

20 January 2016

Mr. Efim Monosov
c/o Mr. Rick Mandile
SAGE Environmental, Inc.
172 Armistice Blvd.
Pawtucket, RI 02860

Dear Mr. Monosov:

The Department of Environmental Management, Office of Air Resources has reviewed and approved your application for the construction, installation and operation of a biogas-to-electricity facility to be located at Plat 43, Lot 2, at the corner of Scituate Avenue and Old Pocasset Road in Johnston, RI.

Enclosed is a minor source permit issued pursuant to our review of your application (Approval Nos. 2302-2312).

Any source with the potential to emit greater than major source thresholds as defined under Air Pollution Control Regulation No. 29, "Operating Permits" is subject to the Operating Permit Program. Your facility is currently subject to the Operating Permit Program as an Emissions Cap Source, with allowable emissions restricted to below the major source threshold. An emissions cap means any emission limitation or physical or operational limitation, imposed in a federally enforceable document that establishes the maximum quantity of emissions which may be released from a stationary source. The Office of Air Resources considers this minor source permit an emissions cap. Air Pollution Control Regulation No. 28, "Operating Permit Fees" requires stationary sources with an emissions cap to pay an annual compliance/assurance fee of \$350.00. Notification concerning the payment of this fee will be mailed to you during the fall of this year.

If there are any questions concerning this permit, please contact me at (401)-222-2808, extension 7028 or at aleida.whitney@dem.ri.gov.

Sincerely,

Aleida M. Whitney
Senior Air Quality Specialist
Office of Air Resources

cc: Johnston Building Official

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

MINOR SOURCE PERMIT

ORBIT ENERGY RHODE ISLAND, LLC

APPROVAL Nos. 2302-2312

Pursuant to the provisions of Air Pollution Control Regulation No. 9, this minor source permit is issued to:

Orbit Energy Rhode Island, LLC

For the following:

Installation of a 2.0 MW Caterpillar lean-burn engine, Model No. MWM TCG 2020 V20 2.000K (Approval No. 2302) and a 1.2 MW Caterpillar lean-burn engine, Model No. MWM TCG 2020 V12 1.200K (Approval No. 2303). The engines shall fire biogas containing 200 ppm hydrogen sulfide or less. Each engine is equipped with an air pollution control system consisting of a Selective Catalytic Reduction (SCR) system and an oxidation catalyst (Approval Nos. 2304-2307). Installation of an Austep odor control wet scrubber and biofilter to control odors generated from the Reception Building (Approval Nos. 2308 & 2309). Installation of one 22.37 MMBtu/hr and one 16.77 MMBtu/hr Austep enclosed flares (Approval Nos. 2310 & 2311) to burn excess biogas. Installation of a wet, packed tower Austep scrubber (Approval No. 2312) to control ammonia emissions from the digestate dryer.

Located at: *Plat 43, Lot 2, corner of Scituate Ave. & Old Pocasset Road,*
Johnston, RI

This permit shall be effective from the date of its issuance and shall remain in effect until revoked by or surrendered to the Department. This permit does not relieve *Orbit Energy Rhode Island, LLC* from compliance with applicable state and federal air pollution control rules and regulations. The design, construction and operation of this equipment shall be subject to the attached permit conditions and emission limitations.

Douglas L. McVay, Chief
Office of Air Resources

Date of Issuance

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

Permit Conditions and Emission Limitations

Orbit Energy Rhode Island, LLC

Approval Nos. 2302-2310

I. The following requirements are applicable to:

- The Caterpillar, Model No. MWM TCG 2020 V20 2.000K, 2.0 MW, lean burn, spark ignition internal combustion engine (Approval No. 2302), equipped with SCR (Approval No. 2304) and an oxidation catalyst (Approval No. 2305).
- The Caterpillar, Model No. MWM TCG 2020 V12 1.200K, 1.2 MW, lean burn, spark ignition internal combustion engine (Approval No. 2303), equipped with SCR (Approval No. 2306) and an oxidation catalyst (Approval No. 2307).

A. Emission Limitations

1. 2.0 MW Unit

a. Nitrogen Oxides (as Nitrogen Dioxide (NO₂))

The emission rate of nitrogen oxides discharged to the atmosphere from the engine exhaust shall not exceed 0.50 pounds per megawatt-hour (lb/MWh) or 1.00 pounds per hour, whichever is more stringent.

b. Carbon Monoxide (CO)

The emission rate of carbon monoxide discharged to the atmosphere from the engine exhaust shall not exceed 0.60 pounds per megawatt-hour (lbs/MWh) or 1.20 pounds per hour, whichever is more stringent.

c. Volatile Organic Compounds (VOC)

The emission rate of volatile organic compounds discharged to the atmosphere from the engine exhaust shall not exceed 0.91 pounds per megawatt-hour (lb/MWh) or 1.82 pounds per hour, whichever is more stringent.

d. Sulfur Dioxide (SO₂)

- (1) The sulfur content of all biogas burned in the engine shall not exceed 200 ppm by volume, dry.
- (2) The emission rate of sulfur dioxide discharged to the atmosphere from the engine exhaust shall not exceed 1.18 pounds per hour.

e. Particulate Matter (as PM)

The emission rate of particulate matter discharged to the atmosphere from the engine exhaust shall not exceed 0.16 pounds per megawatt-hour (lb/MWh) or 0.32 pounds per hour, whichever is more stringent.

f. Ammonia (NH₃)

- (1) The concentration of ammonia discharged to the atmosphere from the engine exhaust shall not exceed 5 ppmv, on a dry basis, corrected to 15 percent O₂ (one-hour average).
- (2) The emission rate of ammonia discharged to the atmosphere from the engine exhaust shall not exceed:
 - (a) 0.13 pounds per hour
 - (b) 3.12 pounds per day
 - (c) 1092.78 pounds in any consecutive 12-month period

g. Listed Toxic Air Contaminants

The emissions of acrolein, benzene, 1,3-butadiene, ethylene dibromide and formaldehyde discharged to the atmosphere from the engine exhaust shall not exceed the levels specified in the following table:

Pollutant	lbs/hour	lbs/day	lbs/year
Acrolein	1.69 x 10 ⁻⁴	--	1.42
Benzene	0.020	0.486	170.00
1,3-Butadiene	--	--	2.43
Ethylene dibromide	--	1.24 x 10 ⁻³	0.435
Formaldehyde	0.021	0.514	180.00

h. Opacity

Visible emissions from the engine exhaust shall not exceed 10% opacity.

