

RULE 4702 INTERNAL COMBUSTION ENGINES (Adopted August 21, 2003; Amended June 16, 2005; Amended April 20, 2006; Amended January 18, 2007; Amended August 18, 2011; Amended November 14, 2013; Amended date)

1.0 Purpose

The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM), and sulfur oxides (SO_x) from internal combustion engines.

2.0 Applicability

This rule applies to any internal combustion engine rated at 25 brake horsepower or greater.

3.0 Definitions

3.1 Agriculture Operations (AO): the growing and harvesting of crops or the raising of fowl or animals, for the primary purpose of earning a living, or of conducting agricultural research or instruction by an educational institution.

3.2 Air Pollution Control Officer (APCO): the Air Pollution Control Officer of the San Joaquin Valley Unified Air Pollution Control District, or any person authorized to act on behalf of the APCO.

3.3 ARB: California Air Resources Board.

3.4 California Reformulated Diesel: diesel fuel meeting 15 ppmv sulfur content limit as required by the California Diesel Fuel Regulations as specified in the California Code of Regulations, Title 13, Division 3, Chapter 5 (Standards for Motor Vehicle Fuels), Article 2 (Standards for Diesel Fuel), Section 2281- Sulfur content of Diesel Fuel.

3.5 California Reformulated Gasoline: gasoline meeting ARB requirements for motor vehicle fuel as specified in California Code of Regulations, Title 13, Division 3, Chapter 5, Article 1, Subarticle 2 - Standards for gasoline sold beginning March 1, 1996.

3.6 Certified Compression-Ignited Engine: a Tier 1, Tier 2, Tier 3, or Tier 4 compression-ignited engine that is EPA certified as specified in Title 40 Code of Federal Regulations Part 89 or in Title 40 Code of Federal Regulations Part 1039.

3.7 Certified Spark-Ignited Engine: a spark-ignited engine that is used exclusively in agricultural operations and that is ARB certified as specified in Title 13, Division 3, Chapter 9, Article 4.5, Section 2433 of the California Code of Regulations or has an EPA certification per 40 CFR Part 1048 and that has been certified to meet a Certification Level at or below the NO_x emission limits in Table 5~~for hydrocarbon plus NO_x emissions of 0.6 grams/bhp-hr (40.2 ppmv) or less.~~

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- 3.8 CO: carbon monoxide.
- 3.9 Compression-Ignited Internal Combustion Engine: an engine that uses the heat of compression to initiate combustion.
- 3.10 Cyclic Loaded Engine: an internal combustion engine that, under normal operating conditions, varies in shaft load by 40% or more of rated brake horsepower during recurrent periods of 30 seconds or less or is used to power an oil well reciprocating pump unit.
- 3.11 De-rated Engine: an internal combustion engine which has been physically limited and restricted by permit condition to an operational level of less than 50 horsepower.
- 3.12 Diesel Engine: a compression-ignited internal combustion engine.
- 3.13 Disaster or State of Emergency: a fire, flood, earthquake, or other similar natural catastrophe.
- 3.14 Distributed Generation (DG): relatively small power plants, such as internal combustion engine generator sets, which are used to generate electrical power that is either fed into the power grid or used on-site. DG units are located throughout the grid and are usually sited in or close to load centers or utility customers' sites. Distributed Generation also refers to a mechanical drive system consisting of one or more internal combustion engines and electric motors, where use of the internal combustion engines or electric motors is interchangeable.
- 3.15 Emergency Standby Engine: an internal combustion engine which operates as a temporary replacement for primary mechanical or electrical power during an unscheduled outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the operator. An engine shall be considered to be an emergency standby engine if it is used only for the following purposes: (1) periodic maintenance, periodic readiness testing, or readiness testing during and after repair work; (2) unscheduled outages, or to supply power while maintenance is performed or repairs are made to the primary power supply; and (3) if it is limited to operate 100 hours or less per calendar year for non-emergency purposes. An engine shall not be considered to be an emergency standby engine if it is used: (1) to reduce the demand for electrical power when normal electrical power line service has not failed, or (2) to produce power for the utility electrical distribution system, or (3) in conjunction with a voluntary utility demand reduction program or interruptible power contract.
- 3.16 EPA: U.S. Environmental Protection Agency.
- 3.17 Exhaust Control: device or technique used to treat an engine's exhaust to reduce NO_x, VOC, or CO emissions, and includes, but is not limited to, catalysts, afterburners, reaction chambers, and chemical injectors.

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- 3.18 Flood: a sudden and reasonably unforeseen rising and overflowing of a body of water especially onto normally dry land.
- 3.19 Gaseous Fuel: a fuel which is a gas at standard conditions including but not limited to natural gas, methane, ethane, propane, butane and liquefied petroleum gas (LPG).
- 3.20 Higher Heating Value (hhv): the total heat liberated per mass or volume of fuel burned (expressed as Btu per pound, Btu per cubic foot, or Btu per gallon), when fuel and dry air at Standard Conditions undergo complete combustion and all resulting products are brought to their standard states at Standard Conditions. If certification of hhv is not provided by the fuel supplier, it shall be determined by the applicable test methods specified in Section 6.4.
- 3.21 Installation Date: the date that an internal combustion engine is initially placed at a location in order to be operated for the first time in its lifetime.
- 3.22 Internal Combustion Engine: a spark- or compression-ignited reciprocating engine.
- 3.23 Lean-Burn Engine: a spark-ignited internal combustion engine that is operated with an exhaust stream oxygen concentration of four (4) percent by volume, or greater, prior to any exhaust stream control device.
- 3.24 Limited Use Engine: an internal combustion engine that is limited by a permit condition to be operated no more than 4,000 hours per calendar year and provided the following requirements are met:
- 3.24.1 The engine is operated with an operating nonresettable elapsed time meter;
 - 3.24.2 In lieu of an operating nonresettable elapsed time meter, the operator may use an alternative device, method, or technique, in determining operating time, provided that the alternative is approved by the APCO and EPA and is allowed by the Permit-to-Operate. The operator must demonstrate that the alternative device, method, or technique is equivalent to using a nonresettable elapsed time meter;
 - 3.24.3 The operator shall properly maintain and operate the nonresettable elapsed time meter or alternative device in accordance with the manufacturer's instructions; and
 - 3.24.4 The engine operator maintains records of the annual operating hours and makes the records available to the APCO upon request.
- 3.25 Location: a single site at a building, structure, facility, or installation.

- 3.26 Low-use Engine: an internal combustion engine that is limited by a permit condition to be operated no more than 200 hours per calendar year and the engine is not used to perform any of the functions specified in Section 3.26.1 through Section 3.26.3.
- 3.26.1 Generate electrical power that is either fed into the electrical utility power grid or used to reduce electrical power purchased by a stationary source;
- 3.26.2 Generate mechanical power that is used to reduce electrical power purchased by a stationary source; or
- 3.26.3 Is used in a distributed generation application.
- 3.27 Military Tactical Equipment: a transportable engine operated by the United States armed forces or National Guard which is designed specifically for military use in an off-road, dense terrain; hostile environment; or aboard military combat vessels.
- 3.28 Mobile Agricultural Equipment: equipment at an agricultural operation which is towed or mounted on a vehicle and is continuously moved during the operation of the equipment. Mobile Agricultural Equipment includes, but is not limited to sprayers, balers, and harvest equipment.
- 3.29 NOx: oxides of nitrogen, calculated as equivalent nitrogen dioxide (NO₂).
- 3.30 Operator: includes but is not limited to any person who owns, leases, supervises, or operates a facility and/or equipment.
- 3.31 Particulate Matter: any material except uncombined water, which exists in a finely divided form as a liquid or solid at standard conditions.
- ~~3.34~~2 Public Utilities Commission (PUC) Quality Natural Gas: high methane gas (at least 80% methane by volume) as specified in PUC General Order 58-A.
- ~~3.32~~3 Rated Brake Horsepower: the continuous brake horsepower rating specified for the engine by the manufacturer or listed on the nameplate of the unit, unless otherwise physically limited and specified by a condition on the engine's Permit-to-Operate or Permit-Exempt Equipment Registration.
- ~~3.33~~4 Replacement Unit Engine: an engine that is installed to replace an engine that was in place as of August 18, 2011, and that such replacement is performed solely for the purpose of complying with the requirements of Section 5.2 of this rule.
- ~~3.34~~5 Rich-Burn Engine: a spark-ignited internal combustion engine that is operated with an exhaust stream oxygen concentration of less than four (4) percent by volume prior to any exhaust stream control device.

