State of Ohio Environmental Protection Agency

Street Address: Lazarus Gov. Center **TELE:** (614) 644-3020 **FAX:** (614) 644-2329 Mailing Address: Lazarus Gov. Center

RE: FINAL PERMIT TO INSTALL **CERTIFIED MAIL**
MONTGOMERY COUNTY
Application No: 08-04195
DATE: 3/8/2001

City of Dayton Wastewater Treatment Plt
Phil Bennington
2800 Guthrie Rd
Dayton, OH 45418-0000

Enclosed please find an Ohio EPA Permit to Install which will allow you to install the described source(s) in a manner indicated in the permit. Because this permit contains several conditions and restrictions, I urge you to read it carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, buy it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action by the Director is final and may be appealed to the Ohio Environmental Review Appeals Commission pursuant to Chapter 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed within thirty (30) days after the notice of the Directors action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street, Room 300
Columbus, Ohio 43215

Very truly yours,

Thomas G. Rigo

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

CC: USEPA **RAPCA**

STATE OF OHIO ENVIRONMENTAL PROTECTION AGENCY

Permit To Install **Issue Date: March 8, 2001**
Terms and Conditions **Effective Date: March 8, 2001**

FINAL PERMIT TO INSTALL 08-04195

Application Number:	08-04195
APS Premise Number:	0857100983
Permit Fee:	**$1200**
Name of Facility:	City of Dayton Wastewater Treatment Plt
Person to Contact:	Phil Bennington
Address:	2800 Guthrie Rd Dayton, OH 45418-0000

Location of proposed air contaminant source(s) [emissions unit(s)]:
2800 Guthrie Rd
Dayton, **Ohio**

Description of proposed emissions unit(s):
3 hot water boilers.

The above named entity is hereby granted a Permit to Install for the above described emissions unit(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described emissions unit(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described emissions unit(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

_____
Director

Part I - GENERAL TERMS AND CONDITIONS

A. Permit to Install General Terms and Conditions

1. Compliance Requirements

The emissions unit(s) identified in this Permit to Install shall remain in full compliance with all applicable State laws and regulations and the terms and conditions of this permit.

2. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

3. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Such records may be maintained in computerized form.

4. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any

information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

5. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions units or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emissions unit(s) that is (are) served by such control system(s).

6. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

7. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

8. Termination of Permit to Install

This Permit to Install shall terminate within eighteen months of the effective date of the Permit to Install if the owner or operator has not undertaken a continuing program of installation or modification or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation or modification. This deadline may be extended by up to 12 months if application is made to the Director within a reasonable time before the termination date and the party shows good cause for any such extension.

9. Construction of New Sources(s)

The proposed emissions unit(s) shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional

facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources are inadequate or cannot meet applicable standards.

If the construction of the proposed emissions unit(s) has already begun or has been completed prior to the date the Director of the Environmental Protection Agency approves the permit application and plans, the approval does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the approved plans. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of the Permit to Install does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Approval of the plans in any case is not to be construed as an approval of the facility as constructed and/or completed. Moreover, issuance of the Permit to Install is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities prove to be inadequate or cannot meet applicable standards.

10. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

11. Applicability

This Permit to Install is applicable only to the emissions unit(s) identified in the Permit to Install. Separate application must be made to the Director for the installation or modification of any other emissions unit(s).

12. Best Available Technology

As specified in OAC Rule 3745-31-05, all new sources must employ Best Available Technology (BAT). Compliance with the terms and conditions of this permit will fulfill this requirement.

13. Source Operation and Operating Permit Requirements After Completion of Construction

a. If the permittee is required to apply for a Title V permit pursuant to OAC Chapter 3745-77, the permittee shall submit a complete Title V permit application or a complete Title V permit modification application within twelve (12) months after commencing operation of the emissions units covered by this permit. However, if the proposed new or modified source(s) would be prohibited by the terms and conditions of an existing Title V permit, a Title V permit modification must be <u>obtained before</u> the operation of such new or modified source(s) pursuant to OAC rule 3745-77-04(D) and OAC rule 3745-77-08(C)(3)(d).

b. If the permittee is required to apply for permit(s) pursuant to OAC Chapter 3745-35, the source(s) identified in this Permit To Install is (are) permitted to operate for a period of up

to one year from the date the source(s) commenced operation. Permission to operate is granted only if the facility complies with all requirements contained in this permit and all applicable air pollution laws, regulations, and policies. Pursuant to OAC Chapter 3745-35, the permittee shall submit a complete operating permit application within thirty (30) days after commencing operation of the source(s) covered by this permit.

14. Construction Compliance Certification

The applicant shall provide Ohio EPA with a written certification (see enclosed form) that the facility has been constructed in accordance with the Permit to Install application and the terms and conditions of the Permit to Install. The certification shall be provided to Ohio EPA upon completion of construction but prior to startup of the source.

15. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable Permit to Install fees within 30 days after the issuance of this Permit to Install.

B. Permit to Install Summary of Allowable Emissions

The following information summarizes the total allowable emissions, by pollutant, based on the individual allowable emissions of each air contaminant source identified in this permit.

SUMMARY (for informational purposes only)
TOTAL PERMIT TO INSTALL ALLOWABLE EMISSIONS

Pollutant	Tons Per Year
SO2	60.09
CO	26.01
NOx	31.02
PM	3.84

Emissions Unit ID: **B010**

PART II - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	
B010 - 14.645 mmBtu/hr digester gas or natural gas hot water boiler use identified as DB-1	OAC rule 3745-31-05(A)(3)	OAC rule 3745-17-07(A)(1)
	OAC rule 3745-35-07(B)	
	OAC rule 3745-17-10(B)(1)	

Applicable Emissions Limitations/Control Measures
4.57 lbs/hr, 20.03 TPY sulfur dioxide (SO2); 1.98 lbs/hr, 8.67 TPY carbon monoxide (CO); 2.36 lbs/hr, 10.34 TPY nitrogen oxides (NOx) 1.28 TPY particulate matter (PM)
Visible particulate emissions shall not exceed 5% opacity, as a six-minute average
The requirements of this rule also include compliance with the requirements of OAC rule 3745-17-10(B)(1)
See A.2.d
See A.2.a to A.2.c
The annual limits are based upon a rolling, 365-day summation
Particulate emissions shall not exceed 0.02 lb/mmBtu of actual heat input
The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3)

2. Additional Terms and Conditions

2.a The emissions of sulfur dioxide (SO2) from all emissions units at this facility identified as

P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 99.0 tons, based on a rolling 365-day summation.

2.b The emissions of carbon monoxide (CO) from all emissions units at this facility, identified as P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 99.0 tons/year based on a rolling 365-day summation.

2.c The emissions of nitrogen oxides (NOx) from all emissions units at this facility P002, P003, P004, B004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 94.00 tons, based on a rolling, 365-day summation.

2.d The lbs/hr and TPY limitation specified in this permit were established for PTI purposes to reflect the potential to emit for this emissions unit. Therefore, it is not necessary to develop record keeping and reporting requirements to ensure compliance with these limitations.

B. Operational Restrictions

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

2. The maximum amount of digester gas burned in the emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 2,800,000 cubic feet/day.

3. The hydrogen sulfide content of the digester gas shall not exceed 1306 ppm by weight and 1007 ppm by volume, as fired, see Section C.

4. The maximum amount of digester gas burned in the flares, P002, P003, and P004, combined, shall not exceed 1,400,000 cubic feet/day.

C. Monitoring and/or Recordkeeping 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 of the digester gas shall be calculated based on the average daily percent of CO2 in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft3 of CO2 is as zero and the average Btu/ft3 of methane is assumed as 1020.

