25\%$$

Where:

Alternate Compliance Limit = Allowable NO<sub>x</sub> or VOC emissions (ppm by volume)

Reference Limit = The NO<sub>x</sub> or VOC reference emission limit (ppm by volume) for various bhp ICEs corrected to fifteen percent (15%) oxygen on a dry gas basis and averaged over fifteen (15) consecutive minutes as listed in Table II

TABLE II REFERENCE EMISSIONS LIMITS		
Bhp Rating	NO <sub>x</sub>	VOC
500 bhp and greater	36 ppm	250 ppm
50 to 500 bhp	45 ppm	250 ppm

And,

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

Actual Heat Rate at HHV of Fuel (Btu/kW-hr)

or

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

The demonstrated percent efficiency at full load when averaged over 15 consecutive minutes of the ICE only, as calculated, within 30 days of the first source test, without consideration of any downstream energy recovery from the actual heat rate, (Btu/kW-hr) or 1.34 (Btu/hp-hr); corrected to the HHV (higher heating value) of the fuel as measured at peak load for that facility; or the manufacturer's continuous rated percent efficiency (manufacturer's rated efficiency) of the ICE 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. ICEs having lower efficiencies will be assigned a 25-percent efficiency for this calculation.

(3) Portable ICE Emission Limit

- (a) The owner or operator of any Portable ICE subject to this rule shall:
  - (i) Register the ICE with the CARB State-wide Portable Equipment Program, successfully obtaining a valid certificate for the ICE; or
  - (ii) For spark-ignited ICEs comply with the following emissions limits in TABLE III below:

<b>TABLE III SPARK-IGNITION PORTABLE ICES COMPLIANCE LIMITS</b>		
<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>
80 ppm*	240 ppm*	176 ppm*

\* Corrected to 15% oxygen on a dry gas basis and averaged over a 15 minute interval.

- (iii) For compression-ignited ICES comply with the following emissions limits in TABLE IV below.

<b>TABLE IV PORTABLE COMPRESSION-IGNITED ICE LIMITS</b>	
<b>Rated Brake Horsepower</b>	<b>Requirements</b>
100 bhp $\geq$ X < 117 bhp	770 ppm* NO <sub>x</sub> or a turbocharger and 4-degree injection timing retard
117 bhp $\geq$ X < 400 bhp	550 ppm* NO <sub>x</sub> or a turbocharger and aftercooler/intercooler and 4-degree injection timing retard
X > 400 bhp	535 ppm* NO <sub>x</sub> or a turbocharger and aftercooler/intercooler and 4-degree injection timing retard

\* Corrected to 15% oxygen on a dry gas basis and averaged over a 15 minute interval.

#### (D) Compliance Schedule

The owner or operator of any ICES subject to this rule shall comply with the requirements of this rule in accordance with the following schedule:

- (1) For existing Stationary ICES, the emissions limits of subsection (C)(1) or (2) shall apply.
- (2) For Portable ICES operated pursuant to subsection (C)(3):
  - (a) By December 31, 2009, the owner/operator shall complete stack modifications to facilitate source testing required pursuant to sections (E) and (F) of this rule.
- (3) Any new ICE that is not an existing ICE must be in compliance with the provisions of this and other applicable rules before being placed in service.

#### (E) Monitoring

- (1) For stationary ICES of 1000 bhp and greater, subject to the provisions of section (C) of this rule and operating more than two million bhp-hr per calendar year:
  - (a) CEMS Requirement

- (i) The owner/operator shall install, operate and maintain in calibration a NO<sub>x</sub> continuous emission monitoring system (CEMS) as approved by the APCO to demonstrate compliance within the emission limits of this rule.
- (ii) Measurement and Recording – This system shall include equipment that measures and records exhaust gas NO<sub>x</sub> concentrations, corrected to 15 percent oxygen on a dry basis.
- (iii) CEMS System Requirements – CEMS shall meet the requirements described in 40 CFR Part 60, particularly those in Appendix B, Spec. 2 and Appendix F.
- (iv) CEMS Reporting Requirements - CEMS reporting shall be as prescribed in 40 CFR Part 60.7(c), 60.7(d) and 60.13, with NO<sub>x</sub> reported after corrections to 15 percent oxygen on a dry basis.

(b) Alternative Monitoring Device or Equipment, in lieu of CEMS

- (i) The owner/operator of an ICE that is required to install CEMS may request in writing to the APCO approval of an alternative monitoring device (or system components) to demonstrate compliance with the limits of this rule.
- (ii) The applicant shall demonstrate to the APCO that the proposed monitoring device is, at a minimum, comparable in relative accuracy, precision, reliability and timeliness to a CEMS for that ICE, on a case-by-case basis; or
- (iii) The APCO may approve, on a case-by-case basis, criteria for equipment which is equivalent to the criteria specified in 40 CFR 75, Subpart E.
- (iv) Such alternative monitoring device, equipment or procedure must be approved in writing by the APCO and obtain a valid permit to operate with the District. The approval shall include a monitoring plan that includes, at a minimum, equipment specifications, monitoring, record keeping, compliance testing and reporting requirements.

