

**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
AIR QUALITY DIVISION**

March 9, 2022

PERMIT TO INSTALL
123-11B

ISSUED TO
North American Natural Resources, Inc.

LOCATED AT
9536 Lennon Road
Lennon, Michigan 48449

IN THE COUNTY OF
Shiawassee

STATE REGISTRATION NUMBER
N5910

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environment, Great Lakes, and Energy. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203: October 20, 2021	
DATE PERMIT TO INSTALL APPROVED: March 9, 2022	SIGNATURE:
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

PERMIT TO INSTALL

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COMMON ACRONYMS

AQD	Air Quality Division
BACT	Best Available Control Technology
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
COMS	Continuous Opacity Monitoring System
Department/department/EGLE	Michigan Department of Environment, Great Lakes, and Energy
EU	Emission Unit
FG	Flexible Group
GACS	Gallons of Applied Coating Solids
GC	General Condition
GHGs	Greenhouse Gases
HVLP	High Volume Low Pressure*
ID	Identification
IRSL	Initial Risk Screening Level
ITSL	Initial Threshold Screening Level
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
MAERS	Michigan Air Emissions Reporting System
MAP	Malfunction Abatement Plan
MSDS	Material Safety Data Sheet
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standard for Hazardous Air Pollutants
NSPS	New Source Performance Standards
NSR	New Source Review
PS	Performance Specification
PSD	Prevention of Significant Deterioration
PTE	Permanent Total Enclosure
PTI	Permit to Install
RACT	Reasonable Available Control Technology
ROP	Renewable Operating Permit
SC	Special Condition
SCR	Selective Catalytic Reduction
SNCR	Selective Non-Catalytic Reduction
SRN	State Registration Number
TBD	To Be Determined
TEQ	Toxicity Equivalence Quotient
USEPA/EPA	United States Environmental Protection Agency
VE	Visible Emissions

*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 psig.

POLLUTANT / MEASUREMENT ABBREVIATIONS

acfm	Actual cubic feet per minute
BTU	British Thermal Unit
°C	Degrees Celsius
CO	Carbon Monoxide
CO ₂ e	Carbon Dioxide Equivalent
dscf	Dry standard cubic foot
dscm	Dry standard cubic meter
°F	Degrees Fahrenheit
gr	Grains
HAP	Hazardous Air Pollutant
Hg	Mercury
hr	Hour
HP	Horsepower
H ₂ S	Hydrogen Sulfide
kW	Kilowatt
lb	Pound
m	Meter
mg	Milligram
mm	Millimeter
MM	Million
MW	Megawatts
NMOC	Non-Methane Organic Compounds
NO _x	Oxides of Nitrogen
ng	Nanogram
PM	Particulate Matter
PM10	Particulate Matter equal to or less than 10 microns in diameter
PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
pph	Pounds per hour
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
psia	Pounds per square inch absolute
psig	Pounds per square inch gauge
scf	Standard cubic feet
sec	Seconds
SO ₂	Sulfur Dioxide
TAC	Toxic Air Contaminant
Temp	Temperature
THC	Total Hydrocarbons
tpy	Tons per year
µg	Microgram
µm	Micrometer or Micron
VOC	Volatile Organic Compounds
yr	Year

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to Rule 210 (R 336.1210), operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to Rule 219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of Rule 219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal condition or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of Rule 301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with Rule 303 (R 336.1303). **(R 336.1301)**
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this Permit to Install.
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001. **(R 336.2001)**

EMISSION UNIT SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date / Modification Date	Flexible Group ID
EUNANENGINE7	This emission unit, and any replacement of this unit as applicable under R 336.1285(2)(a)(vi), is for a Caterpillar G3516 reciprocating internal combustion engine rated at 1146 bhp fueled with treated landfill/digester gas to produce electricity.	TBD	NA
EUNANENGINE8R	A 1600 kW (2242 HP) CAT G3520C landfill gas generator engine, will be manufactured after 2012. Equipped with an electronic air to fuel ratio controller.	2014	FGENGINES8R-10, FGRICEMACT
EUNANENGINE9	A 1600 kW (2233 HP) CAT G3520C landfill gas generator engine, manufactured in 2011. Equipped with an electronic air to fuel ratio controller.	5/8/2012	FGENGINES8R-10, FGRICEMACT
EUNANENGINE10	A 1600 kW (2233 HP) CAT G3520C landfill gas generator engine, manufactured in 2011. Equipped with an electronic air to fuel ratio controller.	5/8/2012	FGENGINES8R-10, FGRICEMACT

Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1291.

