

**MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS
REGULATION III – CONTROL OF AIR CONTAMINANTS**

**RULE 324
STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES (RICE)**

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**MARICOPA COUNTY
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**RULE 324
STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES (RICE)**

SECTION 100 – GENERAL

101 PURPOSE: To limit carbon monoxide (CO), nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOCs), and particulate matter (PM) emissions from stationary reciprocating internal combustion engines (RICE).

102 APPLICABILITY:

102.1 This rule applies to a spark-ignition engine or compression-ignition engine including stationary RICE used in cogeneration, with a rated brake horsepower (rated bhp) of greater than 250. This rule also applies to a combination of stationary RICE each with a rated bhp greater than 50 used at a source, whose maximum aggregate rated bhp is greater than 250.

102.2 A stationary RICE subject to this rule that is also subject to the federal standards of performance set forth in 40 CFR Part 60, Subpart IIII for compression-ignition engines or 40 CFR Part 60, Subpart JJJJ for spark-ignition engines shall comply with the most stringent requirements. Whenever more than one provision in this rule applies to such engine or whenever a provision in this rule and a provision in the federal standards apply to such engine, the provision or combination of provisions resulting in the lowest rate of emissions shall apply, unless otherwise specifically exempted or designated.

102.3 NSPS & NESHAP: In addition to this rule, a stationary RICE may be subject to New Source Performance Standards (NSPS) in Rule 360 and/or National Emission Standards for Hazardous Air Pollutants (NESHAP) in Rule 370 of these rules. Whenever more than one provision in this rule applies to such engine or whenever a provision in this rule and a provision in the federal standards apply to such engine, the provision or combination of provisions resulting in the lowest rate of emissions shall apply, unless otherwise specifically exempted or designated.

103 EXEMPTIONS:

103.1 The following types of stationary RICE are exempt from all of the requirements of this rule but shall comply with Rule 300 (Visible Emissions) of these rules:

- a. A rotary engine, including gas turbines, jet engines.
- b. A stationary RICE used directly and exclusively for engine research including engine development, and subsequent engine performance verification for the purpose of either engine emission control techniques or engine efficiency improvements.

- c. A non-emergency engine when it is operated for purposes of performance verification and testing by the owner or operator or by a manufacturer or distributor of such equipment for the purpose of performance verification and testing at the production facility.
- d. A compressed gas stationary RICE used for solar testing and research programs.
- e. A stationary RICE operated as an emergency engine or other equipment at a nuclear power plant that must run for safety reasons and/or operational tests to meet requirements imposed by the Nuclear Regulatory Commission.
- f. A stationary RICE test stand used for evaluating engine performance.
- g. A stationary RICE used for training purposes as long as the total number of hours of the operation does not exceed 100 hours per calendar year per engine.

103.2 An IC engine operated as a nonroad IC engine is exempt from all of the requirements of this rule but shall comply with Rule 300 (Visible Emissions) of these rules.

104 PARTIAL EXEMPTIONS FOR EMERGENCY ENGINES: A stationary RICE operated as an emergency engine, as defined in this rule, for any of the following reasons shall comply only with the provisions in Sections 301, 303, 306, 307, 400, 502.1 and 502.4 of this rule when:

- 104.1** Used only for power when normal power service fails from the serving utility or if onsite electrical transmission or onsite power generation equipment fails.
- 104.2** Used only for the emergency pumping of water resulting from a flood, fire, lightning strikes, police action or for any other essential public services which affect public health and safety.
- 104.3** Used for lighting airport runways.
- 104.4** Used for sewage overflow mitigation and/or prevention.
- 104.5** Used for reliability-related activities such as engine readiness, calibration, or maintenance or to prevent the occurrence of an unsafe condition during electrical system maintenance, as long as the total number of hours of the operation does not exceed 100 hours per calendar year per engine as evidenced by an installed non-resettable hour meter.
- 104.6** Used as the non-emergency engine when the non-emergency engine has failed, but only for such time as is needed to repair the non-emergency engine.
- 104.7** Used to operate standby emergency water pumps for fire control that activate when sensors detect low water pressure.

105 PARTIAL EXEMPTIONS FOR LOW USAGE NON-EMERGENCY ENGINES: The following low usage non-emergency engines shall comply only with the provisions in Sections 301, 303, 306, 307, 400, 502.1 and 502.4 of this rule for:

- 105.1** Each engine with a rated bhp at or below 1000 that operates less than 200 hours per calendar year as evidenced by an installed non-resettable hour meter.