- 3.356 Spark-Ignited Internal Combustion Engine: a liquid or gaseous fueled engine designed to ignite its air/fuel mixture by a spark across a spark plug.
- 3.367 Stationary Source: as defined in Rule 2201 (New and Modified Stationary Source Review Rule).
- 3.378 Tier 1 Engine, Tier 2 Engine, Tier 3 Engine, and Tier 4 Engine: an EPA-certified compression-ignited engine that meets the Tier 1, Tier 2, or Tier 3 emission standards of Table 1 (Emission Standards in g/kW-hr (g/hp-hr)) on page 56970 of the Final Rule (63 Fed. Reg. 205, October 23, 1998) or the Tier 4 emission standards of Table II.A2. (Tier 4 NOx and NMHC Standards and Schedule) on page 38971 of the Final Rule (69 Fed. Reg. 124, June 29, 2004) or Table II.A-4 (Tier 4 Standards for Engines Over 750 hp (g/bhp-hr)) on page 38980 of the Final Rule (69 Fed. Reg. 124, June 29, 2004), respectively.
- 3.389 VOC: volatile organic compounds, as defined in Rule 1020 (Definitions).
- 3.3940 Waste Gas: an untreated, raw gas derived through a natural process, such as anaerobic digestion, from the decomposition of organic waste at municipal solid waste landfills or publicly owned wastewater treatment facility. Waste gas includes landfill gas which is generated at landfills, digester gas which is generated at sewage treatment facilities, or a combination of the two.
- 3.401 Wind Machine: a machine consisting of a large fan mounted on a tower powered by an internal combustion engine, used exclusively to provide protection to crops, including, but not limited to oranges, lemons, and grapes, from cold weather by effecting a heat transfer by moving warmer atmospheric air downward and mixing it with the colder air surrounding a crop.

4.0 Exemptions

- 4.1 The requirements of this rule shall not apply to the following engines:
 - 4.1.1 An engine used to propel implements of husbandry, as that term is defined in Section 36000 of the California Vehicle Code, as that section existed on January 1, 2003.
 - 4.1.2 An engine used exclusively to power a wind machine.
 - 4.1.3 A de-rated spark-ignited engine not used in agricultural operations, provided the de-rating occurred before June 1, 2004.
 - 4.1.4 A de-rated spark-ignited engine used in agricultural operations or a de-rated compression-ignited engine, provided the de-rating occurred before June 1, 2005.
 - 4.1.5 An engine used exclusively to power Mobile Agricultural Equipment.
 - 4.1.6 An internal combustion engine registered as a portable emissions unit under the Statewide Portable Equipment Registration Program pursuant to California Code of Regulations Title 13, Division 3, Chapter 9, Article 5, Sections 2450-2465.
 - 4.1.7 An internal combustion engine registered as a portable emissions unit under Rule 2280 (Portable Equipment Registration).
- 4.2 Except for the requirements of Sections 5.9 and 6.2.3, the requirements of this rule shall not apply to an emergency standby engine or a low-use engine, provided that the engine is operated with a functional nonresettable elapsed time meter.
 - 4.2.1 In lieu of operating a nonresettable elapsed time meter, the operator may use an alternative device, method, or technique, in determining operating time, provided that the alternative is approved by the APCO and EPA and is allowed by the Permit-to-Operate or Permit-Exempt Equipment Registration. The operator must demonstrate that the alternative device, method, or technique is equivalent to using a nonresettable elapsed time meter.
 - 4.2.2 The operator shall properly maintain and operate the nonresettable elapsed time meter or alternative device in accordance with the manufacturer's instructions.
- 4.3 Except for the administrative requirements of Section 6.2.3, the requirements of this rule shall not apply to the following:

- 4.3.1 An internal combustion engine that meets the following conditions:
 - 4.3.1.1 The engine is operated exclusively to preserve or protect property, human life, or public health during a disaster or state of emergency, such as a fire or flood; and
 - 4.3.1.2 Except for operations associated with Section 4.3.1.1, the engine is limited to operate no more than 100 hours per calendar year as determined by an operational nonresettable elapsed time meter, for periodic maintenance, periodic readiness testing, and readiness testing during and after repair work of the engine; and
 - 4.3.1.3 The engine is operated with an operational nonresettable elapsed time meter. In lieu of installing a nonresettable elapsed time meter, the operator of an engine may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO and EPA. The operator of the engine shall properly maintain and operate the nonresettable elapsed time meter or alternative device in accordance with the manufacturer's instructions.
- 4.3.2 Military Tactical Equipment and engines used to retract military aircraft arresting gear cables.
- 4.4 For existing facilities, a replacement unit installed for the sole purpose of complying with the requirements of this rule shall be considered to be an emission control technique and shall be exempt from the Best Available Control Technology (BACT) and offsets requirements of District Rule 2201 (New and Modified Stationary Source Review Rule) provided that all other requirements of Rule 2201 are met.
- 4.5 Except for the requirements of Section 5.1, the requirements of this rule shall not apply to stationary engines rated at least 25 Brake Horsepower, up to, and including 50 Brake Horsepower.

5.0 Requirements

5.1 Stationary Engines Rated at Least 25 Brake Horsepower, Up To, and Including 50 Brake Horsepower and Used in Non-Agricultural Operations (Non-AO)

5.1.1 ~~On and after July 1, 2012~~ No person shall sell or offer for sale any non-AO spark-ignited engine or any non-AO compression-ignited engine unless the engine meets the applicable requirements and emission limits specified in 40 Code of Federal Regulation (CFR) 60 Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines) and 40 CFR 60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines) for the year in which the ownership of the engine changes.

~~5.1.2 By January 1, 2013, the operator shall submit a one-time report that includes the number of engines at the stationary source, and the following information for each engine:~~

~~5.1.2.1 Location of each engine,~~

~~5.1.2.2 Engine manufacturer,~~

~~5.1.2.3 Model designation and engine serial number,~~

~~5.1.2.4 Rated brake horsepower,~~

~~5.1.2.5 Type of fuel and type of ignition,~~

~~5.1.2.6 Combustion type: rich burn, lean burn, or compression ignition,~~

~~5.1.2.7 Purpose, and intended use, of the engine,~~

~~5.1.2.8 Typical daily operating schedule, and~~

~~5.1.2.9 Fuel consumption (cubic feet for gas or gallons for liquid fuel) for the previous one-year period.~~

5.2 Engines Rated at Greater than 50 Brake Horsepower (>50 bhp)

5.2.1 Spark Ignited Engines Used in non-AO - Table 1 Emission Limits/Standards

The operator of a spark-ignited internal combustion engine rated at >50 bhp that is used exclusively in non-AO shall not operate it in such a manner that results in emissions exceeding the limits in Table 1 for the appropriate engine type until such time that the engine has demonstrated compliance with Table 2 emission limits pursuant to the compliance deadlines in Section 7.5. In lieu of complying with Table 1 emission limits, the operator of a spark-ignited engine shall comply with the applicable emission limits pursuant to Section 8.0.

Table 1 Emission Limits/Standards for a Spark-Ignited Internal Combustion Engine rated at >50 bhp Used Exclusively in Non-AO (All ppmv limits are corrected to 15% oxygen on a dry basis.).			
Engine Type	NOx	CO	VOC
1. Rich-Burn			
a. Waste gas fueled (\geq 50% total heat monthly input from waste gas based on hhv)	90% reduction	2000 ppmv	250 ppmv
b. Cyclic loaded, field gas fueled	50 ppmv	2000 ppmv	250 ppmv
d. All other engines	25 ppmv or 96% reduction	2000 ppmv	250 ppmv
2. Lean-Burn			
a. Two stroke, gaseous fueled, less than 100 horsepower	75 ppmv or 85% reduction	2000 ppmv	750 ppmv
e. All other engines	65 ppmv or 90% reduction	2000 ppmv	750 ppmv

5.2.2 Spark-Ignited Engines Used in non-AO – Table 2 and 3 Emission Limits/Standards

On and after the compliance schedule specified in Section 7.5, the operator of a spark-ignited engine > 50 bhp that is used in non-AO shall comply with all the applicable requirements of the rule and one of the following, on an engine-by-engine basis:

5.2.2.1 On and after the compliance schedule specified in Section 7.5, the operator of a spark-ignited engine that is used exclusively in non-AO shall comply with Sections 5.2.2.1.1 through 5.2.2.1.3 on an engine-by-engine basis:

5.2.2.1.1 NOx, CO, and VOC emission limits pursuant to Table 2 or Table 3, as applicable;

5.2.2.1.2 SOx control requirements of Section 5.7, pursuant to the deadlines specified in Section 7.5; and

5.2.2.1.3 Monitoring requirements of Section 5.4~~11~~, pursuant to the deadlines specified in Section 7.5.

5.2.2.2 In lieu of complying with the NOx emission limit requirement of Section 5.2.2.1.1, an operator may pay an annual fee to the District, as specified in Section 5.6, pursuant to Section 7.6. This compliance option will sunset after December 31, 2023, where after an operator must comply with the NOx emissions limit requirements in Table 2 and Table 3, per the compliance schedule included in Section 7.5.

On and after the compliance schedule specified in Section 7.5, the operator of a spark-ignited engine that is used exclusively in non-AO shall comply with Sections 5.2.2.2.1 through 5.2.2.3 on an engine-by-engine basis:

5.2.2.2.1 Engines in the fee payment program shall have actual emissions not greater than the applicable limits in Table 1 during the entire time the engine is part of the fee payment program.

