Facility ID: 0857100983 Issuance type: Final State Permit To Operate

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In addition to the terms and conditions, hyperlinks have been inserted into the document so you may more readily access the section of the document you wish to review.

Finally, the term language under "Part II" and before "A. Applicable Emissions Limitations..." has been added to aid in document conversion, and was not part of the original issued permit.

THIS IS NOT AN OFFICIAL VERSION OF THE PERMIT. SEE PAGE 1 FOR ADDITIONAL INFORMATION

Facility ID: 0857100983 Emissions Unit ID: P002 Issuance type: Final State Permit To Operate

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Part II - Special Terms and Conditions

This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

1. For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

   (a) None.

2. For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

   (a) None.

A. **Applicable Emissions Limitations and/or Control Requirements**

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
Waste Digester Gas Flare Burner #1	OAC rule 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, as a six-minute average.
	OAC rule 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC rule 3745-35-07(B)(2)	See A.2.a - A.2.d

2. **Additional Terms and Conditions**

   (a) The emissions of sulfur dioxide (SO2) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
   The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
   The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, combined, shall not exceed 84.0 tons/year, based on a rolling, 365-day summation.
   The emissions of nitrogen oxides (NOx) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. **Operational Restrictions**

1. The permittee shall burn only digester gas in this emissions unit.

2. The maximum amount of digester gas burned in the emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.

3. The maximum amount of digester gas burned in emissions units P002, P003, and P004, combined, shall not exceed 730,000,000 cubic feet/year, based on a 365-day rolling summation.

4. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2.

C. **Monitoring and/or Record Keeping Requirements**

1. The permittee shall determine daily the CO2 content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft3 and density values shall be calculated daily by using the percentage of CO2 in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft3 of CO2 is zero, and the Btu/ft3 of methane is assumed to be 1000 Btu/ft3.

   The Btu content of the digester gas shall be calculated by the following equation:

   Btu/ft3 digester gas = (% CO2 in digester gas)(0 Btu/ft3) + (1-% CO2 in digester gas)(1000 Btu/ft3).

   The density of the digester gas shall be calculated by the following equation:

   Density of digester gas = (% CO2 in digester gas)(0.1225 lb/ft3*) + (1- % CO2 in digester gas)(0.0446 lb/ft3*).

   *0.1225 lb/ft3 is the density of C02
   0.0446 lb/ft3 is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods will be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm, hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

   The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be considered to be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

3. The permittee shall collect and record the following information on a daily basis:

   a. The total quantity of digester gas burned, in cubic feet in emissions units P002, P003, and P004, combined, as a 365-day summation.

   b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.

   c. The average decimal fraction of sulfur in the digester gas, by weight.

   d. The calculated heat content of the digester gas, in Btu per standard cubic foot.

   e. The calculated density of the digester gas, in lb per standard cubic feet.

   f. The rolling, 365-day summation of the sulfur dioxide emission rate, in tons, for emissions units P002, P003, P004, B004, B005, BO06, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.b.

   g. The rolling, 365-day summation of the CO emission rate, in tons, from emissions units P002, P003, and P004 combined, based upon the methodology specified in Section E.1.d.

   h. The rolling, 365-day summation of the CO emission rate, in tons, calculated based upon the methodology specified Section E.1.c, from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.

   i. The rolling 365-day summation of the NOx emission rate, in tons, calculated based upon the methodology outlined in Section E.1.e, from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.

4. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

D. **Reporting Requirements**

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than digester gas was burned in this emissions unit.

2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:

   a. The rolling, 365-day usage of digester gas, in cubic feet, in emissions units P002, P003, and P004, combined (reference B.3.).
   b. The daily usage of digester gas, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined (reference B.2.).
   c. The rolling, 365-day sulfur dioxide emissions (refer to Section A.2.a).
   d. The rolling, 365-day CO emissions (refer to Section A.2.c).
   e. The rolling, 365-day CO emissions for all emissions units, combined (refer to Section A.2.b).
   f. The rolling, 365-day NOx emissions (refer to Section A.2.d).

   These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

3. The permittee shall submit annual reports which specify the total digester gas usage for emissions units P002, P003, and P004, combined, and the total digester gas usage and the total carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined. These reports shall be submitted by January 31 of each year.

E. **Testing Requirements**

1. Emission Limitation-
   5% opacity visible emission limitation, as a six-minute average

   Applicable compliance Method-
   Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

Emission Limitation-
99.0 tons/year SO2 emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-
Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3):

ER = (1 X 10^6)/H X D X S X 1.998

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO2 emissions are calculated using the following equation:

SO2 (tons/day) = ER (lbs/mmBtu) X Gas Consumption (cu.ft/day) X (Btu/cu.ft)/ 2000 lbs/ton

The rolling, 365-day summation is the sum of the daily SO2 emission rates for the 365-day period. The SO2 emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas

*The Drager or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H2S/density of digester gas. The density of H2S is equal to 0.08672 lb/ft3.
Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-
Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
v. sum (iii) and (iv);
vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the natural gas (1000 Btu/cu.ft.);
ix. sum (vii) and (viii);
x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lbmmBtu;
xi. sum the results from (ii), (vi), and (x); and
xii. sum the results from (xi) for the 365-day period; and
xiii. divide (xii) by 2000 lbs/ton.
Emission Limitation-
84.0 TPY CO, as a rolling 365-day summation, from emissions units P002, P003, and P004

Applicable Complance Method-
Compliance shall be determined by the calculation of the rolling 365-day emissions for emissions units P002, P003, and P004 as determined by the following methodology:

i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
ii. multiply the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
iii. divide the product in (ii) by 2000 lbs/ton.
Emission Limitation-
83.0 tons/year NOx for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling, 365-day summation

Applicable Compliance Method-
Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
ii. determine the NOx emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NOx/mmBtu.;
iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
v. sum (iii) and (iv);
vi. determine the NOx emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by

the average heat value of natural gas (1000 Btu/cu.ft.);

ix. sum (vii) and (viii);

x. determine the NOx emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;

xi. sum the results from (ii), (vi), and (x);

xii. sum the results from (xi) for the 365-day period; and

xiii. divide (xii) by 2000 lbs/ton.

F. **Miscellaneous Requirements**

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F.