105.2 Each engine with a rated bhp above 1000 that operates less than 100 hours per calendar year as evidenced by an installed non-resettable hour meter.

106 PARTIAL EXEMPTION FOR NON-EMERGENCY ENGINES SUBJECT TO 40 CFR PART 63, SUBPART ZZZZ: A stationary RICE subject to the federal standards of performance set forth in 40 CFR Part 63, Subpart ZZZZ shall comply only with the provisions in Sections 502.1, 502.2, and 502.3 of this rule.

SECTION 200 – DEFINITIONS: For the purpose of this rule, the following definitions shall apply, in addition to those definitions found in Rule 100 (General Provisions and Definitions) of these rules. In the event of any inconsistency between any of the Maricopa County Air Pollution Control Rules, the definitions in this rule take precedence.

201 AFTERCOOLER / INTERCOOLER: A system that cools the engine intake air or air/fuel mixture after the air exits the turbocharger and prior to the introduction into the cylinder, thereby lowering NO_x emissions.

202 COGENERATION UNIT: A stationary RICE unit that burns fuel to simultaneously produce electricity and heat in a single thermodynamic process and is usually located in close proximity to the equipment requiring the heat energy.

203 COMPRESSION-IGNITION ENGINE: A stationary RICE with operating characteristics wherein the principal mechanism of igniting the fuel and air mixture in the cylinders is the compression of air in the cylinder until it is so hot that any fuel injected into the air or mixed with the air ignites. In this type of engine, a separate ignition source, such as a spark plug, is not used.

204 DIESEL ENGINE: A type of compression-ignition engine.

205 EMERGENCY ENGINE: A stationary RICE whose sole function is to provide back-up power when electric power from the local utility is interrupted or when operated solely for any of the reasons listed in Section 104 of this rule. An emergency engine, for the purposes of this rule, shall not be used to supply standby power due to a voluntary reduction in power by a utility or power company, supply power for distribution or sale to the grid, or supply power at a source in order to avoid peak demand charges or high electric energy prices during on-peak price periods and shall not exceed 500 hours of operation per calendar year including the 100 hours listed in Section 104.5 of this rule.

206 ENGINE FAMILY: A group of stationary RICE with similar design features such as fuel type, cooling medium, method of air aspiration, combustion chamber design including cylinder bore and stroke, exhaust after treatment (if any), method of fuel admission, and method of control. These engines are also expected to have similar emission and operating characteristics throughout their useful lives.

207 EQUIVALENT REPLACEMENT ENGINE: A stationary RICE that is substituted for another stationary RICE that is intended to perform the same or similar function as the original stationary RICE and where all of the following conditions exist:

- 207.1 The equivalent replacement engine results in equal or lower air contaminant emissions than the original stationary RICE; and
 - 207.2 The equivalent replacement engine meets the emission control technology standards contained in Section 304 of this rule; and
 - 207.3 The rated bhp of the equivalent replacement engine does not exceed the rated bhp of the original stationary RICE (or sum of original stationary RICE) by more than 20 percent, for the purpose of this rule. For every percentage point increase of the rated bhp, there shall be an associated decrease in emissions of nitrogen oxides, expressed as a mass per unit time, equal to or exceeding two percentage points.
- 208 **IDENTICAL REPLACEMENT ENGINE:** A stationary RICE that is substituted for another stationary RICE that is intended to perform the same or similar function as the original stationary RICE and where all of the following conditions exist:
- 208.1 The identical replacement engine results in equal or lower air contaminant emissions than the original stationary RICE; and
 - 208.2 The identical replacement engine meets the emission control technology standards contained in Section 304 of this rule; and
 - 208.3 The identical replacement engine has the same manufacturer type, model number, and manufacturer's rated bhp as the original stationary RICE.
- 209 **LEAN-BURN ENGINE:** A spark-ignition engine with an air-to-fuel operating range that has more air present than is needed to burn the fuel present and cannot be adjusted to operate with an exhaust oxygen concentration of less than or equal to 2%.
- 210 **LOCATION:** Any single site at a building, structure, facility or installation.
- 211 **NON-EMERGENCY ENGINE:** A stationary RICE that is dedicated to a process or processes for the purpose of supplying primary mechanical or electrical power.
- 212 **NONROAD INTERNAL COMBUSTION (IC) ENGINE:**
- 212.1 Equipment that meets the following requirements are nonroad IC engines:
 - a. An internal combustion engine that is (or will be) 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 garden tractors, off-highway mobile cranes and bulldozers); or
 - b. An internal combustion engine that is (or will be) used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or
 - c. An internal combustion engine that by itself or in or on a piece of equipment is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include but are not limited to, wheels, skids, carrying handles, dollies, trailers, or platforms.
 - 212.2 The following are not nonroad IC engines:

- a. An engine used to propel a motor vehicle, an aircraft, or equipment used solely for competition; or
- b. An engine regulated by a federal New Source Performance Standard promulgated under Section 111 of the Clean Air Act; or
- c. An engine otherwise included in Section 212.1(c) of this rule that remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replace(s) an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e. at least two years) and that operates at that single location approximately three months (or more) each year. This paragraph does not apply to an engine after the engine is removed from the location.

213 PART(S) PER MILLION, DRY VOLUME (PPMDV): A unit of proportion equal to 10^{-6} that is measured on a dry basis (minus water) at 15% oxygen.

214 RATED BRAKE HORSEPOWER (RATED BHP): The maximum brake horsepower (bhp) specified by the engine manufacturer for the engine application, usually listed on the nameplate of the engine. If the engine has been altered so that the maximum brake horsepower is different than the rated brake horsepower on the nameplate, then the maximum brake horsepower shall be considered the rated brake horsepower.

215 RICH-BURN ENGINE: A spark-ignition engine that is not a lean-burn engine.

216 SPARK-IGNITION ENGINE: A stationary RICE wherein the fuel is usually mixed with intake air before introduction into the combustion chamber resulting in a relatively homogeneous air/fuel mixture in the combustion chamber, at which time a spark plug, or other device, then ignites the air/fuel mixture.

217 STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINE (RICE): A reciprocating, piston-driven internal combustion engine that is operated or intended to be operated at one specific location for more than 12 consecutive months or that is attached to a foundation at the location. An engine that replaces an engine at a location and is intended to perform the same or similar function as the engine being replaced will be included in calculating the consecutive time period. A stationary RICE is not a nonroad engine.

218 SULFUR OXIDES (SO_x): Oxides of sulfur calculated as equivalent sulfur dioxide.

219 ULTRA LOW SULFUR DIESEL: Fuel oil containing less than or equal to 0.0015% sulfur by weight.

220 WASTE DERIVED FUEL GAS: A gaseous fuel that is generated from the biodegradation of solid or liquid waste including, but not limited to, digester gas and landfill gas.

SECTION 300 – STANDARDS:

301 LIMITATIONS FOR STATIONARY RICE - FUEL: An owner or operator of an engine that meets the criteria listed in Section 102 of this rule shall comply with either of the following:

- 301.1** Use any fuel that contains no more than 0.0015% sulfur by weight, alone or in combination with other fuels.
- 301.2** Use any waste derived fuel gas that contains no more than 0.08% sulfur by weight, alone or in combination with other fuels.

302 GOOD COMBUSTION PRACTICES / TUNING PROCEDURE FOR STATIONARY RICE: An owner or operator of an engine that meets the criteria listed in Section 102 of this rule shall conduct preventative maintenance or tuning procedures as recommended by the engine manufacturer to ensure good combustion practices to minimize NO_x emissions. A handheld monitor may be used if so desired by the owner or operator for measurement of NO_x and CO concentrations in the effluent stream after each adjustment is made; this may assist in determining that the proper adjustment has been made to minimize NO_x and CO emissions. A handheld monitor may be used by the Control Officer to determine compliance with this section. The owner or operator shall include all of the following in the tuning procedures, if the engine is so equipped, and if such procedures are appropriate to the type of engine:

- 302.1** Lubricating Oil and Filter: Change once every three months or after no more than 300 hours of operation, whichever occurs last.
- 302.2** Inlet Air Filter: Clean once every three months or after no more than 300 hours of operation and replace every 1,000 hours of operation or every year, whichever occurs last.
- 302.3** Fuel Filter: Clean once every year or replace (if cartridge type) once every 1,000 hours of operation, whichever occurs last.
- 302.4** Check and adjust the following once every year or after no more than 1,000 hours of operation, whichever occurs last:
 - a.** Intake and exhaust valves
 - b.** Spark plugs (if so equipped)
 - c.** Spark timing and dwell or fuel injection timing (if adjustable), and
 - d.** Carburetor mixture (if adjustable).
- 302.5** Spark Plugs and Ignition Points: Replace after 3,000 hours of operation or every year whichever occurs last
- 302.6** Coolant: Change after 3,000 hours of operation or every year whichever occurs last.
- 302.7** Exhaust System: Check for leaks and/or restrictions after 3,000 hours of operation or every year whichever occurs last.

