

**SPECIAL TERMS AND CONDITIONS**  
**Kent State University Heating Plant**  
**PTI #16-1757**

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

**1. Operations/Equipment, Applicable Rules/Requirements and Emissions Limitations**

Kent State University (OEPA ID # 1667010085), currently a Title V facility, is applying for a Permit-to-Install (PTI) for a new steam power plant to replace the existing steam power plant. The existing steam power plant consists of three boilers, including two coal-fired boilers (OEPA ID B001, rated @ 97 MMBtu/hr heat input; and OEPA ID B004, rated @ 50 MMBtu/hr heat input) and one gas-fired boiler (OEPA ID B002, rated @ 143 MMBtu/hr heat input). The new steam power plant consists of three natural gas/#2 fuel oil-fired boilers (OEPA ID B005, rated @ 151 MMBtu/hr heat input; OEPA ID B006, rated @ 121 MMBtu/hr heat input; and OEPA ID B007, rated @ 121 MMBtu/hr heat input), all of which are to be installed with low-NOx burners. No add-on pollution control equipment is planned for any of the new boilers. Although natural gas will be the primary fuel for each of the new steam plant boilers, the facility may at times switch to #2 fuel oil to fire the boilers when necessary. Also included in this PTI are six identical fiberglass underground horizontal fixed-roof fuel oil storage tanks (OEPA ID T001 - T006), each with a capacity of 30,000 gallons.

The new steam power plant, with a total heat input of all three boilers of 393 MMBtu/hr, would be considered, without limitations, a major source subject to Prevention of Significant Deterioration (PSD) review. It is the goal of the University to simultaneously remove itself from the Title V program and be exempt from PSD review by accepting federally enforceable limits on the potential to emit of the new steam power plant, thus allowing operation as a minor source facility once the installation of new boilers and the shutdown of existing boilers is complete. To limit the potential to emit, the University is requesting federally enforceable limitations on fuel burned. These federally enforceable limitations on fuel burned will ensure that emissions of each criteria pollutant is under 100 tons per year (TPY). Also with the emissions credits received from the timely shutdown of the existing boilers, resulting in emissions increases of less than the "Ohio Modeling Significant Emission Rates" of 25 tons/year for sulfur dioxide and 25 tons/year for nitrogen oxides, the facility can "net" out of having to model for incremental ground-level concentration impacts from emissions of sulfur dioxide and nitrogen oxides.

Each of the three boilers in the new steam power plant (B005 - B007) shall be regulated, for the following listed emissions, under the appropriate Ohio Administrative Code (OAC) state rules

and 40 CFR 60, Subpart Db - Standards of Performance federal rules. Applicable emissions limitations are included for the most stringent rules (i.e., either state or federal):

Particulates

OAC rule 3745-17-10(B): 0.020 pound of particulate emissions per million Btu actual heat input.

Opacity

40 CFR 60.43b: 20% opacity as a six-minute average, except as provided by rule. OAC rule 3745-17-07(A): the limit based on this rule is less stringent.

Sulfur Dioxide

OAC 3745-31-05: 0.5 pound of sulfur dioxide per million Btu heat input. OAC rule 3745-18-06(D): the limit based on this rule is less stringent. 40 CFR 60.42b: the limit based on this rule is less stringent.

Nitrogen Oxides

OAC 3745-31-05: 0.16 pound of nitrogen oxides per million Btu heat input, when burning gas. 40 CFR 60.44b: the limit based on this rule, when burning gas, is less stringent. 40 CFR 60.44b: 0.20 pound of nitrogen oxides per million Btu heat input, when burning oil.

Carbon Monoxide

OAC rule 3745-31-05: 0.16 pound of carbon monoxide per million Btu heat input, when burning gas. OAC rule 3745-31-05: 0.18 pound of carbon monoxide per million Btu heat input, when burning oil.

Each of the six storage tanks (T001 - T006) shall be regulated under OAC rule 3745-21-09(L) and 40 CFR 60 Subpart Kb. Pursuant to OAC rule 3745-21-09(L) (2) (a), all of the above storage tanks are exempt from the requirements of (L) (1), (L) (3), and (L) (4) of OAC rule 3745-21-09(L). Pursuant to 40 CFR 60 Subpart Kb, each storage tank is exempt from controls, but monitoring/recordkeeping must be kept per 40 CFR 60.116b (a) and (b). Based on the US EPA TANKS model, version 3.0 computer program, the maximum allowable hourly and annual VOC emissions per storage tank are set in this PTI at 0.005 pounds per hour per tank and 44 pounds per year per tank, respectively.