The heat value of digester gas shall be calculated by the following:
The heat value in Btu/ft3 digester gas = (% CO2 in digester gas)(0 Btu/ft3) + (1-% CO2 in digester gas)(1020 Btu/ft3).

The density of digester gas shall be calculated by the following:
Density of digester gas, in lbs/ft3 = (% 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 CO2
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 value 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%. To assure compliance with a H2S concentration of 1007 ppm, H2S readings on the Drager or Gastec tube shall not exceed 806 ppm.

   The permittee shall maintain records of all data obtained by the hydrogen sulfide monitoring system including, but not limited to, parts per million hydrogen sulfide determined during each testing period and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentration shall be used to determine the decimal fraction of sulfur for purposes of determining compliance with the sulfur dioxide emission limitation. The hydrogen sulfide concentration determined shall be assumed as the average daily hydrogen sulfide concentration for the day of monitoring and 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 unit B010.

   b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, as a 365-day summation.

   c. The total quantity of natural gas burned, in cubic feet, in emissions unit B010.

d. The total quantity of natural gas burned, in cubic feet in emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, as a 365-day summation.

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

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

g. The calculated density of the digester gas, in lb per standard cubic foot.

h. The 365-day rolling summation of the SO2 emission rate in tons, for emission units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, calculated based upon the methodology specified in E.1.i.

i. The rolling, 365-day summation of the CO emission rate in tons calculated based upon the methodology outlined in Section E.1.k for emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined.

j. The rolling 365-day summation of the NOx emission rate in tons calculated based upon the methodology outlined in Section E.1.j, for emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined.

4. For each day during which the permittee burns a fuel other than natural gas or digester gas, the permittee shall maintain a record of the type and quantity of fuel burned in this emissions unit.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas or 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 daily usage of digester gas, in cubic feet, in emissions units P002, P003, P004, B007, B008, B009, B010, B011, B012 combined.

b. The daily usage of digester gas in cubic feet, in emissions units P002, P003, and P004.

c. The rolling, 365-day sulfur dioxide emissions for identified emission units combined (reference Section A.2.a).

d. The rolling, 365-day CO emissions for identified emissions units combined (reference Section A.2.b).

e. The rolling, 365-day NOx emissions for identified emissions units combined (reference Section A.2.c).

3. The quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (2) of the General Terms and Conditions.

4. The permittee shall submit annual reports which specify the total digester gas usage, the total natural gas usage, the carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B007, B008, B009,B010, B011, B012, P002, P003, and P004, combined, as a rolling 365-day summation. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

1. Compliance with the emission limitation(s) in section A.1. of these terms and conditions shall be determined in accordance with the following methods:

   a. 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.

   b. Emission Limitation-
   0.020 pound particulates/mmBtu

   Applicable Compliance Method-
   For the use of digester gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0236 mm cu.ft./hour) by the adjusted AP-42, Table 1.4-2, (7/98) emission factor for digester gas (12.50 lbs particulate/mm cu ft)* and dividing by the maximum hourly heat input capacity of the emissions unit (14.645 mm Btu/hr). For the use of natural gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0146 mm cu.ft./hour) by the AP-42, Table 1.4-2, (7/98), emission factor for natural gas (7.69 lbs particulate/mm cu ft) and dividing by the maximum hourly heat input capacity of the emissions unit (14.645 mm Btu/hr)

   *The AP-42 emission factor for natural gas is adjusted for digester gas by multiplying the factor for natural gas of 7.6 lbs/10^6 scf by 1020 Btu per ft3 natural gas/620 Btu per ft3 digester gas.

   c. Emission Limitation-
   4.57 lbs/hr, SO2 from emissions unit B010

   Applicable Compliance Method-
   Compliance shall be determined by employing the maximum hourly digester gas burning

capacity (23,621 cubic feet/hr) in the following formula:
SO2 (lbs/hr) = D X S X 1.998 X Hourly Gas Consumption/2000 lbs/ton

D = density of gas in pounds per standard cubic foot
S = decimal fraction of sulfur in the gaseous fuel
Gas Consumption =23,621 cubic feet/hr

d. Emission Limitation-
20.03 TPY SO2 from emissions unit B010

Applicable Compliance Method-
The 20.03 TPY limitation was developed by multiplying the 4.57 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

e. Emission Limitation-
1.98 lbs/day CO from emissions unit B010

Applicable Compliance Method-
Compliance shall be determined by:
(i) dividing the AP-42 emission factor of 84 lb/10^6 scf, Table 1.4-1(7/98), by the average heat value of digester gas (Btu/ft3) as determined in C.1.;
(ii) multiplying (i) by the maximum heat input capacity of B010 (14.645 mmBtu/hr).

f. Emission Limitation-
8.67 TPY CO from emissions unit B010

Applicable Compliance Method-
The 8.66 TPY limitation was developed by multiplying the 1.98 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

g. Emission Limitation-
2.36 lbs/hr NOx from emission unit B010

Applicable Compliance Method-
Compliance is determined by:
(i) dividing the AP-42 emission factor of 100 lb/10^6 scf, Table 1.4-1(7/98), by the average heat value of digester gas (Btu/ft3) as determined in C.1.;

(ii) multiplying (i) by the maximum heat input capacity of B010 (14.645 mmBtu/hr).

h. Emission Limitation-
10.34 TPY NOx from emissions unit B010

Applicable Compliance Method-
The 10.34TPY limitation was developed by multiplying the 2.36 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

i. Emission Limitation-
99.0 tons/year SO2 emissions for P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, as a rolling, 365-day summation

Applicable Compliance Method-

(i) The formula for gaseous fuels in OAC rule 3745-18-04(F)(3) shall be used to determine the emission rate (lbs/mmBtu) from the burning of digester gas in P002, P003, P004, B007, B008, B009, B010, B011, B012, i.e.,
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;
S = the decimal fraction of sulfur in the gaseous fuel, by weight.

SO2 = ER (lbs/mmBtu) X Gas Consumption (cu.ft/year) X (Btu/cu.ft)/ 2000 lbs/ton
Or:
SO2 (lbs/year) =(D X S X 1.998 X Annual Gas Consumption)/2000 lbs/ton

where: D = the density of the gaseous fuel in pounds per standard cubic foot;
S = the decimal fraction of sulfur in the gaseous fuel, by weight;*
Gas Consumption = cubic feet/year, as a rolling 365-day summation

*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 0.0894 lb/ft3

(ii) The emissions of SO2 from the burning of natural gas shall be determined by multiplying the AP-42 emissions factor , Chapter 1.4-2(7/9), of 0.6 lb/10^6 scf by the amount of natural gas burned each year, as a rolling 365-day summation, in

emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012.

(iii) SO2 emissions shall be determined by the summation of (i) and (ii).