~~5.2.2.2.2 Compliance with Section 5.7 and 5.1011, pursuant to the deadlines specified in Section 7.5, is also required as part of the fee payment option.~~

5.2.2.3 In lieu of complying with the NOx, CO, and VOC limits of Table 2 or Table 3 on an engine-by-engine basis, an operator may elect to implement an alternative emission control plan pursuant to Section 8.0. An operator electing this option shall not be eligible to participate in the fee payment option outlined in Section 5.2.2.2 and Section 5.6.

Table 2 Emission Limits for a Spark-Ignited Internal Combustion Engine Rated at >50 bhp Used Exclusively in Non-AO (All ppmv limits are corrected to 15% oxygen on a dry basis). Emission Limits are effective according to the compliance schedule specified in Section 7.5.			
Engine Type	NOx Limit (ppmv)	CO Limit (ppmv)	VOC Limit (ppmv)
1. Rich-Burn			
a. Waste Gas Fueled (<u>≥ 50% total monthly heat input from waste gas based on hhv</u>)	50	2000	250
b. Cyclic Loaded, Field Gas Fueled	50	2000	250
c. Limited Use	25	2000	250
d. Rich-Burn Engine, not listed above	11	2000	250
2. Lean-Burn Engines			
a. Two-Stroke, Gaseous Fueled, >50 bhp and < 100 bhp	75	2000	750
b. Limited Use	65	2000	750
c. Lean-Burn Engine used for gas compression	65 ppmv or 93% reduction	2000	750
d. Waste Gas Fueled (<u>≥ 50% total monthly heat input from waste gas based on hhv</u>)	65 ppmv or 90% reduction	2000	750
e. Lean-Burn Engine, not listed above	11	2000	750

<u>Table 3 Emission Limits for a Spark-Ignited Internal Combustion Engine Rated at >50 bhp Used Exclusively in Non-AO (All ppmv limits are corrected to 15% oxygen on a dry basis). Emission Limits are effective according to the compliance schedule specified in Section 7.5.</u>			
<u>Engine Type</u>	<u>NOx Limit (ppmv)</u>	<u>CO Limit (ppmv)</u>	<u>VOC Limit (ppmv)</u>
<u>1. Rich-Burn</u>			
<u>a. Waste Gas Fueled (\geq 50% total monthly heat input from waste gas based on hhv)</u>	<u>11</u>	<u>2000</u>	<u>90</u>
<u>b. Cyclic Loaded, Field Gas Fueled</u>	<u>11</u>	<u>2000</u>	<u>90</u>
<u>c. Limited Use</u>	<u>11</u>	<u>2000</u>	<u>90</u>
<u>d. Rich-Burn Engine, not listed above</u>	<u>11</u>	<u>2000</u>	<u>90</u>
<u>2. Lean-Burn Engines</u>			
<u>a. Limited Use</u>	<u>11</u>	<u>2000</u>	<u>90</u>
<u>b. Lean-Burn Engine used for gas compression</u>	<u>40</u>	<u>2000</u>	<u>90</u>
<u>c. Waste Gas Fueled (\geq 50% total monthly heat input from waste gas based on hhv)</u>	<u>40</u>	<u>2000</u>	<u>90</u>
<u>d. Lean-Burn Engine, not listed above</u>	<u>11</u>	<u>2000</u>	<u>90</u>

5.2.3 Spark-Ignited Engines Used Exclusively in Agricultural Operations (AO)

5.2.3.1 The operator of a spark-ignited internal combustion engine rated at >50 bhp that is used exclusively in AO shall not operate it in such a manner that results in emissions exceeding the limits in Table ~~4~~ 3 for the appropriate engine type on an engine-by-engine basis.

On and after the compliance schedule specified in Section 7.5 Table 9, the operator of a spark-ignited internal combustion engine rated at >50 bhp that is used exclusively in AO shall comply with the emission limits specified in Table 5.

5.2.3.2 In lieu of complying with the NOx, CO, and VOC limits of Table ~~4~~ 3 or 5 on an engine-by-engine basis, an operator may elect to implement an alternative emission control plan pursuant to Section 8.0.

5.2.3.3 An operator of an AO spark-ignited engine that is subject to the applicable requirements of Table ~~4~~ 3 or 5 shall not replace such engine with an engine that emits more emissions of NOx, VOC, and CO, on a ppmv basis, (corrected to 15% oxygen on a dry basis) than the engine being replaced.

Table 43 Emission Limits/Standards and Compliance Schedule for a Spark-Ignited Internal Combustion Engine >50 bhp Used Exclusively in AO (All ppmv limits are corrected to 15% oxygen on a dry basis).			
Engine Type	NOx Limit	CO Limit	VOC Limit
1. Rich-Burn	90 ppmv or 80% reduction	2000 ppmv	250 ppmv
2. Lean-Burn	150 ppmv or 70% reduction	2000 ppmv	750 ppmv
3. Certified and installed on or before June 16, 2005	Meet a Certified Spark-Ignited Engine Standard of HC + NOx < 0.6 g/bhp-hr		

Table 5 Emission Limits/Standards for a Spark-Ignited Internal Combustion Engine >50 bhp Used Exclusively in AO (All ppmv limits are corrected to 15% oxygen on a dry basis).			
Engine Type	NOx Limit	CO Limit	VOC Limit
1. Rich-Burn	0.15 g/bhp-hr or 11 ppmv	2000 ppmv	90 ppmv
2. Lean-Burn	0.6 g/bhp-hr or 43 ppmv	2000 ppmv	90 ppmv

5.2.4 Certified Compression-Ignited Engines (AO and non-AO)

The operator of a certified compression-ignited engine rated >50 bhp shall comply with the following requirements:

- 5.2.4.1 Repower, replace, or control the engine’s emissions to comply with the applicable limits/standards in Table 46 on an engine-by-engine basis by the compliance dates as specified in Table-46.
- 5.2.4.2 The annual hours of operation shall be determined on a calendar year basis.
- 5.2.4.3 In lieu of complying with the ~~NOx, CO, and VOC limits~~ emission standards of Table-46 on an engine-by-engine basis, an operator may elect to implement an alternative emission control plan pursuant to Section 8.0.
- 5.2.4.4 An operator of an AO compression-ignited engine that is subject to the applicable requirements of Table-4 6 shall not replace such engine with an engine that emits more emissions of NOx, VOC, and CO, on a ppmv basis, (corrected to 15% oxygen on a dry basis) than the engine being replaced.
- 5.2.4.5 ~~Non-AO~~ Compression-ignited engines shall be operated in such a manner to comply with the SOx control requirements of Section 5.7, and the SOx monitoring requirements of Section 5.4011, per

the compliance dates in Table 6 below for the applicable engine type.

Table 64 Emission Standards and Compliance Schedule for Compression-Ignited Internal Combustion Engine		
Engine Type	Emission Standard	Compliance Date
1. Non-Certified Compression-Ignited Engine Installed on or before January 1, 2015		
a. Greater than 50 bhp but not more than 500 bhp	EPA Tier 3 or Tier 4	1/1/2010
b. Greater than 500 bhp but not more than 750 bhp and less than 1000 annual operating hours	EPA Tier 3	1/1/2010
c. Greater than 750 bhp and less than 1000 annual operating hours	EPA Tier 4	7/1/2011
d. Greater than 500 bhp and greater than or equal to 1000 annual operating hours	80 ppmv NO _x , 2,000 ppmv CO, 750 ppmv VOC	1/1/2008, if owner has an agreement to electrify, comply by 1/1/2010
2. Certified Compression-Ignited Engine		
a. EPA Certified Tier 1 or Tier 2 Engine	EPA Tier 4	1/1/2015 or 12 years after installation date, but not later than 6/1/2018
b. EPA Certified Tier 3 or Tier 4 Engine	Meet Certified Compression-Ignited Engine Standard in effect at time of installation	At time of installation

5.2.5 Non-Certified Compression-Ignited Engines (AO and Non-AO)

The operator of a non-certified compression-ignited engine, in place on or before June 1, 2006, shall comply with the Emission Standard and Compliance Date in Table 46 based on the non-certified compression-ignited engine that was in place on June 1, 2006, unless the operator meets one of the following conditions:

- 5.2.5.1 Replace the non-certified compression-ignited engine with a non-modified Tier 3 or a non-modified Tier 4 engine after June 1, 2006;

- 5.3 All continuous emission monitoring systems (CEMS) emissions measurements shall be averaged over a period of 15 consecutive minutes. Any 15-consecutive-minute block average CEMS measurement exceeding the applicable emission limits of this rule shall constitute a violation of this rule.
- 5.4 Percent emission reductions, if used to comply with the NO_x emission limits of Section 5.2, shall be calculated as follows:
- 5.4.1 For engines with external control devices that are not operated in combination with a second emission control device or technique, percent reduction shall be calculated using emission samples taken at the inlet and outlet of the control device.
- 5.4.2 For engines without external control devices and for engines with an external control device in combination with a second emission control device or technique, percent reduction shall be based on source test results for the uncontrolled engine and the engine after the control device or technique has been employed. In this situation, the engine's typical operating parameters, loading, and duty cycle shall be documented and repeated at each successive post-control source test to ensure that the engine is meeting the percent reduction limit. When representative source sampling prior to the application of an emissions control technology or technique is not available, the APCO may approve the use of a manufacturer's uncontrolled emissions information or source sampling from a similar, uncontrolled engine.
- 5.5 The operator of an internal combustion engine that uses percent emission reduction to comply with the NO_x emission limits of Section 5.2 shall provide an accessible inlet and outlet on the external control device or the engine as appropriate for taking emission samples and as approved by the APCO.
- 5.6 Payment of an Annual Fee In Lieu of Complying with a NO_x Emission Limit

The operator of a non-AO spark-ignited engine who elects to comply under Section 5.2.2.2 shall comply with the requirements of Sections 5.6 by the schedule specified in Section 7.6 and all other applicable provisions of this rule.

