DANSKAMMER ENERGY CENTER

Case No. 18-F-0325

1001.17 Exhibit 17

Air Emissions

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Exhibit 17: Air Emissions

This Exhibit has been prepared to identify the air quality regulatory framework that will apply to the assessment of this Project under Article 10 regulations and the general air resources that may be affected by the proposed Danskammer Energy Center (the Project). This Exhibit presents information related to existing air resources at the Project Site and an assessment of the potential air quality impacts of the proposed Project on the existing air quality.

Federal, New York State, and local air quality regulatory requirements are also identified in this Exhibit as well as the measures that will be implemented to ensure the Project complies with the air quality regulatory requirements. This Exhibit includes the determination of the consequent actions required of the proposed Project (i.e., the regulatory framework for obtaining project approval, the need to apply pollution control, and the need to perform modeling impact assessments). Further information on the applicable New York State and federal regulatory requirements and Danskammer's compliance determinations with the regulatory requirements can be found in the New York State Department of Environmental Conservation (NYSDEC) Part 201/231 Air Permit Application, a copy of which is included in Appendix 17-1.

Exhibit 17 examines the potential adverse impacts of criteria pollutants and other NYSDEC-regulated pollutants ("Criteria Pollutant Study") and toxic air pollutants ("Non-Criteria Pollutant Study") from the Project on air quality. The components of the Criteria Pollutant Study include identification of existing climate and air quality conditions, an inventory of proposed emission sources at the proposed Project, an assessment of Project technology and design, air emissions, air quality impacts, and, where warranted, a cumulative impacts analysis with major combustion sources in the vicinity of the proposed Project. The components of the Non-Criteria Pollutant Study include identification of toxic air pollutant emission constituents and an assessment of Project impacts.

17(a) Demonstration of Compliance with Applicable Federal, State, and Local Regulatory Requirements Regarding Air Emissions

The following section provides a demonstration of the Project's compliance with applicable federal, state, and local regulatory requirements regarding air emissions, including: Clean Air Act (CAA) New Source Performance Standards (NSPS); New York State or National Ambient Air Quality Standards; Maximum Achievable Control Technology pursuant to 40 Code of Federal Regulations (CFR) Part 63; Prevention of Significant Deterioration and Nonattainment New Source Review under 6 New York Codes, Rules and Regulations (NYCRR) Part 231;

Class I Area Impact Analysis; Cross-State Air Pollution Rule; Acid Rain Program; CO_2 Performance Standards under 6 NYCRR Part 251; Regional Greenhouse Gas (GHG) Initiative CO_2 Budget Trading Program; New York State regulatory emission limits; and Reasonably Available Control Technology requirements.

Federal New Source Performance Standards

Section 111 of the CAA authorizes the U.S. Environmental Protection Agency (EPA) to develop technology-based standards which apply to specific categories of stationary sources. These standards are referred to as NSPS and are found in 40 CFR Part 60. The NSPS are developed and implemented by EPA and are delegated to the states. There are approximately 100 NSPS, which apply to new, modified, and reconstructed affected facilities in specific source categories.

The NSPS are technology-based standards applicable to new and modified stationary sources. NSPS requirements have been established for approximately 70 source categories. Six subparts apply to the proposed Project:

- General Provisions (40 CFR Part 60, Subpart A);
- Standards of Performance for Stationary Gas Turbines (40 CFR Part 60, Subpart KKKK);
- Standards of Performance for GHG Emissions from New, Modified, or Reconstructed Stationary Sources: Electric Utility Units (40 CFR Part 60, Subpart TTTT);
- Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR Part 60, Subpart Dc);
- Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII); and
- 40 CFR Part 60, Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984).

The following subsections describe the requirements under the six currently applicable NSPS regulations in greater detail.

40 CFR PART 60, SUBPART A: General Provisions

The combined-cycle combustion turbine, duct burner, auxiliary boiler, emergency diesel generator, new emergency diesel fire pump, and fuel oil storage tank are subject to the general provisions for NSPS units in 40 CFR Part 60, Subpart A. These include the following 40 CFR Parts 60.7 and 60.8 requirements:

40 CFR 60.7 Notification and Recordkeeping

(a)(1) A notification of the date of construction start – no later than 30 days after such date.

(a)(3) A notification of actual date of initial startup – within 15 days after such date.

(a)(5) A notification of the date of continuous monitoring system performance commencement – not less than 30 days prior to such date.

(b) Maintain quarterly records of the startup, shutdown, or malfunction of facility, air pollution control equipment, or continuous monitor system.

(c) Excess emissions reports – by the 30^{th} day following the end of each quarter. (required even if no excess emissions occur).

(f) Maintain file of all measurements, maintenance, reports, and records for 2 years.

40 CFR 60.8 Performance Tests

(a) Perform within 60 days after achieving maximum production rate but no later than 180 days after initial startup.

(d) Notification of performance tests at least 30 days prior.

40 CFR PART 60, SUBPART Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The natural gas-fired auxiliary boiler is subject to the provisions of 40 CFR Part 60, Subpart Dc because its maximum heat input capacity is between 10 and 100 million British Thermal Units per hour (MMBtu/hr). Subpart Dc requires an initial notification and one-time opacity test for boilers that operate only on natural gas such as the unit proposed. Opacity is limited to no greater than 20 percent over a 6-minute average except for one 6-minute period per hour of not more than 27-percent opacity. Opacity monitoring is not required because the auxiliary boiler will not combust coal. Additionally, records must be maintained regarding the amount of fuel burned monthly. However, because natural gas is the only fuel burned in the auxiliary boiler, there is no reporting requirement to EPA.

40 CFR PART 60, SUBPART Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels

40 CFR Part 60, Subpart Kb establishes volatile organic compound (VOC) standards for volatile organic liquid storage vessels (including petroleum liquid storage vessels) that have commenced construction, reconstruction, or modification after July 23, 1984. The project will include a volatile organic liquid storage vessel (oil tank) with a capacity greater than 40 cubic meters. As such, the tank will be subject to 40 CFR 60, Subpart Kb. Because the vapor pressure of the ultra-low sulfur diesel (ULSD) tank is less than 3.5 kilopascals, the only applicable requirement is the recordkeeping requirement specified in 40 CFR 60.116b(b). The proposed Project will maintain records showing the dimensions and capacity of the ULSD storage tank.

40 CFR PART 60, SUBPART IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

40 CFR Part 60, Subpart IIII establishes emission standards, fuel sulfur limitations, maintenance requirements, operating limitations, monitoring requirements, and recordkeeping requirements for affected units. An affected unit must be a compression ignition designed internal combustion engine that is new (dates vary between April 1, 2006 and 2007 model year) or reconstructed after July 11, 2006. Danskammer will purchase and install two new internal combustion diesel engines (i.e., one emergency diesel generator and one emergency diesel fire pump) that will meet the applicability requirements of Subpart IIII. The proposed potential emission rates of oxides of nitrogen (NO_X), carbon monoxide (CO), particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), and VOC from the emergency diesel engines will not exceed the applicable emission standards set forth in Subpart IIII. The engines will be certified by the manufacturer to meet these emission standards. Danskammer will operate and maintain each engine according to the manufacturer's emission-related written instructions and will keep records of conducted maintenance to demonstrate compliance.

40 CFR PART 60, SUBPART KKKK: Standards of Performance for Stationary Gas Turbines

On July 6, 2006, EPA promulgated 40 CFR Part 60, Subpart KKKK to establish emission standards and compliance schedules for the control of emissions from stationary combustion turbines that commence construction, modification, or reconstruction after February 18, 2005. Stationary combustion turbines regulated under Subpart KKKK are exempt from Subpart GG requirements, which are applicable to units constructed, modified, or reconstructed prior to

February 18, 2005. Additionally, heat recovery steam generators (HRSGs) and duct burners regulated under Subpart KKKK are exempt from the requirements set forth in Subparts Da, Db, and Dc for fossil fuel combustion units.

Subpart KKKK establishes emission limits for NO_x for combustion turbines with a heat input capacity greater than 850 million MMBtu/hr. During natural gas firing, NO_x emissions from the proposed combined-cycle turbine are limited to 15 parts per million (ppm) (dry basis by volume, corrected to 15 percent oxygen [O_2]) or 0.43 pounds per megawatt-hour (lbs./MW-hr) of useful output. Emissions of sulfur dioxide (SO_2) from combustion turbines regardless of fuel type are limited to 0.90 lbs./MW-hr gross power output or low-sulfur fuel to achieve no greater than 0.060 lbs./MMBtu.

The Project's proposed emission rates from the combustion turbine and duct burner are well below the applicable Subpart KKKK emission standards. Compliance with the NO_X emission standard will be verified based on continuous emissions monitoring system (CEMS) data. The proposed combustion turbine will burn pipeline quality natural gas with a sulfur content of 0.5 grains sulfur/100 standard cubic feet (scf); therefore, compliance with the Subpart KKKK SO_2 emission limit is expected.

40 CFR PART 60, SUBPART TTTT: Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units

40 CFR Part 60, Subpart TTTT establishes emission standards and electric generation monitoring/recordkeeping requirements for affected units. These standards reflect the degree of emission limitation achievable through the application of the best system of emission reduction (BSER) that EPA has determined has been adequately demonstrated for each type of unit.

An affected new source is any newly constructed fossil fuel-fired power plant that commenced construction on or after January 8, 2014 and with newly constructed stationary combustion turbines that have a base load rating for fossil fuels greater than 250 MMBtu/hr and serve a generator capable of selling more than 25 MW-net of electricity to the grid. EPA determined that the BSER for new and reconstructed stationary combustion turbines is natural gas combined-cycle technology. The final standard for base load combustion turbines is an emission limit of 1,000 pounds of CO_2 per megawatt-hour on a gross-output basis (lbs. CO_2/MW-hr-g). This standard applies to all sizes of base load units.

The method to calculate compliance is to sum the emissions for all operating hours and to divide that value by the sum of the electric energy output over a rolling 12-operating-month period. In compliance determinations, sources must incorporate emissions from all periods, including startup or shutdown, during which fuel is combusted and emissions are being monitored, in addition to all power produced over the periods of emissions measurements.

Taking into account the efficiency metric for the combined-cycle power plant of pounds of CO_2 per gross MW-hr of electrical generation, the capability of duct firing, the inherent degradation in turbine performance over the life of the Project, the inclusion of startup and shutdowns and part-load operation over the course of a year, and operation on ULSD backup fuel, it has been concluded that the Project will meet the Subpart TTTT limit on a 12-month rolling average during the lifetime of Project operation. In addition, Danskammer will comply with all applicable Subpart TTTT monitoring, recordkeeping, reporting, and performance test requirements.

New York State or National Ambient Air Quality Standards

EPA has established National Ambient Air Quality Standards (NAAQS) for each of the following criteria air pollutants: PM_{10}, particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), SO_2, ozone (O_3), nitrogen dioxide (NO_2), CO, and lead (Pb). Areas in which the NAAQS are being met are referred to as attainment areas. Areas in which the NAAQS are not being met are referred to as non-attainment areas. Areas that were formerly non-attainment areas but are now in attainment and covered by a maintenance plan are referred to as maintenance areas. Areas for which sufficient data are not available to determine a classification are referred to as unclassifiable. The federal attainment status designations of areas in New York with respect to NAAQS are listed at 40 CFR 81.333. The Project Site is located in Orange County in the Hudson Valley Intrastate Air Quality Control Region (AQCR).

The location of the proposed Project is in an area currently designated as attainment for SO_2, NO_2, CO, PM_{10}, $PM_{2.5}$, and ozone. Orange County, however, is located in the ozone transport region, and under this designation for 8-hour ozone, modifications at existing major facilities with net emissions increases more than 40 tons per year of NO_X and/or more than 40 tons per year of VOC, respectively, are subject to nonattainment new source review (NNSR) requirements for these pollutants under Title 6 NYCRR Part 231.

NYSDEC has adopted the NAAQS as the New York Ambient Air Quality Standards (NYAAQS), as shown in Tables 17-1 and 17-2. In addition, NYSDEC has NYAAQS for Total Suspended Particulates, gaseous fluoride, beryllium, and hydrogen sulfide.

In order to identify those new sources with the potential to impact ambient air quality, EPA and the NYSDEC have adopted Significant Impact Levels (SILs) for NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ as shown in Table 17-1 below. Sources that have maximum modeled air quality impacts that exceed the SILs require a more comprehensive analysis that considers the combined impacts of the new source, existing sources, and measured background levels, in order to evaluate compliance with NAAQS and with Prevention of Significant Deterioration (PSD) Class II increments.

Table 17-1. NAAQS, PSD Increments, Significant Monitoring Concentrations, and SILs

Pollutant	Averaging Period	NAAQS[1] (μg/m³)	Class II PSD Increment (μg/m³)	Significant Monitoring Concentrations (μg/m³)	SIL (μg/m³)
CO	1-Hour 8-Hour	40,000 10,000	-- --	-- 575	2,000 500
NO_2	1-Hour Annual	188 100	-- 25	-- 14	7.5 1
O_3 (VOC)	8-Hour	137	--	--	--
PM_{10}	24-Hour Annual	150 --	30 17	10 --	5 1
$PM_{2.5}$	24-Hour Annual	35 12	9 4	-- --	1.2 0.2
SO_2	1-Hour 24-Hour Annual 3-Hour	196 365 80 1,300	-- 91 20 512	-- 13 -- --	7.8 5 1 25
Pb	3-Month	0.15	--	0.1	--

Table 17-1. NAAQS, PSD Increments, Significant Monitoring Concentrations, and SILs

Pollutant	Averaging Period	NAAQS[1] ($\mu g/m^3$)	Class II PSD Increment ($\mu g/m^3$)	Significant Monitoring Concentrations ($\mu g/m^3$)	SIL ($\mu g/m^3$)

Notes: (--) indicates there are no standards for this pollutant.

1 All short-term (1-hour, 3-hour, 8-hour, and 24-hour) standards except ozone, $PM_{2.5}$, PM_{10}, and 1-hour SO_2 and NO_2 are not to be exceeded more than once per year. For 8-hour ozone, EPA uses the average of the annual fourth highest 8-hour daily maximum concentrations from each of the last 3 years of air quality monitoring data to determine a violation of the standard. For 24-hour PM_{10}, EPA uses the sixth highest 24-hour maximum concentration from the last 3 years of air quality monitoring data to determine a violation of the standards. For 24-hour $PM_{2.5}$, EPA uses the 98th percentile 24-hour maximum concentration from the last 3 years of air quality monitoring data to determine a violation of the standard. For the 1-hour NO_2 NAAQS, compliance would be determined by the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area and for the 1-hour SO_2 NAAQS, compliance would be determined by the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area.

Table 17-2. New York Ambient Air Quality Standards

Pollutant	Averaging Period	NYAAQS (ug/m^3)
SO_2	3-Hour	1,300[1]
	24-Hour	365[1]
	Annual	8[2]
NO_2	Annual	100[2]
PM_{10}	24-Hour	250[1]
$PM_{2.5}$	24-Hour	N/A
	Annual	N/A
Total Suspended Particulates	24-Hour	250[1]
	Annual	65[3]
CO	1-Hour	40,000[1]
	8-Hour	10,000[1]
O_3	1-Hour	160[1]
	8-Hour	N/A

Table 17-2. New York Ambient Air Quality Standards

Pollutant	Averaging Period	NYAAQS (ug/m^3)
Pb	Quarterly	N/A
Gaseous Fluorides (as F)[4]	12-Hour	3.70[2]
	24-Hour	2.85[2]
	1-Week	1.65[2]
	1-Month	0.80[2]
Beryllium	1-Month	0.01[2]
Hydrogen Sulfide[4]	1-Hour	14[2]
Settleable Particulates[4]	Annual	0.40[5]
	Annual	0.60[6]

Notes:

[1]Not to be exceeded more than once per year.

[2]Not to be exceeded.

[3]Geometric mean of the 24-hour average concentrations over 12-month period.

[4]Pollutant will not be emitted from the proposed Project.

[5]Units of milligrams per square centimeter per month. Fifty percent of monthly values should not exceed 0.40.

[6]Units of milligrams per square centimeter per month. Eighty-four percent of monthly values should not exceed 0.60.

Source: 6 NYCRR Part 257.

National Emission Standards for Hazardous Air Pollutants

Section 112 of the CAA requires that the EPA develop and enforce regulations to protect the public from exposure to airborne contaminants that are known to be hazardous to human health and are not covered by the NAAQS. National Emission Standards for Hazardous Air Pollutants (NESHAP) are established to control the emissions of air toxics from sources in an industry group or source category. The standards for a particular source category require the maximum degree of emission reduction that EPA determines to be achievable, which is known as the Maximum Achievable Control Technology.

NESHAPs are found in 40 CFR Parts 61 and 63. The Project does not include any of the specific sources for which NESHAP have been established in Part 61. Therefore, Part 61

NESHAP requirements will not apply to the Project. The Part 63 NESHAP apply to certain emission units at facilities that are major sources of HAPs. Some NESHAP apply or may apply in the future to non-major sources (area sources) of HAPs. The Project is considered an area source of HAPs and includes some units that could potentially be subject to certain subparts of Part 63 NESHAP, such as Subpart A (General Provisions), Subpart ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines), and Subpart JJJJJJ (NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters).

40 CFR PART 63, SUBPART YYYY: National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

40 CFR Part 63, Subpart YYYY applies to stationary combustion turbines at major sources of HAPs. Emissions and operating limitations under Subpart YYYY apply to new and reconstructed stationary combustion turbines. A new stationary combustion turbine is proposed as part of the Project. However, the Project will be an area source of HAPs and therefore, Subpart YYYY will not apply to the Project.

40 CFR PART 63, SUBPART ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

40 CFR Part 63, Subpart ZZZZ applies to existing, new, and reconstructed stationary reciprocating internal combustion engines depending on size, use, and whether the engine is located at a major or area source of HAPs. The Project will be an area source of HAPs. The existing emergency diesel fire pump at the Project is subject to Subpart ZZZZ and must comply with certain emission limitations and/or operating limitations as of October 19, 2013. However, these requirements apply even in the absence of the Project.

As part of the Project, Danskammer will purchase and install one new emergency diesel generator and one new emergency diesel fire pump. Under Subpart ZZZZ, new emergency stationary reciprocating internal combustion engines located at an area source of HAPs must comply with the NESHAP by meeting the NSPS standards at 40 CFR Part 60, Subpart IIII. As previously stated, these engines will be subject to 40 CFR Part 60, Subpart IIII, and therefore, will comply with Subpart ZZZZ.

40 CFR PART 63 SUBPART UUUUU: National Emission Standards for Hazardous Air Pollutants: Coal and Oil-Fired Electric Utility Steam Generating Units

40 CFR Part 63, Subpart UUUUU establishes national emission limitations and work practice standards for HAPs emitted from coal and oil-fired electric utility steam-generating units. An

electric utility steam generating unit is defined in Subpart UUUUU as a fossil fuel-fired combustion unit of more than 25 MW that serves a generator that produces electricity for sale. An oil-fired electrical utility steam-generating unit is defined as a unit that burns oil for more than 10.0 percent of the average annual heat input during any 3 consecutive calendar years or for more than 15.0 percent of the annual heat input during any one calendar year.

Other than an integrated gasification combined-cycle unit covered by 40 CFR Part 63, Subpart YYYY, stationary combustion turbines are not subject to Subpart UUUUU. As such, Subpart UUUUU does not apply to the Project.

40 CFR PART 63, SUBPART JJJJJJ: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

40 CFR Part 63, Subpart JJJJJJ applies only to certain new and existing boilers at area sources, where a boiler is defined as “an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water.” The rule does not apply to gas-fired boilers. The Project will be an area source of HAP and will include one auxiliary boiler that meets the definition of a gas-fired boiler under Subpart JJJJJJ. Thus, the auxiliary boiler will not be subject to the requirements of Subpart JJJJJJ.

Major New Source Review: Prevention of Significant Deterioration and Nonattainment New Source Review

The federal NSR program is composed of two distinct pre-construction permitting programs: 1) PSD (for attainment areas/pollutants); and 2) NNSR (for non-attainment areas/pollutants). For an existing major stationary source like the Danskammer Generating Station, these permitting programs are required to be evaluated when a new source is constructed, or an existing source is modified at the Facility. The applicability determination for existing major stationary sources involves first determining if a major modification would occur as a result of the proposed Project and, if so, which pollutants are subject to PSD and/or NNSR permitting requirements.

The NYSDEC administers its NSR program through the NYCRR at 6 NYCRR Part 231, which establishes preconstruction, construction, and operation requirements for new sources and modifications to existing sources. The New York State Implementation Plan (SIP) was updated in November 2010 to create a new state PSD program and to update the existing New York NNSR rules to include the 2002 federal NSR reform provisions.

In New York, if an existing major stationary source proposes to undergo a physical or operational change, it must review the project emission potential (PEP) associated with the proposed project to determine if the project is considered an NSR major modification. The PEP is compared to the significant project threshold (SPT). If the PEP is less than the SPT, the pollutant does not trigger NSR. If the PEP exceeds the SPT for any regulated air pollutant, then the net emissions increase (NEI) of that pollutant must be determined and compared to the significant net emission increase threshold (SNEIT). If the significant emission rates (SER) (i.e., SPT or SNEIT) for any regulated air pollutant are exceeded, then the project is considered an NSR major modification and is subject to PSD review and/or NNSR.

The NYSDEC administers its air permitting program under 6 NYCRR Part 201. NYSDEC authorizes both construction and operation of emission sources under one permit. Facilities apply for and are issued minor facility registrations (for minor NSR sources) under 6 NYCRR Subpart 201-4, State facility permits (for synthetic minor sources or minor NSR sources with emissions above certain thresholds) under 6 NYCRR Subpart 201-5, or Title V facility permits (for major NSR sources) under 6 NYCRR Subpart 201-6. Emission sources or activities listed under 6 NYCRR Subpart 201-3 are exempt from the registration and permitting provisions of 6 NYCRR Subparts 201-4, 201-5, and 201-6.

The Danskammer Generating Station is an existing major stationary source operating under an existing 6 NYCRR Part 201-6 Title V facility permit. The Project is located in Orange County, which is designated as attainment or unclassifiable for SO_2, NO_2, CO, and PM_{10}/$PM_{2.5}$. Orange County is also within the Ozone Transport Region. The SERs applicable to determining whether the Project will result in an NSR major modification, as set for in 6 NYCRR Subpart 231-13, are listed below in Table 17-3.

A complete emissions analysis is included in the NYSDEC Part 201/231 air permit application for the Project, provided in Appendix 17-1. The results of the NSR netting analysis are provided in Table 17-4 below and demonstrate the NEI is greater than the SNEIT thresholds for all pollutants except for SO_2. Thus, the Project is considered an NSR major modification for NO_X, VOC, CO, PM_{10}, $PM_{2.5}$, H_2SO_4, and carbon dioxide equivalent (CO_2e) (i.e., GHG). The Project will represent a modified major Part 201 source, and is seeking a significant modification to the facility's existing Title V permit under 6 NYCRR 201-6.6(d). The proposed Project is considered to be a significant modification to an existing major source.

Table 17-3. PSD and NNSR Significant Emission Rates

Pollutant	Significant Project Threshold (Tons/Year)	Significant Net Emission Increase Threshold (Tons/Year)	Project Regulated Under PSD or NNSR?
CO	100	100	PSD
Nitrogen Oxides (NO_x) (as an ozone precursor)	40	40	NNSR
SO_2	40	40	PSD
PM	25	25	PSD
$PM_{2.5}$	10	10	PSD
PM_{10}	15	15	PSD
H_2SO_4	7	7	PSD
VOCs (as an ozone precursor)	40	40	NNSR
CO_2e	75,000	75,000	PSD

Under the PSD regulations, facilities must perform an air quality analysis (which can include atmospheric dispersion modeling and preconstruction ambient air quality monitoring), and a Best Available Control Technology (BACT) demonstration for those pollutants that exceed the pollutant-specific SER identified in the regulations. The preconstruction NNSR review requirements for NSR major modifications differ from the PSD requirements. First, the emissions control requirement for nonattainment areas, Lowest Achievable Emission Rate (LAER), is defined differently and is more stringent than the BACT emissions control requirement. Second, the source must obtain any required emissions reduction credits (ERC) (offsets) of the nonattainment pollutant precursors from other sources that impact the same area as the proposed source. The air permit application provided in Appendix 17-1 includes an analysis of the BACT, LAER, and offsets necessary to meet the requirements of the PSD and NNSR programs.

In addition to obtaining offsets from other sources in the same impact area of the proposed source, Danskammer will apply for certification of NNSR and PSD ERCs due to the shutdown of the four existing boilers at the existing Danskammer Generating Station. These ERCs are used in the NNSR/PSD netting analysis and were calculated in accordance with 6 NYCRR 231-10.2. The total ERCs used by the Project NNSR/PSD netting analysis are listed in Table 17-4.

Class I Area Impact Analysis

Proposed major sources greater than 50 kilometers (km) from a Class I area may be eligible for an exemption from the requirement to perform a Class I area modeling analysis. The Class I areas closest to the proposed Project are the Lye Brook National Wilderness Area in Vermont and Edwin B. Forsythe National Wildlife Refuge at Brigantine, New Jersey, located approximately 181 km to the north-northeast and approximately 228 km to the south, respectively. The Federal Land Managers (FLM) for these Class I areas were notified by letter and a determination requested for whether assessments of impacts in the Class I areas would be required. The FLMs reviewed the proposed Project's details and related correspondence and confirmed that Class I analyses for the proposed Project are not required. Copies of the relevant correspondence are provided in the air permit application in Appendix 17-1 to this Exhibit.

Cross State Air Pollution Rule Requirements

On July 6, 2011, EPA completed the Cross-State Air Pollution Rule (CSAPR), limiting the interstate transport of emissions of NO_X and SO_2 that contribute to harmful levels of $PM_{2.5}$ and ozone in downwind states. The CSAPR requires certain states in the eastern United States to reduce SO_2, annual NO_X, and ozone season NO_X emissions from fossil fuel-fired power plants that affect the ability of downwind states to attain and maintain compliance with the 1997 and 2006 $PM_{2.5}$ NAAQS and the 1997 ozone NAAQS. On September 7, 2016, EPA revised the CSAPR ozone season NO_X emission program by finishing the CSAPR Update for the 2008 ozone NAAQS.

Table 17-4. PSD/NNSR Netting Analysis

Pollutant	Baseline Period [1]	Baseline Actual Emissions (BAE) (ERC) [2] tons/yr	Project Emission Potential [3] NSR Step 1 (PEP) tons/yr	Contemporaneous [4] Emission Increases tons/yr	Project Net Emission Increase NSR Step 2 (PEP - ERC) [5] tons/yr	PSD/NNSR Significant Net Emission Rate Thresholds [6] tons/yr	Subject to PSD/NNSR?
NO_x	December 2014 to November 2016	44.2	143.5	0.0	99.3	40	NNSR
CO	December 2014 to November 2016	9.2	115.6	0.0	106.4	100	PSD
SO_2	December 2014 to November 2016	27.1	24.4	0.0	(2.6)	40	No
PM_{10}	December 2014 to November 2016	2.9	81.5	0.0	78.6	15	PSD
$PM_{2.5}$	December 2014 to November 2016	2.9	81.5	0.0	78.6	10	PSD
VOC	December 2014 to November 2016	2.1	58.6	0.0	56.5	40	NNSR
H_2SO_4	December 2014 to November 2016	2.1	22.1	0.0	20.0	7	PSD
GHG	December 2014 to November 2016	47,303.9	1,954,952	0.0	1,907,648.2	75,000	PSD

Notes:

[1] Per 6 NYCRR 231-4(b)(7), "baseline period" is defined for an ERC, which is scheduled to occur in the future, as any 24 consecutive months within the 5 years immediately preceding date of receipt by the department of the permit application, which proposes to use the ERC. (Submittal Date of December 2019).

[2] Per 6 NYCRR 231-10.2, ERCs are quantified as the difference between BAE and subsequent Potential to Emit (PTE). The existing units will be retired so the existing unit post Project PTE is zero.

a. Baseline actual emissions based upon EPA Clean Air Markets Data and NYSDEC Emission Statement Data.

b. Baseline emissions conservatively do not include existing auxiliary fuel-burning equipment that will be retired.

[3] For new units, PEP is defined as potential to emit (see future operating assumptions below).

[4] Per 6 NYCRR 231-4(b)(13), "contemporaneous" is defined as the period beginning 5 years prior to the scheduled commence construction date of the new or modified emission source and ending with the scheduled commence operation date.

[5] The net emissions increase is defined under 6 NYCRR 231-4.1(b)(30) as the aggregate increase in emissions of a regulated NSR contaminant in tpy at an existing major facility resulting from the sum of:

a. the project emission potential of the modification (PEP);

b. every creditable emission increase at the facility, which is contemporaneous and for which an emission offset was not obtained; and (no creditable contemporary increases occurred);

c. any ERC at the facility, or portion thereof, selected by Danskammer which is contemporaneous, and which was not previously used as part of an emission offset, an internal offset, or relied upon in the issuance of a permit under this Part.

[6] Significant net emission increase threshold from NYCRR 231-13.

CSAPR establishes an allowance trading system to reduce emissions of NO_X and SO_2 from fossil fuel-fired power plants. EPA established individual state emissions budgets based on the emissions reductions that each upwind state must achieve to prevent it from unlawfully interfering with other states' efforts to achieve the NAAQS. CSAPR also includes an "assurance provision" that requires a state's covered sources to surrender additional allowances if the state's overall emissions threshold is exceeded.

In November 2018, NYSDEC revised the SIP for New York State to incorporate EPA's federal CSAPR requirements by repealing 6 NYCRR Part 243, *Transport Rule NO_X Ozone Season Trading Program*, 6 NYCRR Part 244, *Transport Rule NO_X Annual Trading Program*, and 6 NYCRR Part 245, *Transport Rule SO_2 Trading Program* and replacing with three new rules, 6 NYCRR Part 243, *CSAPR NO_X Ozone Season Group 2 Trading Program*, 6 NYCRR Part 244, *CSAPR NO_X Annual Trading Program*, and 6 NYCRR Part 245, *CSAPR SO_2 Group 1 Trading Program*. These rules allow the NYSDEC to allocate CSAPR allowances to regulated entities in New York for the 2021 control period and beyond. For emissions occurring in the 2017 through 2020 control periods, CSAPR allowances are allocated by EPA through the Federal Implementation Plan at 40 CFR 97.410(a), 97.610(a), and 97.810(a).

Applicability for the CSAPR trading programs in the State of New York is defined at 40 CFR 97.404, 97.604, and 97.804. A CSAPR Unit is any stationary, fossil-fuel-fired combustion turbine serving at any time, on or after January 1, 2005, a generator with nameplate capacity of more than 25 MW producing electricity for sale. A CSAPR Source is a source that includes one or more CSAPR Units. A cogeneration unit that supplies one-third or less of the unit's potential electrical output capacity or less than 219,000 MWh, whichever is greater, to any utility power distribution system for sale is not considered a CSAPR Unit.

The Project will be considered a CSAPR Source and will be subject to the standard requirements under 40 CFR 97.406, 97.606, and 97.806, as follows:

- Designated representative requirements at 40 CFR 97.406(a), 97.606(a), and 97.806(a);
- Emissions monitoring, reporting, and recordkeeping requirements at 40 CFR 97.406(b), 97.606(b), and 97.806(b);
- NO_X and SO_2 emissions requirements at 40 CFR 97.406(c), 97.606(c), and 97.806(c), including, for each control period, holding in a compliance account the required NO_X and SO_2 allowance allocations to meet applicable emissions limitations;

- Title V permit requirements at 40 CFR 97.406(d), 97.606(d), and 97.806(d); and
- Additional recordkeeping requirements at 40 CFR 97.406(e), 97.606(e), and 97.806(e).

Federal Acid Rain Program

The Acid Rain Program (ARP) was established by Title IV of the 1990 CAA Amendments. It requires major emission reductions of SO_2 and NO_x, the primary precursors of acid rain, from the power sector. The SO_2 program sets a cap on the total amount of SO_2 that may be emitted by electric generating units (EGUs) in the contiguous United States. NO_X reductions under the ARP are achieved through a program that applies to certain coal-fired EGUs.

The program employs both traditional and market-based approaches for controlling air pollution. Under the market-based part of the program, existing units are allocated SO_2 allowances by EPA. Once allowances are allocated, affected facilities may use their allowances to cover emissions, or may trade their allowances to other units under a market allowance program. In addition, applicable facilities are required to implement CEMS for affected units.

As an affected facility, the Project will be required to obtain a Title IV Acid Rain Permit, obtain SO_2 and NO_X allowances to cover emissions, and install a NO_X and SO_2 CEMS. The proposed combustion turbine meets the definition of an affected Phase II “utility unit” under the ARP pursuant to Title IV of the 1990 CAA Amendments.

This applicability requires Danskammer to:

- Apply for a Phase II Acid Rain Permit to include the new utility unit;
- Install CEMS to demonstrate compliance with the ARP provisions meeting the requirements specified in 40 CFR 75; and
- Hold allowances equivalent to annual NO_x and SO_2 emissions.

An Acid Rain permit application must include the date that the units will commence commercial operation and the deadline for monitoring certification (90 days after commencement of commercial operation). The Project will meet applicable Acid Rain requirements that become effective after the issuance of an Acid Rain permit. The Project will develop a Title IV Acid Rain monitoring plan as required under 40 CFR 72. The plan will include the installation, proper operation, and maintenance of continuous monitoring systems or approved monitoring provisions under 40 CFR 75 for NO_x, SO_2, CO_2, or O_2 (as a diluent), and opacity. Depending on the monitoring technology available at the time of installation, the plan will cite the specific operating practices and maintenance programs that will be applied to the instruments. The plan will also cite the specific form of records that will be maintained, their availability for inspection, and the length of time that they will be archived. The plan will further cite that the Acid Rain permit and applicable regulations will be reviewed at specific intervals for continued compliance and will cite the specific mechanism to be used to keep current on rule applicability.

CO_2 Performance Standards under 6 NYCRR Part 251

On June 12, 2012, NYSDEC adopted 6 NYCRR Part 251, CO_2 Performance Standards for Major Electric Generating Facilities, which became effective on July 12, 2012. 6 NYCRR Part 251 applies to owners and/or operators of new major electric generating facilities (defined as facilities that have a generating capacity of at least 25 MW that commence construction after July 12, 2012 and for increases in capacity of at least 25 MW at existing electric-generating facilities). 6 NYCRR Part 251 will apply to the Project's combined-cycle combustion turbine. New combined-cycle units subject to this Part must comply with either an input-based emission limit of 120 pounds of CO_2 per MMBtu or an output-based CO_2 emission limit of 925 lbs./MWh (gross). The emission limits will be measured on a 12-month rolling average basis. In accordance with 6 NYCRR Part 251.5, Danskammer will monitor CO_2 emissions in accordance with 40 CFR Part 75 Appendix G.

Regional Greenhouse Gas Initiative CO_2 Budget Trading Program

The CO_2 Budget Trading Program is a mandatory cap-and-trade program to reduce GHG emissions as part of the Regional Greenhouse Gas Initiative (RGGI). RGGI is a cooperative effort by nine Northeast and Mid-Atlantic states to limit GHG emissions. RGGI is the first mandatory, market-based CO_2 emissions reduction program in the United States. RGGI is composed of individual CO_2 Budget Trading Programs in each of the nine participating states. These nine programs are implemented through state regulations, based on a RGGI Model Rule, and are linked through CO_2 allowance reciprocity. Regulated power plants will be able to use a CO_2 allowance issued by any of the nine participating states to demonstrate compliance with the state program governing their facility. Taken together, the nine individual state programs function as a single regional compliance market for carbon emissions. 6 NYCRR Part 242 establishes the New York State component of the CO_2 Budget Trading Program. Program requirements, including allowance allocations, account reconciliation, monitoring and reporting, and regulatory timelines are addressed in these rules. Sources need to acquire, from auctions or directly from allowance holders, one allowance (permit to emit CO_2) for every ton of CO_2 that they emit.

New York State Regulatory Emission Limits

Applicable NYSDEC Air Regulations and the associated proposed means of Project compliance are identified below:

- 6 NYCRR Part 200 defines general terms and conditions, requires sources to restrict emissions, and allows NYSDEC to enforce NSPS, PSD, and NESHAP. Part 200 is a general applicable requirement. No action is required by the Project.

- 6 NYCRR Part 200.1 defines emergency power generating stationary internal combustion engines as stationary internal combustion engines that operate as mechanical or electrical power sources only when the usual supply of power is unavailable, and operate for no more than 500 hours per year (i.e., applicable to the proposed emergency diesel generator and emergency diesel fire pumps, all of which have been assumed to operate no more than 250 hours per year, including periodic testing and maintenance activities to ensure reliability).

- 6 NYCRR Part 201 requires existing and new sources to evaluate minor or major source status and evaluate and certify compliance with all applicable requirements. The Project will represent a modified major Part 201 source, and is seeking a significant modification to the facility's existing Title V permit under 6 NYCRR 201-6.6(d). The proposed Project is considered to be a significant modification to an existing major source.

- 6 NYCRR Subpart 202-1 requires sources to conduct emissions testing upon the request of NYSDEC. Permit conditions covering construction of the proposed Project will likely require stack testing as a condition of receiving its permit to construct.