(iv) Dividing (iii) by 2000 lbs/ton.

j. Emission Limitation-
94.0 tons/year NOx for P002, P003, P004, B007, B008, B009, B010, B011, and B012 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) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units P002, P003, and P004 by the average 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) determine the average heat value ratio of digester gas:natural gas by dividing the average heat value of digester gas determined in C.1. (Btu/ft3) by the heat value of natural gas (1020 Btu/ft3);
(iv) multiplying the AP-42 emission factor for natural gas of 100 lbs NOx/10^6 scf, Table 1.4-1 (7/98) by the average heat value ratio as determined in (iii);
(v) multiplying the cubic feet of digester gas burned (cubic feet/yr) by (iv);
(vi) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B010, B011, and B012 by the AP-42 emission factor of 100 lbs/10^6scf, Table 1.4-1(7/98);
(vii) determine the NOx emissions from B010, B011, and B012 by summing (v) and (vi);
(viii) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of digester gas as determined in C.1.;
(ix) multiply the value in (viii) by the AP-42 emission factor for digester gas of 0.16 lb/mmBtu, Table 3.11 (4/00);
(x) multiplying the cubic feet of natural gas burned (cubic feet/year) in emission units B007, B008, and B009 by the average heat value of 1020 Btu/cubic feet;
(xi) multiplying (x) by the AP-42 emission factor for natural gas of 0.32 lb

NOx/mmBtu, Table 3.11 (4/00);

(xii) determine the NOx emission from B007, B008, and B009 by summing (ix) and (xi);

(xiii) summing (ii), (vii), and (xii);

(xiv) dividing (xiii) by 2000 lbs/ton.

k. Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B007, B008, B009, B010, B011, and B012 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) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units P002, P003, and P004 by the average 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) determine the average heat value ratio of digester gas:natural gas by dividing the average heat value of digester gas determined in C.1. (Btu/ft3) by the heat value of natural gas (1020 Btu/ft3);

(iv) multiplying the AP-42 emission factor for natural gas of 84 lbs CO/10^6 scf, Table 1.4-1 (7/98) by the average heat value ratio as determined in (iii);

(v) multiplying the cubic feet of digester gas burned (cubic feet/yr) by (iv);

(vi) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B010, B011, and B012 by the AP-42 emission factor of 84 lbs CO/10^6scf, Table 1.4-1(7/98);

(vii) determine the CO emissions from B010, B011, and B012 by summing (v) and (vi);

(viii) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of digester gas as determined in C.1.;

(ix) multiplying the value in (viii) by the AP-42 emission factor for digester gas of 0.017 lb CO/mmBtu, Table 3.11 (4/00);

(x) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of 1020 Btu/cubic feet;

(xi) multiplying (x) by the AP-42 emission factor for natural gas of 0.082 lb CO/mmBtu, Table 3.11 (4/00);

(xii) determine the CO emission from B007, B008, and B009 by summing (ix) and (xi);

(xiii) summing (ii), (vii), and (xii);
(xiv) dividing (xiii) by 2000 lbs/ton.

l. Emission Limitation-
1.28 TPY particulate matter

Applicable Compliance Method-
Compliance shall be based record keeping and shall be determined by:

(i) multiplying the total digester gas burned, as a rolling 365 day summation, by the adjusted emission factor of 12.50 lbs/10^6 scf which was determined by multiplying the AP-42 emission factor for natural gas, Table 1.4-2(7/98) of 7.6 lbs/10^6 scf by (1020 Btu/ft3 natural gas)(ft3 digester gas/620 Btu);
(ii) multiplying the total natural gas burned, as a rolling 365 day summation, by the emission factor of 7.6 lbs/10^6 scf, Table 1.4-2 (7/98); and
(iii) Summing the particulate emission rates determined in (i) and (ii) and dividing by 2000 lbs/ton.

F. Miscellaneous Requirements

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

2. Emissions units B004, B005, and B006 are to be shutdown upon the installation and startup of the new replacement units.

PART II - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	
		OAC rule 3745-17-07(A)(1)
B011 - 14.645 mmBtu/hr digester gas or natural gas hot water boiler identified as DB-2	OAC rule 3745-31-05(A)(3)	
	OAC rule 3745-35-07(B)	
	OAC rule 3745-17-10(B)(1)	

Applicable Emissions Limitations/Control Measures
4.57 lbs/hr, 20.03 TPY sulfur dioxide (SO2); 1.98 lbs/hr, 8.67 TPY carbon monoxide (CO); 2.36 lbs/hr, 10.34 TPY nitrogen oxides (NOx) 1.28 TPY particulate matter (PM)
Visible particulate emissions shall not exceed 5% opacity, as a six-minute average
The requirements of this rule also include compliance with the requirements of OAC rule 3745-17-10(B)(1)
See A.2.d
See A.2.a to A.2.c
The annual limits are based upon a rolling, 365-day summation
Particulate emissions shall not exceed 0.02 lb/mmBtu of actual heat input
The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3)

2. Additional Terms and Conditions

2.a The emissions of sulfur dioxide (SO2) from all emissions units at this facility, identified as P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed

99.0 tons, based on a rolling 365-day summation.

2.b The emissions of carbon monoxide (CO) from all emissions units at this facility, identified as P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 99.0 tons/year based on a rolling 365-day summation.

2.c The emissions of nitrogen oxides (NOx) from all emissions units at this facility P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 94.0 tons, based on a rolling, 365-day summation.

2.d The lbs/hr and TPY limitations specified in this permit were established for PTI purposes to reflect the potential to emit for this emissions unit. Therefore, it is not necessary to develop record keeping and reporting requirements to ensure compliance with these limitations.

B. Operational Restrictions

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

2. The maximum amount of digester gas burned in the emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 2,800,000 cubic feet/day.

3. The hydrogen sulfide content of the digester gas shall not exceed 1306 ppm by weight and 1007 ppm by volume, as fired, see Section C.

4. The maximum amount of digester gas burned in the flares, P002, P003, and P004, combined shall not exceed 1,400,000 cubic feet/day.

C. Monitoring and/or Recordkeeping 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 of the digester gas shall be calculated based on the average daily percent of CO2 in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft3 of CO2 is as zero and the average Btu/ft3 of methane is assumed as 1020.

   The heat content of digester gas shall be calculated by the following:
   The heat content in Btu/ft3 digester gas = (% CO2 in digester gas)(0 Btu/ft3) + (1-% CO2 in digester gas)(1020 Btu/ft3).

The density of digester gas shall be calculated by the following:
Density of digester gas, in lbs/ft3 = (% 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 CO2
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%. To assure compliance with a H2S concentration of 1007 ppm, by volume, H2S readings on the Drager or Gastec tube shall not exceed 806 ppm.

   The permittee shall maintain records of all data obtained by the hydrogen sulfide monitoring system including, but not limited to, parts per million hydrogen sulfide determined during each testing period and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentration shall be used to determine the decimal fraction of sulfur for purposes of determining compliance with the sulfur dioxide emission limitation. The hydrogen sulfide concentration determined shall be assumed as the average daily hydrogen sulfide concentration for the day of monitoring and 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 unit B011.

   b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, as a 365-day summation.

   c. The total quantity of natural gas burned, in cubic feet, in emissions unit B011.

   d. The total quantity of natural gas burned, in cubic feet in emissions units P002, P003, P004, B007, B008, B009 , B010, B011, and B012 combined, as a 365-day summation.

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

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

g. The calculated density of the digester gas, in lb per standard cubic foot.

h. The 365-day rolling summation of the SO2 emission rate in tons, for emission units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, calculated based upon the methodology specified in E.1.i.

i. The rolling, 365-day summation of the CO emission rate in tons calculated based upon the methodology outlined in Section E.1.k. for emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined.

j. The rolling 365-day summation of the NOx emission rate in tons calculated based upon the methodology outlined in Section E.1.j., for emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined.

4. For each day during which the permittee burns a fuel other than natural gas or digester gas, the permittee shall maintain a record of the type and quantity of fuel burned in this emissions unit.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas or 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 daily usage of digester gas, in cubic feet, in emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012, combined.

b. The daily usage of digester gas in cubic feet, in emissions unit P002, P003, and P004.

c. The rolling, 365-day sulfur dioxide emissions for identified emission units combined (reference Section A.2.a).

d. The rolling, 365-day CO emissions for identified emissions units combined (reference Section A.2.b).

e. The rolling, 365-day NOx emissions for identified emissions units combined (reference Section A.2.c).