**2. Additional Terms and Conditions**

Pursuant to the best available technology (BAT) requirements for new sources, as covered under OAC rule 3745-31-05, the permittee shall perform the following:

- a. Utilization of submerged filling and installation of conservation breather vents on each of the six storage tanks (T001 - T006).

b. Utilization of natural gas as the primary fuel to fire the three boilers (B005 - B007).

c. Utilization of low-NOx burners for each of the three boilers (B005 - B007).

d. Utilization of only oil defined as being both *distillate oil* and *very low sulfur oil*, per the definitions in 40 CFR 60.41b, to fire the three boilers (B005 - B007). No other oil types shall be allowed.

**B. Operational Restrictions**

1. The permittee shall not place, store, or hold in any of the six fixed-roof tanks (T001 - T006) any petroleum liquid which, as stored, has a true vapor pressure greater than 1.52 pounds per square inch absolute.

2. If burned exclusively, with no usage of natural gas, the maximum annual oil usage for the three boilers combined (B005 - B007) shall not exceed 2.74 million gallons based upon a rolling 12-month summation of the monthly oil usage rates.

3. If burned exclusively, with no usage of oil, the maximum annual natural gas usage for the three boilers combined (B005 - B007) shall not exceed 1238 million cubic feet based upon a rolling 12-month summation of the monthly natural gas usage rates.

4. If oil is substituted for natural gas, then the annual limit of 1238 million cubic feet of natural gas shall be reduced by 156.3 cubic feet for each gallon of oil burned.

5. To ensure enforceability during the first 12 calendar months of operation following the issuance of this permit, the permittee shall not exceed the production levels specified in the following table:

<u>Month</u>	<u>Cumulative Allowable Natural Gas Useage (MMCF) Allowing for both Natural Gas Alone and with some #2 Fuel Oil Usage</u>
1	218 <sup>a</sup>
1-2	428 <sup>a</sup>
1-3	614 <sup>a</sup>
1-4	796 <sup>a</sup>

1-5	974 <sup>a</sup>
1-6	1,149 <sup>a</sup>
1-7	1,238 <sup>a</sup>
1-8	1,238 <sup>a</sup>
1-9	1,238 <sup>a</sup>
1-10	1,238 <sup>a</sup>
1-11	1,238 <sup>a</sup>
1-12	1,238 <sup>a</sup>

a - for each gallon of fuel oil burned, reduce allowable natural gas usage by 156.3 cubic feet for that month and each following month resulting in a smaller allowable annual natural gas limit.

b. - for demonstrative purposes, using the permit allowable maximum of 2.74 million gallons of #2 fuel oil would still provide for 809.7 million cubic feet of natural gas.

c. - for demonstrative purposes, at maximum usage, #2 fuel oil would last 40 days so no cumulative limit needed to demonstrate compliance with synthetic minor.]

After the first 12 calendar months of operation following the issuance of this permit, compliance with the annual production rate limitation shall be based upon a rolling, 12-month summation of the production rates.

### **C. Monitoring and/or Recordkeeping Requirements**

1. In accordance with 40 CFR 60.116b (a) and (b), the permittee of the six storage tanks or vessels (T001 - T006) shall keep readily accessible records showing the dimension of each of the storage tanks and an analysis showing the capacity of the storage tanks for the life of the storage tanks.

2. The permittee shall obtain and maintain at the facility fuel receipts from the fuel supplier, for all shipments of fuel oil received, which certify that the oil meets the definitions of both *distillate oil* and *very low sulfur oil* as defined in 40 CFR 60.41b. For the purposes of the sulfur dioxide emission rate limitation in this permit, the oil need not meet the fuel nitrogen content specification in the definition of distillate oil.

3. The permittee shall maintain monthly records of the following information for each of the three boilers B005 -

B007 and the three boilers combined:

- a. the amount of oil burned (gallons);
- b. the rolling 12-month summation of the oil usage (gallons);
- c. the amount of natural gas burned (cubic feet); and
- d. the rolling 12-month summation of natural gas usage (cubic feet).

Also, during the first 12 calendar months of operation following the issuance of this permit, the permittee shall record the cumulative production rate for each calendar month.

4. For the combustion of oil, the permittee shall install, calibrate, maintain, and operate a continuous emission monitoring (CEM) system for measuring the opacity of emissions discharged to the atmosphere and record the output of the system. The permittee shall maintain records of opacity.

5. The permittee shall install, calibrate, maintain, and operate a CEM system for measuring nitrogen oxide emissions discharged to the atmosphere and record the output of the system. This system shall be operated and data recorded during all periods of operation except for breakdowns and repairs (All breakdowns of the CEM system and/or the emissions unit shall be recorded and include the date, time, and duration of the breakdown, cause and nature of the breakdown, description of repairs, and steps taken to prevent future breakdowns). Data is recorded during calibration checks, and zero and span adjustments. One-hour average nitrogen oxides emission rates measured by the CEM system shall be expressed in lb/million Btu heat input and shall be used to calculate the average emissions rates as required by rule. The 1-hour averages shall be calculated using the data points required under 40 CFR 60.13(b). At least 2 data points must be used to calculate each 1-hour average.