- 6 NYCRR Subpart 202-2 requires sources to submit annual emission statements for emissions tracking and fee assessment. Pollutants are required to be reported in an emission statement if certain annual thresholds are exceeded. Project emissions will be reported as required.

- 6 NYCRR Subpart 211-3 defines general opacity limits for sources of air pollution in New York State. General applicable requirement facility-wide visible emissions are limited to

20-percent opacity (6-minute average) except for one continuous 6-minute period per hour of not more than 57-percent opacity. Note that the opacity requirements under 6 NYCRR Subpart 227-1 (see below) are more restrictive and effectively supersede the requirements of 6 NYCRR Subpart 211-3.

- 6 NYCRR Subpart 225-1 regulates sulfur content of fossil fuels. Fuel sulfur is limited to 0.0015 percent by weight for distillate oil. Danskammer proposes to use 0.0015 percent sulfur ULSD. The Project will not fire residual oil.

- 6 NYCRR Subpart 227-1.2 sets a 0.10 lb./MMBtu PM limit for oil-fired stationary combustion installations with a maximum heat input capacity exceeding 250 MMBtu/hr. Danskammer proposes to comply with this emission standard by proposing a maximum PM emission limit of 0.0089 lbs./MMBtu when the combustion turbine is operating on ULSD.

- Visible emissions (opacity) for stationary fuel-burning equipment are regulated under 6 NYCRR Subpart 227-1.3. Project stationary combustion installations must be operated so that the following opacity limits are not violated:

  - 6 NYCRR 227-1.3(a) 20-percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27-percent opacity.

- 6 NYCRR Subpart 227-2 sets NO_X Reasonably Achievable Control Technology (RACT) emission limits for combustion sources. Under 227-2.4(e), combined-cycle combustion turbines that operate after July 1, 2014 must submit a case-by-case NO_X RACT analysis that includes descriptions of available NOx control technologies, the projected effectiveness of the technologies considered, and the costs for installation and operation for each of the technologies, as well as a proposal for the RACT technology and emission limit selected as RACT. The unit uses dry low-NO_X combustion (on gas), water injection (on ULSD), and SCR for NO_X control to meet limits of 2.0 ppm on gas (with and without duct firing), and 4.0 ppm on ULSD. Because the new combustion turbine will use state-of-the-art NO_X control technology for this type of unit and meets the criteria for LAER under ozone NNSR, the proposed NO_X emission limits satisfy NO_X RACT. Recordkeeping and reporting requirements under 6 NYCRR Subpart 227-2.6 will apply.

- 6 NYCRR Part 231 requires NSR for major modifications to existing major sources in both attainment and nonattainment areas. While the Project Site is designated as attainment for the 8-hour ozone standard, it is located in the ozone transport region. Therefore, it is consistent with 6 NYCRR 231-13.3, Table 3, because significant net emissions increase of NO_x and/or VOC, precursors to ozone formation, exceed 40 tons per year of NO_x and/or VOC, the Project is required to meet LAER levels for the applicable pollutant(s) and obtain emission offsets of VOC and NO_x at a 1.15 to 1 ratio.

- 6 NYCRR Subparts 231-7 and 231-8 are the NYSDEC implementation of PSD Rules. Under 6 NYCRR Subpart 231-8, the Project must address BACT for NOx, CO, PM_{10}/$PM_{2.5}$, and GHG.

- 6 NYCRR Part 242 establishes the New York State component of the CO_2 Budget Trading Program. Program requirements, including allowance allocations, account reconciliation, monitoring and reporting, and regulatory timelines are addressed in these rules.

- Parts 243, 244, and 245 implement EPA's CSAPR and allow the NYSDEC to distribute CSAPR allowances to regulated entities in New York. These rules implement the transport rules annual NO_X and SO_2 trading program and the NO_X ozone season trading program. Program requirements, including items such as allowance allocations and regulatory timelines are addressed in these rules.

- NYCRR Part 251, CO_2 Performance Standards for Major Electric Generating Facilities applies to owners and/or operators of new major electric generating facilities (defined as facilities that have a generating capacity of at least 25 MW that commence construction after July 12, 2012 and for increases in capacity of at least 25 MW at existing electric generating facilities. 6 NYCRR Part 251 will apply to the Project's combustion turbine. New combined-cycle units subject to this Part must comply with either an input-based emission limit of 120 pounds of CO_2 per MMBtu or an output-based CO_2 emission limit of 925 lbs./MWh (gross). The emission limit will be measured on a 12-month rolling average basis. In accordance with 6 NYCRR Part 251.5, Danskammer will install a CO_2 CEMS to measure total turbine CO_2 emissions.

- Under 6 NYCRR 257, New York's ambient air quality standards, project emissions must not exceed State ambient air standards for SO_2, PM, CO, photo-chemical oxidants, NO_2, fluorides, beryllium, and hydrogen sulfide.

- To meet NYSDEC guidelines for ammonia (NH_3) "slip," combined-cycle stack emissions of NH_3 will be limited to 5 ppm by controlling the NH_3 injection rate and employing good operating practices.

Reasonably Available Control Technology Requirements

As previously stated, 6 NYCRR Subpart 227-2 sets NO_X RACT emission limits for combustion sources. Under 227-2.4(e), combined-cycle combustion turbines that operate after July 1, 2014 must submit a case-by-case NO_X RACT analysis that includes descriptions of available NO_x control technologies, the projected effectiveness of the technologies considered, and the costs for installation and operation for each of the technologies, as well as a proposal for the RACT technology and emission limit selected as RACT. The unit uses dry low-NO_X combustion (on gas), water injection (on ULSD), and SCR for NO_X control to meet limits of 2.0 ppm on gas (with and without duct firing) and 4.0 ppm on ULSD. Because the new combustion turbine will use the state-of-the-art NO_X control technology for this type of unit and meets the criteria for LAER under ozone NNSR, the proposed NO_X emission limits satisfy NO_X RACT. Recordkeeping and reporting requirements under 6 NYCRR Subpart 227-2.6 would apply.

17(b) Assessment of Existing Ambient Air Quality Levels and Trends

This section provides an assessment of existing ambient air quality levels and air quality trends for pollutants in the region surrounding the Project Site, including air quality levels and trends taken from regional air quality summaries and air quality trend reports.

The CAA requires that EPA set NAAQS for pollutants considered harmful to public health and the environment. NAAQS apply to criteria pollutants with each NAAQS expressed in terms of a pollutant concentration level and an associated averaging period.

The NYSDEC Bureau of Air Surveillance operates various air quality monitors throughout New York for SO_2, NO_2, CO, PM_{10}, $PM_{2.5}$, O_3, Pb, and NO_x. The federal attainment status designations of areas in New York with respect to the NAAQS are listed at 40 CFR 81.333. The Project is located in Orange County in the Hudson Valley Intrastate AQCR. NYSDEC Regions 2 and 3 monitoring sites were reviewed to determine which ones were representative/conservative of the air quality at the Project Site.

Table 17-5 below presents the maximum annual and second highest short-term concentrations recorded during the latest 3 years (2016 – 2018) at the selected monitoring sites for the specific criteria pollutants. Second highest concentrations, as opposed to maximum concentrations, are presented in Table 17-5 below for pollutants with short-term standards (except $PM_{2.5}$, 1-hour SO_2, and 1-hour NO_2) because one exceedance of the standard is allowed per year. For 24-hour $PM_{2.5}$, EPA uses the 98th percentile 24-hour maximum concentration from the last 3 years of air quality monitoring data to determine a violation of the standard. For 1-hour SO_2, EPA uses the 3-year average of the 99th percentile of the daily maximum 1-hour average and for 1-hour NO_2, EPA uses the 3-year average of the 98th percentile of the daily maximum 1-hour average. For annual $PM_{2.5}$, EPA uses the 3-year average annual concentration.

Table 17-5. Background Concentrations of Criteria Pollutants

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)	Background Concentration[1] ($\mu g/m^3$)			Monitor Location
			2016	2017	2018	
CO	1-hour	40,000	2,024	403	2,300	Pfizer Lab/Botanical Gardens, Bronx County
	8-hour	10,000	1,150	345	1,380	
SO_2	1-hour [2]	196	6.3	15.5	7.9	Mt. Ninham, Putnam County
	24-hour	365	3.9	3.7	4.2	
	Annual	80	0.6	0.6	0.3	
PM_{10}	24-hour	150	32	27	30	IS 52, Bronx County
$PM_{2.5}$[4]	24-hour	35	20.0	13.9	16.0	Newburgh, Orange County
	Annual	12	6.1	6.1	6.4	
NO_2	1-hour [3]	188	104.9	105.3	101.5	Pfizer Lab/Botanical Gardens, Bronx County
	Annual	100	29.3	28.0	27.1	
O_3[5]	8-hour	137	125	116	120	Valley Central, Orange County

Table 17-5. Background Concentrations of Criteria Pollutants

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)	Background Concentration[1] ($\mu g/m^3$)			Monitor Location
			2016	2017	2018	

Notes:

[1] Highest second-highest short-term (1-, 8-, and 24-hour) and maximum annual average concentrations presented, except for 24-hour $PM_{2.5}$, which is the 98th percentile concentration, 8-hour O_3, which is the fourth highest concentration, annual $PM_{2.5}$, which is the 3-year average, 1-hour SO_2, which is the 99th percentile concentration, and 1-hour NO_2, which is the 98th percentile concentration.

[2] 1-hour 3-year average 99th percentile value for SO_2 is 9.9 ug/m^3.

[3] 1-hour 3-year average 98th percentile value for NO_2 is 103.9 ug/m^3.

[4] 24-hour 3-year average 98th percentile value for $PM_{2.5}$ is 16.6 ug/m^3; annual 3-year average value for $PM_{2.5}$ is 6.2 ug/m^3.

[5] Fourth-highest daily maximum 8-hour concentration averaged over 3 years is 120 ug/m^3.

Sources: NYSDEC 2016, 2017, 2018. EPA Air Data Database.

Sulfur Dioxide

The closest representative NYSDEC monitor for SO_2 is located at Mt. Ninham (Gypsy Trail Road in Kent) in Putnam County. This station is located approximately 25.0 km east-southeast from the Project Site. Data collected from 2016 through 2018 shows a trend of the annual averaging period concentrations staying the same from 2016 to 2017 and decreasing from 2017 to 2018. Data collected from 2016 through 2017 shows a trend of the 24-hour averaging period concentrations decreasing from 2016 to 2017 and increasing from 2017 to 2018.

The maximum ambient SO_2 concentrations recorded between 2016 and 2018 show the 3-year average 99th percentile 1-hour SO_2 value to be 5 percent of the NAAQS of 0.075 ppm (196 $\mu g/m^3$).

Inhalable Particulates (PM_{10})

Conservative background PM_{10} concentrations were recorded at the IS 52 monitor at 681 Kelly Street in Bronx County. This monitor is located approximately 84.1 km south of the Project Site. High second-high background 24-hour PM_{10} concentrations at the IS 52 monitor have decreased 2 ug/m^3 since 2016 and are 20 percent of the NAAQS. In 2016, the highest second-highest background 24-hour PM_{10} concentration was 21 percent of the NAAQS.

The background air quality concentrations recorded at the IS 52 monitor are influenced by the densely populated Bronx County. This monitor is located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area of Orange County. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the Project Area. Thus, this monitor is considered to conservatively represent the ambient air quality within the Project Area.

Nitrogen Dioxide

Conservative background NO_2 concentrations were recorded at the Pfizer Lab/Botanical Gardens monitor at 200th Street and Southern Boulevard in Bronx County. This monitor is located approximately 79 km south of the Project Site. Between 2016 and 2018, 1-hour NO_2 concentrations have decreased approximately 3 percent. The maximum ambient NO_2 concentrations recorded between 2016 and 2018 show the 3-year average 98th percentile 1-hour NO_2 value to be over 55 percent of the NAAQS of 0.1 ppm (188 $\mu g/m^3$). Maximum annual NO_2 concentrations decreased from 2016 to 2018 (approximately 8 percent). The maximum annual concentration of 29.3 $\mu g/m^3$ recorded in 2016 is 29.3 percent of the 0.053 ppm (100 $\mu g/m^3$) ambient air quality standard.

The background air quality concentrations recorded at the Pfizer Lab monitor are influenced by the densely populated Bronx County. This monitor is located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area of Orange County. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the Project Area. Thus, this monitor is considered to conservatively represent the ambient air quality within the Project Area.

Carbon Monoxide

Like NO_2, the Pfizer Lab/Botanical Gardens monitor in the Bronx is the nearest representative/conservative CO monitor to the Site. CO is more of a concern from mobile sources than from stationary combustion sources. CO concentrations are monitored for comparison against a 1-hour and an 8-hour standard. The highest-second highest 1-hour concentration in 2018 was recorded to be 2,300 $\mu g/m^3$, which is well under the standard of 35 ppm (40,000 μg/m^3). The highest-second highest 8-hour concentration in 2018 was 1,380 μg/m^3, also well under the 9 ppm (10,000 μg/m^3) standard.

The background air quality concentrations recorded at the Pfizer Lab monitor are influenced by the densely populated Bronx County. This monitor is located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area of Orange County. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the Project Area. Thus, this monitor is considered to conservatively represent the ambient air quality within the Project Area.

Ozone

The closest representative ozone monitor to the Project Site is the Valley Central Station monitor (Valley Central High School, 1175 Route 17K in Montgomery) in Orange County, New York. This monitor is located approximately 21.5 km west-southwest of the Project Site. The 3-year (2016 to 2018) average of the fourth-highest 8-hour concentration is less than the federal standard of 137 μg/m^3.

Inhalable Particulates

The monitor at 55 Broadway in Newburgh, Orange County (Newburgh) is the nearest representative $PM_{2.5}$ monitor to the Site. EPA has set the annual $PM_{2.5}$ NAAQS at 12 μg/m^3, based on the 3-year average of annual mean concentrations, and the 24-hour $PM_{2.5}$ NAAQS at 35 μg/m^3, based on the 3-year average of the 98th percentile of the 24-hour concentrations. Using the latest 3 years of $PM_{2.5}$ monitoring data (2016 to 2018) from the Newburgh monitor, the 3-year average annual $PM_{2.5}$ concentration was 6.2 μg/m^3, while the 3-year average 98th percentile 24-hour $PM_{2.5}$ concentration was 16.6 μg/m^3. Both of these values are less than their respective NAAQS.

17(c) Emissions by Combustion Sources at the Facility

Provided below are tables presenting the emissions of criteria and non-criteria pollutants by combustion sources at the Project including but not limited to emergency fire pumps and additional ancillary stationary source generating equipment (auxiliary boiler, emergency generator, etc.). Detailed emission calculations for the proposed combustion sources are provided in Tables B-3 through B-5, Tables B-8 through B-11, and Table F-3 of the air permit application in Appendix 17-1.

Table 17-6. Emission Rates for the Combustion Turbine[1, 2]

Parameter	Hourly Emission Rate (lbs./hr)[3]	Annual Potential to Emit (tpy)[4]	Annual GHG (CO_2e) (tpy)[4]
NO_x	31.5	136.9	1,927,496
CO	19.2	104.7	
SO_2	6.0	24.1	
CO_2	469,800	1,925,594	
Methane (CH_4)	8.71	34.7	
Nitrous Oxide (N_2O)	0.87	3.47	
$PM/PM_{10}/PM_{2.5}$	21.5/21.5/21.5	79.7/79.7/79.7	
VOC	8.8	57.6	
NH_3	29.1	116.7	
H_2SO_4	5.5	22.1	
Pb	3.59E-04	0.02	
Non-criteria Pollutants, including Mercury	See footnote[2]	See footnote[2]	

Notes:

1 The full set of emissions of criteria pollutants from the turbine under various operating scenarios are presented in Tables B-3 and B-4 of the air permit application in Appendix 17-1 of this Exhibit.

2 The emissions of each individual non-criteria pollutant from the turbine are presented in Table F-3 of Appendix 17-1.

3 Turbine performance varies as a function of ambient temperature and load. Hourly emission rates are based on performance at annual average temperature firing natural gas at maximum load with duct burner operating.

4 Turbine performance varies as a function of ambient temperature and load. Annual potential emissions are based on performance at annual average temperature and maximum load and include emissions from startup/shutdown, duct firing, and 720 hours/year ULSD firing.

Table 17-7. Emission Rates for the Auxiliary Boiler

Parameter	Hourly Emission Rate (lbs./hr)	Annual Potential to Emit (tpy)[1]	Annual GHG (CO_2e) (tpy)[1]
NO_x	0.83	1.98	26,959
CO	3.55	8.52	
SO_2	0.132	0.32	
CO_2	11,221	26,931	
CH_4	0.212	0.51	
N_2O	0.021	0.05	
$PM/PM_{10}/PM_{2.5}$	0.71/0.71/0.71	1.7/1.7/1.7	
VOC	0.16	0.39	
NH_3	--	--	
H_2SO_4	0.010	0.02	
Pb	4.63E-05	1.11E-04	
Non-criteria Pollutants, including Mercury	See footnote[2]	See footnote[2]	

Notes:

1 Annual potential emissions are based on maximum annual operation of 4,800 hours/year.

2 The emissions of each individual non-criteria pollutant from the auxiliary boiler are presented in Table F-3 of Appendix 17-1.

Table 17-8. Emission Rates for the Emergency Diesel Generator

Parameter	Hourly Emission Rate (lbs./hr)	Annual Potential to Emit (tpy)[1]	Annual GHG (CO_2e) (tpy)[1]
NO_x	28.38	3.55	399
CO	15.37	1.92	
SO_2	0.03	3.67E-03	
CO_2	3,183	398	
CH_4	0.13	0.02	
N_2O	0.03	3.17E-03	
$PM/PM_{10}/PM_{2.5}$	0.89/0.89/0.89	0.11/0.11/0.11	
VOC	1.66	0.21	
NH_3	--	--	
H_2SO_4	2.94E-03	3.67E-04	
Pb	--	--	
Non-criteria Pollutants, including Mercury	See footnote[2]	See footnote[2]	

Notes:

1 Annual potential emissions are based on maximum annual operation of 250 hours/year.

2 The emissions of each individual non-criteria pollutant from the emergency generator are presented in Table F-3 of Appendix 17-1.

Table 17-9. Emission Rates for the New Emergency Diesel Fire Pump

Parameter	Hourly Emission Rate (lbs./hr)	Annual Potential to Emit (tpy)[1]	Annual GHG (CO_2e) (tpy)[1]
Oxides of Nitrogen (NO_x)	2.16	0.27	47.2
CO	1.87	0.23	
SO_2	3.48E-03	4.34E-04	
CO_2	376	47.0	
CH_4	0.02	1.88E-03	
N_2O	3.00E-03	3.75E-04	
$PM/PM_{10}/PM_{2.5}$	0.11/0.11/0.11	0.01/0.01/0.01	
VOC	0.09	0.01	
NH_3	--	--	
H_2SO_4	3.48E-04	4.34E-05	
Pb	--	--	
Non-criteria Pollutants, including Mercury	See footnote[2]	See footnote[2]	

Notes:

1 Annual potential emissions are based on maximum annual operation of 250 hours/year.

2 The emissions of each individual non-criteria pollutant from the new emergency fire pump are presented in Table F-3 of Appendix 17-1.

Table 17-10. Emission Rates for the Existing Emergency Diesel Fire Pump

Parameter	Hourly Emission Rate (lbs./hr)	Annual Potential to Emit (tpy)[1]	Annual GHG (CO_2e) (tpy)[1]
Oxides of Nitrogen (NO_x)	6.45	0.81	50.6
CO	2.15	0.27	
SO_2	3.73E-03	4.66E-04	
CO_2	404	50.5	
CH_4	0.02	2.01E-03	
N_2O	3.22E-03	4.03E-04	
GHG (CO_2e)	405	50.6	
PM/PM_{10}/$PM_{2.5}$	0.33/0.33/0.33	0.04/0.04/0.04	
VOC	0.28	0.04	
NH_3	--	--	
H_2SO_4	3.73E-04	4.66E-05	
Pb	--	--	
Non-criteria Pollutants, including Mercury	See footnote[2]	See footnote[2]	

Notes:

1 Annual potential emissions are based on maximum annual operation of 250 hours/year.

2 The emissions of each individual non-criteria pollutant from the existing emergency fire pump are presented in Table F-3 of Appendix 17-1.

17(d) An Assessment of the Potential Impacts to Ambient Air Quality that may Result from Pollutant Emissions from the Facility

(1) Criteria Air Pollutant Study

The New York State Department of Health (NYSDOH) and NYSDEC were consulted to determine which criteria pollutants emitted by the Project should be evaluated for ambient air quality impacts. Section 17(h) presents the maximum predicted short-term and long-term ambient air concentrations of those pollutants associated with the Project, compared to ambient background concentrations and applicable ambient air quality standards. Sections 5 and 6 of the NYSDEC Part 201/231 air permit application located in Appendix 17-1 provide a detailed assessment of maximum predicted impacts from the proposed criteria pollutant emissions from the Project.

(2) Non-Criteria Air Pollutant Study

NYSDOH and NYSDEC were consulted to determine which non-criteria pollutants emitted by the Project should be evaluated for ambient air quality impacts. Section 17(i) presents the maximum predicted short-term and long-term ambient air concentrations of those pollutants associated with the Project, compared to the NYSDEC Short-term and Annual Guideline Concentrations (SGCs and AGCs). The SGCs that are based on occupational guidelines were compared to other short-term health-based comparison values, such as the Agency for Toxic Substances and Disease Registry's (ATSDR) Acute Minimal Risk Levels (MRL). Section 5 of the NYSDEC Part 201/231 air permit application located in Appendix 17-1 provides a detailed assessment of maximum predicted impacts from the proposed non-criteria pollutant emissions from the Project.

(3) Cumulative Source Impact Study

As demonstrated in Section 17(h), a cumulative impact assessment is required for PM_{10}/$PM_{2.5}$ and NO_2 per NYSDEC Part 231 air quality regulations and per NYSDEC Part 487 environmental justice regulations. The total modeled concentrations from the proposed Project were determined to be greater than the SILs for these pollutants. Thus, a cumulative impact assessment to demonstrate compliance with the NAAQS and PSD Class II increments is required. Danskammer conducted a cumulative air quality analysis for these pollutants as detailed in Section 6 of the NYSDEC Part 201/231 air permit application located in Appendix 17-1. Based on the results of the cumulative air quality impact study, the Project will not cause or significantly contribute to an exceedance of the NO_2 NAAQS or cause or contribute to an exceedance of a PM_{10}/$PM_{2.5}$ NAAQS or PSD increment.

Danskammer analyzed air quality for non-criteria air pollutants, as detailed in Section 17(i), which followed NYSDEC guidance for criteria air pollutants and modeling maximum Project impacts of all relevant non-criteria pollutants to determine if any exceeded either 10 percent of the NYSDEC AGC if based on non-cancer effects or 100 percent of the AGC if based on a one-in-one-million cancer risk. This screening was used to determine the appropriate number of chemicals included in a potential non-criteria cumulative impact analysis, which would be conducted after consultation with NYSDEC and NYSDOH. As shown in Section 17(i), results of the analysis indicate that all the maximum modeled Project concentrations were less than their respective SGCs and AGCs and for most HAPs, only a fraction of a percentage of the SGCs and/or AGCs. Thus, none of the non-criteria air pollutants have modeled concentrations that are 100 percent of the AGC if based on a one-in-one-million cancer risk. Therefore, a cumulative non-criteria air quality assessment for carcinogenic air pollutants is not warranted per NYSDOH guidance. Similarly, none of the non-criteria air pollutants have maximum modeled concentrations greater than 10 percent of the AGC, if based on non-cancer effects. Therefore, a cumulative non-criteria air quality assessment is not necessary per NYSDOH guidance.

(4) Ambient Air Quality Impacts within EJ Areas

The purpose of the Environmental Justice (EJ) program is to evaluate whether minority low-income communities are affected adversely or disproportionately by the actions of federal agencies, including approvals under the PSD program. The EJ analysis is presented in Exhibit 28. The analysis satisfies the requirements of 6 NYCRR Part 487 *Analyzing Environmental Justice Issues in Siting of Major Electric Generating Facilities Pursuant to Public Service Law Article 10*. As determined in consultation with NYSDOH and NYSDEC, air quality impact analyses were conducted for certain pollutants in accordance with the requirements of 6 NYCRR Part 487. An assessment of the impact on air quality at these certain receptor points, defined as those areas identified as EJ areas per Part 487 requirements, is provided in Exhibit 28.

Air dispersion modeling was used to determine EJ areas that have the potential to be significantly impacted by the Project. In order to identify those new sources with the potential to significantly affect air quality, EPA has adopted the NAAQS for the protection of human health. They have also established SILs as a screening level. If a project's impacts are found to be below the SILs, then the project will have an insignificant impact on air quality. If the project's air quality impacts are shown to be insignificant, then there will be no disproportionately high or adverse burden on communities in the area.

The Project was modeled in accordance with the procedures documented in Section 17(h). Maximum calculated Project impacts were determined for various pollutants and averaging periods. As shown in Section 17(h), maximum modeled impacts were compared to the SILs and the sum of maximum Project impacts and representative background air quality levels from existing NYSDEC air quality monitoring data were compared to the corresponding NAAQS.

All modeled Project impacts, except for $PM_{10}/PM_{2.5}$ and NO_2 impacts, are below the SILs. The sum of maximum calculated impacts and background levels are below the corresponding NAAQS for all pollutants and averaging periods. Therefore, the Project is not considered to have any adverse air quality impacts. Exhibit 28 shows the maximum modeled impact locations for all pollutants and averaging times. The maximum modeled Project impacts are generally modeled to occur at or near the Project fence line or located to the west-northwest of the Project and outside the potential EJ areas. Therefore, the identified receptors within the EJ areas will not receive a disproportionately high share of the maximum Project impacts.

(5) Potential Impacts on Greenhouse Gas Emissions

The Project's potential impact on GHG emissions was assessed using the procedures outlined in the July 15, 2009 Draft NYSDEC Commissioner's Policy. This assessment is provided in Appendix 17-2.

17(e) Accidental Release Scenario for Aqueous Ammonia

Ammonia used in the SCR system of the combined-cycle unit will be supplied from a single aqueous ammonia storage tank. The 35,000-gallon ammonia storage tank will be equipped with an ammonia leak detection system and passive or active abatement system(s). The aqueous ammonia concentration will be limited to no greater than 19 percent by weight. The percentage concentration is below the 40 CFR Part 68, section 112(r) (Table 1) risk management planning applicability threshold. However, to ensure that an accidental release of this material will not adversely affect the health and safety of the community surrounding the proposed Project, the potential for off-site impacts resulting from a worst-case ammonia release scenario (e.g., rupture of the tank walls) were assessed. A full description of the off-site consequence analyses can be found in Appendix 17-3.

In EPA's *Risk Management Program Guidance for Offsite Consequence Analysis* (EPA, 2009), ammonia is considered neutrally buoyant with a prescribed toxic endpoint level of 0.105 milligrams per liter (mg/l), which is approximately equivalent to 150 ppm. The toxic endpoint value is based on the existing short-term exposure value from the American Industrial Hygiene Association Emergency Response Planning Guidelines Level 2 (ERPG-2). This value represents the maximum airborne concentration below which nearly all individuals could be exposed for up to an hour without experiencing or developing irreversible or other serious adverse health effects.

To predict the potential worst-case impact distance, the EPA-approved Areal Locations of Hazardous Atmospheres (ALOHA) model was used. This accidental release model is routinely used in predicting impact areas associated with hazardous material releases.

For neutrally buoyant aqueous ammonia vapors and using a 10-minute release duration per EPA guidance and urban conditions, the ALOHA results indicate that ground-level concentrations never exceed the ERPG-2 concentration of 150 ppm at the nearest residential locations. Therefore, the defined worst-case accidental release scenario would not result in an exceedance of the ERPG-2 guideline (150 ppm) for ammonia.

17(f) Visibility Impairment Analysis for Scenic Vistas

A Level-1 screening analysis was performed based upon procedures described in EPA's *Workbook for Plume Visual Impact Screening and Analysis* (EPA, 1992). The screening procedure involves calculation of three plume contrast coefficients using emissions of NO_x, PM/PM_{10}, and sulfates (i.e., H_2SO_4). The Level-1 screening procedure determines the light scattering impacts of particulates, including sulfates and nitrates, with a mean diameter of 2 micrometers with a standard deviation of 2 micrometers. The analysis was run assuming that all emitted particulate would be as $PM_{10}/PM_{2.5}$, which results in a conservative assessment of visibility impact. These coefficients consider plume/sky contrast, plume/terrain contrast, and sky/terrain contrast.

A modified Level-1 screening analysis using the EPA VISCREEN (Version 13190) model was performed for the worst possible operating scenario. The visibility assessment for the surrounding area was performed for an observer at the visual range of 40 km from the Project Site. The results of this analysis are presented in Appendix 17-1 and indicate that the Project will not impact visibility in the area surrounding the Project Site.

17(g) Air Quality Modeling Protocols

Criteria and non-criteria pollutant studies are provided in the NYSDEC Part 201/231 air permit application provided in Appendix 17-1. The studies include ambient air quality analyses, which have been performed in accordance with the air quality modeling protocol submitted to the NYSDEC on May 15, 2019. The NYSDEC reviewed and approved the air quality modeling protocol in a letter dated June 20, 2019. Copies of the air quality modeling protocol and correspondence with the NYSDEC are presented in Appendix 17-1. Summaries of the studies are provided in the following sections.

17(h) Criteria Pollutant Study

(1) Assessment of Meteorological Data

Two meteorological datasets are required for a 6 NYCRR Part 201/231 and/or New York PSL Article 10 air quality modeling analysis using the EPA AERMOD dispersion model: 1) hourly surface data and 2) upper air sounding data. According to EPA *Guideline on Air Quality Models (Revised)* (2017), the meteorological data used in an air quality modeling analysis should be selected based on its spatial and climatological representativeness of a proposed Project Site and its ability to accurately characterize the transport and dispersion conditions in the area of concern. The spatial and climatological representativeness of the meteorological data are dependent on four factors:

1. The proximity of the meteorological monitoring site to the area under consideration;
2. The complexity of the terrain;
3. The exposure of the meteorological monitoring site; and,
4. The period of time during which data were collected.

One hourly surface dataset and one upper air sounding dataset were used in modeling the proposed Project to be located in the Town of Newburgh, Orange County. The closest source of representative hourly surface meteorological data is the Hudson Valley Regional Airport located in the Town of Wappinger. This meteorological station is located approximately 9 km to the northeast of the proposed Project at an elevation of approximately 150 feet above mean sea level.

The Hudson Valley Regional Airport meteorological tower location is such that the recorded data are free of interferences caused by nearby natural or manmade structures and provides an excellent representation of dispersion characteristics within the local area. Figure 5-6 of Appendix 17-1 shows the location of the Hudson Valley Regional Airport meteorological tower in relation to the Project Site. A wind rose displaying the composite wind rose for the most recent 5-year period (2014 to 2018) of wind speed and direction is shown on Figure 5-5 of Appendix 17-1. Over the 5-year period, predominant winds varied from the north, west-southwest, and south-southeast. The average wind speed over the 5 years is 2.64 meters per second. Calm winds during the 5 years had an average frequency of 2 percent. Additionally, the wind data recorded at the Hudson Valley Regional Airport meteorological tower is consistent from year to year, indicating a stable climatic regime with few extreme conditions.

Concurrent upper air sounding data from Albany International Airport (WBAN 54775) in New York was used with the hourly surface dataset to create the meteorological dataset required for the modeling analysis. Albany International Airport is approximately 132 km to the north of the Project Site. Based on an examination of the spatial distribution of seasonal and annual mixing heights using Holzworth's *Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States* (EPA, 1972), upper air meteorological conditions in the Albany area are considered representative of the air regime at the Project Site.

Both the surface and upper air sounding data were processed by the NYSDEC using AERMOD's meteorological processor, AERMET (version 18081). The meteorological data at the Hudson Valley Regional Airport is recorded by an Automated Surface Observing System (ASOS) that records 1-minute measurements of wind direction and wind speed along with hourly surface observations. NYSDEC used the EPA AERMINUTE program to process 1-minute ASOS wind data (2014 to 2018) in order to generate hourly averaged wind speed and wind direction data to supplement the standard hourly ASOS observations. The hourly averaged wind speed and direction data generated by AERMINUTE was merged with the aforementioned hourly surface data. This fully processed, 5-year (2014 to 2018) meteorological dataset was provided by the NYSDEC. The output from AERMET was used as the meteorological database for the modeling analysis and consisted of a surface data file and a vertical profile data file.

The meteorological data recorded at the Hudson Valley Regional Airport meteorological tower and upper air data recorded from the Albany International Airport in Albany, New York are most representative of the air regime at the Project Site and were suitable to be used in an atmospheric dispersion modeling study because:

- Due to the relative proximity of the Hudson Valley Regional Airport meteorological tower to the Project Site, overall climatological conditions would be expected to be quite similar;
- The meteorological tower is well sited and in an area free of obstructions to wind flow;
- The monitoring station at the Hudson Valley Regional Airport continues to operate; and,
- The quality of the available data is good, exceeding EPA data recovery guidelines and displaying consistency from year to year of the available data record.

(2) Assessment for Existing Air Quality Levels and Air Quality Trends for Criteria Pollutants

An assessment of existing ambient air quality levels and air quality trends for pollutants in the region surrounding the Project Site, including air quality levels and trends taken from regional air quality summaries, is provided in Section 17(b).

(3) Assessment of the Impacts from Quantifiable Criteria Pollutant Emissions

The following provides an assessment of the impacts from quantifiable criteria pollutant emissions, including those generated during construction of the Project. Also provided is a qualitative assessment of construction-related emissions and impacts and an analysis of fugitive dust and a discussion of fugitive dust control measures.

Facility Related Impacts During Operation

Sections 17(h)(4) through 17(h)(14) provide an assessment of quantifiable criteria pollutant emissions and air quality impacts generated during operation of the Project.

Facility-Related Impacts During Construction

Construction activities will result in temporary increases in emissions of some pollutants due to the use of equipment powered by diesel fuel or gasoline engines. Construction activities will also result in the temporary generation of fugitive dust due to disturbance of the ground's surface and other dust-generating actions. Indirect emissions during the construction period will be associated with delivery vehicles of construction materials, equipment, and supplies, including cut and primary fill. There may also be temporary indirect emissions attributable to construction workers commuting to and from work at the Project Site during construction.

Large earth-moving equipment and other mobile sources are sources of combustion-related emissions, including criteria pollutants (i.e., NO_x, CO, VOC, SO_2, and $PM_{2.5}$/PM_{10}) and small amounts of hazardous air pollutants (HAPs). Additionally, the combustion-related emissions will include GHG.

Construction Vehicle Engine Emissions

Construction emission estimates are based on a typical construction equipment list, hours of operation, and vehicle miles traveled by the construction equipment and supporting vehicles for the Project. This is a conservative estimate based on worst-case assumptions and EPA emission factors. Nevertheless, the estimated air emissions from construction of the Project are expected to be transient in nature, with negligible impact on the regional air quality. Construction equipment will be properly tuned and operated only when needed to minimize the emissions from construction equipment.

Emissions from construction equipment engines used during Project construction-related activities have been estimated based on the anticipated types of nonroad equipment (e.g., dozers, cranes, etc.) and their associated levels of use. Emission factors in grams per horsepower-hour (g/hp-hr) for NO_x, PM_{10}/$PM_{2.5}$, SO_2, VOC, HAPs, and CO_2 for diesel and gasoline nonroad equipment engines were obtained using the most recent version of EPA's NONROAD model. NONROAD was run to obtain annual average emission factors representative of the construction period (2021 through 2023) using temperature data from Hudson Valley Regional Airport for construction sources in the local area. To be conservative, the analysis used the default engine population distribution in NONROAD. Emissions for each engine in each year were calculated as the product of the engine horsepower (hp), the engine load factor, the hours of engine use, and the emission factor. Emissions were summed over all engines for each year of construction to yield estimates of total yearly emissions from the nonroad construction equipment engines.

Emission factors in units of grams per vehicle-mile traveled (VMT) for 2021 through 2023 for on-road engine emissions were obtained for various vehicle categories based on the results of modeling using EPA Motor Vehicle Emission Simulator (MOVES) mobile source emission factor model. Factors were selected for Orange County and are representative of emission factors for the Project Area. Emission factors were obtained for various vehicle classes, including heavy-duty diesel vehicles, light-duty gasoline trucks, and light-duty gasoline vehicles.

Emissions from on-road vehicles were calculated for the following construction-related activities:

- Heavy-duty diesel vehicles and other vehicles involved in material delivery to or removal from the Project Site; and,
- Heavy-duty diesel vehicles and light-duty vehicles driven on the Project Site.

For each vehicle category and activity, emissions were calculated in each year as the product of the estimated VMT and the associated emission factor from MOVES.

Table 17-11 below summarizes the estimated emissions of criteria pollutants and total HAPs from the construction equipment. Table 17-11 also summarizes the estimated GHG emissions from operation of construction equipment and material deliveries and removals.