3. The quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (2) of the General Terms and Conditions.

4. The permittee shall submit annual reports which specify the total digester gas usage, the total natural gas usage, the carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B007, B008, B009, B010, B011, B012, P002, P003, and P004, combined, as a rolling 365-day summation. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

1. Compliance with the emission limitation(s) in section A.1. of these terms and conditions shall be determined in accordance with the following methods:

   a. 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.

   b. Emission Limitation-
   0.020 pound particulates/mmBtu

   Applicable Compliance Method-
   For the use of digester gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0236 mm cu.ft./hour) by the adjusted AP-42, Table 1.4-2, (7/98) emission factor for digester gas (12.50 lbs particulate/mm cu ft)* and dividing by the maximum hourly heat input capacity of the emissions unit (14.645 mm Btu/hr). For the use of natural gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0146 mm cu.ft./hour) by the AP-42, Table 1.4-2, (7/98), emission factor for natural gas (7.69 lbs particulate/mm cu ft) and dividing by the maximum hourly heat input capacity of the emissions unit (14.645 mm Btu/hr)

   *The AP-42 emission factor for natural gas is adjusted for digester gas by multiplying the factor for natural gas of 7.6 lbs/10^6 scf by 1020 Btu per ft3 natural gas/620 Btu per ft3 digester gas.

   c. Emission Limitation-
   4.57 lbs/hr, SO2 from emissions unit B011

   Applicable Compliance Method-
   Compliance shall be determined by employing the maximum hourly digester gas burning capacity (23,621 cubic feet/hr) in the following formula:
   SO2 (lbs/hr) = D X S X 1.998 X Hourly Gas Consumption/2000 lbs/ton

   D = density of gas in pounds per standard cubic foot
   S = decimal fraction of sulfur in the gaseous fuel
   Gas Consumption =23,621 cubic feet/hr

d. Emission Limitation-
20.03 TPY SO2 from emissions unit B011

Applicable Compliance Method-
The 20.03 TPY limitation was developed by multiplying the 4.57 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

e. Emission Limitation-
1.98 lbs/day CO from emissions unit B011

Applicable Compliance Method-
Compliance shall be determined by:
(i) dividing the AP-42 emission factor of 84 lb/10^6 scf, Table 1.4-1(7/98), by the average heat value of digester gas (Btu/ft3) as determined in C.1.;
(ii) multiplying (i) by the maximum heat input capacity of B011 (14.645 mmBtu/hr).

f. Emission Limitation-
8.67 TPY CO from emissions unit B011

Applicable Compliance Method-
The 8.66 TPY limitation was developed by multiplying the 1.98 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

g. Emission Limitation-
2.36 lbs/hr NOx from emission unit B011

Applicable Compliance Method-
Compliance is determined by:
(i) dividing the AP-42 emission factor of 100 lb/10^6 scf, Table 1.4-1(7/98), by the average heat value of digester gas (Btu/ft3) as determined in C.1.;
(ii) multiplying (i) by the maximum heat input capacity of B011 (14.645 mmBtu/hr).

h. Emission Limitation-
10.34 TPY NOx from emissions unit B011

Applicable Compliance Method-
The 10.34TPY limitation was developed by multiplying the 2.36 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

i. Emission Limitation-
99.0 tons/year SO2 emissions for P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, as a rolling, 365-day summation

Applicable Compliance Method-

(i) The formula for gaseous fuels in OAC rule 3745-18-04(F)(3) shall be used to determine the emission rate (lbs/mmBtu) from the burning of digester gas in P002, P003, P004, B007, B008,B009, B010, B011, and B012, i.e.,
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;
S = the decimal fraction of sulfur in the gaseous fuel, by weight.

SO2 = ER (lbs/mmBtu) X Gas Consumption (cu.ft/year) X (Btu/cu.ft)/ 2000 lbs/ton
Or:
SO2 (lbs/year) =(D X S X 1.998 X Annual Gas Consumption)/ 2000 lbs/ton

where: D = the density of the gaseous fuel in pounds per standard cubic foot;
S = the decimal fraction of sulfur in the gaseous fuel, by weight;*
Gas Consumption = cubic feet/year, as a rolling 365-day summation

*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 0.0894 lb/ft3

(ii) The emissions of SO2 from the burning of natural gas shall be determined by multiplying the AP-42 emissions factor , Chapter 1.4-2(7/9), of 0.6 lb/10^6 scf by the amount of natural gas burned each year in emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012.

(iii) SO2 emissions shall be determined by the summation of (i) and (ii).

(iv) Dividing (iii) by 2000 lbs/ton.

j. Emission Limitation-
94.0 tons/year NOx for P002, P003, P004, B007, B008, B009, B010, B011, and B012 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) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units P002, P003, and P004 by the average 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) determine the average heat value ratio of digester gas:natural gas by dividing the average heat value of digester gas determined in C.1. (Btu/ft3) by the heat value of natural gas (1020 Btu/ft3);
(iv) multiplying the AP-42 emission factor for natural gas of 100 lbs NOx/10^6 scf, Table 1.4-1 (7/98) by the average heat value ratio as determined in (iii);
(v) multiplying the cubic feet of digester gas burned (cubic feet/yr) by (iv);
(vi) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B010, B011, and B012 by the AP-42 emission factor of 100 lbs/10^6scf, Table 1.4-1(7/98);
(vii) determine the NOx emissions from B010, B011, and B012 by summing (v) and (vi);
(viii) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of digester gas as determined in C.1.;
(ix) multiply the value in (viii) by the AP-42 emission factor for digester gas of 0.16 lb/mmBtu, Table 3.11 (4/00);
(x) multiplying the cubic feet of natural gas burned (cubic feet/year) in emission units B007, B008, and B009 by the average heat value of 1020 Btu/cubic feet;
(xi) multiplying (x) by the AP-42 emission factor for natural gas of 0.32 lb NOx/mmBtu, Table 3.11 (4/00);
(xii) determine the NOx emission from B007, B008, and B009 by summing (ix) and (xi);
(xiii) summing (ii), (vii), and (xii);
(xiv) dividing (xiii) by 2000 lbs/ton.

k. Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B007, B008, B009, B010, B011, and B012 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) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units P002, P003, and P004 by the average 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) determine the average heat value ratio of digester gas:natural gas by dividing the

average heat value of digester gas determined in C.1. (Btu/ft3) by the heat value of natural gas (1020 Btu/ft3);

(iv) multiplying the AP-42 emission factor for natural gas of 84 lbs CO/10^6 scf, Table 1.4-1 (7/98) by the average heat value ratio as determined in (iii);

(v) multiplying the cubic feet of digester gas burned (cubic feet/yr) by (iv);

(vi) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B010, B011, and B012 by the AP-42 emission factor of 84 lbs CO/10^6scf, Table 1.4-1(7/98);

(vii) determine the CO emissions from B010, B011, and B012 by summing (v) and (vi);

(viii) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of digester gas as determined in C.1.;

(ix) multiplying the value in (viii) by the AP-42 emission factor for digester gas of 0.017 lb CO/mmBtu, Table 3.11 (4/00);

(x) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of 1020 Btu/cubic feet;

(xi) multiplying (x) by the AP-42 emission factor for natural gas of 0.082 lb CO/mmBtu, Table 3.11 (4/00);

(xii) determine the CO emission from B007, B008, and B009 by summing (ix) and (xi);

(xiii) summing (ii), (vii), and (xii);

(xiv) dividing (xiii) by 2000 lbs/ton.

l. Emission Limitation-
1.28 TPY particulate matter

Applicable Compliance Method-
Compliance shall be based record keeping and shall be determined by:

(i) multiplying the total digester gas burned, as a rolling 365 day summation, by the adjusted emission factor of 12.50 lbs/10^6 scf which was determined by multiplying the AP-42 emission factor for natural gas, Table 1.4-2(7/98) of 7.6 lbs/10^6 scf by (1020 Btu/ft3 natural gas)(ft3 digester gas/620 Btu);

(ii) multiplying the total natural gas burned, as a rolling 365 day summation, by the emission factor of 7.6 lbs/10^6 scf, Table 1.4-2 (7/98); and

(iii) Summing the particulate emission rates determined in (i) and (ii) and dividing by 2000 lbs/ton.

