

VIA EMAIL

March 12, 2020

Michelle Luplow
Environmental Quality Analyst
Air Quality Division
Michigan Department of Environment, Great Lakes
and Energy (EGLE)
Lansing District Office
525 West Allegan Street
Lansing, MI 48909

Re: *Energy Developments Michigan, LLC*

Dear Ms. Luplow:

I am writing on behalf of Energy Developments Michigan, LLC (“EDM”) in response to your letter dated February 20, 2020 regarding the stack testing that was conducted December 3-6, 2019 at the Brent Run Generating Station facility (the “VN”). As you know, EDM tested five engines for six pollutants subject to permit limits (NO_x, CO, HCOH, VOC, SO₂ and PM_{10/2.5}). Four of the engines were also tested and compared to NSPS limits for NO_x, CO and VOC.

With the exception of SO₂, all of the engines tested were found to be within the applicable limits. In the case of Engines 3, 4 and 6, the SO₂ measured was slightly above the hourly SO₂ emission limit of 3.56 lb./hr., with the highest average at Engine 3 being 3.79 lb./hr. (about 6.5% above the limit). As you know, sulfur content in the landfill gas can fluctuate based on conditions in the landfill that are beyond EDM’s ability to control or predict. This result was surprising, however, because the gas generated from the Brent Run Landfill has not been highly variable, ranging from 520 to 675 ppm from May 2019 through February 2020, based on Draeger tube readings, but generally below the 640 ppm level that triggers more frequent H₂S sampling. On the days of the stack test, the Draeger tube results were 650 ppm (December 3), 525 ppm (December 4), 600 ppm (December 5) and 610 ppm (December 6). Lab results for H₂S on December 6 was 545 ppm, indicating that the Draeger tube readings were perhaps higher than the actual H₂S levels in the gas. Typically, Draeger tube testing does show higher H₂S concentration than corresponding Lab results.

Based on the attached calculations by Tetra Tech, EDM did not reach or exceed 40 tons/yr (tpy) SO₂ significant emission increase (SER). Permit-to-Install (PTI) #176-18 was issued by EGLE on April 1, 2019 for the newest Engine #7. This PTI’s limits were based on a PTI Application demonstrating the facility was not subject to Prevention of Significant Deterioration (PSD) permitting (or, that the total project increase would not exceed 40 tons/yr of SO₂). Emission estimates provided at the time of permitting of Engine #7 determined that a rolling SO₂ limit of 71.0 tons/yr would keep the EDL facility below any SER increase. The attached calculations show rolling monthly emissions from April 2019 through April 2020, which demonstrate the facility is not projected to exceed this limit with the operations data collected to date. Rolling monthly

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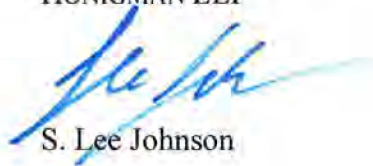
calculations have been calculated with the average of monthly TRS samples as indicated in PTI #176-18. As a full twelve months of data have not yet been collected on the engine emissions totals since the installation of Engine #7 in April 2019, February 2020 through April 2020 have very conservatively been estimated using the maximum engine operating hours and the TRS level of 640 ppmv included in the PTI. Detailed calculations are provided in the attachment.

Based on subsequent Draeger tube readings in January and February 2020 (575 and 600 ppm, respectively) and Tetra Tech's analysis, we do not believe there is any ongoing exceedance of SO2 emission levels at this time. EDM will schedule a retest for SO2 in the near future. In addition, EDM will continue to monitor and record H2S sample results as required in PTI 176-18.

Thank you for your attention to this matter. Please contact me if you have any questions.

