Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

7/23/2015

Certified Mail

Yes	TOXIC REVIEW
Yes	PSD
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
Yes	CEMS
Yes	MACT/GACT
Yes	NSPS
No	NESHAPS
No	NETTING
No	MAJOR NON-ATTAINMENT
Yes	MODELING SUBMITTED
Yes	MAJOR GHG
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

Mr. William Siderewicz
Lordstown Energy Center
24 Proctor Street
Manchester, MA 01944

RE: DRAFT AIR POLLUTION PERMIT-TO-INSTALL
Facility ID: 0278112009
Permit Number: P0117655
Permit Type: Initial Installation
County: Trumbull

Dear Permit Holder:

A draft of the Ohio Administrative Code (OAC) Chapter 3745-31 Air Pollution Permit-to-Install for the referenced facility has been issued for the emissions unit(s) listed in the Authorization section of the enclosed draft permit. This draft action is not an authorization to begin construction or modification of your emissions unit(s). The purpose of this draft is to solicit public comments on the permit. A public notice will appear in the Ohio Environmental Protection Agency (EPA) Weekly Review and the local newspaper, Warren Tribune Chronicle. A copy of the public notice and the draft permit are enclosed. This permit can be accessed electronically on the Division of Air Pollution Control (DAPC) Web page, www.epa.ohio.gov/dapc by clicking the "Search for Permits" link under the Permitting topic on the Programs tab. Comments will be accepted as a marked-up copy of the draft permit or in narrative format. Any comments must be sent to the following:

Andrew Hall
Permit Review/Development Section
Ohio EPA, DAPC
50 West Town Street, Suite 700
P.O. Box 1049
Columbus, Ohio 43216-1049

and

Ohio EPA DAPC, Northeast District Office
2110 East Aurora Road
Twinsburg, OH 44087

Comments and/or a request for a public hearing will be accepted within 30 days of the date the notice is published in the newspaper. You will be notified in writing if a public hearing is scheduled. A decision on issuing a final permit-to-install will be made after consideration of comments received and oral testimony if a public hearing is conducted.Any permit fee that will be due upon issuance of a final Permit-to-Install is indicated in the Authorization section. Please do not submit any payment now.If you have any questions, please contact Ohio EPA DAPC, Northeast District Office at (330)963-1200.

Sincerely,

Michael E. Hopkins, P.E.
Assistant Chief, Permitting Section, DAPC

Cc: U.S. EPA Region 5 *-Via E-Mail Notification*
Ohio EPA-NEDO; Pennsylvania; West Virginia; Canada

Permit Strategy Write-Up

1. Check all that apply:

   Synthetic Minor Determination

   Netting Determination

   __X_ **PSD (CO, NO_x, PM_{10}, $PM_{2.5}$, VOC, H_2SO_4, GHG)**

2. Source Description:

   Clean Energy Future-Lordstown, LLC (CEF-L) has submitted a PTI application for the installation of a nominal 940 MW Potential combined-cycle gas turbine (CCGT) electric generating facility located in the Village of Lordstown, Trumbull County.

   As noted above, this project will trigger PSD review forCO, NO_x, PM_{10}, $PM_{2.5}$, VOC, H_2SO_4, GHG. The Title V permit program applies to this project once operating. When built and operating it will be subject to the Title V Permit Program.

   This facility is similar to the Oregon Clean Energy Center (P0117413) and the Carroll County Energy Center (P0113762), hence similar permit terms and conditions. The permit application identifies two potential turbines being considered for the project (Siemens Model SCC6-800H, GE Model 7HA.01) and the data presented in the application is based on worst-case scenarios involving both turbines. The design net plant base heat rate is 7,165 Btu/kW-hr HHV (ISO conditions without duct firing) which is an indicator of the efficiency of heat input being converted to electricity.

3. Facility Emissions and Attainment Status:

   This facility is projected to be an area source for HAPs. The following chart identifies the facility's PTE:

Pollutant	CCGT-1* tpy	CCGT-2* tpy	Ancillary Equipment** tpy	Total*** Tons per rolling, 12-month period
PM_{10}	62.63	62.63	6.06	131.3
$PM_{2.5}$	62.63	62.63	2.71	128.0
SO_2	19.05	19.05	0.06	38.2
NO_x	107.24	107.24	6.29	220.8
CO	128.53	128.53	5.53	262.6
VOC	47.1	47.1	0.99	95.2
H_2SO_4	14.0	14.0	0.0039	28.0
NH_3	88.9	88.9	0.0	177.8
Pb	0.000384	0.000384	0.00002	0.0008
CO_{2e}	1,510,526.6	1,510,526.6	4,732	3,025,785

*Includes duct burners

**Ancillary equipment includes an auxiliary boiler (B001), emergency generator (P003), emergency fire pump (P004), and the wet cooling tower (P005).

***ISO conditions per the permit application.

Trumbull County is in attainment concerning NAAQS for all criteria pollutants.

4. Source Emissions:

2,725 MMBtu/hr Heat Input Turbine at ISO conditions and 179 MMBtu/hr Heat Input Duct Burner Combustion Turbines (P001 and P002):

Pollutant	Emission Rate (lb/mmBtu)	Emission Rate (ppmvdc)	Emission Rate (tons per rolling, 12-month period)	BACT/BAT
NO_x CTG only CTG w/DB	 0.0076 0.0077	 2.0 2.0	107.24	2.0 ppmvdc *DLN and SCR
VOC CTG only CTG w/DB	 0.0014 0.0027	 1.0 2.0	47.1	2.0 ppmvdc (w/DB) 1.0 ppmvdc (w/out DB) Good combustion controls and oxidation catalyst
CO CTG only CTD w/DB	 0.0047 0.0047	 2.0 2.0	128.53	2.0 ppmvdc Good combustion controls and oxidation catalyst
$PM_{10}/PM_{2.5}$ CTG only CTG w/DB	 0.0068 0.0049	 n/a n/a	62.63	0.0049 lb/mmBtu (w/DB) 0.0068 (w/out DB) Low sulfur fuel
SO_2 CTG only CTG w/DB	 0.0015 0.0015	 n/a n/a	19.05	0.0015 lb/mmBtu Low sulfur fuel
H_2SO_4 CTG only CTG w/DB	 0.0011 0.0011	 n/a n/a	14.0	0.0011 lb/mmBtu Low sulfur fuel
GHG (CO_{2e})	833 lb CO_{2e}/MW-hr (at full load ISO conditions w/out duct burning)	n/a	1,510,526.6	High efficient combustion technology

*Dry low NOx (DLN) burners and selective catalytic reduction (SCR)

34 mmBtu/hr Auxiliary Boiler (B001):

Pollutant	Emission Rate (lb/mmBtu)	Emission Rate (lb/hr and tons per rolling, 12-month period)	BACT/BAT
NO_x	0.02	0.68 and 0.68	Flue gas recirculation (FGR) and low NO_x burner
VOC	0.006	0.2 and 0.2	Good combustion controls
CO	0.055	1.87 and 1.87	Good combustion controls
$PM_{10}/PM_{2.5}$	0.008	0.27 and 0.27	Low sulfur fuel
SO_2	0.0015	n/a and 0.1	Low sulfur fuel
H_2SO_4	0.00011	0.004 and 0.004	Low sulfur fuel
GHG (CO_{2e})	119	n/a and 4,008	Good combustion controls/natural gas combustion

1,750 kW (2,346 hp) Emergency Generator (P003):

Pollutant	Emission Rate (g/kW-hr)	Emission Rate (g/hp-hr)	Emissions Rate (lb/hr and tons per rolling, 12-month period)	BACT/BAT
NO_x	5.2	3.88	21.6 and 5.41	State-of-the-art combustion design
VOC	0.1	0.09	3.1 and 0.76	State-of-the-art combustion design
CO	0.6	0.43	13.5 and 3.37	State-of-the-art combustion design
$PM_{10}/PM_{2.5}$	0.2	0.15	0.77 and 0.19	State-of-the-art combustion design
SO_2	n/a	0.0048	0.024 and 0.01	Low sulfur fuel
H_2SO_4	0.000132	n/a	0.00051 and 0.00013	Low sulfur fuel
GHG (CO_{2e})	n/a	n/a	n/a and 683	Efficient design

140 hp (104.5 kW) Emergency Fire Pump (P004):

Pollutant	Emission Rate (g/kW-hr)	Emission Rate (g/hp-hr)	Emissions Rate (lb/hr and tons per rolling, 12-month period)	BACT/BAT

NO_x	3.5	3.88	21.6 and 5.41	State-of-the-art combustion design
VOC	0.1	0.09	3.1 and 0.76	State-of-the-art combustion design
CO	0.6	0.43	13.5 and 3.37	State-of-the-art combustion design
$PM_{10}/PM_{2.5}$	0.2	0.15	0.77 and 0.19	State-of-the-art combustion design
SO_2	n/a	0.0048	0.024 and 0.01	Low sulfur fuel
H_2SO_4	0.000132	n/a	0.00051 and 0.00013	Low sulfur fuel
GHG (CO_{2e})	n/a	n/a	n/a and 683	Efficient design

Wet Cooling Tower*:

Pollutant	**Emission Rate (lb/hr and tons per rolling, 12-month period)**
PM10	1.27 and 5.58
PM2.5	0.51 and 2.23
VE	Shall not exceed 10% opacity as a 6-minute average. The presence of condensed water vapor shall not be deemed a violation for failure of stack emissions meeting this visible emission limitation.

*Per the permit application, the circulating water, having gained heat from the condensing steam, needs to be cooled in order to be reused as cooling water. This cooling is accomplished by means of a mechanical draft cooling tower. A mechanical draft cooling tower provides cooling of the circulating water by spraying (warm) circulating water over sheets of plastic material known as fill. This exposes the circulating water to ambient air, which is being drawn in through the sides of the tower, towards a fan generally located above the fill. A fraction of the circulating water evaporates into this air, warming it and causing it to become saturated with moisture. A small portion of the circulating water may be entrained into this air flow. These droplets of circulating water (called drift) contain dissolved solids. Specially designed drift eliminators are typically located above the water sprays to remove most of these droplets and return them to the fill. But a small fraction of these droplets can escape into the fan discharge into the atmosphere. These droplets then evaporate, and the particulates in these droplets are a source of particulate (PM10/PM2.5) emissions.

Ohio Air Toxics Modeling:

Modeling was completed for NH3, formaldehyde, toluene, xylenes, and H2SO4 to demonstrate compliance with MAGLC criteria established in the evaluation method described in the Ohio EPA document entitled Option A – Review of New Sources of Air Toxic Emissions (Ohio EPA 1986).

The worst case pollutant was H_2SO_4, with an emission rate of 1.98 lbs/hr and a MAGLC of 4.76 µg/m3. The model's max predicted impact was 1.33 µg/m3.

Air Dispersion Modeling:

Air dispersion modeling was conducted for CO, nitrogen dioxide (NO_2), PM_{10}, and $PM_{2.5}$ to demonstrate compliance with the NAAQS and PSD Increments. The project's air quality dispersion modeling was submitted to Ohio EPA's Central Office and was reviewed by MengyuCai.

5. Conclusion/Recommendation:

Issue Draft PSD PTI.

STAFF DETERMINATION FOR THE APPLICATION TO CONSTRUCT
UNDER THE PREVENTION OF SIGNIFICANT DETERIORATION REGULATIONS
FOR LORDSTOWN ENERGY CENTER
LORDSTOWN, OHIO
PERMIT NUMBER P0117655

The Clean Air Act and regulations promulgated thereunder require that major air pollution sources undergoing construction or modification comply with all applicable Prevention of Significant Deterioration (PSD) provisions and nonattainment area New Source Review requirements. The federal PSD rules govern emission increases in attainment areas for major sources, which are sources with the potential to emit 250 tons per year or more of any pollutant regulated under the Clean Air Act, or 100 tons per year or more if the source is included in one of 28 source categories. In nonattainment areas, the definition of major source is one having at least 100 tons per year potential emissions. A major modification is one resulting in a contemporaneous increase in emissions which exceeds the significance level of one or more pollutants. Any changes in actual emissions within a five-year period are considered to be contemporaneous. In addition, Ohio now has incorporated the PSD and NSR requirements by rule under OAC 3745-31.

Both PSD and nonattainment rules require that certain analyses be performed before a facility can obtain a permit authorizing construction of a new source or major modification to a major source. The principal requirements of the PSD regulations are:

1. Best Available Control Technology (BACT) review - A detailed engineering review must be performed to ensure that BACT is being installed for the pollutants for which the new source is a major source.

2. Ambient Air Quality Review - An analysis must be completed to ensure the continued maintenance of the National Ambient Air Quality Standards (NAAQS) and that any increases in ambient air pollutant concentrations do not exceed the incremental values set pursuant to the Clean Air Act.

For nonattainment areas, the requirements are:

1. Lowest Achievable Emissions Rate (LAER) - New major sources must install controls that represent the lowest emission levels (highest control efficiency) that has been achieved in practice.

2. The emissions from the new major source must be offset by a reduction of existing emissions of the same pollutant by at least the same amount, and a demonstration must be made that the resulting air quality shows a net air quality benefit. This is more completely described in the Emission Offset Interpretative Ruling as found in Appendix S of 40 cfr Part 51

3. The facility must certify that all major sources owned or operated in the state by the same entity are either in compliance with the existing State Implementation Plan (SIP) or are on an approved schedule resulting in full compliance with the SIP.

For rural ozone nonattainment areas, the requirements are:

1. LAER - New major sources must install controls that represent the lowest emissions levels (highest control efficiency) that has been achieved in practice.

2. The facility must certify that all major sources owned or operated in the state by the same entity are either in compliance with the existing SIP or are on an approved schedule resulting in full compliance with the SIP.

Finally, New Source Performance Standards (NSPS), SIP emission standards and public participation requirements must be followed in all cases.

SITE DESCRIPTION

The facility will be located in Lordstown, Ohio, which is in Trumbull County. This area is classified as attainment for all of the criteria pollutants, particulate matter less than 10 microns, particulate matter less than 2.5 microns, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds (ozone) and lead.

FACILITY DESCRIPTION

Clean Energy Future - Lordstown, LLC (CEF-L) is proposing to construct the Lordstown Energy Center, a nominal net 940-megawatt (MW) combined cycle gas turbine (CCGT) facility (hereinafter “the Project”) that will utilize CCGT technology in a 2x2x1 configuration.

The Project is intended to operate as a base-load facility and is proposed to be available to operate up to 8,760 hours per year, incorporating a range of load conditions. The Project also seeks the flexibility to operate with frequent starts in order to meet energy demands. Air emissions from the proposed Project primarily consist of products of combustion from the CTGs, HRSG duct burners, and ancillary equipment. Because Trumbull County is in attainment with respect to the NAAQS for all criteria pollutants, the Project is subject to Prevention of Significant Deterioration (PSD) requirements.

PROJECT DESCRIPTION

The project site consists of an approximately 17-acre parcel located in the Lordstown Industrial Park within Trumbull County in the Village of Lordstown, Ohio. The Project will utilize either the Siemens-SCC6-8000H or the GE 7HA.01 combustion turbine technology. Supplemental (duct) firing in the combined-cycle unit HRSGs will be incorporated into the Project's design. An auxiliary boiler will be used to assist plant start-up and maintain warm-start conditions during standby periods. The only fuel used in the combustion turbines, duct burners, and auxiliary boiler will be natural gas. Other ancillary equipment having emissions include an emergency generator and an emergency fire pump. Ultra-low sulfur distillate (ULSD) fuel oil will be used in this emergency equipment. Otherwise, the Project will operate on natural gas only. The mechanical draft cooling tower is also considered an emission source.

The Project will include the following major and ancillary equipment:

- Two combustion turbine generators (CTGs);
- Two heat recovery steam generators (HRSGs) with supplemental duct firing;
- One steam turbine generator (STG);
- One mechanical draft cooling tower;
- One 1,600-kilowatt (kW) emergency diesel generator;
- One natural gas-fired, 34-million British thermal units (MMBtu) steam production auxiliary boiler;
- One 140-horsepower (hp) emergency fire pump; and
- Storage tanks for aqueous ammonia (NH_3), sulfuric acid (H_2SO_4), ultra-low sulfur diesel (ULSD) and water.

Combustion Turbine Generators

Thermal energy will be produced in the two CTGs through the ignition of natural gas as the sole fuel. Each CTG is capable of running independently of the other. The thermal energy is converted to mechanical energy in the CTG that drives its integral compressor and electric generator. The maximum heat input rate of each CTG is 2,725.3 million British thermal units per hour (MMBtu/hr) (higher heating value [HHV]) at 100 percent load and ISO conditions.

Heat Recovery Steam Generators and Duct Burners

In combined-cycle configuration, each CTG will exhaust through a dedicated HRSG to generate steam from the waste-heat energy in the exhaust gas. Each HRSG will be equipped with supplemental firing via a duct burner. The duct burners provide additional thermal energy to the HRSG, to provide more steam to the STG during periods of high electricity demand. The duct burners will be natural gas-fired and each will have a maximum input capacity of 179 MMBtu/hr (HHV), although the duct burners will not always operate at maximum capacity. The use of the duct burners will vary based upon different temperature and operating conditions.

Steam Turbine Generator

Steam generated in the HRSGs will be expanded through a multi-stage, reheat-capable, condensing steam turbine. The discharge steam from the steam turbine will be directed to a water-cooled condenser. The condenser cooling water (also referred to as circulating water) is the heat sink for the heat released by the condensing steam. The circulating water provides non-contact cooling using heat exchangers Rotational power created by the steam turbine will be converted to electric power via the connected generator.

Air Cooled Condenser

The circulating water, having gained heat from the condensing steam, needs to be cooled in order to be reused as cooling water. This cooling is accomplished by means of a wet mechanical draft cooling tower. Mechanical draft cooling towers provide cooling of the circulating water by spraying (warm) circulating water over sheets of plastic material known as fill. This exposes the circulating water to ambient air being drawn in through the sides of the tower towards a fan generally located above the fill. A fraction of the cooling water evaporates into this air, warming it and causing it to become saturated with moisture. A small portion of the circulating water may be entrained into this air flow. These droplets of circulating water (called drift) contain dissolved solids. Specially designed drift eliminators are typically located above the water sprays to remove most of these droplets and return them to the fill. But a small fraction of these droplets can escape into the fan discharge into the atmosphere. These droplets then evaporate, and the particulates in these droplets are a source of particulate ($PM/PM_{10}/PM_{2.5}$) emissions.

Auxiliary Boiler

The auxiliary boiler will be natural gas-fired and operate as needed to keep the HRSG warm during periods of facility shutdown and provide steam to the STG during start-ups. The auxiliary boiler will have a maximum input capacity of 34 MMBtu/hr, and will be limited to 2,000 hours of operation per year.

Emergency Diesel Generator

The Project will have an emergency diesel generator with a rated electrical output of 1,600 kilowatt (kW) powered with a 1,750-kW (2,346-horsepower [hp]) diesel engine to provide on-site emergency power capabilities independent of the utility grid. The emergency generator will fire ULSD fuel and will typically only operate for testing and to maintain operational readiness in the event of an emergency. Routine operation of the generator will be limited to a maximum of 500 operating hours per year.

Emergency Diesel Fire Pump

The Project will have a 140 hp (104.5 kW) emergency fire pump to provide on-site firefighting capabilities independent of the off-site electrical utilities grid. The emergency fire pump will fire ULSD fuel and will typically only operate for testing and to maintain operational readiness in the event of an emergency. A small ULSD storage tank will be integrated into this equipment. Similar to the emergency generator, it will be limited to a maximum of 500 operating hours per year.

Aqueous Ammonia Storage Tanks

The proposed Project will have tanks for storage of 19 percent aqueous NH_3 for use in the SCR system. The tanks will be equipped with secondary containment sized to accommodate the entire volume of one tank and sufficient freeboard for precipitation. The tanks will be located outdoors within an impermeable containment area. Other tanks will include small, integrated units providing ULSD in the emergency equipment, sulfuric acid (H_2SO_4) and for water storage.

NEW SOURCE REVIEW (NSR)/PSD APPLICABILITY

Combined-cycle power plants with potential emissions greater than 100 tpy of one or more criteria pollutants are considered new major stationary sources under the PSD program. As shown in the table below, for this Project, the potential emissions of at least one regulated criteria pollutant will exceed this threshold. As such, the proposed facility is subject to PSD New Source Review. Under the PSD

regulations, once a major source threshold is triggered, PSD review must be completed for all pollutants whose potential emissions exceed their respective Significant Emission Rate.

The Project has triggered major source thresholds for NO_x, CO, VOC, H_2SO_4, $PM_{10}/PM_{2.5}$ and GHG emissions.

PSD review requirements include application of BACT, an ambient air quality modeling analysis demonstrating compliance with NAAQS and PSD increments, and additional impacts analyses. Ohio EPA has been delegated PSD review authority by the USEPA. For an air contaminant subject to BACT, compliance with BACT requirements also represents Ohio EPA BAT.

CEF-L is subject to MACT. The facility will satisfy the requirements of 40 CFR Part 63, Subpart ZZZZ by complying with 40 CFR Part 60, Subpart IIII.

Summary of Proposed Potential Emissions and Applicable Regulatory Thresholds

Pollutant	Annual Emissions (tpy)	PSD Major Source Threshold (tpy)	PSD Significant Emission Rate (tpy)	PSD Applies? (Yes/No)
PM_{10}	131.3	100	15	Yes
$PM_{2.5}$	128.0	100	10	Yes
SO_2	38.2	100	40	No
NO_x	220.8	100	40	Yes
CO	262.6	100	100	Yes
VOC	95.2	100	40	Yes
H_2SO_4	28.0	100	7	Yes
Pb	$8x10^{-4}$	10	0.6	No
GHGs[a]	3,025,785	NA	75,000	Yes

a. GHGs are expressed as CO_2e. Note that as of a June 23, 2014 Supreme Court Decision, GHG emissions cannot determine major source status. USEPA issued a Policy Memo dated July 24, 2014, indicating that it intends to apply the current GHG SER threshold for requiring PSD BACT review for GHG for "anyway" sources.

PM_{10} = Particulate Matter <10 microns
$PM_{2.5}$ = Particulate Matter <2.5 microns
SO_2 = Sulfur Dioxide
NO_x = Nitrogen Oxides
CO = Carbon Monoxide
VOC = Volatile Organic Compound
H_2SO_4 = Sulfuric Acid
Pb = Lead
GHG (CO2e) = Greenhouse Gases (CO2 equivalent)

Based upon the above information, PSD review is required for PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, H_2SO_4 and GHGs.

BACT REVIEW

As part of the application for any source regulated under the PSD requirements, an analysis must be conducted that demonstrates that Best Available Control Technology will be employed by the source. In this specific case, the BACT analysis was conducted for PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, H_2SO_4 and GHGs. Each pollutant will be reviewed separately.

The application used a "top-down" approach to determine an appropriate level of control.

The basic steps to be followed are:

- Identify all available potential control options;
- Eliminate technically infeasible options;
- Rank remaining technologies by control effectiveness;
- Evaluate the feasible controls by performance and cost analysis; and
- Select BACT

CCGT - BACT Analysis for NOx

In CCGTs, NO_x is formed during the combustion of fuel and is generally classified as either thermal NOx or fuel-related NO_x. Thermal NO_x results when atmospheric nitrogen is oxidized at high temperatures to produce nitrogen oxide (NO), nitrogen dioxide (NO_2), and other oxides of nitrogen. The major factors influencing the formation of thermal NO_x are peak flame temperatures, availability of oxygen at peak flame temperatures, and residence time within the combustion zone. Fuel-related NO_x is formed from the oxidation of chemically bound nitrogen in the fuel. Fuel-related NO_x is generally minimal for natural gas combustion. As such, NO_x formation from combustion of natural gas is due mostly to thermal NO_x formation.

Reduction in NO_x formation can be achieved using combustion controls and/or flue gas treatment. Available combustion controls include water or steam injection and low emission combustors. Modern CTGs generally use lean pre-mix low emission combustors for natural gas firing. In these type of combustors, natural gas and air are pre-mixed prior to combustion. This approach limits the formation of NO_x because there are lower peak flame temperatures. Using this approach, lean combustors are designed to operate below the stoichiometric ratio, thereby reducing the thermal NO_x formation within the combustion chamber.

The CTGs proposed for the Project utilize a lean pre-mix combustion technology. In addition, exhaust gases from the CTG (and duct burner) will exhaust through an SCR system (discussed below) to further reduce NO_x emissions to 2.0 ppmv at 15 percent O_2, with and without duct firing.

The following discussion demonstrates that the proposed NO_x emission rates for the CCGT Units and ancillary equipment are considered BACT.

Identification and Ranking of Technically Feasible Control Options

The ranking of technically feasible NO_x control technologies identified for new large (> 100 MW) combined-cycle turbines are as follows:

1. SCR: This is a catalytic reduction technology using ammonia as a reagent that has been in widespread use on new combined-cycle turbines for over 20 years. SCR is widely recognized as the most stringent available control technology for NO_x emissions from combined-cycle turbines.

2. DLN Combustion: Turbine vendors offer what is known as lean pre-mix combustors for natural gas firing, which limits NO_x formation by reducing peak flame temperatures. DLN is generally used in combination with SCR.