F. Miscellaneous Requirements

1. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the hydrogen sulfide monitoring system designed to ensure valid

and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the hydrogen sulfide monitoring system must be kept on site and available for inspection during regular office hours.

2. Emissions units B004, B005, and B006 are to be shutdown upon the installation and startup of the new replacement units.

PART II - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	
		OAC rule 3745-17-07(A)(1)
B012 - 14.645 mmBtu/hr digester gas or natural gas hot water boiler identified as DB-3	OAC rule 3745-31-05(A)(3)	
	OAC rule 3745-35-07(B)	
	OAC rule 3745-17-10(B)(1)	

Applicable Emissions Limitations/Control Measures
4.57 lbs/hr, 20.03 TPY sulfur dioxide (SO2); 1.98 lbs/hr, 8.67 TPY carbon monoxide (CO); 2.36 lbs/hr, 10.34 TPY nitrogen oxides (NOx) 1.28 TPY particulate matter (PM)
Visible particulate emissions shall not exceed 5% opacity, as a six-minute average
The requirements of this rule also include compliance with the requirements of OAC rule 3745-17-10(B)(1)
See A.2.d
See A.2.a to A.2.c
The annual limits are based upon a rolling, 365-day summation
Particulate emissions shall not exceed 0.02 lb/mmBtu of actual heat input
The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3)

2. Additional Terms and Conditions

Emissions Unit ID: **B012**

2.a The emissions of sulfur dioxide (SO2) from all emissions units at this facility, identified as P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 99.0 tons, based on a rolling 365-day summation.

2.b The emissions of carbon monoxide (CO) from all emissions units at this facility, identified as P002, P003, P004, B007, B008, B009, B010, B011, B012 combined, shall not exceed 99.0 tons/year based on a rolling 365-day summation.

2.c The emissions of nitrogen oxides (NOx) from all emissions units at this facility P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 94.0 tons, based on a rolling, 365-day summation.

2.d The lbs/hr and TPY limitations specified in this permit were established for PTI purposes to reflect the potential to emit for this emissions unit. Therefore, it is not necessary to develop record keeping and reporting requirements to ensure compliance with these limitations.

B. Operational Restrictions

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

2. The maximum amount of digester gas burned in the emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, shall not exceed 2,800,000 cubic feet/day.

3. The hydrogen sulfide content of the digester gas shall not exceed 1306 ppm by weight and 1007 ppm by volume, as fired, see Section C.

4. The maximum amount of digester gas burned in the flares, P002, P003, and P004, combined, shall not exceed 1,4000,000 cubic feet/day.

C. Monitoring and/or Recordkeeping 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 of the digester gas shall be calculated based on the average daily percent of CO2 in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft3 of CO2 is as zero and the average Btu/ft3 of methane is assumed as 1020.

   The heat content of digester gas shall be calculated by the following:
   The heat content in Btu/ft3 digester gas = (% CO2 in digester gas)(0 Btu/ft3) + (1-% CO2 in

digester gas)(1020 Btu/ft3).

The density of digester gas shall be calculated by the following:
Density of digester gas, in lbs/ft3 = (% 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 CO2
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%. To assure compliance with a H2S concentration of 1007 ppm, by volume, H2S readings on the Drager or Gastec tube shall not exceed 806 ppm.

   The permittee shall maintain records of all data obtained by the hydrogen sulfide monitoring system including, but not limited to, parts per million hydrogen sulfide determined during each testing period and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentration shall be used to determine the decimal fraction of sulfur for purposes of determining compliance with the sulfur dioxide emission limitation. The hydrogen sulfide concentration determined shall be assumed as the average daily hydrogen sulfide concentration for the day of monitoring and 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 unit B012

   b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B007, B008, B009,B010, B011, and B012 combined, as a 365-day summation.

   c. The total quantity of natural gas burned, in cubic feet, in emissions unit B012.

   d. The total quantity of natural gas burned, in cubic feet in emissions units P002, P003,

P004, B004, B007, B008, B009, B010, B011, and B012 combined, as a 365-day summation.

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

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

g. The calculated density of the digester gas, in lb per standard cubic foot

h. The 365-day rolling summation of the SO2 emission rate in tons, for emission units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, calculated based upon the methodology specified in E.1.i.

i. The rolling, 365-day summation of the CO emission rate in tons calculated based upon the methodology outlined in Section E.1.k. for emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined.

j. The rolling 365-day summation of the NOx emission rate in tons calculated based upon the methodology outlined in Section E.1.j., for emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined.

4. For each day during which the permittee burns a fuel other than natural gas or digester gas, the permittee shall maintain a record of the type and quantity of fuel burned in this emissions unit.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas or 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 daily usage of digester gas, in cubic feet, in emissions units P002, P003, P004, B007, B008, B009 B010, B011, and B012, combined.

b. The daily usage of digester gas in cubic feet, in emissions unit P002, P003, and P004.

c. The rolling, 365-day sulfur dioxide emissions for identified emission units combined (reference Section A.2.a).

d. The rolling, 365-day CO emissions for identified emissions units combined (reference Section A.2.b).

e. The rolling, 365-day NOx emissions for identified emissions units combined (reference Section A.2.c).

3. The quarterly deviation (excursion) reports shall be submitted in accordance with paragraph **(2)** of the General Terms and Conditions.

4. The permittee shall submit annual reports which specify the total digester gas usage, the total natural gas usage, the carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B007, B008, B009, P002, P003,P004, B010, B011, and B012 combined, as a rolling 365-day summation. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

1. Compliance with the emission limitation(s) in section A.1. of these terms and conditions shall be determined in accordance with the following methods:

   a. 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.

   b. Emission Limitation-
   0.020 pound particulates/mmBtu

   Applicable Compliance Method-
   For the use of digester gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0236 mm cu.ft./hour) by the adjusted AP-42, Table 1.4-2, (7/98) emission factor for digester gas (12.50 lbs particulate/mm cu ft)* and dividing by the maximum hourly heat input capacity of the emissions unit (14.645 mm Btu/hr). For the use of natural gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0146 mm cu.ft./hour) by the AP-42, Table 1.4-2, (7/98), emission factor for natural gas (7.69 lbs particulate/mm cu ft) and dividing by the maximum hourly heat input capacity of the emissions unit (14.645 mm Btu/hr)

   *The AP-42 emission factor for natural gas is adjusted for digester gas by multiplying the factor for natural gas of 7.6 lbs/10^6 scf by 1020 Btu per ft3 natural gas/620 Btu per ft3 digester gas.

   c. Emission Limitation-
   4.57 lbs/hr, SO2 from emissions unit B012

   Applicable Compliance Method-
   Compliance shall be determined by employing the maximum hourly digester gas burning capacity (23,621 cubic feet/hr) in the following formula:
   SO2 (lbs/hr) = D X S X 1.998 X Hourly Gas Consumption/2000 lbs/ton

   D = density of gas in pounds per standard cubic foot
   S = decimal fraction of sulfur in the gaseous fuel

Gas Consumption =23,621 cubic feet/hr

d. Emission Limitation-
20.03 TPY SO2 from emissions unit B012

Applicable Compliance Method-
The 20.03 TPY limitation was developed by multiplying the 4.57 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

e. Emission Limitation-
1.98 lbs/day CO from emissions unit B012

Applicable Compliance Method-
Compliance shall be determined by:
(i) dividing the AP-42 emission factor of 84 lb/10^6 scf, Table 1.4-1(7/98), by the average heat value of digester gas (Btu/ft3) as determined in C.1.;
(ii) multiplying (i) by the maximum heat input capacity of B012 (14.645 mmBtu/hr).