Sincerely,

HONIGMAN LLP



S. Lee Johnson

Attachments: Actual-to-Potential Emission Analysis
PTI# 176-18

cc: Mary Ann Dolehanty, EGLE
Eduardo Olageur, EGLE
Jenine Camilleri, EGLE
Chris Ethridge, EGLE

Brad Myott, EGLE
Dan Zimmerman, EDL
Khaled Mahmood, Tetra Tech

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

April 1, 2019

**PERMIT TO INSTALL
176-18**

ISSUED TO
Energy Developments Michigan, LLC

LOCATED AT
8247 Vienna Road (M-57)
Montrose, Michigan

IN THE COUNTY OF
Genesee

STATE REGISTRATION NUMBER
N5987

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: March 19, 2019	
DATE PERMIT TO INSTALL APPROVED: April 1, 2019	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	Michigan Department of Environmental Quality
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
MDEQ	Michigan Department of Environmental Quality
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 Environmental Quality, 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 Environmental Quality. **(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 conditions 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
EUENGINE3	This emission unit, and any replacement of this unit as applicable under R 336.1285(a)(vi), is for a Caterpillar 3520C lean burn reciprocating internal combustion engine (RICE) rated at 2,242 bhp fueled with treated landfill gas to produce electricity.	November 2012	FGICEENGINES, FGRICENSPS, FGRICEMACT
EUENGINE4	This emission unit, and any replacement of this unit as applicable under R 336.1285(a)(vi), is for a Caterpillar 3520C lean burn RICE rated at 2,242 bhp fueled with treated landfill gas to produce electricity.	November 2012	FGICEENGINES, FGRICENSPS, FGRICEMACT
EUENGINE5	This emission unit, and any replacement of this unit as applicable under R 336.1285(a)(vi), is for a Caterpillar 3512 lean burn RICE rated at 1,148 bhp fueled with treated landfill gas to produce electricity.	November 2010	FGICEENGINES, FGRICEMACT
EUENGINE6	This emission unit, and any replacement of this unit as applicable under R 336.1285(a)(vi), is for a Caterpillar 3520C lean burn RICE rated at 2,242 bhp fueled with treated landfill gas to produce electricity.	August/September 2016	FGICEENGINES, FGRICENSPS, FGRICEMACT
EUENGINE7	This emission unit, and any replacement of this unit as applicable under R 336.1285(a)(vi), is for a Caterpillar 3520C lean burn RICE rated at 2,242 bhp fueled with treated landfill gas to produce electricity.	April 2019	FGICEENGINES, FGRICENSPS, 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.

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
FGICEENGINES	Lean burn RICE fueled with treated landfill gas and used to produce electricity.	EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6, EUENGINE7
FGRICENSPS	Non-emergency RICE greater than 500 hp, fueled with landfill gas. Each engine was ordered after June 12, 2006 and manufactured on or after July 1, 2007.	EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7
FGRICEMACT	New, existing, and/or reconstructed non-emergency RICE greater than 500 hp fueled with landfill gas, located at a major source of HAPs. Construction or reconstruction commenced on or after December 19, 2002.	EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6, EUENGINE7

**FGICEENGINES
 FLEXIBLE GROUP CONDITIONS**

DESCRIPTION

Reciprocating internal combustion engine(s) fueled with treated landfill gas and used to produce electricity. This flexible group includes the emission units below and any subsequent replacements for those units as applicable under R 336.1285(a)(vi).

Emission Unit: EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6, EUENGINE7

POLLUTION CONTROL EQUIPMENT

Air-to-fuel ratio controller on each engine.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. NO _x	4.94 pph (Limit applies to each engine)	Hourly	EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7	SC V.1, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3), R 336.2803, R 336.2804
2. NO _x	5.10 pph	Hourly	EUENGINE5	SC V.1, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3), R 336.2803, R 336.2804
3. NO _x	108.7 tpy	12-month rolling time period as determined at the end of each month	FGICEENGINES	SC VI.4, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3)
4. CO	16.30 pph (Limit applies to each engine)	Hourly	EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7	SC V.1, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3), R 336.2804
5. CO	7.84 pph	Hourly	EUENGINE5	SC V.1, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3), R 336.2804
6. SO ₂	3.56 pph (Limit applies to each engine)	Hourly	EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7	SC V.1, SC V.3, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3), R 336.2803, R 336.2804
7. SO ₂	1.96 pph	Hourly	EUENGINE5	SC V.1, SC V.3, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3), R 336.2803, R 336.2804