3. Water or Steam Injection: Water or steam injection has been historically used for both gas- and oil-fired turbines, but for new turbines is generally only used for liquid fuel firing. Water or steam injection is less effective than SCR or DLN.

SCR is an add-on NO_x control technology that is placed in the exhaust stream following the CTG/duct burner. SCR involves the injection of NH_3 into the exhaust gas upstream of a catalyst bed. On the catalyst surface, NH_3 reacts with the NO_x contained within the flue gas to form N_2 and H_2O in accordance with the following chemical reactions:

$4NH_3 + 4NO + O_2 \rightarrow 4N_2 + 6H_2O$

$8NH_3 + 6NO_2 \rightarrow 7N_2 + 12H_2O$

The catalyst's active surface is usually a noble metal (platinum), base metal (titanium or vanadium) or a zeolite-based material. Metal-based catalysts are usually applied as a coating over a metal or ceramic substrate. Zeolite catalysts are typically a homogeneous material that forms both the active surface and the substrate. NH3 is fed and mixed into the combustion gas upstream of the catalyst bed in greater than stoichiometric amounts to achieve maximum conversion of NO_x. Excess NH_3 which is not reacted in the catalyst bed is subsequently emitted through the stack; this is called "ammonia slip."

An important factor that affects the performance of an SCR system is the operating temperature. The optimal temperature range for standard base metal catalysts is between 400°F and 800°F. Because the optimal temperature is below the CTG exhaust temperature but above the stack exhaust temperature, the catalyst needs to be located within the HRSG.

An undesirable side effect of the use of SCR systems is the potential for formation of ammonium bisulfate and ammonium sulfate, referred to as ammonium salts. These salts are reaction products of sulfur trioxide (SO_3) and NH_3. Ammonium salts are corrosive and can stick to the heat exchanger surfaces, duct work or the stack at low temperatures. In addition, ammonium salts are considered $PM_{10}/PM_{2.5}$ and, therefore, increase the emissions of these criteria pollutants. Use of low sulfur fuels such as natural gas minimizes the formation of SO_3 and the subsequent formation of these ammonium salts.

Search of RBLC Determinations

The search of the RBLC and other available permits identified the lowest permitted NO_x limit for a natural gas-fired CCGT with duct burning is 2.0 ppmvdc. The details of this review are presented in Appendix C, Table C-1 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application. All of the projects permitted at 2.0 ppmvdc of NO_x use SCR systems, typically in combination with lean pre-mix combustion. Therefore, the most stringent level of NO_x control identified for similar natural gas-fired CCGT units is SCR in combination with low-NO_x combustors to achieve 2.0 ppmvdc.

Proposed BACT – CCGT NO_x

CEF-L is proposing a NO_x emission limit of 2.0 ppmvdc at 15 percent O_2 (with and without duct burning) as BACT for the proposed Project. This level of emissions will be achieved through the application of DLN burners in combination with SCR. This emission level is consistent with the most stringent level of control found during the RBLC search and has been demonstrated in practice.

Since this most stringent level of control is being proposed, an economic analysis with respect to the cost-effectiveness of alternative controls has not been conducted.

CCGT - BACT Analysis for VOC

CTGs have inherently low VOC emission rates. Emissions of VOC from a CTG occur as a result of incomplete combustion of organic compounds within the fuel. In an ideal combustion process, all carbon and hydrogen contained within the fuel are oxidized to form CO_2 and water. VOC emissions can be minimized by the use of good combustion controls and add-on controls as described below.

The CTGs proposed for the Project will utilize good combustion controls and exhaust through an oxidation catalyst to further reduce VOC emissions. Emissions of VOC from the exhaust stack will be limited to 2.0 ppmv at 15 percent O_2 with duct burning and 1.0 ppmv at 15 percent O_2 without duct burning.

Identification and Ranking of Technically Feasible Control Options

The ranking of technically feasible VOC control technologies identified for new large (> 100 MW) combined-cycle turbines are as follows:

1. Oxidation Catalyst: An oxidation catalyst system provides the most stringent level of control available for VOC emissions from a CCGT unit.

2. Combustion Controls: Turbine vendors have designed lean pre-mix combustors for natural gas firing to provide a high degree of fuel oxidation. Combustion controls are commonly used in combination with an oxidation catalyst to minimize VOC emissions. However, combustion controls alone are less effective than an oxidation catalyst in combination with combustion controls.

Oxidation catalyst systems consist of a passive reactor comprised of a grid of metal panels with a platinum catalyst. The optimal location for VOC control, in the 900 degrees F to 1,100 degrees F temperature range, would be upstream of the HRSG or in the front-end section of the HRSG. However, at the high temperatures necessary to make the oxidation catalyst optimized for VOC reduction, there is the undesirable result of causing substantially more conversion of SO_2 to SO_3. As described previously, SO_3 may react with H_2O and/or NH_3 to form H_2SO_4 and/or ammonium salt (PM_{10}/$PM_{2.5}$). Therefore, placement of the oxidation catalyst is most frequently in the "cooler" section of the HRSG, normally just upstream of the SCR system.

Search of RBLC Determinations

The results of the search of the RBLC and other available permits for VOC BACT/LAER precedents is presented in Appendix C, Table C-2 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application. Based on this search, use of an oxidation catalyst is the most stringent level of VOC control for natural gas fired CCGTs. Therefore, the use of an oxidation catalyst is considered to represent the most stringent level of VOC control achieved in practice.

The lowest VOC limit for any project presented in Table C-2 is 0.3 ppmvdc. This limit is for the Chouteau Power Plant in Mayes County, Oklahoma. This plant has four Siemens V84.3 CCGT units, two of which have duct firing. The unfired units (i.e., no duct firing) went on line in 1999 and the duct fired units went on line in 2009. However, none of these units actually have an oxidation catalyst, so this facility does not actually have the most stringent level of VOC control equipment installed. A memorandum in support of a Title V renewal for this facility was issued by the Oklahoma Department of Environmental Quality on October 21, 2013. This memo indicates the 0.3 ppmvdc limit (which applies to all the units including those with and without duct firing) was based on vendor data. However, the memo also states that the VOC emissions at full load (both with and without duct firing) are 0.0028 lb/MMBtu, which actually corresponds to 2.2 ppmvdc. The permit contains lb/hr limits that match the 0.0028 lb/MMbtu value at full load. Therefore, there is a disconnect in the Chouteau ppmvdc and lb/hr limits. VOC emissions of 2 ppmvdc are most consistent with the range of VOC data in Appendix C, and are consistent with the proposed duct-fired VOC BACT for the Project.

The second lowest VOC limits for any project presented in Appendix C are for the natural gas-fired Brunswick Power Project and Warren County projects in Virginia, which have permitted VOC limits of 0.7 ppmvdc (unfired) and 1.6 ppmvdc (duct-fired). These projects will use Mitsubishi 501G CCTGs with duct firing and will have oxidation catalysts installed for VOC (and CO) control. Brunswick Power Project is currently under construction, and the
Warren County Power Station went into commercial operation on December 10, 2014. Warren County has recently demonstrated these VOC limits in practice.

Appendix C also lists several natural gas-fired CCGT projects, which have permitted VOC limits with duct firing of 1.5 to 1.7 ppmvdc (duct-fired). These projects all have oxidation catalysts for VOC (and CO) control. Three of these projects (Kendall, Mystic, and Fore River) have demonstrated 1.5 – 1.7 ppmvdc in practice, while the more recent projects have not yet demonstrated compliance with these limits.

Except for the Chouteau, Brunswick, and Warren County projects, all other projects listed in Appendix C have unfired VOC limits of 1.0 ppmvdc or greater. Several projects have duct-fired VOC limits less than 2.0 ppmvdc. The proposed VOC BACT is as or more stringent than most of the VOC limits listed in Table C-2. As described above, the Chouteau 0.3 ppmvdc value is inconsistent with the lb/hr limits. Brunswick is still under construction and its limits have not yet been demonstrated in practice. Kendall has the lowest demonstrated VOC limit of 1.5 ppmvdc for duct firing, but this remains an aggressive commercial limit not typical of most projects. The majority of the recent BACT precedents in Table C-2 support the proposed Project VOC BACT limits of 2.0 ppmvdc with duct firing and 1.0 ppmvdc without duct firing.

CCGT VOC BACT Determination

The Project is proposing to use the most stringent available control equipment for VOC, and is proposing VOC BACT limits consistent with this most stringent level of control. Emissions of VOC from the exhaust stacks wilbe limited to 2.0 ppmvdc with duct firing and 1.0 ppmvdc without duct firing. This level of emissions will be achieved via good combustion control and an oxidation catalyst.

Since the most stringent control equipment for VOC is being proposed, an economic analysis with respect to the cost-effectiveness of alternative controls has not been conducted.

One collateral environmental impact that has been identified with an oxidation catalyst is oxidation of SO_2 to SO_3. SO_3 then forms H_2SO_4 in the presence of H_2O and/or ammonia salts in the presence of NH_3. The conversion of SO_2 to SO_3 is adequately minimized by use of low sulfur natural gas as the only CCGT fuel, along with placement of the oxidation catalyst just upstream of the SCR system. This lower temperature

oxidation catalyst placement minimizes the oxidation of SO_2 to SO_3 that would otherwise occur, with placement of the oxidation catalyst at the HRSG outlet.

BACT Analysis for CO

Emissions of CO from combustion occur as a result of incomplete combustion of fuel. CO emissions are minimized by the use of proper combustor design, good combustion practices and add-on controls. Since the potential emissions from the Project exceed PSD significance thresholds, BACT is required for CO emissions. As indicated previously, pollutants that comply with BACT meet BAT requirements.

The CTGs proposed for the Project will utilize good combustion controls and exhaust through an oxidation catalyst to reduce CO emissions. Emissions of CO from the exhaust stack will be limited to 2.0 ppmvdc at 15 percent O2 with and without duct firing in the HRSG.

The following discussion demonstrates that the proposed CO emission rates for the CCGTs satisfy BACT.

Identification and Ranking of Technically Feasible Control Options

The ranking of technically feasible CO control technologies identified for new large (> 100 MW) combined-cycle turbines are as follows:

1. Oxidation Catalyst: An oxidation catalyst system provides the most stringent level of control available for CO emissions from a CCGT unit.

2. Combustion Controls: Turbine vendors have designed lean pre-mix combustors for natural gas firing to provide a high degree of fuel oxidation. Combustion controls are commonly used in combination with an oxidation catalyst to minimize VOC emissions. However, combustion controls alone are less effective than an oxidation catalyst in combination with combustion controls.

Oxidation catalyst systems consist of a passive reactor comprised of a grid of metal panels with a platinum catalyst. CO reduction efficiencies in the range of 80 to 90 percent are typical, although CO reduction may at times be less than these values due to the low inlet concentrations expected from the CCGT Units.

Search of RBLC Determinations

The results of the search of the RBLC and other available permits for CO BACT/LAER precedents are presented in Appendix C, Table C-3 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application. Based on this search, use of an oxidation catalyst is the most stringent level of CO control for natural gas-fired CCGTs. Therefore, the use if an oxidation catalyst is considered to represent the most stringent level of CO control achieved in practice.

The lowest CO limit for any project presented in Table C-3 is 0.9 ppmvdc without duct firing. This limit is for the Kleen Energy Systems project in Connecticut. The Kleen Energy Systems project (with Siemens SGT6-5000F technology) is in operation and this 0.9 ppmvdc limit is reportedly achieved in practice. However, the practical impact of this limit at this facility is that it restricts the minimum operating load of the CCGT to approximately 60 percent load. Normally, a well-operated modern natural gas-fired CCGT unit with an oxidation catalyst has minimal CO emission (< 0.5 ppm) at 75 percent load and above. During periods of lower power demand, typically during nighttime hours, these type of units may operate at minimum load rather than shutting down in the late evening and starting up the next morning. It is during

these lower load periods when the CO emissions may be between 1 and 2 ppmvdc. A very low CO limit such as 0.9 ppmvdc represents a significant operating flexibility restriction for this type of facility. In addition, the Kleen facility has a considerably higher VOC emission rate than proposed for the Project (5.0 ppmvdc).

The second lowest (unfired) CO limits for any project listed in Appendix C are for the natural gas-fired Brunswick and Warren County projects in Virginia, which each have an unfired permitted CO limit if 1.5 ppmvdc. However, the CO permit limit for duct firing of 2.4 ppmvdc is higher than the Project's proposed duct-fired limit of 2.0 ppmvdc. These projects will use Mitsubishi 501G CCGTs with duct firing and will have oxidation catalysts installed for CO (and VOC) control. The Brunswick project is still under construction, while the Warren County project recently began commercial operation. Warren County has recently demonstrated these CO limits in practice.

The Palmdale and Avenal projects in California also have unfired permitted CO limits of 1.5 ppmvdc, which will take effect after a three-year demonstration period. The Palmdale plant is in operation and the three-year demonstration period has not been completed. The Avenal plant has not been constructed.

The only other project in Table C-3 with an unfired or fired CO limit effectively less than 2.0 ppmvdc is the Footprint project, which has a lb/hr limit at full load with duct firing which effectively caps the CO at approximately 1.5 ppmvdc. However, at less than maximum firing conditions, 2.0 ppmvdc is the controlling limit. All the other projects listed in Table C-3 have CO limits of 2.0 ppmvdc or greater. The project's proposed CO limit of 2.0 ppmvdc is as or more stringent than the clear majority of CO limits listed in Table C-3.

BACT Determination for CCGT CO

CEF-L is proposing a CO emission limit of 2.0 ppmvdc at 15 percent O_2 with and without duct firing as BACT. This level of emissions will be achieved via good combustion control and an oxidation catalyst. This proposal is consistent with the limits and control technologies found in the RBLC and with the majority of recent BACT determinations in Ohio and in other states.

BACT Analysis for Particulate Matter ($PM_{10}/PM_{2.5}$)

Emissions of particulate matter from combustion can occur as a result of inert solids contained in the fuel and products of incomplete combustion which may agglomerate or condense to form particles. Particulate emissions can also result from the formation of ammonium salts due to the conversion of SO_2 to SO_3, which is then available to react with NH_3 to form ammonium sulfates. All of the particulate matter emitted from the CCGTs is conservatively assumed to be less than 2.5 microns in diameter. Therefore, PM_{10} and $PM_{2.5}$ emission rates are assumed to be the same.

The combustion of clean-burning fuels is the most effective means for controlling particulate emissions from combustion equipment. The Project is proposing to use natural gas as the only fuel for the turbines. Natural gas is a very clean-burning fuel with very low associated particulate emissions

For $PM_{10}/PM_{2.5}$, this evaluation does not identify and rank technically feasible control technologies, since there are no CCGT post-combustion control technologies available for $PM_{10}/PM_{2.5}$. Post-combustion particulate control technologies such as fabric filters (baghouses), electrostatic precipitators, and/or wet scrubbers, which are commonly used on solid-fuel boilers, are not available for combustion turbines since the large amount of excess air inherent to combustion turbine technology would create an unacceptable

amount of backpressure for turbine operation. The Project is not aware of any CCGT facilities which are equipped with any post-combustion particulate control technologies.

The CCGT units proposed for the Project will utilize natural gas as their only fuel to minimize particulate emissions. Emissions of $PM_{10}/PM_{2.5}$ from the exhaust stack will be limited to 0.0068 lb/MMBtu (HHV) without duct-firing and 0.0049 lb/MMBtu (HHV) with duct-firing.

Search of RBLC Determinations

The results of the search of the RBLC and other available permits for $PM/PM_{10}/PM_{2.5}$ BACT/LAER precedents are presented in Appendix C, Table C-4 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application. Based on this search, use of clean-burning fuels and good combustion practices are the most stringent available technologies for control of CCGT particulate emissions.

A review of Table C-4 indicates that $PM/PM_{10}/PM_{2.5}$ emission limits can be expressed either in lb/hr or lb/MMBtu, or in some cases in both lb/hr and lb/MMBtu. Different emission limits for the same project can also be associated with different turbine suppliers. This is illustrated by some projects which have one set of limits for one supplier and another set of limits for another supplier.

Based on review of available information, differences in $PM/PM_{10}/PM_{2.5}$ emission limits among various projects appear to be due to different emission guarantee philosophies of the various suppliers, and are not believed to be actual differences in the quantity of $PM/PM_{10}/PM_{2.5}$ emissions inherently produced by the type of turbine. The different emission guarantee philosophies are influenced by the overall uncertainties of the $PM/PM_{10}/PM_{2.5}$ test procedures, especially given reported difficulties in achieving test repeatability, and concerns with artifact emissions introduced by the general inclusion of condensable particulate emissions in permit limits in the last decade.

The Project has proposed an unfired lb/MMBtu limit to include 50 percent load. Duct-firing will not occur at 50 percent load, so the proposed duct-fired PM limit reflects full-load operation only. The project has determined that the flexibility to operate at 50 percent load is important to the Project's mission of providing a flexible and quick response to the future system power needs. Minimum Emissions Compliance Load turbine operation, therefore, results in the Project's highest unfired lb/MMBtu rate of 0.0068 lb/MMBtu. It is important to note that a number of the lb/MMBtu emission rates in Table C-4 correspond to the full-load heat input rate. For comparative purposes, the Project's full load lb/MMBtu $PM_{10}/PM_{2.5}$ emission rate (without duct firing) does not exceed 0.0046 lb/MMBtu.

The lowest $PM_{10}/PM_{2.5}$lb/MMBtu limits for any Project presented in Table C-4 are for the Dominion Warren County (VA) project, which are 0.0040 lb/MMBtu with duct firing and 0.0027 lb/MMBtu without duct firing. The Dominion Warren County project is based on 3 Mitsubishi 501 GAC turbines. Mitsubishi in particular has recently taken a more aggressive approach to $PM_{10}/PM_{2.5}$ guarantees, as reflected by the Warren County Project as well as the Brunswick County (VA) project (0.0033 lb/MMBtu without duct firing and 0.0047 lb/MMBtu with duct firing).

The Project's proposed $PM_{10}/PM_{2.5}$ limits of 0.0068 lb/MMBtu (HHV) unfired and 0.0049 lb/MMBtu (HHV) with duct-firing are in the range of the other articulate BACT limits in Table C-4, in particular for Siemens and GE CTGs. The actual guarantees for $PM/PM_{10}/PM_{2.5}$ emissions vary by manufacturer, and permit limits within the range of recently approved projects for a given turbine supplier are justified as PSD BACT limits.

BACT Determinations

Combustion Turbine Generators and Duct Burners

CEF-L is proposing $PM_{10}/PM_{2.5}$ emission limits of 0.0068 lb/MMBtu (HHV) without duct firing and 0.0049 lb/MMBtu with duct firing as BACT for the proposed Project. BACT will be achieved with the most stringent available particulate control technologies, which are good combustion practices and firing only commercially available, pipeline-quality natural gas in the CCGT units. The proposed BACT limits are consistent with the range of values found in the RBLC for recent BACT determinations in Ohio and in other states, given the different guarantee approaches of different turbine suppliers.

CCGT - BACT Analysis for H_2SO_4 and BAT Analysis for SO_2

Emissions of SO_2 and H_2SO_4 are formed from the oxidation of sulfur in the fuel. Normally, all sulfur compounds contained in the fuel will oxidize, with the vast majority initially oxidizing to SO_2. A small percentage will initially oxidize to SO_3 in the CCGT combustor. Also, a portion of the fuel sulfur which initially oxidizes to SO_2 will subsequently oxidize to SO_3 prior to being emitted. After being formed, the SO_3 and sulfate (SO_4) will react to form H_2SO_4 and sulfate particulate.

For SO_2 and H_2SO_4, this evaluation does not identify and rank technically feasible control technologies, since there are no CCGT post-combustion control technologies available for $SO_2/H2SO_4$. Post-combustion SO_2/H_2SO_4 control technologies, such as dry or wet scrubbers which are commonly used on solid-fuel boilers, are not available for combustion turbines since the large amount of excess air inherent to combustion turbine technology would create an unacceptable amount of backpressure for turbine operation. The Project is not aware of any CCGT facilities which are equipped with any post-combustion SO_2/H_2SO_4 control technologies.

Key considerations in the development of specific SO_2/H_2SO_4 emission rates for a natural gas-fired combined-cycle unit are the sulfur content of natural gas, and the appropriate allowance for oxidation of fuel sulfur and SO_2 to SO_3. For the sulfur content of natural gas, the Project has used the USEPA definition of “pipeline natural gas” in 40 CFR 72.2. This definition is that pipeline natural gas has a maximum sulfur content of 0.5 grains of sulfur per 100 scf. This corresponds to the proposed BAT SO_2 emission rate of 0.0015 lb/MMBtu.

For H_2SO_4, up to approximately 50 percent of the fuel sulfur can convert to SO_3 in the combustor, oxidation catalyst, and SCR system. This corresponds to the proposed BACT H_2SO_4 emission rate of 0.0011 lb/MMBtu, both with and without duct firing.

Search of RBLC Determinations

The results of the search of the RBLC and other available permits for SO_2/H_2SO_4 BACT/LAER precedents are presented in Appendix C, Table C-5 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application. This search confirms that the only SO_2/H_2SO_4 BACT technology identified for large natural gas-fired combined-cycle turbines is use of clean fuel (i.e., natural gas). There are no cases where any post-combustion controls have been used to control SO_2/H_2SO_4 emissions from large natural gas-fired combined-cycle turbines.

The results in Table C-5 indicate BACT emissions for H_2SO_4 can be expressed either as lb/MMBtu or lb/hr, or both. A relatively wide range of BACT emission rates for H_2SO_4 are found, reflecting a range of assumed SO_2 to SO_3 oxidation rates and natural gas sulfur contents. One of the projects listed in Table C-

5 (Panda Sherman) was approved without a CO oxidation catalyst, which explains the low H_2SO_4 rate for this project. As noted previously, a CO oxidation catalyst oxidizes some of the SO_2 to SO_3/H_2SO_4. However, the other projects in Appendix C, Table C-5 with lower H_2SO_4 rates appear to have assumed a very stringent natural gas sulfur content and/or assumed low rates for the oxidation of SO_2 to SO_3 from a CO catalyst. The Project considers it prudent to use a conservative estimate for SO_2 to SO_3 oxidation across the CO catalyst, and a natural gas sulfur content corresponding to USEPA's definition for "pipeline natural gas" (0.5 grains of sulfur per 100 scf).

In summary, the available evidence clearly indicates that PSD BACT for H_2SO_4 and Ohio BAT for SO_2 for combustion turbines is use if clean low-sulfur fuel (e.g., natural gas). The H_2SO_4 emission calculation needs to allow for a reasonable variation in the sulfur content of pipeline natural gas, which is outside the control of a given generation facility, and oxidation of SO_2 to SO_3 oxidation from a CO catalyst. The Project proposes an H_2SO_4 limit for the Project of 0.0011 lb/MMBtu, which is consistent with the range of recent PSD BACT precedents.

CCGT BACT and BAT Determinations for H_2SO_4 and SO_2

The Project is proposing to use the most stringent identified H_2SO_4 BACT control technology (pipeline natural gas) and is proposing an H_2SO_4 emission limit of 0.0011 lb/MMBtu with and without duct firing as BACT. This level of emissions will be achieved by combusting only commercially available, pipeline-quality natural gas with a maximum sulfur content of 0.5 grains/100 scf in the CTGs and duct burners. This emission level is consistent with the range of limits found in Appendix C, Table C-5. The emissions of H_2SO_4 are directly dependent on the assumed maximum sulfur content in natural gas, and the assumed SO_2 to SO_3 oxidation, which has substantial variability between projects.

The Project is proposing exclusive use of pipeline-quality natural gas as BAT for SO_2. The Project is proposing SO_2 emission limits of 0.0015 lb/MMBtu with and without duct firing.

BACT Analysis for Greenhouse Gases

This section presents the BACT analysis for GHGs using methodology presented in the USEPA document *PSD and Title V Permitting Guidance for Greenhouse Gases* (USEPA, 2011).

The principal GHGs associated with the Project are CO_2, methane (CH_4), and nitrous oxide (N_2O). Because these gases differ in their ability to trap heat, 1 ton of CO_2 in the atmosphere has a different effect on global warming than 1 ton of CH_4 or 1 ton of N_2O. For example, CH_4 and N_2O have 25 times and 298 times the global warming potential of CO_2, respectively. GHG emissions from the proposed Project are primarily attributable to combustion of fuels in the CCGT units. There will also be minor fugitive releases of natural gas (primarily CH_4) from valves and flanges associated with the natural gas piping and of sulfur hexafluoride (SF_6) from the circuit breakers in the substation. By far the greatest proportion of potential GHGs emissions associated with the Project are CO_2 emissions associated with combustion of natural gas in the CCGTs. Trace amounts of CH_4 and N_2O, will be emitted during combustion in varying quantities depending on operating conditions. However, as indicated in the table below, emissions of CH_4 and N_2O are negligible when compared to total CO_2 emissions. As such, BACT for the combustion processes focus on the options for reducing and controlling emissions of CO_2.