2. 1.2 MW Unit

a. Nitrogen Oxides (as Nitrogen Dioxide (NO₂))

The emission rate of nitrogen oxides discharged to the atmosphere from the engine exhaust shall not exceed 0.50 pounds per megawatt-hour (lb/MWh) or 0.60 pounds per hour, whichever is more stringent.

b. Carbon Monoxide (CO)

The emission rate of carbon monoxide discharged to the atmosphere from the engine exhaust shall not exceed 0.60 pounds per megawatt-hour (lbs/MWh) or 0.72 pounds per hour, whichever is more stringent.

c. Volatile Organic Compounds (VOC)

The emission rate of volatile organic compounds discharged to the atmosphere from the engine exhaust shall not exceed 0.91 pounds per megawatt-hour (lb/MWh) or 1.11 pounds per hour, whichever is more stringent.

d. Sulfur Dioxide (SO₂)

(1) The sulfur content of all biogas burned in the engine shall not exceed 200 ppm by volume, dry.

(2) The emission rate of sulfur dioxide discharged to the atmosphere from the engine exhaust shall not exceed 0.71 pounds per hour.

e. Particulate Matter (as PM)

The emission rate of particulate matter discharged to the atmosphere from the engine exhaust shall not exceed 0.16 pounds per megawatt-hour (lb/MWh) or 0.19 pounds per hour, whichever is more stringent.

- f. Ammonia (NH₃)
- (1) The concentration of ammonia discharged to the atmosphere from the engine exhaust shall not exceed 5 ppmv, on a dry basis, corrected to 15 percent O₂ (one-hour average).
 - (2) The emission rate of ammonia discharged to the atmosphere from the engine exhaust shall not exceed:
 - (a) 0.08 pounds per hour
 - (b) 1.92 pounds per day
 - (c) 672.00 pounds in any consecutive 12-month period

g. Listed Toxic Air Contaminants

The emissions of acrolein, benzene, 1,3-butadiene, ethylene dibromide and formaldehyde discharged to the atmosphere from the engine exhaust shall not exceed the levels specified in the following table:

Pollutant	lbs/hour	lbs/day	lbs/year
Acrolein	1.02 x 10 ⁻⁴	--	0.853
Benzene	0.012	0.291	102.00
1,3-Butadiene	--	--	1.46
Ethylene dibromide	--	7.47 x 10 ⁻⁴	0.261
Formaldehyde	0.013	0.312	108.0

h. Opacity

Visible emissions from the engine exhaust shall not exceed 10% opacity.

B. Operating Requirements

1. Biogas shall be the only fuel fired in the engines.
2. All biogas shall be directed through the hydrogen sulfide (H₂S) pretreatment system prior to being fired in the engines.
3. The maximum firing rate for the 2.0 MW engine shall not exceed 35,000 ft³/hr of biogas.
4. The maximum firing rate for the 1.2 MW engine shall not exceed 21,000 ft³/hr of biogas.

5. Each engine shall not operate more than 8400 hours in any consecutive 12-month period.
6. Each engine must be equipped with an automatic fail-safe block valve, which must be designed to stop the flow of biogas in the event of an engine failure.
7. In the event that an engine is not operational, all biogas from the anaerobic digester system shall be routed to a flare.
8. There shall be no bypassing of the air pollution control system for each engine during start-up, operation, or shutdown.
9. The owner/operator shall maintain and operate the hydrogen sulfide (H₂S) pretreatment system, and each SCR and oxidation catalyst system according to the manufacturer's design specifications and operating procedures.

C. Monitoring Requirements

1. Each engine shall be equipped with a non-resettable elapsed time meter to indicate, in cumulative hours, the elapsed engine operating time for the unit.
2. Each generator shall be equipped with a kilowatt-hour meter to indicate, in cumulative kilowatt-hours, the power generated by the engine-generator set.
3. Biogas flow to each engine shall be continuously measured and recorded.
4. Each engine shall be equipped with an air-to-fuel ratio controller.
5. The owner/operator shall continuously measure and record the inlet temperature of each SCR system and oxidation catalyst system.
6. The owner/operator shall continuously measure the pressure drop across the catalyst bed of each SCR system and oxidation catalyst system.
7. The owner/operator shall install and operate an alarm system on the urea injector in such a manner that an operator will be alerted if the urea flow is outside the designed manufacturer's design range.
8. The owner/operator shall install, operate, and maintain a continuous parameter monitoring system (CPMS) for each engine according to the requirements in paragraphs (a) through (c) below. The CPMS system shall monitor the SCR urea solution injection rate and operating temperature at the SCR inlet in order to maintain these parameters within the ranges recommended by the manufacturer to achieve compliance with the limits in this permit.
 - a. The CPMS must collect data at least once every 15 minutes.