6. Procedures established under 40 CFR 60.13 shall be followed for installation, evaluation, and operation of the CEM systems.

7. Span values for nitrogen oxides shall be determined in accordance with 40 CFR 60.48b.

8. When nitrogen oxides emission data are not obtained because of CEM system breakdowns, repairs, calibration checks, and zero and span adjustments, emission data will be obtained by using standby monitoring systems, Method 7, Method 7A, or other approved reference methods to provide emission data for a minimum of 75 percent of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days.

9. The permittee shall maintain records of the following information for each steam generating unit operating day:

- a. Calendar date;
- b. The average hourly nitrogen oxides emission rates (lb/million Btu heat input) measured or predicted;
- c. The 30-day average nitrogen oxides emission rates (lb/million Btu heat input) calculated at the end of each steam generating unit operating day from the measured or predicted hourly nitrogen oxides emission rates or the preceding 30 steam generating unit operating days;
- d. Identification of the steam generating unit operating days when the calculated 30-day average nitrogen oxides emission rates are in excess of the nitrogen oxides emissions standards, with the reasons for such excess emissions as well as a description of corrective actions taken;
- e. Identification of the steam generating unit operating days for which pollutant data have not been obtained, including reasons for not obtaining sufficient data and a description of corrective actions taken;
- f. Identification of times when emission data have been excluded from the calculation of average emission rates and the reasons for excluding data;
- g. Identification of "F" factor used for calculations, method of determination, and type of fuel combusted;
- h. Identification of the times when the pollutant concentration exceeded full span of the CEM system;
- i. Description of any modifications to the CEM system that could affect the ability of the system to comply with Performance Specification 2 or 3; and
- j. Results of daily CEM systems drift tests and quarterly accuracy assessments as required under Appendix F, Procedure 1.

**D. Reporting requirements**

1. 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.)

2. The permittee shall submit notification of the date of initial startup, as provided by 40 CFR60.7. The notification shall include the design heat input capacity of the steam generating unit(s) and identification of the fuels to be combusted in the subject units.

3. The permittee shall submit to the Administrator the performance test data from the initial performance test and the performance evaluation of the CEM systems using the applicable performance specifications in appendix B.

4. The permittee shall submit excess emission reports covering opacity and nitrogen oxides emissions for any calendar quarter during which there are excess emissions from the affected facility. If there are no excess emissions from the facility during the calendar quarter, the permittee shall submit a report semiannually stating that no excess emissions occurred during the semiannual reporting period.

For opacity, excess emissions are defined as all 6-minute periods during which the average opacity exceeds the opacity standards under 40 CFR 60.43b(f).

For nitrogen oxides, excess emissions are defined as any calculated 30-day rolling average nitrogen oxides emission rate, as determined under 40 CFR 60.46b(e) and in accordance with the terms and conditions of this permit, which exceeds the applicable emission limits in 40 CFR 60.44b.

5. The permittee shall submit a quarterly report containing the information recorded under 40 CFR 60.49b(g) and Monitoring and Recordkeeping Requirement #9 of this permit. All quarterly reports shall be postmarked by the 30th day following the end

of each calendar quarter.

6. The permittee shall submit quarterly reports certifying that only very low sulfur oil meeting the definition contained in 40 CFR 60.41b was combusted in the affected facility during the preceding calendar quarter.

7. The permittee shall submit deviation (excursion) reports that identify all exceedances of the rolling, 12 month production rate limitation and, for the first 12 calendar months of operation following the issuance of this permit, all exceedances of the maximum allowable cumulative production levels. These reports are due by the date described in Part 2 - Additional Terms and Conditions of this permit under section (D) (1).

The notification shall include a copy of such record and shall be sent to the Director (the appropriate District Office or local air agency) within 45 days after the deviation occurs.

8. The permittee shall submit written notification to the Akron Regional Air Quality Management District (ARAQMD) of **actual** date(s) of each of the following milestones, as outlined in miscellaneous Requirements #3 and #4 of this permit:

- a. installation and commencement of operations of Boiler B007 in the existing steam power plant;
- b. permanent ceasement of operations of Boilers B001 and B004;
- c. permanent ceasement of operations of Boiler B002; and
- d. complete relocation of Boiler B007 to the new steam power plant.

9. If the actual date(s) of any of the above milestones cannot or does not meet expected dates, as outlined in Miscellaneous Requirements #3 and #4 of this permit, the permittee shall notify ARAQMD within 30 days after the expected date with a written report including the following:

- a. cause of the milestone delay;
- b. any corrective actions, which have been or will be taken to complete the milestone in a timely fashion; and
- c. the actual date the milestone was completed or the estimated date the milestone will be completed.