Summary of GHG Emissions from CCGTs (tpy)

Pollutant	CO_2	CH_4	N_2O	CO_2e
CCGTs	3,017,986	55.98	5.60	3,021,053

Identification of Technically Feasible Control Options

CO_2 is a product of combusting any carbon containing fuel, including natural gas. All fossil fuel contains significant amounts of carbon. During complete combustion, the fuel carbon is oxidized into CO_2 via the following reaction:

$$C + O_2 \rightarrow CO_2$$

Full oxidation of carbon in fuel is desirable because CO, a product of partial combustion, has long been a regulated pollutant and because full combustion results in more useful energy. In fact, emission control technologies required for CO emissions (oxidation catalysts) increase CO_2 emission by oxidizing CO to CO_2. Recent BACT determinations for CCGT projects have focused on reducing emissions of CO_2 through high efficiency power generation technology and use of cleaner-burning fuels. There are limited post-combustion options for controlling CO_2. The USEPA has indicated in the document, *PSD and Title V Permitting Guidance for Greenhouse Gases,* that carbon capture and sequestration (CCS) should be considered in BACT analyses as a technically feasible add-on control option for CO_2 (USEPA, 2011). Currently, there are no CCGT projects utilizing CCS, and although theoretically feasible, this technology is not commercially available. Each of these control options are discussed in greater detail in the sections below.

Power Generation Efficiency

Because emissions of CO_2 are directly related to the amount of fuel combusted, an effective means of reducing GHG emissions is through efficient power generation combustion technologies. By utilizing more efficient technology, less fuel is required to produce the same amount of output electricity. The Project is proposing to use CTGs which represent the most efficient fossil fuel electric generation technology commercially available.

The Project will utilize state-of-the-art CTG technology in combined-cycle mode. Combined-cycle generation takes advantage of the waste heat from the CTGs, capturing that heat in the HRSG and generating steam which then powers a conventional steam turbine. Use of waste heat in this manner makes combined cycle projects considerably more efficient than conventional steam electric boiler technology. The proposed Project will use "H" CTG technology, the latest and most efficient CTG technology, which has a "Design Base Heat Rate" (new and clean) of approximately 6,455 British thermal units per kilowatt-hour (Btu/kW-hr), HHV full load at ISO conditions (with no duct firing). The emphasis on GHG reductions via efficient combustion is reflected in the recently proposed NSPS for power plants and recently issued BACT determinations for similar projects.

On March 27, 2012, the USEPA proposed an NSPS for carbon emissions from power plants. This NSPS would apply to new fossil fuel-fired electric utility generating units (EGUs), which, under this rule, include stationary CCGTs larger than 25 MW. New EGUs would be required to meet an output-based standard of 1,000 pounds of CO_2 per megawatt-hour (MW-hr) gross output. The NSPS emission limits are based on the USEPA's extensive analysis of the feasibility of controls. In addition, the NSPS implements standards

in more stringent phases from 2007 to 2015 based upon a feasibility analysis for future years. As such, compliance with an applicable NSPS can be considered BACT.

Low Emission Fuels

Another effective method to reduce GHG emissions is pollution prevention or the use of inherently lower-emitting fuels. The Project's CCTGs will combust natural gas as their only fuel source. As presented in table below, other fossil fuels generate a greater amount of CO_2 per MMBtu of fuel consumed.

Comparison of CO_2 Emissions from Different Fuels (lb CO_2/ MMBtu)

Pollutant	Emission Factor
Natural Gas	118.9
Diesel Fuel	162.3
Coal	210

Carbon Capture and Sequestration

There are limited post-combustion options for controlling CO_2, the most common being CCS, which is considered a technically feasible add-on control option for CO_2. CCS is a relatively new technology which requires three distinct processes:

1. Isolation of CO_2 from the waste gas stream;
2. Transportation of the captured CO_2 to a suitable storage location; and
3. Safe and secure storage of the captured and delivered CO_2.

The first step in the CCS process is capture of the CO_2 from the process in a form that is suitable for transport. There are several methods that may be used for capturing CO_2 from gas streams including chemical and physical absorption, cryogenic separation, and membrane separation. Exhaust streams from natural gas combustion sources have relatively low CO_2 concentrations. Only physical and chemical absorption would be considered technically implementable for a high volume, low concentration gas stream. The capital expenditure required to capture CO_2 from the exhaust and compress it to the pressure required for transport and sequestration is very significant. The Report of the *Interagency Task Force on Carbon Capture and Storage (ITF 2010)* indicates that it costs approximately $105 per ton to install a post-combustion system on a new installation to capture and compress CO_2 for transport and sequestration. Applying this factor to the 3,025,690 tpy of CO_2 potentially emitted from the Project's CCGT units and annualizing just the capital recovery cost over 10 years results in an estimated annual cost of over $45,000,000. This is clearly an excessive cost, and does not take into account the large parasitic load caused by a CCS system, which reduces the overall efficiency of the facility and increases overall emissions of CO_2 and all other regulated pollutants on a per MW-hr basis.

The next step in the CCS process is transportation of the captured CO_2 to a suitable storage location. Currently, development of commercially available CO2 storage sites is in its infancy. The Project site is an area where the suitability of geological formations for CO_2 storage is being studied by the Midwest Regional Carbon Sequestration Partnership (MRCSP), which is funded by the Department of Energy. While several CO_2 sequestration demonstrations have been initiated under this program, much further development is needed before a commercially available CO_2 sequestration site becomes available near the Project site. Currently, the only MRCSP CO_2 sequestration site in the development phase is in northern

Michigan, approximately 400 miles from the Project site by land. Currently, the plan is to test CO_2 sequestrations at this site using by-product CO_2 from natural gas processing. If this development phase is successful, it is conceivable that commercial CO_2 sequestration could be offered at this site at some point in the future, at some scale yet to be determined.

If the Project were to use the northern Michigan sequestration site, captured CO_2 would have to be transported by pipeline. Pipelines are the most common method for transporting large quantities of CO_2 over long distances. There are currently approximately 3,600 miles of existing pipeline located in the United States, but no pipelines going from northeast Ohio towards Michigan. As such, a CO_2 transportation pipeline would need to be constructed to the northern Michigan location. The cost for permitting and constructing this pressurized pipeline would be economically prohibitive and impractical.

It is important to note that there are no CCGT facilities utilizing CCS. As such, this technology, while theoretically feasible, has not been demonstrated in practice for combined-cycle facilities. As demonstrated above, even if it were commercially available, the cost for designing, installing and operating this type of capture system would be prohibitive. Based upon the large costs associated with the capture, transportation and storage of CO_2, in addition to the large parasitic load, CCS is considered cost prohibitive and economically infeasible for the Project.

Power generation efficiency and low carbon fuels are clearly technically feasible, and in combination represent the most effective fossil fuel power generation GHG control technology demonstrated in practice. CCS, while promising, has not yet reached the stage where it is economically feasible for the Project. The Project is proposing to use the low carbon fuels and high efficiency combined-cycle generation, so it is using the most stringent fossil fuel GHG economically feasible control technology available.

Search of RBLC Determinations

The results of the search of the RBLC and other available permits for GHG BACT precedents is presented in Appendix C, Table C-6 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application. GHG BACT determinations in Table C-6 are expressed in varying units, including mass emissions (tons or pounds per unit time), lb CO_{2e} per MW-hr, and/or "heat rate" (Btu/kW-hr). The energy-based limits are expressed as either "gross" or "net". Energy units (MW-hr or kW-hr) are more meaningful than mass emission limits since they relate directly to the efficiency of the equipment, which is a key available BACT technology (in addition to low carbon fuel). The mass emissions are specific to the fuel firing rate of a given project and the carbon content of the fuel, but do not incorporate Project efficiency.

The Project is proposing an energy-based GHG BACT limit of 833 lbs CO_{2e}/MW-hr (gross), corresponding to a net heat rate of 7,165 Btu/kW-hr. These limits are proposed as full load performance limits without duct firing, corrected to ISO conditions. These values include an 11% margin for degradation over the life of the facility. For comparison purposes, the 833 lbs CO_{2e}/MW-hr (gross) corresponds to 852 lbs CO_{2e}/MW-hr (net).

These proposed energy-based GHG BACT limits compare favorably with the majority of GHG BACT limits in Table C-6. The lowest GHG lb/MW-hr limit is for the Palmdale project (774 lb/MW-hr source wide net 365 day average), which is more stringent than the Project limit. However, the Palmdale project is a hybrid solar/gas turbine project, and the Palmdale GHG limits appear to account for the solar energy production component. The Project's Ohio climate precludes a solar component that could achieve the Palmdale limits.

The Footprint Salem Harbor and Pioneer Valley projects in Massachusetts each have an 825 lbs CO_2/MW-hr full load ISO limit without duct firing, expressed on a net basis. However, these limits are for "new and clean" conditions only, and do not account for degradation over the life of the unit. So if the same 7.75% degradation margin is added to 825 lbs CO_2/MW-hr, the result is higher than the Project's equivalent 852 lbs CO_{2e}/MW-hr net value.

BACT Determination for CCGT GHG

Combustion Turbines

As described above, the technically feasible options for controlling GHG's from the CTGs include:

- Use of high-efficiency engine technology
- Use of natural gas; and
- Installation and operation of CCS.

Installation and operation of a CCS system is economically cost-prohibitive and impractical. Implementation of high efficiency technology and low-carbon fuels is proposed. The Project will utilize combined-cycle technology which provides greater power output per fuel input, and will burn natural gas exclusively. Based upon the Project design, and adding a reasonable degradation margin for the life of the facility, the Project is proposing the following as BACT, for full load at ISO conditions without duct firing:

- 7,165 Btu/kW-hr HHV net basis; and
- 833 lbs CO_{2e} per MW-hr gross basis.

These limits are consistent with the majority of recently permitted projects. This level of emissions will be achieved through utilization of high efficiency, state-of-the-art, combustion turbine technology and combusting only commercially available, pipeline-quality natural gas in the turbines.

Auxiliary Boiler BACT Analysis

This section presents the PSD BACT analysis for the auxiliary boiler. The Project is subject to PSD review for NO_x, VOC, CO, $PM_{10}/PM_{2.5}$, H_2SO_4 and GHG, and thus the auxiliary boiler is subject to PSD BACT for these pollutants. The Project includes a 34 MMBtu/hr auxiliary boiler that will have natural gas as the only fuel of use. This auxiliary boiler will be permitted for a maximum of 2,000 hours per year of operation.

Identification and Ranking of Technically Feasible Control Options

The ranking of technically feasible control technologies identified for auxiliary boilers at new large (> 100 MW) combined-cycle turbines ar as follows:

1. SCR: SCR systems are offered for gas-fired boilers and provide the most stringent level of NO_x control available.

2. Oxidation Catalyst: Oxidation catalyst systems provide the most stringent level of control available for CO/VOC emissions for gas-fired boilers.

3. Combustion Controls: Boiler vendors provide ultra low-NOx and low NOx burners for gas-fired boilers which also provide a high degree of fuel oxidation to control VOC, CO and particulates.

4. Low Emitting Fuels: Natural gas is the lowest emitting fuel for auxiliary boilers.

Search of RBLC Determinations

The results of the search of the RBLC and other available permits for CCGT auxiliary boiler BACT/LAER determinations is presented in Appendix C, Table C-7 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application.

For NO_x, the most stringent level of control identified is use of ultra-low NO_x burners to achieve an emission rate of 0.01 lb/MMBtu. No precedents were identified for use of SCR on CCGT facility auxiliary boilers. The majority of the natural gas-fired auxiliary boilers in Table C-7 are approved with conventional low-NO_x burners at emission rates of 0.019 – 0.05 lb/MMBtu. The proposed BACT limit for NO_x for the Project's auxiliary boiler of 0.02 lb/MMBtu is consistent with the low end of this range for conventional low-NO_x burners. The additional expense of an ultra-low NO_x burner (approximately $100,000 for this size boiler) is not considered justified based on the low expected use factor for this unit.

For VOC, the most stringent level of control identified is 0.0015 lb/MMBtu, for a 40 MMBtu/hr auxiliary boiler for the Hickory Run project in Pennsylvania. This is much lower than most of the auxiliary boiler VOC precedents, which are mostly all at 0.005 – 0.006 lb/MMBtu. There is no specific control equipment specified for this auxiliary boiler, so this appears to be an unusually low performance value. This limit is considered unrealistically low for a boiler of this type. All new gas-fired boilers, properly operated, are expected to have intrinsically low VOC emissions. There is one auxiliary boiler recently approved at Footprint Salem Harbor with an oxidation catalyst, but the VOC rate here is still set at 0.005 lb/MMBtu. The proposed BACT limit for VOC for the Project's auxiliary boiler of 0.006 lb/MMBtu is consistent with the majority of the precedents in Table C-7.

For CO, the most stringent level of control identified is 0.0035 lb/MMBtu for an 80 MMBtu/hr auxiliary boiler for Footprint Salem Harbor, which will have an oxidation catalyst. This is much lower than most of the other auxiliary boiler CO precedents, which are in the range of 0.037 – 0.0164 lb/MMBtu. Footprint Salem Harbor volunteered to install a CO oxidation catalyst on the auxiliary boiler to help reduce overall project emissions to below the 100 tpy CO PSD review threshold. For all other cases, the emissions are based on vendor burner performance and there is no CO control equipment specified for the auxiliary boiler. The proposed BACT limit for CO for the Project's auxiliary boiler of 0.055 lb/MMBtu is consistent with the range of the precedents in Table C-7. The additional expense of an oxidation catalyst ($50,000) is not considered justified based on the low expected use factor for this unit.

For $PM_{10}/PM_{2.5}$, the most stringent level of control identified is 2.5 lb/MMcf of natural gas, for a 91 MMBtu/hr auxiliary boiler at the Portland, Oregon General Electric Carty Plant. This limit of 2.5 lb/MMcf of natural gas (which corresponds to 0.0025 lb/MMBtu) is considered unrealistically low for a guarantee for a boiler of this type. This is because of uncertainty and variability with available $PM_{10}/PM_{2.5}$ test methods, and the risk of artifact emissions resulting in a tested exceedance. All new gas-fired boilers, properly operated, are expected to have intrinsically low $PM_{10}/PM_{2.5}$ emissions. Another boiler with a low $PM_{10}/PM_{2.5}$ limit is at the Palmdale Hybrid Power facility, with a limit of 0.33 lb/hr, which corresponds to 0.003 lb/MMBtu. The other $PM_{10}/PM_{2.5}$ BACT precedents range from 0.005 – 0.018 lb/MMBtu. The proposed BACT limit for $PM_{10}/PM_{2.5}$ for the Project's auxiliary boiler of 0.008 lb/MMBtu is consistent with this range of the precedents in Table C-7.

For H_2SO_4, the most stringent level of control identified is 0.0001 lb/MMBtu, for a 66.2 MMBtu/hr auxiliary boiler at the Newark Hess project (New Jersey). This is essentially the same rate as approved for the Oregon Clean Energy (Ohio) project, of 0.00011 lb/MMBtu. Other H_2SO_4 rates, when specified, range up to 0.055 lb/MMBtu. The proposed BACT limit for H_2SO_4 for the Project's auxiliary boiler of 0.00011 lb/MMBtu matches the approved rate for the Oregon, Ohio project.

For GHG, most auxiliary boilers have just a mass emission limit specified, based on annual gas use. One unit has a limit of 119 lb CO_{2e}/MMBtu, and one unit has a boiler efficiency specified of 80 percent. The proposed BACT limit for GHG for the Project's auxiliary boiler is 119 lb CO_{2e}/MMBtu, which also matches the approved rate for the Oregon, Ohio project.

These limits are consistent with the majority of recently permitted projects. This level of emissions will be achieved through utilization of high efficiency, state-of-the-art, combustion turbine technology and combusting only commercially available, pipeline-quality natural gas in the turbines.

Emergency Diesel Generator BACT Analysis

This section presents the PSD BACT analysis for the emergency diesel generator. The Project is subject to PSD review for NOx, VOC, CO, PM10/PM2.5, H2SO4 and GHG, and thus the emergency diesel generator is subject to PSD BACT for these pollutants. The Project includes a 1,600-kW emergency diesel generator that will have ULSD as the only fuel of use. This emergency diesel generator will be permitted for a maximum of 500 hours per year of operation.

Since the emergency diesel generator is a small, limited-use emission source compared to the CCGT units, the BACT evaluation combines the various pollutants into a single discussion.

Identification and Ranking of Technically Feasible Control Options

The ranking of technically feasible control technologies identified for diesel generators are as follows:

1. SCR: SCR systems are offered for diesel generators and provide the most stringent level of NO_x control available.

2. Oxidation Catalyst: Oxidation catalyst systems are offered for diesel generators and provide the most stringent level of control available for CO/VOC emissions.

3. Diesel Particulate Filter: Post-combustion devices similar to oxidation catalysts are also offered for diesel generators, known as diesel particulate filters (DPFs). This is the most stringent level of control for diesel particulates.

4. Combustion Controls: Diesel engine vendors provide engine combustion designs which meet the federal off-road standards known as "Tier 2" standards for new engines > 560 kW.

5. Low Emitting Fuels: ULSD is normally used for emergency generators, since a fuel supply stored in a tank onsite can always be assured for emergency use.

Search of RBLC Determinations

The results of the search of the RBLC and other available permits for CCGT emergency generator BACT/LAER determinations is presented in Appendix C, Table C-8 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application.

The most stringent level of control identified is for a natural gas-fired emergency generator, which is at the Avenal Power Center project in California. This emergency generator has SCR to control NOx down to 1.0 gram per brake hp-hour. This is very unusual for a power plant emergency generator, since most projects consider it very important to have a fuel source onsite for an emergency generator. The Avenal Project, approved in 2011, has not been constructed. All other emergency generators in Table C-8 do not have any post combustion controls for PSD pollutants.

Most of the emergency generators in Table C-8 have BACT specified as compliance with the 40 CFR Part 60, Subpart IIII limits, as is proposed for the Project. The Moxie projects in Pennsylvania have NO_x/VOC/CO/PM BACT limits specified at less than the Subpart IIII limits, but the basis for how this will be accomplished is not clear.

For H_2SO_4, the Project's proposed limit of 0.000132 g/kW-hr is as or more stringent than any other energy or output based limit.

For GHG, most emergency generators have just a mass emission limit specified, based on ULSD. The proposed BACT limit for GHG for the Project's emergency generator is 683 tpy of CO_{2e}.

Emergency Diesel Fire Pump BACT Analysis

This section presents the PSD BACT analysis for the emergency diesel fire pump. The Project is subject to PSD review for NO_x, VOC, CO, PM_{10}/$PM_{2.5}$, H_2SO_4 and GHG, and thus the emergency diesel fire pump is subject to PSD BACT for these pollutants. The Project includes a 140 hp emergency diesel fire pump that will have ULSD as the only fuel of use. This emergency diesel fire pump will be permitted for a maximum of 500 hours per year of operation.

Since the emergency diesel fire pump is a small, limited use emission source compared to the CCGT units, the BACT evaluation combines the various pollutants into a single discussion.

Identification and Ranking of Technically Feasible Control Options

The ranking of technically feasible control technologies identified for diesel engines are as follows:

1. SCR: SCR systems are offered for diesel engines and provide the most stringent level of NO_x control available.

2. Oxidation Catalyst: Oxidation catalyst systems are offered for diesel engines and provide the most stringent level of control available for CO/VOC emissions.

3. Diesel Particulate Filter: Post-combustion devices similar to oxidation catalysts are also offered for diesel engines, known as DPFs. This is the most stringent level of control for diesel particulates.

4. Combustion Controls: Diesel engine vendors provide engine combustion designs which meet the

federal off-road standards known as "Tier 3" standards for new engines in the size range typically used for fire pumps.

5. Low Emitting Fuels: ULSD is normally used for emergency engines, since a fuel supply stored in a tank onsite can always be assured for emergency use.

Search of RBLC Determinations

The results of the search of the RBLC and other available permits for CCGT emergency fire pump BACT/LAER determinations are presented in Appendix C, Table C-9 of document 501160: Update to PSD Application Preconstruction Permit – Feb. 2015 Rev. 1 in the permit application.

Most of the emergency fire pumps in Table C-9 have BACT specified as compliance with the 40 CFR Part 60, Subpart IIII limits, as is proposed for the Project. None of the emergency fire pump engines in Table C-9 have any post-combustion controls for PSD pollutants. The Moxie projects in Pennsylvania have proposed NO_x/VOC/CO/PM BACT limits specified at less than the Subpart IIII limits. Also, Brockton, Massachusetts has proposed a very low PM limit, much lower than the Subpart IIII requirements. The basis for how these limits will be achieved is not clear.

For H_2SO_4, the Project's proposed limit of 0.000132 g/kW-hr is as or more stringent than any other energy or output based limit.

For GHG, most emergency fire pumps have just a mass emission limit specified, based on ULSD. The proposed BACT limit for GHG for the Project's emergency fire pump is 41 tpy of CO_{2e}.

Other Ancillary Sources

There are several other smaller sources associated with the Project that have the potential to emit PSD pollutants. These include fugitive releases from the natural gas pipelines, SF_6 releases from circuit breakers, and particulate emissions from the cooling towers.

Methane is a GHG with a global warming potential of 25 times that of CO_2. There is the potential for minor fugitive leaks of methane gas from connection points along the natural gas pipeline. These connection points include valves, flanges and compressors. The Project will have many of these piping components incorporated into its design. The Project will implement best management practices and routine monitoring to minimize fugitive leaks from the piping components. While BACT for fugitive emissions has not been included in recent permits, this is consistent with BACT determinations for other projects.

SF_6 is a dielectric fluid used in circuit breakers with a global warming potential of 23,900 times that of CO_2. There is the potential for negligible leakage of SF_6 from circuit breakers and the Project will/may have several circuit breakers incorporated into its design. The Project will use state-of-the-art, enclosed pressure SF_6 circuit breakers with leak detection, which is consistent with BACT for other similar projects.

The cooling towers will use high efficiency drift eliminators to limit drift to no more than 0.0005 percent of the circulating water flow.

SUMMARY OF BACT EVALUATIONS

The following tables summarize the proposed emission limits and associated control technology for the facility.

Summary of Proposed BACT/BAT Emission Limits and Associated Control Technologies for the Combustion Turbines

Pollutant	Emission Rate (lb/MMBtu)	Emission Rate (ppm_v) at 15% O_2	Control Technology	Represents
NO_x CTG only CTG w/ DB	 0.0076 0.0077	 2.0 2.0	DLN and SCR	BACT/BAT
VOC CTG only CTG w/ DB	 0.0014 0.0027	 1.0 2.0	Good combustion controls and oxidation catalyst	BACT/BAT
CO CTG only CTG w/ DB	 0.0047 0.0047	 2.0 2.0	Good combustion controls and oxidation catalyst	BACT/BAT
$PM_{10}/PM_{2.5}$ CTG only CTG w/ DB	 0.0068 0.0049	 n/a n/a	Low sulfur fuel	BACT/BAT
SO_2 CTG only CTG w/ DB	 0.0015 0.0015	 n/a n/a	Low sulfur fuel	BAT
H_2SO_4 CTG only CTG w/ DB	 0.0011 0.0011	 n/a n/a	Low sulfur fuel	BACT/BAT
GHG	833 lb CO_{2e}/MW-hr (at full load ISO conditions without duct firing)	n/a	High efficient combustion technology	BACT/BAT

Summary of Proposed BACT/BAT Emission Limits and Associated Control Technologies for the Auxiliary Boiler

Pollutant	Emission Rate (lb/MMBtu)	Control Technology	Represents
NO_x	0.02	Flue Gas Recirculation (FGR) and low NO_x burner	BACT/BAT
VOC	0.006	Good combustion controls	BACT/BAT
CO	0.055	Good combustion controls	BACT/BAT
$PM_{10}/PM_{2.5}$	0.008	Low sulfur fuel	BACT/BAT
SO_2	0.0015	Low sulfur fuel	BAT
H_2SO_4	0.00011	Low sulfur fuel	BACT/BAT
CO_2e (GHG)	119	Good combustion controls and Natural gas combustion	BACT/BAT

Summary of Proposed BACT/BAT Emission Limits and Associated Control Technologies for the Emergency Fire Pump

Pollutant	Emission Rate (g/kW-hr)	Emission Rate (g/hp-hr)	Control Technology	Represents
NO_x	3.5	--	State-of-the-art combustion design	BACT/BAT
VOC	0.5	--	State-of-the-art combustion design	BACT/BAT
CO	5.0	--	State-of-the-art combustion design	BACT/BAT
$PM_{10}/PM_{2.5}$	0.3	0.15	State-of-the-art combustion design	BACT/BAT
SO_2	--	0.0048	Low sulfur fuel	BAT
H_2SO_4	0.000132	--	Low sulfur fuel	BACT/BAT
CO_{2e} (GHG)	41 tpy		Efficient Design	BACT/BAT

Summary of Proposed BACT/BAT Emission Limits and Associated Control Technologies for the Emergency Generator

Pollutant	Emission Rate (g/kW-hr)	Emission Rate (g/hp-hr)	Control Technology	Represents
NO_x	5.2	3.88	State-of-the-art combustion design	BACT/BAT
VOC	0.1	0.09	State-of-the-art combustion design	BACT/BAT
CO	0.6	0.43	State-of-the-art combustion design	BACT/BAT
$PM_{10}/PM_{2.5}$	0.2	0.15	State-of-the-art combustion design	BACT/BAT
SO_2	--	0.0048	Low sulfur fuel	BAT
H_2SO_4	0.000132	--	Low sulfur fuel	BACT/BAT
CO_{2e} (GHG)	683 tpy		Efficient Design	BACT/BAT

Modeling Review

Clean Energy Future- Lordstown, LLC (CEF-L) has submitted air dispersion modeling prepared by Tetra Tech, Inc. for carbon monoxide (CO), nitrogen oxides (NOx) and particulate matter with a diameter equal to or less than 10 microns (PM10), particulate matter with a diameter equal to or less than 2.5 microns (PM2.5) and air toxics (sulfuric acid, ammonia, formaldehyde, toluene, and xylene). CEF-L is proposing to construct the Lordstown Energy Center, a nominal net 800-megawatt (MW) combined-cycle gas turbine (CCGT) electric generating facility in the Village of Lordstown, Trumbull County, Ohio. The details of the project are included in the "Air Quality Dispersion Modeling Report- Lordstown Energy Center" submitted by CEF-L and prepared by Tetra Tech, Inc. CEF-L has proposed to install two integrated combustion turbine generators (CTG) and two duct-fired heat recovery steam generator (HRSG), a common steam turbine generator (STG), a mechanical draft cooling tower, and associated ancillary equipment and system. The ancillary equipment includes one auxiliary boiler, one emergency generator, and one emergency fire pump.