- b. The temperature sensor must have a minimum tolerance of 2.8 degrees Celsius (5 degrees Fahrenheit) or 1 percent of the measurement range, whichever is larger.
 - c. Urea shall not be injected during start-up or shutdown unless the catalyst bed is at, or above, the manufacturer's specified minimum operating temperature of 632°F (350°C).
9. The owner/operator shall prepare a site-specific monitoring plan for the CPMS that addresses the monitoring system design, data collection, and the quality assurance and quality control elements outlined in paragraphs (a) through (f) of this section.
- a. The performance criteria and design specifications for the monitoring system equipment, including the sample interface, detector signal analyzer, and data acquisition and calculations;
 - b. Sampling interface (*e.g.*, thermocouple) location such that the monitoring system will provide representative measurements;
 - c. Equipment performance evaluations, system accuracy audits, or other audit procedures;
 - d. Ongoing operation and maintenance procedures.
 - e. At least annually the owner/operator shall conduct the CPMS equipment performance evaluation, system accuracy audits, or other audit procedures specified in your site-specific monitoring plan.
 - f. The owner/operator shall conduct a performance evaluation of each CPMS in accordance with the site-specific monitoring plan.
10. The owner/operator shall monitor the ammonia emissions from each SCR system according to the following schedule:
- a. For the first 18,000 hours of catalyst life, the ammonia concentration (ppm) and mass emission rate (lb/hr) after the SCR system shall be measured during the initial and each subsequent performance test required by Condition D.1 using Conditional Test Method 27 (CTM-027) or another method approved by the Office of Air Resources.
 - b. After 18,000 hours of catalyst life, the ammonia concentration (ppm) shall be measured every 750 operating hours until the SCR catalyst is replaced. CTM-027 is not required for this periodic monitoring. The test method used for this periodic monitoring shall

be approved by the Office of Air Resources prior to the performance of this monitoring.

This testing schedule may be revised by the Office of Air Resources if it determines, based on the ammonia emissions testing, that the above schedule is not sufficient to monitor compliance with Condition I.A.1.f and I.A.2.f of this permit.

D. Compliance Demonstration/Stack Testing

1. Within 180 days of start-up, initial performance testing shall be conducted for each engine for nitrogen oxides, carbon monoxide, volatile organic compounds, and ammonia.

For nitrogen oxides, carbon monoxide, and volatile organic compounds, performance testing shall be conducted in accordance with 40 CFR 60.4244. The test report shall indicate the engine power in (kW and BHP) during the test and the biogas heating value. To demonstrate compliance with this permit, the performance test results shall also be reported in lb/hr and lb/MWh. To demonstrate compliance with NSPS 40 CFR Part 60, Subpart JJJJ emission limits, the performance test results shall also be reported in g/bhp-hr.

For ammonia, performance testing shall be conducted using Conditional Test Method 27 (CTM-027) or another method approved by the USEPA and the Director.

Thereafter, emissions testing for each engine shall be conducted every 8760 hours of operation or every 3 years, whichever is first, to determine compliance with the nitrogen oxides, carbon monoxide, volatile organic compounds, and ammonia emission limitations. Each emission test for nitrogen oxides, carbon monoxide, and volatile organic compounds shall be conducted in accordance with the procedures specified in 40 CFR 60.4244. Each emission test for ammonia shall be conducted using Conditional Test Method 27 (CTM-027) or another method approved by the USEPA and the Director.

2. Additionally, during the initial performance test, the owner/operator shall measure the emissions of sulfur dioxide, particulate matter, 1,3-butadiene, acrolein, benzene, ethylene dibromide and formaldehyde from each engine to demonstrate compliance with the emission limitations in Conditions I.A.1.d-g and I.A.2.d-g of this permit.
3. A stack testing protocol shall be submitted to the Office of Air Resources and the USEPA at least 60 days prior to the performance of any emissions test. The owner/operator shall provide the Office of Air Resources and the USEPA at least 60 days prior notice of any emissions test.

4. All test procedures used for stack testing shall be approved by the Office of Air Resources and the USEPA prior to the performance of any stack test.
5. The owner/operator shall install any and all test ports or platforms necessary to conduct the required stack testing, provide safe access to any platforms and provide the necessary utilities for sampling and testing equipment.
6. All testing shall be conducted under operating conditions deemed acceptable and representative for the purpose of assessing compliance with the applicable emission limitations.
7. All emissions testing must be observed by the Office of Resources to be considered acceptable, unless the Office of Air Resources provides written authorization to the owner/operator to conduct the testing without an observer present.
8. A final report of the results of the initial and subsequent performance tests shall be submitted to the Office of Air Resources and the USEPA no later than 60 days following completion of the testing.

E. Recordkeeping and Reporting

1. The owner/operator shall, on a monthly basis, no later than 15 days after the first of each month, determine and record the following for each engine for the previous month:
 - a. The hours of operation and the total hours of operation for the prior consecutive 12-month period.
 - b. The fuel use.
 - c. The gross electrical power generated in kilowatt-hours.

The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources or its authorized representative and EPA upon request.

2. The owner/operator shall notify the Office of Air Resources, in writing, within 15 days of determining that the hours of operation in any consecutive 12-month period exceeds 8,400 hours for each engine.
3. The owner/operator shall, on a daily basis, measure and record the O₂ content in the exhaust of each engine and the date, time and measurement shall be recorded. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources or its authorized representative and EPA upon request.