#### **E. Testing Requirements**

Compliance with the emission limitations in this permit shall be determined in accordance with the following method(s):

1. For each of Boilers B005 - B007:

- a. Emission Limitation: 0.020 pound of particulate emissions

per million Btu actual heat input

Applicable Compliance Method:

When using natural gas, compliance shall be demonstrated specifically for each boiler by multiplying the maximum hourly gas burning capacity of the specific boiler (0.151 million cubic feet per hour for B005 and 0.121 million cubic feet per hour for each of B006 and B007) by the particulate emission factor for natural gas (5.0 pounds of particulate per million cubic feet), and dividing by the maximum hourly heat input capacity of the specific boiler (151 mmBtu per hour for B005 and 121 mmBtu per hour for each of B006 and B007).

When using #2 fuel oil, compliance shall be demonstrated specifically for each boiler by multiplying the maximum fuel oil capacity of the specific boiler (1040 gal/hr for B005 and 830 gal/hr for each of B006 and B007) by the particulate emission factor for #2 fuel oil (2.0 pounds of particulate per 1000 gal), and dividing by the maximum hourly heat input capacity of the specific boiler (151 mmBtu per hour for B005 and 121 mmBtu per hour for each of B006 and B007).

The above emission factors are taken from US EPA reference document AP-42, Fifth Edition, Compilation of Air Pollution Emission Factors, Sections 1.3 (Table 1.3-2) and 1.4 (Table 1.4-1).

Future testing also may be required in accordance with the methods and procedures as specified by 40 CFR Part 60, Appendix A, Method 5.

**b.** Emission Limitation: 20% opacity as a six-minute average

Applicable Compliance Method:

Method 9 of 40 CFR Part 60, Appendix A

Note: The opacity limits under 40 CFR 60.43b apply at all times except during periods of startup, shutdown, or malfunction.

**c.** Emission limitation: 0.5 pound of sulfur dioxide per million Btu heat input

Applicable Compliance Method:

When firing oil, compliance with the allowable sulfur dioxide emission limitation shall be demonstrated by Monitoring and Recordkeeping Requirement #2 for each shipment of oil received.

When firing natural gas, compliance with this limitation will be assumed due to the negligible percent sulfur, by

weight, in the fuel.

Note: The applicable sulfur dioxide emission standards under 40 CFR 60.42b apply at all times.

**d.** Emission limitations: 0.16 pound of nitrogen oxides per million Btu heat input, when burning natural gas; 0.20 pound of nitrogen oxides per million Btu heat input, when burning oil.

Applicable Compliance Method:

The permittee shall conduct performance testing as required under 40 CFR 60.46b, in accordance with 40 CFR 60.8, using the continuous system for monitoring nitrogen oxides under 40 CFR 60.48b.

Note: The applicable nitrogen oxide emission standards under 40 CFR 60.44b apply at all times.

**e.** Emission limitations: 0.16 pound of carbon monoxide per million Btu heat input, when burning natural gas; 0.18 pound of carbon monoxide per million Btu heat input, when burning oil.

Applicable Compliance Method:

Future stack testing may be required, in accordance with Method 10 of 40 CFR Part 60, Appendix A

**2.** For each of the storage tanks T001 - T006:

Emission Limitations: 0.005 lb/hr of VOC and 44 lbs/year of VOC

Applicable Compliance Method: US EPA Tanks 3.0 computer program

## **F. Miscellaneous Requirements**

**1.** The application and enforcement of the provisions of the New Source Performance Standards (NSPS), as promulgated by the United States Environmental Protection Agency, 40 CFR Part 60, are delegated to the Ohio Environmental Protection Agency. The requirements of 40 CFR Part 60 are also federally enforceable.

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

**3.** The permittee shall install, on a timely schedule, three new natural gas/oil-fired boilers (B005 - B007) in accordance with PTI 16-1757 to permanently replace the three existing boilers (B001, B002, and B004). After the installation of

each new boiler, the permittee shall have up to a 6-month shakedown period to ensure proper operation of the new boiler. If the addition of a new boiler triggers an exceedance of the "Ohio Modeling Significant Emission Rate" of 25 tons/year for sulfur dioxide or 25 tons/year for nitrogen oxides, then one or more existing boilers shall be shut down within the shakedown period in order to avoid subjectivity to OEPA air modeling requirements. In no case shall any of the existing Boilers B001, B002, or B004 remain in active or standby operation beyond the shakedown period of the last new boiler installed. The permittee shall provide written notification to the Director or local air agency after each new boiler is installed, and after each existing boiler is permanently shut down.

4. All the terms in this permit are federally enforceable.