Potential emissions for the proposed project are shown in Table 2-1 of the Air Quality Dispersion Modeling Report to be 220.8 tons per year (tpy) for NO_x, 262.6 tpy of CO, 95.2 tpy of VOC, 128.0 tpy of $PM_{2.5}$, 131.3 tpy for PM_{10}, 38.2 tpy of SO_2, 28 tpy of H_2SO_4, 177.8 tpy for ammonia and 3,025,785 tpy of greenhouse gases (GHG). Based on the analysis of the potential emissions from the proposed facility, the project triggers Federal Prevention of Significant Deterioration (PSD) modeling requirements for its emissions of CO, NO_x, PM_{10}, and $PM_{2.5}$. The proposed facility will also emit air toxics (sulfuric acid, ammonia, formaldehyde, toluene, and xylene) that exceed the Ohio EPA threshold of one ton per year (Appendix D).

CEF-L has used the latest version of the AERMOD dispersion model (version 14134) to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) and PDS increments for CO, NO_x, PM_{10}, and $PM_{2.5}$. The facility has also submitted a qualitative analysis of secondary $PM_{2.5}$ formation potential to show compliance with $PM_{2.5}$ NAAQS under USEPA's *Guidance for $PM_{2.5}$ Permit Modeling* (May 20, 2014). For air toxics modeling, the facility has used AERMOD to show compliance in accordance with the Ohio EPA's Maximum Allowable Ground Level Concentrations (MAGLC).

Modeling Information

The proposed CEF-L Project is located on an approximately 17- acre parcel located in the Lordstown Industrial Park within Trumbull County in the Village of Lordstown, Ohio. The coordinates of the center of the property, represented in the Universal Transverse Mercator (UTM) coordinate system, are approximately 512,454.14 m East, 4,555,327.09 m North in UTM Zone 17 (NAD83).

When modeling, all concentrations were computed in micrograms per cubic meter ($\mu g/m^3$). No deposition or depletion was modeled for this case. The latest version of AERMOD (version 14134) with the rural regulatory default option was selected in the control parameter. Elevated terrain and building parameters were considered in the modeling. Source elevations for all sources within the CEF-L boundary were determined using to-scale plot plans that included site specific elevation data.

Emissions from two CCTGs with HRSG dust burners, an auxiliary boiler and a mechanical draft cooling tower ($PM_{10}/PM_{2.5}$ emissions only) were included in the modeling for the proposed energy facility. Air dispersion modeling was conducted for several different operating scenarios, including start-up and shut-down, to capture worst case potential impact concentration from the combustion turbine units. Information about start-up and shut-down operations is included in Table2-3: Emissions and Downtimes Associated with Start-up and Shutdown Events–per CCGT Unit in the Application for Prevention of Significant Deterioration Preconstruction Permit. Emissions during start-up and shut-down may, for some pollutants, result in an increase in short-term (pounds per hour [lb/hr]) emission rates. Table 4-2 of the Air Quality Dispersion Modeling Report summarizes the stack characteristics for the combustion turbines and ancillary sources. Detailed emissions and source parameter data are provided in Appendix A for the full range of normal operating loads and ambient temperature conditions for the combustion turbines, as well as for SU/SD conditions. In addition, Appendix A also provides the emission and stack parameters for the auxiliary boilers.

Ground-level concentrations were calculated within Cartesian receptor grids and at receptors placed along the facility fence-line to determine the location of the maximum estimated concentration impact. A “property line” grid consisting of evenly-spaced receptors 25 meters apart placed along the facility fence-line. Two “fine” grids containing 50-meter and 100-meter spaced receptors extending out to approximately 300m from the center of the property and from 300m to 1km from the center of the facility, respectively. One “medium” grid containing 500 meter spaced receptors exclusive of receptors on the fine grid extending from 1 to 5 km from the center of the property. Two “coarse” grids containing 1,000 and 2,000 meter spaced receptors exclusive of receptors on the fine and medium grids extending from 5 to 10 km and from 10 to 20 km from the center of the facility, respectively. A total of 2,100 receptors were considered. Additional receptors have been added to make sure the maximum concentrations are captured.

Five years of meteorological data have been used in accordance with the Ohio EPA Engineering Guide #69: Air Dispersion Modeling Guidance. CEF-L used five years (i.e., 2009-2013) of Youngstown surface meteorological data (#14852) and five years of Pittsburgh upper air data (#94823) in the model. The National Weather Service data of the region was determined to be representative of the geographical surroundings of the proposed facility.

RESULTS

Class I

The facility is located over 250 kilometers from the closest Class I area. The project impacts were evaluated in accordance with the *Federal Land Managers AQRV Workgroup Phase I Report – Revised*, 2010 using the screening criteria method (Q/D). The results of the analysis are presented in Table 5-1 of the Air Quality Dispersion Modeling Report. Primary and secondary pollutants associated with this project are not anticipated to affect local or Class I visibility.

Class II

PSD Significant Impact Level (SIL)

Ohio EPA analyzed the significant impact of criteria pollutants (NO_2, CO, PM_{10} and $PM_{2.5}$), and compared the estimated concentration with the appropriate SIL resulting from the potential emissions. Ohio EPA is in agreement with the facility maximum predicted impacts for various averaging periods (1-hr, 8-hr, 24-hr, and annual) found in Appendix C of the Air Quality Dispersion Modeling Report. For all modeling scenarios, with the exception of a cold start-up scenario, the maximum predicted concentrations were found to be less than the respective SILs. The 1-hour predicted NO_2 modeled concentration for the two turbines cold start with auxiliary boiler exceeded the SIL.

PSD Increment and NAAQS

PSD Increment modeling was submitted and reviewed for $PM_{2.5}$ and PM_{10}. NAAQS modeling was submitted and reviewed for NO_2 and CO. The maximum predicted impacts for all of the steady state operating conditions were below the SIL. However, the worst-case startup conditions, a cold start of two turbines with the auxiliary boiler, resulted in a maximum predicted impact above the 1-hour NO2 SIL, triggering PSD/NAAQS modeling for all pollutants above the PSD SER. Modeling for $PM_{2.5}$ and PM_{10} showed a maximum incremental predicted impact below one half of the PSD increment and maximum project concentrations (with background) below the respective NAAQS. The maximum predicted impacts from CO were less than one quarter of the NAAQS, and well below the NAAQS with the addition of background CO.

CEF-L modeled start-up cases with both CCGT units and the auxiliary boiler operating as the worst case scenarios for evaluating the concentrations of NO_2 and CO from the proposed project. The maximum modeled 1-hr NO_2 concentration exceeded SIL for the cold start-up scenario. Consistent with Ohio EPA Guidance, assessment of the 1-hour NO_2 NAAQS for the transient turbine start-up conditions consists of adding ambient background to the maximum predicted concentration (98^{th} percentile 5-year average). The CEF-L Project incremental impact is below the NAAQS considering background NO_2.

Secondary $PM_{2.5}$ Formation Analysis

Pursuant to *Guidance for $PM_{2.5}$ Modeling* issued by USEPA in May 2014, addressing secondary formation of $PM_{2.5}$ in a NAAQS compliance demonstration under the PSD program, CEF-L submitted an analysis of secondary $PM_{2.5}$ formation based on the SO_2 and NO_x emissions from the facility. Ohio EPA reviewed the hybrid analysis and sensitivity analysis submitted by CEF-L. The Agency is in agreement that secondary $PM_{2.5}$ formation will neither consume additional PSD increments nor cause a violation of the 24-hour and annual $PM_{2.5}$ NAAQS.

Ozone Formation Analysis

CEF-L submitted an analysis of the potential contribution to regional ozone levels based on the increase in NO_x and VOC emissions from the proposed project. Ohio EPA reviewed the hybrid analysis and is in agreement that the analysis demonstrates that the project will not cause a violation of the ozone NAAQS.

Ohio Acceptable Increment Impact (OAII) Modeling

After reviewing increment modeling of the proposed project, Ohio EPA found that the modeled 1-hr, 8-hr, 24-hr and annual pollutants concentrations to be well below the OAII levels. Ohio EPA is in agreement with the maximum modeled impacts of NO_2, CO, PM_{10} and $PM_{2.5}$. The installation of CEF-L Project will not result in any exceedances of the OAII levels.

Ohio Air Toxic Modeling

After reviewing the air toxic modeling analysis of air toxics (sulfuric acid, ammonia, formaldehyde, toluene, and xylene) for the proposed installation, the Ohio EPA found no exceedances of the MAGLCs of these air

toxics. The Ohio EPA is in agreement with the modeled maximum 1-hour ground level concentrations of the above listed air toxics presented in Appendix D of the Modification Application.

Soils and Vegetation Analysis

EPA Air Quality Criteria documents were reviewed for information on pollutants and adverse effects on the type of vegetation and soils in the area. No adverse impact upon soils or vegetation is expected. The modeled concentrations are below the primary and secondary NAAQS limits.

Modeling analyses shows that the proposed installation of CEF-L Project will not cause or contribute significantly to a violation of the NAAQS criteria pollutants. Modeling demonstrates compliance with all applicable air toxics standards.

CONCLUSION

Based upon the review of the permit to install application and the supporting documentation provided by the applicant, the Ohio EPA staff has determined the proposed installation will comply with all applicable State and Federal environmental regulations and that the requirements for BACT are satisfied. Therefore, the Ohio EPA staff recommends that a permit to install be issued to the CEF-L for the proposed installation.

PUBLIC NOTICE

The following matters are the subject of this public notice by the Ohio Environmental Protection Agency. The complete public notice, including any additional instructions for submitting comments, requesting information, a public hearing, or filing an appeal may be obtained at:http://epa.ohio.gov/actions.aspx or Hearing Clerk, Ohio EPA, 50 W. Town St., Columbus, Ohio 43215. Ph: 614-644-2129 email:HClerk@epa.ohio.gov

Draft Air Pollution Permit-to-Install Initial Installation
Lordstown Energy Center

Henn Parkway,, Lordstown, OH 44481
ID#:P0117655
Date of Action: 7/23/2015
Permit Desc:Initial installation permit for the construction of the Lordstown Energy Center - a nominal 940 MW combined cycle gas turbine (CCGT) facility..
The Director of the Ohio Environmental Protection Agency issued the draft permit above. The permit and complete instructions for requesting information or submitting comments may be obtained at: http://epa.ohio.gov/dapc/permitsonline.aspx by entering the permit # or: Corey Kurjian, Ohio EPA DAPC, Northeast District Office, 2110 East Aurora Road, Twinsburg, OH 44087. Ph: (330)963-1200

DRAFT

Division of Air Pollution Control
Permit-to-Install
for
Lordstown Energy Center

Facility ID:	0278112009
Permit Number:	P0117655
Permit Type:	Initial Installation
Issued:	7/23/2015
Effective:	To be entered upon final issuance

Ohio Environmental Protection Agency

Division of Air Pollution Control
Permit-to-Install
for
Lordstown Energy Center

Table of Contents

Authorization

Facility ID:	0278112009
Facility Description:	800 MW combined cycle gas turbine (CCGT) facility
Application Number(s):	A0051702, A0052799, A0052920
Permit Number:	P0117655
Permit Description:	Initial installation permit for the construction of the Lordstown Energy Center - a nominal 940 MW combined cycle gas turbine (CCGT) facility.
Permit Type:	Initial Installation
Permit Fee:	$4,700.00*DO NOT send payment at this time, subject to change before final issuance*
Issue Date:	7/23/2015
Effective Date:	To be entered upon final issuance

This document constitutes issuance to:

Lordstown Energy Center
Henn Parkway
Lordstown, OH 44481

of a Permit-to-Install for the emissions unit(s) identified on the following page.

Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Ohio EPA DAPC, Northeast District Office
2110 East Aurora Road
Twinsburg, OH 44087
(330)963-1200

The above named entity is hereby granted a Permit-to-Install for the emissions unit(s) listed in this section 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 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

Craig W. Butler
Director

Authorization (continued)

Permit Number: P0117655
Permit Description: Initial installation permit for the construction of the Lordstown Energy Center - a nominal 940 MW combined cycle gas turbine (CCGT) facility.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Emissions Unit ID:	**B001**
Company Equipment ID:	Auxiliary Boiler
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P001**
Company Equipment ID:	CTG #1
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P002**
Company Equipment ID:	CTG #2
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P003**
Company Equipment ID:	Emergency Generator
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P004**
Company Equipment ID:	Emergency Fire Pump
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	**P005**
Company Equipment ID:	Wet Cooling Tower
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable

A. Standard Terms and Conditions

1. Federally Enforceable Standard Terms and Conditions

a) All Standard Terms and Conditions are federally enforceable, with the exception of those listed below which are enforceable under State law only:

(1) Standard Term and Condition A.2.a), Severability Clause

(2) Standard Term and Condition A.3.c) through A. 3.e)General Requirements

(3) Standard Term and Condition A.6.c) and A. 6.d), Compliance Requirements

(4) Standard Term and Condition A.9., Reporting Requirements

(5) Standard Term and Condition A.10., Applicability

(6) Standard Term and Condition A.11.b) through A.11.e), Construction of New Source(s) and Authorization to Install

(7) Standard Term and Condition A.14., Public Disclosure

(8) Standard Term and Condition A.15., Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations

(9) Standard Term and Condition A.16., Fees

(10) Standard Term and Condition A.17., Permit Transfers

2. Severability Clause

a) A determination that any term or condition of this permit is invalid shall not invalidate the force or effect of any other term or condition thereof, except to the extent that any other term or condition depends in whole or in part for its operation or implementation upon the term or condition declared invalid.

b) All terms and conditions designated in parts B and C of this permit are federally enforceable as a practical matter, if they are required under the Act, or any of its applicable requirements, including relevant provisions designed to limit the potential to emit of a source, are enforceable by the Administrator of the U.S. EPA and the State and by citizens (to the extent allowed by section 304 of the Act) under the Act. Terms and conditions in parts B and C of this permit shall not be federally enforceable and shall be enforceable under State law only, only if specifically identified in this permit as such.

3. General Requirements

a) Any noncompliance with the federally enforceable terms and conditions of this permit constitutes a violation of the Act, and is grounds for enforcement action or for permit revocation, revocation and re-issuance, or modification.

b) It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the federally enforceable terms and conditions of this permit.

c) This permit may be modified, revoked, or revoked and reissued, for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or revocation, or of a notification of planned changes or anticipated noncompliance does not stay any term and condition of this permit.

d) This permit does not convey any property rights of any sort, or any exclusive privilege.

e) 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 or revoking this permit or to determine compliance with this permit. Upon request, the permittee shall also furnish to the Director or an authorized representative of the Director, copies of records required to be kept by this permit. For information claimed to be confidential in the submittal to the Director, if the Administrator of the U.S. EPA requests such information, the permittee may furnish such records directly to the Administrator along with a claim of confidentiality.

4. Monitoring and Related Record Keeping and Reporting Requirements

a) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall maintain records that include the following, where applicable, for any required monitoring under this permit:

(1) The date, place (as defined in the permit), and time of sampling or measurements.

(2) The date(s) analyses were performed.

(3) The company or entity that performed the analyses.

(4) The analytical techniques or methods used.

(5) The results of such analyses.

(6) The operating conditions existing at the time of sampling or measurement.

b) 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.

c) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall submit required reports in the following manner:

(1) Reports of any required monitoring and/or recordkeeping of federally enforceable information shall be submitted to the Ohio EPA DAPC, Northeast District Office.

(2) Quarterly written reports of (i) any deviations from federally enforceable emissionlimitations, operationalrestrictions, andcontroldeviceoperatingparameterlimitations, excluding deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06, that have been detected by the testing, monitoring and recordkeeping requirements specified in this permit, (ii) the probable cause of such deviations, and (iii) any corrective actions or preventive measures taken, shall be made to the Ohio EPA DAPC, Northeast District Office. The written reports shall be submitted quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. See A.15. below if no deviations occurred during the quarter.

(3) Written reports, which identify any deviations from the federally enforceable monitoring, recordkeeping, andreportingrequirements contained in this permit shall be submitted to the Ohio EPA DAPC, Northeast District Office every six months, by January 31 and July 31 of each year for the previous six calendar months. If no deviations occurred during a six-month period, the permittee shall submit a semi-annual report, which states that no deviations occurred during that period.

(4) This permit is for an emissions unit located at a Title V facility. Each written report shall be signed by a responsible official certifying that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.

d) The permittee shall report actual emissions pursuant to OAC Chapter 3745-78 for the purpose of collecting Air Pollution Control Fees.

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, i.e., upset, of any emissions units or any associated air pollution control system(s) shall be reported to theOhio EPA DAPC, Northeast District Officein accordance with paragraph (B) of OAC rule 3745-15-06. (The definition of an upset condition shall be the same as that used in OAC rule 3745-15-06(B)(1) for a malfunction.) The verbal and written reports shall be submitted pursuant to 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 emission unit(s) that is (are) served by such control system(s).

6. Compliance Requirements

a) All applications, notifications or reports required by terms and conditions in this permit to be submitted or "reported in writing" are to be submitted to Ohio EPA through the Ohio EPA's eBusiness Center: Air Services web service ("Air Services"). Ohio EPA will accept hard copy submittals on an as-needed basis if the permittee cannot submit the required documents through the Ohio EPA eBusiness Center. In the event of an alternative hard copy submission in lieu of the eBusiness Center, the post-marked date or the date the document is delivered in person will be recognized as the date submitted. Electronic submission of applications, notifications or reports required to be submitted to Ohio EPA fulfills the requirement to submit the required information to the Director, the appropriate Ohio EPA District Office or contracted

local air agency, and/or any other individual or organization specifically identified as an additional recipient identified in this permit unless otherwise specified. Consistent with OAC rule 3745-15-03, the electronic signature date shall constitute the date that the required application, notification or report is considered to be "submitted". Any document requiring signature may be represented by entry of the personal identification number (PIN) by responsible official as part of the electronic submission process or by the scanned attestation document signed by the Authorized Representative that is attached to the electronically submitted written report.

Any document (including reports) required to be submitted and required by a federally applicable requirement in this permit shall include a certification by a Responsible Official that, based on information and belief formed after reasonable inquiry, the statements in the document are true, accurate, and complete

b) Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Director of the Ohio EPA or an authorized representative of the Director to:

(1) At reasonable times, enter upon the permittee's premises where a source is located or the emissions-related activity is conducted, or where records must be kept under the conditions of this permit.

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit, subject to the protection from disclosure to the public of confidential information consistent with ORC section 3704.08.

(3) Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.

(4) As authorized by the Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit and applicable requirements.

c) The permittee shall submit progress reports to the Ohio EPA DAPC, Northeast District Office concerning any schedule of compliance for meeting an applicable requirement. Progress reports shall be submitted semiannually or more frequently if specified in the applicable requirement or by the Director of the Ohio EPA. Progress reports shall contain the following:

(1) Dates for achieving the activities, milestones, or compliance required in any schedule of compliance, and dates when such activities, milestones, or compliance were achieved.

(2) An explanation of why any dates in any schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.

7. Best Available Technology

As specified in OAC Rule 3745-31-05, new sources that must employ Best Available Technology (BAT) shall comply with the Applicable Emission Limitations/Control Measures identified as BAT for each subject emissions unit.

8. 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.

9. Reporting Requirements

The permittee shall submit required reports in the following manner:

a) Reports of any required monitoring and/or recordkeeping of state-only enforceable information shall be submitted to the Ohio EPA DAPC, Northeast District Office.

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 state-only required 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 theOhio EPA DAPC, Northeast District Office. 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, 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.)

10. 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)not exempt from the requirement to obtain a Permit-to-Install.

11. Construction of New Sources(s) and Authorization to Install

a) This permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. This permit does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the application and terms and conditions of this permit. 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 this permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Issuance of this permit 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 cannot meet the requirements of this permit or cannot meet applicable standards.

b) If applicable, authorization to install any new emissions unit included in this permit shall terminate within eighteen months of the effective date of the permit if the owner or operator has not undertaken a continuing program of installation or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation. 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 permittee shows good cause for any such extension.

c) The permittee may notify Ohio EPA of any emissions unit that is permanently shut down (i.e., the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31) by submitting a certification from the authorized official that identifies the date on which the emissions unit was permanently shut down. Authorization to operate the affected emissions unit shall cease upon the date certified by the authorized official that the emissions unit was permanently shut down. At a minimum, notification of permanent shut down shall be made or confirmed by marking the affected emissions unit(s) as "permanently shut down" in "Air Services" along with the date the emissions unit(s) was permanently removed and/or disabled. Submitting the facility profile update electronically will constitute notifying the Director of the permanent shutdown of the affected emissions unit(s).

d) The provisions of this permit shall cease to be enforceable for each affected emissions unit after the date on which an emissions unit is permanently shut down (i.e., emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31). All records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, must be maintained in accordance with law. All reports required by this permit must be submitted for any period an affected emissions unit operated prior to permanent shut down. At a minimum, the permit requirements must be evaluated as part of the reporting requirements identified in this permit covering the last period the emissions unit operated.

Unless otherwise exempted,no emissions unit certified by the responsible official as being permanently shut down may resume operation without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31 and OAC Chapter 3745-77 if the restarted operation is subject to one or more applicable requirements.

e) The permittee shall comply with any residual requirements related to this permit, such as the requirement to submit a deviation report, air fee emission report, or other any reporting required by this permit for the period the operating provisions of this permit were enforceable, or as required by regulation or law. All reports shall be submitted in a form and manner prescribed by the Director. All records relating to this permit must be maintained in accordance with law.

12. Permit-To-Operate Application

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 operation of the proposed new or modified source(s) as authorized by this permit would be prohibited by the terms and conditions of an existing Title V permit, a Title V permit modification of such new or modified source(s) pursuant to OAC rule 3745-77-04(D) and OAC rule 3745-77-08(C)(3)(d)must be obtained beforeoperating the source in a manner that would violate the existing Title V permit requirements.

13. Construction Compliance Certification

The applicant shall identify the following dates in the "Air Services"facility profile for each new emissions unit identified in this permit.

a) Completion of initial installation date shall be enteredupon completion of construction and prior to start-up.

b) Commence operation after installation or latest modification date shall be entered within 90 days after commencing operation of the applicable emissions unit.

14. 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.

15. Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations

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 by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters.

16. 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 any permit-to-install. The permittee shall pay all applicable permit-to-operate fees within thirty days of the issuance of the invoice.

17. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The new owner must update and submit the ownership information via the "Owner/Contact Change" functionality in "Air Services" once the transfer is legally completed.The change must be submitted through "Air Services" within thirty days of the ownership transfer date.

18. Risk Management Plans

If the permittee is required to develop and register a risk management plan pursuant to section 112(r) of the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. ("Act"), the permittee shall comply with the requirement to register such a plan.

19. Title IV Provisions

If the permittee is subject to the requirements of 40 CFR Part 72 concerning acid rain, the permittee shall ensure that any affected emissions unit complies with those requirements. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

B. Facility-Wide Terms and Conditions

1. All the following facility-wide terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:

   a) None.

2. The permittee shall ensure that any emissions unit(s) subject to the Clean Air Interstate Rule (CAIR) complies/comply with the requirements of the Ohio Administrative Code (OAC) Chapter 3745-109, which includes submitting timely permit applications.

3. The following emissions unit contained in this permit is subject to 40 CFR Part 60, Subparts A and Dc: B001. The complete NSPS requirements, including the NSPS General Provisions may be accessed via the internet from the electronic Code of Federal Regulations (e-CFR) website www.ecfr.gov or by contacting the Ohio EPA Northeast District Office.

4. The following emissions units contained in this permit are subject to 40 CFR Part 60, Subparts A and KKKK: P001 and P002. The complete NSPS requirements, including the NSPS General Provisions may be accessed via the internet from the electronic Code of Federal Regulations (e-CFR) website www.ecfr.gov or by contacting the Ohio EPA Northeast District Office.