303 LIMITATIONS FOR STATIONARY RICE – OPACITY: An owner or operator of an engine that meets the criteria in Section 102 of this rule shall not discharge into the ambient

air from any such engine any air contaminant, other than uncombined water, in excess of 20% opacity.

304 LIMITATIONS FOR NON-EMERGENCY ENGINES 250 RATED BHP OR GREATER: In addition to meeting the standards in Sections 301, 302 and 303 of this rule, an owner or operator of a non-emergency engine that meets the criteria in Section 102 of this rule shall comply with Sections 304.1 or 304.2 of this rule.

304.1 Engine Requirements for Non-Emergency Engines: The emissions in parts per million by dry volume (ppmdv) or grams per bhp (g/bhp) from the non-emergency engines shall comply with either Table 1 or Table 2 of this rule.

**TABLE 1
COMPRESSION-IGNITION ENGINES**

MANUFACTURED OR MODIFIED	RATED BHP	ENGINE REQUIREMENTS
Prior to October 22, 2003	250-399	770 ppmdv or 10 g/bhp-hr. NO _x or turbocharger with aftercooler/intercooler or 4-degree injection timing retard
Prior to October 22, 2003	400 plus	550 ppmdv or 7.2 g/bhp-hr. NO _x or turbocharger with aftercooler/intercooler or 4-degree injection timing retard
On or after October 22, 2003 but prior to July 11, 2005	>250	530 ppmdv or 6.9 g/bhp-hr. NO _x or turbocharger with aftercooler/intercooler or 4-degree injection timing retard; 1,000 ppmdv CO; 0.40 g/bhp-hr PM

**TABLE 2
SPARK-IGNITION ENGINES**

LEAN-BURN ENGINES				
MANUFACTURED OR MODIFIED	RATED BHP	OXIDES OF NITROGEN (NO_x)	VOLATILE ORGANIC COMPOUND (VOC)	CARBON MONOXIDE (CO)
Prior to October 22, 2003	>250	280 ppmdv or 4.0 g/bhp-hr	800 ppmdv or 5.0 g/bhp-hr	4,500 ppmdv
On or after October 22, 2003 but prior to June 12, 2006	>250	110 ppmdv or 1.5 g/bhp-hr	800 ppmdv or 5.0 g/bhp-hr	4,500 ppmdv

TABLE 2 cont.
SPARK-IGNITION ENGINES

RICH-BURN ENGINES				
MANUFACTURED OR MODIFIED	RATED BHP	OXIDES OF NITROGEN (NOX)	VOLATILE ORGANIC COMPOUND (VOC)	CARBON MONOXIDE (CO)
Prior to October 22, 2003	>250	280 ppm _{dv} or 4.0 g/bhp-hr or three-way catalyst*	800 ppm _{dv} or 5.0 g/bhp-hr or three-way catalyst*	4,500 ppm _{dv} or three-way catalyst*
On or after October 22, 2003 but prior to June 12, 2006	>250	20 ppm _{dv} or 0.30 g/bhp-hr or three-way catalyst*	800 ppm _{dv} or 5.0 g/bhp-hr or three-way catalyst*	4,500 ppm _{dv} or three-way catalyst*

* The three-way catalyst shall provide a minimum of 80% control efficiency for NO_x and CO for those engines fueled with natural gas, propane or gasoline. In addition, the three-way catalyst shall also provide a minimum of at least 50% control efficiency for VOC for those engines fueled by gasoline.