Table 17-11. Non-Road and On-Road Construction Vehicle Emissions

Year	CO_2	CO	NOx	PM_{10}	$PM_{2.5}$	SO_2	VOC	Total HAP
2021	7,398.3	26.5	20.5	1.5	1.27	0.045	2.6	0.19
2022	7,254.6	28.7	22.0	1.6	1.42	0.044	2.8	0.19
2023	2,250.5	18.6	8.7	0.76	0.60	0.016	1.1	0.07
Note: Emissions in tons per year.								

Emissions from Commuting Workers

There will also be some emissions attributable to vehicles driven by construction workers commuting to and from the Project Site during construction. Emission factors in grams per VMT for on-road vehicles were obtained from the EPA MOVES model. The MOVES model generates emissions based upon vehicle equipment categories and on the type and location of roads. Because workers will be commuting in passenger cars and trucks over a number of local and regional roadways, a conservative worst-case pollutant emission factor for each combination of vehicle, roadway, and location type was used in the emission calculations. In addition, some workers will use public transit and carpooling to the Project Site, which would result in reduced emissions from those presented in this analysis that are based upon all workers commuting individually in private passenger vehicles.

Table 17-12 below provides estimates of tailpipe emissions of criteria pollutants, total HAPs, and GHG from vehicles used by commuting construction workers. Note that the PM_{10} and $PM_{2.5}$ emissions also include the PM emission contributions from brake wear and tire wear.

Table 17-12. On-Road Commuting Worker Emissions

Year	CO_2	CO	NOx	PM_{10}	$PM_{2.5}$	SO_2	VOC	Total HAP
2021	1,912.5	15.2	1.31	0.24	0.053	0.0127	0.34	0.37
2022	2,332.9	18.5	1.6	0.3	0.06	0.016	0.4	0.45
2023	701.0	5.6	0.5	0.09	0.02	0.005	0.1	0.13
Note: Emissions in tons per year.								

Fugitive Dust Emissions

Fugitive dust will result from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. The amount of dust generated will be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions will be greater during dry periods and in areas of fine-textured soils subject to surface activity. Danskammer will employ proven construction-related practices to control fugitive dust such as application of water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic.

Table 17-13 below provides estimates of fugitive dust emissions associated with construction activities.

Table 17-13. Fugitive Dust Emissions from Construction Activities

Year	PM_{10}	$PM_{2.5}$
2021	20.9	2.1
2022	20.9	2.1
2023	15.7	1.6
Note: Emissions in tons per year.		

Detailed construction emissions calculations along with the methodology and emissions factors used are provided in Appendix 17-4. Table 17-4-1 in Appendix 17-4 provides a summary of construction-related emissions.

Construction-Related Mobile Source Air Emissions Quantitative Assessment

The majority of air emissions produced during construction activities will be PM_{10} and $PM_{2.5}$ in the form of fugitive dust in addition to CO and NO_x from construction equipment engines. However, these air quality impacts will generally be temporary and localized.

General conformity regulations in 40 CFR Part 93, Subpart B are designed to ensure that federal actions that occur in air quality nonattainment and maintenance areas do not interfere with a state's ability to attain or maintain compliance with a NAAQS. EPA designates the attainment status of an area on a pollutant-specific basis based on whether an area meets the NAAQS. Areas that meet the NAAQS are termed "attainment areas." Areas that do not meet the NAAQS are termed "nonattainment areas." Areas for which insufficient data are available to determine attainment status are termed "unclassified areas." Areas formerly designated as nonattainment areas that have subsequently reached attainment are termed "maintenance areas."

The General Conformity Rule establishes conformity in coordination with, and as part of, the National Environmental Policy Act process. The rule considers air pollutant emissions associated with actions that are federally funded, licensed, permitted, or approved, and ensures emissions do not contribute to air quality degradation, thus preventing the achievement of state and federal air quality goals. Succinctly, General Conformity refers to the process of evaluating plans, programs, and projects to determine and demonstrate that they meet the requirements of the CAA and applicable SIP. An implementation plan describes how ambient air quality standards will be achieved and maintained.

The activities associated with the construction of the Project and its ongoing operation are not considered to be federal actions (i.e., a Federal agency will not be providing funding for, have continuous program responsibility for or ownership of, or otherwise be approving the Project), and therefore, General Conformity is not be applicable to the Project. Nonetheless, the General Conformity regulations provide a framework for assessing the significance of direct and indirect air emissions from a project's construction and operation on a state's ability to attain or maintain compliance with a NAAQS.

As part of the General Conformity analysis, the sum of non-exempt direct and indirect emissions of nonattainment pollutants or designated precursor pollutants associated with a federal action is compared to annual General Conformity applicability emissions thresholds in 40 CFR section

93.153. If an applicability threshold is exceeded, then General Conformity applies, and a conformity determination is necessary to ensure that the Project's emissions will not interfere with a state's ability to attain or maintain compliance with a NAAQS. If emissions are below the applicability thresholds, then the emissions are considered to be *de minimis*, general conformity requirements do not apply, and the Project is deemed to have conformed to the appropriate SIP. In other words, if the emissions are considered to be *de minimis*, then a project will not cause or significantly contribute to an exceedance of a NAAQS per the regulation. Under the General Conformity regulations, emissions from stationary sources that are covered by any New Source Review (NSR) air permit (major or minor) are exempt from general conformity. Therefore, emissions covered by an NSR permit do not count toward the General Conformity applicability thresholds because sources subject to NSR are evaluated in accordance with the State Implementation Plan (SIP) requirements. The emissions associated with operation of the proposed Project will be permitted with an NSR permit to be issued by NYSDEC, and thus, would not count towards the General Conformity *de minimis* thresholds. However, emissions from other Project activities, such as mobile source emissions from construction activities, would count and are considered below.

A summary of the General Conformity *de minimis* thresholds for the Project Area is provided in Table 17-14 below.

Table 17-14. General Conformity *De Minimis* Thresholds

Air Quality Region	Nonattainment/ Maintenance Pollutant	Project Area	Project Components	General Conformity De minimis Thresholds (tons/year)
Hudson Valley Intrastate AQCR; and New York-N. New Jersey-Long Island, NY-NJ-CT	$PM_{2.5}$ - Maintenance 2008 Ozone – Ozone transport region	Air Quality Region	Fugitive Dust Generation Material Delivery and Removal Trucks Worker Commutes	$PM_{2.5}$ -100 SO_2 – 100 NO_x – 100 VOC – 50

The summary of Project construction emissions by year is summarized below in Table 17-15 for comparison to the general conformity *de minimis* thresholds. The calculated Project construction air emissions in federally designated nonattainment or maintenance areas are below the corresponding general conformity *de minimis* thresholds. Therefore, the mobile source emissions and fugitive dust air emissions associated with the construction of the Project will not cause or significantly contribute to an exceedance of a NAAQS.

Table 17-15. Construction Air Emissions Totals

Designated Pollutant	Pollutant or Precursor	General Conformity *De Minimis* Threshold	2021 Total Emissions	2022 Total Emissions	2023 Total Emissions
O_3	VOC	50	0.2	3.1	1.0
	NO_x	100	1.4	23.0	8.0
$PM_{2.5}$	$PM_{2.5}$	100	0.3	3.6	1.9
	SO_2	100	0.004	0.06	0.02
	NO_x	100	1.4	23.0	8.0
Note: Emissions in tons per year.					

Qualitative Assessment of Construction Air Impacts Summary

Temporary, local, and minor impacts to air quality could result from the operation of construction equipment and vehicles. Impacts from fugitive dust created during site preparation and travel on newly created access roads and unpaved roads could occur. Additionally, engine exhaust emissions from construction vehicles will occur. Fugitive dust and exhaust emissions will be at low levels and for limited durations, and will not significantly impact local air quality. Any impacts from fugitive dust emissions are anticipated to be short-term and localized, and will be mitigated using dust control measures as described below.

Project-related air quality impacts during the construction phase are expected to include fugitive dust emissions and vehicle emissions from ground excavation, cut and fill operations, removal of debris, concrete pouring, and equipment erection. However, because the construction period is limited and activities change during the construction phases, these emissions are only temporary and vary throughout this period.

Emissions of fugitive dust will depend on such factors as soil properties (i.e., moisture content, volume of spoils, and soil silt content), meteorological variables, and construction practices employed. For airborne particulates such as fugitive dust, the New York State Department of

Transportation (NYSDOT) recommends the use of control measures to minimize these emissions. Consistent with the NYSDOT's Environmental Procedures Manual (EPM), emissions of fugitive dust will be mitigated using the following measures:

- Water or other wetting agents on areas of exposed and dry soils;
- Covered trucks for soils and other dry materials;
- Controlled storage of spoils on the construction Site; and
- Final grading and landscaping of exposed areas as soon as possible.

NYSDOT reports that such measures have proved effective in limiting fugitive dust during construction.

Emissions from vehicles will include on-site equipment and those from construction workers. As noted in the NYSDOT's EPM, these emissions are "temporary" and "self-correcting once the project is completed." Nevertheless, NYSDOT recommends in the EPM that mitigation measures should be implemented to minimize emissions. Such measures will include proper maintenance of construction equipment, controlling unnecessary idling of equipment, and providing sufficient parking for construction workers.

(4) Control Technology Assessment

Pre-construction review for new major stationary sources involves an evaluation of BACT and/or LAER control technology. If an area is designated by EPA as attainment or unclassifiable for a particular pollutant, then new major sources would require permitting under the PSD program, including a BACT demonstration for pollutants emitted in quantities greater than the regulatory thresholds. If an area is designated by EPA as non-attainment for a given pollutant and the major source has the potential to emit the non-attainment pollutant at levels greater than the pollutant-specific regulatory thresholds, then non-attainment NSR applies. Non-attainment NSR requires the application of LAER technology and the requirement to obtain emission offsets.

A control technology analysis has been performed for the proposed Project based on guidance presented in the EPA Guidance Document *New Source Review Workshop Manual* (EPA, 1990). The detailed BACT and LAER analyses are included in Section 4 of the air permit application that is provided in Appendix 17-1 of this Exhibit.

Applicability of Control Technology Requirements

An applicability determination is the process of determining the level of emission control required for each applicable air pollutant. Control technology requirements are generally based upon the potential emissions from the new or modified source and the attainment status of the area in which the source is to be located.

PSD Pollutants Subject to BACT

Pollutants subject to PSD review are subject to a BACT analysis. BACT is defined as an emission limitation based on the maximum degree of reduction, on a case-by-case basis, taking into account energy, environmental, and economic considerations. The proposed Project is considered a major stationary source, as defined under the CAA, because potential emissions exceed major source thresholds. Individual regulated pollutants are subject to BACT requirements if potential emissions exceed the significant emission rates presented in 40 CFR 52.21(b)(23) in a PSD (attainment) area, as presented in Table 17-3. Based upon these criteria, NO_x, CO, PM_{10}/$PM_{2.5}$, H_2SO_4, and GHG are all subject to BACT requirements. Because the area is designated attainment for NO_2, NO_X emissions are subject to BACT. However, because NO_X is also a precursor for ozone formation and subject to NNSR, the more stringent LAER requirements under the ozone transport region provisions apply. Because LAER technology is generally at least as stringent as BACT, the LAER analysis will satisfy the BACT requirements for NO_X.

Non-Attainment Pollutants Subject to LAER

Pollutants subject to NNSR must be limited to LAER levels. LAER is defined as the more stringent of (1) the most stringent emission limitation, which is achieved in practice by the class or category of source, or (2) the most stringent emission limitation contained in the applicable SIP (unless such emission rate is demonstrated not to be achievable), whichever is more stringent. LAER is based upon the lowest permitted emission rates that are verified as being achieved in practice. Pollutants are subject to LAER if potential emissions of individual pollutants exceed area-specific emission thresholds. Based upon these criteria, emissions of VOC and $NO_{X,}$ as precursors to ozone formation, are subject to LAER requirements.

Summary of Control Technology Proposals

Tables 17-16 through 17-20 provide a summary, by pollutant, of the proposed control technology for the combined-cycle combustion turbine, auxiliary boiler, emergency diesel generator, and emergency diesel fire pump at the Project.

Table 17-16. Summary of Proposed Emissions – Combined-Cycle Combustion Turbine (Gas Firing)

Pollutant	LAER/BACT	Method	Basis
NO_X	2.0 ppm (with and without duct firing)	SCR and Dry Low-NO_x Burner	LAER
VOC	0.7 ppm (without duct firing) 1.6 ppm (with duct firing)	Oxidation catalyst and good combustion practices	LAER
CO	1.0 ppm (without duct firing) 2.0 ppm (with duct firing)	Oxidation catalyst and good combustion practices	BACT
$PM/PM_{10}/PM_{2.5}$[4]	0.0040 lbs./MMBtu (without duct firing) 0.0055 lbs./MMBtu (with duct firing)	Low-sulfur fuels	BACT
SO_2	0.50 grains Sulfur/100 scf (gas firing)	Low-sulfur fuels	NSPS (KKKK)
H_2SO_4	0.0014 lbs./MMBtu (with and without duct firing)	Low-sulfur fuels	BACT
GHG	6,925 Btu/kWh (gross) at ISO conditions and 100% load (without duct firing) 1,927,496 tons/year of CO_2e	Clean fuels and thermal efficiency	BACT
NH_3	5 ppm	N/A	OTHER

Notes:

1 “ppm” refers to ppmvd @ 15% O_2; lbs./MMBtu limits are HHV basis. All ppm values are 1-hour averages.

2 Project may exceed short-term limits during defined startup and shutdown periods.

3 All proposed emission limits (in units of ppm and lbs./MMBtu) do not serve as the basis for determining annual emission limits. Refer to Appendix 17-1 for potential annual emissions calculations.

4 Includes filterables, condensables, and sulfates.

Table 17-17. Summary of Proposed Emissions – Combined Cycle Combustion Turbine (ULSD Firing)

Pollutant	LAER/BACT	Method	Basis
NO_X	4.0 ppm	SCR and Water injection	LAER
VOC	2.0 ppm	Oxidation catalyst and good combustion practices	LAER
CO	2.0 ppm	Oxidation catalyst and good combustion practices	BACT
$PM/PM_{10}/PM_{2.5}$[4]	0.0089 lbs./MMBtu	Low-sulfur fuels	BACT
SO_2	0.0015% sulfur, by weight	Low-sulfur fuels	NSPS (KKKK)
H_2SO_4	0.0015% sulfur, by weight	Low-sulfur fuels	BACT
GHG	See Table 17-16	Clean fuel and thermal efficiency	BACT
NH_3	5 ppm	N/A	OTHER

Notes:

[1] "ppm" refers to ppmvd @ 15% O_2; lbs./MMBtu limits are HHV basis. All ppm values are 1-hour averages.

[2] Project may exceed short-term limits during defined startup and shutdown periods.

[3] All proposed emission limits (in units of ppm and lbs./MMBtu) do not serve as the basis for determining annual emission limits. Refer to Appendix 17-1 for potential annual emissions calculations.

[4] Includes filterables, condensables, and sulfates.

Table 17-18. Summary of Proposed Emissions - Auxiliary Boiler

Pollutant	LAER/BACT	Method	Basis
NO_x	0.0086 lbs./MMBtu (gas firing)	Ultra-Low NO_x burner and Flue Gas Recirculation	LAER
VOC	0.0017 lbs./MMBtu (gas firing)	Good combustion practices	LAER
CO	0.037 lbs./MMBtu (gas firing)	Good combustion practices	BACT
$PM/PM_{10}/PM_{2.5}$	0.0074 lbs./MMBtu (gas firing)	Low-sulfur fuels	BACT
SO_2	0.50 grains sulfur/100 scf (gas firing)	Low-sulfur fuels	OTHER
H_2SO_4	0.50 grains sulfur/100 scf (gas firing)	Low-sulfur fuels	BACT
GHG (CO_2e)	26,959 tons/year	Clean fuels, limited operation	BACT

Table 17-19. Summary of Proposed Emissions - Emergency Diesel Generator

Pollutant	LAER/BACT	Method	Basis
NO_x	4.8 g/hp-hr	Limited operation	LAER
VOC	0.28 g/hp-hr	Good combustion practices and limited operation	LAER
CO	2.6 g/hp-hr	Good combustion practices and limited operation	BACT
$PM/PM_{10}/PM_{2.5}$	0.15 g/hp-hr	Low-sulfur fuels	BACT
SO_2	0.0015% sulfur fuel, by weight	Low-sulfur fuels	OTHER
H_2SO_4	0.0015% sulfur fuel, by weight	Low-sulfur fuels	BACT
GHG (CO_2e)	399 tons/year	Limited operation	BACT

Table 17-20. Summary of Proposed Emissions - Emergency Diesel Fire Pump

Pollutant	LAER/BACT	Method	Basis
NO_x	3.0 g/hp-hr	Limited operation	LAER
VOC	0.12 g/hp-hr	Good combustion practices and limited operation	LAER
CO	2.6 g/hp-hr	Good combustion practices and limited operation	BACT
$PM/PM_{10}/PM_{2.5}$	0.15 g/hp-hr	Low-sulfur fuels	BACT
SO_2	0.0015% sulfur fuel, by weight	Low-sulfur fuels	OTHER
H_2SO_4	0.0015% sulfur fuel, by weight	Low-sulfur fuels	BACT
GHG (CO_2e)	47 tons/year	Limited operation	BACT

(5) Maximum Achievable Control Technology

The Project's HAP emissions do not exceed regulatory thresholds. Therefore, a case-by-case determination of the Maximum Achievable Control Technology is not required and was not conducted.

(6) Requirements of New Source Performance Standards

The requirements of NSPS at 40 CFR Part 60 are addressed in Section 17(a).

(7) Assessment of Optimal Stack Height

Section 123 of the CAA required EPA to promulgate regulations to assure that the degree of emission limitation for the control of any air pollutant under an applicable SIP was not affected by (1) stack heights that exceed Good Engineering Practice (GEP); or (2) any other dispersion technique. EPA provides specific guidance for determining GEP stack height and for determining whether building downwash will occur in the Guidance for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations), (EPA, 1985). GEP is defined as:

…the height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, and wakes that may be created by the source itself, or nearby structures, or nearby terrain "obstacles."

The GEP definition is based on the observed phenomenon of atmospheric flow in the immediate vicinity of a structure. It identifies the minimum stack height at which significant adverse aerodynamics (downwash) are avoided. The EPA GEP stack height regulations (40 CFR Part 51.100) specify that the GEP stack height (H_{GEP}) be calculated using the following equation:

$$H_{GEP} = H_B + 1.5L$$

Where: H_B = the height of adjacent or nearby structures, and

L = the lesser dimension (height or projected width of the adjacent or nearby structures).

A detailed plot plan of the proposed Project is shown on Figure 5-4 of Appendix 17-1. A GEP stack height analysis has been conducted using the EPA-approved Building Profile Input Program with PRIME (BPIPPRM, version 04274). Controlling structures include the steam turbine generation building (80 feet above grade), the air-cooled condenser (120 feet above grade), and the HRSG (121 feet above grade).

In addition to the proposed Project structures, the air quality modeling analysis includes the building structures associated with the existing Danskammer Generating Station because part of the existing Station (the existing precipitator building and the existing Unit 3/4 exhaust stack) could be razed in the future after the Project is operational. Thus, the air quality modeling analysis was conducted for two phases of the Project. The first phase will consist of an interim operational time period that the existing Danskammer Generating Station structures remain in place while the Project is commercially operating. The second phase will consist of an option where a portion of the existing Danskammer Generating Station could be razed.

Concerted efforts were expended by Danskammer to minimize the visibility of the proposed Project including changes to the Project's profile and size. The Project's combustion turbine/HRSG exhaust stack is the most visually prominent feature. A primary way of minimizing stack height is to limit the height of nearby controlling structures that determine the stack height in accordance with GEP guidelines. The maximum GEP stack height for the combustion turbine/HRSG stack was calculated to be 362.4 feet (110.46 meters) above grade.

Due to the inherently low emissions resulting from natural gas and ULSD for backup fuel usage, air quality standards will be achieved with a lower than GEP stack height. Through optimization, final emission data from the equipment vendor and further refinement in the Project design and modeling analysis, the stack height was reduced further to 200 feet. A stack height of 200 feet was determined to be the minimum stack height required to ensure modeled compliance with the ambient air quality standards. This height represents an optimal compromise between minimizing the visual effects and minimizing the air quality impacts. Further, the proposed Project's combustion turbine/HRSG exhaust stack will be lower than the existing Station's exhaust stacks (Unit 1 and 2 plant exhaust stacks are approximately 220 feet above grade and Units 3 and 4 have a combined stack (a concrete shell houses both stacks) at approximately 240 feet above grade).

Direction-specific downwash parameters for the combustion turbine/HRSG exhaust stack were determined using the EPA BPIPPRM model. Direction-specific downwash parameters for the additional ancillary equipment exhaust stacks (i.e., auxiliary boiler, emergency diesel generator, and emergency diesel fire pumps) were also determined using BPIPPRM. Any direction-specific building downwash parameters were input to the NYSDEC Part 201/231 modeling analysis.

(8) Assessment of Stack Emissions of Criteria Pollutants

Summary tables of the stack emissions of criteria pollutants provided in hourly and annual estimates are provided in Section 17(c). Detailed criteria emission calculations for the proposed combustion sources, including references to emissions factors and other regulatory specifications, are provided in Tables B-3 through B-5 and Tables B-8 through B-11 of the NYSDEC Part 201/231 air permit application in Appendix 17-1.

(9) Nitrogen Oxides and Volatile Organic Compounds Offsets, NO_X RACT, and Acid Rain Program

Emission Offset Requirements

A major source or major modification planned in an EPA-designated non-attainment or transport area must obtain emissions reductions as a condition for approval. The emissions reductions, generally obtained from existing sources located in the vicinity of a proposed source, must offset the emissions increase from the new source or modification. These offsets, obtained from existing sources that implement a permanent, enforceable, quantifiable, and surplus emissions reduction, must equal the emissions increase from the new source or modification multiplied by the offset ratios established in 6 NYCRR Subpart 231-13. For the Project, the required offset ratio is 1.15:1.

In accordance with 6 NYCRR Subpart 231-6.6, proposed NSR major modifications located in an attainment area of the State within the ozone transport region may obtain emission offsets of VOC or NO_X from any location within the ozone transport region. These offsets may also be obtained from another state in the ozone transport region, provided that an interstate reciprocal trading agreement is in place.

The Project is located in an ozone transport region and will be required to purchase ERCs from a source (or sources) located in the ozone transport region. In order to streamline the procedures for satisfying the “contribution test” for NO_X and VOC offsets, NYSDEC developed a graphic that delineates the upwind, downwind, and crosswind zones where sources of VOC and NO_X offsets can be located relative to the source needing the offsets. This graphic is presented as “Figure 2" in Appendix E of NYSDEC’s *DAR-10 - NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis* (NYSDEC, May 2006). Additionally, DAR-10 provides a table of default acceptable NO_X and VOC offset source areas for proposed sources in New York State. Based upon Table 2 of DAR-10, NO_X and VOC offsets for the Project can be obtained from all sources in New York State.

Each emission source providing offsets must be identified along with the proposed mechanism to affect the emission reduction. After the sources of the emission offsets are identified, the offsets will need to be certified pursuant to the requirements of 6 NYCRR Subpart 231-10. If the source identification is not made prior to the issuance of a draft permit for the Project, then the offset transaction will be subject to a notice and hearing process separate from the air permit application itself. ERCs may be created from past or future Project shutdowns, emission unit shutdowns or other reduction mechanisms acceptable to NYSDEC.

NYSDEC maintains a registry of emission reduction credits for sources that have fulfilled the requirements for certifying emission reduction credits through enforceable permit modifications. This registry may be utilized in identifying such offsets. As of September 2019, the ERC Registry reported more than 23,444 tons of NO_X offsets and 2,479 tons of VOC offsets available within New York State.[1] Danskammer is presently in discussions relating to NO_X and VOC offsets from both eligible in-state and out-of-state sources located within the applicable emissions trading area identified in DAR-10 and described above.

[1] The ERC Registry is available at https://www.dec.ny.gov/chemical/8564.html.

The calculation of required offsets for the proposed Project is presented in Table 17-21 below.

Table 17-21. Calculation of Offsets

Non-Attainment Pollutant	Potential Emissions Increase (tons/year)	Proposed Offset Ratio	Required Offsets (Rounded Up)
NO_X	99.3	1.15:1	115
VOCs	56.5	1.15:1	65

NO_X RACT Requirements

The NO_X Reasonable Available Control Technology requirements applicable to the Project are addressed in Section 17(a).

Acid Rain Program Requirements

The Acid Rain Program requirements applicable to the Project are addressed in Section 17(a).

(10) Criteria Pollutant Modeling

An air quality modeling analysis was performed consistent with the procedures found in the following documents: *Guideline on Air Quality Models (Revised)* (EPA, 2017), *New Source Review Workshop Manual* (EPA, 1990), *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources* (EPA, 1992), and *DAR-10: NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis* (NYSDEC, 2006).

As stated previously in Section 17(g), the modeling methodology used for assessing the proposed Project's air quality impact was detailed in the Air Quality Modeling Protocol submitted to NYSDEC on May 15, 2019 and approved by NYSDEC in a comment letter dated June 20, 2019.

The modeling input and output files that are provided to NYSDEC and EPA as Appendix G to the NYSDEC Part 201/231 air permit application are provided as Appendix 17-1 to this Exhibit. Figures 5-7 through 5-18 of Appendix 17-1 show the maximum modeled criteria pollutant specific impact areas in graphical format on a map of the surrounding community. A wind rose displaying the composite wind data (i.e., wind speed and direction) from the Hudson Valley Regional Airport for the most recent 5-year period (2014 to 2018) is shown on Figure 5-5 of Appendix 17-1.

(11) A Comparison of the Predicted Air Quality Impacts from the Dispersion Modeling Analysis to the Significant Impact Levels and NAAQS/NYAAQS

The first step in an air quality modeling analysis is to determine if the Project will result in significant impacts for any criteria pollutant. EPA and NYSDEC SILs are presented in Table 17-1. Under longstanding EPA guidance and interpretations, the SILs are used to determine if a source makes or could make a significant contribution to a predicted violation of a NAAQS or PSD increment. If a source is predicted to have maximum impacts that are below the SILs, then a cumulative (or multisource) impact analysis that includes other facilities is not required, and the impacts of the project are considered *de minimis* or insignificant.

To determine if the overall operations of the Project will have significant impacts, the Project was modeled using the worst-case combustion turbine operating scenarios, as identified through a detailed load screening analysis detailed in section 5.6 of the NYSDEC Part 201/231 air permit application provided in Appendix 17-1, and under the following Project operating scenarios:

- The annual emission rate for the combined-cycle turbine is based on 8,760 hours per year with up to 4,380 hours of operation of the natural gas-fired duct burner and up to 720 hours of operation on ULSD;
- The auxiliary boiler will operate up to 4,800 hours per year; and
- The diesel-fired fire-water pumps and diesel-fired emergency generator are expected to operate 250 hours per year per unit (operability testing, typically 1-hour per week intermittently). Modeled emission rates for the diesel generator and the fire-water pump engines were normalized based on 1-hour of operation within the averaging periods for $PM_{2.5}$ modeling. The short-term modeling analyses for CO and SO_2 were conservatively based on the emergency engines operating all hours of the hourly to daily averaging periods. Similarly, the annual emission rates were annualized based on the 250 hours per year.

Table 17-22 below presents the maximum modeled air quality concentrations during normal operations of the proposed Project calculated by AERMOD for either future building downwash scenario assessed per the discussion in Section 17(h)(7). As shown in this table, the maximum concentrations are below the applicable SILs, except for 1-hour NO_2, 24-hour PM_{10}/$PM_{2.5}$, and annual $PM_{2.5}$. In addition, as shown in Table 5-10 of Appendix 17-1, the maximum modeled concentrations with the addition of ambient background levels are below the NAAQS and NYAAQS.

Table 17-22. Maximum Modeled Concentrations Due to Normal Operations Compared to SILs

Pollutant	Averaging Period	SIL Concentration (μg/m^3)	Maximum Modeled Concentration (μg/m^3)
CO	1-Hour	2,000	531
	8-Hour	500	211
SO_2	1-Hour	7.8	4.9
	3-Hour	25	3.5
	24-Hour	5	1.7
	Annual	1	0.06
PM_{10}	24-Hour	5	6.0
	Annual	1	0.2
$PM_{2.5}$	24-Hour	1.2	3.9[3]
	Annual	0.2	0.2[4]
NO_2	1-Hour	7.5	23.6[1, 2]
	Annual	1	0.6[1]

Notes:

1 Includes use of Plume Volume Molar Ratio Method (PVMRM).

2 Based upon maximum first highest maximum daily 1-hour results averaged over 5 years.

3 Based upon maximum first highest 24-hour results averaged over 5 years, including secondary formation.

4 Maximum annual results averaged over 5 years, including secondary formation. Note that the maximum modeled impact is below the SIL for the operational scenario that includes downwash from buildings associated with the existing Danskammer Generating Station.

By showing that maximum predicted Project impacts will be below the corresponding SILs for SO_2 and CO, the Project is exempt from the requirement to conduct any additional analyses to demonstrate compliance with the NAAQS for these pollutants. Additionally, the modeled impacts for annual NO_2 and PM_{10} are below the corresponding SILs and thus, the Project is also exempt from the requirement to conduct additional analysis for the annual NO_2 and PM_{10} averaging periods.

(12) State Acid Deposition Control Act

In accordance with the State Acid Deposition Control Act, an assessment of the Project's contribution to the New York State total deposition of sulfates and nitrates at 18 NYSDEC-defined sensitive receptors in New York State, New England, and Canada. The analysis followed the methodology presented in the March 4, 1993 memorandum from Leon Sedefian (of NYSDEC) to Impact Assessment and Meteorology (IAM) staff. The components of the analysis are as follows:

1. Select a representative source that best represents the proposed (new) source. If a representative source cannot be found, then select the New York county in which the project is located.

2. Reference the tables contained in the memorandum, determine the proposed source NO_x and SO_2 impacts by scaling the reference source or county NO_x and SO_2 impacts at each of the 18 receptors by the ratio of the new source NO_x and SO_2 emissions over the reference source or county NO_x and SO_2 emissions.

3. Calculate the percentage contribution of new source NO_x and SO_2 impacts to the total impacts determined for each of the 18 receptors from all sources.

The results of the analysis are presented in Table 17-23 below. The reference source used in the analysis was Orange County. New source emissions were scaled as described above, and percent contribution of total values were determined. Given the firing of natural gas and the use of LAER NO_x control, the proposed Project’s contribution to the New York State total deposition of sulfates and nitrates at each of the 18 receptors are below 0.16 percent.

Table 17-23. Acid Deposition Impacts

	Receptor SO_2 Impact (g/m²/yr)				Receptor NO_x Impact (Kg/Ha)			
Receptor Name	**Reference Source**	**All NY Sources**	**Proposed Source**	**% of All NY**	**Reference Source**	**All NY Sources**	**Proposed Source**	**% of All NY**
Whiteface	0.000616	0.143425	0.00000451	0.0031%	0.045065	4.136114	0.00068928	0.0167%
W. Adirondacks	0.000618	0.201734	0.00000453	0.0022%	0.038782	5.179167	0.00059318	0.0115%
Catskills	0.001778	0.263758	0.00001302	0.0049%	0.110809	7.107259	0.00169485	0.0238%
West Point	0.003543	0.332539	0.00002595	0.0078%	0.241563	11.260204	0.00369477	0.0328%
Chautauqua	0.000356	0.178049	0.00000261	0.0015%	0.00922	1.581787	0.00014102	0.0089%
Brookhaven	0.113367	0.671944	0.00083022	0.1236%	1.868847	18.500769	0.02858448	0.1545%
Bennett's Bridge	0.000585	0.409691	0.00000428	0.0010%	0.030332	7.170561	0.00046394	0.0065%
Green Mountains	0.00069	0.121215	0.00000505	0.0042%	0.057964	3.440833	0.00088657	0.0258%
Berkshires	0.002177	0.32963	0.00001594	0.0048%	0.195805	8.233134	0.00299489	0.0364%
Connecticut	0.00647	0.291966	0.00004738	0.0162%	0.898317	9.387031	0.01373998	0.1464%
Muskoka	0.000204	0.03358	0.00000149	0.0044%	0.00688	0.589719	0.00010523	0.0178%
S. New Hampshire	0.001155	0.065597	0.00000846	0.0129%	0.072368	1.366437	0.00110689	0.0810%
New Hampshire	0.000727	0.090665	0.00000532	0.0059%	0.067505	2.380087	0.00103251	0.0434%
SW Quebec	0.000153	0.016791	0.00000112	0.0067%	0.007991	0.499722	0.00012222	0.0245%
S Quebec	0.000267	0.024986	0.00000196	0.0078%	0.026585	1.015349	0.00040662	0.0400%
NE Quebec	0.000128	0.008503	0.00000094	0.0110%	0.013489	0.368393	0.00020632	0.0560%
Newfoundland	0.000225	0.012184	0.00000165	0.0135%	0.011406	0.24335	0.00017446	0.0717%
Hubbard Brook	0.001043	0.138607	0.00000764	0.0055%	0.090467	3.27392	0.00138372	0.0423%

(13) Cumulative Source Impact Analysis

The maximum modeled concentrations of 24-hour $PM_{10}/PM_{2.5}$, annual $PM_{2.5}$, and 1-hour NO_2 have been determined to be above their respective SILs as shown in Table 17-22. Therefore, they are the only pollutants/averaging periods determined to have a significant area of impact, thus requiring additional impact assessments. The additional impact assessment required is a multiple source NAAQS and PSD Class II increment modeling assessment.

The first step of conducting a cumulative NAAQS/PSD Class II increment analysis is to determine the pollutant specific area(s) of impact of the proposed Project. The area of impact corresponds to the distance at which the model calculated pollutant concentrations fall below the SILs. The maximum modeled area of impact for the Project is 18.26 km for 1-hour NO_2. The second step is obtaining an off-site major source emissions inventory for sources within the area of impact plus those that are nearby to the Project. EPA guidance for nearby sources provided in the EPA *Guideline on Air Quality Models* (Revised) (EPA, 2017) defined these sources as:

Individual sources located in the vicinity of the source(s) under consideration for emissions limits that are not adequately represented by ambient monitoring data. Typically, sources that cause a significant concentration gradient in the vicinity of the source(s) under consideration for emissions limits are not adequately represented by background ambient monitoring. The number of nearby sources to be explicitly modeled in the air quality analysis is expected to be few except in unusual situations. In most cases, the few nearby sources will be located within the first 10 to 20 km from the source(s) under consideration.

The NYSDEC was consulted regarding sources within 30 km of the proposed Project Site be used. The NYSDEC's response was coordinated with the USEPA. This distance incorporates nearby sources within the significant impact area and those within the recommended 10 to 20 km distance from the proposed Project Site. Additional sources within 20 to 30 km from the proposed Project Site were requested to conservatively represent the sources that may cause a significant concentration gradient within the vicinity of the proposed Project.

Upon request, and from its Air Facility System database, the NYSDEC Central Office in Albany provided a comprehensive inventory of sources and relevant emissions and stack exhaust data for individual emission points located within a 30-km radius of the proposed Project. Section 6 of the NYSDEC Part 201-231 Air Permit Application in Appendix 17-1 provides a detailed inventory of sources and the modeling methodology used to perform the multisource modeling analysis.

A summary of the multisource NAAQS analyses is provided in the following sections for each pollutant and applicable air quality standard. The maximum modeled NAAQS results are provided in Table 17-24 below. Based on the PSD Class II increment analysis provided in Appendix 17-1, the results of the multiple source modeling demonstrate compliance for 24-hour and annual PM2.5 and 24-hour PM10 PSD increments .

Table 17-24. Multisource Maximum Modeled NAAQS Concentrations

Pollutant	Averaging Period	NAAQS (ug/m^3)	Maximum Modeled Multisource Concentration (μg/m^3)	Background Concentration (ug/m^3)	Total Concentration (μg/m^3)
$PM_{2.5}$	24-Hour	35	6.4	16.6	23.0
PM_{10}	24-Hour	150	14.2	32.0	46.2
$PM_{2.5}$	Annual	12	1.2	6.2	7.4
NO_2	1-Hour	188	235	-- [1]	235

Notes:

[1] Included in maximum modeled concentration based on results of AERMOD PVMRM modeling assessment using AERMOD with background concentrations that vary by season and hour of day, as discussed in Appendix 17-1.

***$PM_{2.5}$* and *PM_{10}* NAAQS Compliance**

Multiple source modeling was performed to assess the impacts of the Project plus nearby sources of $PM_{2.5}$, including representative ambient monitored background $PM_{2.5}$ concentrations. As shown in Table 17-24, the modeled multiple source impacts demonstrate compliance with the NAAQS. Specifically, the modeled concentration for 24-hour $PM_{2.5}$ from all sources combined, plus ambient background, equals 23.0 μg/m^3, which is well below the 24-hour $PM_{2.5}$ NAAQS of 35 μg/m^3. Similarly, the modeled annual concentration for $PM_{2.5}$ from all sources combined, plus ambient background, equals 7.4 μg/m^3, which is well below the annual $PM_{2.5}$ NAAQS of 12 μg/m^3. Additionally, the modeled PM_{10} concentration from all sources combined, plus ambient background, equals 46.2 μg/m^3, is well below the 24-hour PM_{10} NAAQS of 150 μg/m^3. Thus, the results of the multiple source modeling demonstrate that the Project will not cause or significantly contribute to an exceedance of the PM_{10}/$PM_{2.5}$ NAAQS.

