This is a new permit condition titled, "2D .1111 Subpart ZZZZ, Part 63 (Existing Non-Emergency non-black start CI > 500 brake HP)"

Note to Permit Writer: This condition is for existing engines (commenced construction prior to June 12, 2006) at an Area Source.
If facility is NOT using CEMs then you may delete: the last two rows of the table in ***Section d. Initial Compliance Demonstration*** *that references CEMs;* ***Section f.iii****.; and the 2nd row of the table in* ***Section g. Continuous Compliance Demonstration*** *that references CEMs.*

15A NCAC 2D .1111 "National Emissions Standards for Hazardous Air Pollutants", for the (selected equipment and ID No.), which is considered an existing, non-emergency, non-black start, compression ignition (CI) reciprocating internal combustion engine (RICE) greater than 500 brake horsepower, the Permittee shall comply with all applicable provisions, including the notification, testing, recordkeeping, reporting and monitoring requirements contained in Environmental Management Commission Standard 15A NCAC 2D .1111, as promulgated in 40 CFR 63, Subpart ZZZZ, "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines", including Subpart A "General Provisions."

a. **Compliance Date** - Pursuant to 40 CFR 63.6595(a)(1), the source(s) shall be in compliance with 40 CFR 63, Subpart ZZZZ by May 3, 2013.

b. Emission Limits - Pursuant to 40 CFR 63.6603(a); the affected source shall comply with the following emission limits, except during periods of startup:

i. The concentration of carbon monoxide (CO) in the exhaust cannot exceed 23 ppmvd at 15 percent oxygen; or

ii. Reduce CO emissions by 70 percent or more; or

iii. If the engine is certified to the Tier 3 (Tier 2 for engines above 560 kW) emission standards in Table 1 of 40 CFR 89.112, the Permittee may comply with the requirements under NESHAP Subpart ZZZZ by meeting the requirements for Tier 3 engines (Tier 2 for engines above 560 kW) in 40 CFR part 60 Subpart IIII instead of the emission limitations and other requirements that would otherwise apply under NESHAP Subpart ZZZZ for existing non-emergency CI RICE with a site rating of more than 500 brake HP located at an area source of HAP emissions.

c. Testing - Pursuant to 40 CFR 63.6612(a), 63.6615, 63.6620, 63.6630, 63.6640, and 63.6645 the Permittee shall:

i. Conduct an emission test per 40 CFR 63.6620 and Table 4 of 40 CFR 63 Subpart ZZZZ within 180 days after the compliance date.

ii. Per 40 CFR 63.6630(b) during the initial performance test, the Permittee shall establish each operating limitation identified in Table 2b of 40 CFR 63 Subpart ZZZZ (summarized below):

For each CI RICE complying with the requirement to . . .	**The Permittee shall establish and record during initial performance testing the following operating limitations . . .**
Reduce CO emissions and using an oxidation catalyst; OR Limit the concentration of CO in the RICE exhaust by using an oxidation catalyst	The pressure drop across the catalyst and the temperature at the catalyst inlet. The temperature for the catalyst inlet must be greater than or equal to 450 °F and less than or equal to 1350 °F. The Permittee may petition the director of DAQ pursuant to the requirements of 40 CFR 63.8(g) for a different temperature range.
Reduce CO emissions and not using an oxidation catalyst; Or Limit the concentration of CO in the RICE exhaust and not using an oxidation catalyst	Comply with any operating limitations approved by the DAQ Regional Supervisor.

Pursuant to 40 CFR 63.6620(f), if complying with the emission limitation to reduce CO in the exhaust without using an oxidation catalyst then the Permittee shall petition the DAQ Regional Supervisor for operating limitations to be established during the initial performance test and continuously monitored thereafter, or for approval of no operating limitation. The Permittee shall not conduct the initial performance test until after the petition has been approved by the Regional Supervisor. The petition must include the information described in 40 CFR 63.6620(g) or (h).

iii. Pursuant to 40 CFR 63.6620(i), the engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load in a specific application. A written report of the average percent load determination must be included in the notification of compliance status. The following information must be included in the written report: the engine model number, the engine manufacturer, the year of purchase, the manufacturer's site-rated brake horsepower, the ambient temperature, pressure, and humidity during the performance test, and all assumptions that were made to estimate or calculate percent load during the performance test must be clearly explained. If measurement devices such as flow meters, kilowatt meters, beta analyzers, stain gauges, etc. are used, the model number of the measurement device, and an estimate of its accuracy in percentage of true value must be provided.