(2) For stationary ICEs of less than 1,000 bhp and stationary ICEs of greater than 1,000 bhp operating less than two million bhp-hr per calendar year which are subject to the provisions of section (C) of this rule:

(a) Quarterly Screening Analysis

- (i) The owner/operator shall inspect each engine each calendar quarter in which compliance testing is not required pursuant to subsection (F)(1)(c) of this rule with a portable NO<sub>x</sub> analyzer to determine compliance with the emissions limits contained in section (C) of this rule.
- (ii) An instrument reading in excess of the emission limit contained in section (C) of this rule shall not be considered a violation of this

rule, so long as the problem is corrected and a follow-up inspection is conducted within fifteen (15) days of the initial inspection.

- (iii) Instrument readings, a determination of whether or not the engine is in compliance, a description of corrective action(s) taken, and the initials of the person recording the reading shall be recorded on an inspection log and kept in accordance with the provisions of section (G) of this rule.

(b) Alternate Screening Analysis

- (i) The owner/operator of an ICE that is required to be inspected pursuant to subsection (E)(2)(a) above may request the APCO, in writing, for approval of an alternate screening analysis to demonstrate compliance with the emissions limits contained in section (C) of this rule.
- (ii) The application for an alternate screening analysis shall include:
  - a. A listing of each engine, its permit number and location which is to be subject to the alternate screening analysis.
  - b. A specific emission inspection procedure to assure that the engine is operated in compliance with the provisions of this rule. Inspections shall be conducted every quarter or after every 2,000 hours of engine operations whichever is less, but in no case less than quarterly.
  - c. A description and schedule of preventative maintenance procedures or practices which will be used to maintain the engine(s) in compliance with the provisions of this rule.

- (3) Data Gathering/Retrieval Capability – Any monitoring system shall have data gathering and retrieval capability approved by the APCO. Data shall be maintained for at least two years and made available for inspection by the APCO.

(F) Equipment and Compliance Testing Requirements

- (1) All ICEs subject to this rule shall:

- (a) Elapsed Time Meter – Have operational non-resettable totalizing time (in hours) meters to determine the ICE's elapsed operating time.
- (b) Fuel Meter – Have a non-resettable fuel meter or acceptable alternative as approved by the APCO, to determine fuel consumption.
- (c) Compliance Testing – Provide source test information regarding the exhaust gas; specifically for NO<sub>x</sub>, VOC reported as methane, and CO concentrations (concentrations in ppm by volume, corrected to 15 percent oxygen on dry basis) according to the following schedule:
  - (i) Once each 8,760 hours of operation or once every twenty-four (24) months whichever period is shorter;



- (ii) Compliance testing shall be conducted under conditions that are typical of normal engine load and duty cycle
- (iii) The compliance test shall be conducted and the report received at the District not less than 90 days prior to the ICE's permit renewal date

#### (G) Record Keeping and Reporting

- (1) Record Keeping – The owner/operator of any ICE shall maintain an engine operating log that includes, on a monthly basis:
  - (a) The total hours of operation for each day of operation; and
  - (b) Type and quantity of fuel used (liquid/gas); and
  - (c) The cumulative hours of operation since the last source test required in subparagraph (F)(1)(c); and
  - (d) The purpose or reason for operating the engine for each day of operation.
  - (e) The results of any screening analysis or alternative screening analysis if required pursuant to subsection (E)(2).
- (2) Reporting – Required records and data shall be available for inspection any time, remain at the facility for 2 years, and upon request, be submitted to the APCO at the end of each calendar year in a manner and form approved by the APCO.

#### (H) Compliance Test Methods

- (1) NOx emissions subject to the provisions of this rule shall be determined by the procedure detailed in EPA Test Method 7E.
- (2) CO emissions by EPA Test Method 10.
- (3) VOC emissions by EPA Test Method 25, 25A or 25B.
- (4) Other test methods determined to be equivalent after review by the staffs of the District, California Air Resources Board, and the United States Environmental Protection Agency, and approved in writing by the Air Pollution Control Officer, may also be used to determine compliance with provisions of this rule.

#### (I) Exemptions

- (1) The provisions of paragraphs (C), (D), (E), (F), (G) and (H) shall not apply to:
  - (a) ICEs used directly and exclusively by the owner/operator for agricultural operations necessary for the growing of crops or raising of fowl or animals.

- (b) ICEs operated for purposes of performance verification and testing.
  - (c) Auxiliary ICEs used to power other ICEs or gas turbines during start-ups.
  - (d) Portable ICEs that are registered under the California State-wide Portable Equipment Registration Program pursuant to Health & Safety Code §§ 41750 through 41755.
- (2) The provisions of paragraphs (C), (D), (E), (F)(1)(c), and (H) shall not apply to:
- (a) The operation of any ICE during the existence of any officially declared disaster or state of emergency.
  - (b) Emergency ICEs which operate less than 200 hours per year as determined by an elapsed operating time meter.
  - (c) Non-road engines.
  - (e) Laboratory ICEs used in research and testing purposes.
  - (f) Supplemental ICEs which operate for the manufacture of snow and/or operation of ski lifts, during seasonal operations (November 1 through April 15).

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