The emissions fee compliance option provided under Section 5.2.2.2 shall sunset after December 31, 2023, where after an operator must comply with the NO_x emissions limit requirements in Table 3, per the compliance schedule included in Section 7.5. The final emissions fee payment shall be due to the District no later than June 30, or by the next District working day after June 30, 2024.

- 5.6.1 An operator shall pay a total annual fee to the District based on the total NO_x emissions from those engines that will be subject to Section 5.2.2.2. The annual fee shall be calculated in the following manner:

5.6.1.1 The operator shall calculate the total emissions for all engines operating at a stationary source that will comply with Section 5.2.2.2. The total NO_x emissions shall be calculated in accordance with Section 5.6.1.3.

5.6.1.2 The total annual fee shall be calculated in accordance with Section 5.6.1.4. These calculations include only the units that have been identified to comply with Section 5.2.2.2.

5.6.1.3 Total Emissions (TE) Calculation

$$E_{(engine)} = A \times B \times C \times D \times 2.147 \times 10^{-16}$$

Where:

$E_{(engine)}$ = Annual NO_x emissions for each unit, in tons/year.

A = NO_x emission limit for the Permit-to-Operate, in ppmvd corrected to 15% oxygen.

B = Annual fuel use (ft³/year)

C = Fuel higher heating value (Btu/ft³) for natural gas use 1,000 Btu/ft³

D = Fuel F-Factor at 60°F (Ddscf/MMBtu) for natural gas use 8,579 Ddscf/MMBtu

$$TE = \sum E(engine)$$

Where:

$\sum E(engine)$ = Sum of all NO_x emissions from all units in the annual fee program, in tons per year.

5.6.1.4 Total Annual Fee Calculation

$$\text{Total Annual Fee} = (TE \times FR) + \text{Administrative Fee}$$

Where:

TE = Total Emissions, in tons per year, as calculated in Section 5.6.1.3.

FR (Fee Rate) = the cost of NO_x reductions, in dollars per ton, as established by District Rule 9510. Under no circumstances shall the cost per ton of NO_x reductions exceed the cost effectiveness threshold for the Carl Moyer Cost Effectiveness, as established by the applicable state law.

Administrative
Fee = 4% x (TE x FR)

5.7 Sulfur Oxides (SO_x) Emission Control Requirements

On and after the compliance schedules specified in Section 7.0, operators of ~~non-AO~~ spark-ignited engines and ~~non-AO~~ compression-ignited engines shall comply with one of the following requirements:

- 5.7.1 Operate the engine exclusively on PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases; or
- 5.7.2 Limit gaseous fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet; or
- 5.7.3 Use California Reformulated Gasoline for gasoline-fired spark-ignited engines; or
- 5.7.4 Use California Reformulated Diesel for compression-ignited engines; or
- 5.7.5 Operate the engine on liquid fuel that contains no more than 15 ppm sulfur, as determined by the test method specified in Section 6.4.6; or
- 5.7.6 Install and properly operate an emission control system that reduces SO₂ emissions by at least 95% by weight as determined by the test method specified in Section 6.4.6.
- 5.7.7 For AO IC engines fueled with digester gas installed before 12/31/2021, limit fuel sulfur content to no more than 250 ppmv. For AO IC engines fueled with digester gas installed on or after 12/31/2021, units must comply with Section 5.7.2 or 5.7.6, above.

5.8 Particulate Matter (PM) Emission Control Requirements

On and after the compliance schedule specified in Section 5.2.4 and 7.0, operators of engines subject to this rule shall limit emissions of particulate matter through compliance with the following requirements:

5.8.1 Spark-ignited engines shall comply with the requirements of Section 5.7.

5.8.2 Compression-ignited engines shall comply with the applicable CARB/EPA Tier certification standard at the time of installation per Table 6.

5.8-9 Monitoring Requirements: Non-AO Spark-Ignited Engines and Engines in an AECF (Section 8.0)

The operator of a non-AO spark-ignited engine subject to the requirements of Section 5.2 or any engine subject to the requirements of Section 8.0 shall comply with the following requirements:

5.89.1 For each engine with a rated brake horsepower of 1,000 bhp or greater and which is allowed by Permit-to-Operate or Permit-Exempt Equipment Registration condition to operate more than 2,000 hours per calendar year, or with an external emission control device, either install, operate, and maintain continuous monitoring equipment for NO_x, CO, and oxygen, as identified in Rule 1080 (Stack Monitoring), or install, operate, and maintain APCO-approved alternate monitoring. The monitoring system may be a continuous emissions monitoring system (CEMS), a parametric emissions monitoring system (PEMS), or an alternative monitoring system approved by the APCO. APCO-approved alternate monitoring shall consist of one or more of the following:

5.89.1.1 Periodic NO_x and CO emission concentrations,

5.89.1.2 Engine exhaust oxygen concentration,

5.89.1.3 Air-to-fuel ratio,

5.89.1.4 Flow rate of reducing agents added to engine exhaust,

5.89.1.5 Catalyst inlet and exhaust temperature,

5.89.1.6 Catalyst inlet and exhaust oxygen concentration, or

5.89.1.7 Other operational characteristics.

5.89.2 For each engine not subject to Section 5.89.1, monitor operational characteristics recommended by the engine manufacturer or emission control system supplier, and approved by the APCO.

5.89.3 For each engine with an alternative monitoring system, submit to, and receive approval from the APCO, adequate verification of the alternative monitoring system's acceptability. This would include data demonstrating the system's accuracy under typical operating conditions for the specific application and any other information or data deemed necessary in assessing the acceptability of the alternative monitoring system.

5.89.4 For each engine with an APCO approved CEMS, operate the CEMS in compliance with the requirements of 40 Code of Federal Regulations (CFR) Part 51, 40 CFR Parts 60.7 and 60.13 (except subsection h), 40 CFR Appendix

B (Performance Specifications), 40 CFR Appendix F (Quality Assurance Procedures), and applicable provisions of Rule 1080 (Stack Monitoring).

- 5.89.5 For each engine, have the data gathering and retrieval capabilities of an installed monitoring system described in Section 5.89 approved by the APCO.
- 5.89.6 For each engine, install and operate a functional nonresettable elapsed time meter.
- 5.89.6.1 In lieu of installing a nonresettable elapsed time meter, the operator may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO and EPA and is allowed by a Permit-to-Operate or Permit-Exempt Equipment Registration condition.
- 5.89.6.2 The operator shall properly maintain and operate the nonresettable elapsed time meter or alternative device in accordance with the manufacturer's instructions.
- 5.89.7 For each engine, implement the Inspection and Monitoring (I&M) plan, if any, submitted to and approved by the APCO pursuant to Section 6.5.
- 5.89.8 For each engine, collect data through the I&M plan in a form approved by the APCO.
- 5.89.9 For each engine, use a portable ~~NO_x~~ analyzer to take NO_x and CO emission readings and oxygen concentration readings to verify compliance with the emission requirements of Section 5.2 or Section 8.0 during each calendar quarter in which a source test is not performed and the engine is operated.
- 5.89.9.1 If an engine is operated less than 120 calendar days per calendar year, take one NO_x and CO emission reading and oxygen concentration reading during the calendar year in which a source test is not performed and the engine is operated.
- 5.89.9.2 All emission readings shall be taken with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate or Permit-Exempt Equipment Registration.
- 5.89.9.3 The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO.
- 5.89.9.4 All NO_x and CO emissions readings shall be reported to the APCO in a manner approved by the APCO.

5.89.9.5 NO_x and CO emission readings taken pursuant to this section shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings evenly spaced out over the 15 consecutive-minute period.

5.89.10 The APCO shall not approve an alternative monitoring system unless it is documented that continued operation within ranges of specified emissions-related performance indicators or operational characteristics provides a reasonable assurance of compliance with applicable emission limits. The operator shall source test over the proposed range of surrogate operating parameters to demonstrate compliance with the applicable emission standards.

5.89.11 For each engine subject to Section 8.0, install and operate a functional nonresettable fuel meter.

5.89.11.1 In lieu of installing a nonresettable fuel meter, the operator may use an alternative device, method, or technique in determining daily fuel consumption provided that the alternative is approved by the APCO and EPA.

5.89.11.2 The operator shall properly maintain, operate, and calibrate the required fuel meter in accordance with the manufacturer's instructions.