1-Hour NO_2 NAAQS Compliance

Multiple source modeling was performed to assess the impacts of the Project plus other major sources of NO_2 in the surrounding region, including conservative ambient monitored background data as discussed in Section 17(b). The modeling was conducted to demonstrate that the total combined impacts of the Project and the other permitted sources in the region, plus the background concentrations, will comply with the 1-hour NAAQS for NO_2. Multiple source impacts were modeled using the worst-case normal operating scenario for the single source modeling, with all other sources at maximum permitted emission rates.

The results of the multiple source modeling analyses indicate that there are potential exceedances of the NAAQS within the significant impact area (SIA). When a violation of the NAAQS is predicted at receptor(s) in the SIA, a source is not considered to have caused or contributed to the violation if its own impact is insignificant (i.e., the source's contribution to the modeled violations is less than the SIL) at the violating receptor at the time of the predicted violation.

The maximum modeled 1-hour NO_2 concentration was 235 $\mu g/m^3$, which occurred 4.1 km to the west of the Project, and which the Project contributed 0.7 ug/m^3, which is much lower than the SIL of 7.5 ug/m^3. The maximum contribution by the Project during normal operation to a modeled exceedance of the NAAQS was 2.2 $\mu g/m^3$. Thus, the Project contribution to modeled exceedances of the NAAQS is well below the NO_2 1-hour SIL, and as such demonstrates compliance with the 1-hour NO_2 NAAQS.

Thus, the results of the multiple source modeling for 1-hour NAAQS demonstrate that the Project will not cause or significantly contribute to a modeled exceedance of the NO_2 NAAQS.

(14) Startup and Shutdown Conditions and Ancillary Emissions

Ancillary emission sources are included in the air quality analyses presented in Section 17(h)(11) through 17(h)(13). Aqueous ammonia accidental release scenarios are addressed in Section 17(e). The following section addresses startup and shutdown conditions.

Startup and shutdown of a combustion turbine are short-term, transitional modes of operation for the combined-cycle unit. In combined-cycle operation, where the exhaust gases are directed through an HRSG to produce steam for a steam turbine generator, additional startup time is necessary in order to reduce thermal shock and excessive wear in both the HRSG and the steam turbine. Emission rates of some pollutants may be higher during startup and shutdown operations because emissions controls are not fully effective unless a minimum threshold operating load and or control device temperature is attained. The need for additional modeling to account for predicted short-term Project impacts during startup and shutdown of the combined-cycle unit was assessed for those criteria pollutants whose short-term emission rates during startup may exceed those during normal operation and for which a short-term NAAQS has been defined (i.e., for CO and NO_2). Furthermore, in order to facilitate startup of the combustion turbine generator and steam turbine generator, as well as for maintenance purposes, the auxiliary boiler may operate simultaneously with the combustion turbine. Thus, combustion turbine startup conditions with auxiliary boiler operation were included in the startup modeling analysis.

The results of the startup modeling analysis are summarized in Tables 17-25 and 17-26. As shown in Table 17-25 below, the maximum modeled startup/shutdown periods do not exceed any applicable SIL, except 1-hour NO_2.

Table 17-25. Maximum Modeled Concentrations During Startup/Shutdown Compared to SILs

Pollutant	Averaging Period	Significant Impact Concentration ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)
CO	1-Hour	2,000	565
	8-Hour	500	212
NO_2	1-Hour	7.5	55.9[1, 2]

Notes:

1 Includes use of PVMRM modeling algorithm in AERMOD.

2 Based upon maximum first-highest maximum daily 1-hour results averaged over 5 years.

Additionally, as shown in Table 17-26 below, none of the pollutants exceed any applicable PSD Class II increment, nor when combined with a representative background concentration, exceed any applicable NAAQS/NYAAQS.

Table 17-26. Maximum Modeled Concentrations During Startup/Shutdown Compared to PSD Increments and NAAQS

Pollutant	Averaging Period	Class II PSD Increment (μg/m³)	NAAQS (μg/m³)	Maximum Modeled Concentration (μg/m³)	Background Concentration (μg/m³)	Total Concentration (μg/m³)
CO	1-Hour	-	40,000	565	2,300	2,865
	8-Hour	-	10,000	212	1,380	1,592
NO_2	1-Hour	-	188	48.1[1, 2]	103.9	152.0

Notes:

1 Includes use of PVMRM modeling algorithm in AERMOD.

2 Maximum eighth-highest maximum daily 1-hour results averaged over 5 years.

17(i) Non-Criteria Pollutant Study

(1) Review of Pertinent Available data on Non-Criteria Pollutants

Emissions of air contaminants from the proposed combustion sources have been estimated based upon expected vendor emission guarantees, control technology analysis results, emission factors presented in the EPA publication *Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources* (EPA, 2000), (AP-42), Ventura County *APD Combustion Emission Factors* (May 2001), and engineering estimates.

Potential emissions of non-criteria pollutants from the operation of the combustion sources at the proposed Project have been quantified based on the following emissions data:

- Combustion turbine non-criteria emissions have been quantified based on AP-42 - Chapter 3.1 (April 2000), except for formaldehyde which was based on vendor data.
- Duct Burner and Auxiliary Boiler non-criteria emissions have been quantified based on emission factors from AP-42 Chapter 1.4 (July 1998), except for benzene, formaldehyde, naphthalene, acrolein, propylene, toluene, xylenes, ethyl benzene, and hexane, which were based on Ventura County APD Combustion Emission Factors (May 2001).
- The non-criteria emissions from the Fire Pump engines have been quantified based on emission factors from AP-42 Chapters 3.3 (October 1996).
- The Emergency Generator engine non-criteria emissions have been quantified based on emission factors from AP-42 Chapter 3.4 (October 1996).

(2) Assessment of Emission Rates for Non-Criteria Pollutants

Summary tables of the stack emissions of non-criteria pollutants provided in hourly and annual estimates are provided in Appendix 17-1. Detailed non-criteria emission calculations for the proposed combustion sources are provided in Table F-3 of Appendix 17-1. The short-term emission rates were calculated by multiplying the appropriate emission factors as provided in Table F-3 in units of lbs./MMBtu with the maximum potential heat input rating in units of MMBtu/hr. The resultant annual emission rates were calculated by multiplying the maximum annual number of hours per year that each piece of equipment may potentially operate by the maximum hourly emission rate to arrive at an annual emission rate in units of tons per year.

(3) and (4) Maximum Potential Air Concentrations of Non-Criteria Pollutants Compared to NYSDEC Guideline Concentrations

Maximum potential ground level air concentrations (short-term and annual averages) of non-criteria pollutants from the Project were quantified using the models and approach as approved by the EPA and NYSDEC. A comparison of the maximum predicted air concentrations of non-criteria pollutants to NYSDEC Short-term and Annual Guideline Concentrations is provided in Table 17-27 below. For those NYSDEC Short-term Guideline Concentrations that are based on occupational guidelines, other short-term health-based comparison values, such as the ATSDR Acute Minimal Risk Levels (MRL), were compared to predicted air concentrations.

As shown in Table 17-27 below, all of the maximum modeled toxic air pollutants are well below their corresponding NYSDEC SGC and AGC and ATSDR Acute MRLs.

Table 17-27. Maximum Modeled Concentrations Compared to NYSDEC Guideline Concentrations[1]

Non-Criteria Pollutants	NYSDEC SGC (ug/m^3)	NYSDEC AGC (ug/m^3)	ATSDR Acute MRL (ug/m^3)	1-hr Maximum Modeled Concentration		Annual Maximum Modeled Concentration	
				Facility (ug/m^3)	% SGC	Facility (ug/m^3)	% AGC
1,3-Butadiene	---	3.30E-02		**5.81E-02**	N/A	**9.01E-05**	0.2729%
1,1,1-Trichloroethane	---	1.4		**0.00E+00**	N/A	**0.00E+00**	0.0000%
2-Methylnapthalene	---	7.1		**4.37E-05**	N/A	**5.57E-07**	0.0000%
3-Methylchloranthrene				**3.28E-06**	N/A	**4.18E-08**	N/A
7,12-Dimethylbenz(a)anthracene				**2.91E-05**	N/A	**3.71E-07**	N/A
Acenaphthene				**3.26E-03**	N/A	**1.99E-06**	N/A
Acenaphthylene				**7.47E-03**	N/A	**5.04E-06**	N/A

Table 17-27. Maximum Modeled Concentrations Compared to NYSDEC Guideline Concentrations[1]

Non-Criteria Pollutants	NYSDEC SGC (ug/m³)	NYSDEC AGC (ug/m³)	ATSDR Acute MRL (ug/m³)	1-hr Maximum Modeled Concentration		Annual Maximum Modeled Concentration	
				Facility (ug/m³)	% SGC	Facility (ug/m³)	% AGC
Acetaldehyde	470	4.50E-01		**4.90E-01**	0.1042%	**2.19E-03**	0.4874%
Acrolein	2.5	3.50E-01		**6.96E-02**	2.7860%	**3.72E-04**	0.1064%
Ammonia	2,400	100	11,800	**2.22E+01**	0.9239%	**3.19E-01**	0.3191%
Anthracene	---	2.00E-02		**1.55E-03**	N/A	**1.34E-06**	0.0067%
Arsenic	---	2.30E-04		**2.79E-02**	N/A	**4.07E-05**	17.6954%
Barium	---	5.00E-01		**8.01E-03**	N/A	**1.02E-04**	0.0204%
Benz(a)anthracene	---	2.00E-02		**1.12E-03**	N/A	**1.07E-06**	0.0054%
Benzene	1,300	1.30E-01		**1.00E+00**	0.0773%	**1.30E-03**	0.9998%
Benzo(a)pyrene				**2.31E-04**	N/A	**1.91E-07**	N/A
Benzo(b)fluoranthene				**6.68E-04**	N/A	**3.80E-07**	N/A
Benzo(b,k)fluoranthene				**0.00E+00**	N/A	**0.00E+00**	N/A
Benzo(g,h,i)perylene				**5.36E-04**	N/A	**4.24E-07**	N/A
Benzo(k)fluoranthene				**1.96E-04**	N/A	**1.78E-07**	N/A
Beryllium	---	4.20E-04		**7.93E-04**	N/A	**1.29E-06**	0.3070%
Butane	238,000	---		**3.82E+00**	0.0016%	**4.87E-02**	N/A
Cadmium	---	2.40E-04		**1.33E-02**	N/A	**4.04E-05**	16.8523%
Chromium	---	45		**2.93E-02**	N/A	**6.76E-05**	0.0002%
Chrysene	---	2.00E-02		**1.02E-03**	N/A	**6.20E-07**	0.0031%
Cobalt	---	1.00E-03		**1.53E-04**	N/A	**1.95E-06**	0.1948%
Copper		4.90E+02		**1.55E-03**	NA	**1.97E-05**	0.000004%
Dibenzo(a,h)anthracene	---	2.00E-02		**4.62E-04**	N/A	**4.19E-07**	0.0021%
Dichlorobenzene	---	9.00E-02		**2.18E-03**	N/A	**2.78E-05**	0.0309%
Ethane	---	2,900		**5.64E+00**	N/A	**7.19E-02**	0.0025%
Ethylbenzene		1,000		**1.06E-01**	N/A	**1.50E-03**	0.0002%
Fluoranthene				**5.73E-03**	N/A	**5.05E-06**	N/A
Fluorene				**2.05E-02**	N/A	**1.85E-05**	N/A
Formaldehyde	30	6.00E-02		**1.24E+00**	4.1451%	**1.01E-02**	16.8251%
Hexane	---	700		**6.16E-03**	N/A	**7.48E-05**	0.0000%
Indeno (1,2,3-cd)pyrene				**4.06E-04**	N/A	**3.43E-07**	N/A
Lead	---	3.80E-02		**3.58E-02**	N/A	**5.73E-05**	0.1508%

Table 17-27. Maximum Modeled Concentrations Compared to NYSDEC Guideline Concentrations[1]

Non-Criteria Pollutants	NYSDEC SGC (ug/m^3)	NYSDEC AGC (ug/m^3)	ATSDR Acute MRL (ug/m^3)	1-hr Maximum Modeled Concentration		Annual Maximum Modeled Concentration	
				Facility (ug/m^3)	% SGC	Facility (ug/m^3)	% AGC
Manganese	---	5.00E-02		**1.99E+00**	N/A	**2.61E-03**	5.2194%
Mercury	6.00E-01	3.00E-01		**3.32E-03**	0.5526%	**9.78E-06**	0.0033%
Molybdenum	---	1.2		**2.00E-03**	N/A	**2.55E-05**	0.0021%
Naphthalene	7,900	3		**2.00E-01**	0.0025%	**2.51E-04**	0.0084%
Nickel	2.00E-01	4.20E-03		**1.40E-02**	6.9882%	**4.87E-05**	1.1598%
OCDD				**0.00E+00**	N/A	**0.00E+00**	N/A
PAH	---	2.00E-02		**2.19E-01**	N/A	**2.83E-04**	1.4163%
Pentane	---	70,250		**4.73E+00**	N/A	**6.03E-02**	0.0001%
Phenanthrene	---	2.00E-02		**3.62E-02**	N/A	**2.61E-05**	0.1307%
POM				**0.00E+00**	N/A	**0.00E+00**	N/A
Propane	---	43,000		**2.91E+00**	N/A	**3.71E-02**	0.0001%
Propylene	---	3,000		**3.35E+00**	N/A	**9.37E-03**	0.0003%
Propylene Oxide	3,100	2.70E-01		**8.76E-02**	0.0028%	**1.26E-03**	0.4671%
Pyrene	---	2.00E-02		**4.26E-03**	N/A	**3.55E-06**	0.0177%
Selenium	---	20		**6.29E-02**	N/A	**8.29E-05**	0.0004%
Sulfuric Acid	120	1		**2.51E-01**	0.2093%	**1.56E-03**	0.1563%
Toluene	37,000	5,000		**7.72E-01**	0.0021%	**6.37E-03**	0.0001%
Vanadium	---	2.00E-01		**4.19E-03**	N/A	**5.33E-05**	0.0267%
Xylenes	22,000	100		**4.58E-01**	0.0021%	**3.30E-03**	0.0033%
Zinc	---	45		**5.28E-02**	N/A	**6.73E-04**	0.0015%

Notes:

[1] For those NYSDEC Short-term Guideline Concentrations that are based on occupational guidelines, other short-term, health-based comparison values such as the ATSDR Acute MRL was compared to predicted air concentrations.

17(j) Air Quality Analysis Documents, Methodology, Procedures and Data

Where applicable, the following documents, methodology, procedures, and data were used for the air quality analyses:

(1) Air Quality Dispersion Modeling

For performing air quality dispersion modeling:

(i) NYSDEC, DAR-10, NYSDEC Guidelines on Modeling Procedures for Air Quality Impact Analysis (May 2006).

(ii) Air Modeling Protocol to be established to the satisfaction of EPA and NYSDEC specifically for this Project, which such Air Modeling Protocol has already been established to the satisfaction of EPA and NYSDEC, and approved by NYSDEC.

(iii) EPA, Draft New Source Review Workshop Manual (October 1990).

(iv) EPA, Revisions to the Guideline on Air Quality Models – Enhancement to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter, Appendix W of 40 CFR Part 51 (January 2017).

(v) Modeling Emission Rates for Precursors guidance for including secondarily formed $PM_{2.5}$ in the air quality assessment.

(vi) EPA, Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO2 National Ambient Air Quality Standard (May 2014).

(2) Determining Stack Height

For determining stack height:

(i) EPA, Guidelines for Determination of Good Engineering Practice Stack Height (EPA Technical Support Document for the Stack Height Regulations), Document Number EPA-450/4-80-023R (June 1985).

(3) Quantification and Assessment of Sulfates and Nitrates

For quantification and assessment of the Project's contribution to the New York State total deposition of sulfates and nitrates, in accordance with the State Acid Deposition Control Act:

(i) Memorandum from Leon Sedefian to IAM Staff (March 4, 1993).

(4) Visibility Modeling

For performing visibility modeling:

(i) EPA, Workbook for Plume Visual Impact Screening and Analysis, Document Number EPA-454/R-92-023 (October 1992).

(5) Ambient Air Guidelines and Benchmarks

For non-criteria pollutant ambient air guidelines and benchmarks:

(i) NYSDEC, DAR-1, AGC/SGC Tables, Division of Air Resources, Air Toxics Section, July 14, 2016.
(ii) NYSDEC, *DAR-1, Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212* (August 2016).

(6) Fine Particulate Matter Emissions

For assessing $PM_{2.5}$ emissions:

(i) NYSDEC Subpart 231-12.6, SILs.
(ii) EPA, Guidance for $PM_{2.5}$ Permit Modeling (May 2014).

References

New York State Department of Environmental Conservation (NYSDEC). 1993. *Memorandum from Leon Sedefian to IAM Staff*. March 4, 1993.

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EPA. 2014. *Guidance for $PM_{2.5}$ Permit Modeling*. May 20, 2014.

EPA. 2014. *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 NAAQS*. September 30, 2014.

EPA. 2017. Revisions to the Guideline on Air Quality Models (Revised). Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter. Appendix W to Title 40 U.S. Code of Federal Regulations Parts 51 and 52. January 17, 2017.

Ventura County APD. 2001. *Combustion Emission Factors* (May 2001).

APPENDIX 17-1

DRAFT NYSDEC PART 201/231 AIR PERMIT APPLICATION

APPENDIX 17-1A

DRAFT NYSDEC PART 201/231
AIR PERMIT APPLICATION

TRC
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November 15, 2019

Mr. George Sweikert
Regional Air Pollution Control Engineer, Region 3
New York State Department of Environmental Conservation
21 South Putt Corners
New Paltz, NY 12561

Subject: Danskammer Energy, LLC
Danskammer Energy Center
Town of Newburgh, Orange County, New York
Part 201/231 Air Permit Application
Permit ID: 3-3346-00011

Dear Mr. Sweikert:

TRC Environmental Corporation (TRC) is submitting the enclosed Part 201/231 air permit application to the Department on behalf of Danskammer Energy, LLC (Danskammer Energy), who is proposing to construct a new approximately 536 net megawatt (MW) primarily natural gas fired 1-on-1 combined cycle power facility (Danskammer Energy Center or Project) on the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York. As discussed further below, Danskammer Energy is also requesting confidential treatment of certain information in the enclosed application materials, and that the Department protect such information from disclosure under the Freedom of Information Law, pursuant to Public Officers Law §§ 87(2), 89(5) and 6 NYCRR 616.7.

The Station's existing generating units will be retired once the Project is completed. The proposed Danskammer Energy Center will be a new modern energy center with state-of-the-art power generation and emission control equipment. The combustion turbine will be primarily fueled by natural gas with ultra-low sulfur diesel (ULSD) as a backup fuel for up to the full load equivalent of 720 hours per year.

The proposed Project is located in a United States Environmental Protection Agency (U.S. EPA) designated attainment area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter (PM) with an aerodynamic diameter less than 10 micrometers (μm) (PM-10), particulate matter with an aerodynamic diameter less than 2.5 μm (PM-2.5), and ozone. The existing Danskammer Generating Station is a major stationary source pursuant to the 6 New York Codes, Rules and Regulations (NYCRR) Part 231 (Part 231) New Source Review (NSR) regulation. Major modifications to an existing major source are subject to 6 NYCRR Part 231 and U.S. EPA Prevention of Significant Deterioration (PSD) review, if net emissions increases are above the significant emission increase thresholds. The net emission increases from the proposed Project may exceed the Part 231 significant increase thresholds for one or more criteria air pollutants, and as such, the proposed Danskammer Energy Center is subject to Part 231 and PSD review.

Danskammer Energy is applying for a State Facility Permit pursuant to 6 NYCRR Subpart 201-5.2, and will apply for a modification to its existing Title V operating permit in accordance with 6 NYCRR Subpart

201-6.6(d) and 201-6.2(a)(3) within one year of the commencement of operation of the new emission unit.

Emissions from the combined cycle unit will be controlled by the use of dry low-NO_x burner technology (during natural gas firing), water injection (during ULSD firing), Selective Catalytic Reduction (SCR) for NO_x control, an oxidation catalyst for CO and volatile organic compounds (VOC) control, and the use of clean low-sulfur fuels (i.e., natural gas and ULSD) to minimize emissions of SO_2, PM/PM-10/PM-2.5, and sulfuric acid (H_2SO_4). Spent steam from the steam turbine will be sent to an air-cooled condenser (ACC) where it will be cooled to a liquid state and returned to the heat recovery steam generator (HRSG) for reuse.

The enclosed NYSDEC Part 201/231 air permit application forms and technical support document describe the emissions processes and equipment at the facility, details the emissions calculations, addresses applicable regulatory requirements, and includes air quality modeling analyses for the proposed Project.

Confidential Treatment of Certain Information

Pursuant to Public Officers Law §§ 87(2), 89(5) and 6 NYCRR 616.7, Danskammer Energy respectfully requests that the Department grant protection from disclosure under the Freedom of Information Law (FOIL) of certain information included in the enclosed documents (the Confidential Information). The Confidential Information contains confidential commercial and business information relative to Danskammer Energy's proposed processes that, if disclosed prematurely by the Department, would provide an advantage to competitors and a disadvantage to Danskammer Energy. The documents for which confidential treatment is sought include plans, design specifications, detailed process information, and calculations specific to the Project. The enclosed documents that include Confidential Information have been marked "CONFIDENTIAL BUSINESS INFORMATION."

To protect the confidentiality of this information, Danskammer Energy requests that the Confidential Information be maintained in the Department's confidential files and provided only to involved members of the Department and its Staff, and not otherwise be disclosed or made available to any other person or entity, either through a response to a FOIL request or otherwise. Danskammer Energy also requests that, consistent with 6 NYCRR 616.7(c), upon the request of any person for the enclosed record, that the Department provide Danskammer Energy an opportunity to submit a written statement of the necessity for the Department's granting of the requested confidential treatment.

If you have any questions concerning the enclosed application, please feel free to call me at (201) 508-6954.

Sincerely,

Michael D. Keller

Michael D. Keller
Principal – Power Generation and Air Quality

cc: J. Kent, NYSDEC
M. Higgins, NYSDEC
M. Jennings, NYSDEC
M. Sanza, NYSDEC
W. Reid, Danskammer Energy
H. Taylor, Danskammer Energy
J. Garcia, Danskammer Energy

Danskammer Energy Center
Combined Cycle Power Facility

NYSDEC Part 201/231
Air Permit Application

Prepared for:

Danskammer Energy, LLC

Prepared by:

TRC Environmental Corporation

1099 Wall Street West, Suite 250B

Lyndhurst, NJ 07071

November 2019

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Acronym	Definition
ACC	air-cooled condenser
AGL	above grade level
AP-42	Compilation of Air Pollutant Emission Factors, Fifth Edition
AQRV	Air Quality Related Values
ARP	Acid Rain Program
BACT	Best Available Control Technology
BHP	Brake Horsepower
BPIPPRM	Building Profile Input Program for PRIME
Btu	British thermal unit
CAAA	Clean Air Act Amendments
CAIR	Clean Air Interstate Rule
CARB	California Air Resources Board
CEMS	continuous emissions monitoring system
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CTG	combustion turbine generator
DB	duct burner
DEM	Digital Elevation Model
DLN	dry low-NO_x
EJ	Environmental Justice
ERCs	emission reduction credits
F	fluoride
°F	Degrees in Fahrenheit
FGD	Flue Gas Desulfurization
FGR	flue gas recirculation
FLM	Federal Land Manager
Ft	feet
GEP	good engineering practice
GPM	gallons per minute
GHG	greenhouse gas

Acronym	Definition
H_2O	water
H_2SO_4	sulfuric acid
HAP	Hazardous Air Pollutant
HF	Hydrogen Fluoride
HHV	higher heating value
HRSG	heat recovery steam generator
°K	degrees on the Kelvin scale
km	kilometer
LAER	Lowest Achievable Emission Rate
lb/hr	pounds per hour
lb/MMBtu	pounds per million British thermal units
LNB	low-NO_x burner
$\mu g/m^3$	microgram per cubic meter
m/s	meters per second
MACT	Maximum Achievable Control Technology
MMBtu/hr	million British thermal units per hour
MSL	mean sea level
MW	megawatt
N_2	nitrogen
NAAQS	National Ambient Air Quality Standards
NAD83	North American Datum 1983
NCDC	National Climatic Data Center
NESHAP	National Emission Standards for Hazardous Air Pollutants
NH_3	ammonia
$(NH_4)_2SO_4$	ammonium sulfate
NH_4HSO_4	ammonium bisulfate
NO	nitric oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
NNSR	Non-Attainment New Source Review
NSR	New Source Review
NWA	National Wilderness Area

Acronym	Definition
NWR	National Wildlife Refuge
NWS	National Weather Service
NYSDEC	New York State Department of Environmental Conservation
O_2	oxygen
O_3	ozone
OTC	Ozone Transport Commission
OTR	Ozone Transport Region
Pb	lead
PM	particulate matter
PM-2.5	Particulate matter with an aerodynamic diameter of 2.5 microns or less
PM-10	particulate matter with an aerodynamic diameter of 10 microns or less
ppm	parts per million
ppmvd	parts per million dry volume
PSD	Prevention of Significant Deterioration
PTE	potential to emit
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
RGGI	Regional Greenhouse Gas Initiative
scf	standard cubic feet
SCR	Selective Catalytic Reduction
SER	Significant Emission Rate
SICs	Significant Impact Concentrations
SILs	Significant Impact Levels
SIP	State Implementation Plan
SMC	Significant Monitoring Concentration
SNCR	selective noncatalytic reduction
SO_2	sulfur dioxide
SO_3	sulfur trioxide
STG	steam turbine generator
tpy	tons per year
TSP	total suspended particulate
ULSD	Ultra-low sulfur diesel

Acronym	Definition
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	volatile organic compounds

1.0 INTRODUCTION

1.1 Project Overview

Danskammer Energy, LLC (Danskammer Energy) is proposing to construct an approximately 536-megawatt (MW) primarily natural gas fired 1-on-1 combined cycle power facility (Danskammer Energy Center or Project) on land at the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York. The Station's existing generators will be retired once the combined cycle plant is complete. The proposed Danskammer Energy Center will result in a new modern energy center through installation of state-of-the-art power generation equipment. The proposed Project (combustion turbine) will be primarily fueled by natural gas with ultra-low sulfur diesel (ULSD) as a backup fuel for up to the full load equivalent of 720 hours per year.

The proposed Danskammer Energy Center will be located on an approximately 180+ acre parcel that is controlled by Danskammer Energy. The Project site is located within the Town of Newburgh, Orange County, New York. The Danskammer-owned property in the area of the Project site is bordered to the northwest by the Tilcon Materials Inc. quarry and the Hudson River to the northeast and east, and to the south by Riverview Power, LLC's Roseton Generating Station. The CSX Transportation rail road tracks transect the eastern portion of the property (west of the plant) in a northwest/southeast orientation, and the property is bordered to the west by a single-story house and Danskammer Road.

Figure 1-1 presents the proposed Project's location on the U.S. Geological Survey (USGS) 7.5-minute topographic map for the surrounding area. The proposed Project will be located at approximately 41º 34' 19.6" North Latitude, 73º 57' 58.5" West Longitude, North American Datum 1983 (NAD83). The approximate Universal Transverse Mercator (UTM) coordinates of the Project are 586,180 meters Easting, 4,602,785 meters Northing, in Zone 18, NAD83. Figure 1-2 shows an aerial photograph of the Project location and the surrounding area.

The proposed Project is located in a United States Environmental Protection Agency (U.S. EPA) designated attainment area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter (PM) with an aerodynamic diameter less than 10 micrometers (μm) (PM-10), particulate matter with an aerodynamic diameter less than 2.5 μm (PM-2.5), and ozone. The existing Danskammer Generating Station is a fossil fuel fired steam electric plant with a heat input capacity greater than 250 MMBtu/hr with potential emissions greater than 100 tons per year of any regulated criteria air pollutant. Thus, the existing facility is considered a major stationary source based upon the 6 New York Codes, Rules and Regulations (NYCRR) Part 231 (Part 231) New Source Review (NSR) regulation. Major modifications to existing major sources are subject to 6 NYCRR Part 231 and U.S. EPA Prevention of Significant Deterioration (PSD) review, if net emissions increases are above the significant increase thresholds. The proposed net emission increases for one or more criteria air pollutants may exceed the Part 231 significant increase thresholds and as such, the proposed Danskammer Energy Center will be subject to Part 231 and PSD review.

The Danskammer Energy Center will consist of one (1) Mitsubishi M501JAC combustion turbine at the proposed Project site. Hot exhaust gases from the combustion turbine will flow into one (1) heat recovery steam generator (HRSG). The HRSG will be equipped with a natural gas fired duct burner. The HRSG will produce steam to be used in the steam turbine. Upon leaving the HRSG, the turbine exhaust gases will be directed to one (1) exhaust stack. Other ancillary combustion equipment at the proposed Project includes a natural gas fired auxiliary boiler, emergency diesel fire pumps, and an emergency diesel generator. Danskammer Energy is proposing to utilize pipeline quality natural gas as the primary fuel for the combustion turbine and duct burner with ULSD (with a maximum sulfur content of 0.0015%, by weight) as a backup fuel for up to 720 full load hours per year.

Emissions from the combined cycle unit will be controlled by the use of dry low-NO_x burner technology (during natural gas firing), water injection (during ULSD firing), Selective Catalytic Reduction (SCR) for nitrogen oxides (NO_x) control, an oxidation catalyst for CO and volatile organic compounds (VOC) control, and the use of clean low-sulfur fuels (i.e., natural gas and ULSD) to minimize emissions of SO_2, PM/PM-10/PM-2.5, and sulfuric acid (H_2SO_4). Spent steam from the steam turbine will be sent to an air cooled condenser (ACC) where it will be cooled to a liquid state and returned to the HRSG.

1.2 Summary of Federal and State-Level Emission Control Requirements

The Danskammer Generating Station is an existing major stationary source (as defined under the Clean Air Act). For Clean Air Act purposes, the proposed Danskammer Energy Center will be considered a modification of the existing Danskammer Generating Station. The following provides a general description of the proposed Project's applicable regulatory and emission control requirements imposed through Federal and State air programs. Please see Section 3 of this Air Permit Application for a detailed regulatory analysis and Table 3-4 for a comparison of the proposed Project's potential emissions to the regulatory applicability thresholds.

1.2.1 Lowest Achievable Emission Rate (LAER)

Non-attainment New Source Review (NNSR) rules will apply to NO_x and VOC emissions (as precursors to the pollutant ozone). Because the Project is located in an area within the ozone transport region, modifications at major facilities emitting more than 40 tons per year of NO_x or VOC are subject to NNSR for these pollutants. A component of NNSR is a requirement to meet LAER limits. To meet the LAER requirement for NO_x emissions, the Project will employ dry low-NO_x burner combustion technology and SCR control technology to control flue gas NO_x emissions from the combustion turbine and natural gas-fired duct burner. To meet LAER requirements for VOC emissions, the Project will employ good combustion practices and an oxidation catalyst. Proposed NO_x and VOC LAER emission limits and control technologies for all combustion units are described in Section 4.

1.2.2 Best Available Control Technology (BACT)

BACT must be applied to control emissions of pollutants that are subject to PSD review based on potential emissions of each pollutant for which the Project site area is in attainment. For the proposed combined cycle power Project, BACT is required for CO, H_2SO_4, PM/PM-10/PM-2.5, and greenhouse gases (GHG), regulated as carbon dioxide equivalent (CO_2e). BACT is also triggered for NO_x and VOC, which are subject to the more stringent LAER requirements discussed above. It is assumed that meeting LAER requirements will satisfy BACT requirements for NO_x and VOC. The Project is proposing to meet BACT requirements by using an oxidation catalyst for control of CO emissions and low sulfur fuels for control of H_2SO_4 and PM/PM-10/PM-2.5 emissions. The Project will comply with BACT for GHGs by primarily firing natural gas and through its very high efficiency. Section 4 presents detailed BACT proposals for the combined cycle unit, as well as BACT proposals for applicable pollutants from the auxiliary boiler, emergency diesel generator and diesel fire pump.

1.3 Assessment of Air Quality Impact

1.3.1 Impact on Ambient Air Quality Standards and PSD Increments

Atmospheric dispersion modeling was performed in accordance with U.S. EPA and New York State Department of Environmental Conservation (NYSDEC) modeling guidelines to estimate maximum expected air quality impacts from the proposed Project. The results of this modeling show that modeled Project impacts are below U.S. EPA defined Significant Impact Levels (SILs) for all pollutants and averaging periods except for NO_2 and PM-10/PM-2.5. Further, none of the pollutants exceed any applicable PSD Class II increment, nor when combined with a representative background concentration, exceed any applicable National Ambient Air Quality Standards (NAAQS) and New York Ambient Air Quality Standards (NYAAQS).

1.3.2 Class I Area Impacts

Proposed major sources greater than 50 kilometers from a Class I area may be eligible for an exemption from the requirement to perform a Class I area modeling analysis. The Class I areas closest to the proposed Project are the Lye Brook National Wilderness Area (NWA) in Vermont and Edwin B. Forsythe National Wildlife Refuge (NWR) at Brigantine, New Jersey, located approximately 181 kilometers to the north and approximately 228 kilometers to the south, respectively. The Federal Land Managers (FLM) for these Class I areas were notified by letter and requested for a determination if assessments of impacts in the Class I areas would be required. The FLMs reviewed the proposed Project's details and related correspondence and confirmed that Class I analyses for the proposed Project are not required. (See Appendix D for copies of the relevant correspondence).

1.3.3 Impacts to Soils, Vegetation, Visibility, and Industrial, Commercial, and Residential Growth

An analysis was performed to assess the proposed Project's impact on soils, vegetation, visibility, and industrial, commercial, and residential growth. This analysis demonstrated that the proposed Project will have negligible effects with respect to these issues.

1.4 Conclusions

The results of the engineering and air quality modeling analyses shows that the Danskammer Energy Center will: 1) meet all control technology requirements resulting from LAER and BACT; 2) not cause or contribute to a violation of the NAAQS for any pollutant; 3) not exceed the PSD Class II increment for any pollutant; 4) not cause adverse impacts to soils, vegetation, growth and visibility; and 5) comply with all other applicable Federal and New York State air quality requirements.

1.5 Summary of Proposed Emission Limits

Tables 1-1 through 1-5 present a summary of the permit limits proposed for the Danskammer Energy Center. These limits reflect the application of LAER or BACT, as appropriate. In addition, Sections 5.0 and 6.0 of this application provides atmospheric dispersion modeling documentation that confirms that the Project operating at the proposed limits will not contravene the NAAQS/NYAAQS or PSD Class II increment air quality levels.

1.6 Contents of Application Support Document and Appendices

Completed application forms for the Danskammer Energy Center are included as Appendix A of this document. Emission calculation spreadsheets providing supporting calculations for the application forms are included as Appendix B. Appendix C contains tables summarizing the results of U.S. EPA's RACT/BACT/LAER Clearinghouse and other permit searches in support of the control technology analyses. Appendix D contains copies of all relevant Project correspondence. Air quality modeling information and data files are included in Appendices E through G. The assessment of impacts to threatened and endangered species is included in Appendix H and the environmental justice assessment is included in Appendix I.

1.7 Project Schedule

Preliminary schedule milestones for the planned Danskammer Energy Center are as follows:

- Air permit application submitted to NYSDEC November 2019
- Final Permit Issuance Fourth Quarter 2020
- Commercial Operation Fourth Quarter 2023

Table 1-1: Proposed Emissions - Combustion Turbine/Duct Burner (Gas Firing)

Pollutant	LAER/BACT	Method	Basis
NO_x	2.0 ppm (with and without duct firing)	SCR and Dry Low-NO_x Burner	LAER
VOC	0.7 ppm (without duct firing) 1.6 ppm (with duct firing)	Oxidation catalyst & good combustion practices	LAER
CO	1.0 ppm (without duct firing) 2.0 ppm (with duct firing)	Oxidation catalyst & good combustion practices	BACT
PM/PM-10/ PM-2.5 [1]	0.0040 lb/MMBtu (without duct firing) 0.0055 lb/MMBtu (with duct firing)	Low-sulfur fuels	BACT
SO_2	0.5 grains sulfur per 100 standard cubic feet of natural gas	Low-sulfur fuels	NSPS (KKKK)

Table 1-1: Proposed Emissions - Combustion Turbine/Duct Burner (Gas Firing)

Pollutant	LAER/BACT	Method	Basis
H_2SO_4	0.0014 lb/MMBtu (with and without duct firing)	Low-sulfur fuels	BACT
GHG	6,925 Btu/kWh (gross) at ISO conditions and 100% load (without duct firing) 1,927,496 tons/year of CO_2e	Clean fuels and thermal efficiency	BACT
NH_3	5 ppm	N/A	OTHER

Notes:

"ppm" refers to ppmvd @ 15% O_2; lb/MMBtu limits are HHV basis. All ppm values are one-hour averages.

Facility may exceed short-term limits during defined startup and shutdown periods.

All proposed emission limits (in units of ppm and lb/MMBtu) do not serve as the basis for determining annual emission limits. Refer to Appendix B for potential annual emissions calculations.