iv. The Permittee shall perform such testing in accordance with 40 CFR 63.6645 and 15A NCAC 2D .2600 (see GENERAL EMISSIONS TESTING AND REPORTING REQUIREMENTS in Section B. of this Air Permit). The procedures are outlined below:

A. The Permittee shall notify DAQ in writing of their intent to conduct the performance test and submit a completed Protocol Submittal Form to the DAQ Regional Supervisor at least 60 days before the scheduled performance test in accordance with 40 CFR 63.6645(g) and 40 CFR 63.7(b)(1). A copy of the Protocol Submittal Form may be obtained from the Regional Supervisor.

B. The Permittee shall notify the Regional Supervisor of the specific test dates at least 15 days prior to testing in order to afford the DAQ the opportunity to have an observer on-site during the sampling program. If a specific test date cannot be identified due to the operational requirements of the RICE, then the Permittee shall notify the Regional Supervisor of the approximate test date. If a specific test date is identified within the 15 day notification timeframe identified above, then the Permittee shall notify the Regional Supervisor as soon as the test date is determined.

C. The Permittee shall submit **two** copies of the test report to the DAQ. The test report shall be submitted to the Regional Supervisor – DAQ not later than 60 days after completion of testing. The Permittee may request an extension to submit the final test report. The DAQ Regional Supervisor will approve an extension request if it is determined that the extension request is a result of actions beyond the control of the Permittee. The test report shall contain at a minimum the following information:

I. a description of the training and air testing experience of the person directing the test;

II. a certification of the test results by the sampling team leader and facility representative;

III. a summary of emissions results and text detailing the objectives of the testing program, the applicable state and federal regulations, and conclusions about the testing and compliance status of the emission source(s);

IV. a detailed description of the tested emission source(s), process flow diagrams, engineering drawings, and sampling location schematics should be included as necessary;

V. all field, analytical, and calibration data necessary to verify that the testing was performed as specified in the applicable test methods;

VI. example calculations for at least one test run using equations in the applicable test methods and all test results including intermediate parameter calculations.

D. The testing requirement(s) shall be considered satisfied only upon written approval of the test results by the DAQ.

E. The DAQ will review emission test results with respect exclusively to the specified testing objectives as proposed by the Permittee and approved by the DAQ.

d. <u>Initial Compliance Demonstration</u> - Pursuant to 40 CFR 63.6630(a), initial compliance for each existing, non-emergency, non-black start, compression ignition reciprocating internal combustion engine greater than 500 brake horsepower is provided in Table 5 of 40 CFR 63 Subpart ZZZZ and shall be demonstrated as follows:

For each CI RICE complying with the requirement to . . .	**The Permittee will demonstrate initial compliance if. . .**
Reduce CO emissions and using an oxidation catalyst, and using a continuous parameter monitoring system (CPMS)	i. The average reduction of emissions of CO determined from the initial performance test achieves the required CO percent reduction; and ii. The Permittee has installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and iii. The Permittee has recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test.
Limit the concentration of CO, using an oxidation catalyst, and using a CPMS	i. The average CO concentration determined from the initial performance test is less than or equal to the CO emission limitation; and ii. The Permittee has installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and iii. The Permittee has recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test.
Reduce CO emissions and not using an oxidation catalyst	i. The average reduction of emissions of CO determined from the initial performance test achieves the required CO percent reduction; and ii. The Permittee has installed a CPMS to continuously monitor operating parameters approved by the Administrator (if any) according to the requirements in §63.6625(b); and