f. Emission Limitation-
8.67 TPY CO from emissions unit B012

Applicable Compliance Method-
The 8.66 TPY limitation was developed by multiplying the 1.98 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

g. Emission Limitation-
2.36 lbs/hr NOx from emission unit B012

Applicable Compliance Method-
Compliance is determined by:
(i) dividing the AP-42 emission factor of 100 lb/10^6 scf, Table 1.4-1(7/98), by the average heat value of digester gas (Btu/ft3) as determined in C.1.;
(ii) multiplying (i) by the maximum heat input capacity of B012 (14.645 mmBtu/hr).

h. Emission Limitation-
10.34 TPY NOx from emissions unit B012

Applicable Compliance Method-
The 10.34TPY limitation was developed by multiplying the 2.36 lbs/hr limitation operating schedule of 8760 hrs/yr, and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

i. Emission Limitation-
99.0 tons/year SO2 emissions for P002, P003, P004, B007, B008, B009, B010, B011, and B012 combined, as a rolling, 365-day summation

Applicable Compliance Method-

(i) The formula for gaseous fuels in OAC rule 3745-18-04(F)(3) shall be used to determine the emission rate (lbs/mmBtu) from the burning of digester gas in P002, P003, P004, B007, B008,B009, B010, B011, and B012, i.e.,
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;
S = the decimal fraction of sulfur in the gaseous fuel, by weight.

SO2 = ER (lbs/mmBtu) X Gas Consumption (cu.ft/year) X (Btu/cu.ft)/ 2000 lbs/ton
Or:
SO2 (lbs/year) =(D X S X 1.998 X Annual Gas Consumption)/ 2000 lbs/ton

where: D = the density of the gaseous fuel in pounds per standard cubic foot;
S = the decimal fraction of sulfur in the gaseous fuel, by weight;*
Gas Consumption = cubic feet/year, as a rolling 365-day summation

*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 0.0894 lb/ft3

(ii) The emissions of SO2 from the burning of natural gas shall be determined by multiplying the AP-42 emissions factor , Chapter 1.4-2(7/9), of 0.6 lb/10^6 scf by the amount of natural gas burned each year in emissions units P002, P003, P004, B007, B008, B009, B010, B011, and B012.

(iii) SO2 emissions shall be determined by the summation of (i) and (ii).

(iv) Dividing (iii) by 2000 lbs/ton.

j. Emission Limitation-
94.0 tons/year NOx for P002, P003, P004, B007, B008, B009, B010, B011, and B012 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) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units P002, P003, and P004 by the average 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) determine the average heat value ratio of digester gas:natural gas by dividing the average heat value of digester gas determined in C.1. (Btu/ft3) by the heat value of natural gas (1020 Btu/ft3);

(iv) multiplying the AP-42 emission factor for natural gas of 100 lbs NOx/10^6 scf, Table 1.4-1 (7/98) by the average heat value ratio as determined in (iii);

(v) multiplying the cubic feet of digester gas burned (cubic feet/yr) by (iv);

(vi) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B010, B011, and B012 by the AP-42 emission factor of 100 lbs/10^6scf, Table 1.4-1(7/98);

(vii) determine the NOx emissions from B010, B011, and B012 by summing (v) and (vi);

(viii) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of digester gas as determined in C.1.;

(ix) multiply the value in (viii) by the AP-42 emission factor for digester gas of 0.16 lb/mmBtu, Table 3.11 (4/00);

(x) multiplying the cubic feet of natural gas burned (cubic feet/year) in emission units B007, B008, and B009 by the average heat value of 1020 Btu/cubic feet;

(xi) multiplying (x) by the AP-42 emission factor for natural gas of 0.32 lb NOx/mmBtu, Table 3.11 (4/00);

(xii) determine the NOx emission from B007, B008, and B009 by summing (ix) and (xi);

(xiii) summing (ii), (vii), and (xii);

(xiv) dividing (xiii) by 2000 lbs/ton.

k. Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B007, B008, B009, B010, B011, and B012 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) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units P002, P003, and P004 by the average 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) determine the average heat value ratio of digester gas:natural gas by dividing the average heat value of digester gas determined in C.1. (Btu/ft3) by the heat value of natural gas (1020 Btu/ft3);

(iv) multiplying the AP-42 emission factor for natural gas of 84 lbs CO/10^6 scf, Table 1.4-1 (7/98) by the average heat value ratio as determined in (iii);

(v) multiplying the cubic feet of digester gas burned (cubic feet/yr) by (iv);

(vi) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B010, B011, and B012 by the AP-42 emission factor of 84 lbs CO/10^6scf, Table 1.4-1(7/98);

(vii) determine the CO emissions from B010, B011, and B012 by summing (v) and (vi);

(viii) multiplying the cubic feet of digester gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of digester gas as determined in C.1.;

(ix) multiplying the value in (viii) by the AP-42 emission factor for digester gas of 0.017 lb CO/mmBtu, Table 3.11 (4/00);

(x) multiplying the cubic feet of natural gas burned (cubic feet/year) in emissions units B007, B008, and B009 by the average heat value of 1020 Btu/cubic feet;

(xi) multiplying (x) by the AP-42 emission factor for natural gas of 0.082 lb CO/mmBtu, Table 3.11 (4/00);

(xii) determine the CO emission from B007, B008, and B009 by summing (ix) and (xi);

(xiii) summing (ii), (vii), and (xii);

(xiv) dividing (xiii) by 2000 lbs/ton.

l. Emission Limitation-
1.28 TPY particulate matter

Applicable Compliance Method-
Compliance shall be based record keeping and shall be determined by:

(i) multiplying the total digester gas burned, as a rolling 365 day summation, by the adjusted emission factor of 12.50 lbs/10^6 scf which was determined by multiplying the AP-42 emission factor for natural gas, Table 1.4-2(7/98) of 7.6 lbs/10^6 scf by (1020 Btu/ft3 natural gas)(ft3 digester gas/620 Btu);

(ii) multiplying the total natural gas burned, as a rolling 365 day summation, by the emission factor of 7.6 lbs/10^6 scf, Table 1.4-2 (7/98); and

(iii) Summing the particulate emission rates determined in (i) and (ii) and dividing by 2000 lbs/ton.

F. Miscellaneous Requirements

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

2. Emissions units B004, B005, and B006 are to be shutdown upon the installation and startup of the new replacement units.

NEW SOURCE REVIEW FORM B

PTI Number: 08-04195 Facility ID: 0857100983

FACILITY NAME City of Dayton Wastewater Treatment Plt

FACILITY DESCRIPTION 3 hot water boilers. CITY/TWP Dayton

SIC CODE 9511 SCC CODE 10200602 EMISSIONS UNIT ID B010

EMISSIONS UNIT DESCRIPTION 14.645 mmBtu/hr digester gas or natural gas hot water boiler use identified as DB-1

DATE INSTALLED January 2001

EMISSIONS: (Click on bubble help for Air Quality Descriptions)

Pollutants	Air Quality Description	Actual Emissions Rate		PTI Allowable	
		Short Term Rate	Tons Per Year	Short Term Rate	Tons Per Year
Particulate Matter	lb/mmBtu heat input	0.02	1.28	0.02	1.28
PM_{10}					
Sulfur Dioxide	lbs/hr	4.57	20.03	4.57	20.03
Organic Compounds					
Nitrogen Oxides	lbs/day	2.36	10.34	2.36	10.34
Carbon Monoxide	lbs/day	1.98	8.67	1.98	8.67
Lead					
Other: Air Toxics					

APPLICABLE FEDERAL RULES:

NSPS? NESHAP? PSD? OFFSET POLICY?