5.910 Monitoring Requirements: All Other Engines

5.910.1 The operator of any of the following engines shall comply with the requirements specified in Section 5.910.2 through Section 5.910.5 below:

5.910.1.1 An AO spark-ignited engine subject to the requirements of Section 5.2;

5.910.1.2 A compression-ignited engine subject to the requirements of Section 5.2; or

5.910.1.3 An engine subject to Section 4.2.

5.910.2 Properly operate and maintain each engine as recommended by the engine manufacturer or emission control system supplier.

5.910.3 Monitor the operational characteristics of each engine as recommended by the engine manufacturer or emission control system supplier.

5.910.4 Install and operate a functional nonresettable elapsed time meter.

5.910.4.1 In lieu of installing a nonresettable elapsed time meter, the operator may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO and EPA and is allowed by a Permit-to-Operate or Permit-Exempt Equipment Registration condition.

5.910.4.2 The operator shall properly maintain and operate the nonresettable elapsed time meter or alternative device in accordance with the manufacturer's instructions.

~~5.910.5 The operator of an AO spark ignited engine that has been retro-fitted with a NOx exhaust control that has not been certified in accordance with Section 9.0 Exhaust Control System Certification Requirements, or a compression-ignited engine that has been retro-fitted with a NOx exhaust control shall comply with the following:~~

All AO spark-ignited engines and compression-ignited engines that have been retro-fitted with a NOx exhaust control, except certified spark-ignited engines, engines certified per Section 9.0, and certified compression-ignited engines, shall comply with Sections 5.10.5.1 through 5.10.5.7.

5.910.5.1 Use a portable ~~NOx~~ analyzer to take NOx and CO emission readings and oxygen concentration readings to demonstrate compliance with the emission requirements of Section 5.2.

~~5.9.5.2 The operator of a compression ignited engine that is subject to the limits/standards of Section 5.2 Table 4 Category 1.d shall use a portable NOx analyzer to take NOx emission readings at least once every six (6) months that the engine is operated.~~

5.910.5.32 The operator of any other engine that has been retro-fitted with a NOx exhaust control shall use a portable ~~NOx~~ analyzer to take NOx and CO emission readings and oxygen concentration readings at least once every 24 months that the engine is operated.

5.910.5.43 All emission readings shall be taken with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate or Permit-Exempt Equipment Registration.

5.910.5.54 The portable ~~NOx~~ analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO.

5.910.5.65 All NOx and CO emissions readings shall be reported to the APCO in a manner approved by the APCO.

~~5.9~~~~10.5.76~~ NOx and CO emission readings taken pursuant to this section shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings evenly spaced out over the 15 consecutive-minute period.

~~5.10~~11 SOx Emissions Monitoring Requirements

On and after the compliance schedules specified in Section 7.0, an operator of an ~~non-AO~~ engine shall comply with the following requirements:

~~5.10~~11.1 An operator of an engine complying with Sections 5.7.2, ~~or 5.7.5,~~ or Section 5.7.7 shall perform an annual fuel sulfur ~~fuel~~ analysis in accordance with the test methods in Section 6.4. The operator shall keep the records of the fuel analysis and shall provide it to the District upon request,

~~5.10~~11.2 An operator of an engine complying with Section 5.7.6 by installing and operating a control device with at least 95% by weight SOx reduction efficiency shall submit for approval by the APCO the proposed key system operating parameters and frequency of the monitoring and recording not later than July 1, 2013, and

~~5.10~~11.3 An operator of an engine complying with Section 5.7.6 shall perform an annual source test unless a more frequent sampling and reporting period is included in the Permit-to-Operate. Source tests shall be performed in accordance with the test methods in Section 6.4.

~~5.11~~2 Permit-Exempt Equipment Registration Requirements

The operator of an engine used exclusively in agricultural operations shall register such engine pursuant to Rule 2250 (Permit-Exempt Equipment Registration), except for an engine that meets any one of the following conditions:

~~5.11~~2.1 The engine is required to have a Permit-to-Operate pursuant to California Health and Safety Code Section 42301.16; or

~~5.11~~2.2 The engine is not required to comply with Section 5.2 of this rule.

6.0 Administrative Requirements

6.1 Emission Control Plan

The operator of an engine subject to the requirements of Section 5.2 Table 3 Categories 1a, 1b, 1c, 2a, 2b, and 2c, and Table 5 of this rule shall submit to the APCO an APCO-approvable emission control plan of all actions to be taken to satisfy the

emission requirements of Section 5.2 and the compliance schedules of Section 7.0. If there is no change to the previously-approved emission control plan, the operator shall submit a letter to the District indicating that the previously approved plan is still valid.

~~6.1.1 The requirement to submit an emission control plan shall apply to the following engines:~~

~~6.1.1.1 Engines that have been retrofitted with an exhaust control device, except those certified per Section 9.0;~~

~~6.1.1.2 Engines subject to Section 8.0;~~

~~6.1.1.3 An AO spark-ignited engine that is subject to the requirements of Section 8.0;~~

~~6.1.1.4 An AO spark-ignited engine that has been retrofitted with a catalytic emission control and is not subject to the requirements of Section 8.0.~~

6.1.~~12~~ Such emission control plan shall contain the following information, as applicable for each engine:

6.1.~~12~~.1 Permit-to-Operate number, Authority-to-Construct number, or Permit-Exempt Equipment Registration number,

6.1.~~12~~.2 Engine manufacturer,

6.1.~~12~~.3 Model designation and engine serial number,

6.1.~~12~~.4 Rated brake horsepower,

6.1.~~12~~.5 Type of fuel and type of ignition,

6.1.~~12~~.6 Combustion type: rich-burn or lean-burn,

6.1.~~12~~.7 Total hours of operation in the previous one-year period, including typical daily operating schedule,

6.1.~~12~~.8 Fuel consumption (cubic feet for gas or gallons for liquid) for the previous one-year period,

6.1.~~12~~.9 Stack modifications to facilitate continuous in-stack monitoring and to facilitate source testing,

6.1.~~12~~.10 Type of control to be applied, including in-stack monitoring specifications,

6.1.~~12~~.11 Applicable emission limits,

6.1.~~12~~.12 Documentation showing existing emissions of NO_x, VOC, and CO, except for Certified Spark-Ignited Engines and those certified per Section 9.0, and

6.1.~~12~~.13 Date that the engine will be in full compliance with this rule.

6.1.~~23~~ The emission control plan shall identify the type of emission control device or technique to be applied to each engine and a construction/removal schedule,

or shall provide support documentation sufficient to demonstrate that the engine is in compliance with the emission requirements of this rule.

- 6.1.34 For an engine being permanently removed from service, the emission control plan shall include a letter of intent pursuant to Section 7.2.

6.2 Recordkeeping

- 6.2.1 The operator of an engine subject to the requirements of Section 5.2 of this rule shall maintain an engine operating log to demonstrate compliance with this rule. This information shall be retained for a period of at least five years, shall be readily available, and be made available to the APCO upon request. The engine operating log shall include, on a monthly basis, the following information:

- 6.2.1.1 Total hours of operation,
- 6.2.1.2 Type of fuel used,
- 6.2.1.3 Maintenance or modifications performed,
- 6.2.1.4 Monitoring data,
- 6.2.1.5 Compliance source test results, and
- 6.2.1.6 Any other information necessary to demonstrate compliance with this rule.
- 6.2.1.7 For an engine subject to Section 8.0, the quantity (cubic feet of gas or gallons of liquid) of fuel used on a daily basis.

- 6.2.2 The data collected pursuant to the requirements of Section 5.89 and Section 5.910 shall be maintained for at least five years, shall be readily available, and made available to the APCO upon request.

- 6.2.3 An operator claiming an exemption under Section 4.2 or Section 4.3 shall maintain annual operating records. This information shall be retained for at least five years, shall be readily available, and provided to the APCO upon request. The records shall include, but are not limited to, the following:

- 6.2.3.1 Total hours of operation,
- 6.2.3.2 The type of fuel used,
- 6.2.3.3 The purpose for operating the engine,
- 6.2.3.4 For emergency standby engines, all hours of non-emergency and emergency operation shall be reported, and
- 6.2.3.5 Other support documentation necessary to demonstrate claim to the exemption.

6.3 Compliance Testing

The operator of an engine subject to the requirements of Section 5.2 or the requirements of Section 8.0 shall comply with the following requirements:

~~6.3.1 The requirements of Section 6.3.2 through Section 6.3.4 shall apply to the following engines:~~

~~6.3.1.1 Engines that have been retrofitted with an exhaust control device, except those certified per Section 9.0;~~

~~6.3.1.2 Engines subject to Section 8.0;~~

~~6.3.1.3 An AO spark-ignited engine that is subject to the requirements of Section 8.0;~~

~~6.3.1.4 An AO spark-ignited engine that has been retrofitted with a catalytic emission control and is not subject to the requirements of Section 8.0.~~

All spark-ignited engines and compression-ignited engines that have been retro-fitted with a NOx exhaust control, except certified spark-ignited engines, those certified per Section 9.0, and certified compression-ignited engines, shall comply with Sections 6.3.2 through 6.3.4.