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
8. SO ₂	71.0 tpy	12-month rolling time period as determined at the end of each month	FGICEENGINES	SC VI.3, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3)
9. PM ₁₀	0.73 pph (Limit applies to each engine)	Hourly	EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7	SC V.1, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3), R 336.2803, R 336.2804
10. PM ₁₀	0.40 pph	Hourly	EUENGINE5	SC V.1, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3), R 336.2803, R 336.2804
11. PM _{2.5}	0.73 pph (Limit applies to each engine)	Hourly	EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7	SC V.1, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3) R 336.2803, R 336.2804
12. PM _{2.5}	0.40 pph	Hourly	EUENGINE5	SC V.1, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3) R 336.2803, R 336.2804
13. PM _{2.5}	14.5 tpy	12-month rolling time period as determined at the end of each month	FGICEENGINES	SC VI.4, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3)
14. VOC (formaldehyde is included in this limit)	4.94 pph (Limit applies to each engine)	Hourly	EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7	SC V.1, SC VI.4, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3)
15. VOC (formaldehyde is included in this limit)	1.04 pph	Hourly	EUENGINE5	SC V.1, SC VI.4, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3)
16. VOC (formaldehyde is included in this limit)	91.1 tpy	12-month rolling time period as determined at the end of each month	FGICEENGINES	SC VI.4, SC VI.5, SC VI.6	R 336.1205(1)(a) & (3)
17. Formaldehyde	2.10 pph (Limit applies to each engine)	Hourly	EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7	SC V.2, SC VI.5, SC VI.6	R 336.1225(2)
18. Formaldehyde	0.75 pph	Hourly	EUENGINE5	SC V.2, SC VI.5, SC VI.6	R 336.1225(2)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. Treated Landfill Gas	1,546.26 MMscf per year	12-month rolling time period as determined at the end of each calendar month	FGICEENGINES	SC VI.5	R 336.1205(1)(a) & (3)

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only burn landfill gas in FGICEENGINES. The landfill gas must be treated in a system which complies with 40 CFR 60.752(b)(2)(iii)(C). **(R 336.1225, R 336.1331, R 336.1702, 40 CFR 60.752(b)(2)(iii)(C))**
2. Within 30 days prior to startup of EUENGINE7 of FGICEENGINES, the permittee shall submit to the AQD District Supervisor, for review and approval, a revised malfunction abatement/preventative maintenance plan for FGICEENGINES. After approval of the malfunction abatement/preventative maintenance plan by the AQD District Supervisor, the permittee shall not operate FGICEENGINES 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, R 336.2803, R 336.2804)**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall not operate each engine of FGICEENGINES 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 EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7 shall not exceed 2,242 hp each, as specified by the equipment manufacturer. **(R 336.1205(1)(a), R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
3. The permittee shall equip and maintain FGICEENGINES with a device to monitor and record the daily fuel usage. **(R 336.1205(1)(a), R 336.1225, R 336.1702(a))**

V. TESTING/SAMPLING

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

1. By December 31, 2019, the permittee shall verify emission rates for each engine in FGICEENGINES for NO_x, CO, VOC, SO₂, PM10, and PM2.5 and within every 5 years thereafter from the date of completion of the most recent stack test, 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
NO _x	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
SO ₂	40 CFR Part 60, Appendix A
PM10 / PM2.5	40 CFR Part 51, Appendix M

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. If a recent (less than 1 year) NO_x and/or CO stack test from any engine has been verified by the AQD, the permittee may use it for compliance with this initial test only. 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 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804)**

2. By December 31, 2019, the permittee shall verify formaldehyde emission rates from the three engines EUENGINE3 or EUENGINE4, EUENGINE5, and EUENGINE7 of FGICEENGINES and within every 5 years from the date of completion of the most recent stack test, by testing at owner's expense, in accordance with Department requirements. Thereafter, the permittee may petition the AQD District Office to test a representative engine(s) for FGICEENGINES. 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)**