5. The following emissions units contained in this permit are subject to 40 CFR Part 60,Subparts A and IIII: P003 and P004. The complete NSPS requirements, including the NSPS General Provisions may be accessed via the internet from the electronic Code of Federal Regulations (e-CFR) website www.ecfr.gov or by contacting the Ohio EPA Northeast District Office.

6. The following emissions units contained in this permit are subject to 40 CFR Part 63 Subparts A and ZZZZ: P003 and P004. The complete MACT requirements, including the MACT General Provisions may be accessed via the internet from the electronic Code of Federal Regulations (e-CFR) website www.ecfr.gov or by contacting the Ohio EPA Northeast District Office.

C. Emissions Unit Terms and Conditions

1. B001, Auxiliary Boiler

Operations, Property and/or Equipment Description:

34 MMBtu/hr* natural gas-fired auxiliary boiler

*All references to MMBtu or MMBtu/hr in this permit are on a Higher Heating Value (HHV) basis.

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3) June 30, 2008	Sulfur dioxide (SO_2) emissions shall not exceed 1.5E-03 pound per million Btu (lb/mmBtu) of heat input. See b)(2)a and b)(2)b.
b.	OAC rule 3745-31-05(A)(3)(a)(ii) June 30, 2008	The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the $PM_{2.5}$, PM_{10}, NO_x, CO, SO_2, or VOC emissions from this air contaminant source since the potential to emit is less than 10 tons per year. See b)(2)c.
c.	OAC rule 3745-31-10 through 20 (Prevention of Significant Deterioration of Air Quality)	Carbon monoxide (CO) emissions shall not exceed 0.055 pound per million Btu (lb/mmBtu) of heat input, 1.87 pounds per hour (lbs/hr), and 1.87 tons per rolling, 12-month period. Nitrogen Oxides (NO_x) emissions shall not exceed 0.020 lb/mmBtu of heat input, 0.68 lb/hr, and 0.68 ton per rolling, 12-month period. Particulate matter emissions less than 10 microns in diameter (PM_{10}) and

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) shall not exceed 0.008 lb/mmBtu of heat input, 0.27 lb/hr, and 0.27 ton per rolling, 12-month period. Volatile organic compound (VOC) emissions shall not exceed 0.006 lb/mmBtu of heat input, 0.20 lb/hr and 0.20 ton per rolling, 12-month period. Sulfuric acid mist (H_2SO_4) emissions shall not exceed 1.1E-04 lb/mmBtu, 0.004 lb/hr, and 0.004 ton per rolling, 12-month period. Carbon dioxide equivalent (CO_2e) emissions shall not exceed 4,008 tons per rolling, 12-month period. Visible particulate emissions from the stack serving this emissions unit shall not exceed 10% opacity as a 6-minute average. See b)(2)d and b)(2)e.
d.	OAC rule 3745-31-05(E)	SO_2 emissions shall not exceed 0.1 ton per rolling, 12-month period. See b)(2)k.
e.	OAC rule 3745-17-07(A)	See b)(2)f.
f.	OAC rule 3745-17-10(B)(1)	See b)(2)f.
g.	OAC rule 3745-110-03(J)(16)	Exemption - see b)(2)l.
h.	40 CFR Part 60, Subpart A (40 CFR 60.1 – 40 CFR 60.19)	See b)(2)g.
i.	40 CFR Part 60, Subpart Dc (40 CFR 60.40c – 40 CFR 60.48c)	See b)(2)h and b)(2)i.
j.	40 CFR Part 63, Subpart JJJJJJ (40 CFR 63.11193 – 63.11236)	See b)(2)j.
k.	40 CFR Part 63, Subpart A (40 CFR 63.1 – 40 CFR 63.16)	See b)(2)m.

(2) Additional Terms and Conditions

a. Compliance with the requirements of this rule for CO, NO_x, $PM_{10}/PM_{2.5}$, and VOC emissions includes compliance with the requirements of OAC rule 3745-31-10 through 20.

b. The BAT emission limits apply until U.S. EPA approves Ohio Administrative Code (OAC) paragraph 3745-31-05(A)(3)(a)(ii) (the less than ten tons per year BAT exemption) into the Ohio State Implementation Plan (SIP).

c. These requirements apply once U.S. EPA approves OAC paragraph 3745-31-05(A)(3)(a)(ii) (the less than ten tons per year BAT exemption) as part of the Ohio SIP.

d. All particulate emissions are assumed to be less than 2.5 microns in diameter. The $PM_{10}/PM_{2.5}$ emissions limitations include both filterable and condensable particulate emissions.

e. The lb/mmBtu and lb/hr, emission limitations are based on the emissions unit's potentials to emit. Therefore, no monitoring, record keeping, and reporting requirements are necessary to ensure ongoing compliance with these emission limitations.

f. The emission limitation specified by this rule is less stringent than the limitation established by OAC rule 3745-31-10 through 20.

g. 40 CFR Part 60, Subpart A provides applicability provisions, definitions, and other general provisions that are pertinent to emissions units affected by 40 CFR Part 60.

h. This rule does not establish emission limitations for natural gas-fired boilers, but does require record keeping of gas usage per 40 CFR 60.48c(g).

i. This emissions unit is subject to the applicable provisions of Subpart Dc of the New Source Performance Standards (NSPS) as promulgated by the United States Environmental Protection Agency, 40 CFR Part 60. The application and enforcement of these standards are delegated to the Ohio EPA. The requirements of 40 CFR Part 60 are also federally enforceable.

j. This emissions unit is exempt from the requirements of this rule per 40 CFR 63.11195(e) due to combusting only natural gas.

k. The maximum annual operating hours for this emissions unit shall not exceed 2,000 hours per rolling, 12-month period.

l. The permittee is exempt from the requirements of OAC rule 3745-110-03(A) through (F) since this permit restricts NO_x emissions from this emissions unit to less than 25 tons per year.

m. Table 8 to Subpart JJJJJJ of 40 CFR Part 63 – Applicability of General Provisions to Subpart JJJJJJ shows which parts of the General Provisions in 40 CFR 63.1 - 63.16 apply.

c) Operational Restrictions

(1) The permittee shall burn only natural gas in this emissions unit.

d) Monitoring and/or Recordkeeping Requirements

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

(2) The permittee shall maintain monthly records of the following information:

a. the operating hours for each month; and

b. beginning after the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the rolling, 12-month summation of the operating hours.

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

(3) See 40 CFR Part 60, Subpart Dc (40 CFR 60.40c-48c).

e) Reporting Requirements

(1) The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas was burned in this emissions unit. Each report shall be submitted within 30 days after the deviation occurs.

(2) Pursuant to 40 CFR Part 60.7 and 60.48c(a), the permittee is hereby advised of the requirement to report the following at the appropriate times:

a. construction date (no later than 30 days after such date);

b. actual start-up date (within 15 days after such date); and

c. the design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.

(3) The permittee shall submit quarterly deviation (excursion) reports that identify the following:

a. all exceedances of the rolling, 12-month limitation on the hours of operation for this emissions unit; and

b. for the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, all exceedances of the maximum allowable cumulative hours of operation.

The quarterly deviation (excursion) reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

(4) See 40 CFR Part 60, Subpart Dc (40 CFR 60.40c-48c).

(5) Unless other arrangements have been approved by the Director, all notifications and reports shall be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal.

f) Testing Requirements

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

CO emissions shall not exceed 0.055 lb/mmBtu of heat input, 1.87 lbs/hr, and 1.87 tons per rolling, 12-month period.

Applicable Compliance Method:

The lb/mmBtu emission limitation is based on manufacturer's data. The hourly emission limitation was developed by multiplying the maximum heat input (34 mmBtu/hr) by the CO emission factor supplied by the manufacturer (0.055 lb/mmBtu) to determine the hourly emissions.

The annual emission limitation was developed by multiplying the hourly emission limitation (1.87 lbs/hr) by the maximum annual operating hours (2,000 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation is shown.

Compliance with the short-term emission limitations shall be demonstrated based upon the emission test required in f)(2).

b. Emission Limitation:

NO_x emissions shall not exceed 0.020 lb/mmBtu of heat input, 0.68 lb/hr, and 0.68 ton per rolling, 12-month period.

Applicable Compliance Method:

The lb/mmBtu limitation is based on manufacturer's data. The hourly emission limitation was developed by multiplying the maximum heat input (34 mmBtu/hr) by the NO_x emission factor supplied by the manufacturer (0.020 lb/mmBtu) to determine the hourly emissions.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.68 lb/hr) by the maximum annual operating hours (2,000 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the annual operating hours limitation is shown.

Compliance with the short-term emission limitations shall be demonstrated based upon the emission test required in f)(2).

c. Emission Limitation:

PM_{10} and $PM_{2.5}$ shall not exceed 0.008 lb/mmBtu of heat input, 0.27 lb/hr, and 0.27 ton per rolling, 12-month period.

Applicable Compliance Method:

The lb/mmBtu limitation is based on manufacturer's data. The hourly emission limitation was developed by multiplying the maximum heat input (34 mmBtu/hr) by the $PM_{10}/PM_{2.5}$ emission factor supplied by the manufacturer (0.008 lb/mmBtu) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the lb/mmBtu and hourly emission limitation using Methods 201 or 201A and 202 of 40 CFR Part 51, Appendix M. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.27 lb/hr) by the maximum annual operating hours (2,000 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the annual operating hours limitation is shown.

d. Emission Limitation:

SO_2 emissions shall not exceed 1.5E-03 lb/mmBtu of heat input and 0.1 ton per rolling, 12-month period.

Applicable Compliance Method:

The lb/mmBtu limitation was established based on using pipeline quality natural gas having a maximum sulfur content of 0.5 grain per 100 cubic feet according to the following calculation. Multiply the maximum sulfur content of natural gas (0.5 grain S/100 scf) by the molecular weight of SO_2 (64.07 lb SO_2/lb-mole), divide by the molecular weight of sulfur (32.06 lb S/lb-mole), divide by (7,000 grains/lb), divide by manufacturer's gas specification (983 Btu/scf), and multiply by (10^6 Btu/mmBtu).

If required, the permittee shall demonstrate compliance with the lb/mmBtu and hourly emission limitation using Methods 1 thru 4 and 6C of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the lb/mmBtu emission limitation (1.5E-03 lb/mmBtu) by the maximum heat input (34 mmBtu/hr), multiplied by the maximum annual operating hours (2,000 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the annual operating hours limitation is shown.

e. Emission Limitation:

VOC emissions shall not exceed 0.006 lb/mmBtu of heat input, 0.20 lb/hr, and 0.20 ton per rolling, 12-month period.

Applicable Compliance Method:

The lb/mmBtu limitation is based on manufacturer's data. The hourly emission limitation was developed by multiplying the maximum heat input (34 mmBtu/hr) by the VOC emission factor supplied by the manufacturer (0.006 lb/mmBtu) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the lb/mmBtu and hourly emission limitation Methods 1 through 4 and 18, 25 or 25A, as appropriate, of 40 CFR Part 60, Appendix A. Use of Method 18, 25 or 25A is to be selected based on the results of pre-survey stack sampling and U.S. EPA guidance documents. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.20 lb/hr) by the maximum annual operating hours (2,000 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the annual operating hours limitation is shown.

f. Emission Limitation:

H_2SO_4 emissions shall not exceed 1.1E-04 lb/mmBtu, 0.004 lb/hr, and 0.004 ton per rolling, 12-month period.

Applicable Compliance Method:

The lb/mmBtu emission limitation is based on the assumption that 5% of the SO_2 emissions are converted to SO_3 and then converted to H_2SO_4 when combined with water vapor by the following calculation:

1.5E-03 lb SO_2/mmBtu(0.05)(98 lb H_2SO_4/lb-mole)(lb-mole/64 lb SO_2) = 1.1E-04 lb H_2SO_4/mmBtu

Multiply the lb H_2SO_4/mmBtu (1.1E-04 lb/mmBtu) by the maximum heat input (34 mmBtu/hr) to determine the maximum hourly H_2SO_4 emissions (0.004 lb/hr), and multiply by the maximum annual hours of operation (2,000 hrs/yr) divided by 2,000 lbs/ton to determine the annual H_2SO_4 emissions (0.004 ton/yr).

If required, the permittee shall demonstrate compliance with the lb/mmBtu and lb/hr emissions limitations using Methods 1 thru 4 and 8 of 40 CFR Part 60, Appendix A.

g. Emission Limitation:

CO_2e emissions shall not exceed 4,008 tons per rolling, 12-month period.

Applicable Compliance Method:

This emission limitation was established to reflect the potential to emit for this emissions unit by calculating the sum of the product of the maximum natural gas firing rate (34 mmBtu/hr) multiplied by the AP-42 emission factors for CO_2, N_2O, and CH_4 from Table 1.4-2 dated 7/98 (120,000 lb/mmscf, 0.64 lb/mmscf, and 2.3 lb/mmscf, respectively), multiplied by the global warming potentials for CO_2, N_2O, and CH_4 (1, 310, and 21, respectively from Table A-1 to Subpart A of 40 CFR Part 98). Divide by the average heating value used for AP-42 emission factors in Table 1.-42 dated 7/98 (1,020 Btu/scf), multiply by the maximum annual hours of operation (2,000 hrs/yr) and divide by 2,000 pounds per ton.

$$\left(34\frac{mmBtu}{hr}\right)x\left[\left(120{,}000\frac{lb}{mmscf}x(1)\right)+\left((0.64\frac{lb}{mmscf)}(298)\right)\right.$$
$$\left.+\left(\left(2.3\frac{lb}{mmscf}\right)(25)\right)\right]x\left(\frac{mmscf}{1020mmBtu}\right)\left(2{,}000\frac{hrs}{hr}\right)x\left(\frac{ton}{2{,}000lb}\right)$$
$$=4{,}008\frac{tons}{yr}$$

Since the CO_2e emissions are estimated to consist of more than 99% CO_2, compliance with this emission limitation will be assumed provided that the lb/scf CO_2 emission rate does not exceed 120,000 lb/mmscf.

If required, the permittee shall conduct emissions testing using Methods 1, 2, 3A and 4 of 40 CFR Part 60, Appendix A to determine the lb/scf CO_2 emission rate. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

h. Emission Limitation:

Visible particulate emissions from the stack serving this emissions unit shall not exceed 10% opacity as a 6-minute average.

Applicable Compliance Method:

If required, compliance with the stack visible particulate emission limitation shall be demonstrated through visible emission observations performed in accordance with the methods and procedures specified in 40 CFR Part 60, Appendix A, Method 9.

(2) The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

a. The emission testing shall be conducted within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of the emissions unit.

b. The emission testing shall be conducted to demonstrate compliance with the following emissions limitations:

i. CO emissions in lb/hr and lb/mmBtu; and

ii. NO_x emissions in lb/hr and lb/mmBtu.

c. The following test method(s) shall be employed to demonstrate compliance with the allowable mass emission rate(s):

for CO, Methods 1 thru 4 and 10 of 40 CFR Part 60, Appendix A; and

for NO_x, Methods 1 thru 4 and 7E of 40 CFR Part 60, Appendix A.

Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

d. The test(s) shall be conducted under those representative conditions that challenge to the fullest extent possible a facility's ability to meet the applicable emissions limits and/or control requirements, unless otherwise specified or approved by the Ohio EPA Northeast District Office. Although this generally consists of operating the emissions unit at its maximum material input/production rates and results in the highest emission rate of the tested pollutant, there may be circumstances where a lower emissions loading is deemed the most challenging control scenario. Failure to test under these conditions is justification for not accepting the test results as a demonstration of compliance.

e. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emission test(s).

f. Personnel from the Ohio EPA Northeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

g. A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Northeast District Office within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Northeast District Office.

g) Miscellaneous Requirements

(1) None.

2. Emissions Unit Group – P001 and P002

EU ID	Operations, Property and/or Equipment Description
P001	Combined cycle combustion turbine (2,725 MMBtu/hr heat input turbine at ISO conditions and 179 MMBtu/hr heat input duct burner) with dry low NO_x combustors, selective catalytic reduction (SCR), and catalytic oxidizer.
P002	Combined cycle combustion turbine (2,725 MMBtu/hr heat input turbine at ISO conditions and 179 MMBtu/hr heat input duct burner) with dry low NO_x combustors, selective catalytic reduction (SCR), and catalytic oxidizer.

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) d)(11), d)(12), d)(13), d)(14), d)(15) and e)(6)

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	ORC 3704.03(T)	Sulfur dioxide (SO_2) emissions shall not exceed 1.5E-03 lb/mmBtu of heat input. See b)(2)b and See b)(2)e.
b.	OAC rule 3745-31-10 through 20 (Prevention of Significant Deterioration of Air Quality)	Visible particulate emissions from the stack serving this emissions unit shall not exceed 10% opacity as a 6-minute average. Carbon dioxide equivalent (CO_2e) emissions shall not exceed 833 lb/MW-hr gross energy output (at full load ISO conditions without duct firing) and 369,700 lbs/hr (maximum under any condition with duct firing). See b)(2)c, b)(2)d, b)(2)f through b)(2)i and b)(2)q through b)(2)s.
c.	OAC rule 3745-17-07(A)	See b)(2)j.
d.	OAC rule 3745-17-11(B)(4)	See b)(2)j.
e	OAC rule 3745-18-06(A)	See b)(2)l.
f.	OAC rule 3745-110-03(J)(19)	Exemption from NO_x RACT requirements
g.	OAC rule 3745-114-01	See d)(11), d)(12), d)(13), d)(14), d)(15) and e)(6)

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
h.	40 CFR Part 60, Subpart A (40 CFR 60.1 – 40 CFR 60.19)	See b)(2)m.
i.	40 CFR Part 60, Subpart KKKK (40 CFR 60.4300 – 60.4420) [In accordance with 40 CFR 60.4305(a), this emissions unit is a stationary combustion turbine with a heat input at peak load greater than 10 mmBtu/hr with a heat recovery steam generator/duct burners subject to the emissions limitations/control measures specified in this section.]	See b)(2)k and b)(2)n.
j.	40 CFR Part 63, Subpart YYYY (40 CFR 63.6080 – 63.6175)	See b)(2)o.
k.	40 CFR Part 63, Subpart JJJJJJ (40 CFR 63.11193 – 63.11236)	See b)(2)p.
l.	40 CFR Part 63, Subpart A (40 CFR 63.1 – 40 CFR 63.16)	See b)(2)t.

(2) Additional Terms and Conditions

a. All requirements specified in this Section of the permit for Emissions Unit Group P001 and P002 apply to each combined cycle combustion turbine (P001 and P002) unless a combined requirement is otherwise specified.

b. Compliance with the requirements of this rule for CO, NO_x, PM_{10}, $PM_{2.5}$ and VOC includes compliance with the requirements of OAC rule 3745-31-10 through 20.

c. The emissions from this emissions unit shall be vented to the SCR and catalytic oxidation units at all times during which the emissions unit is in operation.

d. All particulate emissions are assumed to be less than 2.5 microns in diameter. The PM_{10}/$PM_{2.5}$ emission limitations include both filterable and condensable particulate emissions.

e. The sulfur content of natural gas burned in this emissions unit shall not exceed 0.5 grain per 100 standard cubic feet.

f. The permittee shall comply with the following emissions limitations:

Allowable Emissions				
Pollutant	**Operating Mode[a]**	**Emission Rate[b,e]**	**Emission rate, lb/hr[b]**	**Emission rate, tons per rolling, 12-month period**
CO	CT with DB	2.0[c]	14.3	-
	CT only	2.0[c]	13.6	-
	All operating modes, including startup periods	-	-	128.5
NO_x	CT with DB	2.0[c]	23.5	-
	CT only	2.0[c]	22.3	-
	All operating modes, including startup periods			107.2
$PM_{10}/PM_{2.5}$	CT with DB	4.9E-03[d]	14.9	-
	CT only	6.8E-03[d]	13.1	-
	All operating modes, including startup periods	-	-	62.6
VOC	CT With DB	2.0[c]	8.2	-
	CT only	1.0[c]	3.9	-
	All operating modes, including startup periods	-	-	47.1
H_2SO_4	CT with DB	0.0011[d]	3.4	-
	CT only	0.0011[d]	3.2	-
	All operating modes, including startup periods	-	-	14.0
CO_2e	All operating modes, including startup periods	-	-	1,510,526.6

Allowable Emissions				
Pollutant	**Operating Mode[a]**	**Emission Rate[b,e]**	**Emission rate, lb/hr[b]**	**Emission rate, tons per rolling, 12-month period**

a. CT = combustion turbine; BD = duct burner

b. Limitation does not apply during periods of startup and shutdown.

c. Parts per million by volume dry (ppmvd) at 15% oxygen.

d. Pounds per million Btu of heat input.

e. Emissions limitations are based on an hourly average.

g. To ensure enforceability of the rolling, 12-month emissions limitations during the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the permittee shall not exceed the emission levels specified in the following table:

	Maximum Allowable Cumulative Emissions (Tons)				
Month(s)	CO	NO_x	$PM_{10}/PM_{2.5}$	VOC	H_2SO_4
1	21.4	17.9	10.4	7.9	2.3
1-2	42.8	35.8	20.8	15.8	4.6
1-3	64.2	53.7	31.2	23.7	6.9
1-4	85.6	71.6	41.6	31.6	9.2
1-5	107.0	89.5	52.0	39.5	11.5
1-6	128.5	107.2	62.6	47.1	14.0
1-7	128.5	107.2	62.6	47.1	14.0
1-8	128.5	107.2	62.6	47.1	14.0
1-9	128.5	107.2	62.6	47.1	14.0

	Maximum Allowable Cumulative Emissions (Tons)				
Month(s)	CO	NO_x	$PM_{10}/PM_{2.5}$	VOC	H_2SO_4
1-10	128.5	107.2	62.6	47.1	14.0
1-11	128.5	107.2	62.6	47.1	14.0
1-12	128.5	107.2	62.6	47.1	14.0

After the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, compliance with the annual emissions limitations shall be based upon a rolling, 12-month summation of the monthly emissions.

h. The permittee shall comply with the following requirements during periods of startup and shutdown.

	Emissions Limitations During Startup and Shutdown (lbs/hr)[a]			
	Cold Startup	**Hot Startup**	**Warm Startup**	**Shutdown**
CO	526.0	436.1	496.0	150.3
NO_x	162.1	78.7	112.8	57.3
VOC	64.4	60.1	59.6	62.8

[a] Pound per hour emissions rates as presented are the maximum rates during any hour during the event from each unit.

"Cold Startup" is defined as a combustion turbine startup that occurs more than 64 hours after a combustion turbine shutdown. The period of startup is defined as the lesser of the first 180 minutes of continuous fuel flow to the combustion turbine after fuel flow is initiated or the period of time from combustion turbine fuel flow initiation until the combustion turbine achieves ten consecutive CEM data points in compliance with the ppmvd emissions limitations for CO and NO_x.

"Hot Startup" is defined as a combustion turbine startup that occurs within 16 hours of a combustion turbine shutdown. The period of hot startup is defined as the lesser of the first 82 minutes of continuous fuel flow to the combustion turbine after fuel flow is initiated or the period of time from combustion turbine fuel flow

initiation until the combustion turbine achieves ten consecutive CEM data points in compliance with the ppmvd emissions limitations for CO and NO_x.

"Warm Startup" is defined as a combustion turbine startup that occurs between 16 hours of and 64 hours of a combustion turbine shutdown. The period of startup is defined as the lesser of the first 98 minutes of continuous fuel flow to the combustion turbine after fuel flow is initiated or the period of time from combustion turbine fuel flow initiation until the combustion turbine achieves ten consecutive CEM data points in compliance with the ppmvd emissions limitations for CO and NO_x.

"Shutdown" is the continuous process of taking the turbine off line. The shutdown period begins with the first CEM data point out of compliance with either the CO or NO_xppmvd emission limit that occurs when load is dropping in conjunction with the process of ceasing operation of the unit, and ends when fuel flow to the turbine ceases.

i. The design net plant base heat rate shall not exceed 7,165 Btu/kW-hr HHV (ISO conditions without duct firing).

j. The emission limitation specified by this rule is less stringent than the limitation established by OAC rule 3745-31-10 through 20.

k. The emission limitation specified by this rule is less stringent than the limitation established by ORC 3704.03(T).

l. This emissions unit is exempt from the requirements of this rule, since only natural gas is burned.

m. 40 CFR Part 60, Subpart A provides applicability provisions, definitions, and other general provisions that are pertinent to emissions units affected by 40 CFR Part 60.

n. This emissions unit is subject to the applicable provisions of Subpart KKKK of the New Source Performance Standards (NSPS) as promulgated by the United States Environmental Protection Agency, 40 CFR Part 60. The application and enforcement of these standards are delegated to the Ohio EPA. The requirements of 40 CFR Part 60 are also federally enforceable.

o. This emissions unit is not subject to the requirements of 40 CFR Part 63, Subpart YYYY, since it is not located at a major source of HAP emissions.

p. The duct burner is exempt from the requirements of this rule per 40 CFR 63.11195(e) due to combusting only natural gas.

q. Each continuous NO_x monitoring system shall be certified to meet the requirements of 40 CFR Part 60, Appendix B, Performance Specifications 2 and 6. At least 45 days before commencing certification testing of the continuous NO_x monitoring system(s), the permittee shall develop and maintain a written quality assurance/quality control plan designed to ensure continuous valid and

representative readings of NO_x emissions from the continuous monitor(s), in units of the applicable standard(s). Except as allowed below, the plan shall follow the requirements of 40 CFR Part 60, Appendix F and 40 CFR Part 75, Appendix B. The quality assurance/quality control plan and a logbook dedicated to the continuous monitoring system must be kept on site and available for inspection during regular office hours.