**EUNANRENGINE7
 EMISSION UNIT CONDITIONS**

DESCRIPTION

This emission unit, and any replacement of this unit as applicable under R 336.1285(2)(a)(vi), is for a Caterpillar G3516 reciprocating internal combustion engine rated at 1146 bhp fueled with treated landfill/digester gas to produce electricity.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT

Air-to-fuel ratio controller.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. NOx	3.0 g/hp-hr	Hourly	EUNANRENGINE7	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60
2. NOx	5.06 pph	Hourly	EUNANRENGINE7	SC V.1	R 336.1205(1)(a) & (3), 40 CFR 52.21(c) & (d)
3. CO	5.0 g/hp-hr	Hourly	EUNANRENGINE7	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60
4. CO	7.85 pph	Hourly	EUNANRENGINE7	SC V.1	R 336.1205(1)(a) & (3), 40 CFR 52.21 (d)
5. VOC*	1.0 g/hp-hr*	Hourly	EUNANRENGINE7	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60
6. VOC	3.24 pph	Hourly	EUNANRENGINE7	SC V.1	R 336.1205(1)(a) & (3), R 336.1702(a)
7. SO ₂	1.33 pph	Hourly	EUNANRENGINE7	SC V.2, SC V.4	R 336.1205(1)(a) & (3), 40 CFR 52.21(c) & (d)
8. Formaldehyde	0.71 pph	Hourly	EUNANRENGINE7	SC V.3	R 336.1225(2)

*per the NSPS, formaldehyde is not included

II. MATERIAL LIMIT(S)

NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only burn landfill gas in EUNANRENGINE7. **(R 336.1225, R 336.1331, R 336.1702)**
2. No later than 60 days prior to startup, the permittee shall submit to the AQD District Supervisor, for review and approval, a malfunction abatement/preventative maintenance plan for EUNANRENGINE7. After approval of the malfunction abatement/preventative maintenance plan by the AQD District Supervisor, the permittee shall not operate EUNANRENGINE7 unless the malfunction abatement/preventative maintenance plan, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained. The plan shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the plan shall include:
 - a) Identification of the equipment and, if applicable, air-cleaning device, and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
 - b) Description of the items or conditions to be inspected and frequency of the inspections or repairs.
 - c) Identification of the equipment and, if applicable, air-cleaning device, operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
 - d) Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
 - e) A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the plan within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the malfunction abatement/preventative maintenance plan to be inadequate, the AQD District Supervisor may request modification of the plan to address those inadequacies. **(R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, 40 CFR 52.21(c) & (d))**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall not operate EUNANRENGINE7 unless an air-to-fuel ratio controller is installed, maintained and operated in a satisfactory manner. **(R 336.1702, R 336.1910)**
2. The design capacity of EUNANRENGINE7 shall not exceed 1148 hp, as specified by the equipment manufacturer. **(R 336.1205(1)(a), R 336.1225, R 336.1702, 40 CFR 52.21(c) & (d))**
3. The permittee shall equip and maintain EUNANRENGINE7 with a device to monitor and record the daily fuel usage. **(R 336.1205, R 336.1225, R 336.1702)**
4. The permittee shall equip and maintain EUNANRENGINE7 with a non-resettable hours meter to continuously monitor and record the operating hours. **(R 336.1205(1)(a))**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Within 180 days after initial startup of EUNANRENGINE7 and within every 5 years from the date of completion of the most recent stack test, the permittee shall verify NOx, CO and VOC emission rates from EUNANRENGINE7, by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below:

Pollutant	Test Method Reference
NOx	40 CFR Part 60, Appendix A
CO	40 CFR Part 60, Appendix A
VOC (Includes formaldehyde)	40 CFR Part 60, Appendix A; or Method 320 of Appendix A of 40 CFR Part 63

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the

AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1205, R 336.1225, R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21(c) & (d))**

2. Within 180 days after initial startup of EUNANRENGINE7 the permittee shall verify SO₂ emission rates from EUNANRENGINE7, by testing at owner's expense, in accordance with Department requirements. The permittee shall perform subsequent testing as requested by the AQD District Supervisor. Testing shall be performed using an approved EPA Method listed in the table below:

Pollutant	Test Method Reference
SO ₂	40 CFR Part 60, Appendix A

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1205, R 336.1225, R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21(c) & (d))**

- .3. Within 180 days after initial startup of EUNANRENGINE7 and within every 5 years from the date of completion of the most recent stack test, the permittee shall verify formaldehyde emission rates from EUNANRENGINE7, by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below:

Pollutant	Test Method Reference
Formaldehyde	40 CFR Part 60, Appendix A; or Method 320 of Appendix A of 40 CFR Part 63

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1225, R 336.2001, R 336.2003, R 336.2004)**

4. The permittee shall verify the hydrogen sulfide (H₂S) or total reduced sulfur (TRS) content of the landfill gas burned in EUNANRENGINE7 monthly by gas sampling (e.g. Draeger Tubes, Tedlar Sampling Bags, etc.) and semi-annually by gas sampling using an EPA approved method and laboratory analysis, at the owner's expense, in accordance with Department requirements. If at any time, the H₂S (TRS equivalent) concentration of the landfill gas sample exceeds 400 ppmv, the permittee shall sample and record the H₂S (TRS equivalent) concentration of the landfill gas weekly and shall review all operating and maintenance activities for the landfill gas collection and treatment system along with keeping records of corrective actions taken. Once the H₂S (TRS equivalent) concentration of the landfill gas (determined from 4 weekly samples) is maintained below 400 ppmv for one month after an exceedance, the permittee may resume monthly monitoring and recordkeeping. No less than 30 days prior to the initial test for each type of gas sampling, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to the first test for each type of gas sampling. Thereafter, the permittee shall submit a test plan upon the request of the AQD District Supervisor or if any changes are made to the approved testing protocol. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205(1)(a) and (3), R 336.1225, R 336.2001, R 336.2003, R 336.2004)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205, R 336.1225, R 336.1702, 40 CFR 52.21(c) & (d))**
2. The permittee shall continuously monitor and record, in a satisfactory manner, the landfill gas usage for EUNANRENGINE7 **(R 336.1205(1)(a), CFR 52.21(c) & (d))**
3. The permittee shall maintain the following record for EUNANRENGINE7. The following information shall be recorded and kept on file at the facility:
 - a) Engine manufacturer.
 - b) Date engine was manufactured.
 - c) Engine model number.
 - d) Engine horsepower.
 - e) Engine serial number.
 - f) Engine specification sheet.
 - g) Date of initial startup of the engine.
 - h) Date engine was removed from service at this stationary source.

All of the above information shall be stored in a format acceptable to the AQD District Supervisor. **(R 336.1205, R 336.1225, R 336.1301, R 336.1331, R 336.1702, R 336.1910, R 336.1911, R 336.1912, 40 CFR 52.21(c) & (d))**

4. The permittee shall maintain records of all information necessary for all notifications and reports for EUNANRENGINE7, as specified in these special conditions as well as that information necessary to demonstrate compliance with the emission limits of this permit. This information shall include, but shall not be limited to the following:
 - a) Compliance tests and any testing required under the special conditions of this permit.
 - b) Monitoring data for the hours of operation, volumetric flow rate and landfill gas usage.
 - c) Calculated amount of landfill gas combusted in each engine on a monthly and 12-month rolling basis.
 - d) Hours of operation on a monthly and 12-month rolling basis.
 - e) Monthly average Btu content of the landfill gas burned.
 - f) Manufacturer's data, specifications, and operating and maintenance procedures.
 - g) Maintenance activities conducted according to the PM/MAP.
 - h) All calculations necessary to show compliance with the limits contained in this permit.

All of the above information shall be stored in a format acceptable to the AQD District Supervisor. **(R 336.1205, R 336.1225, R 336.1301, R 336.1331, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, 40 CFR 52.21(c) & (d))**

VII. REPORTING

1. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of EUNANRENGINE7. **(R 336.1201(7)(a))**
2. The permittee shall notify the AQD district office within 10 days of when the frequency of the gas sampling changes for any reason. **(R 336.1201(3))**
3. The permittee shall notify the AQD District Supervisor of an engine change-out and submit a description of the engine and acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting. The data shall be submitted within 30-days of the engine change out. **(R 336.1205, R 336.1702(a), R 336.1911, 40 CFR 52.21 (c) & (d))**