304.2 Federal Standards of Performance for Non-Emergency Engines: An owner or operator of an engine listed in Sections 304.2(a) or (b) of this rule shall comply with the federal standards of performance for compression-ignition engines set forth in 40 CFR Part 60, Subpart IIII or spark-ignition engines set forth in 40 CFR Part 60, Subpart JJJJ and in all accompanying appendices as incorporated by reference in Rule 360 (New Source Performance Standards) of these rules. Whenever more than one provision in this rule applies to such engine or whenever a provision in this rule and a provision in the federal standards apply to such engine, the provision or combination of provisions resulting in the lowest rate of emissions shall apply, unless otherwise specifically exempted or designated.

- a. 40 CFR Part 60, Subpart IIII applies to all of the following non-emergency compression-ignition engines:
 - (1) Any stationary compression-ignition IC engine that was ordered after July 11, 2005 and manufactured after April 1, 2006.
 - (2) Any stationary compression-ignition IC engine that was modified or reconstructed after July 11, 2005.
- b. 40 CFR Part 60, Subpart JJJJ applies to the following non-emergency spark-ignition engine:
 - (1) Any stationary spark-ignition engine that was ordered after June 12, 2006 and manufactured on or after:
 - (a) July 1, 2007 for engines with a rated bhp greater than or equal to 500 (except lean burn engines with a rated bhp greater than or equal to 500 and less than 1,350)

(b) January 1, 2008 for lean burn engines with a rated bhp greater than or equal to 500 and less than 1,350

(c) July 1, 2008 for engines with a rated bhp less than 500.

(2) Any stationary spark-ignition engine that was modified or reconstructed after June 12, 2006.

305 EFFICIENCY ALLOWANCE: Each emission limit expressed in Tables 1 or 2 of this rule may be multiplied by X, where X equals the engine efficiency (E) divided by a reference efficiency of 30 percent. Engine efficiency shall be determined by one of the following methods whichever is higher:

a. $E = (\text{Engine Output}) \times (100) \div (\text{Energy Input})$ where Energy Input is determined by a fuel measuring device accurate to +/- 5 % and is based upon the higher heating value (HHV) of the fuel. Percent efficiency (E) shall be averaged over 15 consecutive minutes and measured at peak load for the applicable engine.

b. $E = (\text{Manufacturers Rated Efficiency [Continuous] at (LHV)} \times (\text{LHV}) \div (\text{HHV}))$ where LHV = the lower heating value of the fuel Engine efficiency (E) shall not be less than 30 percent; an engine with an efficiency lower than 30 percent shall be assigned an efficiency of 30 percent for the purposes of this rule.

306 EQUIVALENT REPLACEMENT ENGINE OR IDENTICAL REPLACEMENT ENGINE: An equivalent replacement engine or an identical replacement engine shall be treated as the original stationary RICE that it replaces for the purposes of compliance with this rule.

307 MODIFICATION TO A STATIONARY RICE: If a modification, including the contractual obligation to undertake and complete an order for an engine, is made to a stationary RICE, then such engine shall comply with all applicable provisions of this rule. The date of the modification shall be the trigger for when the modification is subject to the provisions of Section 304 of this rule. Whenever a provision in this rule and a provision in Section 304 of this rule apply to such engine, the provision or combination of provisions resulting in the lowest rate of emissions shall apply, unless otherwise specifically exempted or designated.

308 NON-RESETTING TOTALIZING HOUR METER: The owner or operator of a stationary RICE, subject to any provision of this rule, except for those engines being removed from service under Section 401 of this rule, shall install, operate, and maintain a non-resetting totalizing hour meter. If the non-resetting totalizing hour meter is found to be malfunctioning, operation of the engine shall cease until corrective action(s) can be implemented or the function of the meter is restored.

SECTION 400 – ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE SCHEDULE-STATIONARY RICE BEING REMOVED FROM SERVICE: If a stationary RICE must be removed from service because such engine does not comply with the emission limits listed in Section 300 of this rule, then the stationary RICE shall be removed from service no later than November 2, 2017. The stationary RICE

that replaces such engine shall comply with all applicable provisions of this rule and shall comply with Section 304 of this rule upon installation.

402 COMPLIANCE SCHEDULE-NON-RESETTING TOTALIZING HOUR

METER: The owner or operator of a stationary RICE, subject to any provision of this rule, except for those engines being removed from service under Section 401 of this rule, shall install, operate, and maintain a non-resetting totalizing hour meter on each such engine no later than November 2, 2017.