[1]Includes filterables, condensables, and sulfates.

Table 1-2: Proposed Emissions - Combustion Turbine/Duct Burner (ULSD Firing)

Pollutant	LAER/BACT	Method	Basis
NO_x	4.0 ppm	SCR and Water injection	LAER
VOC	2.0 ppm	Oxidation catalyst & good combustion practices	LAER
CO	2.0 ppm	Oxidation catalyst & good combustion practices	BACT
PM/PM-10/ PM-2.5 [1]	0.0089 lb/MMBtu	Low-sulfur fuels	BACT
SO_2	0.0015% sulfur, by weight	Low-sulfur fuels	NSPS (KKKK)
H_2SO_4	0.0015% sulfur, by weight	Low-sulfur fuels	BACT
GHG	See Table 1-1	Clean fuel and thermal efficiency	BACT
NH_3	5 ppm	N/A	OTHER

Notes:

"ppm" refers to ppmvd @ 15% O2; lb/MMBtu limits are HHV basis. All ppm values are one-hour averages.

Facility may exceed short-term limits during defined startup and shutdown periods.

All proposed emission limits (in units of ppm and lb/MMBtu) do not serve as the basis for determining annual emission limits. Refer to Appendix B for potential annual emissions calculations.

[1]Includes filterables, condensables, and sulfates.

Table 1-3: Proposed Emissions - Auxiliary Boiler

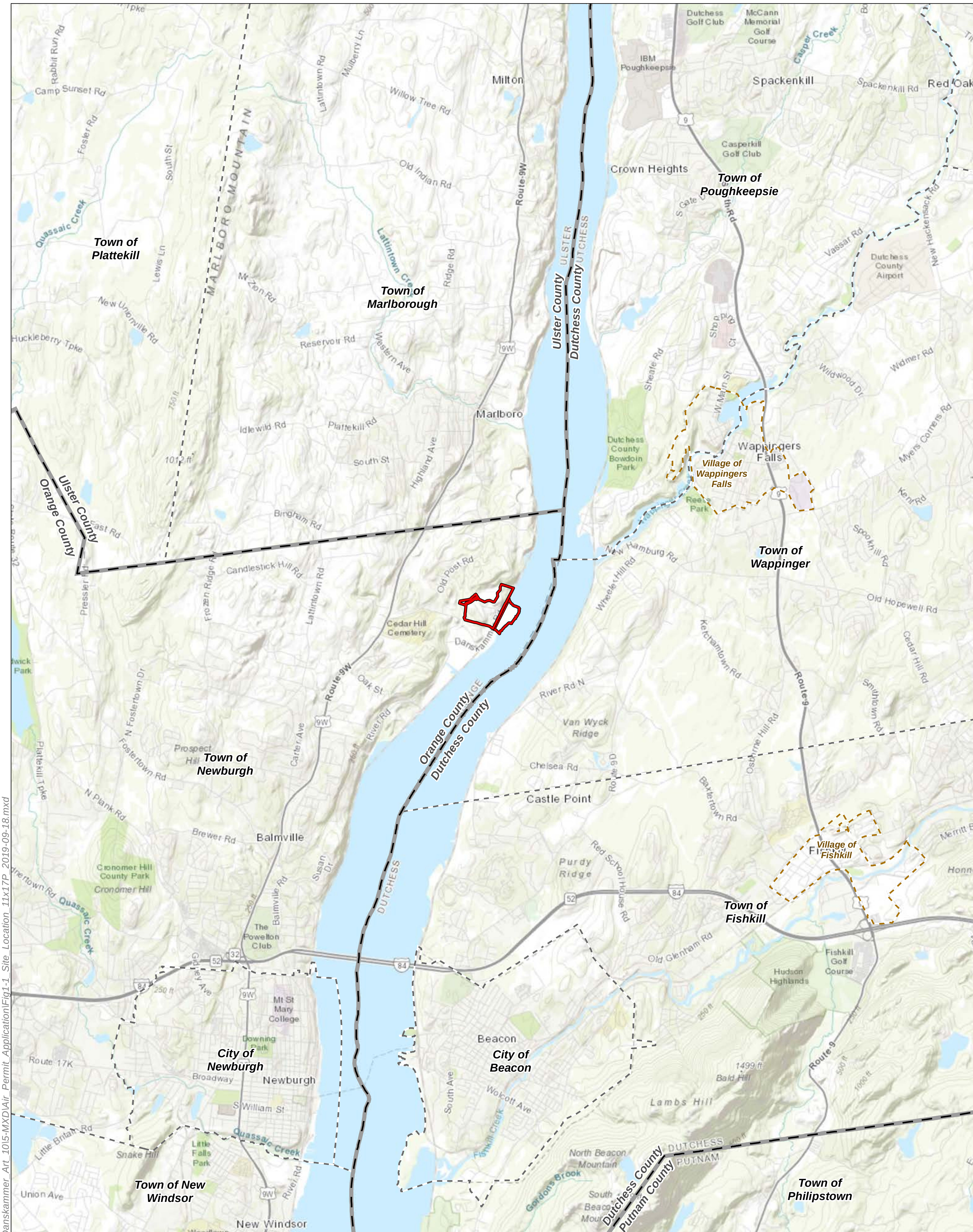
Pollutant	LAER/BACT	Method	Basis
NO_x	0.0086 lb/MMBtu	Ultra-Low NO_x burner & FGR	LAER
VOC	0.0017 lb/MMBtu	Good combustion practices	LAER
CO	0.037 lb/MMBtu	Good combustion practices	BACT
PM/PM-10/ PM-2.5	0.0074 lb/MMBtu	Low-sulfur fuels	BACT
SO_2	0.50 grains Sulfur/100 standard cubic feet (scf)	Low-sulfur fuels	OTHER
H_2SO_4	0.50 grains Sulfur/100 scf	Low-sulfur fuels	BACT
GHG (CO_2e)	26,959 tons/year	Clean fuels, limited operation	BACT

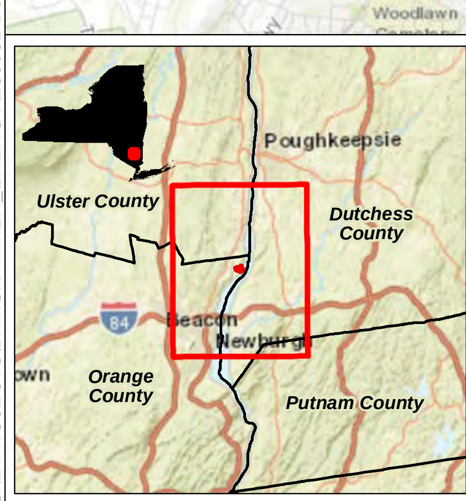
Table 1-4: Proposed Emissions - Emergency Diesel Generator

Pollutant	LAER/BACT	Method	Basis
NO_x	4.8 g/hp-hr	Limited operation	LAER
VOC	0.28 g/hp-hr	Good combustion practices & limited operation	LAER
CO	2.6 g/hp-hr	Good combustion practices & limited operation	BACT
PM/PM-10/ PM-2.5	0.15 g/hp-hr	Low-sulfur fuels	BACT
SO_2	0.0015% Sulfur fuel, by weight	Low-sulfur fuels	OTHER
H_2SO_4	0.0015% Sulfur fuel, by weight	Low-sulfur fuels	BACT
GHG (CO_2e)	399 tons/year	Limited operation	BACT

Table 1-5: Proposed Emissions - Emergency Diesel Fire Pump

Pollutant	LAER/BACT	Method	Basis
NO_x	3.0 g/hp-hr	Limited operation	LAER
VOC	0.12 g/hp-hr	Good combustion practices & limited operation	LAER
CO	2.6 g/hp-hr	Good combustion practices & limited operation	BACT
PM/PM-10/ PM-2.5	0.15 g/hp-hr	Low-sulfur fuels	BACT
SO_2	0.0015% Sulfur fuel, by weight	Low-sulfur fuels	OTHER
H_2SO_4	0.0015% Sulfur fuel, by weight	Low-sulfur fuels	BACT
GHG (CO_2e)	47 tons/year	Limited operation	BACT





Project Area
Village Boundary
Municipal Boundary
County Boundary

Data: Rextag, 2019
Base Map: Esri and its Contributors

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Danskammer Energy, LLC

Danskammer Energy Center

Figure 1-1
Site Location Map

Town of Newburgh
Orange County, NY

Prepared on 9/18/2019 by TRC

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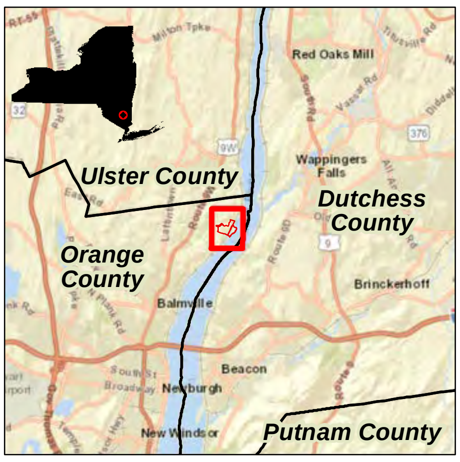

Project Area

Data: Rextag, 2019
Base Map: Nearmap - March 2019

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Feet

N W E S

Danskammer Energy, LLC

Danskammer Energy Center

Figure 1-2: Site Location Aerial Map

Town of Newburgh
Orange County, NY

Prepared on 9/6/2019 by TRC

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2.0 PROJECT DESCRIPTION

2.1 Facility Conceptual Design

Danskammer Energy, LLC (Danskammer Energy) is proposing to construct and operate a 536 megawatt (nominal) combined cycle electric power generating unit and ancillary equipment in the Town of Newburgh, Orange County, New York (Project or Danskammer Energy Center). The facility is identified as Danskammer Energy Center. The project will include one (1) Mitsubishi M501JAC combustion turbine that will primarily utilize pipeline natural gas with ULSD as a backup fuel. A HRSG downstream of the combustion turbine will recover heat from the exhaust gases to generate steam. The HRSG will be equipped with a natural gas-fired duct burner for supplementary firing and will provide steam for a single steam turbine generator (STG). By using the waste heat from the combustion turbine to produce steam and generate additional electricity, the Facility will operate with a higher thermal efficiency than most other electricity generating facilities. Supporting ancillary equipment will include a natural gas fired auxiliary boiler, an emergency diesel generator, emergency diesel fire pumps, ULSD storage tanks, and an aqueous ammonia storage tank. Figure 2-1 presents a simplified process flow diagram for the combined cycle unit.

Emissions from the combined cycle unit will be controlled by the use of dry low-NO_x burner technology and SCR for NO_x, an oxidation catalyst for CO and VOC, and the use of clean low-sulfur fuels to minimize emissions of SO_2, PM/PM-10/PM-2.5, and H_2SO_4. Exhaust gases from the combined cycle unit after emission controls will be dispersed to the atmosphere via a single 200-foot (above grade) stack. Steam from the steam turbine will be sent to an air cooled condenser where it will be cooled to a liquid state and returned to the HRSG. Waste heat from the condenser will be dissipated to the atmosphere.

2.2 Combined Cycle Unit

Danskammer Energy is proposing to install one (1) combined cycle Mitsubishi M501JAC combustion turbine firing natural gas as the primary fuel. Ultra-low sulfur diesel (ULSD) will be used as a backup fuel source for up to the full load equivalent of 720 hours per year. The maximum heat input rates for the CTG (without duct firing) at base load and an ambient temperature of 0 degrees Fahrenheit (°F) are 3,302 and 3,315 million British thermal units per hour (MMBtu/hr) based on the Higher Heating Value (HHV), for natural gas and ULSD, respectively.

2.2.1 Duct Burner

The HRSG will have a natural gas duct burner. The duct burner will have a maximum heat input capacity of 744 MMBtu/hr (HHV). The duct burner can operate when the CTG is operating on natural gas. Operation of the duct burner will only occur when the CTG is operating at full load.

2.2.2 Control Equipment for the Combined Cycle Unit

The emission control technologies proposed for the combustion turbine and duct burner exhaust gases include a dry low-NO_x (DLN) combustor located within the combustion turbine and an SCR system located within the HRSG to control NO_x emissions. An oxidation catalyst and efficient combustion controls will be used to control emissions of CO and VOC. Emissions of SO_2, PM/PM-10/PM-2.5 will be minimized through the use of low sulfur fuel, as well as efficient combustion controls.

2.2.2.1 DLN Combustor

Dry low-NO_x combustion will control NO_x emissions from the turbine. DLN combustion limits NO_x formation by controlling the combustion process through air/fuel optimization.

2.2.2.2 Selective Catalytic Reduction

NO_x is formed by the interaction of chemical and physical processes occurring during combustion. There are two principal forms of NO_x - "thermal" NO_x and "fuel" NO_x. Thermal NO_x formation is the result of oxidation of atmospheric nitrogen in the combustion zone. The major factors influencing thermal NO_x formation are temperature, concentrations of nitrogen and oxygen in the inlet air and residence time within the combustion zone. Fuel NO_x is formed by the oxidation of fuel-bound nitrogen. NO_x formation can be controlled by adjusting the combustion process and/or installing post-combustion controls.

Selective Catalytic Reduction (SCR) is a post combustion NO_x control technology that is placed in the flue gas stream within the HRSG and downstream of the natural gas-fired duct burner. SCR involves the injection of ammonia (NH_3) into the exhaust gas stream upstream of a catalyst bed. On the catalyst surface, ammonia reacts with NO_x contained within the flue gas stream to form nitrogen gas (N_2) and water (H_2O) in accordance with the following chemical equations:

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

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

The catalyst's active surface includes a metal (e.g., titanium, vanadium, or similar) to promote the NO_x reduction process. The geometric configuration of the catalyst body is designed for maximum surface area and minimum obstruction of the flue gas flow path in order to achieve maximum conversion efficiency of NO_x to N_2.

Aqueous ammonia (19% by weight) is drawn from a storage tank, vaporized, and injected into the flue gas stream ahead of the catalyst bed. Excess ammonia that is not reacted in the SCR and emitted from the stack is referred to as ammonia slip.

2.2.2.3 Oxidation Catalyst

Other than combustion control, the only practical method to reduce CO emissions from the combined cycle unit is an oxidation catalyst. Exhaust gases from the combustion turbine and duct burner are passed over a catalyst bed where excess air oxidizes the CO to carbon dioxide. The oxidation catalyst system will reduce inlet CO concentrations to 2.0 ppm. The oxidation catalyst will also reduce VOC emissions. The oxidation catalyst will be located in an optimum temperature region within the HRSG immediately upstream of the SCR ammonia injection grid and downstream of the gas-fired duct burner.

2.2.2.4 Process Controls

The project will incorporate modern data acquisition and control systems that will optimize combustion performance. These same systems will minimize pollutant emissions through a combination of operator and software-driven process adjustments and notifications.

2.3 Auxiliary Boiler

For the Danskammer Energy Center, Danskammer Energy is proposing to install and operate one (1) auxiliary boiler to support start-up and shutdown activities for the combined cycle unit. The auxiliary boiler will have a maximum heat input of 96.0 MMBtu/hr (HHV) and will combust natural gas. Auxiliary boiler operation will not exceed the equivalent of 4,800 hours per year of full load operation and be permitted to operate simultaneously with the combustion turbine. The proposed boiler will be equipped with ultra-low-NO_x burners and flue gas recirculation (FGR) to control NO_x emissions. Low sulfur fuels will minimize the formation of PM/PM-10/PM-2.5 and SO_2. Good combustion practices and design will minimize CO and VOC emissions.

2.4 Emergency Diesel Engines

The proposed Project will include three auxiliary diesel internal combustion (IC) engines: an emergency generator and two fire pumps. Each of these three auxiliary diesel engines will undergo periodic testing and maintenance based operation. Each engine will be limited to no more than 250 hours of operation per year[1] and only operated in an emergency or for periodic testing and maintenance.

2.5 Air Cooled Condenser

The air cooled condenser (ACC) is not a source of air emissions and, therefore, is not considered further in this application, except that the structures are included in the building profile analysis for air quality impact modeling.

2.6 ULSD and Aqueous Ammonia Storage Tanks

Danskammer Energy will store ULSD in one (1) approximate 1,700,000 gallon tank, in order to provide a backup fuel supply for the Project. The tank will be equipped with modern vapor recovery systems. VOC emissions from the tank are calculated and included in the Project's potential emissions.

Ammonia used in the SCR system of the combined cycle unit will be supplied from a single aqueous ammonia storage tank. The aqueous ammonia concentration will be limited to no greater than 19% by weight. The percentage concentration is below the 40 CFR Part 68, Section 112(r) (Table 1) risk management planning applicability threshold. The 35,000-gallon ammonia storage tank will be equipped with an ammonia leak detection system and passive or active abatement system(s).

2.7 Fuels

Danskammer Energy is proposing to utilize pipeline quality natural gas as the primary fuel for the combustion turbine and auxiliary boiler. The natural gas is assumed to have a HHV of 1,036 Btu/standard cubic foot (scf) and a sulfur content of 0.50 grains per 100 scf. The CTG will burn ULSD as a backup fuel. In addition, the three emergency auxiliary engines will also fire ULSD. The ULSD is assumed to have a HHV of approximately 139,117 Btu/gal with a sulfur content of 0.0015% (15 ppm) by weight.

[1] In accordance with NSPS Subpart IIII, maintenance and testing activities will be limited to 100 hours per year.

2.8 Facility Operating Modes

The combined cycle unit will be operated to follow electrical demand (i.e., dispatch mode). The Project will operate up to the equivalent of 8,760 full-load hours per year, but may operate at partial loads. Partial loads can be achieved by operating the turbine at less than its full capacity. However, except for startup and shutdown, part-load turbine operation will be limited to a minimum of 50% load.

2.9 Source Emission Parameters

Emissions of air contaminants from the proposed combined cycle power facility have been estimated based upon expected vendor emission guarantees, control technology analysis results, emission factors presented in the U.S. EPA publication Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources (EPA, 2000), (AP-42), mass balance calculations, and engineering estimates. Emission calculations used to develop the emission estimates for the proposed equipment are included in this application as Appendix B.

2.9.1 Emissions from the Combined Cycle Unit

Emissions from the combined cycle unit will include criteria pollutants, non-criteria pollutants, and hazardous air pollutants (HAPs). Air emissions from the proposed Danskammer Energy Center have been estimated based upon vendor emission guarantees, emission factors presented in AP-42, other published emission factors, mass balance calculations and engineering estimates. Short-term and annual emission rates of these pollutants from the combined cycle unit are described below.

2.9.1.1 Criteria Pollutants

Depending upon electrical demand, the Project can operate at loads ranging from approximately 50 percent to 100 percent of full capacity. Combustion turbine performance and emissions are affected by ambient temperature with combustion turbine fuel consumption, power output and emissions (on a lb/hr basis) increasing at lower ambient temperatures.

Because of the different emission rates and exhaust characteristics, a matrix of operating modes is employed in the various analyses presented in this application, including air quality impact analysis and potential emission calculations. Exhaust and emission parameters for three (3) ranges of ambient temperatures (-5°Fahrenheit (F) to 0°F, 50°F to 59°F, and 92°F to 100°F), three (3) sets of combustion turbine loads (50 percent to 60 percent, 75 percent, and 100 percent), duct burner operation, and two fuels (natural gas and ULSD) (a total of 25 operating scenarios) are accounted for in this air permit application.

Emission rates for all criteria pollutants and ammonia slip for the combined cycle unit are based upon vendor emission estimates. The PM-10/PM-2.5 emissions estimates obtained from the vendor include condensable particulate matter and an allowance for sulfuric acid and/or ammonia salt formation due to reaction of SO_3 with water or excess ammonia slip .

2.9.1.2 Greenhouse Gases

For PSD purposes, greenhouse gases (GHGs) are a single air pollutant defined as the aggregate group of the following six gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6). CO_2, N_2O and CH_4 are the only GHG pollutants of concern for the combustion turbine unit. Potential emissions of GHGs from the proposed turbine are based on vendor data and 40 CFR Part 98 Emission Factors.

2.9.1.3 HAPs

Appendices B and F present tables of potential emissions of HAPs from the proposed Project. Potential annual emissions of HAPs from the operation of the combustion turbine have been quantified based on AP-42 and Ventura County APD Combustion Emission Factors (May 2001) emission factors. Total potential emissions of HAPs from all sources are less than 25 tons/yr. Therefore, the proposed Danskammer Energy Center will be an area source for HAP emissions.

2.9.1.4 Other Pollutants

SCR control for NO_x reduction involves the use of ammonia, which acts to remove NO_x as the flue gas passes through a catalyst. Some of the ammonia does not react with the NO_x and ends up being emitted into the atmosphere. The maximum emission of ammonia slip will not exceed 5 ppm during steady state operation.

2.9.2 Auxiliary Boiler Emissions

The Project is proposing to use an auxiliary boiler that will burn natural gas. Emission rates for the auxiliary boiler are based on expected vendor emission guarantees, emission factors presented in AP-42, other published emission factors, mass balance calculations and engineering estimates. The auxiliary boiler will employ an ultra-low-NO_x burner and flue gas recirculation to reduce emissions of NO_x. Total auxiliary boiler hours for the Project will be limited to the full load equivalent of 4,800 hours per year. Potential emissions of GHGs from the auxiliary boiler are based on 40 CFR Part 98 Emission Factors. Potential HAP emissions are based on emission factors from the U.S. EPA document AP-42 Chapter 1.4 (July 1998) as well as Ventura County APD Combustion Emission Factors (May 2001). Please see Appendices B and F for potential emission calculation details.

2.9.3 Fire Pump/Emergency Diesel Engine Emissions

Emission rates for NO_x, CO, VOC, SO_2 and PM-10/PM-2.5 from the emergency diesel fire pumps and one emergency diesel electric generator have been estimated based upon 40 CFR 60 Subpart IIII emission rates, AP-42 emission factors, and 40 CFR Part 98 emission factors, with SO_2 emissions adjusted to the 0.0015 percent sulfur oil proposed for this Project. The emergency engines will only be used for emergency situations, except for occasional testing to ensure that they are operating properly. Thus, to account for short-term testing, the units will be operated one hour or less per day and less than 250 hours per year each. Potential emissions of GHGs from the proposed emergency engines are based on 40 CFR Part 98 Emission Factors. Potential HAP emissions are based on emission factors from AP-42 Chapters 3.3 and 3.4. Please see Appendices B and F for potential emission calculation details.

2.9.4 Facility Total Potential Annual Emissions

Total potential annual emissions for the proposed combined cycle power Project are presented in Table 2-1. Annual emission values in Table 2-1 represent total PTE from all proposed sources and were based on the following worst-case operating scenarios:

- Year round (8,760 hours), full load operation of the combustion turbines (at 50°F ambient temperature for gas firing and 0°F ambient temperature for ULSD firing);
- The full load equivalent of 30 days of ULSD firing for the combustion turbine;
- The full load equivalent of 4,380 hours per year of duct burner operation;
- A total of 272 annual turbine startup/shutdown events, which include a combination of cold, warm and hot startups/shutdowns on natural gas as well as a combination of cold, warm and hot startups/shutdowns on ULSD;
- The equivalent of 4,800 full load hours of operation of the auxiliary boiler; and
- 250 hours per year of operation (each) of the emergency diesel generator and 250 hours per year of operation for the diesel fire pump engines.

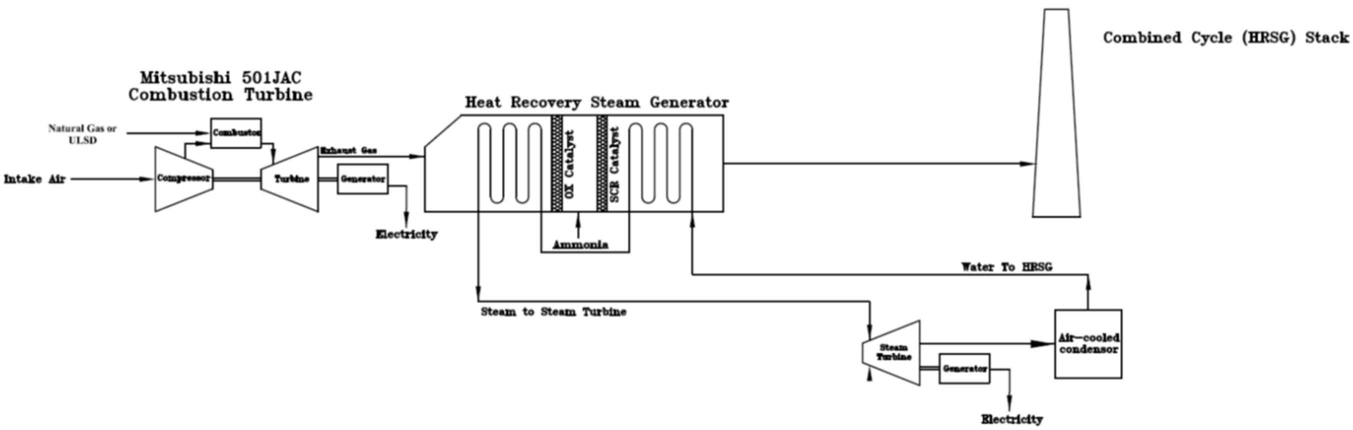
Table 2-1: Summary of Project Criteria Pollutant and Total HAPs Annual Emissions

Source	Potential Annual Emissions (tons/yr)												
	NO_x	CO	VOC	SO_2	PM-10	PM-2.5	H_2SO_4	CO_2e	CH4	NH_3	Pb	Maximum Individual HAP [1]	Total HAPs
Combined Cycle Unit Steady-State Basis	136.6	62.6	28.5	24.1	79.7	79.7	22.1	1,927,496	34.7	116.7	1.7E-02		
Combined Cycle Unit Start-Up/Shutdown [2]	0.3	42.0	29.1		0.0	0.0							
Auxiliary Boiler	2.0	8.5	0.4	0.3	1.7	1.7	0.024	26,959	0.5		1.1E-04		
Diesel Generator	3.5	1.9	0.2	3.67E-03	1.11E-01	1.11E-01	3.67E-04	399	0.02		0.0E+00		
Fire Pump (New)	0.3	0.2	0.01	4.34E-04	1.35E-02	1.35E-02	4.34E-05	47	0.002		0.0E+00		
Fire Pump (Existing)	0.8	0.3	0.04	4.66E-04	4.13E-02	4.13E-02	4.66E-05	51	0.002		0.0E+00		
ULSD Storage Tank			0.27										
Total Project PTE	143.5	115.6	58.6	24.4	81.5	81.5	22.1	1,954,952.2	35.3	116.7	1.76E-02	3.0	8.9

Notes:

[1] The potential HAP emission calculations presented in Appendix B result in total HAP emissions less than 25 tons/yr. Additionally, potential annual emissions of the maximum individual HAP (formaldehyde) are less than 10 tons/yr.

[2] Combined cycle unit start-up/shutdown emissions are added to the baseline steady-state PTE values if the total start-up/shutdown emissions are more than the steady-state full-load equivalent during the period of unit off-line downtime and duration of the start-up (and previous shutdown). For start-up/shutdown emissions noted above as "—" for certain pollutants, the start-up/shutdown emissions addition to the baseline steady-state PTE is not applicable since mass emissions of these pollutants are fuel input based (lb/MMBtu) and the full-load, steady-state basis represents the worst-case scenario for PTE emissions.



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CONCEPTUAL FLOW DIAGRAM FOR COMBINED CYCLE UNIT

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 2-1	**NOVEMBER 2019**

3.0 APPLICABLE REQUIREMENTS AND REQUIRED ANALYSES

This section contains an analysis of the applicability of federal and state air quality regulations to the proposed Danskammer Energy Center combined cycle combustion turbine power facility. The specific regulations included in this applicability review are the Federal New Source Performance Standards (NSPS), Prevention of Significant Deterioration (PSD) and Non-Attainment New Source Review (NNSR) requirements, Maximum Achievable Control Technology (MACT) applicability for HAPs, Federal Acid Rain Program, Cross State Air Pollution Rule (CSAPR) requirements, and NYSDEC Regulations.

3.1 Federal New Source Performance Standards

The NSPS are technology-based standards applicable to new and modified stationary sources. NSPS requirements have been established for approximately 70 source categories. Six subparts apply to the proposed Project:

- General Provisions (40 Code of Federal Regulations (CFR) Part 60, Subpart A);
- Standards of Performance for Stationary Gas Turbines (40 CFR Part 60, Subpart KKKK);
- Standards of Performance for Greenhouse Gas Emissions from New, Modified, or Reconstructed Stationary Source: Electric Utility Units (40 CFR Part 60, Subpart TTTT);
- Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR Part 60, Subpart Dc);
- Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII); and,
- 40 CFR Part 60, Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984).

3.1.1 Subpart A: General Provisions

The combustion turbine, duct burner, auxiliary boiler, emergency diesel engine generator, new emergency diesel fire pump, and fuel oil storage tank are subject to the general provisions for

NSPS units in 40 CFR Part 60, Subpart A. These include the following 40 CFR Parts 60.7 and 60.8 requirements:

40 CFR 60.7 Notification and Record Keeping

(a)(1) A notification of the date of construction start—no later than 30 days after such date.

(a)(3) A notification of actual date of initial startup—within 15 days after such date.

(a)(5) A notification of the date of continuous monitoring system performance commences—not less than 30 days prior to such date.

(b) Maintain quarterly records of the startup, shutdown, or malfunction of facility, air pollution control equipment, or continuous monitoring system.

(c) Excess emissions reports - by the 30th day following end of each quarter. (required even if no excess emissions occur).

(f) Maintain file of all measurements, maintenance, reports, and records for two years.

40 CFR 60.8 Performance Tests

(a) Performed within 60 days after achieving maximum production rate but no later than 180 days after initial startup.

(d) Notification of performance tests at least 30 days prior.

3.1.2 Subpart KKKK: Stationary Combustion Turbines

On July 6, 2006, the U.S. EPA promulgated Subpart KKKK to establish emission standards and compliance schedules for the control of emissions from stationary combustion turbines that commence construction, modification, or reconstruction after February 18, 2005.

Subpart KKKK establishes emission limits for NO_x for combustion turbines with a heat input capacity greater than 850 MMBtu/hr. During natural gas firing, NO_x emissions from the proposed combined cycle turbine are limited to 15 parts per million (ppm) (dry basis by volume, corrected to 15% oxygen (O_2)) or 0.43 pounds per megawatt-hour (lb/MW-hr) of useful output. Emissions of SO_2 from combustion turbines regardless of fuel type are limited to 0.90 lb/MW-hr gross output or low-sulfur fuel to achieve no greater than 0.060 lb/MMBtu.

The Project's proposed emission rates from the combustion turbine and duct burner are well below the applicable Subpart KKKK emission standards as shown in Tables 1-1 and 1-2. Compliance with the NO_x emission standard will be verified based on continuous emissions monitoring (CEMS) data. The proposed CTG will burn pipeline quality natural gas with a sulfur content of 0.5 grains sulfur/100 scf, therefore the SO_2 emission rate will not exceed 0.0015 lb/MMBtu. Therefore, compliance with the SO_2 emission limit will be achieved.

3.1.3 Subpart TTTT: Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units

Subpart TTTT establishes emission standards and electric generation monitoring/record keeping requirements for affected units. These standards reflect the degree of emission limitation achievable through the application of the best system of emission reduction (BSER) that the U.S. EPA has determined has been adequately demonstrated for each type of unit. An affected new source is any newly constructed fossil fuel-fired power plant that commenced construction on or after January 8, 2014 and with newly constructed stationary combustion turbines that have a base load rating for fossil fuels greater than 250 MMBtu/hr and serve a generator capable of selling more than 25 MW-net of electricity to the grid. U.S EPA determined that the BSER for new and reconstructed stationary combustion turbines is natural gas combined cycle (NGCC) technology. The final standard for base load combustion turbines is an emission limit of 1,000 pounds of CO_2 per megawatt-hour on a gross-output basis (lb CO_2/MWhr-g). This standard applies to all sizes of base load units.

The method to calculate compliance is to sum the emissions for all operating hours and to divide that value by the sum of the electric energy output over a rolling 12-operating-month period. In compliance determinations, sources must incorporate emissions from all periods, including startup or shutdown, during which fuel is combusted and emissions are being monitored, in addition to all power produced over the periods of emissions measurements.

Taking into account the efficiency metric for the combined-cycle power plant of pounds of CO_2 per gross MW-hr of electrical generation, the capability of HRSG duct firing, the inherent degradation in turbine performance over the life of the Project, the inclusion of startup and shutdowns and part-load operation over the course of a year, and operation on ULSD backup fuel, it has been concluded that the Project will meet the NSPS TTTT limit on a 12-month rolling average during the lifetime of Project operation. In addition, Danskammer Energy will comply with all applicable Subpart TTTT monitoring, recordkeeping, reporting, and performance test requirements.

3.1.4 Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The auxiliary boiler is subject to the provisions of 40 CFR Part 60, Subpart Dc because its maximum heat input capacity is between 10 and 100 MMBtu/hr. While the boiler is subject to Subpart Dc, the PM and SO_2 emission standards under Subpart Dc are not applicable because the boiler will only burn natural gas. Subpart Dc does not include NO_x emission standards. Danskammer Energy will comply with all applicable Subpart Dc monitoring, recordkeeping and reporting requirements.

Additionally, opacity is limited to no greater than 20 percent over a 6-minute average except for one 6-minute period per hour of not more than 27 percent opacity. Opacity monitoring is not required since the auxiliary boiler will not combust coal.

3.1.5 Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Subpart IIII establishes emission standards, fuel sulfur limitations, maintenance requirements, operating limitations, monitoring requirements, and recordkeeping requirements for affected units. An affected unit must be a compression ignition designed internal combustion engine that is new (dates vary between April 1, 2006 and 2007 model year) or reconstructed after July 11, 2006. Danskammer Energy will purchase and install two (2) new internal combustion diesel engines for the emergency generator and back-up fire pump that will meet the applicability requirements of Subpart IIII. The proposed potential emission rates of NO_x, CO, PM-10, and VOC from the emergency diesel engines will not exceed the applicable emission standards set forth in Subpart IIII. The engines will be certified by the manufacturer to meet these emission standards. Danskammer Energy will operate and maintain the engines according to the manufacturer’s emission-related written instructions and will keep records of conducted maintenance to demonstrate compliance.

3.1.6 Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels

The Project will include volatile organic liquid storage vessels (oil tanks) with a capacity greater than 40 cubic meters. As such, the ULSD storage tank will be subject to 40 CFR 60 Subpart Kb. Since the vapor pressure of the distillate oil tank is less than 3.5 kilopascals (kPa), the only requirement applicable is the recordkeeping requirement specified in 40 CFR 60.116b(b). The proposed Project will maintain records showing the dimensions and capacity of the oil storage tank.

3.2 National Emission Standards for Hazardous Air Pollutants (NESHAP)

NESHAP are emissions standards set by the U.S. EPA for an air pollutant not covered by the National Ambient Air Quality Standards (NAAQS) and that may cause an increase in serious health effects or adverse environmental effects. The standards for a particular source category require the maximum degree of emission reduction that the U.S. EPA determines to be achievable, which is known as the Maximum Achievable Control Technology (MACT). These standards are authorized by Section 112 of the Clean Air Act and the regulations are published in 40 CFR Parts 61 and 63. The proposed Project is subject to the following two subparts: General Provisions (40 CFR Part 63, Subpart A) and the emission standards for Reciprocating Internal Combustion Engines (RICE) (40 CFR Part 63, Subpart ZZZZ).

3.2.1 40 CFR Part 63, Subpart A – General Provisions

The emergency diesel generators and fire pump are subject to the general provisions for NESHAPs units in 40 CFR Part 63 Subpart A. These include the requirements for notification, record keeping, and performance testing.

3.2.2 40 CFR Part 63, Subpart ZZZZ – Reciprocating Internal Combustion Engines

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAPs) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. An area source is defined as a source which is not a major source of HAP emissions. The proposed emergency diesel generator and new fire pump are subject to these rules. By complying with the NSPS Subpart IIII, the units will comply with Subpart ZZZZ.

3.2.3 40 CFR 63 Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

The Combustion Turbine MACT standard (Subpart YYYY) only applies to major HAP sources.

Since the Project is not a major source of HAPs, Subpart YYYY will not apply to the Project.

3.2.4 40 CFR 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers Area Sources

Subpart JJJJJJ regulates HAP emissions from boilers at area sources of HAP. The rule defines boiler as:[2]

> *An enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water.*

Gas fired boilers are exempt from this regulation per 40 CFR 63.11195(e). Gas fired boilers are defined as:[3]

> *Any boiler that burns gaseous fuels not combined with any solid fuels, [and] burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year.*

The proposed Project will include one auxiliary boiler, with up to the full load equivalent of 4,800 hours per year of natural gas operation. Thus, the proposed auxiliary boiler will be exempt because it meets the definition of a gas-fired boiler.

3.2.5 40 CFR Part 63 Subpart UUUUU – National Emission Standards for Hazardous Air Pollutants: Coal and Oil-Fired Electric Utility Steam Generating Units

Subpart UUUUU establishes national emission limitations and work practice standards for HAP emitted from coal and oil-fired electric utility steam generating units. An electric utility steam generating unit is defined in Subpart UUUUU as a fossil fuel-fired combustion unit of more than 25 MW that serves a generator that produces electricity for sale. An oil-fired electrical utility steam generating unit is defined as a unit that burns oil for more than 10.0 percent of the average annual heat input during any 3 consecutive calendar years or for more than 15.0 percent of the annual heat input during any one calendar year.