	iii. The Permittee has recorded the approved operating parameters (if any) during the initial performance test.
Limit the concentration of CO and not using an oxidation catalyst	i. The average CO concentration determined from the initial performance test is less than or equal to the CO emission limitation; and ii. The Permittee has installed a CPMS to continuously monitor operating parameters approved by the Administrator (if any) according to the requirements in §63.6625(b); and iii. The Permittee has recorded the approved operating parameters (if any) during the initial performance test.
Reduce CO emissions and using a CEMS	i. The Permittee has installed a CEMS to continuously monitor CO and either O_2 or CO_2 at both the inlet and outlet of the oxidation catalyst according to the requirements in §63.6625(a); and ii. The Permittee has conducted a performance evaluation of the CEMS using PS 3 and 4A of 40 CFR part 60, appendix B; and iii. The average reduction of CO calculated using §63.6620 equals or exceeds the required percent reduction. The initial test comprises the first 4-hour period after successful validation of the CEMS. Compliance is based on the average percent reduction achieved during the 4-hour period.
Limit the concentration of CO and using a CEMS	i. The Permittee has installed a CEMS to continuously monitor CO and either O_2 or CO_2 at the outlet of the oxidation catalyst according to the requirements in §63.6625(a); and ii. The Permittee has conducted a performance evaluation of the CEMS using PS 3 and 4A of 40 CFR part 60, appendix B; and iii. The average concentration of CO calculated using §63.6620 is less than or equal to the CO emission limitation. The initial test comprises the first 4-hour period after successful validation of the CEMS. Compliance is based on the average concentration measured during the 4-hour period.

e. Operating Requirements - Pursuant to 40 CFR 63.6603(a), 63.6604, and 63.6625(b), (g), and (h), the Permittee shall:

i. Minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.

ii. If the engine is not equipped with a closed crankcase ventilation system the Permittee shall:

A. Install a closed crankcase ventilation system that prevents crankcase emissions from being emitted; or

B. Install an open crankcase filtration emission control system that reduces emissions from the crankcase by filtering the exhaust stream to remove oil mist, particulates, and metals.

iii. Follow the manufacturer's maintenance requirements for operating and maintaining the open or closed crankcase ventilations system and replacing crankcase filters.

iv. If the engine displacement is less than 30 liters per cylinder then the Permittee shall use diesel fuel that meets the requirements in 40 CFR 80.510(b) for nonroad diesel fuel.

Sulfur content	15 ppm maximum.
Cetane index or Aromatic content	A minimum cetane index of 40; or A maximum aromatic content of 35 volume percent.

f. Monitoring Requirements –

i. Pursuant to 40 CFR 63.6603(a), the Permittee shall meet each operating limitation as follows:

For each CI RICE complying with the requirement to . . .	**The Permittee shall meet the following operating limitation . . .**
Reduce CO emissions and using an oxidation catalyst; OR Limit the concentration of CO in the RICE exhaust and using an oxidation catalyst	a. maintain the catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water from the pressure drop across the catalyst that was measured during the initial performance test; and b. maintain the temperature of the RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F. The Permittee may petition the director of DAQ pursuant to the requirements of 40 CFR 63.8(f) for a different temperature range.

Reduce CO emissions and not using an oxidation catalyst; OR Limit the concentration of CO in the RICE exhaust and not using an oxidation catalyst	Comply with any operating limitations approved by the Regional Supervisor - DAQ.

ii. Pursuant to 63.6625(b), if the Permittee is required to install a continuous parameter monitoring system (CPMS) as specified in the table in Section d. "Initial Compliance Demonstration" above, the Permittee shall install, operate, and maintain each CPMS according to the following requirements:

A. The Permittee shall prepare a site-specific monitoring plan that addresses the monitoring system design, data collection, and the quality assurance and quality control elements outlined below and in §63.8(d). As specified in §63.8(f)(4), the Permittee may request approval of monitoring system quality assurance and quality control procedures alternative to those specified below in the site-specific monitoring plan.

(I) The performance criteria and design specifications for the monitoring system equipment, including the sample interface, detector signal analyzer, and data acquisition and calculations;
(II) Sampling interface (*e.g.*, thermocouple) location such that the monitoring system will provide representative measurements;
(III) Equipment performance evaluations, system accuracy audits, or other audit procedures;
(IV) Ongoing operation and maintenance procedures in accordance with provisions in 40 CFR 63.8(c)(1)(ii) and (c)(3); and
(V) Ongoing reporting and recordkeeping procedures in accordance with provisions in 40 CFR 63.10(c), (e)(1), and (e)(2)(i).

B. The Permittee shall install, operate, and maintain each CPMS in continuous operation according to the procedures in the site-specific monitoring plan.