4. The owner/operator shall, on a daily basis, measure and record the pressure drop across each catalyst bed and the date, time and measurement shall be recorded. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources or its authorized representative and EPA upon request.
5. The owner/operator shall maintain the following records:
 - a. The inlet temperature of each SCR system and oxidation catalyst system;
 - b. All records monitored and recorded by each CPMS including the urea solution injection rate, date, and time.
6. The owner/operator shall notify the Office of Air Resources in writing, within 15 days of determining that the urea solution injection rate was outside of the range recommended by the manufacturer. The date, time, duration of exceedance, and the measured injection rate shall be provided.
7. The owner/operator shall, on a monthly basis, no later than 15 days after the first of the month, determine the total quantity of acrolein, ammonia, benzene, 1,3-butadiene, ethylene dibromide and formaldehyde discharged to the atmosphere from each engine during the previous month. Hourly emission averages shall be calculated for acrolein, ammonia, benzene and formaldehyde. These hourly averages shall be used for comparison to the hourly emission limitations. Daily emission totals shall be calculated for ammonia, benzene, ethylene dibromide, and formaldehyde to be used for comparison the daily emission limitations. Monthly and annual emission averages shall be calculated for acrolein, ammonia, benzene, 1,3-butadiene, ethylene dibromide and formaldehyde to be used for comparison to the annual emission limitations. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
8. The owner/operator shall notify the Office of Air Resources in writing, within 15 days of determining that the total quantity of acrolein, ammonia, benzene, 1,3-butadiene, ethylene dibromide or formaldehyde, discharged to the atmosphere from the 2.0 MW engine or the 1.2 MW engine exceeds the hourly, daily, or annual emission limitations.
9. The owner/operator shall develop a maintenance plan for the engines and air pollution control systems and shall maintain records of all maintenance conducted.
10. The owner/operator shall notify the Office of Air Resources in writing of the date whenever the catalyst is replaced for each SCR system.

11. The owner/operator shall notify the Office of Air Resources in writing of the date whenever the catalyst is replaced for each oxidation catalyst system.

F. Other Permit Conditions

1. The emission limitations of Conditions A.1 and A.2 shall not apply during engine startup/shutdown conditions. Engine startup shall be defined as the first ten minutes of firing following the initiation of firing. Engine shutdown shall be defined as the cessation of operation for any purpose.
2. The owner/operator is subject to the requirements of 40 CFR 60, Subpart A (General Provisions) and Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines). Compliance with all applicable provisions therein is required.

II. The following requirements are applicable to:

- The 22.37 MMBtu/hr Austep Enclosed Flare (Approval No. 2310)
- The 16.77 MMBtu/hr Austep Enclosed Flare (Approval No. 2311)

A. Emission Limitations

1. 22.37 MMBtu/hr Unit

- a. Nitrogen Oxides (as Nitrogen Dioxide (NO₂))

The emission rate of nitrogen oxides discharged to the atmosphere from the flare shall not exceed 0.24 pounds per million BTU or 5.44 pounds per hour, whichever is more stringent.

- b. Carbon Monoxide (CO)

The emission rate of carbon monoxide discharged to the atmosphere from the flare shall not exceed 0.12 pounds per million BTU or 2.72 pounds per hour, whichever is more stringent.

- c. Volatile Organic Compounds (VOC)

The emission rate of volatile organic compounds discharged to the atmosphere from the flare shall not exceed 0.02 pounds per million BTU or 0.54 pounds per hour, whichever is more stringent.

d. Sulfur Dioxide (SO₂)

- (1) The sulfur content of all biogas burned in the flare shall not exceed 200 ppm by volume, dry.
- (2) The emission rate of sulfur dioxide discharged to the atmosphere from the flare shall not exceed 1.26 pounds per hour, whichever is more stringent.

e. Particulate Matter (as PM)

The emission rate of particulate matter discharged to the atmosphere from the flare shall not exceed 0.02 pounds per million BTU or 0.34 pounds per hour, whichever is more stringent.

f. Listed Toxic Air Contaminants

The emissions of the following listed toxic air contaminants discharged to the atmosphere from the flare shall not exceed the levels specified in the following table:

Pollutant	lbs/hour	lbs/day	lbs/year
Acrolein	5.53×10^{-5}	--	0.031
Benzene	1.64×10^{-4}	3.94×10^{-3}	0.092
Ethylene dibromide	--	8.57×10^{-6}	2.00×10^{-4}
Formaldehyde	3.48×10^{-4}	8.36×10^{-3}	0.195

g. Opacity

The flare shall be operated with no visible emissions.

2. 16.77 MMBtu/hr Unit

a. Nitrogen Oxides (as Nitrogen Dioxide (NO₂))

The emission rate of nitrogen oxides discharged to the atmosphere from the flare shall not exceed 0.24 pounds per million BTU or 4.08 pounds per hour, whichever is more stringent.

b. Carbon Monoxide (CO)

The emission rate of carbon monoxide discharged to the atmosphere from the flare shall not exceed 0.12 pounds per million BTU or 2.04 pounds per hour, whichever is more stringent.

c. Volatile Organic Compounds (VOC)

The emission rate of volatile organic compounds discharged to the atmosphere from the flare shall not exceed 0.02 pounds per million BTU or 0.41 pounds per hour, whichever is more stringent.

d. Sulfur Dioxide (SO₂)

(1) The sulfur content of all biogas burned in the flare shall not exceed 200 ppm by volume, dry.

(2) The emission rate of sulfur dioxide discharged to the atmosphere from the flare shall not exceed 0.94 pounds per hour, whichever is more stringent.

e. Particulate Matter (as PM)

The emission rate of particulate matter discharged to the atmosphere from the flare shall not exceed 0.02 pounds per million BTU or 0.25 pounds per hour, whichever is more stringent.

f. Listed Toxic Air Contaminants

The emissions of the following listed toxic air contaminants discharged to the atmosphere from the flare shall not exceed the levels specified in the following table:

Pollutant	lbs/hour	lbs/day	lbs/year
Acrolein	4.15 x 10 ⁻⁵	--	0.023
Benzene	1.23 x 10 ⁻⁴	2.95 x 10 ⁻³	0.069
Ethylene dibromide	--	6.44 x 10 ⁻⁶	1.50 x 10 ⁻⁴
Formaldehyde	2.61 x 10 ⁻⁴	6.27 x 10 ⁻³	0.146

g. Opacity

The flare shall be operated with no visible emissions.