Any unit designated as a stationary combustion turbine, other than an integrated gasification combined cycle unit, covered by 40 CFR 63, Subpart YYYY, is not subject to Subpart UUUUU. As such, Subpart UUUUU does not apply to the Project gas turbine nor to the Project.

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[2] 40 CFR 63.11237

[3] Ibid

3.3 New York State Department of Environmental Conservation Regulations

Applicable NYSDEC air regulations are identified below:

- Part 200 defines general terms and conditions, requires sources to restrict emissions, and allows NYSDEC to enforce NSPS, PSD, and NESHAP. Part 200 is a general applicable requirement; no action is required by the Project.

- Part 200.1 defines emergency power generating stationary internal combustion engines as stationary internal combustion engines that operate as mechanical or electrical power sources only when the usual supply of power is unavailable, and operate for no more than 500 hours per year (i.e., applicable to the proposed emergency diesel generator and emergency diesel fire pumps, all of which have been assumed to operate no more than 250 hours per year, including periodic testing and maintenance activities to ensure reliability).

- Part 201 requires existing and new sources to evaluate minor or major source status and evaluate and certify compliance with all applicable requirements. The Project will represent a modified major Part 201 source, and is seeking a construction permit under 201-5, and will apply for a Title V operating permit under 201-6 within one year of commencing operation.

- Part 202-1 requires sources to conduct emissions testing upon the request of NYSDEC. Permit conditions covering construction of the proposed Project will likely require stack testing as a condition of receiving its permit to construct.

- Part 202-2 requires sources to submit annual emission statements for emissions tracking and fee assessment. Pollutants are required to be reported in an emission statement if certain annual thresholds are exceeded. Project emissions will be reported as required.

- Part 211-3 defines general opacity limits for sources of air pollution in New York State. General applicable requirement Project-wide visible emissions are limited to 20 percent opacity (6-minute average) except for one continuous six-minute period per hour of not more than 57 percent opacity. Note that the opacity requirements under Part 227-1 (see below) are more restrictive and effectively supersede the requirements of Part 211-3.

- Part 225-1 regulates sulfur content of fossil fuels. Fuel sulfur is limited to 0.0015 percent by weight for distillate oil. Danskammer Energy proposes to use 0.0015 percent sulfur ULSD. The Project will not fire residual oil.

- Part 227-1.2 sets a 0.10 lb/MMBtu particulate matter limit for oil-fired stationary combustion installations with a maximum heat input capacity exceeding 250 MMBtu/hr. Danskammer Energy proposes to comply with this emission standard by proposing a maximum particulate matter emission limit of 0.0089 lb/MMBtu when the combustion turbine is operating on ULSD.

- Visible emissions (opacity) for stationary fuel-burning equipment are regulated under 6 New York Codes, Rules and Regulations (NYCRR) Subpart 227-1.3. Project stationary combustion installations must be operated so that the following opacity limits are not violated; 227-1.3(a) 20 percent opacity (six minute average), except for one six-minute period per hour of not more than 27 percent opacity.

- Part 227-2 sets NO_x Reasonably Achievable Control Technology (RACT) emission limits for combustion sources. Under 227-2.4(e), combined cycle combustion turbines that operate after July 1, 2014 must submit a case-by-case NO_x RACT analysis that includes descriptions of available NO_x control technologies, the projected effectiveness of the technologies considered, and the costs for installation and operation for each of the technologies, as well as a proposal for the RACT technology and emission limit selected as RACT. The unit utilizes dry low-NO_x combustion (on gas), water injection (on ULSD) and SCR for NO_x control to meet limits of 2.0 ppm on gas (with and without duct firing) and 4.0 ppm on ULSD. Because the new combustion turbine will utilize the state of the art NO_x control technology for this type of unit and meets the criteria for lowest achievable emission rate (LAER) under ozone non-attainment new source review, the proposed NO_x emission limits satisfy NO_x RACT. Recordkeeping and reporting requirements under Part 227-2.6 would apply.

- Part 231 requires New Source Review for major modifications to existing major sources in both attainment and nonattainment areas. While the Project site is designated as attainment for the 8-hour ozone standard, it is located in the ozone transport region. Therefore, and consistent with 6 NYCRR 231-13.3, Table 3, since significant net emissions increase of NO_x and/or VOC, precursors to ozone formation, exceed 40 tons per year of NO_x and/or VOC, the facility is required to meet LAER levels for the applicable pollutant(s) and obtain emission offsets from existing sources of VOC and NO_x at a 1.15 to 1 ratio.

- Subparts 231-7 and 231-8 are the NYSDEC implementation of Prevention of Significant Deterioration (PSD) Rules. Under Subpart 231-8, the Project must address Best Available Control Technology (BACT) for NO_x, CO, PM/PM-10/PM-2.5 and greenhouse gases (GHG). See Section 4 for a complete control technology analysis.

- Part 242 establishes the New York State component of the CO_2 Budget Trading Program. Program requirements, including allowance allocations, account reconciliation, monitoring and reporting and regulatory timelines are addressed in these rules.

- Parts 243, 244, and 245 implement the US EPA's Cross-State Air Pollution Rule (CSAPR) and allow the NYSDEC to distribute CSAPR allowances to regulated entities in New York. These rules implement the transport rules annual NO_x and SO_2 trading program and the NO_x ozone season trading program. Program requirements, including items such as allowance allocations and regulatory timelines are addressed in these rules.

- Part 251, CO_2 Performance Standards for Major Electric Generating Facilities applies to owners and/or operators of new major electric generating facilities (defined as facilities that have a generating capacity of at least 25 megawatts (MW)) that commence construction after July 12, 2012 and for increases in capacity of at least 25 MW at existing electric generating facilities. Part 251 will apply to the project's combustion turbine. New combined cycle units subject to this Part must comply with either an input-based emission limit of 120 pounds of CO_2 per MMBtu or an output-based CO_2 emission limit of 925 lb/MWh (gross). The emission limit will be measured on a 12-month rolling average basis. In accordance with 6 NYCRR Part 251.5, Danskammer Energy will install a CO_2 CEMS to measure total turbine CO_2 emissions.

- Under 6 NYCRR 257, New York's ambient air quality standards, project emissions must not exceed state ambient air standards for SO_2, PM, CO, photo-chemical oxidants, NO_2, fluorides, beryllium and hydrogen sulfide.

- To meet NYSDEC guidelines for ammonia (NH_3) "slip", combined cycle stack emissions of ammonia will be limited to 5 ppm by controlling the ammonia injection rate and employing good operating practices.

3.4 Attainment Status and Compliance with Air Quality Standards

The U.S. EPA has established National Ambient Air Quality Standards for each of the following criteria air pollutants: PM-10, PM-2.5, SO_2, ozone (O_3), NO_2, CO, and lead (Pb). Areas in which the NAAQS are being met are referred to as attainment areas. Areas in which the NAAQS are not being met are referred to as non-attainment areas. Areas that were formerly non-attainment areas but are now in attainment and covered by a maintenance plan are referred to as maintenance areas. Areas for which sufficient data are not available to determine a classification are referred to as unclassifiable. The federal attainment status designations of areas in New York with respect to NAAQS are listed at 40 CFR 81.333. The Project is located in Orange County in the Hudson Valley Intrastate Air Quality Control Region (AQCR).

The location of the proposed Project is in an area currently designated as attainment for SO_2, NO_2, CO, PM-10, PM-2.5, and ozone. Orange County, however, is located in the ozone transport region, and under this designation for 8-hour ozone, modifications at existing major facilities with net emissions increases more than 40 tons per year of NO_x and/or more than 40 tons per year of VOC, respectively, are subject to Part 231 NNSR for these pollutants.

The NYSDEC has adopted the NAAQS as the New York Ambient Air Quality Standards (NYAAQS), as shown in Tables 3-1 and 3-2. In addition, NYSDEC has NYAAQS for TSP, gaseous fluoride, beryllium, and hydrogen sulfide.

In order to identify those new sources with the potential to impact ambient air quality, the U.S. EPA and the NYSDEC have adopted Significant Impact Levels (SILs) for NO_2, SO_2, CO, PM-10, and PM-2.5 as shown in Table 3-1. Sources that have maximum modeled air quality impacts that exceed SILs require a more comprehensive analysis that considers the combined impacts of the new source, existing sources, and measured background levels, in order to evaluate compliance with NAAQS and with PSD increments.

3.5 NSR Analysis

The federal NSR program is comprised of two distinct pre-construction permitting programs: 1) Prevention of Significant Deterioration (PSD) (for attainment areas/pollutants); and 2) Non-attainment New Source Review (NNSR) (for non-attainment areas/pollutants). For an existing major stationary source like the Danskammer Generating Station, these permitting programs are required to be evaluated when a new source is constructed, or an existing source is modified at the Project. The applicability determination for existing major stationary sources involves first determining if a major modification would occur as a result of the proposed Project and, if so, which pollutants are subject to PSD and/or NNSR permitting requirements.

PSD permitting may apply to facilities located in areas designated as in attainment with the National Ambient Air Quality Standards (NAAQS). Projects that are either new major stationary sources or modifications to existing major sources resulting in a significant emissions increase and a significant net emissions increase of an attainment pollutant are subject to the PSD permitting program. The NYSDEC's PSD permitting program is established in 6 NYCRR Part 231.

NNSR permitting may apply to facilities located in areas that are designated as not in attainment with the NAAQS for a specific criteria pollutant. Projects that are either new major stationary sources or modifications to existing major sources resulting in a significant emissions increase of a non-attainment pollutant are regulated under the NNSR program in New York. NYSDEC has its own NNSR permitting program as established in 6 NYCRR Part 231.

3.5.1 Existing Facility Major NSR Status

The first step in completing a PSD/NNSR applicability analysis is to determine if a premises is currently considered a major stationary source. NYSDEC defines a major stationary source with potential emissions greater than a threshold of 100 tpy for any regulated NSR pollutant except for VOC, which has a lower threshold of 50 tpy in Orange County. The major source threshold for greenhouse gases is 100,000 tpy of CO_2e.

Based on the potential emissions from the existing Danskammer Generating Station for attainment pollutants, the Project is considered a major stationary source under the PSD program (since criteria air pollutant potential emissions exceed 100 tpy). The Project is also considered an existing major stationary source for GHGs under the PSD program since potential emissions exceed 100,000 tpy of CO_2e. The existing Danskammer Generating Station is also considered an existing major stationary source under NNSR regulations for VOC and NO_x as precursors to ozone.

3.5.2 NSR Netting Analysis

If a modification is subject to PSD review, the PSD regulations state that facilities must perform an air quality analysis (which can include atmospheric dispersion modeling and preconstruction ambient air quality monitoring), and a BACT demonstration for those pollutants that exceed the pollutant-specific significant net emissions increase thresholds (SNEIT) identified in the regulations. The preconstruction NNSR review requirements for major modifications differ from the PSD requirements. First, the emissions control requirement for non-attainment areas, LAER, is defined differently and is more stringent than the BACT emissions control requirement. Second, the source must obtain any required emissions reduction credits (ERC) (offsets) of the non-attainment pollutant precursors from sources which impact the same area as the proposed source.

If an existing major source proposes to undergo a physical or operational change, the applicant must review the project emission potential (PEP) associated with the proposed project to determine if the project is considered an NSR major modification. The PEP is compared to the significant project threshold (SPT) as shown in Table 3-3. If the PEP is less than the SPT, the pollutant does not trigger NSR. If the PEP exceeds the SPT, then the net emissions increase (NEI) must be determined and compared to the SNEIT. The NEI takes into account not only emissions increases from the proposed project, but also contemporaneous creditable emission increases at the facility and for which an emission offset was not obtained; and any ERC at the facility, or portion thereof, selected by the applicant which is contemporaneous to the project. If the PEP exceeds the SPT and the NEI exceeds the SNEIT for any regulated air pollutant, then PSD and/or NNSR permitting is required. That is, the permit application requirements for PSD and NNSR only apply to those pollutants that result in a significant project increase and a significant net emissions increase.

3.5.3 NSR Applicability and Significant Emission Rates

If an existing major stationary source proposes to undergo a physical or operational change, the applicant must review potential emissions associated with the proposed Project to determine if the Project is considered a major modification. The Project becomes directly subject to PSD/NNSR review for each pollutant for which the proposed Project is determined to be a major modification.

3.6 Danskammer Generating Station Project Emissions Analysis

A net emissions increase is the sum of emissions increases from a particular physical change at a stationary source and any other increases and decreases in actual emissions at the major stationary source that are contemporaneous with the particular change and are otherwise creditable. Per 6 NYCRR 231-4(b)(13), "contemporaneous" is defined as the period beginning five years prior to the scheduled construction commencement date of the new or modified emission source, and ending with the scheduled operation commencement date. The scheduled construction commencement date is assumed as the first quarter of 2021 and the scheduled operation commencement date is assumed as the fourth quarter of 2023. Therefore, the contemporaneous period is defined as the first quarter of 2016 through the fourth quarter of 2023.

The following sections detail the assumptions and calculation methodology to determine the baseline actual emissions, projected Project emissions potential, and contemporaneous creditable emissions increases and decreases that are associated with this Project.

3.6.1 Baseline Actual Emissions

Per 6 NYCRR 231-4(b)(7), "baseline period" is defined for an emission reduction credit (ERC), which is scheduled to occur in the future, as the average rate in tons per year, at which the unit actually emitted the pollutant during any consecutive 24-month period within a 5-year period immediately preceding the date a complete permit application is received. The NYSDEC air permit application completeness determination date is assumed to be December 2019.

The proposed 5-year baseline period for the Project is December 2014 through and including November 2019. The 24-month period used to establish pollutant-specific baseline actual emissions (BAE) is December 2014 through November 2016.

Emissions for this period were calculated using the 2014-2016 NYSDEC Emissions Statements and U.S. EPA Clean Air Markets data for the existing Danskammer Generating Station. Note that per NYCRR 231-4(b)(4), baseline actual emissions must be adjusted downward to exclude any non-compliant emissions that occurred while the emission source was operating above any applicable emission limitation. Thus, the NO_x CEM emissions reported in the annual emission statements were adjusted downward to account for those NO_x emissions that were above the Title V NO_x RACT limit for the existing facility as provided in the annual Title V deviation reports and NO_x RACT compliance reports.

3.6.2 Proposed Future Emissions Potential

For new emission units as defined in 6 NYCRR Part 231-4.1, Project Emission Potential (PEP) is defined as maximum potential to emit for the Project. Table 2-1 provides a summary of the PEP. The detailed operation, equipment, and emission calculations are provided in Appendix B.

3.6.3 Contemporaneous Emissions Increases

No projects occurred at the facility which resulted in creditable emission increases during the contemporaneous period. As such, no creditable emission increases are included in the calculation of NEI for the Project.

3.6.4 Contemporaneous Emissions Decreases

Danskammer Energy will apply for certification of NNSR and PSD ERCs due to the shutdown of the four (4) existing boilers at the facility. These ERCs will be utilized in the NNSR/PSD netting analysis and were calculated in accordance with 6 NYCRR 231-10.2. This regulation requires that an ERC may be obtained for any decrease in emissions of a regulated NSR contaminant which is:

- Surplus, quantified, permanent, enforceable, and included in a Part 201 permit;

- Will result or resulted from a physical change in, or change in the method of operation, of an emission source subject to Part 201 of this Title that is quantified as the difference between baseline actual emissions and the subsequent potential to emit and is approved in accordance with the provisions of this Part.

For a future emission reduction, the Baseline Period consists of any 24 consecutive months within the five (5) years immediately preceding the date of receipt by the NYSDEC of the permit application for the project which proposes to use the emission reduction credits as emission offsets or for netting purposes. The proposed 5-year baseline period for the Project is December 2014 through and including November 2019. The 24-month period used to establish pollutant-specific ERCs are December 2014 through November 2016.

3.6.5 Net Emissions Summary

In the final step of major source NSR applicability, NEI is compared to the SNEIT for any pollutants for which PEP exceeds the significant project threshold. NEI is defined under 6 NYCRR 231 4.1(b)(30) as the aggregate increase in emissions of a regulated NSR contaminant at an existing major facility resulting from the sum of:

- The project emission potential;
- Every creditable emission increase at the facility which is contemporaneous and for which an emission offset was not obtained; and
- Any emission reduction credit (ERC) at the facility, or portion thereof, selected by the applicant which is contemporaneous, and which was not previously used as part of an emission offset, an internal offset, or relied upon in the issuance of a permit.

In summary, the net changes in emissions of pollutants potentially subject to PSD/NNSR review were determined as follows:

Net Emissions Change

equals

Emissions increases associated with the proposed Danskammer Energy Center

minus

Source-wide creditable contemporaneous emissions decreases associated with shutdown of the existing Danskammer Generating Station

3.7 NSR Netting Conclusions and PSD/NNSR Applicability

The results of the NSR netting analysis are provided in Table 3-4. As shown in Table 3-4, the NEI is greater than the SNEIT thresholds for all pollutants except for SO_2. Thus, the Project is subject to PSD review for CO, PM-10/PM-2.5, H_2SO_4, and CO_2 and is subject to NNSR review for NO_x and VOC. As such, the Project will be required to install LAER control technology for NO_x and VOC and will be required to obtain ERCs for these pollutants.

3.8 Prevention of Significant Deterioration Program Requirements

The PSD regulations state that facilities subject to PSD review must perform an air quality analysis (which can include atmospheric dispersion modeling and preconstruction ambient air quality monitoring), and a BACT demonstration for those pollutants that exceed the pollutant-specific significant emission rates (SERs) identified in the regulations as well as an additional impacts analysis that examines the impacts of air emissions from the project on visibility, soils and vegetation.

3.8.1 Best Available Control Technology (BACT)

The Danskammer Energy Center will incorporate BACT controls for emissions of NO_x, CO, PM-10/PM-2.5, H_2SO_4, and GHG from each piece of new equipment. As previously stated, BACT is defined as the optimum level of control applied to pollutant emissions based upon consideration of energy, economic and environmental factors. In a BACT analysis, the energy, environmental, and economic factors associated with each alternate control technology are evaluated, in addition to the benefit of reduced emissions that the technology would bring. Since the LAER requirements are more stringent than BACT, the LAER analysis will satisfy the technology requirements for VOC and NO_x. The BACT analysis for the proposed Danskammer Energy Center is detailed in Section 4.

3.8.2 Air Quality Analysis

The PSD air quality impact analysis (described in detail in Section 5) requires dispersion modeling that uses emission rates and stack parameters (stack height and flue gas exit temperature and velocity, etc.) coupled with historical meteorology representative of the site to predict the location and magnitude of maximum impacts for various pollutants and averaging periods. If dispersion modeling indicates that the predicted air quality impact concentration of a given pollutant emitted from the proposed facility is lower than its respective Significant Impact Level (SIL) shown in Table 3-1, it is considered to have an insignificant impact and no further air quality analysis is required. If modeled concentrations of one or more pollutants exceed their respective SILs, the proposed facility is considered to have an area of impact and requires additional air quality analysis.

3.8.3 Ambient Air Quality Monitoring

Proposed facilities subject to PSD review may have to perform up to one year of pre-construction ambient air quality monitoring for those pollutants with emission rates exceeding the thresholds specified in 40 CFR 52.21(b)(23)(i) and shown in Table 3-1, unless granted an exemption by the reviewing agency. Danskammer Energy is requesting an exemption from the requirement to perform preconstruction ambient air quality monitoring with respect to the project because there exists acceptable quality assured ambient air quality data from alternate locations that satisfy the requirements of 6 NYCRR 231-12.4(b) and 40 CFR 52.21.1670. The monitoring waiver request is included in Appendix D.

3.8.4 Additional Impact Analyses

The fact that the proposed Project's potential emissions are greater than the applicable PSD significant emission rate thresholds means that certain additional analyses are required as part of the PSD review. These include modeling to assess potential for impacts to soils and vegetation, visibility, and include emissions from associated industrial, commercial, and residential growth as well as the emissions from the proposed Project. A more detailed explanation of this analysis is presented in Section 5 of this application.

3.8.4.1 Impacts on Class I Areas

Proposed modifications to existing major sources greater than 50 kilometers from a Class I area may be eligible for an exemption from the requirement to perform a Class I area modeling analysis. The Class I areas closest to the proposed Project are the Lye Brook National Wilderness Area (NWA) in Vermont and Edwin B. Forsythe National Wildlife Refuge (NWR) at Brigantine, New Jersey, located approximately 181 kilometers to the north-northeast and approximately 228 kilometers to the south, respectively. The Federal Land Managers (FLM) for these Class I areas were notified by letter and requested for a determination if assessments of impacts in the Class I areas would be required. The FLMs reviewed the proposed Project's details and related correspondence and confirmed that Class I analyses for the proposed Project are not required. (See Appendix D for copies of the relevant correspondence).

3.8.4.2 Environmental Justice

The purpose of the Environmental Justice (EJ) program is to evaluate whether minority low-income communities are affected adversely or disproportionately by the actions of federal agencies, including approvals under the PSD program. The EJ analysis is presented in Appendix I. The analysis satisfies the requirements of NYSDEC Part 487 - Analyzing Environmental Justice Issues in Siting of Major Electric Generating Facilities Pursuant to Public Service Law Article 10.

3.9 Non-Attainment New Source Review Requirements

Based upon the provisions of 6 NYCRR Subdivision 231-6, major modifications located in areas designated by EPA as non-attainment or transport areas, must demonstrate, as part of the permit application, that several special conditions are met. These include the need to apply LAER and obtain emission offsets, (i.e., emission reduction credits (ERCs)). Additional requirements specific to NNSR are as follows:

1. The certification that all emission sources, which are part of any major facility located in New York State and under the applicant's ownership or control (or under the ownership or control of any entity which controls, is controlled by, or has common control with the applicant) are in compliance, or are on a schedule for compliance, with all applicable emission limitations and standards under NYSDEC's regulations (from 6 NYCRR 231-6.3(a)).
2. The submission of an analysis of alternative sites, sizes and production processes, and environmental control techniques which demonstrates that benefits of the proposed project or proposed major facility significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification within New York State (from 6 NYCRR 231-6.3(b)).
3. The submission of a list which identifies the source(s) of approved or proposed ERCs of VOC or NO_x that will be used. The list must include the name and location of the facility, NYSDEC identification number, if applicable, and the emission reduction mechanism. All of the proposed ERCs must be submitted and certified prior to final permit issuance (from 6 NYCRR 231-6.3(d)).

3.9.1 Lowest Achievable Emission Rate (LAER)

Pollutants subject to NNSR must be limited to LAER levels. LAER is defined as either the most stringent emission limitation contained in a State Implementation Plan (SIP) (unless it is demonstrated to not be achievable) or the most stringent emission limitation which is achieved in practice by the class or category of source, whichever is the most stringent. Pollutants are subject to LAER if potential emissions of individual pollutants exceed significance levels as defined in 6 NYCRR 231-13. Based upon these criteria, emissions of NO_x and VOC are subject to LAER requirements. LAER analyses for each piece of new equipment with emissions of NO_x and VOC are presented in Section 4 of this application support document.

3.9.2 Emission Offset Requirements

A major source or major modification planned in an EPA-designated non-attainment or transport area must obtain emissions reductions as a condition for approval. The emissions reductions, generally obtained from existing sources located in the vicinity of a proposed source, must offset the emissions increase from the new source or modification. These offsets, obtained from existing sources that implement a permanent, enforceable, quantifiable and surplus emissions reduction, must equal the emissions increase from the new source or modification multiplied by the offset ratios established in 6 NYCRR 231-13. For the Danskammer Generating Station, the required offset ratio is 1.15:1.

3.9.2.1 Emission Reduction Credit (ERC) Requirements

In accordance with 6 NYCRR Part 231-6.6, proposed NSR major modifications located in an attainment area of the state within the ozone transport region may obtain emission offsets of VOC or NO_x from any location within the ozone transport region. These offsets may also be obtained from another state in the ozone transport region, provided that an interstate reciprocal trading agreement is in place.

The Project is located in an ozone transport region and will be required to purchase ERCs from a source (or sources) located in the ozone transport region. In order to streamline the procedures for satisfying the “contribution test” for NO_x and VOC offsets, NYSDEC developed a graphic which delineates the upwind, downwind and crosswind zones where sources of VOC and NO_x offsets can be located relative to the source needing the offsets. This graphic is presented as “Figure 2" in Appendix E of NYSDEC’s DAR-10 - NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis (NYSDEC, May 2006).

Additionally, DAR-10 provides a Table of default acceptable NO_x and VOC offset source areas for proposed sources in New York State. Based upon Table 2 of DAR-10, NO_x and VOC offsets for the Danskammer Generating Station can be obtained from all sources in New York State.

The calculation of required offsets for the proposed Project is presented in Table 3-5.

3.9.2.2 Availability and Certification of Emission Reduction Credits (ERCs)

As was previously noted, each emission source providing offsets must be identified along with the proposed mechanism to affect the emission reduction. After the sources of the emission offsets are identified, the offsets will need to be certified pursuant to the requirements of 6 NYCRR Subpart 231-10. If the source identification is not made prior to the issuance of a draft permit for the project, then the offset transaction will be subject to a separate notice and hearing process from the air permit application itself. ERCs may be created from past or future facility shutdowns, emission unit shutdowns or other reduction mechanisms acceptable to NYSDEC.

NYSDEC maintains a registry of emission reduction credits for sources that have fulfilled the requirements for certifying emission reduction credits through enforceable permit modifications. This registry may be utilized in identifying such offsets. As of September 2019, the ERC Registry reported more than 23,444 tons of NO_x offsets within New York State and 2,479 tons of VOC offsets available within New York State.[4] Danskammer Energy is presently in discussions relating to NO_x and VOC offsets from both eligible in-state and out-of-state sources located within the applicable emissions trading area identified in DAR-10 and described above.

3.9.3 Compliance Status of Other Danskammer Energy, LLC's New York Facilities

Danskammer Energy, LLC does not own or operate any other facility in New York other than the existing Danskammer Generating Station. At the present time, the Danskammer Generating Station is operating in full compliance with applicable emission limitations and standards under NYSDEC's regulations.

3.9.4 Analysis of Alternatives

Based upon the NYSDEC requirements at 6 NYCRR 231-6.3(b), the Project is required to conduct an analysis of "alternative sites, sizes, production processes and environmental control techniques for the proposed facility, which demonstrates that the benefits of the proposed

[4] The ERC Registry is available on the Internet at https://www.dec.ny.gov/chemical/8564.html

facility significantly outweigh the environmental and social costs" imposed as a result of the proposed construction. These analyses, which are presented in the following sections, show that the benefits of the proposed facility significantly outweigh the environmental and social costs imposed as a result of the proposed facility's construction and operation in the Town of Newburgh, Orange County, New York.

3.9.4.1 Alternative Sites Evaluated

Danskammer is a private facility applicant because it does not have eminent domain authority nor does it intend to acquire it from an entity that may have such authority by statute. Accordingly, its analysis of alternative available location sites is limited to those owned, or under option to, Danskammer or its affiliates. Danskammer owns approximately 180 acres in the Town of Newburgh. The proposed Project Site comprises approximately 106 acres within the Danskammer Property. This property is transected in a northwest/southeast orientation by the CSX Transportation rail line. Neither Danskammer nor any of its affiliates owns or has under option any other property in New York.

The proposed location of the Danskammer Energy Center, immediately adjacent to the existing Danskammer Generating Station, was selected to take advantage of existing infrastructure (i.e., natural gas and electrical interconnections, access roads, security infrastructure) and minimize construction-related environmental impacts. The proposed Project will interconnect with Central Hudson's 115 kV transmission system through the existing substation onsite. As such, no additional offsite electrical transmission system right-of-way will be required for the interconnection to Central Hudson's transmission system. The proposed Project will also use the existing natural gas transmission system and metering station for the delivery of natural gas. The project location does not require new offsite infrastructure to be constructed since the existing site has this infrastructure available to support future operations.

3.9.4.2 Alternative Project Technologies

The design configuration selection for the proposed Project included evaluation of both simple-cycle and combined-cycle operational modes and alternative turbine and cooling technologies.

Combined Cycle and Simple Cycle Combustion Turbines

Combined cycle and simple cycle operational modes were evaluated as part of the project design selection. A combined-cycle facility has several key advantages over a simple-cycle facility. By using the waste heat from the combustion turbine to produce steam that in turn generates additional electricity, the proposed facility will operate with a higher thermal efficiency than other types of electric generating facilities. The combined cycle technology is about 30 percent more efficient than simple cycle technology. Further, since a combined cycle plant uses less fuel than either a steam turbine or a gas turbine to generate a kilowatt-hour of electricity, the savings in fuel is significant and results in lower operating costs that ultimately benefit the consumer. The proposed facility will likely be dispatched on a more continuous basis, enabling it to displace older, less efficient electric generating facilities, and resulting in a net environmental benefit for the state of New York. Danskammer proposes to use the Mitsubishi M501JAC combined cycle technology, which is designed for faster start-ups to respond to rapidly increasing system demands. This system also allows for much lower output during times of low system demands and provides the NYISO greater flexibility in its selection of generation resources (both fossil and renewables) from within its portfolio.

Alternative Combustion Turbines and Providers

The increased efficiency and associated reduction in operating costs and environmental benefits resulted in the selection of combined cycle technology for the Project. Consideration was given to various frame (F-, G-, H-, and J-class) turbine technologies and configurations that would have resulted in a project with a larger or smaller generating capacity. These different frame turbine technologies, while similar, do result in different turbine performance and potential environmental impacts. Two turbine vendors/providers (GE and MHPS) were contacted and turbine performance specifications were obtained. Danskammer evaluated the project's life-cycle costs, preliminary engineering design, vendor emissions data, costs, operations and maintenance programs, and warranties.

The review of vendor specifications also considered the proposed Project Site location and recognized the Project would be affected by the following:

- The Project Site is in the Ozone Transport Region;
- The Project will result in an emissions increase of greater than 40 tons of NO_x and VOC per year and will be subject to ozone non-attainment requirements;
- The Project will need to comply with Lowest Achievable Emission Rate (LAER) provisions;

- Emission Reduction Credits (ERCs) for NO_x and VOC will need to be acquired;

- The proposed Project will be a major modification to an existing major source and require Best Available Control Technology (BACT) for pollutants that trigger a major modification but that are not subject to non-attainment NSR requirements.

It was determined that the alternative F- and H-class turbine technologies would result in similar, but not identical, turbine performance and potential environmental impacts. After consideration of the above, Danskammer determined the selection of the Mitsubishi 501JAC combustion turbine generator was the preferred alternative.

Alternative Sizes and Power Block Arrangements

Danskammer considered several different sizes/power block arrangements during its technology evaluation, which included the following:

- Two GE 7FA.05 combustion turbines in simple cycle mode, with an output of approximately 486 MW (gross)

- Five GE LMS 100 combustion turbines in simple cycle mode, with an output of approximately 585 MW (gross)

- Six GE EA combustion turbines in simple cycle mode, with an output of approximately 585 MW (gross)

- Two MHPS 501 GAC combustion turbines in simple cycle mode, with an output of approximately 566 MW (gross)

- Two GE 7HA.02 combustion turbines in simple cycle mode, with an output of approximately 768 MW (gross)

- Two MHPS 501JAC combustion turbines in simple cycle mode, with an output of approximately 850 MW (gross)

- One GE 7HA.02 combustion turbine in simple cycle mode, with an output of approximately 384 MW (gross)

- One MHPS 501JAC combustion turbine in simple cycle mode, with an output of approximately 425 MW (gross)
- Two GE 7FA.05 combustion turbines in combined cycle mode (2-on-1 configuration), with an output of approximately 756 MW (gross)
- One MHPS GAC combustion turbine in combined cycle mode (1-on-1 configuration), with an output of approximately 427 MW (gross)
- One GE 7HA.02 combustion turbine in combined cycle model (1-on-1 configuration), with an output of approximately 573 MW (gross)
- One MHPS 501JAC combustion turbine in combined cycle mode (1-on-1 configuration), with an output of approximately 614 MW (gross)

The following twelve criteria promote the design goals of the Project, many of which are environmentally based:

- Power density capability similar to the existing facility
- Utilize existing gas and electric interconnections
- Eliminate use of cooling water
- Fit within existing Project Site footprint
- Lowest heat rate
- Lowest emissions
- Dispatchable output
- Rapid start and Ramping
- High turndown
- Advanced fuels capabilities
- Improved emergency operations
- Proven latest design

After careful consideration of the above, Danskammer determined the selection of the Mitsubishi 501JAC combustion turbine generator (in combined cycle mode and in a 1-on-1 configuration) was the preferred alternative and the best fit for the proposed Project.

Alternative Cooling Technology

Three cooling technologies are potentially feasible for the Project: wet cooling, hybrid wet/dry cooling, and air cooling. The following sections provide a brief description of the cooling technologies and the reasoning behind selection of an air-cooled condenser for the Project.

Wet Mechanical Draft Cooling Tower System

A wet mechanical draft cooling tower uses evaporative cooling to cool the circulating water. A supply of makeup water (several million gallons per day) is required to account for evaporation losses. In addition to water lost by evaporation, water is also lost due to drift and blowdown. Drift losses result from water being entrained in the exhaust air stream. Drift losses are minimized by proper cooling tower design and maintenance. Blowdown is required of wet towers because evaporation concentrates the impurities in the circulating water. Blowing down the circulating water reduces the impurities.

Danskammer proposes to obtain its water supply from the Town of Newburgh to meet Danskammer Energy Center's water supply requirements. Due to the water demands of the wet cooling tower system, Danskammer determined that it does not represent a technically or environmentally viable option for the Project. An alternative to public water supply is the use of surface water withdrawal from the Hudson River to meet the Project's water supply requirements. However, surface water withdrawal would have a greater potential for adverse environmental impacts (impingement/entrainment of aquatic life).

In addition, water vapor in the saturated air discharged from the cooling tower condenses upon contact with cooler ambient air, creating a plume. The cooling tower plume could have visual impacts and potentially cause fogging and icing conditions. For these reasons, the wet mechanical draft cooling alternative was eliminated from further consideration.

Hybrid Cooling Tower System

A hybrid cooling system is like a wet cooling system, except that the cooling tower would include both dry tube heat exchanger sections and wet evaporative cooling sections. A wet/dry cooling tower works in combination to cool the circulating water. The hot water enters the tower and initially goes through the dry section (finned tube coil), and then through the wet (evaporative section). The dry section acts as a reheater, raising the temperature of air discharged from the system. This reduces the relative humidity of the air and partially or completely eliminates the visible water vapor plume. Moisture in the air discharged from the tower may still condense and form ice if it encounters a cold surface during winter operation. Because the hybrid cooling system incorporates a wet evaporative cooling section, it requires make-up water and generates blowdown in the same way as a wet cooling system. For these reasons, a hybrid cooling tower was not considered a viable alternative for the Project.

Air Cooled Condenser System

An air-cooled condenser relies only on ambient air as a direct heat sink for the steam cycle and, therefore, does not consume water through evaporation or generate a wastewater discharge. Steam from the steam turbine exhaust flows through a main steam duct to the air-cooled condenser. The condenser consists of several modules, each with tube bundles in an A-shape. The steam distribution manifold is located at the top of the A-frame. Steam turbine exhaust passes through these finned tubes while an air stream passes over the outer tube surface. The cooling air flow for each module is provided by a dedicated large-diameter fan. Condensate is collected in the condensate tank, and then pumped back to the HRSG feed water system. Because air cooling systems do not have cooling water demands, they can be located in or near cities and other areas with great demand for electricity irrespective of the availability of large supplies of cooling water. In addition, an air-cooling system does not create a vapor plume. An air-cooled condenser is somewhat larger than a wet or hybrid system. Thus, while vapor plume impacts are less, project structure visibility is somewhat enhanced through use of air-cooled condenser technology. Because the Project will contract with the Town of Newburgh to meet its water supply needs, an air-cooling system was identified as the preferred cooling technology to minimize environmental impacts associated with water use, withdrawal, and discharge. Air-cooled condensing will be employed to minimize water usage, reduce water treatment costs, and eliminate cooling tower plume impacts.

3.9.4.2.1 Alternative Project Design Options

The evaluation of alternative project design options included an assessment of alternative facility profile and stack heights and a natural gas firing only operational scenario.

Alternative Stack Heights

Concerted efforts were expended by Danskammer to minimize the visibility of the proposed Project including changes to the Project profile and size. The Project's HRSG exhaust stack is the most visually prominent feature. A primary way of minimizing stack height is to limit the height of nearby controlling structures that determine the stack height in accordance with Good Engineering Practice (GEP) guidelines. Due to the inherently low emissions resulting from natural gas and ultra-low sulfur distillate (ULSD) for backup fuel usage, air quality standards will be achieved with lower than GEP stack heights. Through optimization, final emission data from the equipment vendor and further refinement in the project design and modeling analysis, the stack height was reduced to 200 feet. A stack height of 200 feet was determined to be the minimum stack height required to ensure modeled compliance with the ambient air quality standards. This height represents an optimal compromise between minimizing the visual effects and minimizing the air quality impacts. Further, the proposed Project's HRSG exhaust stack will be lower than the existing plant's exhaust stacks (two of the existing plant's exhaust stacks are 220 feet above grade and the other two stacks are 240 feet above grade).