The plan shall include the requirement to conduct relative accuracy test audits for the continuous NO_x monitoring system in accordance with the frequencies required pursuant to 40 CFR Part 60 and 40 CFR Part 75; or may follow relative accuracy test audit frequency requirements for monitoring systems subject to 40 CFR 75, Appendix B, in lieu of frequencies required in 40 CFR Part 60. In either case, results shall be recorded and reported in units of the applicable standard(s) in accordance with 40 CFR Part 60.

The plan shall include the requirement to conduct quarterly cylinder gas audits or relative accuracy audits pursuant to 40 CFR Part 60, and linearity checks pursuant to 40 CFR Part 75; however, linearity checks completed pursuant to 40 CFR Part 75, Appendix B, may be substituted for the quarterly cylinder gas or relative accuracy audits required per 40 CFR Part 60.

r. Each continuous carbon monoxide (CO) monitoring system shall be certified to meet the requirements of 40 CFR Part 60, Appendix B, Performance Specifications 4 or 4a and 6. At least 45 days before commencing certification testing of the continuous CO monitoring system(s), the permittee shall develop and maintain a written quality assurance/quality control plan designed to ensure continuous valid and representative readings of CO emissions from the continuous monitor(s), in units of the applicable standard(s). The fuel flow monitor/meter shall be maintained as required in Part 75, Appendix D. Except as allowed below, the plan shall follow the requirements of 40 CFR Part 60, Appendix F. The quality assurance/quality control plan and a logbook dedicated to the continuous monitoring system must be kept on site and available for inspection during regular office hours.

The plan shall include the requirement to conduct relative accuracy test audits for the continuous CO monitoring system in accordance with the frequencies required for monitoring systems subject to 40 CFR 60, or may follow relative accuracy test audit frequency requirements for monitoring systems subject to 40 CFR 75, Appendix B. In either case, results shall be recorded and reported in units of the applicable standard(s) in accordance with 40 CFR Part 60.

The plan shall include the requirement to conduct quarterly cylinder gas audits or relative accuracy audits as required in 40 CFR Part 60; however, the quarterly cylinder gas audit and relative accuracy audit frequency requirements may be adjusted to coincide with linearity checks completed for continuous emissions monitoring systems subject to 40 CFR Part 75, Appendix B requirements.

s. The continuous emission monitoring system consists of all the equipment used to acquire data to provide a record of emissions and includes the sample extraction

and transport hardware, sample conditioning hardware, analyzers, and data recording/processing hardware and software.

t. Table 8 to Subpart JJJJJJ of 40 CFR Part 63 – Applicability of General Provisions to Subpart JJJJJJ shows which parts of the General Provisions in 40 CFR 63.1 - 63.16 apply.

c) Operational Restrictions

(1) The permittee shall only burn pipeline quality natural gas as fuel in this emissions unit.

(2) See 40 CFR Part 60, Subpart KKKK (40 CFR 60.4300 – 60.4420).

d) Monitoring and/or Recordkeeping Requirements

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

(2) For purposes of demonstrating compliance with the natural gas sulfur concentration restriction of 0.5 grain/scf, the permittee shall sample and analyze the natural gas burned in this emissions unit monthly to determine the sulfur content using the appropriate ASTM or Gas Processors Association standards. Fuel supplier data may be used to comply with this requirement, provided that it is demonstrated to be representative of the fuel received for burning at this emissions unit.

(3) The permittee may elect not to monitor the total sulfur content of the fuel combusted in the turbine as specified in d)(2), if the fuel is demonstrated not to exceed potential sulfur emissions of 1.5E-03 lb SO_2/mmBtu. The permittee shall use one of the following sources of information to make the required demonstration:

a. the fuel quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the fuel, specifying that the maximum total sulfur content for natural gas is 0.5 grains of sulfur or less per 100 standard cubic feet, has potential sulfur emissions of less than less than 1.5E-03 lb SO_2/mmBtu heat input;

b. representative fuel sampling data which show that the sulfur content of the fuel does not exceed 1.5E-03 lb SO_2/mmBtu heat input. At a minimum, the amount of fuel sampling data specified in section 2.3.1.4 or 2.3.2.4 of appendix D to part 75 of this chapter is required; or

c. one of the custom sulfur monitoring schedules outlined in 40 CFR 60.4370(c) may be used to comply with the 1.5E-03 lb SO_2/mmBtu standard.

(4) The permittee shall maintain monthly records of the following information:

a. the CO, NO_x, $PM_{10}/PM_{2.5}$, VOC, and H_2SO_4 emission rate for each month of operations; and

b. beginning after the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the rolling, 12-month summation of the CO, NO_x, $PM_{10}/PM_{2.5}$, VOC, and H_2SO_4 emissions.

Also, during the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the permittee shall record the cumulative CO, NO_x, $PM_{10}/PM_{2.5}$, VOC, and H_2SO_4 emissions for each calendar month.

(5) The permittee shall maintain monthly records of the following information for this emissions unit for purposes of calculating rolling, 12-month emissions:

a. date, time, and duration of each cold, warm, hot startup and shutdown period;

b. the hours of operation of the combustion turbine;

c. the hours of operation of the duct burner;

d. the total duration of all cold startup periods in hours per rolling, 12-month period;

e. the total duration of all hot startup periods in hours per rolling, 12-month period;

f. the total duration of all warm startup periods in hours per rolling, 12-month period;

g. the total duration of all shutdown periods in hours per rolling, 12-month period;

h. the total duration of steady-state operation without duct burner firing in hours per rolling, 12-month period; and

i. the total duration of steady-state operation with duct burner firing in hours per rolling, 12-month period.

(6) Prior to the installation of the continuous NO_x monitoring system, the permittee shall submit information detailing the proposed location of the sampling site in accordance with the siting requirements in 40 CFR Part 60, Appendix B, Performance Specification 2. The Ohio EPA, Central Office shall approve the proposed sampling site and certify that the continuous NO_x monitoring system meets the requirements of Performance Specifications 2 and 6; and the U.S. EPA shall certify that the continuous NO_x monitoring system meets the requirements under 40 CFR Part 75, which may be approved through the recommendation for certification by Ohio EPA to U.S. EPA. Once received, the letter(s)/document(s) of certification under Part 60 and certification or recommendation for certification under Part 75 shall be maintain on-site and made available to the Director (the Ohio EPA Northeast District Office) upon request.

(7) The permittee shall install, operate, and maintain equipment to continuously monitor and record NO_x emissions from this emissions unit in units of the applicable standard(s). The continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 60 and 40 CFR Part 75.

The permittee shall maintain records of all data obtained by the continuous NO_x monitoring system including, but not limited to:

a. emissions of NO_x in parts per million for each cycle time of the analyzer, with no resolution less than one data point per minute required;

b. emissions of NO_x in pounds per hour and in units of the applicable standard(s) in the appropriate averaging period;

c. results of quarterly cylinder gas audits or linearity checks;

d. results of daily zero/span calibration checks and the magnitude of manual calibration adjustments;

e. results of required relative accuracy test audit(s), including results in units of the applicable standard(s);

f. hours of operation of the emissions unit, continuous NO_x monitoring system, and control equipment;

g. the date, time, and hours of operation of the emissions unit without the control equipment and/or the continuous NO_x monitoring system;

h. malfunction of the control equipment and/or the continuous NO_x monitoring system; as well as,

i. the reason (if known) and the corrective actions taken (if any) for each such event in (g) and (h).

All valid data points generated and recorded by the continuous emission monitoring and data acquisition and handling system shall be used in the calculation of the pollutant concentration and/or emission rate over the appropriate averaging period.

(8) Prior to the installation of the continuous carbon monoxide (CO) monitoring system, the permittee shall submit information detailing the proposed location of the sampling site in accordance with the siting requirements in 40 CFR Part 60, Appendix B, Performance Specification 4 or 4a (as appropriate). The Ohio EPA, Central Office shall approve the proposed sampling site and certify that the continuous CO monitoring system meets the requirements of Performance Specifications 4 or 4a and 6. Once received, the letter(s)/document(s) of certification shall be maintained on-site and shall be made available to the Director (the Ohio EPA Northeast District Office) upon request.

(9) The permittee shall operate and maintain equipment to continuously monitor and record CO emissions from this emissions unit in units of the applicable standard(s). The continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Parts 60.

The permittee shall maintain records of all data obtained by the continuous CO monitoring system including, but not limited to:

a. emissions of CO in parts per million for each cycle time of the analyzer, with no resolution less than one data point per minute required;

b. emissions of CO in pounds per hour and in units of the applicable standard(s) in the appropriate averaging period;

c. results of quarterly cylinder gas audits;

d. results of daily zero/span calibration checks and the magnitude of manual calibration adjustments;

e. results of required relative accuracy test audit(s), including results in units of the applicable standard(s);

f. hours of operation of the emissions unit, continuous CO monitoring system, and control equipment;

g. the date, time, and hours of operation of the emissions unit without the control equipment and/or the continuous CO monitoring system;

h. the date, time, and hours of operation of the emissions unit during any malfunction of the control equipment and/or the continuous CO monitoring system; as well as,

i. the reason (if known) and the corrective actions taken (if any) for each such event in (g) and (h).

All valid data points generated and recorded by the continuous emission monitoring and data acquisition and handling system shall be used in the calculation of the pollutant concentration and/or emission rate over the appropriate averaging period.

(10) The permittee shall calculate and record the monthly CO_2 emissions from P001 and P002 using data from the continuous flow monitor using the procedures set forth in 40 CFR Part 75, Appendix G. From this data, the permittee shall calculate the CO_2 emissions from P001 and P002 per rolling, 12-month period.

(11) The Permit to Install application for these emissions units, P001 and P002, was evaluated based on the actual materials and the design parameters of the emissions unit's(s') exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to this/these emissions unit(s) for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A", as follows:

a. the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions unit(s), (as determined from the raw materials processed and/or coatings or other materials applied) has been

documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):

i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; or

ii. STEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.

b. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).

c. This standard is/was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., "X = 24" hours per day and "Y = 7" days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC):

TLV/10 x 8/X x 5/Y = 4 TLV/XY = MAGLC

d. The following summarizes the results of dispersion modeling for the "worst case" toxic contaminant(s):

Toxic Contaminant: H_2SO_4

TLV (mg/m3): 0.2 mg/m^3

Hourly Emission Rate for Maximum Hourly Impact (lbs/hr): 1.98

Predicted 1-Hour Maximum Ground-Level Concentration (µg/m3): 1.33

MAGLC (µg/m3): 4.76

The permittee, has demonstrated that emissions of H_2SO_4, from emissions unit(s) P001 and P002, is estimated to be equal or greater than eighty per cent, but less than 100 per cent of the maximum acceptable ground level concentration (MAGLC), shall not operate the emissions unit(s) at a rate that would exceed the daily emissions rate, process weight rate, and/or restricted hours of operations, as allowed in this permit; and any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

(12) Prior to making any physical changes to or changes in the method of operation of the emissions unit(s), that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration, the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can

affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:

a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;

b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and

c. physical changes to the emissions unit(s) or its/their exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

If the permittee determines that the “Toxic Air Contaminant Statute” will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a “modification”, the permittee shall apply for and obtain a final PTI prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.

(13) The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F):

a. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);

b. the Maximum Acceptable Ground-Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F);

c. a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and

d. the documentation of the initial evaluation of compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.

(14) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.

(15) See 40 CFR Part 60, Subpart KKKK (40 CFR 60.4300 – 60.4420).

e) Reporting Requirements

(1) The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas was burned in this emissions unit. Each report shall be submitted within 30 days after the deviation occurs.

(2) The permittee shall submit quarterly deviation (excursion) reports that identify the following:

a. any monthly record showing an exceedance of the allowable sulfur content of natural gas, 0.5 grain per 100 standard cubic feet.

The quarterly deviation (excursion) reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

(3) The permittee shall comply with the following quarterly reporting requirements for the emissions unit and its continuous NO_x monitoring system:

a. Pursuant to the monitoring, record keeping, and reporting requirements for continuous monitoring systems contained in 40 CFR 60.7 and 60.13(h) and the requirements established in this permit, the permittee shall submit reports within 30 days following the end of each calendar quarter to the Ohio EPA Northeast District Office, documenting all instances of NO_x emissions in excess of any applicable limit specified in this permit, 40 CFR Part 60, 40 CFR Parts 75 and 76, OAC Chapters 3745-14 and 3745-23, and any other applicable rules or regulations. The report shall document the date, commencement and completion times, duration, and magnitude of each exceedance, as well as the reason (if known) and the corrective actions taken (if any) for each exceedance. Excess emissions shall be reported in units of the applicable standard(s).

b. These quarterly reports shall be submitted by January 30, April 30, July 30, and October 30 of each year and shall include the following:

i. the facility name and address;

ii. the manufacturer and model number of the continuous NO_x and other associated monitors;

iii. a description of any change in the equipment that comprises the continuous emission monitoring system (CEMS), including any change to the hardware, changes to the software that may affect CEMS readings, and/or changes in the location of the CEMS sample probe;

iv. the excess emissions report (EER)*, i.e., a summary of any exceedances during the calendar quarter, as specified above;

v. the total NO_x emissions for the calendar quarter (tons);

vi. the total operating time (hours) of the emissions unit;

vii. the total operating time of the continuous NO_x monitoring system while the emissions unit was in operation;

viii. results and date of quarterly cylinder gas audits or linearity checks;

ix. unless previously submitted, results and date of the relative accuracy test audit(s), including results in units of the applicable standard(s), (during appropriate quarter(s));

x. unless previously submitted, the results of any relative accuracy test audit showing the continuous NO_x monitor out-of-control and the compliant results following any corrective actions;

xi. the date, time, and duration of any/each malfunction** of the continuous NO_x monitoring system, emissions unit, and/or control equipment;

xii. the date, time, and duration of any downtime** of the continuous NO_x monitoring system and/or control equipment while the emissions unit was in operation; and

xiii. the reason (if known) and the corrective actions taken (if any) for each event in (b)(xi) and (xii).

Each report shall address the operations conducted and data obtained during the previous calendar quarter. Data substitution procedures from 40 CFR 75 are not to be used for showing compliance with the short term OAC 3745-31-05(A)(3) rule-based or NSPS-based limitation(s) in this permit.

* where no excess emissions have occurred or the continuous monitoring system(s) has/have not been inoperative, repaired, or adjusted during the calendar quarter, such information shall be documented in the EER quarterly report

** each downtime and malfunction event shall be reported regardless if there is an exceedance of any applicable limit

(4) The permittee shall comply with the following quarterly reporting requirements for the emissions unit and its continuous CO monitoring system:

a. Pursuant to the monitoring, record keeping, and reporting requirements for continuous monitoring systems contained in 40 CFR 60.7 and 60.13(h) and the requirements established in this permit, the permittee shall submit reports within 30 days following the end of each calendar quarter to the Ohio EPA Northeast District Office, documenting all instances of CO emissions in excess of any applicable limit specified in this permit, 40 CFR Part 60, OAC Chapter 3745-21,

and any other applicable rules or regulations. The report shall document the date, commencement and completion times, duration, and magnitude of each exceedance, as well as, the reason (if known) and the corrective actions taken (if any) for each exceedance. Excess emissions shall be reported in units of the applicable standard(s).

b. These quarterly reports shall be submitted by January 30, April 30, July 30, and October 30 of each year and shall include the following:

i. the facility name and address;

ii. the manufacturer and model number of the continuous CO and other associated monitors;

iii. a description of any change in the equipment that comprises the continuous emission monitoring system (CEMS), including any change to the hardware, changes to the software that may affect CEMS readings, and/or changes in the location of the CEMS sample probe;

iv. the excess emissions report (EER)*, i.e., a summary of any exceedances during the calendar quarter, as specified above;

v. the total CO emissions for the calendar quarter (tons);

vi. the total operating time (hours) of the emissions unit;

vii. the total operating time of the continuous CO monitoring system while the emissions unit was in operation;

viii. results and dates of quarterly cylinder gas audits;

ix. unless previously submitted, results and dates of the relative accuracy test audit(s), including results in units of the applicable standard(s), (during appropriate quarter(s));

x. unless previously submitted, the results of any relative accuracy test audit showing the continuous CO monitor out-of-control and the compliant results following any corrective actions;

xi. the date, time, and duration of any/each malfunction** of the continuous CO monitoring system, emissions unit, and/or control equipment;

xii. the date, time, and duration of any downtime** of the continuous CO monitoring system and/or control equipment while the emissions unit was in operation; and

xiii. the reason (if known) and the corrective actions taken (if any) for each event in (b)(xi) and (xii).

Each report shall address the operations conducted and data obtained during the previous calendar quarter. Data substitution procedures from 40 CFR 75 are not to be used for showing compliance with the short term OAC 3745-31-05(A)(3) rule-based or NSPS-based limitation(s) in this permit.

* where no excess emissions have occurred or the continuous monitoring system(s) has/have not been inoperative, repaired, or adjusted during the calendar quarter, such information shall be documented in the EER quarterly report

** each downtime and malfunction event shall be reported regardless if there is an exceedance of any applicable limit

(5) The permittee shall collect, record, and maintain measurements, data, records, and reports required per 40 CFR Part 75; and shall submit certification, recertification, notifications, applications, monitoring plans, petitions for alternative monitoring systems, electronic quarterly reports, and any other pertinent record and/or report to the Administrator (U.S. EPA), as required by this Part.

(6) The permittee shall submit annual reports that include any changes to any parameter or value used in the dispersion model used to demonstrate compliance with the "Toxic Air Contaminate Statute", ORC 3704.03(F), through the predicted 1 hour maximum concentration. The report should include:

a. the original model input;

b. the updated model input;

c. the reason for the change(s) to the input parameter(s); and

d. a summary of the results of the updated modeling, including the input changes; and

e. a statement that the model results indicate that the 1-hour maximum ground-level concentration is less than 80% of the MAGLC.

If no changes to the emissions, emissions unit(s), or the exhaust stack have been made during the reporting period, then the report shall include a statement to that effect.

(7) See 40 CFR Part 60, Subpart KKKK (40 CFR 60.4300 – 60.4420).

f) Testing Requirements

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. <u>Emission Limitation</u>:

The sulfur content of natural gas burned in this emissions unit shall not exceed 0.5 grain per 100 standard cubic feet.

Applicable Compliance Method:

Compliance with the sulfur content limitation shall be demonstrated by the monitoring and record keeping requirements specified in 40 CFR 60.4365 or 40 CFR 60.4370.

If required, the permittee shall demonstrate compliance using the procedures specified in 40 CFR 60.4415(a)(1). Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

b. Emission Limitation:

SO_2 emissions shall not exceed 1.5E-03 lb/mmBtu of heat input.

Applicable Compliance Method:

The lb/mmBtu limitation was established based on using pipeline quality natural gas having a maximum sulfur content of 0.5 grain per 100 cubic feet according to the following calculation. Multiply the maximum sulfur content of natural gas (0.5 grain S/100 scf) by the molecular weight of SO_2 (64.07 lb SO_2/lb-mole), divide by the molecular weight of sulfur (32.06 lb S/lb-mole), divide by (7,000 grains/lb), divide by the manufacturer's gas specification (983 Btu/scf), and multiply by (10^6 Btu/mmBtu).

If required, compliance shall be demonstrated according to 40 CFR 60.4415.

c. Emission Limitation:

Visible particulate emissions from the stack serving this emissions unit shall not exceed 10% opacity as a 6-minute average.

Applicable Compliance Method:

If required, the permittee shall demonstrate compliance based upon an emission test performed in accordance with the methods and procedures specified in 40 CFR Part 60, Appendix A, Method 9. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

d. Emission Limitation:

CO emissions from this emissions unit shall not exceed 2.0 ppmvd at 15% oxygen as an hourly average and 13.6 lbs/hr when the duct burner is not in operation; and 2.0 ppmvd at 15% oxygen as an hourly average and 14.3 lbs/hr when the duct burner is in operation.

Applicable Compliance Method:

These emission limitations are based on manufacturer's data. Ongoing compliance with the CO emission limitations shall be demonstrated through the data collected as required in the Monitoring and Record keeping Section of this permit and through demonstration of compliance with the quality

assurance/quality control plan, which shall meet the requirements of 40 CFR Part 60.

If required, the permittee shall demonstrate compliance using Methods 1 thru 4 and 10 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA. See f)(2).

e. Emission Limitation:

CO emissions from this emissions unit shall not exceed 526.0 lbs/hr during cold startup, 436.1 lbs/hr during hot startup, 496.0 lbs/hr during warm startup and 150.3 lbs/hr during shutdown.

Applicable Compliance Method:

These emissions limitations are based on manufacturer's data. Ongoing compliance with the CO emission limitations shall be demonstrated through the data collected as required in the Monitoring and Record keeping Section of this permit and through demonstration of compliance with the quality assurance/quality control plan, which shall meet the requirements of 40 CFR Part 60.

f. Emission Limitation:

CO emissions from this emissions unit shall not exceed 128.5 tons per rolling, 12-month period.

Applicable Compliance Method:

This emissions limitation is based on the following anticipated worst case emissions: 250 hot startups per year, with zero hours of downtime, and a hot startup duration of 30 minutes; shutdown duration of 25 minutes; maximum combined CO emissions of 429 pounds during each hot startup period and 142 pounds during each shutdown period; hourly CO emissions during steady state operation (Siemens Case #10 and #24 of PSD Dispersion Modeling) of 14.3 lbs/hr based on manufacturer's data; and steady state operating hours was determined by the following equation.

$$8{,}760\ hrs - \left(250\left(\frac{(30+25)\ min}{60\left(\frac{min}{hr}\right)}\right)\right) = \text{ 8,530.8 hours}$$

The allowable annual emission rate was determined by the following calculation using the above information.

$$\frac{\left[\left(250\frac{HS}{yr}\right)\left(429\frac{lbs}{HS}+142\frac{lbs}{SD}\right)+\left(8{,}530.8\frac{hrs}{yr}\right)\left(13.4\frac{lbs}{hr}\right)\right]}{2000\frac{lbs}{ton}} = \text{ 128.5 tons/yr}$$

where:

HS = hot starts.

Ongoing compliance with this emissions limitation shall be based on the pounds per hour emission data from the CO CEMS and the actual hours of operation of this emissions unit.

g. Emission Limitation:

NO_x emissions from this emissions unit shall not exceed 2.0 ppmvd at 15% oxygen as an hourly average and 22.3 lbs/hr when the duct burner is not in operation; and NO_x emissions shall not exceed 2.0 ppmvd at 15% oxygen as an hourly average and 23.5 lbs/hr when the duct burner is in operation.

Applicable Compliance Method:

These emission limitations are based on manufacturer's data. Ongoing compliance with the NO_x emission limitations shall be demonstrated through the data collected as required in the Monitoring and Record keeping Section of this permit and through demonstration of compliance with the quality assurance/quality control plan, which shall meet the testing and recertification requirements of 40 CFR Part 60 and 40 CFR Part 75.

If required, the permittee shall demonstrate compliance using Methods 1 thru 4 and 7E of 40 CFR Part 60, Appendix A, and the procedures specified in 40 CFR 60.4400. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA. See f)(2).

h. Emission Limitation:

NO_x emissions shall not exceed 107.2 tons per rolling, 12-month period.

Applicable Compliance Method:

This emissions limitation is based on the following anticipated worst case emissions: 250 hot startups per year, with zero hours of downtime, and a hot startup duration of 30 minutes; shutdown duration of 25 minutes; maximum combined NO_x emissions of 67 pounds during each hot startup period and 43.6 pounds during each shutdown period; hourly NO_x emissions during steady state operation (Siemens Case #24 and #31 of PSD Dispersion Modeling) of 23.5 lbs/hr based on manufacturer's data; and steady state operating hours was determined by the following equation.

$$8{,}760\ hrs - \left(250\left(\frac{(30+25)\ min}{60\left(\frac{min}{hr}\right)}\right)\right) = \text{ 8,530.8 hours}$$

The allowable annual emission rate was determined by the following calculation using the above information.

$$\frac{\left[\left(250\frac{HS}{yr}\right)\left(67\frac{lbs}{HS}+43.6\frac{lbs}{SD}\right)+\left(8{,}530.8\frac{hrs}{yr}\right)\left(21.9\frac{lbs}{hr}\right)\right]}{2000\frac{lbs}{ton}} = 107.2 \text{ tons/yr}$$

where:

HS = hot starts

Ongoing compliance with this emission limitation shall be determined using the pounds per hour emission data from the NO_x CEMS and the actual hours of operation of this emissions unit.

i. Emission Limitation:

NO_x emissions from this emissions unit shall not exceed 162.1 lbs/hr during cold startup, 78.7 lbs/hr during hot startup, 112.8 lbs/hr during warm startup and 57.3 lbs/hr during shutdown.