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter / Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVNANRENGINE7	13.5	75	R 336.1225, 40 CFR 52.21 (c) & (d)

IX. OTHER REQUIREMENT(S)

1. The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines as they apply to EUNANRENGINE7. **(40 CFR Part 63, Subparts A and ZZZZ)**

Footnotes:

¹ This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

FLEXIBLE GROUP SPECIAL CONDITIONS

FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGENGINES8R-10	This Flexible group, and any replacement of these emission units as applicable under R 336.1285(2)(a)(vi), is for three (3) Caterpillar landfill gas fueled engines. These engines are subject to NSPS Subpart JJJJ and are "new" engines under the NESHAP ZZZZ	EUNANENGINE8R, EUNANENGINE9, EUNANENGINE10
FGRICEMACT	New and reconstructed (commenced construction or reconstruction on or after December 19, 2002) engines located at a major source of HAP, greater than 500 HP, non-emergency use, which fire landfill gas.	EUNANENGINE7, EUNANENGINE8R, EUNANENGINE9, EUNANENGINE10

**FGENGINES8R-10
 FLEXIBLE GROUP CONDITIONS**

DESCRIPTION

This Flexible group, and any replacement of these emission units as applicable under R 336.1285(2)(a)(vi), is for three (3) Caterpillar landfill gas fueled engines. These engines are subject to NSPS Subpart JJJJ and are “new” engines under the NESHAP ZZZZ.

Emission Unit: EUNANRENGINE8R, EUNANRENGINE9, EUNANRENGINE10

POLLUTION CONTROL EQUIPMENT

NA

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. NOx	2.0 g/hp-hr	Hourly	Limit applies to each engine in FGENGINES8R-10	SC V.3	40 CFR Part 60 Subpart JJJJ
2. NOx	2.97 pph	Hourly	Limit applies to each Engine in FGENGINES8R-10	SC V.1	R 336.1205(1)(a) & (3), R 336.2801(ee), R 336.2803, R 336.2804
3. CO	3.30 g/hp-hr	Hourly	Limit applies to each engine in FGENGINES8R-10	SC V.1, SC V.3	R 336.1205(1)(a) & (b), R 336.2810(3), 40 CFR Part 60 Subpart JJJJ
4. CO	16.30 pph	Hourly	Limit applies to each engine in FGENGINES8R-10	SC V.1	R 336.1205(1)(a) & (b), R 336.2804
5. PM10	0.74 pph	Hourly	Limit applies to each engine in FGENGINES8R-10	SC V.1	R 336.1205(1)(a) & (3), 40 CFR 52.21(c) & (d)
6. PM2.5	0.74 pph	Hourly	Limit applies to each engine in FGENGINES8R-10	SC V.1	R 336.1205(1)(a) & (b), R 336.2801(ee), R 336.2803, R 336.2804, 40 CFR 52.21(b)(3)(i), 40 CFR 52.21(c) & (d)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
7. VOC	0.63 g/hp-hr**	Hourly	Limit applies to each engine in FGENGINES8R-10	SC V.1, SC V.3	R 336.1205(1)(a) & (b), R 336.1702(a), R 336.2810(3), 40 CFR Part 60 Subpart JJJJ
8. SO ₂	2.10 pph	Hourly	Limit applies to each engine in FGENGINES8R-10	SC V.2, SC V.4	R 336.1205(1)(a) & (b), R 336.2801(ee) FR 52.21(c) & (d)
9. Formaldehyde	2.08 pph	Hourly	Limit applies to each engine in FGENGINES8R-10	SC V.5	R 336.1225(1) & (2)
** This VOC limit includes formaldehyde					

II. MATERIAL LIMIT(S)

NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only burn landfill gas in FGENGINES8R-10. **(R 336.1225, R 336.1331, R 336.1702)**
2. No later than 60 days after issuance of this permit, the permittee shall submit to the AQD District Supervisor, for review and approval, a malfunction abatement/operation and preventative maintenance plan (PM/MAP) for FGENGINES8R-10. After approval of the malfunction abatement/operation and preventative maintenance plan by the AQD District Supervisor, the permittee shall not operate FGENGINES8R-10 unless the malfunction abatement/operation and preventative maintenance plan, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained. The plan shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the plan shall include:
 - a. Identification of the equipment and, if applicable, air-cleaning device, and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
 - b. Description of the items or conditions to be inspected and frequency of the inspections or repairs.
 - c. Identification of the equipment and, if applicable, air-cleaning device, operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
 - d. Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
 - e. A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the plan within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the malfunction abatement/operation and preventative maintenance plan to be inadequate, the AQD District Supervisor may request modification of the plan to address those

inadequacies. (R 336.1205, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, R 336.2801(ee), R 336.2803, R 336.2804, R 336.2810, 40 CFR 52.21 (c) & (d), 40 CFR 60.4243(b))