B. Operating Requirements

1. Biogas shall be the only fuel combusted in each flare.
2. All biogas shall be directed through the hydrogen sulfide (H₂S) pretreatment system prior to being combusted in the flares.
3. Each flare shall not operate more than 560 hours in any consecutive 12-month period.

4. Excess biogas generated from the anaerobic digesters and not combusted by the engines, shall be treated by the flares before discharge to the atmosphere.
5. The minimum operating temperature of each flare shall be 1800°F.
6. The minimum residence time of biogas in the combustion chamber of each flare shall be 0.3 seconds.
7. Each flare shall be operated at all times when biogas is being vented to it.
8. Each flare shall be operated and maintained according to its design specifications whenever biogas is being routed to the device.

C. Monitoring Requirements

1. Temperature Monitoring
 - a. The owner/operator shall install, calibrate, operate, and maintain a temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ± 1 percent of the temperature being measured expressed in degrees Celsius or ± 0.5 degrees Celsius, whichever is greater.
 - b. The thermocouple used to measure flare operating temperature shall be above the flame zone and at least three feet below the top of the flare shroud.
 - c. The owner/operator shall verify the accuracy of the temperature monitor once each calendar year with a reference temperature monitor (traceable to National Institute of Standards and Technology (NIST) standards or an independent temperature measurement device dedicated for this purpose). During accuracy checking, the probe of the reference device shall be at the same location as that of the temperature monitor being tested.
2. The owner/operator shall install, calibrate and maintain a gas flow rate measuring device that shall measure and record the flow of biogas to the each flare continuously when the flare is in operation.
3. The pressure in the biogas line and gasometer (gasholder) shall be continuously monitored and recorded.
4. The hours of operation of each flare shall be continuously monitored and recorded.

5. Each flare shall be equipped with a failure alarm and biogas supply valve shut-off system to isolate the flare from the biogas supply line and to notify a responsible party of the shutdown.
6. Each flare shall be equipped with an interlock system that ensures ignition of the pilot flame before biogas is discharged to the device.

D. Compliance Demonstration/Stack Testing

1. Compliance with the emission limitations specified in Conditions II.A.1 and Conditions II.A.2 shall be demonstrated within 180 days of startup of each flare. Additionally, during the initial performance test, the owner/operator shall measure the emissions of 1,3-butadiene. Testing shall be conducted in accordance with the test methods in 40 CFR 60 as amended or another EPA approved method which has been accepted by the Director.
2. A stack testing protocol shall be submitted to the Office of Air Resources at least 60 days prior to the performance of any stack tests. The owner/operator shall provide the Office of Air Resources at least 60 days prior notice of any performance test.
3. All test procedures used for stack testing shall be approved by the Office of Air Resources prior to the performance of any stack tests.
4. The owner/operator shall install any and all test ports or platforms necessary to conduct the required stack testing, provide safe access to any platforms and provide the necessary utilities for sampling and testing equipment.
5. All testing shall be conducted under operating conditions deemed acceptable and representative for the purpose of assessing compliance with the applicable emissions limitation.
6. All stack testing must be observed by a representative of the Office of Air Resources to be considered acceptable, unless the Office of Air Resources provides prior written authorization to the owner/operator to conduct the testing without an observer present.
7. A final report of the results of stack testing shall be submitted to the Office of Air Resources no later than 60 days following completion of testing.

E. Recordkeeping and Reporting

1. The owner/operator shall maintain the following records and provide such records to the Office of Air Resources upon request:
 - a. The operating temperature of each flare;
 - b. The biogas flow rate to each flare;

- c. The pressure in the biogas line and gasometer (gasholder).
2. The owner/operator shall, on a monthly basis, no later than 15 days after the first of each month, determine and record the hours of operation for each flare for the previous month. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
3. The owner/operator shall notify the Office of Air Resources, in writing, whenever the hours of operation in any 12-month period exceeds 560 hours for any flare.
4. The owner/operator shall, on a monthly basis, no later than 15 days after the first of the month, determine the total quantity of acrolein, ammonia, benzene, ethylene dibromide, and formaldehyde discharged to the atmosphere from each flare during the previous month. Hourly emission averages shall be calculated for acrolein, benzene and formaldehyde. These hourly averages shall be used for comparison to the hourly emission limitations. Daily emission totals shall be calculated for benzene, ethylene dibromide and formaldehyde to be used for comparison the daily emission limitations. Monthly and annual emission averages shall be calculated for acrolein, benzene, ethylene dibromide and formaldehyde to be used for comparison to the annual emission limitations. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
5. The owner/operator shall notify the Office of Air Resources in writing, within 15 days of determining that the total quantity of acrolein, ammonia, benzene, ethylene dibromide, or formaldehyde discharged to the atmosphere from the 22.37 MMBtu/hr flare or the 16.77 MMBtu flare exceeds the respective hourly, daily or annual emission limitations in Conditions II.A.1 and II.A.2 of this permit.
6. All 3-hour periods of operation during which the average combustion temperature of a flare was more than 50°F below the average combustion temperature during the most recent performance test at which compliance was determined constitute exceedances that shall be recorded and reported. The owner/operator shall maintain up-to-date, readily accessible records for all 3-hour periods of operation during which the average combustions temperature was more than 50°F below the average combustion temperature during the most recent performance test at which compliance was determined.