6.3.2 Demonstrate compliance with applicable limits, ppmv or percent reduction, in accordance with the test methods in Section 6.4, as specified below:

6.3.2.1 By the applicable date specified in Section 5.2, and at least once every 24 months thereafter, except for an engine subject to Section 6.3.2.2.

6.3.2.2 By the applicable date specified in Section 5.2 and at least once every 60 months thereafter, for an AO spark-ignited engine that has been retro-fitted with a catalytic emission control device.

6.3.2.3 A portable analyzer may be used to show initial compliance with the applicable limits/standards in Section 5.2 for AO spark-ignited engines, provided the criteria specified in Sections 6.3.2.3.1 to 6.3.2.3.5 are met, and a source test is conducted in accordance with Section 6.3.2 within 12 months from the required compliance date.

6.3.2.3.1 A minimum of 15 minutes of runtime must be measured with data recorded at a minimum of 15, evenly spaced time intervals. Compliance is to be

determined with the arithmetic average of the oxygen-corrected data;

- 6.3.2.3.2 The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Analyzer calibration records shall be made available at the District's request;
 - 6.3.2.3.3 The analyzer shall be checked with EPA protocol span gas at the beginning and end of each test day. The results of these checks shall be recorded and copies submitted to the District with each engine test. If the analyzer exhibits more than a 10% deviation from the span check, the instrument must be re-calibrated. Any analysis performed prior to an end-of-day span check failure shall be void;
 - 6.3.2.3.4 The test results of each engine, including span check results, shall be submitted to the District within 30 days of the test date. Test results shall clearly identify the engine tested including operator, location, permit or registration number, manufacturer, model, and serial number; and
 - 6.3.2.3.5 The analyzer utilized for each check shall be clearly identified in the material submitted with the test results. Identification shall include manufacturer and serial number of the analyzer used, and the last calibration date.
- 6.3.3 Conduct emissions source testing with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate or Permit-Exempt Equipment Registration. For emissions source testing performed pursuant to Section 6.3.2 for the purpose of determining compliance with an applicable standard or numerical limitation, the arithmetic average of three (3) 30-consecutive-minute test runs shall apply. If two (2) of three (3) runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC shall be reported as methane. VOC, NO_x, and CO concentrations shall be reported in ppmv, corrected to 15 percent oxygen. For engines that comply with a percent reduction limit, the percent reduction of NO_x emissions shall also be reported.
- 6.3.4 In addition to other information, the source test protocol shall describe which critical parameters will be measured and how the appropriate range

for these parameters shall be established. The range for these parameters shall be incorporated into the I&M plan.

6.3.5 Engines that are limited by Permit-to-Operate or Permit-Exempt Equipment Registration condition to be fueled exclusively with PUC quality natural gas shall not be subject to the reoccurring source test requirements of Section 6.3.2 for VOC emissions.

6.3.6 Representative Testing

For spark-ignited engines, in lieu of compliance with the applicable requirements of Section 6.3.2, compliance with the applicable emission limits in Section 5.2 shall be demonstrated by submittal of annual emission test results, within 30 days of the test date, to the District, from a unit or units that represents a specified group of units, provided all of the following requirements are satisfied:

6.3.6.1 The units are located at the same stationary source;

6.3.6.2 The units were produced by the same manufacturer, have the same model number or other manufacturer's designation in common, and have the same rated capacity and operating specifications;

6.3.6.3 The units are operated and maintained in a similar manner; and

6.3.6.4 At least 20% of the total number of units are tested during each annual test cycle.

6.3.6.5 The District, based on documentation submitted by the stationary source:

6.3.6.5.1 Determines that the margin of compliance for the identical units tested is significant and can be maintained on an on-going basis; or

6.3.6.5.2 Determines based on a review of sufficient emissions data that, though the margin of compliance is not substantial, other factors allow for the determination that the variability of emissions for identical tested units is low enough for confidence that the untested unit will be in compliance. These factors may include, but are not limited to, the following:

6.3.6.5.2.1 Historical records at the tested unit showing consistent invariant load;

6.3.6.5.2.2 Fuel characteristics yielding low variability and therefore assurance that emissions will be constant and below allowable levels;

6.3.6.5.2.3 Statistical analysis of a robust emissions data set demonstrating sufficiently low variability to convey assurance that the margin of compliance, though small, is reliable.

6.3.6.6 Should any of the representative units exceed the required emission limits, or if the District notifies the operator that the criteria in Sections 6.3.6.1 through 6.3.6.5 have not been fulfilled, each of the units in the group shall individually demonstrate compliance by emissions testing. Failure to complete emissions testing within 90 days of the failed test shall result in the untested units being in violation of this rule. After compliance with the requirements of this section has been demonstrated, subsequent source testing shall be performed pursuant to Sections 6.3.2 or 6.3.6.

6.4 Test Methods

Compliance with the requirements of Section 5.2 shall be determined, as required, in accordance with the following test procedures or any other method approved by EPA and the APCO:

6.4.1 Oxides of nitrogen - EPA Method 7E, or ARB Method 100.

6.4.2 Carbon monoxide - EPA Method 10, or ARB Method 100.

6.4.3 Stack gas oxygen - EPA Method 3 or 3A, or ARB Method 100.

6.4.4 Volatile organic compounds - EPA Method 25A or 25B, or ARB Method 100. Methane and ethane, which are exempt compounds, shall be excluded from the result of the test.

6.4.5 Operating horsepower determination - any method approved by EPA and the APCO.

6.4.6 SO_x Test Methods

6.4.6.1 Oxides of sulfur – EPA Method 6C, EPA Method 8, or ARB Method 100.

- 6.4.6.2 Determination of total sulfur as hydrogen sulfide (H₂S) content – EPA Method 11 or EPA Method 15, as appropriate.
- 6.4.6.3 Sulfur content of liquid fuel – American Society for Testing and Materials (ASTM) D 6920-03 or ASTM D 5453-99.
- 6.4.6.4 The SO_x emission control system efficiency shall be determined using the following:

$$\% \text{ Control Efficiency} = [(C_{\text{SO}_2, \text{inlet}} - C_{\text{SO}_2, \text{outlet}}) / C_{\text{SO}_2, \text{inlet}}] \times 100$$

Where:

$C_{\text{SO}_2, \text{inlet}}$ = concentration of SO_x (expressed as SO₂) at the inlet side of the SO_x emission control system, in lb/∅dscf

$C_{\text{SO}_2, \text{outlet}}$ = concentration of SO_x (expressed as SO₂) at the outlet side of the SO_x emission control system, in lb/∅dscf

- 6.4.7 The Higher Heating Value (hhv) of the fuel shall be determined by one of the following test methods:
- 6.4.7.1 ASTM D 240-02 or ASTM D 3282-88 for liquid hydrocarbon fuels.
- 6.4.7.2 ASTM D 1826-94 or ASTM 1945-96 in conjunction with ASTM D 3588-89 for gaseous fuel.

6.5 Inspection and Monitoring (I&M) Plan

The operator of an engine that is subject to the requirements of Section 5.2 or the requirements of Section 8.0 shall submit to the APCO for approval, an I&M plan that specifies all actions to be taken to satisfy the following requirements and the requirements of Section 5.89. The actions to be identified in the I&M plan shall include, but are not limited to, the information specified below. If there is no change to the previously approved I&M plan, the operator shall submit a letter to the District indicating that previously approved plan is still valid.

- 6.5.1 ~~The requirements of Section 6.5.2 through Section 6.5.9 shall apply to the following engines:~~
- 6.5.1.1 ~~Engines that have been retrofitted with an exhaust control device, except those certified per Section 9.0;~~
- 6.5.1.2 ~~Engines subject to Section 8.0;~~

~~6.5.1.3 An AO spark ignited engine that is subject to the requirements of Section 8.0.~~

~~6.5.1.4 An AO spark ignited engine that has been retrofitted with a catalytic emission control and is not subject to the requirements of Section 8.0.~~

The requirements of Section 6.5.2 through Section 6.5.9 shall apply to all engines, except certified spark-ignited engines, those certified per Section 9.0, and certified compression-ignited engines.

- 6.5.2 Procedures requiring the operator to establish ranges for control equipment parameters, engine operating parameters, and engine exhaust oxygen concentrations that source testing has shown result in pollutant concentrations within the rule limits.
- 6.5.3 Procedures for monthly inspections as approved by the APCO. The applicable control equipment parameters and engine operating parameters will be inspected and monitored monthly in conformance with a regular inspection schedule listed in the I&M plan.
- 6.5.4 Procedures for the corrective actions on the noncompliant parameter(s) that the operator will take when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO_x, CO, VOC, or oxygen concentrations.
- 6.5.5 Procedures for the operator to notify the APCO when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO_x, CO, VOC, or oxygen concentrations.
- 6.5.6 Procedures for preventive and corrective maintenance performed for the purpose of maintaining an engine in proper operating condition.
- 6.5.7 Procedures and a schedule for using a portable ~~NO_x emissions~~ analyzer to take NO_x and CO emission readings pursuant to Section 5.8~~9~~.9.
- 6.5.8 Procedures for collecting and recording required data and other information in a form approved by the APCO including, but not limited to, data collected through the I&M plan and the monitoring systems described in Sections 5.8.1 and 5.8.2. Data collected through the I&M plan shall have retrieval capabilities as approved by the APCO.
- 6.5.9 Procedures for revising the I&M plan. The I&M plan shall be updated to reflect any change in operation. The I&M plan shall be updated prior to any

planned change in operation. An engine operator that changes significant I&M plan elements must notify the District no later than seven days after the change and must submit an updated I&M plan to the APCO no later than 14 days after the change for approval. The date and time of the change to the I&M plan shall be recorded in the engine operating log. For new engines and modifications to existing engines, the I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit-to-Operate or Permit-Exempt Equipment Registration. The operator of an engine may request a change to the I&M plan at any time.