Applicable Compliance Method:

These emissions limitations are based on manufacturer's data. Ongoing compliance with the NO_x emissions limitations shall be demonstrated through the data collected as required in the Monitoring and Record keeping Section of this permit; and through demonstration of compliance with the quality assurance/quality control plan, which shall meet the testing and recertification requirements of 40 CFR Part 60 and 40 CFR Part 75.

j. Emission Limitation:

PM_{10} emissions and $PM_{2.5}$ emissions shall not exceed 6.8E-03 lb/mmBtu of heat input and 13.1 lbs/hr when the duct burner is not in operation; and PM_{10} and $PM_{2.5}$ shall not exceed 4.9E-03 lb/mmBtu of heat input and 14.9 lbs/hr when the duct burner is in operation.

Applicable Compliance Method:

These emission limitations are based on manufacturer's data. If required, the permittee shall demonstrate compliance with these emission limitations using Methods 201A and 202 of 40 CFR Part 51, Appendix M. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

k. Emission Limitation:

PM_{10} and $PM_{2.5}$ emissions from this emissions unit shall not exceed 62.6 tons per rolling, 12-month period.

Applicable Compliance Method:

This emission limitation was developed by multiplying the $PM_{10}/PM_{2.5}$ emissions during steady state operation (Siemens Case #4; ISO conditions) of 14.9 lbs/hrby

the maximum annual hours of operation (8,760 hours), and then dividing by 2,000 pounds per ton. Therefore, if compliance is shown with the short-term allowable emission limitation, compliance shall also be shown with the annual emission limitation.

l. Emission Limitation:

VOC emissions shall not exceed 1.0 ppmvd at 15% oxygen as an hourly average and 3.9 lbs/hr when the duct burner is not in operation; and VOC emissions shall not exceed 2.0 ppmvd at 15% oxygen as an hourly average and 8.2 lbs/hr when the duct burner is in operation.

Applicable Compliance Method:

These emission limitations are based on manufacturer's data. If required, the permittee shall demonstrate compliance with this emission limitation through emission testing performed in accordance with Methods 1 through 4 and 18, 25 or 25A, as appropriate, of 40 CFR Part 60, Appendix A. Use of Method 18, 25 or 25A is to be selected based on the results of pre-survey stack sampling and U.S. EPA guidance documents. Alternative U.S. EPA-approved test methods may be used with prior approval from Ohio EPA.

m. Emission Limitation:

VOC emissions shall not exceed 47.1 tons per rolling, 12-month period.

Applicable Compliance Method:

This emission limitation is based on the following anticipated worst case emissions: 250 hot startups per year, with zero hours of downtime, and a hot startup duration of 30 minutes; shutdown duration of 25 minutes; maximum combined VOC emissions of 56.0 pounds during each hot startup period and 58 pounds during each shutdown period; hourly VOCemissions during steady state operation of 8.2 lbs/hr based on manufacturer's data; and steady state operating hours was determined by the following equation.

$$8{,}760\ hrs - \left(250\left(\frac{(30+25)\ min}{60\left(\frac{min}{hr}\right)}\right)\right) =$$ 8,530.8 hours

The allowable annual emission rate was determined by the following calculation using the above information.

$$\frac{\left[\left(250\frac{HS}{yr}\right)\left(56\frac{lbs}{HS}+58\frac{lbs}{SD}\right)+\left(8{,}530.8\frac{hrs}{yr}\right)\left(7.7\frac{lbs}{hr}\right)\right]}{2000\frac{lbs}{ton}} =$$ 47.1 tons/yr

where:

HS = hot starts

Ongoing compliance with this emission limitation shall be based on the following calculation.

$$\frac{\left[(\#CS)\left(64.4\frac{lbs}{CS}\right)+(\#HS)\left(56\frac{lbs}{HS}\right)+(\#WS)\left(56.2\frac{lbs}{WS}\right)+(\#\mathrm{SD})\left(58\frac{lbs}{SD}\right)+(\#SSDB)\left(7.7\frac{lbs}{hr}\right)+(\#SSNDB)\left(3.6\frac{lbs}{hr}\right)\right]}{2000\frac{lbs}{ton}}$$

= VOC

where:

VOC = tons VOC emissions per rolling, 12-month period;

#CS = number of cold startups per rolling, 12-month period;

#HS = number of hot startups per rolling, 12-month period;

#WS = number of warm startups per rolling, 12-month period;

#SD = number of shutdowns per rolling, 12-month period;

#SSDB = hours operated in steady state with duct burner per rolling, 12-month period; and

#SSNDB = hours operated in steady state without duct burner per rolling, 12-month period.

n. Emission Limitation:

VOC emissions from this emissions unit shall not exceed 64.4 lbs/hr during cold startup, 60.1 lbs/hr during hot startup, 59.6 lbs/hr during warm startup and 62.8 lbs/hr during shutdown.

Applicable Compliance Method:

These emission limitations are based on manufacturer's data. If required, the permittee shall demonstrate compliance with this emission limitation through emission testing performed in accordance with Methods 1 through 4 and 18, 25 or 25A, as appropriate, of 40 CFR Part 60, Appendix A. Use of Method 18, 25 or 25A is to be selected based on the results of pre-survey stack sampling and U.S. EPA guidance documents. Alternative U.S. EPA-approved test methods may be used with prior approval from Ohio EPA.

o. Emission Limitation:

H_2SO_4 emissions shall not exceed 1.1E-03 lb/mmBtu of heat input and 3.2 lbs/hr when the duct burner is not in operation; and H_2SO_4 emissions shall not exceed 1.1E-03 lb/mmBtu of heat input and 3.4 lbs/hr when the duct burner is in operation.

Applicable Compliance Method:

These emission limitations are based on manufacturer's data. If required, the permittee shall demonstrate compliance using Methods 1 thru 4 and 8 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA. See f)(2).

p. Emission Limitation:

H_2SO_4 emissions shall not exceed 14.0 tons per rolling, 12-month period.

Applicable Compliance Method:

This emission limitation was developed by multiplying the steady-state H_2SO_4 emissions ISO conditions for Siemens Case #4 (3.2 lbs/hr) by the maximum annual hours of operation (8,760 hours), and then dividing by 2,000 pounds per ton. Therefore, if compliance is shown with the short-term allowable emission limitation, compliance shall also be shown with the annual emission limitation.

q. Emission Limitation:

CO_2e emissions shall not exceed 369,700 lbs/hr (maximum under any condition with duct firing).

CO_2e emissions shall not exceed 1,510,526.6 tons per rolling, 12-month period during all operating modes, including startup periods.

Applicable Compliance Method:

The hourly emission limitation is based on the sum of the following manufacturer's data Siemens Case #4 (369,225 lbs/hr CO_2, 6.85 lbs/hr CH_4, and 0.685 lbs/hr N_2O) multiplied by the associated global warming potential for each pollutant (CO_2=1, CH_4=25, N_2O=298 from Table A-1 of 40 CFR 98).

$$\left[\left(369{,}325\,\frac{lbs}{hr}\right)(1)+\left(6.85+\frac{lbs}{hr}\right)(25)+\left(0.685\,\frac{lbs}{hr}\right)(298)\right]=369{,}700\ lbs/hr$$

The annual emission limitation was developed by multiplying the steady-state CO_2e emissions (344,869.08 lbs/hr) by the maximum annual hours of operation (8,760 hours), and then dividing by 2,000 pounds per ton. Therefore, if compliance is shown with the short-term allowable emission limitation, compliance shall also be shown with the annual emission limitation.

(2) The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

a. The emission testing shall be conducted within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of the emissions unit.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for CO, NO_x, SO_2, PM_{10}, $PM_{2.5}$, VOC and H_2SO_4, in the appropriate averaging period(s).

The emission testing shall also be conducted to determine a site-specific emission factor for CO_2, in lb/mmBtu.

c. The following test method(s) shall be employed to demonstrate compliance with the allowable mass emission rate(s):

for CO, Methods 1 thru 4 and 10 of 40 CFR Part 60, Appendix A;

for NO_x, Methods 1 thru 4 and 7E of 40 CFR Part 60, Appendix A, and the procedures specified in 40 CFR 60.4400;

for PM_{10} and $PM_{2.5}$, Methods 201A and 202 of 40 CFR Part 51, Appendix M;

for SO_2, 40 CFR 60.4415;

for VOC, Methods 1 through 4 and 18, 25 or 25A, as appropriate, of 40 CFR Part 60, Appendix A. Use of Method 18, 25 or 25A is to be selected based on the results of pre-survey stack sampling and U.S. EPA guidance documents;

for H_2SO_4, Methods 1 thru 4 and 8 of 40 CFR Part 60, Appendix A; and

for CO_2, Methods 1, 2, 3A, and 4 of 40 CFR Part 60, Appendix A, mass balance calculations using ASTM D1945-03 (Standard Test Method for Analysis of Natural Gas by Gas Chromatography) and/or ASTM D1826-94 (Standard Test Method for Calorific Value of Gases in Natural Gas Range by Continuous Recording Calorimeter).

Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

d. The test(s) shall be conducted under those representative conditions that challenge to the fullest extent possible a facility's ability to meet the applicable emissions limits and/or control requirements, unless otherwise specified or approved by the Ohio EPA Northeast District Office. Although this generally consists of operating the emissions unit at its maximum material input/production rates and results in the highest emission rate of the tested pollutant, there may be circumstances where a lower emissions loading is deemed the most challenging control scenario. Failure to test under these conditions is justification for not accepting the test results as a demonstration of compliance.

e. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in

the Ohio EPA Northeast District Office's refusal to accept the results of the emission test(s).

f. Personnel from the Ohio EPA Northeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

g. A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Northeast District Office within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Northeast District Office.

(3) Within 60 days of achieving the maximum production rate at which the emissions unit(s) will be operated, but not later than 180 days after initial startup, the permittee shall conduct certification tests of the continuous NO_x monitoring system, in units of the applicable standard(s), to demonstrate compliance with 40 CFR Part 60, Appendix B, Performance Specification 2; Performance Specification 6 relative accuracy requirements; ORC section 3704.03(I); and 40 CFR Part 75.

The permittee shall certify that the fuel flow monitor/meter meets 40 CFR Part 75 certification requirements prior to the performance specification test and shall demonstrate how the pound per hour emissions of NO_x will be calculated stoichiometrically from the fuel flow rate.

Personnel from the Ohio EPA Central Office and the Ohio EPA Northeast District Office shall be notified 45 days prior to initiation of the applicable tests and shall be permitted to examine equipment and witness the certification tests. Two copies of the test results shall be submitted to Ohio EPA, one copy to the Ohio EPA Northeast District Office and one copy to Ohio EPA Central Office, and pursuant to OAC rule 3745-15-04, within 30 days after the test is completed.

Certification, or recommendation for certification by Ohio EPA to U.S. EPA, of the continuous NO_x monitoring system shall be granted upon determination by the Ohio EPA, Central Office that the system meets the requirements of 40 CFR Part 60, Appendix B, Performance Specification 2; Performance Specification 6 relative accuracy requirements; ORC section 3704.03(I); and 40 CFR Part 75.

Ongoing compliance with the NO_x emissions limitations contained in this permit, 40 CFR Parts 60 and 75, and any other applicable standard(s) shall be demonstrated through the data collected as required in the Monitoring and Record keeping Section of this permit and through demonstration of compliance with the quality assurance/quality control plan, which shall meet the testing and recertification requirements of 40 CFR Part 60 and 40 CFR Part 75.

(4) Within 60 days of achieving the maximum production rate at which the emissions unit(s) will be operated, but not later than 180 days after initial startup, the permittee shall

conduct certification tests of the continuous CO monitoring system in units of the applicable standard(s), to demonstrate compliance with 40 CFR Part 60, Appendix B, Performance Specification 4 or 4a (as appropriate); Performance Specification 6 relative accuracy requirements; and ORC section 3704.03(I).

The permittee shall certify that the fuel flow monitor/meter is calibrated prior to the performance specification test and shall demonstrate how the pound per hour emissions of CO will be calculated stoichiometrically from the fuel flow rate.

Personnel from the Ohio EPA Central Office and the Ohio EPA Northeast District Office shall be notified 30 days prior to initiation of the applicable tests and shall be permitted to examine equipment and witness the certification tests. Two copies of the test results shall be submitted to Ohio EPA, one copy to the Ohio EPA Northeast District Office and one copy to Ohio EPA Central Office, and pursuant to OAC rule 3745-15-04, within 30 days after the test is completed.

Certification of the continuous CO monitoring system shall be granted upon determination by the Ohio EPA Central Office that the system meets the requirements of 40 CFR Part 60, Appendix B, Performance Specification 4 or 4a (as appropriate); Performance Specification 6 relative accuracy requirements; and ORC section 3704.03(I).

Ongoing compliance with the CO emission limitations contained in this permit, 40 CFR Part 60, and any other applicable standard(s) shall be demonstrated through the data collected as required in the Monitoring and Record keeping Section of this permit and through demonstration of compliance with the quality assurance/quality control plan, which shall meet the requirements of 40 CFR Part 60.

g) Miscellaneous Requirements

(1) None.

3. P003, Emergency Generator

Operations, Property and/or Equipment Description:

1,750 kW (2,346 hp) emergency generator

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3) June 30, 2008	Sulfur dioxide (SO_2) emissions shall not exceed 0.024 pound per hour (lb/hr) and 0.01 ton per year. See b)(2)a and b)(2)b.
b.	OAC rule 3745-31-05(A)(3)(a)(ii) June 30, 2008	The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the $PM_{2.5}$, PM_{10}, NO_x, CO, SO_2, or VOC emissions from this air contaminant source since the potential to emit is less than 10 tons per year. See b)(2)c.
c.	OAC rule 3745-31-10 through 20 (Prevention of Significant Deterioration of Air Quality)	Carbon monoxide (CO) emissions shall not exceed 3.5 g/kW-hr, 13.5 pounds per hour (lbs/hr), and 3.37 tons per rolling, 12-month period. Nitrogen oxides (NO_x) emissions shall not exceed 5.61 g/kW-hr, 21.6 lbs/hr, and 5.41 tons per rolling, 12-month period. Particulate matter emissions less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) shall not exceed 0.20 g/kW-hr, 0.77 lb/hr, and 0.19 ton per rolling, 12-month period.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		Volatile organic compound (VOC) emissions shall not exceed 0.79 g/kW-hr, 3.1 lbs/hr, and 0.76 ton per rolling, 12-month period. Sulfuric acid mist (H_2SO_4) emissions shall not exceed 1.32E-04 g/kW-hr, 5.1 E-04 lb/hr and 1.3E-04 ton per rolling, 12-month period. Carbon dioxide equivalent (CO_2e) emissions shall not exceed 683.0 tons per rolling, 12-month period. See b)(2)d.
d.	OAC rule 3745-31-05(E)	See b)(2)e.
e.	OAC rule 3745-17-07(A)	Visible particulate emissions from the stack serving this emissions unit shall not exceed 20% opacity as a 6-minute average, except as provided by the rule.
f.	OAC rule 3745-17-11(B)(5)(a)	See b)(2)f.
g.	OAC rule 3745-18-06(G)	Less stringent than 40 CFR Part 60, Subpart IIII.
h.	OAC rule 3745-110-03(J)(16) and (J)(19)	Exemptions. See b)(2)g.
i.	40 CFR Part 60, Subpart A (40 CFR 60.1 - 60.19)	Table 8 to Subpart IIII of 40 CFR Part 60 – Applicability of General Provisions to Subpart IIII shows which parts of the General Provisions in 40 CFR 60.1 - 60.19 apply.
j.	40 CFR Part 60, Subpart IIII (40 CFR 60.4200 – 60.4219) [In accordance with 40 CFR 60.4200(a)(2), this emissions unit is a compression ignition emergency stationary internal combustion engine (CI ICE) for which construction commenced after July 11, 2005 subject to the emissions limitation/control measures specified in this section.]	Non-methane hydrocarbon (NMHC) + NO_x emissions shall not exceed 6.4 g/kW-hr. CO emissions shall not exceed 3.5 g/kW-hr. PM emissions shall not exceed 0.20 g/kW-hr. Exhaust opacity shall not exceed: 20 percent during acceleration mode; 15 percent during lugging mode; and 50 percent during the peaks in either the acceleration or lugging modes.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		See b)(2)h. [60.4205(b) and 60.4207(b)]
k.	40 CFR Part 63, Subpart ZZZZ (40 CFR 63.6580-63.6675) [In accordance with 40 CFR 63.6590(c)(1), this emissions unit is a new stationary internal combustion engine (RICE) located at an area source of HAP emissions subject to the emissions limitation/control measures specified in this section.]	See b)(2)i. [63.6590(c), (c)(1)]
l.	40 CFR Part 63, Subpart A (40 CFR 63.1 – 40 CFR 63.16)	See b)(2)j.

(2) Additional Terms and Conditions

a. Compliance with the requirements of this rule for CO, NO_x, $PM_{10}/PM_{2.5}$, and VOC emissions includes compliance with the requirements of OAC rule 3745-31-10 through 20.

b. The BAT emission limits apply until U.S. EPA approves Ohio Administrative Code (OAC) paragraph 3745-31-05(A)(3)(a)(ii) (the less than ten tons per year BAT exemption) into the Ohio State Implementation Plan (SIP).

c. These requirements apply once U.S. EPA approves OAC paragraph 3745-31-05(A)(3)(a)(ii) (the less than ten tons per year BAT exemption) as part of the Ohio SIP.

d. All particulate emissions are assumed to be less than 2.5 microns in diameter. The $PM_{10}/PM_{2.5}$ emission limitations include both filterable and condensable particulate emissions.

e. The maximum annual operating hours for this emissions unit shall not exceed 500 hours, based upon a rolling, 12-month summation of the operating hours.

f. The emission limitation required by this applicable rule is less stringent than the emission limitation established by OAC rule 3745-31-10 through 20.

g. The requirements of this rule do not apply, since:

i. NO_x emissions are restricted to less than 25 tons per year; and

ii. the emissions unit is subject to a BACT limitation for NO_x.

h. The permittee shall only combust ultra low sulfur diesel fuel in this emissions unit meeting the following per gallon standards:

i. 15 ppm maximum sulfur content; and

ii. a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.

i. This emissions unit must meet the requirements of 40 CFR Part 60, Subpart IIII. No further requirements apply under this subpart.

j. Table 8 to Subpart ZZZZ of 40 CFR Part 63 – Applicability of General Provisions to Subpart ZZZZ shows which parts of the General Provisions in 40 CFR 63.1 - 63.16 apply.

c) Operational Restrictions

(1) See 40 CFR Part 60, Subpart IIII (40 CFR 60.4200 - 60.4219).

d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall maintain monthly records of the following information:

a. the operating hours for each month; and

b. beginning after the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the rolling, 12-month summation of the operating hours.

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

(2) For each shipment of ultra low sulfur diesel fuel received for burning in this emissions unit, the permittee shall maintain records of the oil supplier's (or permittee's) analyses for sulfur content in parts per million (40 CFR 80.510). The permittee shall perform or require the supplier to perform the analyses for sulfur content in accordance with 40 CFR 80.585.

(3) The permittee shall also maintain documentation of supplier verification that the ultra low sulfur diesel fuel as purchased has a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.

(4) See 40 CFR Part 60, Subpart IIII (40 CFR 60.4200 - 60.4219).

e) Reporting Requirements

(1) The permittee shall submit quarterly deviation (excursion) reports that identify the following:

a. each shipment of ultra low sulfur diesel fuel received for burning in this emissions unit which did not comply with the per gallon standards specified in b)(2); and

b. all exceedances of the rolling, 12-month limitation on the hours of operation for this emissions unit; and for the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, all exceedances of the maximum allowable cumulative hours of operation.

The quarterly deviation (excursion) reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

(2) See 40 CFR Part 60, Subpart IIII (40 CFR 60.4200 - 60.4219).

(3) Unless other arrangements have been approved by the Director, all notifications and reports shall be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal.

f) Testing Requirements

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

CO emissions shall not exceed 3.5 g/kW-hr, 13.5 lbs/hr, and 3.37 tons per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr limitation is based on the Tier 2 emission standards under 40 CFR 89.112(a), Subpart B, Table 1. The hourly emission limitation was developed by multiplying the maximum operating load (1,750 kW) by the CO emission factor supplied by the manufacturer (3.5 g/kW-hr) and dividing by (454 g/lb) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the g/kW-hr limitation and hourly emission limitation using Methods 1 thru 4 and 10 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (13.5 lbs/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

b. Emission Limitation:

NO_x emissions shall not exceed 5.61 g/kW-hr, 21.6 lbs/hr, and 5.41 tons per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr limitation is based on the combined NO_x + NMHC emission limitation specified by the Tier 2 standard in 40 CFR 89.112(a) Table 1 (6.4 g/kW-hr) multiplied by the Tier 1 emission limitation for NO_x in Table 1 (9.2 g/kW-hr) divided by the sum of the Tier 1 emission limitations for NO_x and HC in Table 1 (9.2 g/kW-hr + 1.3 g/kW-hr). The hourly emission limitation was developed by multiplying the maximum operating load (1,750 kW) by the NO_x g/kW-hr emission limitation (5.61 g/kW-hr) divided by (454 g/lb) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the g/kW-hr limitation and hourly emission limitation using Methods 1 thru 4 and 7E of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (21.6 lbs/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

c. Emission Limitation:

$PM_{10}/PM_{2.5}$ emissions shall not exceed 0.20 g/kW-hr, 0.77 lb/hr, and 0.19 ton per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr limitation is based on manufacturer's emissions data. The hourly emission limitation was developed by multiplying the maximum operating load (1,750 kW) by the $PM_{10}/PM_{2.5}$ emission factor supplied by the manufacturer (0.20 g/kW-hr) divided by (454 g/lb) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the g/kW-hr limitation and hourly emission limitation using Methods 201 or 201A and 202 of 40 CFR Part 51, Appendix M. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.77 lb/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

d. Emission Limitation:

SO_2 emissions shall not exceed 0.024 lb/hr and 0.01 ton/yr.

Applicable Compliance Method:

The hourly emission limitation is based on dividing the AP-42 emission factor for SO_2 from AP-42 Table 3.4-1 dated 10/96 when burning diesel fuel with a maximum sulfur content of 15 ppmw (0.0015 lb/mmBtu) multiplied by the maximum power rating (16.1 MMBtu/hr).

If required, the permittee shall demonstrate compliance with the hourly emission limitation using Methods 1 thru 4 and 6C of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.024 lb/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

e. Emission Limitation:

VOC emissions shall not exceed 0.79 g/kW-hr, 3.1 lbs/hr, and 0.76 ton per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr limitation is based on the combined NO_x + NMHC emission limitation specified by the Tier 2 standard in 40 CFR 89.112(a) Table 1 (6.4 g/kW-hr) multiplied by the Tier 1 emission limitation for NMHC in Table 1 (1.3 g/kW-hr) divided by the sum of the Tier 1 emission limitations for NO_x and HC in Table 1 (9.2 g/kW-hr + 1.3 g/kW-hr). The hourly emission limitation was developed by multiplying the maximum operating load (1,750 kW) by the VOC emission factor supplied by the manufacturer (0.79 g/kW-hr) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the g/kW-hr limitation and hourly emission limitation using Methods 1 through 4 and 18, 25 or 25A, as appropriate, of 40 CFR Part 60, Appendix A. Use of Method 18, 25 or 25A is to be selected based on the results of pre-survey stack sampling and U.S. EPA guidance documents. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (3.1 lbs/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

f. Emission Limitation:

H_2SO_4 emissions shall not exceed 1.32E-04 g/kW-hr, 5.1E-04 lb/hr and 1.3E-04 ton per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr emission is based on the sulfuric acid mist emission factor from page 276 of Toxic Air Pollution Emission Factors, EPA 450/2-90-011 (8.9 ng/J x %sulfur in fuel = 8.9(0.0015) = 0.01335 ng/J). The H_2SO_4 emission factor (0.01335 ng/J) was converted to g/kW-hr by multiplying by (1055.1 J/Btu), multiplying by (7000 Btu/hp-hr), multiplying by ($g/10^9$ ng), and multiplying by (1.341 hp/kW) = 1.32E-04 g/kW-hr.

The pound per hour emissions limitation was developed by multiplying the g/kW-hr allowable H_2SO_4 emission limitation (1.32E-04 g/kW-hr) by the maximum operating load (1,750 kW) and dividing by 454 grams per pound to determine the hourly emissions (5.1E-04 lb/hr).

If required, the permittee shall demonstrate compliance with the g/kW-hr and lb/hr emission limitation using Methods 1 thru 4 and 8 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The ton per year emission limitation was developed by multiplying the hourly allowable H_2SO_4 emission limitation (5.1E-04 lb/hr) by the maximum annual hours of operation (500 hours), and then dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

g. Emission Limitation:

CO_2e emissions shall not exceed 683.0 tons per rolling, 12-month period.