Only Natural Gas Fired Operation

Danskammer is proposing to use natural gas as the primary fuel for the combustion turbine. However, natural gas supply can be curtailed during severe cold weather as natural gas supplies are re-routed to support residential, institutional, and commercial heating systems. Using a backup fuel can relieve the stress on the natural gas system during such conditions. Backup fuel use will also ensure that while residences, schools, hospitals and firm sales customers are given first-order priority for gas supply, the Project's ability to operate and provide power is preserved. For this reason, the use of a backup fuel is an important reliability issue and Danskammer proposes using ULSD as a backup fuel. It is expected that the Project will only operate on ULSD only when natural gas is not available. Use of ULSD will be limited to 720 hours per year. The air quality dispersion modeling addresses the potential air impacts during ULSD-fired operation. The modeling results indicated that the maximum-modeled concentrations from the proposed Project when added to existing background concentrations will not result in any NAAQS modeled exceedances.

3.9.4.2.2 Environmental Control Technologies

Based upon the Project's site location within an ozone transport region, the premise for development of the Danskammer Energy Center is that it will be designed to meet federal BACT and LAER standards to comply with PSD requirements, NNSR requirements and New York State Part 231 regulations, the Project's design includes the following:

- Dry low NO_x combustion technology for the combustion turbine and selective catalytic reduction system (SCR) for NO_x control.
- An oxidation catalyst for CO & VOC control.
- Pipeline quality natural gas and ULSD to minimize emissions of SO_2 and PM/PM-10/PM-2.5.
- Utilization of aqueous ammonia (at 19%) as opposed to anhydrous ammonia for the SCR system.

3.9.4.2.3 Environmental/Social Costs and Benefits of the Proposed Project

The proposed Danskammer Energy Center will meet the objective of providing reliable, efficient, economical and environmentally safe electricity to meet the current and future demands for electric generation capacity in the lower Hudson Valley. In addition:

- Construction of the proposed Project will involve up to 450 people during the 30+ month construction schedule.
- The Project will have minimal impact on the Town of Newburgh's municipal services (e.g., schools, police, fire, etc.).
- The Project, once operational, will employ approximately 30 employees to staff and operate the Project.
- There will be minimal, if any, impacts to and/or on local roadways after construction.

- The Project's engineering design will ensure compliance with BACT, LAER and New York State regulatory requirements.

- The Project will have minimal or no impacts on wetlands. It also is not anticipated to impact scenic, recreational or cultural resources.

3.10 Federal Acid Rain Program (ARP) Requirements

Title IV of the CAAA required EPA to establish a program to reduce emissions of acid rain forming pollutants (Acid Rain Program or ARP). The overall goal of the ARP is to achieve significant environmental benefits through reductions in SO_2 and NO_x emissions. To achieve this goal, the program employs both traditional and market-based approaches for controlling air pollution. Under the market-based part of the program, existing units are allocated SO_2 allowances by the EPA. Once allowances are allocated, affected facilities may use their allowances to cover emissions, or may trade their allowances to other units under a market allowance program. In addition, applicable facilities are required to implement CEMS for affected units.

3.11 Cross-State Air Pollution Rule

U.S. EPA finalized the Cross State Air Pollution Rule (CSAPR) in July 2011 as a replacement for the Clean Air Interstate Rule (CAIR). Similar of other trading programs, CSAPR establishes an allowance trading system to reduce emissions NO_x and SO_2 from power plants. EPA established individual state emissions budgets based on the emissions reductions that each upwind state must achieve to prevent it from unlawfully interfering with other states efforts to achieve the NAAQS. CSAPR also includes an "assurance provision" which requires a state's covered sources to surrender additional allowances if the state's overall emissions threshold is exceeded.

The NYSDEC currently enforces the transport rule through 6 NYCRR Part 243, Transport Rule NO_x Ozone Season Trading Program, 6 NYCRR Part 244, Transport Rule NO_x Annual Trading Program, and 6 NYCRR Part 245, Transport Rule SO_2 Trading Program. These adopted rules incorporate the EPA's CSAPR and allows the Department to allocate CSAPR allowances to regulated entities in New York.

3.12 Greenhouse Gas Monitoring

On September 22, 2009, EPA promulgated the final 40 CFR Part 98 greenhouse gas monitoring and reporting regulations that require approximately 10,000 facilities to report their greenhouse gas (GHG) emissions annually. The reporting rule generally applies to facilities that emit more than 25,000 tons of GHG a year and identifies 29 specific categories of covered sources, such as oil refineries, pulp and paper manufacturing, landfills, manure management, and producers of aluminum, cement, iron and steel, glass, and various chemicals, as well as a residual category for facilities with large stationary fuel burning sources. The proposed Project is subject to the federal GHG monitoring requirements and will meet them through use of CEMS in combination with fuel flow monitoring and emission factor calculations for non-CEMS combustion units.

3.13 CO_2 Budget Trading Program

The CO_2 Budget Trading Program is a mandatory cap-and-trade program to reduce greenhouse gas emissions as part of the Regional Greenhouse Gas Initiative (RGGI). RGGI is a cooperative effort by nine Northeast and Mid-Atlantic states to limit greenhouse gas emissions. RGGI is the first mandatory, market-based CO_2 emissions reduction program in the United States. RGGI is composed of individual CO_2 Budget Trading Programs in each of the nine participating states. These nine programs are implemented through state regulations, based on a RGGI Model Rule, and are linked through CO_2 allowance reciprocity. Regulated power plants will be able to use a CO_2 allowance issued by any of the nine participating states to demonstrate compliance with the state program governing their facility. Taken together, the nine individual state programs function as a single regional compliance market for carbon emissions. NYSDEC Part 242 establishes the New York State component of the CO_2 Budget Trading Program. Program requirements, including allowance allocations, account reconciliation, monitoring and reporting and regulatory timelines are addressed in these rules. Sources need to acquire, from auctions or directly from the NYSDEC, one allowance (permit to emit CO_2) for every ton of CO_2 that they emit.

3.14 Section 112(r) Risk Management Program Applicability

Aqueous ammonia will be used as the reducing agent in the Project's SCR system for controlling NO_x emissions from the combustion turbine/duct burner. The NO_x reduction achieved by the SCR system is affected by the ratio of ammonia to NO_x. Section 112(r) of the Clean Air Act and the EPA's Risk Management Program regulations (40 CFR Part 68) require modeling a catastrophic release of any stored ammonia at 20 percent concentration or above in order to ensure the protection of the off-site public. Furthermore, based on the “general duty” clause of Section 112(r), such analyses can be required even if the aqueous ammonia solution is diluted below 20 percent. Danskammer Energy proposes to store aqueous ammonia at a maximum ammonia concentration of 19 percent as the means of complying with Section 112(r).

Table 3-1: National Ambient Air Quality Standards, PSD Increments, Significant Monitoring Concentrations, and Significant Impact Levels

Pollutant	Averaging Period	NAAQS [1] (μg/m³)	Class II PSD Increment (μg/m³)	Significant Monitoring Concentrations (μg/m³)	Significant Impact Level (μg/m³)
Carbon Monoxide (CO)	1-Hour	40,000	--	--	2,000
	8-Hour	10,000	--	575	500
Nitrogen Dioxide (NO_2)	1-Hour	188	--	--	7.5
	Annual	100	25	14	1
Ozone (VOC)	8-Hour	137	--	--	--
Coarse Particulate Matter (PM-10)	24-Hour	150	30	10	5
	Annual	--	17	--	1
Fine Particulate Matter (PM-2.5)	24-Hour	35	9	--	1.2
	Annual	12	4	--	0.2
Sulfur Dioxide (SO_2)	1-Hour	196	--	--	7.8
	24-Hour	365	91	13	5
	Annual	80	20	--	1
	3-Hour	1,300	512	--	25
Lead (Pb)	3-Month	0.15	--	0.1	--

Note: (--) indicates there are no standards for this pollutant.

[1] All short-term (1-hr, 3-hr, 8-hr, and 24-hr) standards except ozone, PM-2.5,PM-10, and 1-hour SO_2 and NO_2 are not to be exceeded more than once per year. For 8-hr ozone, U.S. EPA uses the average of the annual 4th highest 8-hour daily maximum concentrations from each of the last three years of air quality monitoring data to determine a violation of the standard. For 24-hour PM-10, U.S. EPA uses the 6th highest 24-hour maximum concentration from the last three years of air quality monitoring data to determine a violation of the standards. For 24-hour PM-2.5, U.S. EPA uses the 98th percentile 24-hour maximum concentration from the last three years of air quality monitoring data to determine a violation of the standard. For the 1-hour NO_2 NAAQS, compliance would be determined by the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area and for the 1-hour SO_2 NAAQS, compliance would be determined with the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area.

Table 3-2: New York Ambient Air Quality Standards

Pollutant	Averaging Period	NYAAQS (ug/m3)
Sulfur Dioxide (SO_2)	3-Hour	1,300 [1]
	24-Hour	365 [1]
	Annual	80 [2]
Nitrogen Dioxide (NO_2)	Annual	100 [2]
Particulate (PM-10)	24-Hour	250 [1]
Fine Particulate (PM-2.5)	24-Hour	N/A
	Annual	N/A
Total Suspended Particulate (TSP)	24-Hour	250 [1]
	Annual	65 [4]
Carbon Monoxide (CO)	1-Hour	40,000 [1]
	8-Hour	10,000 [1]
Ozone (O_3)	1-Hour	160 [1]
	8-hour	N/A
Lead (Pb)	Quarterly	N/A
Gaseous Fluorides (as F) [5]	12-Hour	3.70 [2]
	24-Hour	2.85 [2]
	1-Week	1.65 [2]
	1-Month	0.80 [2]
Beryllium	1-Month	0.01 [2]
Hydrogen Sulfide [5]	1-Hour	14 [2]
Settleable Particulates [5]	Annual	0.40 [6]
	Annual	0.60 [7]

[1] Not to be exceeded more than once per year.

[2] Not to be exceeded.

[3] Fourth highest concentration over a three year period.

[4] Geometric mean of the 24-hour average concentrations over 12-month period.

[5]Pollutant will not be emitted from the proposed facility.

[6]Units of milligrams per square centimeter per month. Fifty percent of monthly values should not exceed.

[7] Units of milligrams per square centimeter per month. Eighty four percent of monthly values should not exceed.

Source: 6 NYCRR Part 257

Table 3-3: PSD and NNSR Significant Emission Rates

Pollutant	Significant Project Threshold (Tons/Year)	Significant Net Emission Increase Threshold (Tons/Year)	Project Regulated Under PSD or NNSR?
Carbon Monoxide	100	100	PSD
Nitrogen Oxides (as an ozone precursor)	40	40	NNSR
Sulfur Dioxide	40	40	PSD
Particulate Matter	25	25	PSD
PM-2.5	10	10	PSD
PM-10	15	15	PSD
Volatile Organic Compounds (as an ozone precursor)	40	40	NNSR
CO_2e	75,000	75,000	PSD
Lead	0.6	0.6	PSD

Notes:

[1] Regulated substances not emitted by the proposed Project (e.g., fluorides, hydrogen sulfide, and reduced sulfur compounds) have not been included in the table.

Table 3-4: PSD/NNSR Netting Analysis

Pollutant	Baseline Period [1]	Baseline Actual Emissions (BAE) (ERC) [2] tons/yr	Project Emission Potential [3] NSR Step 1 (PEP) tons/yr	Contemporaneous [4] Emission Increases tons/yr	Project Net Emission Increase NSR Step 2 (PEP - ERC) [5] tons/yr	PSD/NNSR Significant Net Emission Rate Thresholds [6] tons/yr	Subject to PSD/ NNSR?
NO_x	December 2014 - November 2016	44.2	143.5	0.0	99.3	40	NNSR
CO	December 2014 - November 2016	9.2	115.6	0.0	106.4	100	PSD
SO_2	December 2014 - November 2016	27.1	24.4	0.0	(2.6)	40	No
PM-10	December 2014 - November 2016	2.9	81.5	0.0	78.6	15	PSD
PM-2.5	December 2014 - November 2016	2.9	81.5	0.0	78.6	10	PSD
VOC	December 2014 - November 2016	2.1	58.6	0.0	56.5	40	NNSR
H2SO4	December 2014 - November 2016	2.1	22.1	0.0	20.0	7	PSD
GHG	December 2014 - November 2016	47,303.9	1,954,952	0.0	1,907,648.2	75,000	PSD
Lead	December 2014 - November 2016	N/A	0.02	0.0	0.02	0.6	No

Notes:

[1] Per 6 NYCRR 231-4(b)(7), "baseline period" is defined for an ERC which is scheduled to occur in the future, as any 24 consecutive months within the five years immediately preceding date of receipt by the department of the permit application, which proposes to use the ERC. (Submittal Date of November 2019)

[2] Per 6 NYCRR 231-10.2, ERCs are quantified as the difference between BAE and subsequent PTE. The existing units will be retired so the existing unit post Project PTE is zero.

(i) Baseline actual emissions based upon EPA Clean Air Markets Data and NYSDEC Emission Statement Data.

(ii) Baseline emissions conservatively do not include existing auxiliary fuel burning equipment that will be retired.

[3] For new units, Project Emission Potential (PEP) is defined as potential to emit. (See future operating assumptions below)

Table 3-4: PSD/NNSR Netting Analysis

Pollutant	Baseline Period [1]	Baseline Actual Emissions (BAE) (ERC) [2] tons/yr	Project Emission Potential [3] NSR Step 1 (PEP) tons/yr	Contemporaneous [4] Emission Increases tons/yr	Project Net Emission Increase NSR Step 2 (PEP - ERC) [5] tons/yr	PSD/NNSR Significant Net Emission Rate Thresholds [6] tons/yr	Subject to PSD/ NNSR?

[4] Per 6 NYCRR 231-4(b)(13), "contemporaneous" is defined as the period beginning five years prior to the scheduled commence construction date of the new or modified emission source, and ending with the scheduled commence operation date.

[5] The net emissions increase is defined under 6 NYCRR 231-4.1(b)(30) as the aggregate increase in emissions of a regulated NSR contaminant in tpy at an existing major facility resulting from the sum of:

(i) the project emission potential of the modification (PEP);

(ii) every creditable emission increase at the facility, which is contemporaneous and for which an emission offset was not obtained; and (No creditable contemporary increases occurred)

(iii) any ERC at the facility, or portion thereof, selected by the applicant which is contemporaneous, and which was not previously used as part of an emission offset, an internal offset, or relied upon in the issuance of a permit under this Part.

[6] Significant net emission increase threshold from NYCRR 231-13.

<u>Project Emissions Potential Operational Assumptions</u>

1. Operation of One (1) MHPS 501JAC for up t0 8,760 hours per year.
2. Operation of natural gas fired duct burner for up to 4,380 hours per year (Full Load Equivalent).
3. Operation of MHPS 501JAC for up to 720 hours per year on ULSD (Full Load Equivalent).
4. Up to 262 startup and shutdowns per year on natural gas and up to 10 on ULSD.
5. Auxiliary Equipment includes the following equipment and operating hours:

(a) 96 MMBtu/hr Natural Gas Fired auxiliary boiler for 4,800 hours per year.

(b) 327 hp emergency diesel fire pump for 250 hours per year.

(c) 2,000 kW emergency diesel generator for up to 250 hours per year.

Table 3-5: Calculation of Offsets

Non-Attainment Pollutant	Project Net Emission Increase (tons/year)	Proposed Offset Ratio	Required Offsets (Rounded Up)
Nitrogen Oxides	99.3	1.15:1	115
Volatile Organic Compounds	56.5	1.15:1	65

4.0 CONTROL TECHNOLOGY ANALYSIS

Pre-construction review for modified major stationary sources located in New York State involves an evaluation of BACT and LAER control technology per 6 NYCRR Part 231. A control technology analysis has been performed for the proposed Project based upon guidance presented in the draft U.S. EPA Guidance Document New Source Review Workshop Manual (October 1990). Note that throughout this section, "ppm" concentration levels for gaseous pollutants are parts per million by volume, dry basis, corrected to 15% O_2 content (ppmvd @ 15% O_2), unless otherwise noted. Likewise, all emission factors expressed as pounds of pollutant per million Btu of fuel (lb/MMBtu) are based upon the HHV of the fuel.

4.1 Applicability of Control Technology Requirements

An applicability determination, as discussed in this section, is the process of determining the level of emission control required for each applicable air pollutant. Control technology requirements are generally based upon the potential emissions from the modified source and the attainment status of the area in which the source is to be located. A detailed determination of applicable regulations, including control technology requirements under the PSD and NNSR regulations, is provided in Section 3 of this application. The following sections discuss the applicability of BACT and LAER for emissions from equipment included in this permit application.

4.1.1 PSD Pollutants Subject To BACT

Pollutants subject to PSD review are subject to a BACT analysis. BACT is defined as an emission limitation based on the maximum degree of reduction, on a case-by-case basis, taking into account energy, environmental and economic considerations. The proposed Project is considered a "major" modification to an existing major source for PSD purposes since potential emissions exceed Significant Emission Rate thresholds. Therefore, individual regulated pollutants are subject to BACT requirements if potential emissions exceed the significant net emission rates as presented in Table 3-4. Based upon these criteria, NO_x, CO, PM-10/PM-2.5, H_2SO_4, and GHG are all subject to BACT requirements. Since the area is designated attainment for NO_2, NO_x emissions are subject to BACT, as well as the more stringent LAER requirements under the ozone non-attainment provisions, since NO_x is also a precursor for ozone formation and subject to NNSR for ozone. Since LAER technology is at least as stringent as BACT, the LAER analysis will satisfy the BACT requirements for NO_x.

4.1.2 Non-Attainment Pollutants Subject To LAER

Pollutants subject to NNSR must be limited to LAER levels. LAER is defined as the more stringent of (1) the most stringent emission limitation which is achieved in practice by the class or category of source or (2) the most stringent emission limitation contained in the applicable State Implementation Plan (SIP) (unless such emission rate is demonstrated not to be achievable), whichever is more stringent. LAER will be based upon the lowest permitted emission rates that are verified as being achieved in practice, as discussed in the appropriate section by pollutant. Pollutants are subject to LAER if potential emissions of individual pollutants exceed area-specific emission thresholds. As detailed in Section 3 and summarized in Table 3-4, emissions of NO_x and VOC are subject to LAER requirements.

4.2 Approach Used in BACT/LAER Analysis

PSD BACT as defined in 40 CFR 52.21 means:

> *"an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61."*

Typically, PSD BACT follows a five step "top-down" approach: (1) identify all control technologies; (2) eliminate technically infeasible options; (3) rank remaining control technologies by control effectiveness; (4) evaluate most effective controls and document results; and (5) select BACT.

However, a key exception to the strict, five-step "top-down" approach is described in page B-8 of the U.S. EPA's October 1990 Draft New Source Review Workshop Manual (the "NSR Manual):

"If the applicant accepts the top alternative in the listing as BACT, the applicant proceeds to consider whether impacts of unregulated air pollutants or impacts in other media would justify selection of an alternative control option. If there are no outstanding issues regarding collateral environmental impacts, the analysis is ended, and the results proposed as BACT. In the event that the top candidate is shown to be inappropriate, due to energy, environmental, or economic impacts, the rationale for this finding should be documented for the public record. Then the next most stringent alternative in the listing becomes the new control candidate and is similarly evaluated. This process continues until the technology under consideration cannot be eliminated by any source-specific environmental, energy, or economic impacts which demonstrate that alternative to be inappropriate as BACT."

The BACT analysis for the Danskammer Energy Center was conducted consistent with the above definition as well as U.S. EPA's five step "top-down" BACT process. This methodology results in the selection of the most stringent control technology in consideration of the technical feasibility and the energy, environmental, and economic impacts. Control options are first identified for each pollutant subject to BACT and evaluated for their technical feasibility. Options found to be technically feasible are ranked in order of their effectiveness and then evaluated for their energy, economic, and environmental impacts. In the event that the most stringent control identified is selected, no further analysis of impacts is performed. If the most stringent control is ruled out based upon economic, energy, or environmental impacts, the next most stringent technology is similarly evaluated until BACT is determined.

After establishing the baseline emissions levels required to meet any applicable New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAPs), or SIP limitations, the "top-down" procedure followed for each pollutant subject to BACT is outlined as follows:

Step 1: Identify available control options from review of U.S. EPA RACT/BACT/LAER Clearinghouse (RBLC), agency permits for similar sources, literature review, and contacts with air pollution control system vendors.

Step 2: Eliminate technically infeasible options - evaluation of each identified control to rule out those technologies that are not technically feasible (i.e., not available and applicable per USEPA guidance).

Step 3: Rank remaining control technologies - "Top-down" analysis, involving ranking of control technology effectiveness.

Step 4: Evaluate most effective controls and document results - Economic, energy, and environmental impact analyses are conducted if the "top" or most stringent control technology is not selected to determine if an option can be ruled out based on unreasonable economic, energy or environmental impacts.

Step 5: Select the BACT based upon the highest ranked option that cannot be eliminated, which includes development of an achievable emission limitation based on that technology.

As previously stated, BACT is defined as the optimum level of control applied to pollutant emissions based upon consideration of energy, economic and environmental factors. The BACT analyses may include reductions achieved through the application of processes, systems, and techniques for the control of each air pollutant. U.S. EPA has placed potentially applicable control alternatives identified and evaluated in the BACT analysis into the following three categories:

(1) Inherently lower-emitting processes/practices/designs;

(2) Add-on controls, and;

(3) Combinations of (1) and (2).

NNSR LAER is defined under 40 CFR Part 51 as the more stringent rate of emissions based on the following:

1. The most stringent emissions limitation which is contained in the implementation plan of any State for such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or

2. The most stringent emissions limitation which is achieved in practice by such class or category of stationary sources. In no event shall the application of the term permit a proposed new or modified stationary source to emit any pollutant in excess of the amount allowable under an applicable new source standard of performance.

A LAER analysis was conducted for the emissions of NO_x and VOC for the Danskammer Energy Center that is consistent with the approach used for a BACT analysis, without taking into account economic considerations.

Inherently lower-emitting processes/practices/designs

Lower-polluting processes (including design considerations) should be considered based on demonstrations made on the basis of manufacturing identical or similar products from identical or similar raw materials or fuels.

Change in raw materials

This emissions limiting technique typically applies to industrial processes that use chemicals, such as solvents, where substitution with a lower emitting chemical may be technically feasible. In the case of the proposed Project, the “raw material” is the fuel combusted for the generation of electricity. The Project proposes the primary use of natural gas with back-up ULSD operation as BACT for the combustion turbine.

Process Modifications

Process modifications may be implemented if a change in the process methods or conditions can result in lower emissions. In the case of the Project, the “process” is the combustion turbine firing natural gas or ULSD. The Mitsubishi 501JAC combined cycle technology is among the most efficient and lowest emitting fossil fuel power plant designs currently available. Therefore, process modifications beyond what is already proposed are not technologically feasible.

4.2.1 Technically Feasible Add-on Control Options

The first step is identification of available technically feasible control technology options, including consideration of transferable and innovative control measures that may not have previously been applied to the source type under analysis. The minimum requirement for a BACT proposal is an option that meets federal NSPS limits or other minimum state or local requirements that would prevail in the absence of BACT decision-making. After elimination of technically infeasible control technologies, the remaining options are ranked by control effectiveness.

If there is only a single feasible option, or if the applicant is proposing the most stringent alternative, then no further analysis is required. If two or more technically feasible options are identified, the next three steps are applied to identify and compare the economic, energy, and environmental impacts of the options. Technical considerations and site-specific sensitive issues will often play a role in BACT determinations. Generally, if the most stringent technology is rejected as BACT, the next most stringent technology is evaluated, and so on.

In order to identify options for each class of equipment, a search of the U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC) has been performed. Individual searches have been performed for each pollutant (subject to BACT/LAER) emitted from each emissions unit. The most recently issued permits for Mitsubishi 501JAC combustion turbines not yet on the RBLC were also analyzed. Results of the RBLC and the review of other recent permits are summarized in Appendix C.

4.2.1.1 Economic (Cost-Effectiveness) Analysis

This analysis consists of estimation of costs and calculation of the cost-effectiveness of each control technology, on a dollar per ton ($/ton) of pollution removed basis. Annual emissions of an option are subtracted from base case emissions to calculate tons of pollutant controlled per year. The base case may be uncontrolled emissions or the maximum emission rate allowable without BACT considerations that would generally correspond to an NSPS level. Annual costs, in dollars per year ($/yr), are calculated by adding annual operation and maintenance costs to the annualized capital cost of an option. Cost-effectiveness ($/ton) of an option is simply the equivalent annual cost ($/yr) divided by the annual reduction in emissions (ton/yr).

Note that no economic analysis is required if either the most effective option is proposed or if there are no technically feasible control options.

4.2.1.2 Energy Impact Analysis

Two forms of energy impacts that may be associated with a control option can normally be quantified. Increases in energy consumption resulting from increased heat rate may be shown as incremental Btu's or fuel consumed per year. Also, the installation of a control option may reduce the output and/or reliability of the proposed equipment. This reduction would also result in loss of revenue from power sales.

4.2.1.3 Environmental Impact Analysis

The primary focus of the environmental impact analysis is the reduction in ambient concentrations of the pollutant being emitted. Increases or decreases in emissions of other criteria or non-criteria pollutants may occur with some technologies, and should also be identified. Non-air related impacts, such as solid waste disposal and increased water consumption/treatment, may be an issue for some projects and control options.

4.2.2 Achievability

BACT and LAER are based on the premise that the limit established through the respective process must be achievable. However, there is an important distinction between emission rates achieved at a specific time on a specific unit, and an emission limitation that a unit must be able to meet continuously over its operating life.

The U.S. EPA has reached the following conclusion in prior determinations for PSD permits:

> *"Agency guidance and our prior decisions recognize a distinction between, on the one hand, measured 'emissions rates, ' which are necessarily data obtained from a particular facility at a specific time, and on the other hand, the 'emissions limitation' determined to be BACT and set forth in the permit, which the facility is required to continuously meet throughout the facility's life. Stated simply, if there is uncontrollable fluctuation or variability in the measured emission rate, then the lowest measured emission rate will necessarily be more stringent than the "emissions limitation" that is "achievable" for that pollution control method over the life of the facility. Accordingly, because the "emissions limitation" is applicable for the facility's life, it is wholly appropriate for the permit issuer to consider, as part of the BACT analysis, the extent to which the available data demonstrate whether the emissions rate at issue has been achieved by other facilities over a long term."*[5]

Therefore, BACT and LAER must be set at the lowest feasible emission rate recognizing that the facility must be in compliance with that limit for the lifetime of the facility on a continuous basis. While viewing individual unit performance can be instructive in evaluating what BACT/LAER might be, any actual performance data must be viewed carefully, as rarely will the data be adequate to truly assess the performance that a unit will achieve during its entire operating life.

In addition, emission limits from existing permitted facilities must be used with caution in assessing what is "achievable." For example, limits established for facilities that were never built must be viewed with caution, since they have never been demonstrated and that facility/company/applicant never took a significant liability in having to meet that limit. Likewise,

[5] EPA Environmental Appeals Board Decision, In re: Newmont Nevada Energy Investment LLC PSD Appeal No. 05-04, decided December 21, 2005.

permitted units that have not yet commenced construction must also be viewed with caution for similar reasons.

4.3 LAER/BACT Analysis for Nitrogen Oxides

This section presents LAER and BACT determinations for control of NO_x emissions from the combined cycle combustion turbine and duct burner, the auxiliary boiler, the emergency diesel generator, and the emergency diesel fire pump. For each type of equipment, alternative control technologies are evaluated and existing permit limits for units in the same source categories are identified.

As previously discussed, a LAER determination for a source category is based upon the more stringent of either 1) the most stringent emission limitation contained in the SIP for such class or category of source or 2) the most stringent emission limitation achieved in practice by such class or category of source unless demonstrated to not be achievable. To determine the most stringent permit limit, a search of the RBLC and recently issued applicable air permits was performed. The results of the search are presented in Section 4.3.1 and Appendix C.

The formation of NO_x in combustion units is determined by the interaction of chemical and physical processes occurring within the combustion chamber. There are two principal forms of NO_x, designated as "thermal" NO_x and "fuel" NO_x. Thermal NO_x formation is the result of oxidation of atmospheric nitrogen contained in the inlet gas in the high temperature, post flame region of the combustion zone. The major factors influencing thermal NO_x formation are temperature, concentrations of nitrogen and oxygen in the inlet air and residence time within the combustion zone. Fuel NO_x is formed by the oxidation of fuel bound nitrogen. NO_x formation can be controlled by adjusting the combustion process and/or by installing post combustion controls. Section 4.3.2 provides a technical description of NO_x control techniques for all the applicable equipment and the relative availability and suitability for the proposed Project.

4.3.1 Review of NO_x RBLC Database

4.3.1.1 Combined Cycle Combustion Turbine

A search of the RBLC and available permits identified numerous recent natural gas-fired combined cycle combustion turbine projects with NO_x emissions limits of 2.0 ppm. All of the projects permitted for a NO_x emission limit of 2.0 ppm use selective catalytic reduction (SCR) in addition to dry low-NO_x (DLN) or low-NO_x burner (LNB) technology. No permit was found with an emissions level below 2 ppm. The remaining projects have limits between 2.5 and 25 ppm.

For ULSD firing, there are far fewer recently permitted combined-cycle combustion turbine projects. The most recently permitted combined-cycle combustion turbines firing ULSD are permitted with NO_x emissions limits ranging from 4.0 ppm to 6.0 ppm. All of the projects permitted at these levels use SCR in addition to DLN or water/steam injection technology.

4.3.1.2 Auxiliary Boiler

An RBLC search of recent air permits for natural gas-fired boilers between 10 and 100 MMBtu/hr identified numerous projects with NO_x emissions limits ranging from 0.006 lb/MMBtu to 0.05 lb/MMBtu with a majority of the recently permitted projects having NO_x emissions of 0.011 lb/MMBTU. All of the projects permitted at these levels utilize LNB technology.

4.3.1.3 Emergency Diesel Engines

The RBLC indicates that the range of permitted NO_x limits for diesel engines similar to the Project's emergency diesel generator are 0.5 to 4.8 g/hp-hr, as summarized in Appendix C. The range of permitted NO_x limits for diesel engines similar in size to the Project's emergency diesel fire pump are 2.6 to 3.0 g/hp-hr, as summarized in Appendix C.

4.3.2 Identification of NO_x Control Options and Technical Feasibility

The following sections detail the options that were identified for controlling NO_x emissions from the combined cycle combustion turbine, auxiliary boiler, and emergency diesel engines. Their technical feasibility and respective level of commercially demonstrated NO_x reduction of each option is also discussed.

4.3.2.1 Combined Cycle Combustion Turbine

The following control technologies for NO_x were evaluated: Lean Burn Combustion, Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR), and SCONOx™.

Lean Burn Combustion – Typical gas turbines are designed to operate at a nearly stoichiometric ratio of fuel and in the combustion zone, with additional air introduced downstream. This is the point where the highest combustion temperature and quickest combustion reactions (including NO_x formation) occur. Fuel-to-air ratios below stoichiometric are referred to as fuel-lean mixtures (i.e., excess air in the combustion chamber); fuel-to-air ratios above stoichiometric are referred to as fuel-rich (i.e., excess fuel in the combustion chamber). The rate of NO_x production falls off dramatically as the flame temperature decreases. Thus, very lean, dry combustors can be used to control emissions.

Based upon this concept, lean combustors are designed to operate below the stoichiometric ratio, thereby reducing thermal NO_x formation within the combustion chamber. The lean combustors typically are two-staged, premixed combustors designed for use with natural gas fuel. The first stage serves to thoroughly mix the fuel and air and to deliver a uniform, lean, unburned fuel-air mixture to the second stage.

Selective Catalytic Reduction (SCR) – SCR is an add-on NO_x control technique that is placed in the exhaust stream following the gas turbine/duct burner. SCR involves the injection of ammonia (NH_3) into the exhaust gas stream upstream of a catalyst bed. On the catalyst surface, ammonia reacts with NO_x contained within the flue gas to form nitrogen gas (N_2) and water (H_2O) in accordance with the following chemical equations:

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

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

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 homogenous material that forms both the active surface and the substrate. The geometric configuration of the catalyst body is designed for maximum surface area and minimum obstruction of the flue gas flow path in order to achieve maximum conversion efficiency and minimum back pressure on the gas turbine/duct burner. The most common configuration is a "honeycomb" design. Ammonia is then fed and mixed into the combustion gas stream upstream of the catalyst bed. Excess ammonia (NH_3) that does not react in the catalyst bed and that is emitted from the stack is referred to as ammonia slip.

An important factor that affects the performance of an SCR is operating temperature. The temperature range for standard base metal catalysts is between 400 and 800^{o}F. Since SCR's effective temperatures are below the turbine exit temperature and above the stack temperature, the catalyst must be located within the HRSG.

An undesirable side-effect of SCR is the potential formation of ammonium bisulfate (NH_4HSO_4) and ammonium sulfate ($(NH_4)_2SO_4$), referred to as ammonium salts, which are corrosive and can stick to the heat recovery surfaces, duct work, or stack at low temperatures and results in additional PM/PM-10/PM-2.5 formation if emitted. Ammonium bisulfate and ammonium sulfate are reaction products of SO_3 and ammonia. Use of low sulfur fuels minimizes the formation of SO_3 and the subsequent formation of these ammonium salts.

Selective Non-Catalytic Reduction (SNCR) – SNCR is another method of post-combustion control of NO_x emissions. SNCR selectively reduces NO_x into nitrogen and water vapor by reacting the flue gas with a reagent. The SNCR system is dependent upon the reagent injection location and temperature to achieve proper reagent/flue gas mixing for optimum NO_x reduction. SNCR systems require a fairly narrow temperature range for reagent injection in order to achieve a specific NO_x removal efficiency. The optimum temperature range for ammonia injection is 1,500 to 1,900°F. The NO_x removal efficiency of an SNCR system decreases rapidly at temperatures outside the optimum temperature window. Operation below this temperature window results in excessive ammonia slip. Operation above the temperature window results in increased NO_x emissions.

Because the exhaust temperature at the exit of the Project's combustion turbine unit is significantly less than the optimum temperature range for the application of this technology, it is not technically feasible to apply this technology to this Project and it will be eliminated from further evaluation in this LAER analysis.

SCONO$_x$™ – SCONO$_x$™ or EM$_x$™ is a proprietary catalytic oxidation and adsorption technology that uses a single catalyst for the control of NO_x, CO, and VOC emissions. The catalyst is a monolithic design, made from a ceramic substrate with both a proprietary platinum-based oxidation catalyst and a potassium carbonate adsorption coating. The catalyst simultaneously oxidizes NO to NO_2, CO to CO_2, and VOC to CO_2 and water, while NO_2 is adsorbed onto the catalyst surface and chemically converted to and stored as potassium nitrates and nitrites.

SCONO$_x$™ is reportedly capable of achieving NO_x emission reductions of 90% or more for combustion turbine application, and it is currently operating on several small natural gas-fired turbines. The advantage of SCONO$_x$™ relative to SCR is that SCONO$_x$™ does not require ammonia injection to achieve NO_x emissions control. Similar to SCR, SCONO$_x$™ only operates within a specific temperature range.

SCONO$_x$™ is not technically feasible for application to this Project since it is no longer being offered for large combustion turbines. In addition, SCONO$_x$™ is considerably more complex than SCR, would consume significantly more water, and would require more frequent cleaning and other maintenance.

4.3.2.2 Auxiliary Boiler

The following control technologies for NO_x were evaluated: Low-NO_x Burners, Flue Gas Recirculation (FGR), SCR, and SNCR.

Low-NO_x Burners – Dry low NO_x burners reduce NO_x through staged combustion. Staging partially delays the combustion process, resulting in a cooler flame, which suppresses thermal NO_x formation. NO_x emission reductions of 40 to 85 percent (relative to uncontrolled emission levels) have been observed with low-NO_x burners.

Flue Gas Recirculation (FGR) – In an FGR system, a portion of the flue gas is recirculated from the exhaust stream back to the burner. The recirculated gas is mixed with combustion air as an inert diluent prior to being fed to the burner. The FGR system reduces NO_x emissions because the recirculated gas reduces combustion temperatures, thus suppressing the thermal NO_x mechanism. FGR also reduces NO_x formation by lowering the oxygen concentration in the primary flame zone. An FGR system is normally used in combination with specially designed low-NO_x burners capable of sustaining a stable flame despite the increased recirculated gas flow resulting from the use of FGR. Together, low-NO_x burners and FGR are capable of reducing NO_x emissions by 60 to 90 percent.

Selective Catalytic Reduction (SCR) – SCR technology uses ammonia as a reducing agent in the presence of oxygen over a catalyst. The general chemical reaction is:

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

The process includes an ammonia delivery system and a selective catalytic reaction section. Vaporized ammonia (or urea) is introduced into the flue gas stream via an injection grid located upstream of the catalyst. NO_x emission reductions of 75 to 90 percent have been achieved through the use of SCR.