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall not operate FGENGINE8R-10 unless the air to fuel ratio electronic controllers (lean burn technology) on each engine are installed, maintained, and operated in a satisfactory manner. (R 336.1225, R 336.1702(a), R 336.2810(3))
2. The design capacity of each engine in FGENGINE8R-10 shall not exceed 2242 BHP, as specified by the equipment manufacturer. (R 336.1205(1)(a), R 336.1225, R 336.1702, R 336.2803, R 336.2804, R 336.2810, 40 CFR 52.21(c) & (d))
3. The permittee shall equip each engine in FGENGINE8R-10 with a device to monitor and record the hours of operation for each engine on a continuous basis. (R 336.1205(1)(a), 40 CFR 60.4243)
4. The permittee shall equip FGENGINE8R-10 with a device to monitor and record the landfill gas usage of the engines on a continuous basis. (R 336.1205(1)(a), R 336.1225, R 336.1702, R 336.2803, R 336.2804, R 336.2810, 40 CFR 52.21(c) & (d))

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. (R 336.1201(3))

1. Within every 5 years from the date of completion of the most recent stack test, the permittee shall verify NOx, CO, VOC, PM10, and PM2.5 emission rates from FGENGINE8R-10, by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below:

Pollutant	Test Method Reference
NOx	40 CFR Part 60, Appendix A
CO	40 CFR Part 60, Appendix A
VOC (Includes formaldehyde)	40 CFR Part 60, Appendix A; or Method 320 of Appendix A of 40 CFR Part 63
PM10	40 CFR Part 60, Appendix A
PM2.5	40 CFR Part 60, Appendix A

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. (R 336.1205, R 336.1225, R 336.1702(a), R 336.2001, R 336.2003, R 336.2004, R 336.2801(ee), R 336.2803, R 336.2804, R 336.2810(3), 40 CFR 52.21(b)(3)(i), 40 CFR 52.21(c) & (d))

2. The permittee shall perform testing as requested by the AQD District Supervisor to verify SO₂ emission rates from any engine in FGENGINE8R-10, by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below:

Pollutant	Test Method Reference
SO ₂	40 CFR Part 60, Appendix A

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. Verification of emission rates includes the submittal of a complete report of the test results to the AQD

Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1205, R 336.1225, R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21(c) & (d))**

3. Except as provided in 40 CFR 60.4243(b), the permittee shall conduct an initial performance test for each engine in FGENGINES8R-10 within one year after startup of the engine and every 8760 hours of operation (as determined through the use of a non-resettable hour meter) or three years, whichever occurs first, to demonstrate compliance with the emission limits in 40 CFR 60.4233(e). The performance tests shall be conducted according to 40 CFR 60.4244. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(40 CFR 60.8, 40 CFR 60.4243, 40 CFR 60.4244, 40 CFR 60.4245, 40 CFR Part 60 Subpart JJJJ)**
4. The permittee shall verify the hydrogen sulfide (H₂S) or total reduced sulfur (TRS) content of the landfill gas burned in FGENGINES8R-10 monthly by gas sampling (e.g. Draeger Tubes, Tedlar Sampling Bags, etc.) and semi-annually by gas sampling using an EPA approved method and laboratory analysis, at the owner's expense, in accordance with Department requirements. If at any time, the H₂S (TRS equivalent) concentration of the landfill gas sample exceeds 400 ppmv, the permittee shall sample and record the H₂S (TRS equivalent) concentration of the landfill gas weekly and shall review all operating and maintenance activities for the landfill gas collection and treatment system along with keeping records of corrective actions taken. Once the H₂S (TRS equivalent) concentration of the landfill gas (determined from 4 weekly samples) is maintained below 400 ppmv for one month after an exceedance, the permittee may resume monthly monitoring and recordkeeping. No less than 30 days prior to the initial test for each type of gas sampling, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to the first test for each type of gas sampling. Thereafter, the permittee shall submit a test plan upon the request of the AQD District Supervisor or if any changes are made to the approved testing protocol. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205(3), R 336.1225, R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21 (c) & (d), R336.2801(ee))**
5. The permittee shall verify formaldehyde emission rates from one or more engines in FGENGINES8R-10 once every 5 years, by testing at owner's expense, in accordance with Department requirements. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test.¹ **(R 336.1225, R 336.2001, R 336.2003, R 336.2004)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205, R 336.1225, R 336.1702, R 336.2801(ee), R 336.2803, R 336.2804, R 336.2810, 40 CFR 52.21(c) & (d))**
2. The permittee shall continuously monitor, in a satisfactory manner, the landfill gas fuel usage of the engines in FGENGINES8R-10 and the hours of operation for each engine. **(R 336.1205, R 336.1225, R 336.1702, R 336.2801(ee), R 336.2803, R 336.2804, R 336.2810, 40 CFR 52.21(c) & (d))**
5. The permittee shall maintain the following record for each engine in FGENGINES8R-10. The following information shall be recorded and kept on file at the facility:
 - a) Engine manufacturer.
 - b) Date engine was manufactured.
 - b) Engine model number.
 - c) Engine horsepower.