C. The CPMS must collect data at least once every 15 minutes.

D. A CPMS for measuring temperature range, the temperature sensor must have a minimum tolerance of 2.8 degrees Celsius (5 degrees Fahrenheit) or 1 percent of the measurement range, whichever is larger.

E. The Permittee shall conduct the CPMS equipment performance evaluation, system accuracy audits, or other audit procedures specified in the site-specific monitoring plan at least annually.

F. The Permittee shall conduct a performance evaluation of each CPMS in accordance with the site-specific monitoring plan.

iii. Pursuant to 63.6625(a), if the Permittee elects to install a continuous emissions monitor (CEMS) as specified in the table in Section d. "Initial Compliance Demonstrations" above, the Permittee shall install, operate, and maintain a CEMS to monitor CO and either oxygen or CO_2 according to the requirements below. If the Permittee is meeting a requirement to reduce CO emissions, the CEMS must be installed at both the inlet and outlet of the control device. If the Permittee is meeting a requirement to limit the concentration of CO, the CEMS shall be installed at the outlet of the control device.

A. Each CEMS must be installed, operated, and maintained according to the applicable performance specifications of 40 CFR part 60, appendix B.

B. The Permittee shall conduct an initial performance evaluation and an annual relative accuracy test audit (RATA) of each CEMS according to the requirements in 40 CFR 63.8 and according to the applicable performance specifications of 40 CFR part 60, appendix B as well as daily and periodic data quality checks in accordance with 40 CFR part 60, appendix F, procedure 1.

C. As specified in 40 CFR 63.8(c)(4)(ii), each CEMS must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period. The Permittee shall have at least two data points, with each representing a different 15-minute period, to have a valid hour of data.

D. The CEMS data must be reduced as specified in 40 CFR 63.8(g)(2) and recorded in parts per million or parts per billion (as appropriate for the applicable limitation) at 15 percent oxygen or the equivalent CO_2 concentration.

g. <u>Continuous Compliance Demonstration</u> - Pursuant to 40 CFR 63.6640(a), and Table 6 of 40 CFR 63 Subpart ZZZZ, continuous compliance for each existing, non-emergency, non-black start, compression ignition reciprocating internal combustion engine greater than 500 brake horsepower shall be demonstrated as follows:

Complying with the requirement to . . .	**The Permittee shall demonstrate continuous compliance by . . .**
Reduce CO emissions, or limit the concentration of CO in the RICE exhaust, and using an oxidation catalyst	i. Conducting performance tests every 8,760 hours or 3 years, whichever comes first, for CO to demonstrate that the required CO percent reduction is achieved or that the emissions remain at or below the CO concentration limit [(1)]; and ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and iii. Reducing these data to 4-hour rolling averages; and

	iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test. *(1) If the reciprocating internal combustion engine is limited use (ie, operates less than 100 hours per year), then demonstrate compliance by conducting the same performance testing as item "i" above every 8,760 hours or 5 years, whichever comes first. A limited use engine must also comply with items "ii" through "v" above.*
Reduce CO emissions or limit the concentration of CO in the RICE exhaust, and using a CEMS	i. Collecting the monitoring data according to §63.6625(a), reducing the measurements to 1-hour averages, calculating the percent reduction or concentration of CO emissions according to §63.6620; and ii. Demonstrating that the catalyst achieves the required percent reduction of CO emissions over the 4-hour averaging period, or that the emission remain at or below the CO concentration limit; and iii. Conducting an annual RATA of the CEMS using PS 3 and 4A of 40 CFR part 60, appendix B, as well as daily and periodic data quality checks in accordance with 40 CFR part 60, appendix F, procedure 1.
Reduce CO emissions, or limit the concentration of CO in the RICE exhaust, and not using an oxidation catalyst	i. Conducting performance tests every 8,760 hours or 3 years, whichever comes first, for CO to demonstrate that the required CO percent reduction is achieved or that the emissions remain at or below the CO concentration limit (2) ; and ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and iii. Reducing these data to 4-hour rolling averages; and iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test.