3. Upon issuance of this PTI, the permittee shall verify the hydrogen sulfide (H₂S) or total reduced sulfur (TRS) content of the landfill gas burned in FGICEENGINES 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 640 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 consecutive weekly samples) is maintained below 640 ppmv for one month after an exceedance, the permittee may resume monthly monitoring and recordkeeping. If after one year, each of the monthly concentrations of the H₂S (TRS equivalent) of the landfill gas are below 640 ppm, the permittee may petition the AQD District Supervisor to reduce the frequency of gas sampling. The AQD must approve the frequency of sampling before it is initiated. 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, 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 336.2803, R 336.2804)**
2. The permittee shall continuously monitor and record, in a satisfactory manner, the landfill gas usage for FGICEENGINES. **(R 336.1205, R 336.2803, R 336.2804)**
3. The permittee shall calculate and record the SO₂ emission rates from FGICEENGINES on a monthly and 12-month rolling basis, using the equation in Appendix A. The calculations shall utilize, at a minimum, weekly and/or monthly gas sampling data collected (SC V.3), the monthly gas usage for each engine, monthly hours of operation for each engine, and the ratio of total sulfur to sulfur as H₂S from the most recent laboratory test. All records shall be kept on file at the facility and make them available to the Department upon request. **(R 336.1205, R 336.2803, R 336.2804)**
4. The permittee shall calculate and record the NO_x, PM_{2.5}, and VOC (including formaldehyde) emission rate from FGICEENGINES on a monthly and 12-month rolling basis, using Appendix A. **(R 336.1205(3), R 336.1702(a))**
5. The permittee shall maintain the following record for each engine in FGICEENGINES. 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; and
 - 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, R 336.2803, R 336.2804)**

6. The permittee shall maintain records of all information necessary for all notifications and reports for each engine in FGICEENGINES, 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 336.2802, R 336.2803, R 336.2804)

VII. REPORTING

1. The permittee shall notify the AQD district office within one week of when the frequency of the gas sampling changes for any reason. (R 336.1201(3))
2. 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 EUENGINE7 of FGICEENGINES. (R 336.1201(7)(a))
3. In accordance with R 336.1285(2)(a)(vi) and R 336.1278, engine replacements can only be done under a normal maintenance program. If any engine in FGICEENGINES is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall notify the AQD District Supervisor of such 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, R 336.2803, R 336.2804)

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. SVICEENG3	14	75	R 336.1225, R 336.2803, R 336.2804
2. SVICEENG4	14	75	R 336.1225, R 336.2803, R 336.2804
3. SVICEENG5	12	30	R 336.1225, R 336.2803, R 336.2804
4. SVICEENG6	14	70	R 336.1225, R 336.2803, R 336.2804
5. SVICEENG7	14	70	R 336.1225, R 336.2803, R 336.2804

IX. OTHER REQUIREMENT(S)

NA

Footnotes:

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

**FGRICENSPS
 FLEXIBLE GROUP CONDITIONS**

DESCRIPTION

Non-emergency RICE greater than 500 hp, fueled with landfill gas. Each engine was ordered after June 12, 2006 and manufactured on or after July 1, 2007.

Emission Unit: EUENGINE3, EUENGINE4, EUENGINE6, EUENGINE7

POLLUTION CONTROL EQUIPMENT

Air-to-fuel ratio controller on each engine.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. NO _x ¹	2.0 g/hp-hr or 150 ppmvd at 15% O ₂	Hourly	Each engine in FGRICENSPS	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60
2. NO _x ²	3.0 g/hp-hr or 150 ppmvd at 15% O ₂	Hourly	Each engine in FGRICENSPS	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60
3. CO ^{1,2}	5.0 g/hp-hr or 610 ppmvd at 15% O ₂	Hourly	Each engine in FGRICENSPS	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60
4. VOC (per the NSPS, formaldehyde is not included) ^{1,2}	1.0 g/hp-hr or 80 ppmvd at 15% O ₂	Hourly	Each engine in FGRICENSPS	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60

¹For engines manufactured after 7/1/2010: NO_x = 2.0 g/hp-hr or 150 ppmvd at 15% O₂.

²For engines manufactured after 7/1/2007: NO_x = 3.0 g/hp-hr or 220 ppmvd at 15% O₂.