- d) Engine serial number.
- e) Engine specification sheet.
- f) Date of initial startup of the engine.
- g) Date engine was removed from service at this stationary source.

All of the above information shall be stored in a format acceptable to the AQD District Supervisor. **(R 336.1205, R 336.1225, R 336.1301, R 336.1331, R 336.1702, R 336.1910, R 336.1911, R 336.1912, R 336.2801(ee), R 336.2803, R 336.2804, R 336.2810(3), 40 CFR 52.21(c) & (d), 40 CFR 60.7(f), 40 CFR Part 60 Subpart JJJJ)**

6. The permittee shall maintain records of all information necessary for all notifications and reports for each engine in FG8R-10, as specified in these special conditions as well as that information necessary to demonstrate compliance with the emission limits of this permit. This information shall include, but shall not be limited to the following:
- a) Compliance tests and any testing required under the special conditions of this permit.
 - b) Monitoring data for the hours of operation, volumetric flow rate and landfill gas usage.
 - c) Calculated amount of landfill gas combusted in each engine on a monthly and 12-month rolling basis.
 - d) Hours of operation on a monthly and 12-month rolling basis.
 - e) Monthly average Btu content of the landfill gas burned.
 - f) Manufacturer's data, specifications, and operating and maintenance procedures.
 - g) Maintenance activities conducted according to the PM/MAP.
 - h) All calculations necessary to show compliance with the limits contained in this permit.

All of the above information shall be stored in a format acceptable to the AQD District Supervisor. **(R 336.1205, R 336.1225, R 336.1301, R 336.1331, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, R 336.2801(ee), R 336.2803, R 336.2804, R 336.2810(3), 40 CFR 52.21(c) & (d), 40 CFR 60.7(f), 40 CFR Part 60 Subpart JJJJ)**

VII. REPORTING

- 1. The permittee shall notify the AQD district office within 10 days of when the frequency of the gas sampling changes for any reason. **(R 336.1201(3))**
- 2. The permittee shall notify the AQD District Supervisor of an engine change-out and submit a description of the engine and acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting. The data shall be submitted within 30-days of the engine change out. **(R 336.1205, R 336.1702(a), R 336.1911)**

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter / Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
2. SVNANREENGINE8R	13.5	75	R 336.1225, R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d)
3. SVNANREENGINE9	13.5	73	R 336.1225, R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d)
4. SVNANREENGINE10	13.5	73	R 336.1225, R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d)

IX. OTHER REQUIREMENT(S)

1. The permittee shall comply with all applicable provisions of the New Source Performance Standards as specified in 40 CFR Part 60, Subpart A and Subpart JJJJ, as they apply to FGENGINES8R-10. **(40 CFR Part 60 Subpart A and JJJJ)**
2. The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ, for Stationary Reciprocating Internal Combustion Engines as they apply to FGENGINES8R-10. **(40 CFR Part 63, Subparts A and ZZZZ)**

Footnotes:

¹ This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

FGRICEMACT FLEXIBLE GROUP CONDITIONS

DESCRIPTION

40 CFR Part 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE), located at a major source of HAP emissions, new and reconstructed spark ignition (SI) RICE greater than 500 bhp and combusts landfill gas equivalent to 10% or more of the gross heat input on an annual basis. Construction or reconstruction of the RICE commenced on or after December 19, 2002.