III. The following requirements are applicable to the Austep double-stage, cross flow, packed tower wet scrubber associated with the digestate drying process (Approval No. 2312):

A. Emission Limitations

1. Ammonia

a. The total quantity of ammonia emissions discharged to the atmosphere from the wet scrubber shall not exceed:

(1) 5.62 pounds per hour; and,

(2) 134.88 pounds per day; and,

(3) 47,208 pounds in any consecutive 12-month period.

b. Ammonia emissions generated from the digestate drying process shall be reduced by 85% or greater before discharge to the atmosphere.

2. Volatile Organic Compounds (VOC)

a. The total quantity of VOC emissions discharged to the atmosphere from the wet scrubber shall not exceed 8.38 pounds per hour.

b. VOC emissions generated from the digestate drying process shall be reduced by 70% or greater before discharge to the atmosphere.

3. Particulate Matter (as PM/PM₁₀/PM_{2.5})

a. The total quantity of particulate matter emissions discharged to the atmosphere from the wet scrubber shall not exceed 1.69 pounds per hour.

b. Particulate matter emissions generated from the digestate drying process shall be reduced by 90% or greater before discharge to the atmosphere.

4. Opacity

Visible emissions from the wet scrubber exhaust shall not exceed 10% opacity (six-minute average). Where the presence of uncombined water is the only reason for failure to meet the requirements of this condition, such failure shall not be a violation of this permit.

5. Odors

Any air contaminant or combination of air contaminants discharged to the atmosphere from the wet scrubber shall not create an objectionable odor beyond the property line of this facility.

B. Operating Requirements

1. All ammonia, VOC and particulate matter emissions generated from the digestate drying process shall be captured, contained and routed to the wet scrubber for treatment prior to discharge to the atmosphere.
2. The digestate dryer shall not operate more than 8400 hours in any consecutive 12-month period.
3. Water shall be used as the scrubbing liquid in the first stage of the wet scrubber and be supplied at a rate no less than 396 gallons per minute.
4. The water make-up rate for the first stage of the wet scrubber shall be maintained at or above 1 gallon per minute.
5. Sulfuric acidic solution shall be used as the scrubbing liquid in the second stage of the wet scrubber and shall be supplied at a rate no less than 396 gallons per minute.
6. The owner/operator shall maintain and operate the wet scrubber according to the manufacturer's design specifications and operating procedures whenever the digestate dryer is emitting air contaminants.

C. Monitoring Requirements

1. The following parameters shall be monitored continuously and checked a minimum of once per day and the date, time and measurement shall be recorded:
 - a. The pH of the scrubbing liquid in the first and second stage;
 - b. The pressure drop across the wet scrubber; and
 - c. The scrubbing liquid flow rate and water make-up rate for each stage.
2. The hours of operation of the digestate dryer and wet scrubber shall be continuously monitored and recorded.

D. Compliance Demonstration/Stack Testing

1. Within 180 days of start-up of the wet scrubber, emissions testing shall be conducted to demonstrate compliance with Conditions III.A.1-4. In addition, emissions testing shall be conducted to determine and quantify individual species of volatile organic compounds (VOC) emissions and to determine if there are emissions of any hazardous air pollutants.
2. A stack testing protocol shall be submitted to the Office of Air Resources for review at least 60 days prior to the performance of any stack tests. The owner/operator shall provide the Office of Air Resources at least 60 days prior notice of any stack test.
3. All test procedures used for emissions testing shall be conducted in accordance with Appendix A of 40 CFR 60 or another method approved by the Office of Air Resources and U.S. Environmental Protection Agency (EPA) prior to the performance of any emissions tests.
4. The owner/operator shall install any and all test ports or platforms necessary to conduct the required stack testing, provide safe access to any platforms and provide the necessary utilities for sampling and testing equipment.
5. All testing shall be conducted under operating conditions deemed acceptable and representative for the purpose of assessing compliance with the applicable emissions limitation.
6. All emissions testing must be observed by the Office of Air Resources to be considered acceptable, unless the Office of Air Resources provides written authorization to the owner/operator to conduct the testing without an observer present.
7. A final report of the results of stack testing shall be submitted to the Office of Air Resources no later than 60 days following completion of testing.

E. Recordkeeping and Reporting

1. The owner/operator shall maintain the following records and provide such records to the Office of Air Resources upon request:
 - a. Records of the pH of the second stage scrubbing liquid, pressure drop across the scrubber, scrubbing liquid flow rate and water make-up flow rate measurements for each stage for the wet scrubber.
 - b. Records of all maintenance performed on the wet scrubber and monitoring equipment.
2. The owner/operator shall, on a monthly basis, no later than 15 days after the first of each month, determine and record the hours of operation for the

digestate dryer for the previous month. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.

3. The owner/operator shall notify the Office of Air Resources, in writing, whenever the hours of operation in any 12-month period exceeds 8,400 hours for digestate dryer.
4. The owner/operator shall, on a monthly basis, no later than 15 days after the first of the month, determine the total quantity of ammonia discharged to the atmosphere from the wet scrubber during the previous month. Hourly emission averages shall be calculated. The hourly averages shall be used for comparison to the hourly emission limitations. Daily emission totals shall be calculated for ammonia to be used for comparison to the daily emission limitation. Monthly and annual emission averages shall be calculated to be used for comparison to the annual emission limitation. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
5. The owner/operator shall notify the Office of Air Resources in writing, within 15 days of determining that the total quantity of ammonia discharged to the atmosphere from the wet scrubber exceeds the hourly, daily or annual emission limitations in Conditions III.A.1.a(1)-(3) of this permit.

IV. The following requirements are applicable to the Austep odor control wet scrubber (Approval No. 2308) followed by a biofilter (Approval No. 2309) associated with the Receiving Building and biopulper tank:

A. Emission Limitations

1. Odors

Any air contaminant or combination of air contaminants discharged to the atmosphere from the wet scrubber and biofilter shall not create an objectionable odor beyond the property line of this facility.