SECTION 500 – MONITORING AND RECORDS

501 COMPLIANCE DETERMINATION:

501.1 Stationary RICE: An owner or operator of a stationary RICE shall demonstrate compliance with all of the following, as applicable:

- a. With Section 300 of this rule, by recordkeeping according to Section 502 of this rule. Emission testing using the applicable test methods listed in Section 503 of this rule shall be performed upon the request of the Control Officer.
- b. With Section 304.2 of this rule, by one of the following:
 - (1) A statement from the manufacturer that the engine meets the most stringent emissions standards found in this rule or 40 CFR Parts 89, 90, and 1039 applicable to the engine and its model year at the time of manufacture.
 - (2) Emission testing using the applicable test methods listed in Section 503 of this rule shall be performed upon the request of the Control Officer.
- c. With 40 CFR Part 60.4213, for a stationary RICE with a displacement of greater than or equal to 30 liters per cylinder.

501.2 Engine Family: An owner or operator of an engine family shall demonstrate compliance with all of the following, as applicable:

- a. With Section 300 of this rule, by recordkeeping according to Section 502 of this rule. Emission testing using the applicable test methods listed in Section 503 of this rule shall be performed upon the request of the Control Officer.
- b. When testing an engine family at one source, the number of engines tested should be the greater of either one engine or one third of all identical engines in the group. If any of the representative engines exceed the emission limits, each engine in the group shall demonstrate compliance by emissions testing.
- c. With Section 304.2 of this rule, by one of the following:
 - (1) A statement from the manufacturer that the engine meets the most stringent emissions standards found in this rule or 40 CFR Parts 89, 90, and 1039 applicable to the engine and its model year at the time of manufacture.
 - (2) Emission testing using the applicable test methods listed in Section 503 of this rule shall be performed upon the request of the Control Officer.
- d. With 40 CFR Part 60.4213, for an engine family with a displacement of greater than or equal to 30 liters per cylinder.

501.3 Ultra Low Sulfur Diesel Verification: If the Control Officer requests documentation of the sulfur content of the fuel to demonstrate the 0.0015% limit, the owner or operator shall submit one of the following:

- a. Fuel receipts, or
- b. Contract specifications, or
- c. Pipeline meter tickets, or
- d. Fuel supplier information, or
- e. Purchase records, or
- f. Test results of the fuel for sulfur content

The items listed above must provide accurate sulfur content values or be based on enforceable test methods as approved by the Administrator to determine the sulfur content.

501.4 Waste Derived Fuel Gas - Sulfur Verification: The owner or operator shall submit documentation of the concentration of the sulfur level of the waste derived fuel gas to the Control Officer upon request. The sulfur content of gaseous fuels shall be determined by South Coast Air Quality Management District Method 307-94 Determination of Sulfur in a Gaseous Matrix.

501.5 Test Method Conditions: The owner or operator shall use the test methods listed in Section 503 of this rule to determine compliance with the limitations listed in Tables 1 or 2 of this rule. Testing for stationary RICE shall be completed under steady state conditions at either the maximum operating load or no less than 80% of the rated bhp. If the owner or operator of an engine demonstrates to the Control Officer that the engine cannot operate at these conditions, then emissions source testing shall be performed at the highest achievable continuous rated bhp or under the typical duty cycle or typical operational mode of the engine.

502 RECORDKEEPING/RECORDS RETENTION: The owner or operator of a stationary RICE subject to this rule shall comply with the following requirements and retain records for at least 5 years:

502.1 Records Required for a Stationary RICE: An owner or operator of a stationary RICE, including emergency engines, non-emergency engines and low usage non-emergency engines, shall keep a record that includes an initial one time entry that lists the particular engine combustion type (compression-ignition or spark-ignition or rich burn, lean burn); manufacturer; model designation, rated bhp, serial number and where the engine is located on the site.

502.2 Monthly Records Required for Non-Emergency Engines: An owner or operator of a non-emergency engine shall maintain a monthly record for non-emergency engines which shall include:

- a. Hours of operation; and
- b. Type of fuel used, and

- c. Documentation verifying compliance with sulfur fuel content according to Section 301.1 of this rule.

502.3 Annual Records Required for Non-Emergency Engines: An owner or operator of a non-emergency engine shall maintain an annual record of the practices/procedure that are followed in order to comply with Section 302 (Good Combustion Practices/Tuning Procedure for Stationary RICE) of this rule.