Applicable Compliance Method:

This emissions limitation was established to reflect the potential to emit for this emissions unit by calculating the sum of the maximum capacity (2,346 hp) by the emission factors for CO_2, N_2O, and CH_4, multiplied by the global warming potentials for CO_2, N_2O, and CH_4 (1, 310, and 21, respectively from Table A-1 to Subpart A of 40 CFR 98). Multiply the sum by the maximum annual hours of operation (500 hrs/yr) and divide by 2,000 pounds per ton. The CO_2 emission factor was obtained from AP-42 Table 3.4-1 dated 10/96 (1.16 lb/hp-hr). The N_2O emission factor was obtained from 40 Table C-2 to Subpart C of 40 CFR 98 (0.6 g/mmBtu). The CH_4 emission factor was obtained from AP-42 Table 3.4-1 dated 10/96 (7.05E-04 lb TOC/hp-hr x 0.09 lb CH_4/lb TOC = 6.34E-05 lb CH_4/hp-hr).

$$(2{,}346\ hp)x\left[\left(1.16\frac{lb}{hp-hr}(1)\right)+\left(\left(0.6\frac{g}{mmBtu}\right)\left(7000\frac{Btu}{hp-hr}\right)\left(\frac{mmBtu}{1E06Btu}\right)\left(\frac{lb}{454g}\right)(310)\right)+\left(6.34E-05\frac{lb}{(hp-hr)}\right)(21)\right]x\left(500\frac{hrs}{hr}\right)x\left(\frac{ton}{2{,}000lb}\right)=683.0\ tons/yr$$

Since the CO_2e emissions are estimated to consist of more than 99% CO_2, compliance with this emission limitation will be assumed provided that the lb/hp-hr CO_2 emission rate does not exceed 1.16 lb/hp-hr. If required, the permittee shall conduct emissions testing using Methods 1, 2, 3A and 4 of 40 CFR Part 60, Appendix A to determine the lb/hp-hr CO_2 emission rate. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

h. Emission Limitation:

The permittee shall only combust ultra low sulfur diesel fuel in this emissions unit meeting the following per gallon standard: 15 ppm maximum sulfur content.

Applicable Compliance Method:

The records required by d)(2) shall be used to demonstrate compliance.

i. Emission Limitation:

The permittee shall only combust ultra low sulfur diesel fuel in this emissions unit meeting the following per gallon standard: a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.

Applicable Compliance Method:

The records required by d)(2) and d)(3) shall serve as demonstration of compliance.

j. Emission Limitation:

Visible particulate emissions from the stack serving this emissions unit shall not exceed 20% opacity as a 6-minute average, except as provided by the rule.

Applicable Compliance Method:

If required, the permittee shall demonstrate compliance based upon an emission test performed in accordance with the methods and procedures specified in 40 CFR Part 60, Appendix A, Method 9.

k. Emission Limitation:

NMHC + NO_x emissions shall not exceed 6.4 g/kW-hr.

CO emissions shall not exceed 3.5 g/kW-hr.

PM emissions shall not exceed 0.20 g/kW-hr.

Exhaust opacity shall not exceed:

20 percent during acceleration mode;

15 percent during lugging mode; and

50 percent during the peaks in either the acceleration or lugging modes.

Applicable Compliance Method:

According to 40 CFR 60.4211(c), the permittee shall demonstrate compliance with these emission limitations by purchasing an engine certified to the emission standards in 40 CFR 60.4205(b) for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications, except as permitted in 40 CFR 60.4211(g). The permittee shall maintain documentation of certification to the emission standards in 40 CFR 60.4205.

g) Miscellaneous Requirements

(1) None.

4. P004, Emergency Fire Pump

Operations, Property and/or Equipment Description:

140 hp (104.5 kW) emergency diesel-fired fire pump engine

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3) June 30, 2008	Sulfur dioxide (SO_2) emissions shall not exceed 0.002 lb/hr and 5.0E-04 ton/yr. See b)(2)a. and b)(2)b.
b.	OAC rule 3745-31-05(A)(3)(a)(ii) June 30, 2008	The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the $PM_{2.5}$, PM_{10}, NO_x, CO, SO_2, or VOC emissions from this air contaminant source since the potential to emit is less than 10 tons per year. See b)(2)c.
c.	OAC rule 3745-31-10 through 20 (Prevention of Significant Deterioration of Air Quality)	Carbon monoxide (CO) emissions shall not exceed 5.0 g/kW-hr, 1.15 pounds per hour (lbs/hr), and 0.29 ton per rolling, 12-month period. Nitrogen oxides (NO_x) emissions shall not exceed 3.5 g/kW-hr, 0.81 lb/hr, and 0.20 ton per rolling, 12-month period. Particulate matter emissions less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) shall not exceed 0.30 g/kW-hr, 0.07 lb/hr, and 0.02 ton per rolling, 12-month period.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		Volatile organic compound (VOC) emissions shall not exceed 0.50 g/kW-hr, 0.11 lb/hr, and 0.03 ton per rolling, 12-month period. Sulfuric acid mist (H_2SO_4) emissions shall not exceed 1.32E-04 g/kW-hr, 3.0E-05 lb/hr and 7.6E-06 ton per rolling, 12-month period. Carbon dioxide equivalent (CO_2e) emissions shall not exceed 41.0 tons per rolling, 12-month period. See b)(2)d.
d.	OAC rule 3745-31-05(E)	See b)(2)e.
e.	OAC rule 3745-17-07(A)	Visible particulate emissions from the stack serving this emissions unit shall not exceed 20% opacity as a 6-minute average, except as provided by the rule.
f.	OAC rule 3745-17-11(B)(5)(a)	See b)(2)f.
g.	OAC rule 3745-110-03(J)(16) and (J)(19)	Exemption. See b)(2)g.
h.	40 CFR Part 60, Subpart A (40 CFR 60.1 - 60.19)	Table 8 to Subpart IIII of 40 CFR Part 60 – Applicability of General Provisions to Subpart IIII shows which parts of the General Provisions in 40 CFR 60.1 - 60.19 apply.
i.	40 CFR Part 60, Subpart IIII (40 CFR 60.4200 – 60.4219) [In accordance with 40 CFR 60.4200(a)(2), this emissions unit is a compression ignition stationary internal combustion fire pump engine for which construction commenced after July 11, 2005 subject to the emissions limitation/control measures specified in this section.]	Non-methane hydrocarbon (NMHC) + NO_x emissions shall not exceed 4.0 g/kW-hr. CO emissions shall not exceed 5.0 g/kW-hr. PM emissions shall not exceed 0.30 g/kW-hr. See b)(2)h. [60.4205(c) and 60.4207(b)]
j.	40 CFR Part 63, Subpart ZZZZ (40 CFR 63.6580 - 63.6675) [In accordance with 40 CFR 63.6590(c)(1), this emissions unit is	See b)(2)i. [63.6590(c), (c)(1)]

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
	a new stationary reciprocating internal combustion engine (RICE) located at an area source of HAP emissions subject to the emissions limitation/control measures specified in this section.]	
k.	40 CFR Part 63, Subpart A (40 CFR 63.1 - 63.16)	Table 8 to Subpart ZZZZ of 40 CFR Part 63 – Applicability of General Provisions to Subpart ZZZZ shows which parts of the General Provisions in 40 CFR 63.1 - 63.16 apply.

(2) Additional Terms and Conditions

a. Compliance with the requirements of this rule for CO, NO_x, $PM_{10}/PM_{2.5}$, and VOC emissions includes compliance with the requirements of OAC rule 3745-31-10 through 20.

b. The BAT emission limits apply until U.S. EPA approves Ohio Administrative Code (OAC) paragraph 3745-31-05(A)(3)(a)(ii) (the less than ten tons per year BAT exemption) into the Ohio State Implementation Plan (SIP).

c. These requirements apply once U.S. EPA approves OAC paragraph 3745-31-05(A)(3)(a)(ii) (the less than ten tons per year BAT exemption) as part of the Ohio SIP.

d. All particulate emissions are assumed to be less than 2.5 microns in diameter. The $PM_{10}/PM_{2.5}$ emission limitations include both filterable and condensable particulate emissions.

e. The maximum annual operating hours for this emissions unit shall not exceed 500 hours, based upon a rolling, 12-month summation of the operating hours.

f. The emission limitation required by this applicable rule is less stringent than the emission limitation established by OAC rule 3745-31-10 through 20.

g. The requirements of this rule do not apply since:

i. NO_x emissions are restricted to less than 25 tons per year; and

ii. the emissions unit is subject to a BACT limitation for NO_x.

h. The permittee shall only combust ultra low sulfur diesel fuel in this emissions unit meeting the following per gallon standards:

i. 15 ppm maximum sulfur content; and

ii. a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.

i. This emissions unit must meet the requirements of 40 CFR Part 60, Subpart IIII. No further requirements apply under this subpart.

c) Operational Restrictions

(1) See 40 CFR Part 60, Subpart IIII (40 CFR 60.4200 – 60.4219).

d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall maintain monthly records of the following information:

a. the operating hours for each month; and

b. beginning after the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the rolling, 12-month summation of the operating hours.

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

(2) For each shipment of ultra low sulfur diesel fuel received for burning in this emissions unit, the permittee shall maintain records of the oil supplier's (or permittee's) analyses for sulfur content in parts per million (40 CFR 80.510). The permittee shall perform or require the supplier to perform the analyses for sulfur content in accordance with 40 CFR 80.585.

(3) The permittee shall also maintain documentation of supplier verification that the ultra low sulfur diesel fuel as purchased has a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.

(4) See 40 CFR Part 60, Subpart IIII (40 CFR 60.4200 – 60.4219).

e) Reporting Requirements

(1) The permittee shall submit quarterly deviation (excursion) reports that identify the following:

a. each shipment of ultra low sulfur diesel fuel received for burning in this emissions unit which did not comply with the per gallon standards specified in b)(2); and

b. all exceedances of the rolling, 12-month limitation on the hours of operation for this emissions unit; and for the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, all exceedances of the maximum allowable cumulative hours of operation.

The quarterly deviation (excursion) reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

(2) See 40 CFR Part 60, Subpart IIII (40 CFR 60.4200 – 60.4219).

(3) Unless other arrangements have been approved by the Director, all notifications and reports shall be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal.

f) Testing Requirements

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

CO emissions shall not exceed 5.0 g/kW-hr, 1.15 lbs/hr, and 0.29 ton per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr limitation is based on the standard specified in Table 4 to 40 CFR Part 60, Subpart IIII. The hourly emission limitation was developed by multiplying the maximum operating load (104.5 kW) by the g/kW-hr CO emission limitation (3.5 g/kW-hr), and then dividing by (454 g/lb) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the g/kW-hr limitation and hourly emission limitation using Methods 1 thru 4 and 10 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (1.15 lbs/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

b. Emission Limitation:

NO_x emissions shall not exceed 3.5 g/kW-hr, 0.81 lb/hr, and 0.20 ton per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr limitation is based on the combined NO_x + NMHC emission limitation specified by the Table 2 to 40 CFR Part 60, Subpart IIII (4.0 g/kW-hr) multiplied by the Tier 1 emission limitation for NO_x in Table 1 to 40 CFR 89.112(a) (9.2 g/kW-hr) divided by the sum of the Tier 1 emission limitations for NO_x and HC in Table 1 to 40 CFR 89.112(a) (9.2 g/kW-hr + 1.3 g/kW-hr). The hourly emission limitation was developed by multiplying the maximum operating load (104.5 kW) by the g/kW-hr NO_x emission limitation (3.5 g/kW-hr), and then dividing by (454 g/lb) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the g/kW-hr limitation and hourly emission limitation using Methods 1 thru 4 and 7E of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.81 lb/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

c. Emission Limitation:

$PM_{10}/PM_{2.5}$ emissions shall not exceed 0.30 g/kW-hr, 0.07 lb/hr, and 0.02 ton per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr limitation is based on manufacturer's emissions data. The hourly emission limitation was developed by multiplying the maximum operating load (104.5 kW) by the $PM_{10}/PM_{2.5}$ emission factor supplied by the manufacturer (0.30 g/kW-hr), and then dividing by (454 g/lb) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the g/kW-hr limitation and hourly emission limitation using Methods 201 or 201A and 202 of 40 CFR Part 51, Appendix M. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.07 lb/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation is shown.

d. Emission Limitation:

SO_2 emissions shall not exceed 0.002 lb/hr and 5.0E-04 ton/yr.

Applicable Compliance Method:

The hourly emission limitation is based on multiplying the AP-42 emission factor for SO_2 from AP-42 Table 3.4-1 dated 10/96 when burning diesel fuel with a maximum sulfur content of 15 ppmw (0.0015 lb/mmBtu) by the maximum heat input capacity of 1.3 mmBtu/hr.

If required, the permittee shall demonstrate compliance with the hourly emission limitation using Methods 1 thru 4 and 6C of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.002 lb/hr) by the maximum annual operating hours (500 hrs/yr) and

dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation is shown.

e. Emission Limitation:

VOC emissions shall not exceed 0.50 g/kW-hr, 0.11 lb/hr, and 0.03 ton/yr as a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The g/kW-hr limitation is based on the combined NO_x + NMHC emission limitation specified by the Table 2 to 40 CFR Part 60, Subpart IIII (4.0 g/kW-hr) multiplied by the Tier 1 emission limitation for NMHC in Table 1 to 40 CFR 89112(a) (1.3 g/kW-hr) divided by the sum of the Tier 1 emission limitations for NO_x and HC in Table 1 to 40 CFR 89.112(a) (9.2 g/kW-hr + 1.3 g/kW-hr). The hourly emission limitation was developed by multiplying the maximum operating load (104.5 kW) by the g/kW-hr VOC emission limitation (0.50 g/kW-hr) divided by (454 g/lb) to determine the hourly emissions.

If required, the permittee shall demonstrate compliance with the g/kW-hr limitation and hourly emission limitation using Methods 1 through 4 and 18, 25 or 25A, as appropriate, of 40 CFR Part 60, Appendix A. Use of Method 18, 25 or 25A is to be selected based on the results of pre-survey stack sampling and U.S. EPA guidance documents. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The annual emission limitation was developed by multiplying the hourly emission limitation (0.11 lb/hr) by the maximum annual operating hours (500 hrs/yr) and dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation is shown.

f. Emission Limitation:

H_2SO_4 emissions shall not exceed 1.32E-04 g/kW-hr, 3.0E-05 lb/hr and 7.6E-06 ton per rolling, 12-month period.

Applicable Compliance Method:

The g/kW-hr emission is based on the sulfuric acid mist emission factor from page 276 of Toxic Air Pollution Emission Factors, EPA 450/2-90-011 (8.9 ng/J x %sulfur in fuel = 8.9(0.0015) = 0.01335 ng/J). The H_2SO_4 emission factor (0.01335 ng/J) was converted to g/kW-hr by multiplying by (1055.1 J/Btu), multiplying by (7000 Btu/hp-hr), multiplying by ($g/10^9$ ng), and multiplying by (1.341 hp/kW) = 1.32E-04 g/kW-hr.

The pound per hour emission limitation was developed by multiplying the g/kW-hr allowable H_2SO_4 emission limitation (1.32E-04 g/kW-hr) by the maximum operating load (104.5 kW), and then dividing by 454 grams per pound to determine the hourly emissions (3.0E-05 lb/hr).

If required, the permittee shall demonstrate compliance with the g/kW-hr and lb/hr emission limitation using Methods 1 thru 4 and 8 of 40 CFR Part 60, Appendix A. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

The ton per year emission limitation was developed by multiplying the hourly allowable H_2SO_4 emission limitation (3.0E-05 lb/hr) by the maximum annual hours of operation (500 hours), and then dividing by 2,000 pounds per ton. Therefore, compliance with the annual limitation shall be demonstrated if compliance with the hourly limitation and operating hours restriction is shown.

g. Emission Limitation:

CO_2e emissions shall not exceed 41.0 tons per rolling, 12-month period.

Applicable Compliance Method:

This emission limitation was established to reflect the potential to emit for this emissions unit by calculating the sum of the maximum capacity (140 hp) by the emission factors for CO_2, N_2O, and CH_4, multiplied by the global warming potentials for CO_2, N_2O, and CH_4 (1, 310, and 21, respectively from Table A-1 to Subpart of 40 CFR 98). Multiply the sum by the maximum annual hours of operation (500 hrs/yr) and divide by 2,000 pounds per ton. The CO_2 emission factor was obtained from AP-42 Table 3.3-1 dated 10/96 (1.15 lb/hp-hr). The N_2O emission factor was obtained from Table C-2 to Subpart C of 40 CFR 98 (0.6 g/mmBtu). The CH_4 emission factor was obtained from AP-42 Table 3.3-1 dated 10/96 (2.47E-03 lb TOC/hp-hr (0.09 lb CH_4/lb TOC)= 2.223E-04 lb CH_4/hp-hr, this table did not include an estimate of how much methane comprises the TOC emission factor, so the value of 9% from AP-42 Table 3.4-1 dated 10/96 was used).

$$(140\ hp)x\left[\left(1.15\frac{lb}{hp-hr}(1)\right)+\left(\left(0.6\frac{g}{mmBtu}\right)\left(7000\frac{Btu}{hp-hr}\right)\left(\frac{mmBtu}{1E06Btu}\right)\left(\frac{lb}{454g}\right)(310)\right)+\left(2.223E-04\frac{lb}{(hp-hr)}\right)(21)\right]x\left(500\frac{hrs}{hr}\right)x\left(\frac{ton}{2{,}000lb}\right)=41\ tons/yr$$

Since the CO_2e emissions are estimated to consist of more than 99% CO_2, compliance with this emission limitation will be assumed provided that the lb/hp-hr CO_2 emission rate does not exceed 2.223E-04 lb/hp-hr. If required, the permittee shall conduct emissions testing using Methods 1, 2, 3A and 4 of 40 CFR Part 60, Appendix A to determine the lb/hp-hr CO_2 emission rate. Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA.

h. Emission Limitation:

The permittee shall only combust ultra low sulfur diesel fuel in this emissions unit meeting the following per gallon standard: 15 ppm maximum sulfur content

Applicable Compliance Method:

The records required by d)(2) shall be used to demonstrate compliance.

i. Emission Limitation:

The permittee shall only combust diesel fuel in this emissions unit meeting the following per gallon standard: a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.

Applicable Compliance Method:

The records required by d)(2) and d)(3) shall serve as demonstration of compliance.

j. Emission Limitation:

Visible particulate emissions from the stack serving this emissions unit shall not exceed 20% opacity as a 6-minute average, except as provided by the rule.

Applicable Compliance Method:

If required, the permittee shall demonstrate compliance based upon an emission test performed in accordance with the methods and procedures specified in 40 CFR Part 60, Appendix A, Method 9.

k. Emission Limitation:

NMHC + NO_x emissions shall not exceed 4.0 g/kW-hr (3.0 g/hp-hr).

CO emissions shall not exceed 5.0 g/kW-hr (2.6 g/hp-hr).

PM emissions shall not exceed 0.30 g/kW-hr (0.15 g/hp-hr).

Applicable Compliance Method:

According to 40 CFR 60.4211(c), the permittee shall demonstrate compliance with these emission limitations by purchasing an engine certified to the emission standards in 40 CFR 60.4205(c) for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications, except as permitted in 40 CFR 60.4211(g).

g) Miscellaneous Requirements

(1) None.

5. P005, Wet Cooling Tower

Operations, Property and/or Equipment Description:

14 cell mechanical draft wet cooling tower with high efficiency drift eliminator

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3) June 30, 2008	See b)(2)a and b)(2)b.
b.	OAC rule 3745-31-05(A)(3)(a)(ii) June 30, 2008	The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the $PM_{2.5}$, or PM_{10} emissions from this air contaminant source since the potential to emit is less than 10 tons per year. See b)(2)c.
c.	OAC rules 3745-10 through 20 (Prevention of Significant Deterioration of Air Quality)	Particulate matter emissions less than 10 microns in diameter (PM_{10}) shall not exceed 1.27 pounds per hour (lbs/hr) and 5.58 tons per rolling, 12-month period. Particulate matter emissions less than 2.5 microns in diameter ($PM_{2.5}$) shall not exceed 0.51 lb/hr and 2.23 tons per rolling, 12-month period. The permittee shall install a drift eliminator with a maximum drift rate of 0.0005% on this emissions unit. Visible particulate emissions shall not exceed 10% opacity as a 6-minute average. The presence of condensed water vapor shall not be deemed a violation for failure of stack emissions

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		meeting this visible emission limitation. See c)(1)
d.	OAC rule 3745-17-07(A)(1)	See b)(2)d.
e.	OAC rule 3745-17-11(B)	See b)(2)d.

(2) Additional Terms and Conditions

a. Compliance with the requirements of this rule for PM_{10} and $PM_{2.5}$ emissions includes compliance with the requirements of OAC rule 3745-31-10 through 20.

b. The BAT emission limits apply until U.S. EPA approves Ohio Administrative Code (OAC) paragraph 3745-31-05(A)(3)(a)(ii) (the less than ten tons per year BAT exemption) into the Ohio State Implementation Plan (SIP).

c. These requirements apply once U.S. EPA approves OAC paragraph 3745-31-05(A)(3)(a)(ii) (the less than ten tons per year BAT exemption) as part of the Ohio SIP.

d. The emission limitation specified by this rule is less stringent than the emission limitation established by OAC rule 3745-31-10 through 20.

c) Operational Restrictions

(1) The permittee shall maintain the total dissolved solids (TDS) concentration of the cooling water less than or equal to 3,075 milligrams per liter.

d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall properly install, operate, and maintain a conductivity meter or other equipment to continuously monitor and record the TDS concentration of the cooling tower water. The monitoring devices shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.

(2) Since the TDS data measured by the conductivity meter or other equipment is based on a correlation between conductivity and TDS, an exceedance measured by the conductivity meter or equivalent is not a violation of the TDS operational restriction, but rather serves as an indicator to initiate corrective action by the permittee to reduce the TDS concentration.

e) Reporting Requirements

(1) The permittee shall submit quarterly deviation (excursion) reports that identify all hourly TDS readings in excess of 3,075 mg/l. The reports shall identify corrective action taken to reduce the TDS concentration.

The quarterly deviation (excursion) reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit

(2) Prior to startup, the permittee shall submit written documentation provided by the vendor/manufacturer of the maximum drift rate of 0.0005% for the drift eliminator and the premise, basis and justification for the drift rate.

(3) Unless other arrangements have been approved by the Director, all notifications and reports shall be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal.

f) Testing Requirements

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

PM_{10} emissions shall not exceed 1.27 lbs/hr and 5.58 tons per rolling, 12-month period.

Applicable Compliance Method:

The lb/hr PM_{10} emission limitation is based on multiplying the maximum re-circulating water flow rate (165,470 gal/min) by the maximum TDS concentration (3,075 mg/l) multiplied by 3.785 l/gal multiplied by the decimal fraction drift rate per flow (0.0005/100) divided by [(1000 mg/g)(60 sec/min)(453.6 g/lb)/(3600 sec/hr)].

The annual emission limitation is based on multiplying the hourly emission limitation (1.27 lbs/hr) by the maximum annual hours of operation (8,760 hrs/yr) and dividing by (2,000 lbs/ton)

Compliance with the hourly and annual emission limitation will be assumed provided that the TDS concentration recorded in d) remains below 3,075 mg

b. Emission Limitation:

$PM_{2.5}$ emissions shall not exceed 0.51 lb/hr and 2.23 tons per rolling, 12-month period.

Applicable Compliance Method:

Per permit application, $PM_{2.5}$ is 40% of PM_{10} as calculated above. The permittee calculated the PM_{10} fraction using AWMA Abstract No. 216, Session No. AM-1b, Orlando, 2001.

The annual emission limitation is based on multiplying the hourly emission limitation (0.51 lb/hr) by the maximum annual hours of operation (8,760 hrs/yr) and dividing by (2,000 lbs/ton)

Compliance with the hourly and annual emissions limitation will be assumed provided that the TDS concentration recorded in d) remains below 3,075 mg/l.

c. Emission Limitation:

The maximum drift rate shall not exceed 0.0005%.

Applicable Compliance Method:

Manufacturer's emissions data shall be used to demonstrate compliance with this limitation.

Within 90 days of startup, the permittee shall submit to Ohio EPA's Northeast District Office written documentation provided by the vendor/manufacturer of the maximum drift rate of 0.0005% for the drift eliminator and the premise, basis, and justification for the drift rate.

d. Emission Limitation:

The permittee shall maintain the TDS concentration of the cooling water less than or equal to 3,075 milligrams per liter.

Applicable Compliance Method:

The monitoring and record keeping requirements under d)(1) and d)(2) shall serve as demonstration of compliance.

If required, compliance shall be demonstrated using test procedures that conform to regulation 40 CFR Part 136, "Test Procedures for the Analysis of Pollutants". Alternative U.S. EPA-approved test methods may be used with prior written approval from the Ohio EPA.

e. Emission Limitation:

Visible particulate emissions shall not exceed 10% opacity as a 6-minute average. The presence of condensed water vapor shall not be deemed a violation for failure of stack emissions meeting this visible emission limitation.

Applicable Compliance Method:

If required, compliance with the stack visible particulate emission limitation shall be demonstrated through visible emission observations performed in accordance with the methods and procedures specified in 40 CFR Part 60, Appendix A, Method 9.

g) Miscellaneous Requirements

(1) None.