B. Operating Requirements

1. All feedstock shall be received in enclosed trucks or containers and unloaded inside the Reception Building.
2. All access doors to the receiving building shall be kept closed at all times except when feedstock delivery trucks are entering or exiting the building.
3. The Reception Building air system shall be designed to continuously provide a negative draft throughout the building.

4. Odorous air from the receiving building and biopulper tank shall be captured and routed to the wet scrubber followed by a biofilter for treatment prior to discharge to the atmosphere.
5. The owner/operator shall maintain and operate the wet scrubber and biofilter in accordance with the manufacturer's operating procedures and good air pollution control practice.
6. Facility grounds shall be kept clean and free of exposed biomass waste and vehicle tires shall be cleaned, if necessary, to prevent tracking of biomass waste offsite.

C. Monitoring Requirements

1. The following parameters shall be monitored continuously and checked a minimum of once per day and the date, time and measurement shall be recorded for the wet scrubber:
 - a. The pH of the scrubbing liquid;
 - b. The pressure drop across the wet scrubber; and
 - c. The scrubbing liquid flow rate and water make-up rate.
2. The following parameters shall be monitored continuously and checked a minimum of once per day and the date, time and measurement shall be recorded for the biofilter:
 - a. The pH;
 - b. The temperature;
 - c. The moisture content; and
 - d. The differential pressure.

D. Recordkeeping and Reporting

1. The owner/operator shall maintain the following records and provide such records to the Office of Air Resources upon request:
 - a. Records of the pH, scrubbing liquid flow rate and water make-up rate for the wet scrubber.
 - b. Records of the pressure drop readings across the wet scrubber.
 - c. Records of the pH, moisture content, temperature, and differential pressure of the biofilter.

V. The following requirements are applicable to operations on a facility-wide basis:

A. Emission Limitations

1. Volatile Organic Compounds (VOCs)

The total quantity of VOC emissions discharged to the atmosphere from all operations conducted at the entire facility shall not exceed 8,167 pounds of VOC per calendar month based upon a 12-month rolling average.

2. Hazardous Air Pollutants (HAPs)

The total quantity of HAP emissions discharged to the atmosphere from the entire facility shall not exceed 1,500 pounds of any one (1) HAP or 4,000 pounds of any combination of HAPs per calendar month based upon a 12-month rolling average. Hazardous Air Pollutant shall mean an air pollutant which has been listed pursuant to Section 112(b) of the Clean Air Act Amendments of 1990.

3. Listed Toxic Air Contaminants

The total quantity of emissions discharged to the atmosphere from the entire facility, of any listed toxic air contaminant, with the exception of acrolein, ammonia, benzene, 1,3-butadiene, ethylene dibromide, and formaldehyde shall not exceed the minimum quantity for that contaminant as specified in Appendix A of Air Pollution Control Regulation No. 9, during a calendar year. Emissions from activities exempted from the provisions of APC Regulation No. 22 in subsection 22.2.2 are not included in this limitation.

4. Odors

Any air contaminant or combination of air contaminants discharged to the atmosphere from the facility shall not create an objectionable odor beyond the property line of this facility. Odor evaluations shall be conducted according to the provisions of Air Pollution Control Regulation No. 17.

B. Monitoring Requirements

1. The owner/operator shall, upon startup and at least daily, measure the hydrogen sulfide concentration (in ppm by volume) at both the inlet and the outlet of the H₂S pretreatment system and the date, time and measurement shall be recorded.

2. The following parameters for the H₂S pretreatment system shall be monitored continuously and checked a minimum of once per day and the date, time, and measurement shall be recorded:

a. The pH of the scrubbing liquid;

- b. The pressure drop across the H₂S pretreatment system; and
 - c. The scrubbing liquid flow rate in the H₂S pretreatment system.
3. All monitoring equipment used for measuring all parameters required by this permit shall be calibrated periodically, consistent with the manufacturer's recommendations.

C. Recordkeeping and Reporting

1. The owner/operator shall maintain the following records and provide such records to the Office of Air Resources upon request:
 - a. The pH of the scrubbing liquid;
 - b. The pressure drop across the H₂S pretreatment system;
 - c. The scrubbing liquid flow rate in the H₂S pretreatment system; and
 - d. The hydrogen sulfide concentration (in ppm by volume) at both the inlet and the outlet of the H₂S pretreatment system
2. The owner/operator shall notify the Office of Air Resources in writing, within 15 days of determining that the concentration of H₂S in the biogas at the outlet of the hydrogen sulfide pretreatment system exceeds 200 ppm, by volume, dry.
3. The owner/operator shall, on a monthly basis, no later than the last day of the following month, determine the total quantity of VOC discharged to the atmosphere from all operations at the entire facility. Monthly and 12-month rolling averages shall be calculated. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
4. The owner/operator shall notify the Office of Air Resources in writing, within 15 days of determining that the total quantity of VOCs discharged to the atmosphere from all operations at this facility exceeds 8,167 pounds per calendar month (12-month rolling average).
5. The owner/operator shall, on a monthly basis, no later than the last day of the following month, determine the total quantity of HAP emissions discharged to the atmosphere from all operations at the entire facility. Monthly and 12-month rolling averages shall be calculated. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
6. The owner/operator shall notify the Office of Air Resources in writing, within 15 days of determining that the total quantity of HAP emissions

discharged to the atmosphere from all operations at this facility exceeds 1,500 pounds of any one (1) HAP or 4,000 pounds of any combination of HAPs per calendar month (12-month rolling average).