7.0 Compliance Schedules

7.1 Loss of Exemption

The operator of an engine which becomes subject to the emission limits/standards of this rule through loss of exemption shall not operate the subject engine, except as required for obtaining a new or modified Permit-to-Operate or Permit-Exempt Equipment Registration for the engine, until the operator demonstrates that the subject engine is in full compliance with the requirements of this rule.

7.2 Permanent Removal of an Engine

The operator of an engine who elects to permanently remove the engine from service shall comply with all of the following conditions:

- 7.2.1 Comply with all applicable requirements of this rule until the engine is permanently removed from service;
- 7.2.2 Submit a letter to the APCO no later than 14 days before the engine is permanently removed from service, stating the intent to permanently remove the engine from service. The engine removal letter can be submitted with the emission control plan, if any; and
- 7.2.3 Permanently remove the engine from service and officially surrender the Permit-to-Operate or Permit-Exempt Equipment Registration, if any, to the APCO no later than 30 days after the engine is permanently removed from service.

7.3 AO Compression-Ignited Engine

- 7.3.1 The operator of an AO compression-ignited engine that is subject to Section 5.2, 5.7, 5.8, and that is required to submit an Authority-to-Construct application in order to comply with the requirements of this rule, shall submit the Authority-to-Construct application, and any required Emission Control Plan or I&M Plan, no later than six months before the engine is

required to be in compliance with the requirements of Section 5.2, 5.7, and 5.8.

7.3.2 The operator of an AO compression-ignited engine that is subject to Section 5.2, 5.7, 5.8 and that is required to submit a Permit-Exempt Equipment Registration application in order to comply with the requirements of Rule 4702, shall submit the Permit-Exempt Equipment Registration application, and any required Emission Control Plan or I&M Plan, no later than three months before the engine is required to be in compliance with the requirements of Section 5.2, 5.7, and 5.8.

7.3.3 Unless otherwise specified, the operator of an engine that is subject to the requirements of Section 5.2 5.7, and 5.8, of Rule 4702 shall be in full compliance with Rule 4702 by the indicated dates in Table 64.

7.4 Non-AO Compression-Ignited Engine

7.4.1 The operator of a non-AO compression-ignited engine that is subject to Section 5.2, 5.7, 5.8, and that is required to submit an Emission Control Plan, an I&M Plan, or an Authority-to-Construct in order to comply with rule requirements, shall submit such document(s) no later than six months before the engine is required to be in compliance with the requirements of Section 5.2.

7.4.2 Unless otherwise specified, the operator of an engine that is subject to the requirements of Section 5.2, 5.7, and 5.8, shall be in full compliance with Rule 4702 by the indicated dates in Table 64.

7.5 Spark-Ignited Engine (AO and Non-AO) ~~Non-AO Spark Ignited Engine~~

7.5.1 An operator with non-AO spark-ignited engines at a stationary source subject to Table 2 or Section 8.0 emission limits, SOx control requirements of Section 5.7, and the SOx monitoring requirements of Section 5.110 shall comply with the schedule specified in Table 75.

7.5.2 An operator with non-AO spark-ignited engines at a stationary source subject to Table 3 or Section 8.0 emission limits, SOx control requirements of Section 5.7, and the SOx monitoring requirements of Section 5.11 shall comply with the schedule specified in Table 8.

7.5.3 An operator with AO spark-ignited engines at a stationary source subject to Table 5 or Section 8.0 emission limits shall comply with the schedule specified in Table 9.

Table 75 Compliance Schedule for Non-AO Spark-Ignited Engines Subject to Table 2 Emission Limits, and SOx Control and Monitoring Requirements			
Engines to be in Compliance at a Stationary Source	Emission Control Plan	Authority to Construct and Inspection and Monitoring Plan	Full Compliance
Operator with a single engine at a stationary source			
Single Engine	1/1/12	1/1/13	1/1/14
Operator with at least two engines, but less than 12 engines at a stationary source			
33% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/13	1/1/14
66% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/14	1/1/15
100% of the engines subject to Table 2 emission limits	7/1/12	1/1/15	1/1/16
Operator with at least 12 engines at a stationary source			
25% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/13	1/1/14
50% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/14	1/1/15
75% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/15	1/1/16
100% of the engines subject to Table 2 emission limits	7/1/12	1/1/16	1/1/17

Table 8 Compliance Schedule for Non-AO Spark-Ignited Engines Subject to Table 3 Emission Limits, and SOx Control and Monitoring Requirements			
<u>Engines to be in Compliance at a Stationary Source</u>	<u>Emission Control Plan</u>	<u>Authority to Construct and Inspection and Monitoring Plan</u>	<u>Full Compliance</u>
<u>100% of engines subject to Table 2 emission limits</u>	<u>8/1/22</u>	<u>8/1/22</u>	<u>12/31/23</u>

<u>Table 9 Compliance Schedule for AO Spark-Ignited Internal Combustion Engine Subject to Table 5 Emission Limits</u>			
<u>Engines to be in Compliance at a Stationary Source</u>	<u>Emission Control Plan</u>	<u>Authority to Construct and Inspection and Monitoring Plan</u>	<u>Full Compliance</u>
<u>Rich Burn AO Engines</u>	<u>8/1/22</u>	<u>8/1/22</u>	<u>12/31/23</u>
<u>Lean Burn AO Engines</u>	<u>8/1/28</u>	<u>8/1/28</u>	<u>12/31/29 or 12 years after engine installation</u>

7.5.32 As shown in Tables ~~57~~, 8, and 9, the column labeled:

7.5.32.1“Emission Control Plan” identifies the date by which the operator shall submit an emission control plan pursuant to the applicable provisions of Section 6.1. The emission control plan shall identify all the ~~Non-AO~~ spark-ignited engines subject to ~~Table 32~~ or Table 5 emission limits, and SOx control and monitoring requirements. The emission control plan shall identify all the steps to be taken to comply with this rule. If there is no change to the previously approved emission control plan, the operator does not need to submit a new emission control plan. However, the operator shall submit a letter to the District indicating that previously approved plan is still valid.

7.5.32.2“Authority to Construct and Inspection and Maintenance Plan” identifies the date by which the operator shall submit an Authority to Construct (if needed) and an Inspection and Monitoring Plan as specified in the applicable provisions of Section 6.5 for each engine subject to ~~Table 32~~ or Table 5 emission limits, SOx control and monitoring requirements. If there is no change to the previously approved I&M plan, the operator does not need to submit a new I&M Plan. However, the operator shall submit a letter to the District indicating that previously approved I&M plan is still valid.

7.5.32.3“Full Compliance” identifies the date by which the operator shall demonstrate that each unit is in compliance with ~~Table 32~~ or Table 5 emission limits, SOx control and monitoring requirements, as applicable.

7.6 Operator of Non-AO Spark-Ignited Engine Who Elects to Pay Fees

In lieu of complying with Table 2 NOx emission limits, the operator of a non-AO spark-ignited engine who elects to pay annual fees under Section 5.2.2.2 and Section 5.6 shall comply with the following requirements:

~~7.6.1—By the date specified in Table 6 submit an Emission Control Plan which includes the following information:~~

~~7.6.1.1 Number of engines at a stationary source that will comply under Section 5.2.2.2,~~

~~7.6.1.2 Location of each engine,~~

~~7.6.1.3 Engine manufacturer, model designation, engine serial number, and Permit to Operate number, and~~

~~7.6.1.4 Each engine's rated brake horsepower, fuel type, and type of ignition.~~

~~7.6.2—The total annual fees shall be paid to the District in the following manner:~~

~~7.6.12.1 Payment shall be paid no later than June 30 of each year, for the emissions of the previous calendar year,~~

~~7.6.12.2 The first payment is due to the District no later than June 30 of the year in which full compliance is required for the specified percent of engines at a stationary source as specified in Table 5 that the operator has opted to pay the annual fees,~~

~~7.6.12.3 Should June 30 fall on a day when the District is closed, the payment shall be made by the next District working day after June 30, and~~

~~7.6.12.4 Payments shall continue annually until the engine either is permanently removed from use in the San Joaquin Valley Air Basin and the Permit-to-Operate is surrendered or the operator demonstrates compliance with the applicable Table 2 emission limits.~~

~~7.6.12.5 The emissions fee for units that operate for less than the full calendar year before demonstrating compliance under Section 5.2, shall be based on the actual fuel used during the portion of the calendar year prior to demonstrating compliance or removing the unit from operation within the San Joaquin Valley Air Basin.~~

~~7.6.1.6 The emissions fee compliance option provided under Section 5.2.2.2 shall sunset after December 31, 2023. The final emissions fee payment shall be due to the District no later than June 30, or by the next District working day after June 30, 2024.~~

8.0 Alternative Emission Control Plan (AECp)

An operator may comply with the NO_x emission requirements of Section 5.2 for a group of engines by meeting the requirements below. An operator that is subject to the requirements below shall also comply with all the applicable requirements of Sections 5.0, 6.0, and 7.0. Only engines subject to Section 5.2 are eligible for inclusion in an AECp.