II. MATERIAL LIMIT(S)

NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall operate and maintain each engine in FGRICENSPS such that it meets the emission limits established, over the entire life of the engine. **(40 CFR 60.4234, 40 CFR 60.4243(b))**
2. If the permittee purchased a non-certified engine or a certified engine operating in a non-certified manner, the permittee shall keep a maintenance plan for each engine in FGRICENSPS and shall, to the extent practicable, maintain and operate each engine in a manner consistent with good air pollution control practice for minimizing emissions. **(40 CFR 60.4243(b))**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall equip and maintain each engine in FGRICENSPS with non-resettable hours meters to track the operating hours. **(40 CFR 60.4243)**

V. TESTING/SAMPLING

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

1. Except as provided in 40 CFR 60.4243(b), the permittee shall conduct an initial performance test for each engine in FGRICENSPS 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), unless the engine(s) have been certified by the manufacturer in accordance with 40 CFR Part 60 Subpart JJJJ and the permittee maintains the engine as required by 40 CFR 60.4243(a)(1). If a performance test is required, the performance tests shall be conducted according to 40 CFR 60.4244. No less than 30 days prior to any 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)**

VI. MONITORING/RECORDKEEPING

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

1. If the permittee purchased a non-certified engine or a certified engine operating in a non-certified manner, the permittee shall keep a maintenance plan and records of conducted maintenance for each engine in FGRICENSPS and shall, to the extent practicable, maintain and operate each engine in a manner consistent with good air pollution control practice for minimizing emissions. **(40 CFR 60.4243(b))**

VII. REPORTING

1. The permittee shall submit an initial notification as required by 40 CFR 60.7(a)(1) for each engine in FGRICENSPS if the engine(s) installed is/are not certified by an engine manufacturer to meet the emission standards in 40 CFR 60.4231. The notification shall include the information below, as specified in 40 CFR 60.4245 (c)(1) through (5):
 - a. Name and address of the owner or operator; **(40 CFR 60.4245(c)(1))**
 - b. The address of the affected source; **(40 CFR 60.4245(c)(2))**
 - c. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement; **(40 CFR 60.4245(c)(3))**
 - d. Emission control equipment; and **(40 CFR 60.4245(c)(4))**
 - e. Fuel used. **(40 CFR 60.4245(c)(5))**

The permittee shall submit the initial notification to the AQD District Supervisor in an acceptable format within 30 days of commencing construction of any engine in FGRICENSPS. **(40 CFR Part 60 Subpart JJJJ)**

VIII. STACK/VENT RESTRICTION(S)

NA

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 each engine in FGRICENSPS. **(40 CFR Part 60 Subparts A and JJJJ)**

Footnotes:

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

FGRICEMACT FLEXIBLE GROUP CONDITIONS

DESCRIPTION

New, existing, and/or reconstructed non-emergency RICE greater than 500 hp fueled with landfill gas, located at a major source of HAPs. Construction or reconstruction commenced on or after December 19, 2002.

Emission Unit: EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6, EUENGINE7

POLLUTION CONTROL EQUIPMENT

Air-to-fuel ratio controller on each engine.

I. EMISSION LIMIT(S)

NA

II. MATERIAL LIMIT(S)

NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. Each engine in FGRICEMACT shall operate in a manner which reasonably minimizes HAP emissions. **(40 CFR 63.6625(c))**
2. Each engine in FGRICEMACT shall operate in a manner which minimizes time spent at idle during startup and minimize the startup time to a period needed for appropriate and safe loading of each engine, not to exceed 30 minutes. **(40 CFR 63.6625(h))**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. FGRICEMACT shall equip and maintain a fuel meter to monitor and record the daily fuel usage and volumetric flow rate of the landfill gas used. **(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 engines in FGRICEMACT, which fire landfill gas equivalent to 10 percent or more of the gross heat input on an annual basis, must monitor and record the daily fuel usage with separate fuel meters to measure the volumetric flow rate of each fuel. **(40 CFR 63.6625(c))**

VII. REPORTING

1. The permittee shall submit an annual report for FGRICEMACT in accordance with Table 7 of 40 CFR Part 63, Subpart ZZZZ to the appropriate AQD district office by no later than January 31.

The following information shall be included in this annual report:

- a. The fuel flow rate and the heating values that were used in the permittee's calculations. Also, the permittee must demonstrate that the percentage of heat input provided by landfill gas or digester 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))**
(40 CFR 63.6650(g), 40 CFR 63.6650(b)(5))

VIII. STACK/VENT RESTRICTION(S)

NA

IX. OTHER REQUIREMENT(S)

1. The permittee shall comply with the provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR, Part 63, Subpart A and Subpart ZZZZ, as they apply to each engine in FGRICEMACT. **(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).

APPENDIX 1 Procedures for Calculating Emissions

The permittee shall demonstrate compliance with the emission limits in this permit by using the following methods.