502.4 Records Required for an Emergency Engine or a Low Usage Non-Emergency Engine: An owner or operator of an emergency engine or a low usage non-emergency engine that meets the exemptions listed in Sections 104 and 105 of this rule shall keep an engine record that includes:

- a. Monthly rolling twelve month total of hours of operation, including hours of operation for testing, reliability and maintenance; and
- b. Fuel type and sulfur content of fuel; and
- c. Explanation for the use of the engine if it is used as an emergency engine.

503 COMPLIANCE DETERMINATION-TEST METHODS INCORPORATED BY

REFERENCE: The following test methods are approved for use for the purpose of determining compliance with this rule. The test methods are incorporated by reference in Appendix G of the Maricopa County Air Pollution Control Regulations. Alternative test methods as approved by the Administrator or other EPA-approved test methods may be used upon written approval from the Control Officer. When more than one test method is permitted for the same determination, an exceedance under any method will constitute a violation. Copies of test methods referenced in this section are available at the Maricopa County Air Quality Department.

503.1 EPA Reference Methods 1 (“Sample and Velocity Traverses for Stationary Sources”) and 1A (“Sample and Velocity Traverses for Stationary Sources with Small Stacks and Ducts”) (40 CFR 60, Appendix A).

503.2 EPA Reference Methods 2 (“Determination of Stack Gas Velocity and Volumetric Flow Rate”), 2A (“Direct Measurement of Gas Volume Through Pipes and Small Ducts”), 2C (“Determination of Stack Gas Velocity and Volumetric Flow Rate in Small Stacks or Ducts”), and 2D (“Measurement of Gas Volumetric Flow Rates in Small Pipes and Ducts”) (40 CFR 60, Appendix A).

503.3 EPA Reference Methods 3 (“Gas Analysis for the Determination of Dry Molecular Weight”), 3A (“Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)”), 3B (“Gas Analysis for the Determination of Emission Rate Correction Factor of Excess Air”), and 3C (“Determination of Carbon Dioxide, Methane, Nitrogen and Oxygen from Stationary Sources”) (40 CFR 60, Appendix A).

503.4 EPA Reference Method 4 (“Determination of Moisture Content in Stack Gases”) (40 CFR 60, Appendix A).

503.5 EPA Reference Method 5 (“Determination of Particulate Emissions from Stationary Sources”) (40 CFR 60, Appendix A)

- 503.6** EPA Reference Method 202 (“Determination of Condensable Particulate Emissions from Stationary Sources”) (40 CFR 51, Appendix M).
- 503.7** EPA Reference Methods 7 (“Determination of Nitrogen Oxide Emissions from Stationary Sources”), 7A (“Determination of Nitrogen Oxide Emissions from Stationary Sources - Ion chromatographic method”), 7B (“Determination of Nitrogen Oxide Emissions from Stationary Sources - Ultraviolet Spectrometry”), 7C (“Determination of Nitrogen Oxide Emissions from Stationary Sources - Alkaline-Permanganate Colorimetric Method”), 7D (“Determination of Nitrogen Oxide Emissions from Stationary Sources - Alkaline - Permanganate Chromatographic Method”), and 7E (“Determination of Nitrogen Oxide Emissions from Stationary Sources - Instrumental Analyzer Method”), (40 CFR 60, Appendix A).
- 503.8** EPA Reference Method 9 (“Visual Determination of the Opacity of Emissions from Stationary Sources”) (40 CFR 60, Appendix A).
- 503.9** EPA Reference Method 10 (“Determination of Carbon Monoxide from Stationary Sources”) (40 CFR 60, Appendix A).
- 503.10** EPA Reference Method 18 (“Measurement of Gaseous Organic Compound Emissions by Gas Chromatography”) (40 CFR 60, Appendix A).
- 503.11** EPA Reference Method 25A (“Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer”) (40 CFR 60, Appendix A).
- 503.12** ASTM D2622-98 Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-Ray Fluorescence Spectrometry.
- 503.13** ASTM D2880-96 Standard Specification for Gas Turbine Fuel Oils
- 503.14** ASTM D4294-02 or D4294-03 Standard Test Method for Sulfur in Petroleum Products by Energy-Dispersive X-Ray Fluorescence Spectroscopy
- 503.15** ASTM D5504-01 or D5504-08 Standard Test Method for Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence
- 504.16** South Coast Air Quality Management District Method 307-94 Determination of Sulfur in a Gaseous Matrix