WHAT IS THE BAT DETERMINATION, AND WHAT IS THE BASIS FOR THE DETERMINATION?
Enter Determination Compliance with the OAC rules, 5% visible emissions, use of natural or digester gas, and maintaining emissions of all pollutants to less than 100.0 tons/yr on a facility wide basis.

IS THIS SOURCE SUBJECT TO THE AIR TOXICS POLICY? no

OPTIONAL: WHAT IS THE CAPITAL COST OF CONTROL EQUIPMENT? $

TOXIC AIR CONTAMINANTS

Ohio EPA's air toxics policy applies to contaminants for which the American Conference of Governmental Industrial Hygienists (ACGIH) has a listed threshold limit value.

AIR TOXICS MODELING PERFORMED*? _____ YES x NO

IDENTIFY THE AIR CONTAMINANTS: _____

NEW SOURCE REVIEW FORM B

PTI Number: 08-04195 Facility ID: 0857100983

FACILITY NAME City of Dayton Wastewater Treatment Plt

FACILITY DESCRIPTION 3 hot water boilers. CITY/TWP Dayton

Emissions Unit ID: **B012**

SIC CODE 9511 SCC CODE 10200602 EMISSIONS UNIT ID B011

EMISSIONS UNIT DESCRIPTION 14.645 mmBtu/hr digester gas or natural gas hot water boiler identified as DB-2

DATE INSTALLED January 2001

EMISSIONS: (Click on bubble help for Air Quality Descriptions)

Pollutants	Air Quality Description	Actual Emissions Rate		PTI Allowable	
		Short Term Rate	Tons Per Year	Short Term Rate	Tons Per Year
Particulate Matter	lb/mmBtu heat input	0.02	1.28	0.02	1.28
PM_{10}					
Sulfur Dioxide	lbs/day	4.57	20.03	4.57	20.03
Organic Compounds					
Nitrogen Oxides	lbs/day	2.36	10.34	2.36	10.34
Carbon Monoxide	lbs/day	1.98	8.67	1.98	8.67
Lead					
Other: Air Toxics					

APPLICABLE FEDERAL RULES:

NSPS? NESHAP? PSD? OFFSET POLICY?

WHAT IS THE BAT DETERMINATION, AND WHAT IS THE BASIS FOR THE DETERMINATION?
Enter Determination Compliance with the OAC rules, 5% visible emissions, use of natural or digester gas, and maintaining emissions of all pollutants to less than 100.0 tons/yr on a facility wide basis.

IS THIS SOURCE SUBJECT TO THE AIR TOXICS POLICY? no

OPTIONAL: WHAT IS THE CAPITAL COST OF CONTROL EQUIPMENT? $

TOXIC AIR CONTAMINANTS

Ohio EPA's air toxics policy applies to contaminants for which the American Conference of Governmental Industrial Hygienists (ACGIH) has a listed threshold limit value.

AIR TOXICS MODELING PERFORMED*? _____ YES x NO

IDENTIFY THE AIR CONTAMINANTS: _____

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NEW SOURCE REVIEW FORM B

PTI Number: 08-04195 Facility ID: 0857100983

FACILITY NAME City of Dayton Wastewater Treatment Plt

FACILITY DESCRIPTION 3 hot water boilers. CITY/TWP Dayton

Emissions Unit ID: **B012**

SIC CODE 9511 SCC CODE 10200602 EMISSIONS UNIT ID B012

EMISSIONS UNIT DESCRIPTION 14.645 mmBtu/hr digester gas or natural gas hot water boiler identified as DB-3

DATE INSTALLED January 2001

EMISSIONS: (Click on bubble help for Air Quality Descriptions)

Pollutants	Air Quality Description	Actual Emissions Rate		PTI Allowable	
		Short Term Rate	Tons Per Year	Short Term Rate	Tons Per Year
Particulate Matter	lb/mmBtu heat input	0.02	1.28	0.02	1.28
PM_{10}					
Sulfur Dioxide	lbs/day	4.57	20.03	4.57	20.03
Organic Compounds					
Nitrogen Oxides	lbs/day	2.36	10.34	2.36	10.34
Carbon Monoxide	lbs/day	1.98	8.67	1.98	8.67
Lead					
Other: Air Toxics					

APPLICABLE FEDERAL RULES:

NSPS? NESHAP? PSD? OFFSET POLICY?

WHAT IS THE BAT DETERMINATION, AND WHAT IS THE BASIS FOR THE DETERMINATION?

Enter Determination Compliance with the OAC rules, 5% visible emissions, use of natural or digester gas, and maintaining emissions of all pollutants to less than 100.0 tons/yr on a facility wide basis.

IS THIS SOURCE SUBJECT TO THE AIR TOXICS POLICY? no

OPTIONAL: WHAT IS THE CAPITAL COST OF CONTROL EQUIPMENT? $

TOXIC AIR CONTAMINANTS

Ohio EPA's air toxics policy applies to contaminants for which the American Conference of Governmental Industrial Hygienists (ACGIH) has a listed threshold limit value.

AIR TOXICS MODELING PERFORMED*? _____ YES x NO

IDENTIFY THE AIR CONTAMINANTS: _____

Ohio EPA Permit to Install Information Form Please describe below any documentation which is being submitted with this recommendation (must be sent the same day). Electronic items should be submitted with the e-mail transmitting the PTI terms, and in software that CO can utilize. If mailing any hard copy, this section must be printed as a cover page. All items must be clearly labeled indicating the PTI name and number. Submit hard copy items to **Pam McGraner**, AQM&P, DAPC, Central Office, and electronic files to **airpti@epa.state.oh.us**

NEW SOURCE REVIEW FORM B

PTI Number: 08-04195 Facility ID: 0857100983

FACILITY NAME City of Dayton Wastewater Treatment Plt

FACILITY DESCRIPTION 3 hot water boilers. CITY/TWP Dayton

Emissions Unit ID: **B012**

Please fill out the following. If the checkbox does not work, replace it with an 'X'	Electronic	**Additional information** File Name Convention (your PTI # plus this letter)	Hard Copy	None
Calculations (required)	☒	0000000**c**.wpd	☐	
Modeling form/results	☐	0000000**s**.wpd	☐	☐
PTI Application (complete or partial)*	☐	0000000**a**.wpd	☐	☐
BAT Study	☐	0000000**b.**wpd	☐	☐
Other/misc.	☐	0000000**t**.wpd	☐	☐

* Mandatory for netting, PSD, nonattainment NSR, 112(g), 21-07(G)(9)(g) and 21-09(U)(2)(f) - 2 complete copies.

Please complete (see comment bubble to the left for additional instructions):

NSR Discussion

The City of Dayton is planning to replace the three existing boilers, B004, B005, and B006 with three larger and more efficient boilers which will be identified as B010, B011, and B012. The boilers will operate by burning digester gas or natural gas. Digester gas is generated as a by-product of anaerobic digestion of wastewater sludge. Sludge gas is composed mainly of CO2 and methane. The Btu value averages 620 Btu/ft3. The sludge gas is utilized in the boilers or cogeneration units as fuel. If adequate sludge gas is not produced, natural gas is used as supplemental fuel. If too much sludge gas is produced, the gas is burned off in the flares.

The City of Dayton has requested federal limitations to avoid Title V thresholds. A FESOP has been drafted for this facility which includes the three boilers which are to be replaced. Since the new boilers are larger, facility limitations have been added in this PTI to assure Title V thresholds and FESOP limitations will not be exceeded.

The emissions imitations specified in the permit are facility wide and based on a 365-day rolling summation. The potential emissions are limited by restricting the hydrogen sulfide content of the digester gas to be burned and limiting the amount of digester gas which may be burned in the flares.