Vendor Data or Stack Testing:

The permittee shall use emission factors from source specific testing (if stack test data is available, use most recent stack test data) or vendor data, as available for each emission unit included in FGICEENGINES. The permittee may use emission factors contained in the most recent AP-42 (Compilation of Air Pollutant Emission Factors) or the most recent FIRE (Factor Information Retrieval) database, if vendor or stack testing data is not available. If emission factors from other sources are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions. The permittee shall document the source of each emission factor used in the calculations.

Calculation for Monthly SO₂ Emissions using gas sampling:

The following calculation for SO₂ emissions shall utilize the monthly average of the weekly (or daily, if required) H₂S concentration measurements from test data collected, the monthly gas usage, monthly hours of operation, and the ratio of total sulfur to sulfur as H₂S from the most recent laboratory test.

SO₂ Emissions (tons per month)

$$\begin{aligned} &= \frac{\text{Monthly or Monthly Average of Weekly TRS Gas Samples (ppmv)}}{1,000,000} \times \frac{1.1733 \text{ mols Sulfur}}{1 \text{ ft}^3} \times \frac{34.08 \text{ grams}}{1 \text{ mol Sulfur}} \times \frac{1 \text{ pound}}{453.59 \text{ grams}} \\ &\times \frac{1 \text{ ton}}{2,000 \text{ pounds}} \times \frac{1.88 \text{ SO}_2}{\text{H}_2\text{S}} \text{ Molecular Weight Ratio} \times \text{Actual Monthly Landfill Gas Usage (ft}^3\text{/month)} \end{aligned}$$

Energy Developments Michigan, LLC
Record Keeping Requirements
Rolling Monthly Emissions

		Engines 3, 4, 5, 6, and 7		Engine 3 CAT G3520C		Engine 4 - CAT G3520 C		Engine 5 - CAT G3512		Engine 6 - G3520		Engine 7 - G3520	
		SO2**		SO2		SO ₂		SO ₂		SO ₂		SO ₂	
		Tons/ month	Rolling ton/12-month	Tons/month	Rolling ton/12-month	Tons/month	Rolling ton/12-month	Tons/month	Rolling ton/12-month	Tons/month	Rolling ton/12-month	Tons/month	Rolling ton/12-month
2019	February			0.89	12.16	0.93	12.19	0.45	6.60	0.93	12.12		
	March			1.04	12.28	1.04	12.17	0.53	6.54	1.05	12.10		
	April	6.49	6.49	1.45	12.70	1.47	12.61	0.80	6.77	1.48	12.57	1.28	1.28
	May	5.85	12.33	1.29	12.91	1.31	12.84	0.72	6.90	1.25	12.80	1.28	2.57
	June	4.97	17.39	1.19	13.09	1.23	13.34	0.47	6.96	1.22	13.02	0.85	3.44
	July	5.45	22.84	1.23	13.26	1.23	13.51	0.53	6.90	1.25	13.40	1.21	4.65
	August	4.23	27.07	1.02	13.22	1.05	13.49	0.03	6.34	1.06	13.40	1.07	5.72
	September	4.67	31.74	1.15	13.45	1.17	13.67	0.00	5.79	1.15	13.55	1.20	6.92
	October	4.04	35.79	1.24	13.64	1.28	13.89	0.24	5.45	0.08	12.58	1.21	8.13
	November	3.97	39.76	1.18	13.83	1.14	14.00	0.44	5.37	0.08	11.70	1.12	9.25
	December	4.89	44.57	1.24	13.98	1.25	14.15	0.63	5.41	0.09	10.71	1.17	10.40
	2020	January	4.38	44.06	1.15	15.12	1.18	15.33	0.62	6.03	1.09	11.80	1.53
February*		5.64	54.59	1.24	15.31	1.24	15.53	0.68	6.14	1.24	11.99	1.24	13.17
March*		6.03	60.61	1.32	15.74	1.32	15.92	0.73	6.41	1.32	12.39	1.32	14.49
April*		5.83	59.96	1.28	15.99	1.28	16.16	0.71	6.59	1.28	12.61	1.28	15.77

*Max PTE (640 ppmv TRS and 100% engine operating hours) assumed