Emission Unit: EUNANRENGINE7, EUNANRENGINE8R, EUNANRENGINE9, EUNANRENGINE10

POLLUTION CONTROL EQUIPMENT

NA

I. EMISSION LIMIT(S)

NA

II. MATERIAL LIMIT(S)

NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee must operate each engine in FGRICEMACT in a manner which reasonably minimizes HAP emissions. **(40 CFR 63.6625(c))**
2. At all times, the permittee must operate and maintain any engine in FGRICEMACT including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source. **(40 CFR 63.6605(b))**
3. The permittee shall submit to the AQD District Supervisor, for review and approval, a malfunction abatement/preventative maintenance plan (PM/MAP) for each engine in FGRICEMACT. After approval of the PM/MAP by the AQD District Supervisor, the permittee shall not operate each engine in FGRICEMACT unless the PM/MAP, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained. The plan shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the plan shall include:
 - a) Identification of the equipment and, if applicable, air-cleaning device, and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
 - b) Description of the items or conditions to be inspected and frequency of the inspections or repairs.
 - c) Identification of the equipment and, if applicable, air-cleaning device, operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
 - d) Identification of the major replacement parts that shall be maintained in inventory for quick replacement.

- e) A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the plan within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the PM/MAP to be inadequate, the AQD District Supervisor may request modification of the plan to address those inadequacies. **(R 336.1911)**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee must monitor and record the fuel usage daily with separate fuel meters to measure the volumetric flow rate of each fuel. **(40 CFR 63.6625(c))**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required records in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1201(3))**
2. A permittee that is operating an engine in FGRICEMACT which fires landfill gas equivalent to 10 percent or more of the gross heat input on an annual basis must keep records of the daily fuel usage monitors. The permittee shall keep all records on file and make them available to the Department upon request. **40 CFR 63.6655(c)**
3. The permittee's records must be in a form suitable and readily available for expeditious review according to 40 CFR 63.10(b)(1). **(40 CFR 63.6660(a))**
4. As specified in 40 CFR 63.10(b)(1), the permittee must keep each record for 5-years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. **(40 CFR 63.6660(b))**
5. The permittee must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to 40 CFR 63.10(b)(1). **(40 CFR 63.6660(c))**
6. The permittee shall maintain the following records for each engine in FGRICEMACT:
 - a) Engine manufacturer;
 - b) Date engine was manufactured;
 - c) Engine model number and model year;
 - d) Maximum engine power;
 - e) Engine serial number;
 - f) Engine specification sheet;
 - g) Date of initial startup of the engine;
 - h) Date engine was removed from service at this stationary source;
 - i) Date replacement engine was installed at this stationary source;
 - j) Manufacturer's data, specifications, and operating and maintenance procedures for each engine;

- k) Maintenance activities conducted according to the PM/MAP.

The permittee shall keep the records on file in a format acceptable to the AQD District Supervisor and make them available to the Department upon request. **(R 336.1911)**

VII. REPORTING

1. The permittee must submit an annual report in accordance with Table 7 of 40 CFR 63, Subpart ZZZZ to the appropriate AQD District Office by no later than March 15. The following information shall be included in this annual report: **(40 CFR 63.6650(g))**
 - a) The fuel flow rate of each fuel and the heating values that were used in the calculations. The permittee must demonstrate that the percentage of heat input provided by landfill gas is equivalent to 10 percent or more of the total fuel consumption on an annual basis. **(40 CFR 63.6650(g)(1))**
 - b) The operating limits provided in the permittee's federally enforceable permit, and any deviations from these limits. **(40 CFR 63.6650(g)(2))**
 - c) Any problems or errors suspected from the fuel flow rate meters. **(40 CFR 63.6650(g)(3))**

VIII. STACK/VENT RESTRICTION(S)

NA

IX. OTHER REQUIREMENT(S)

1. The permittee shall comply with all applicable requirements of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subparts A and ZZZZ for Stationary Reciprocating Internal Combustion Engines. **(40 CFR Part 63, Subparts A and ZZZZ)**

Footnotes:

¹ This condition is state only enforceable and was established pursuant to Rule 201(1)(b).