8.1 During any seven (7) consecutive calendar day period, the operator shall operate all engines in the AECp to achieve an actual aggregate NO_x emission level that is not greater than 90 percent of the NO_x emissions that would be obtained by controlling the engines to comply individually with the NO_x limits in Section 5.2. The operator shall operate engines in the AECp such that

$$AE_{\text{Actual}} \leq 0.90 (AE_{\text{Limit}})$$

and shall notify the APCO within 24 hours of any violation of this section.

8.1.1 The actual aggregate NO_x emissions (AE_{Actual}) is the sum of the actual NO_x emissions, over a seven (7) consecutive calendar day period, from all engines in the AECp which were actually operated during that period. AE_{Actual} shall be calculated as follows:

$$AE_{\text{Actual}} = \sum_i (EF_i)(F_i)(k_i)$$

where:

i identifies each engine in the AECp.

EF_i is the NO_x emission factor of the engine established pursuant to Section 8.2 and approved by the APCO.

F_i is the actual total fuel used by the engine during the seven (7) consecutive calendar day period.

k_i is a constant used to convert an engine's fuel use and NO_x emission factor to the amount of NO_x emitted. k_i is dependent on the engine and the pollutant emitted. Calculation of k_i shall be accomplished using 40 CFR Part 60, Appendix A, Method 19, or an equivalent method approved by EPA, ARB and the APCO.

8.1.2 The estimated aggregate NO_x emissions limit (AE_{Limit}) is the sum of the NO_x emissions, over a seven (7) consecutive calendar day period, for the same engines in the AECp which were actually operated during the same period as considered in Section 8.1.1, calculated with the NO_x limits of Section 5.2 and the actual fuel usage during that seven (7) consecutive calendar day period. AE_{Limit} shall be calculated as follows:

$$AE_{Limit} = \sum_i (EL_i)(F_i)(k_i)$$

where:

i = identifies each engine in the AECF.

EL_i = the NOx emission limit from Section 5.2 for each engine.

F_i = the actual total fuel used by the engine during the seven (7) consecutive calendar day period.

k_i = a constant used to convert an engine's fuel use and NOx emission limit to the amount of NOx emitted. k_i is dependent on the engine and the pollutant emitted. Calculation of k_i shall be accomplished using 40 CFR Part 60, Appendix A, Method 19, or an equivalent method approved by EPA, ARB and the APCO.

8.1.3 Only engines in the AECF which were operated during the seven (7) consecutive calendar day period shall be included in the calculations of AE_{Limit} and AE_{Actual} .

8.1.4 The operator shall, at least one time each day the AECF is used, calculate and record the actual aggregate NOx emissions (AE_{Actual}) and the aggregate NOx emission limit (AE_{Limit}) for the preceding seven (7) consecutive calendar day period.

8.2 The operator shall establish a NOx emission factor limit for each engine. The established NOx emission factor of an engine shall be no less than the NOx emission factor of the engine from the most recent source test conducted pursuant to Section 6.3 and approved by the APCO. The operator shall not operate an AECF engine in such a manner that NOx emissions exceed the established NOx emission factor of the engine.

8.3 The operator shall submit the AECF to the APCO at least 12 ~~48~~ months before compliance with the emission limits in Section 5.2 is required. The AECF shall:

8.3.1 Not be implemented prior to APCO approval.

8.3.2 Be enforceable on a daily basis by the District.

8.3.3 Contain any information necessary to determine eligibility of the engines for alternative emission control, including, but not limited to:

8.3.3.1 A list of engines subject to the AECF. All engines in an AECF shall be under the operational control of a single operator and shall be located at a single stationary source,

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- 8.3.3.2 The NO_x emission factor established by the engine operator for each engine pursuant to Section 8.2, and
 - 8.3.3.3 The estimated aggregate NO_x emissions calculated according to Section 8.1.2.
 - 8.3.4 Present the methodology for determining equivalency of actual NO_x emissions under the proposed AECF as compared to the estimated NO_x emissions allowed by this rule.
 - 8.3.5 Detail the method of recording and verifying daily compliance with the AECF.
 - 8.3.6 Demonstrate to the satisfaction of the APCO that the difference between the NO_x emission limits of this rule and any lower actual NO_x emissions will not be used to increase emissions from the same or another source.
 - 8.3.7 Demonstrate that the engines subject to the requirements of Section 5.2 are in compliance with or on an approved schedule for compliance with all applicable District rules.
 - 8.4 The operator shall submit an updated or modified AECF for approval by the APCO prior to any of the following:
 - 8.4.1 Modification of the engine(s) which would require an Authority-to-Construct;
 - 8.4.2 When new or amended rules are adopted which regulate the emissions from the engines; or
 - 8.4.3 When the NO_x emission factor established by the engine operator for an engine pursuant to Section 8.2 is modified.
 - 8.5 In addition to the records kept pursuant to Section 6.2, the operator shall maintain records, on a daily basis, of the parameters needed to demonstrate compliance with the applicable NO_x emission limits when operating under the AECF. These records shall be retained for at least five years, shall be readily available, and be made available to the APCO upon request. The records shall include, but are not limited to, the following for each engine unless otherwise indicated:
 - 8.5.1 Total hours of operation,
 - 8.5.2 Type and quantity (cubic feet of gas or gallons of liquid) of fuel used,
 - 8.5.3 The actual NO_x emissions limits to be included in the calculation of AE_{Actual} pursuant to Section 8.1.1,

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- 8.5.4 The actual aggregate NOx emissions (AE_{Actual}) for all the engines in the AECP calculated pursuant to Section 8.1.1,
 - 8.5.5 The estimated NOx emissions limits to be included in the calculation of AE_{Limit} pursuant to Section 8.1.2,
 - 8.5.6 The estimated aggregate NOx emissions (AE_{Limit}) for all the engines in the AECP calculated pursuant to Section 8.1.2,
 - 8.5.7 The comparison of the actual aggregate NOx emissions (AE_{Actual}) for all the engines in the AECP and 90 percent of the estimated aggregate NOx emissions (AE_{Limit}) for all the engines in the AECP to demonstrate compliance with Section 8.1, and
 - 8.5.8 Any other parameters needed to demonstrate daily compliance with the applicable NOx emission limits when operating under the AECP.
- 8.6 For the purpose of determining the quantity of spark-ignited engines in compliance pursuant to Section 7.5, a spark-ignited engine in an AECP shall not be considered to be in compliance until all spark-ignited engines in the AECP that have been designated to meet more stringent NOx emission factors pursuant to Section 8.2 are in compliance with the rule.
- 9.0 Exhaust Control System Certification Requirements
- 9.1 To be considered for APCO certification, the manufacturer or operator shall comply with all of the following requirements:
 - 9.1.1 Certification shall be based upon the emission source testing results of a specific exhaust control system,
 - 9.1.2 A source testing protocol shall be submitted in accordance with the provisions of Rule 1081 (Source Sampling) for approval by the APCO prior to conducting the source test. The source testing protocol approved by the APCO shall be strictly adhered to during certification source testing,
 - 9.1.3 Source testing shall be conducted over the range of operating parameters for which the unit(s) will be operated,
 - 9.1.4 The source testing results shall demonstrate compliance with the emission limits of this rule for each model of exhaust control system(s) to be certified,
 - 9.1.5 The source testing procedure and reports shall be prepared by an ARB-approved independent testing laboratory, and shall contain all the elements identified in the APCO-approved source testing protocol,

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- 9.1.6 Source testing shall be conducted no more than 90 days prior to the date of submission of request for certification by the APCO, and
 - 9.1.7 Any additional supporting information required by the APCO to address other performance parameters.
- 9.2 The manufacturer or operator requesting certification shall submit to the APCO the following information:
- 9.2.1 Copies of the source testing results conducted pursuant to the requirements of Section 9.1, and other pertinent technical data to demonstrate compliance with the emission limits of this rule,
 - 9.2.2 The applicant shall sign and date the statement attesting to the accuracy of all information in the statement, and
 - 9.2.3 Name and address of the exhaust control system manufacturer or operator, brand name of the exhaust control unit, model number, and description of model of system(s) being certified.
- 9.3 The APCO will only approve an application for certification to the extent that the requirements of Sections 9.1 through 9.2 are met and the source testing results demonstrate that the emission limits of this rule are met.
- 9.4 The APCO-approved certification is valid only for the range of operating parameters and conditions for which certification is issued.
- 9.5 The APCO shall publish a list of certified exhaust control systems after the certification process is completed.