7. The owner/operator shall, for each calendar year, determine the total quantity of each listed toxic air contaminant in Appendix A of Air Pollution Control Regulation No. 9 discharged to the atmosphere from all operations at the entire facility excluding acrolein, ammonia, benzene, 1,3 butadiene, ethylene dibromide, and formaldehyde. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
8. The owner/operator shall notify the Office of Air Resources in writing, within 15 days of determining that the total quantity of emissions discharged to the atmosphere from the entire facility, of any listed toxic air contaminant excluding acrolein, ammonia, benzene, 1,3 butadiene, ethylene dibromide, and formaldehyde, exceeds the minimum quantity for that contaminant as specified in Appendix A of Air Pollution Control Regulation No. 9. In accordance with Air Pollution Control Regulation No 22, this notification shall be included in the annual air pollution inventory.
9. The owner/operator shall notify the Office of Air Resources in writing of the date of actual initial start-up of each device permitted under this permit no later than fifteen days after such date.
10. Any breakdown or malfunction of the engines or flares resulting in the discharge of biogas gas shall be reported to the Office of Air Resources within one hour after the occurrence. A written report of any breakdown or malfunction shall be submitted within five (5) days of the breakdown or malfunction. The following information shall be provided in each report:
 - a. The date the breakdown or malfunction occurred
 - b. The suspected reason for the malfunction
 - c. The corrective action taken
 - d. The time needed to make repairsA copy of each report shall be kept at the facility.
11. The owner/operator shall notify the Office of Air Resources of any anticipated noncompliance with the terms of this permit or any other applicable air pollution control rules and regulations.
12. The owner/operator shall notify the Office of Air Resources in writing of any planned physical or operational change to any equipment that would:

- a. Change the representation of the facility in the application.
- b. Alter the applicability of any state or federal air pollution rules or regulations.
- c. Result in the violation of any terms or conditions of this permit.
- d. Qualify as a modification under APC Regulation No. 9.

Such notification shall include:

- Information describing the nature of the change.
- Information describing the effect of the change on the emission of any air contaminant.
- The scheduled completion date of the planned change.

Any such change shall be consistent with the appropriate regulation and have the prior approval of the Director.

13. The owner/operator shall notify the Office of Air Resources, in writing, of any noncompliance with the terms of this permit within 30 calendar days of becoming aware of such occurrence and supply the Director with the following information:
 - a. The name and location of the facility;
 - b. The subject source(s) that caused the noncompliance with the permit term;
 - c. The time and date of first observation of the incident of noncompliance;
 - d. The cause and expected duration of the incident of noncompliance;
 - e. The estimated rate of emissions (expressed in lbs/hr or lbs/day) during the incident and the operating data and calculations used in estimating the emission rate;
 - f. The proposed corrective actions and schedule to correct the conditions causing the incidence of noncompliance.
14. The owner/operator shall maintain properly signed, contemporaneous operating logs or other relevant evidence to document actions during startup/shutdown periods.

15. All records required in this permit shall be maintained for a minimum of five years after the date of each record and shall be made available to representatives of the Office of Air Resources or its authorized representative and EPA upon request.

D. Other Permit Conditions

1. To the extent consistent with the requirements of this permit and applicable federal and state laws, the equipment shall be designed, constructed and operated in accordance with the representation of the equipment in the permit application.
2. Employees of the Office of Air Resources and its authorized representatives shall be allowed to enter the facility at all times for the purpose of inspecting any air pollution source, investigating any condition it believes may be causing air pollution or examining any records required to be maintained by the Office of Air Resources.
3. At all times, including periods of startup, shutdown and malfunction, the owner/operator shall, to the extent practicable, maintain and operate the facility in a manner consistent with good air pollution control practice for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this permit have been achieved. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Office of Air Resources which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures and inspection of the source.
4. The emission and dispersion characteristics of all sources of acrolein, ammonia, benzene, 1,3 butadiene, ethylene dibromide, and formaldehyde at the facility shall be consistent with the parameters used in the air quality modeling to demonstrate that the emissions of acrolein, ammonia, benzene, 1,3 butadiene, ethylene dibromide, and formaldehyde from the facility do not cause or contribute to air pollution in violation of RI Air Pollution Control Regulation No. 22. The Office of Air Resources, in its sole discretion, may reopen this minor source permit if it determines that the emission and dispersion characteristics have changed significantly and that emission limitations must be revised and/or added to this permit to ensure compliance with RI Air Pollution Control Regulation No. 22.

E. Malfunctions

1. The owner/operator may seek to establish that a malfunction of any air pollution control system that would result in noncompliance with any of the terms of this permit or any other applicable air pollution control rules and regulations was due to unavoidable increases in emissions attributable

to the malfunction. To do so, the owner/operator must demonstrate to the Office of Air Resources that:

- a. The malfunction was not attributable to improperly designed equipment, lack of preventative maintenance, careless or improper operation or operator error;
- b. The malfunction is not part of a recurring pattern indicative of inadequate design, operation or maintenance;
- c. Repairs were performed in an expeditious fashion. Off-shift labor and overtime should be utilized, to the extent practicable, to ensure that such repairs were completed as expeditiously as practicable.
- d. All possible steps were taken to minimize emissions during the period of time that repairs were performed.
- e. Emissions during the period of time that the repairs were performed will not:
 - (1) Cause an increase in the ground level ambient concentration at or beyond the property line in excess of that allowed by Air Pollution Control Regulation No. 22 and any Calculated Acceptable Ambient Levels; and
 - (2) Cause or contribute to air pollution in violation of any applicable state or national ambient air quality standard.
- f. The reasons that it would be impossible or impractical to cease the source operation during said period.
- g. The owner/operator's actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs or other relevant evidence.

This demonstration must be provided to the Office of Air Resources within two working days of the time when the malfunction occurred and contain a description of the malfunction, any steps taken to minimize emissions and corrective actions taken.

The owner/operator shall have the burden of proof in seeking to establish that noncompliance was due to unavoidable increases in emissions attributable to the malfunction.