	[2] *If the reciprocating internal combustion engine is limited use (ie, operates less than 100 hours per year) then demonstrate compliance by conducting the same performance testing as item "i" above every 8,760 hours or 5 years, whichever comes first. A limited use engine must also comply with items "ii" through "iv" above.*

h. Recordkeeping Requirements – Pursuant to 40 CFR 63.6655, the Permittee shall keep the following records (in written or electronic format). The records must be maintained for five (5) years.

i. A copy of each notification and report submitted to comply with 40 CFR 63 Subpart ZZZZ.

ii. Occurrence and duration of each malfunction of operation (*i.e.*, process equipment) or the air pollution control and monitoring equipment.

iii. Performance tests and performance evaluations as required in 40 CFR 63.10(b)(2)(viii).

iv. All required maintenance performed on the air pollution control and monitoring equipment.

v. Actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

vi. Pursuant to 40 CFR 63.6655(d), all records required to show continuous compliance with each emission or operating limitations listed in Section g. above.

vii. Pursuant to 40 CFR 63.6655(b), for each CEMs or CPMs, the Permittee shall maintain the following records:

A. Records described in 40 CFR 63.10(b)(2)(vi) through (xi).

B. Previous (*i.e.*, superseded) versions of the site-specific monitoring plan as required in 40 CFR 63.8(d)(3).

C. Requests for alternatives to the relative accuracy test for CEMS or CPMS as required in 40 CFR 63.8(f)(6)(i), if applicable.

i. Reporting Requirements –

i. Pursuant to 40 CFR 63.6645(h), for each initial performance test required in Section d. above, the Permittee is required to submit a Notification of Compliance Status before the close of business on the 60th day following the initial performance test according to 40 CFR 63.9(h)(2)(ii). For each subsequent performance test conducted according to the requirements of Section g above, the Permittee shall submit the Notification of Compliance Status, including

the performance test results, before the close of business on the 60th day following the completion of the performance test according to 40 CFR 63.10(d)(2).

ii. Pursuant to 40 CFR 63.6650, the Permittee shall submit a semi-annual report by January 31 of each calendar year for the preceding six-month period between July and December and by July 31 of each calendar year for the preceding six-month period between January and June. If the RICE is classified as "limited use" (operation limited to less than 100 hours per year) and there is no deviation or malfunction, then the report shall be submitted annually by January 31 of each calendar year. The report shall contain the following:

A. Company name and address.
B. Statement by a responsible official, with that official's name, title, and signature, certifying the accuracy of the content of the report.
C. Date of report and beginning and ending dates of the reporting period.
D. If a malfunction occurred during the reporting period, the compliance report must include the number, duration, and a brief description for each time of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. The report must also include a description of actions taken during a malfunction of an affected source to minimize emissions in accordance with 63.6650(b), including actions taken to correct a malfunction.
E. If there is no deviation(s), then provide a statement indicating that no deviation(s) occurred during the reporting period.
F. If there is a deviation(s) during the reporting period, then provide information in 40 CFR 63.6650(d) as follows:

I. total operating time of the RICE at which the deviation occurred during the reporting period.
II. the number, duration, and cause of deviation (including unknown cause, if applicable), as applicable, and the corrective action taken.

iii. If there are no periods during which the Continuous Monitoring System (CMS - including CEMS and CPMS) was out of control, then a statement that there were no periods during which the CMS was out of control during the reporting period.

iv. If there were periods during which the CMS (including CEMS and CPMS) was out-of-control:
A. The date and time that each malfunction started and stopped.
B. The date, time, and duration that each CMS was inoperative, except for zero (low-level) and high-level checks.
C. The date, time, and duration that each CMS was out-of-control, including the information in §63.8(c)(8).
D. The date and time that each deviation started and stopped, and whether each deviation occurred during a period of malfunction or during another period.
E. A summary of the total duration of the deviation during the reporting period, and the total duration as a percent of the total source operating time during that reporting period.

F. A breakdown of the total duration of the deviations during the reporting period into those that are due to control equipment problems, process problems, other known causes, and other unknown causes.
G. A summary of the total duration of CMS downtime during the reporting period, and the total duration of CMS downtime as a percent of the total operating time of the RICE at which the CMS downtime occurred during that reporting period.
H. An identification of each parameter and pollutant (CO or formaldehyde) that was monitored at the RICE.
I. A brief description of the RICE.
J. A brief description of the CMS.
K. The date of the latest CMS certification or audit.
L. A description of any changes in CMS, processes, or controls since the last reporting period.