SO2 will be limited by limiting the concentration of H2S in the sludge gas. The formula in OAC 3745-18-04(F)(3) was used to determine the amount of H2S permitted in the gas to maintain levels of SO2 emissions below Title V thresholds. The H2S concentration shall not exceed 1306 ppm by weight and 1007 ppm by volume. Monitoring requirements for H2S have been written into the permit. Monitoring will be conducted by using the Drager and Gastec tubes. A test for H2S shall be conducted every three days. Due to the large quantity of sludge, 10.8 million gallons, and the detention time of the digesters, 30 to 40 days, any variation in the H2S concentration will be very gradual. If any significant increases in H2S are recognized, ferrous chloride feed rates must be increased to assure compliance with the daily H2S and SO2 limitations. Record keeping requirements are also part of the permit to assure compliance with a 365-day rolling summation limitation.

The CO emissions will be limited by the amount of digester gas which may be burned in the flares. If 2,800,000 cubic

Emissions Unit ID: **B012**

feet of digester gas is produced and only 1,400,000 cubic feet of digester gas is burned in the flares the worst case facility emissions are equal to 98.48 ton/yr. The worst case scenario for CO emissions is indicated in the following table. In this scenario, natural gas will be required to supplement the operation of the boilers at maximum capacity.

	Digester Gas Burned (ft3/day)	Natural Gas Burned (ft3/day)	Tons/yr CO emissions
Flares	1,400,000		58.61
Boilers	1,400,000		21.39
Boilers		183,048	4.60
Cogeneration Units		909,567	13.88
TOTAL			98.48

NOx emissions will not exceed 100 TPY. The worst case scenario for NOx would involve burning 1,700,709 cubic feet of sludge gas in the boilers, emitting 31.02 tons/yr, burning 1,099,291 cubic feet of digester gas in the flares, emitting 8.48 tons/yr, and burning natural gas in the cogeneration units, emitting 54.18 tons/yr, for a total of 93.68 tons/yr NOx.

Each boiler will be limited to 0.02 lb/mmBtu heat input in accordance with OAC rule 3745-17-10(B)(1). BAT is determined as compliance with the OAC rule, 5% visible emissions, and monitoring and record keeping to assure compliance with the limitations specified in the permit.

Please complete for these type permits (For PSD/NSR Permit, place mouse over this text):

☒ **Synthetic Minor Determination and/or** ☐ **Netting Determination**

Permit To Install**#08-04195**

A. Source Description

This facility is a wastewater treatment plant for the City of Dayton. In the process of treating the wastewater, sludge is produced. The sludge is fed to the anaerobic digestion system where sludge gas is produced. The sludge gas is either burned off in flares, utilized in the boilers as fuel, or used in the cogeneration units as fuel. If adequate digester gas is not produced, natural gas is the supplemental fuel which is burned in the boilers and cogeneration units. The City of Dayton Wastewater Treatment Plant plans to install 3 new boilers to replace the existing boilers identified as B004, B005, and B006. The new boilers will each have a capacity of 14.645 mmBtu/hr. Although the input capacity of the boilers is greater than the boilers which are to be replaced, total facility emissions will not exceed the Title V thresholds. This will be assured by monitoring and record keeping.

B. Facility Emissions and Attainment Status

The City of Dayton has requested avoidance of Title V permitting requirements by the imposition of federally

enforceable limitations. The emissions imitations specified in the permit are facility wide and based on a 365-day rolling summation. The emissions are limited by restricting the hydrogen sulfide content of the digester gas to be burned and limiting the amount of digester gas which may be burned. Monitoring requirements for H2S have been written into the permit. Monitoring will be conducted by using the Drager and Gastec tubes. A test for H2S shall be conducted every three days. Due to the large quantity of sludge, 10.8 million gallons, and the detention time of the digesters, 30 to 40 days, any variation in the H2S concentration will be very gradual. If any significant increases in H2S are recognized during the monitoring, ferrous chloride feed rates must be increased to assure compliance with the daily H2S and SO2 limitations. Record keeping requirements are also part of the permit to assure compliance with a 365-day rolling summation limitation.

This PTI been drafted to include facility wide emission limitations. The emissions units include 3 flares, 3 cogeneration units, and 3 boilers. The CO emissions will be limited by the amount of digester gas which may be burned in the flares. If 2,800,000 cubic feet of digester gas is produced and only 1,400,000 cubic feet of digester gas is burned in the flares the worst case facility emissions are equal to 98.48 ton/yr. Worst case emissions for CO would be generated by burning 1,400,000 cubic feet of digester gas in the flares (maximum allowed pursuant to permit condition). The burning of 1,400,000 cubic feet of digester gas in the flares will generate 58.61 tons/yr CO. If 2,800,000 cubic feet/day of digester is generated, 1,400,000 cubic feet of digester gas will remain to be burned in the 3 boilers and cogeneration units. If the boilers operate at maximum capacity, 1,700,709 cubic feet of digester gas will be burned. The burning of the digester gas in the boilers will emit 21.39 TPY CO. To operate the boilers at maximum capacity, natural gas will be used to supplement operation. 183,048 cubic feet/day of natural gas will be needed to supplement operation. Burning of this natural gas in the boilers will emit 4.60 TPY. Natural gas will then be used to operate the cogeneration units, emitting 13.88 TPY. Total facility maximum emissions of CO will be equal to 98.48 tons/yr.

C. Source Emissions

Since the digester gas may be burned in all units (the three boilers, the three cogeneration units, and the three flares) emissions limitations for sulfur dioxide, nitrogen oxides, and carbon monoxide are limited as a facility wide 365-day rolling summation as well as specific limitations on each boiler. Each boiler is limited to 0.02 lb particulates/mmBtu heat input in accordance with OAC rule 3745-17-10(B)(1). To maintain emissions below Title V thresholds, the maximum amount of digester gas burned shall not exceed 2,800,000 cubic feet per day in all the emissions units and the hydrogen sulfide content of the digester gas shall not exceed 1007 ppm by volume, as fired.

Monitoring of the hydrogen sulfide in the digester gas must be conducted with the use of Drager or Gastec tubes. CEMs are not feasible because of the anaerobic environment of the digester gas. The City of Dayton has checked with many vendors and was not able to locate a CEM for hydrogen sulfide in an anaerobic environment. The use of the Drager or Gastic tubes should be an acceptable monitoring practice for the digester gas. Since the digesters' capacity is so large , 10.8 million gallons, and detention time of the digesters is equal to 30 to 40 days, any variation in the H2S concentration would be very gradual. If any significant increases in H2S are recognized during the monitoring, ferrous chloride feed rates will be increased to assure compliance with the daily H2S an

NEW SOURCE REVIEW FORM B

PTI Number: 08-04195 Facility ID: 0857100983

FACILITY NAME City of Dayton Wastewater Treatment Plt

FACILITY DESCRIPTION 3 hot water boilers. CITY/TWP Dayton

Emissions Unit ID: **B012**

SO2 limitations.

CO emissions are limited by limiting the amount of digester gas which may be burned off in the flares. Records shall be maintained to record the amount of digester gas burned.

NOx emissions will not exceed Title V thresholds.

D. Conclusion

The emissions in this PTI will be federally enforceable and will be written as facility wide limitations as well as specific limitations on each boiler. Potential emissions will be limited by federally enforceable limitations on the amount of digester gas burned in the flares, the H2S concentration in the digester gas, and adequate record keeping.

PLEASE PROVIDE ADDITIONAL NOTES OR COMMENTS AS NECESSARY:

NONE

Please complete:

SUMMARY (for informational purposes only)

TOTAL PERMIT TO INSTALL ALLOWABLE EMISSIONS

Pollutant	Tons Per Year
SO2	60.09
CO	26.01
NOx	31.02
PM	3.84