The proposed auxiliary boiler for the combined cycle project will be limited to natural gas firing only and will be operated for the purposes of supplying steam for fast-startup of the plant, including equipment piping pre-warming. Additionally, it will be used to maintain vacuum in the condenser and to provide steam seals when the combined cycle facility is shutdown, but expected to be brought back online for either a warm or hot start. SCR emission control technology is not considered technically feasible for the proposed auxiliary boiler because the design effectiveness of an SCR is not achieved until the flue gas temperature reaches between

400 and 800°F. The proposed auxiliary boiler will be required to supply steam in an expedited manner to minimize the duration of the combined cycle unit start-up, which produces elevated pollutant emission concentrations from the turbine during each start-up procedure.

4.3.2.3 Emergency Diesel Engines

U.S. EPA's Alternative Control Techniques (ACT) Document for reciprocating engines lists add-on techniques such as SCR, as well as combustion control techniques such as ignition timing retard, for NO_x control from diesel engines. The ACT concludes that add-on controls are not cost effective for small emergency diesel engines that operate less than 500 hours/year. While cost is not a factor that may be considered in LAER determinations, add-on techniques would be ineffective. Since the emergency diesel fire pump and emergency diesel generator will run for limited durations, the SCR will never reach the operating temperature required to remove any substantial NO_x emissions, and thus will provide no benefit. Therefore, add-on controls do not represent NO_x LAER for the emergency diesel engines.

4.3.3 Determination of LAER for NO_x

4.3.3.1 Combined Cycle Combustion Turbine

The top level of control for natural gas-fired combined cycle gas turbines is DLN combustion to minimize NO_x formation and post combustion treatment with SCR. Numerous natural gas fired combined cycle projects have been permitted at 2.0 ppmvd at 15% O_2. Danskammer Energy proposes DLN in combination with SCR, in order to achieve LAER for NO_x emissions from the Project's Mitsubishi 501JAC combustion turbine and HRSG. These technologies, when considered together, represent the most stringent NO_x controls available for combined cycle combustion turbines. The proposed NO_x emission limit for the turbine during natural gas operation is 2.0 ppmvd @15% O_2, to be achieved at all operating loads between 50 and 100% of full load.

The proposed NO_x emission limit for the turbine during ULSD operation is 4.0 ppmvd @15% O_2, to be achieved at all operating loads between 60 and 100% of full load. Based upon a review of RBLC and other recent permits for ULSD fired combined cycle turbines, there are no projects permitted less than 4.0 ppmvd @15% O_2. Therefore, 4.0 ppmvd @15% O_2 is considered the most stringent limit guaranteed for a large ULSD fired Mitsubishi 501JAC combined cycle turbine.

4.3.3.2 Auxiliary Boiler

Based on the analysis presented above, the Project is proposing to limit the total hours of operation of the auxiliary boiler to 4,800 hours/year and utilize ultra-low NO_x burners and good combustion practices to achieve a NO_x emission rate of 0.0086 lb/MMBtu as LAER for the natural gas-fired auxiliary boiler. This limit, equivalent to 7.0 ppmvd @ 3% O_2, is one of the lowest permitted emission rates identified in Appendix C (RBLC results).

There is a determination in the RBLC that reflect lower limit than 0.0086 lb/MMBtu. These necessarily address facilities in which either the auxiliary boiler would function differently than the boiler at the proposed Project or for which the challenges for control of NO_x emissions posed by intermittent and variable load operation were not adequately considered. Most notably, the reported NO_x BACT limit at the Moxie Freedom facility in Pennsylvania is 0.006 lb/MMBtu. This limit is equivalent to the reported NO_x BACT limit for a 185 MMBtu/hr auxiliary boiler at the Lackawanna Energy Center in Pennsylvania that utilizes low- NO_x burners and SCR. However, in the evaluation of NO_x control technologies for LAER, SCR would not be an applicable control for the proposed auxiliary boiler. The proposed auxiliary boiler would operate on an intermittent basis, typically for short periods of time, at potentially widely varying loads, as needed to support efficient startup of the combined cycle facility. This manner of operation will not provide the temperatures and stable conditions in the flue gas needed for SCR to function effectively. Thus, for the proposed auxiliary boiler, the appropriate control technologies for NO_x are ultra-low NO_x burners.

4.3.3.3 Emergency Diesel Engines

Although add-on controls, such as SCR, have been employed to reduce emissions from diesel engines with greater annual operating capacity factors as non-emergency engines, the limited annual operation of the proposed Danskammer Energy Center emergency engines rules out such controls. Thus, the Project proposes limited hours of operation (250 hours per year for each), good combustion practices, and the use of ULSD as LAER to achieve a NO_x emission rate of 4.8 g/hp-hr for the emergency diesel generator and 3.0 g/hp-hr for the emergency diesel fire pump. For the emergency diesel generator, the limit is based on the NSPS Subpart IIII emissions standard of 6.4 g/kW-hr (NO_x + non-methane hydrocarbons (NMHC)) for Tier 2 engines found in Table 1, 40 CFR 89.112. For the emergency fire pump, the limit is based on the NSPS Subpart IIII emissions standard of 3.0 g/hp-hr (NO_x + NMHC). Note that the LAER determinations listed in the RBLC require proposed emergency engines to meet the applicable emission standard for emergency engines in 40 CFR 60 Subpart IIII.

Note that emergency engines that can meet U.S. EPA's more stringent Tier IV standards for non-emergency operation, have not been developed and are not available from engine manufacturers. This is a consequence of catalytic aftertreatment control technology, including SCR, not being able to be effectively used on emergency engines to control NO_x. Accordingly, the applicable emission standards in 40 CFR 60 Subpart IIII for non-emergency engines constitute LAER for NO_x. While these standards address the combined emissions of NO_x and NMHC, LAER is being established for NO_x as it is a precursor to ozone and NMHC is also regulated as it is a precursor to ozone. Pursuant to 40 CFR 60 Subpart IIII, Danskammer Energy will use engines that have been certified by the manufacturer as meeting applicable limits of this NSPS and will properly operate and maintain those engines.

4.4 LAER Analysis for Volatile Organic Compounds

The combined cycle combustion turbine, auxiliary boiler, and emergency diesel engines are all sources of VOC emissions at the proposed Project. This section demonstrates that the proposed VOC emissions and controls meet the requirements of LAER. Because LAER requirements are at least as stringent as BACT, the LAER analysis also satisfies the BACT demonstration for VOC.

4.4.1 Review of VOC RBLC Database

4.4.1.1 Combined Cycle Combustion Turbine

The search of the RBLC and available permits identified numerous natural gas-fired combined cycle combustion turbine projects with VOC emission limits ranging from 0.7 to 2.0 ppm with the majority of the recent VOC emission limits in the 0.70-1.00 ppm range. To achieve these low emission levels, these combustion turbines employ an oxidation catalyst and good combustion practices to control VOC emissions.

For ULSD firing, there are far fewer recently permitted combined-cycle combustion turbine projects. The most recently permitted combined-cycle combustion turbines firing ULSD are permitted with VOC emissions equal to 2.0 ppm. All of the projects permitted at these levels use oxidation catalyst technology.

4.4.1.2 Auxiliary Boiler

The RBLC and recent air permit search for natural gas-fired boilers between 10 and 100 MMBtu/hr in size identified VOC emission limits between 0.00015 to 0.0080 lb/MMBtu with a majority of boilers being permitted in the 0.003-0.005 lb/MMBtu range. The most stringent permit limit reported is 0.0015 lb/MMBtu.

4.4.1.3 Emergency Diesel Engines

An RBLC and recent permit search for emergency diesel generators indicated a range between 0.02 and 4.8 g/hp-hr. The range of VOC emission limits for diesel fire pumps is 0.10 – 3.0 g/hp-hr.

4.4.2 Identification of VOC Control Options and Technical Feasibility

4.4.2.1 Combined Cycle Combustion Turbine

Combustion turbines have inherently low VOC emissions. The emissions of VOC in a combustion process are a result of the 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 H_2O.

The only post-combustion control method practical to reduce VOC emissions from combustion turbines is an oxidation catalyst. The optimum location for VOC control, in the 900 to 1,100^{o}F 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 which may, in turn, react with water and/or ammonia to form sulfuric acid mist and/or ammonia salt PM-10/PM-2.5 emissions. Therefore, the placement of the oxidation catalyst in the “cooler” section of the HRSG necessary for CO control is optimal, and has the additional side benefit of reducing VOC emissions from the combustion turbine.

4.4.2.2 Auxiliary Boiler

The rate of VOC emissions from boilers depends on combustion efficiency. Fuel hydrocarbons not converted to CO_2 can result in VOC emissions due to incomplete combustion. VOC emissions are minimized by combustion practices that promote high combustion temperatures, long residence times at those temperatures, and turbulent mixing of fuel and combustion air. Although the primary hydrocarbon constituents of natural gas – methane and ethane – are not considered to be VOC, trace amounts of VOC species in the natural gas fuel may also contribute to VOC emissions if they are not completely combusted in the boiler.

No technically feasible post-combustion control methods have been identified to assure the reduction of VOC emissions from auxiliary boilers. However, it is feasible to utilize an oxidation catalyst to control CO emissions from a boiler, which may also reduce VOC emissions.

4.4.2.3 Emergency Diesel Engines

VOC from diesel engines are composed of a variety of organic compounds emitted into the atmosphere because of incomplete combustion. Most unburned hydrocarbon emissions result from fuel droplets that were transported or injected into the quench layer during combustion. The quench layer is the region immediately adjacent to the combustion chamber surfaces, where heat transfer outward through the cylinder walls causes the mixture temperature to be too low to support combustion. Partially burned hydrocarbons can occur because of poor air and fuel homogeneity due to incomplete mixing, before or during combustion; incorrect air/fuel ratios in the cylinder during combustion due to maladjustment of the engine fuel system; excessively large fuel droplets (diesel engines); and low cylinder temperature due to excessive cooling (quenching) through the walls or early cooling of the gases by expansion of the combustion volume caused by piston motion before combustion is completed. Add-on controls are not technically feasible.

4.4.3 Determination of LAER for VOC

4.4.3.1 Combined Cycle Combustion Turbine

The Project is proposing to install an oxidation catalyst designed to reduce VOC emissions when firing natural gas to 0.7 ppm without duct burning and 1.6 ppm with duct burning at normal operating loads between 50% and full load. Based upon a review of LAER and BACT determinations in U.S. EPA's RBLC and permits for Projects not included in the RLBC, the majority of recent VOC BACT determinations include combustion controls and oxidation catalysts.

Typically, VOC emission rates in the 1.0 to 2.0 ppmvd at 15% O_2 range have been determined to be BACT. However, recently some VOC emission limits have been set at 0.7 ppmvd at 15% O_2 without duct firing. Variations in emissions can be associated with the type of turbine, the use of duct burning, and size of the duct burners. The most recent Project with a Mitsubishi 501JAC combustion turbine and with duct firing, the Killingly Energy Center in Connecticut, has VOC

BACT set at 0.7 ppmvd at 15% O_2 without duct burning and 1.6 ppmvd at 15% O_2 with duct burning. In June 2016, a permit for the Greensville County Project in Virginia, with Mitsubishi 501J gas turbines, was issued with BACT set at 0.7 ppmvd without duct burning and 1.4 ppmvd at 15% O_2 with duct burning. Note that the duct burner size associated with the Greensville County Project of 500 MMBtu/hr is smaller than that proposed for the Danskammer Energy Center of 744 MMBtu/hr and the Killingly Energy Center of 1,106 MMBtu/hr. Thus, it is expected that there would be slight variations between the three Project's combustion turbine VOC emissions limits while the duct burners are in operation provided that all three Projects have proposed or permitted emissions limits for the combustion turbine without duct firing of 0.7 ppmvd at 15% O_2.

The Project is proposing to install an oxidation catalyst designed to reduce VOC emissions when firing ULSD to 2.0 ppm at normal operating loads. This emission level is equal to the lowest permitted limits for ULSD fired combustion turbines and is equivalent to the recent permit limit issued for a ULSD fired Mitsubishi 501JAC combustion turbine at the Killingly Energy Center in Connecticut.

Thus, the proposed LAER levels represent the top level of emission controls available, and are equal to or better than the emission levels that have been demonstrated in practice for any combined cycle electric generating facility.

4.4.3.2 Auxiliary Boiler

The auxiliary boiler is proposed to employ good combustion practices and have a restriction on annual operation of 4,800 hours per year. The Project proposes that these control methods represent VOC LAER by limiting emissions to 0.0017 lb/MMBtu. Thus, based on the range of VOC emission levels from recently issued NSR permits at combined cycle facilities for auxiliary boilers, the proposed LAER level represents the top level of emission controls available, and is equal to the lowest VOC levels in the RBLC Database.

4.4.3.3 Emergency Diesel Engines

The application of good combustion practices and limited operating hours is proposed in order to achieve LAER for the emergency diesel fire pump and emergency diesel generator. The maximum VOC emissions from the emergency diesel generator and emergency fire pump are 0.28 g/hp-hr and 0.12 g/hp-hr, respectively. Based on the range of VOC emission levels from recently issued NSR permits at combined cycle facilities for emergency engines, the proposed

LAER level represents the top level of emission controls available, and represents the lowest VOC levels in the RBLC Database. The applicable emission standards in 40 CFR 60 Subpart IIII for non-emergency engines constitute LAER for VOC. While these standards address the combined emissions of NO_x and NMHC, LAER is also being established for NO_x since it is a precursor to ozone and NMHC is also regulated since it is a precursor to ozone. Pursuant to 40 CFR 60 Subpart IIII, Danskammer Energy will use engines that have been certified by the manufacturer as meeting applicable limits of this NSPS and will properly operate and maintain those engines.

4.5 BACT Analysis for Carbon Monoxide

The combined cycle combustion turbine and duct burner, auxiliary boiler, emergency diesel generator, and emergency diesel fire pump are all sources of CO emissions at the proposed Project. This section demonstrates that the proposed CO emissions and controls meet the requirements of BACT.

4.5.1 Review of CO BACT Database

4.5.1.1 Combined Cycle Combustion Turbine

A review of numerous natural gas-fired combined cycle facilities listed in the U.S. EPA's RBLC as well as recently issued air permits list CO emission limits primarily ranging from 0.9 to 2.0 ppm. There are only three recent projects within the RBLC that have proposed permit limits for ULSD fired combustion turbines that have CO limits. These projects have CO limits ranging from 1.8 ppm to 2.0 ppm.

4.5.1.2 Auxiliary Boiler

The CO limits for boilers of similar type listed in the RBLC primarily range from 0.004 to 0.08 lb/MMBtu. Most of the recently issued permitted limits are in the 0.037-0.055 lb/MMBtu range. A recently issued PSD permit is for an 84.0 MMBtu/hr auxiliary boiler at the Killingly Energy Center, Killingly, CT, with a permitted limit of 0.037 lb/MMBtu.

4.5.1.3 Emergency Diesel Engines

The RBLC indicates that the CO permit limits for diesel engines similar in size to the proposed emergency diesel fire pump primarily range from 0.5 to 2.6 g/hp-hr, as summarized in Appendix C. The permit limits for diesel engines similar in size to the proposed emergency diesel fire generator primarily range from 0.3 to 2.6 g/hp-hr, as summarized in Appendix C.

4.5.2 Identification of CO Control Options and Technical Feasibility

The following sections detail the options that were identified for controlling CO emissions from the combustion turbine/duct burner, auxiliary boiler, emergency diesel generator, and emergency diesel fire pump. The technical feasibility of each option is also discussed.

4.5.2.1 Combined Cycle Combustion Turbine

The formation of CO in the exhaust of a combustion turbine is the result of incomplete combustion of fuel. Several conditions can lead to incomplete combustion, including insufficient O_2 availability, poor air/fuel mixing, cold wall flame quenching, reduced combustion temperature, and decreased combustion residence time and load reduction. By controlling the combustion process carefully, CO emissions can be minimized.

After combustion control, the only practical control method to reduce CO emissions from combustion turbines is an oxidation catalyst. Exhaust gases from the turbine are passed over a catalyst bed where excess air oxidizes the CO to CO_2. CO reduction efficiencies in the range of 80 to 90 percent can be guaranteed, although CO reduction may at times be somewhat less than the design value at the low inlet concentrations that are expected for the Mitsubishi 501JAC combustion turbine. No other technically feasible options are identified for combustion turbine CO control. Drawbacks of the oxidation catalyst include added cost, reduced turbine output and efficiency due to increased back pressure, and the potential for increased PM/PM-10/PM-2.5 and/or sulfuric acid mist emissions.

4.5.2.2 Auxiliary Boiler

An oxidation catalyst for the auxiliary boiler is not considered technically feasible since the auxiliary boiler is required to quickly supply steam to the combined cycle unit during the start-up procedure and the oxidation catalyst requires a high flue gas temperature to achieve effective control. Catalytic oxidation is typically used for process emission units in which CO is present in significant concentrations in the flue gas. Oxidation catalysts typically require gas temperatures between 650 and 1150 °F. Thus, catalytic oxidation is also not a technically feasible option for the auxiliary boiler. A more effective method of reducing emissions, including CO, is by restricting operation on an annual basis.

4.5.2.3 Emergency Diesel Engines

As reflected by existing permits, add-on control technology is not practicable for control of CO emissions from an emergency diesel engine operating less than 250 hours per year. Good combustion control practices and limited operating hours represent CO BACT for the Project's emergency diesel fire pump and emergency diesel engine.

4.5.3 Determination of BACT for CO

4.5.3.1 Combined Cycle Combustion Turbine

Based on the results of the search of the RBLC and other available permits for CO BACT precedents, the use of efficient combustion and an oxidation catalyst is the most stringent level of CO control for natural gas-fired and dual-fuel CTGs. Therefore, the use of efficient

combustion and an oxidation catalyst is considered to represent the most stringent level of CO control achieved in practice. The Project is proposing to install an oxidation catalyst designed to reduce CO emissions to 1.0 ppm at 15% O_2 during normal operation without duct firing on natural gas from 50% to full load. During operation on natural gas with duct firing, the Project is proposing to reduce CO emissions to 2.0 ppm at 15% O_2 with an oxidation catalyst.

There have been recent permits issued (Killingly Energy Center, West Deptford Energy Center, and CPV Towantic) with lower limits than 2.0 ppm with duct firing and with a limit 0.9 ppm without duct firing. Note that the Killingly Energy Center has not yet started construction. The CPV Towantic facility recently began commercial operation and does not currently have an active Title V operating permit. Also, the CPV Towantic's limit only applies at full load, as does the limit for the West Deptford Energy Center, so these limits are not comparable to the proposed limit for the Danskammer Energy Center, which applies at all normal operation loads. As such, across all normal operating loads, CO limits less than 1.0 ppm without duct firing and CO limits less than 2.0 with duct firing are not yet considered demonstrated in practice due to lack of sufficient operating and testing history at those levels. Therefore, the 1.0 ppm limit without duct firing and 2.0 ppm limit with duct firing is considered the most stringent limit achieved in practice for a large Mitsubishi 501JAC combined cycle turbine.

Additionally, although the proposed emission rate is marginally higher than a couple of recently permitted Projects, the U.S. EPA's Environmental Appeals Board (EAB) decision[6] on March 14, 2014 regarding the appeal of the La Paloma Energy Center, LLC PSD permit makes clear that minor differences in permitted PSD emission rates are allowable to account for different technologies, and that turbine model selection cannot be taken into account when determining BACT for a project. The proposed CO BACT emission rate during natural gas firing represents the vendor guarantee with an oxidation catalyst and is consistent with the majority of recently permitted Projects.

The Project is proposing to install an oxidation catalyst designed to reduce CO emissions to 2.0 ppm @15% O_2 during normal operation on ULSD from 60% to full load. The Killingly Energy Center Project is limited to 1.8 ppmvd at 15% O_2. The Mitsubishi guaranteed CO emission rate for ULSD firing with an oxidation catalyst is 2.0 ppmvd at 15% O_2 for the 501JAC combustion turbine across all normal operating loads. The Killingly Energy Center has not begun construction, and thus, the lower CO limit of 1.8 ppm has not been demonstrated in practice across all normal operating loads. Thus, the emission rate of 2.0 ppm is consistent with the historical BACT limit of 2.0 ppm for ULSD fired large combustion turbines.

4.5.3.2 Auxiliary Boiler

The Project is proposing to limit the auxiliary boiler CO emissions to a limit of 0.037 lb/MMBtu, corresponding to the anticipated guarantee level of 50 ppm, and to restrict full load operation to 4,800 hours per year to satisfy BACT requirements. This emission rate of 50 ppm represents the lowest CO emission rate for the vast majority of the recently issued PSD permits issued for auxiliary boilers at combined cycle facilities.

4.5.3.3 Emergency Diesel Engines

Existing permits show that add-on control technology is not practical for control of CO emissions from emergency equipment. Stationary internal combustion engines are subject to 40 CFR Part 60, Subpart IIII and 40 CFR 63, Subpart ZZZZ. A review of recent CO emission limits for emergency generator diesel engines installed as part of major source Projects, as summarized in Appendix C, shows that most of these engines were required to meet the

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[6] http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Recent~Additions/687C700F9FD042F585257C9B006369CE/$File/La%20Paloma.pdf

applicable emission limitations for non-road engines under 40 CFR 60, Subpart IIII. No limits were found that required installation of add-on controls for emergency generator diesel engines. Therefore, the Project is proposing BACT for CO emissions through good combustion practices and limiting operating hours. The proposed emission rate from the emergency diesel generator is 2.6 g/hp-hr. The proposed emission rate for the emergency diesel fire pump is 2.6 g/hp-hr. Pursuant to 40 CFR 60 Subpart IIII, Danskammer Energy will use engines that have been certified by the manufacturer as meeting applicable limits of this NSPS and will properly operate and maintain those engines.

4.6 BACT Analysis for PM-10/PM-2.5

The combined cycle combustion turbine and duct burner, auxiliary boiler, and emergency diesel engines, are all sources of PM-10/PM-2.5 emissions. This section details the BACT analysis that was conducted for the PM-10/PM-2.5 emissions from the Project.

4.6.1 Review of PM/PM-10/PM-2.5 BACT Databases

4.6.1.1 Combined Cycle Combustion Turbine

A review of numerous natural gas-fired combined cycle facilities from the U.S. EPA's RBLC and recently issued air permit searches (see Appendix C) lists a wide range of PM-10/PM-2.5 emissions on a pound per hour, lb/MMBtu, and grains of sulfur per 100 scf of natural gas basis. The PM-10/PM-2.5 emission limits for combustion turbine projects are dependent on the make and model of the combustion turbine selected, the fuel sulfur content, the vendor guaranteed emission rate at full load and at part loads, and the duct burner operational status. Vendors typically will provide higher emission guarantees on a lb/MMBtu basis at part load even though emissions on a pound per hour basis are lower at part load.

A review of recently permitted combined cycle facilities from the USEPA's RBLC and recently issued air permit searches (see Appendix C) lists PM-10/PM-2.5 emission limits ranging from 0.0022 to 0.008 lb/MMBtu for natural gas and PM-10/PM-2.5 emission limits ranging from 0.008 to 0.04 lb/MMBtu for ULSD.

4.6.1.2 Auxiliary Boiler

A review of the RBLC (see Appendix C) shows that typically good combustion practices and low-sulfur fuel have been used as BACT for gas-fired boilers. PM-10/PM-2.5 emission limits for gas-fired boilers of similar size range between 0.005 and 0.008 lb/MMBtu.

4.6.1.3 Emergency Diesel Engines

A review of the RBLC (see Appendix C) shows that only good combustion, limitations on operating hours, and low-sulfur fuels have been used as BACT for emergency diesel engines. The RBLC PM-10/PM-2.5 emission levels for diesel generators range primarily from 0.03 to 0.15 g/hp-hr, as summarized in Appendix C. The RBLC PM-10/PM-2.5 emission levels for emergency diesel fire pumps range primarily from 0.08 to 0.15 g/hp-hr, as summarized in Appendix C.

4.6.2 Identification of PM-10/PM-2.5 Control Options and Technical Feasibility

4.6.2.1 Combined Cycle Combustion Turbine

PM-10 and PM-2.5 emissions from the combustion turbine may be formed from non-combustible constituents in fuel or combustion air, from products of incomplete combustion, or from the formation of ammonium sulfates due to the conversion of SO_2 to SO_3, which is then available to react with ammonia and form ammonium sulfate or ammonium bisulfate post combustion. It is conservatively expected that all PM from the turbine will be equal to PM-10 and PM-2.5.

The combustion of clean burning fuels is the most effective means for controlling PM emissions from combustion equipment. The Project is not aware of any natural gas-fired combustion turbine Project that has been required to add on PM-10 or PM-2.5 controls. Post-combustion controls, such as baghouses, scrubbers and electrostatic precipitators (ESP) are impractical due to the high pressure drops associated with these units, the large flue gas volumes, and the low concentrations of PM-10/PM-2.5 present in the exhaust gas.

4.6.2.2 Auxiliary Boiler

PM-10/PM-2.5 emissions from natural gas-fired boilers may be due to products of incomplete combustion as well as non-combustible constituents in the flue gas stream. Proper burner design and operation, as well as the use of natural gas, will control PM-10/PM-2.5 emissions to low levels. PM-10/PM-2.5 control technologies, such as ESP or fabric filters, are common practice on solid fuel boilers. ESPs are also applied on boilers firing residual oil, where the filterable component of PM is greater than that for the proposed Project.

4.6.2.3 Emergency Diesel Engines

Particulate matter emissions from diesel fired internal combustion engines may result from trace metals present in the fuel, unburned carbon-containing materials, and sulfate formation. Good combustion practices and use of clean fuels are the methods currently utilized to minimize PM-10/PM-2.5 emissions from diesel engines. Post-combustion controls, such as baghouses, scrubbers, and ESPs are impractical due to the high-pressure drops associated with these technologies and the low concentrations of PM-10 and PM-2.5 present in the exhaust gas. In addition, any add-on controls applied would have extremely high cost, on a dollar per ton PM-10/PM-2.5 removed basis, since this emergency equipment is expected to operate infrequently.

4.6.3 Determination of BACT for PM-10/PM-2.5

4.6.3.1 Combined Cycle Combustion Turbine

Good combustion techniques and low-sulfur fuels have been proposed to limit PM-10/PM-2.5 emissions. The proposed emission limit for PM-10/PM-2.5 when firing natural gas in the combined cycle combustion turbine is 0.004 lb/MMBtu without duct firing and 0.0055 lb/MMBtu with duct firing. During ULSD firing, the Project is proposing to limit PM-10/PM-2.5 emissions to 0.0089 lb/MMBtu. These values are within the lower range of recent BACT determinations for combined cycle combustion turbines. It is important to recognize that the differences in PM-10/PM-2.5 emission limits among various Projects are mostly due to different emission guarantee philosophies of the various CTG vendors and the Project specific natural gas or ULSD specifications, and are not believed to be actual differences in the quantity of PM-10/PM-2.5 emissions inherently produced by the various CTG models. The different emission guarantee philosophies are influenced by the overall uncertainties of the PM-10/PM-2.5 test procedures.

4.6.3.2 Auxiliary Boiler

The Project proposes the exclusive use of natural gas, a clean-burning and low sulfur fuel in conjunction with good combustion practices as BACT. The proposed PM-10/PM-2.5 limit for the auxiliary boiler is 0.0074 lb/MMBtu, which is consistent with many other recent BACT determinations for natural gas-fired boilers.

4.6.3.3 Emergency Diesel Engines

The Project proposes to use low sulfur fuel, employ good combustion practices, and limit operating hours as BACT for PM-10/PM-2.5. For the emergency diesel generator, the proposed limit is 0.15 g/hp-hr, and is equal to the NSPS Subpart IIII emissions standard for Tier 2 engines found in Table 1, 40 CFR 89.112. For the emergency diesel fire pump, the proposed limit is 0.15 g/hp-hr, and is equal to the NSPS Subpart IIII, emissions standard. A review of recent PM-10/PM-2.5 emission limits for emergency generator diesel engines installed as part of a major source projects, as summarized in Appendix C, shows that most of these engines were required to meet the applicable emission limitations for non-road engines under 40 CFR 60, Subpart IIII. Pursuant to 40 CFR 60 Subpart IIII, Danskammer Energy will use engines that have been certified by the manufacturer as meeting applicable limits of this NSPS and will properly operate and maintain those engines.

4.7 BACT Analysis for Sulfuric Acid Mist

Sulfuric acid mist emissions, in addition to being a function of fuel sulfur content, are also related to the amount of oxidation of fuel sulfur to SO_3. Sulfuric acid is produced when SO_2 is converted to SO_3 in the presence of a catalyst and is then further combined with water to form H_2SO_4. To be available to react with water to form sulfuric acid, the SO_3 will have to avoid first reacting with ammonia slip (and forming ammonia salts). During the combustion process, most of the sulfur is converted to SO_2.

4.7.1 Review of H_2SO_4 BACT Database

A review of the RBLC and search of recently issued air permits indicated only one option for H_2SO_4 control. For all units where H_2SO_4 control was identified, the only option considered was the combustion of low-sulfur fuels. No other controls have been implemented on a combustion turbine, boiler, or diesel engine.

4.7.1.1 Combined Cycle Combustion Turbine

A search of numerous permits for natural gas-fired combined cycle combustion turbines yielded BACT H_2SO_4 emission limits ranging primarily between 0.0005 and 0.003 lb/MMBtu. A search of recent Projects with H_2SO_4 limits for fuel oil-fired combined cycle combustion turbines yielded a range of H_2SO_4 emission limits between 0.00091 and 0.013 lb/MMBtu.

4.7.1.2 Auxiliary Boiler

A search of the RBLC for H_2SO_4 emissions from natural gas fired boilers similar in size to the auxiliary boiler proposed at the Project shows BACT limits of 0.00005 lb/MMBtu to 0.00025 lb/MMBtu.

4.7.1.3 Emergency Diesel Engines

A search of the RBLC for H_2SO_4 emissions from emergency diesel engines yielded results ranging from 0.00003 to 0.0035 lb/MMBtu.

4.7.2 Identification of H_2SO_4 Control Options and Technical Feasibility

4.7.2.1 Combined Cycle Combustion Turbine

Strategies for the control of H_2SO_4 emissions can be divided into pre- and post-combustion categories. Pre-combustion controls entail the use of low-sulfur fuels. Post-combustion controls comprise various wet and dry flue gas desulfurization (FGD) processes. However, FGD alternatives are undesirable for use on combustion turbine power facilities due to high-pressure drops across the device, and would be particularly impractical for the large flue gas volumes and low sulfur concentrations for the Danskammer Energy Center. The use of natural gas or ULSD results in low emission levels of H_2SO_4.

4.7.2.2 Auxiliary Boiler

FGD is a technology used to control sulfur emissions from various combustion sources. Installation of such systems is an established technology principally used on coal-fired and high-sulfur oil-fired steam electric generating stations, but is not feasible for boilers fired with natural gas, such as the one proposed for this Project.

4.7.2.3 Emergency Diesel Engines

The only practical control technique available for emergency diesel engines that will operate no more than 250 hours per year is the use of low-sulfur fuel.

4.7.3 Determination of BACT for H_2SO_4

4.7.3.1 Combined Cycle Combustion Turbine

The most stringent level of control for H_2SO_4 emissions is the firing of natural gas. The Project proposes to use natural gas as the primary fuel along with ULSD as a backup fuel with limited hours of operation to meet BACT for H_2SO_4. The sulfur content of the natural gas of 0.50 grains/100 scf was used as the design basis. ULSD will have a sulfur content less than or equal to 0.0015%, by weight, which is nearly equivalent to the sulfur content proposed for natural gas.

4.7.3.2 Auxiliary Boiler

The Project proposes to fire low sulfur fuels (0.50 grains S/100 scf of natural gas as the design basis) in the auxiliary boiler to meet BACT for sulfuric acid. This proposal is consistent with the lowest limits identified in the RBLC for auxiliary boilers located at large combined cycle power plants.

4.7.3.3 Diesel Internal Combustion Engines

The Project proposes to utilize ULSD with a maximum sulfur content of 0.0015% by weight in the emergency diesel engines to meet BACT for H_2SO_4. The selection of this fuel represents the greatest level of H_2SO_4 reduction and represents the top level of control.

4.8 BACT Analysis for Greenhouse Gas (GHG) Emissions

The sources of GHG emissions for the Project are the combined cycle combustion turbine, the auxiliary boiler, the emergency diesel engine, and the emergency diesel fire pump. This section details the BACT analysis that was conducted for the CO_2e emissions from the Project.

4.8.1 Review of GHG BACT Database

4.8.1.1 Combined Cycle Combustion Turbine

A summary of recent GHG BACT determinations for combined cycle power plants obtained from the RBLC and from review of other permits not listed in the RBLC is provided in Appendix C. Direct comparison of BACT limits is complicated by inconsistencies in the bases used to establish GHG BACT limits. For example, some heat rate (Btu/KW-hr) and output based limits (lb CO_2/MW-hr) are provided on a gross basis (i.e., the full electric output of the equipment without consideration of internal plant loads such as pumps and fans) and others are provided on a net basis (i.e., the amount of energy actually sold to the electric grid). Furthermore, design performance and degradation factors that are used to adjust the base new and clean heat rates based upon vendor design data to realistic long term limits vary from permit to permit.

The most recent output based limits range from 775 to 1,000 lb CO_2/MW-hr. Heat rates, based on higher heating values, are typically in the range of 7,000 Btu/kWh to 8,000 Btu/kWh. Variations in heat rates and emission limits are due to a number of factors including gas turbine model, fuel type, combined cycle configuration, duct burner size, cooling method, operational variability, averaging times, the use of net or gross power output, use of lower heating value vs. higher heating value, and other factors.

There is a single dual fuel large combined cycle combustion turbine BACT determination for a facility with a Mitsubishi 501 JAC combustion turbine that includes a 7,273 Btu/kWh limit on net basis without duct firing (i.e., the Killingly Energy Center).

4.8.1.2 Auxiliary Boiler

The GHG BACT limits in the RLBC as provided in Appendix C and those listed in a review of proposed permits for auxiliary boilers at combined cycle combustion turbine facilities are based upon an annual ton per year limit and/or based upon a lb CO_2/MMBtu limit. However, note that annual limits reflect the particular boiler size and gas throughput limits and will vary substantially from project to project based upon the intended purpose of the boiler. The GHG BACT limits for natural gas fired boilers are predominantly listed as 117 lb/MMBtu of CO_2.

4.8.1.3 Diesel Internal Combustion Engines

A review of the RBLC database indicates that recent permits for emergency diesel generators of the size proposed for this Project are 163 lb/MMBtu. There are many permit limits based upon an annual tons per year limit that are determined per the anticipated maximum annual operation and size of the engine. The limits for emergency diesel fire pumps are similar to those for emergency diesel engines.

4.8.2 Identification of GHG Control Options and Technical Feasibility

4.8.2.1 Combined Cycle Combustion Turbine

The following potentially applicable control technologies for GHG were evaluated:

CO_2 Capture and Storage (CCS)– Capture and compression, transport, and geologic storage of the CO_2 is a post-combustion technology that is not considered commercially viable at this time for combined cycle power plants. CCS systems involve the use of adsorption or absorption processes to remove CO_2 from flue gas, with subsequent desorption to produce a concentrated CO_2 stream. The concentrated CO_2 is then compressed to supercritical temperature and pressure, a state in which CO_2 exists neither as a liquid nor a gas, but instead has physical properties of both liquids and gases. The supercritical CO_2 would then be transported to an appropriate location for underground injection into a suitable geological storage reservoir, such as a deep saline aquifer or depleted coal seam, or used in crude oil production for enhanced oil recovery.

On October 23, 2015, U.S. EPA promulgated a NSPS (Subpart TTTT) that applies to new fossil fuel fired electric generating units including natural gas-fired combustion turbines. U.S. EPA rejected CCS as the best system of emission reduction for natural gas-fired combustion turbines because they did not have sufficient information to determine whether implementing CCS was technically feasible. U.S. EPA expressed concerns about applying CCS to fast-start natural gas combined cycle units similar to the proposed units because these units might not be base loaded like a large coal fired electric generating unit. In addition, U.S. EPA noted that the U.S. Department of Energy has not yet funded a CCS demonstration project for a natural gas-fired combined cycle unit and no natural gas-fired combined cycle CCS demonstration projects are operational or being constructed in the U.S.

With regard to CCS, as identified by U.S. EPA, CCS is composed of three main components: CO_2 capture and/or compression, transport, and storage. CCS may be eliminated from a BACT analysis in Step 2 if it can be shown that there are significant differences pertinent to the successful operation for each of these three main components from what has already been applied to a differing source type. For example, the temperature, pressure, pollutant concentration, or volume of the gas stream to be controlled, may differ so significantly from previous applications that it is uncertain the control device will work in the situation currently undergoing review. Furthermore, CCS may be eliminated from a BACT analysis in Step 2 if the three components working together are deemed technically infeasible for the proposed source, taking into account the integration of the CCS components with the base facility and site-specific considerations (e.g., space for CO_2 capture equipment at an existing facility, right-of-ways to build a pipeline or access to an existing pipeline, access to suitable geologic reservoirs for sequestration, or other storage options).

Each component of CCS technology (i.e., capture and compression, transport, and storage) is discussed separately.

CO_2 Capture and Compression **–** Though amine absorption technology for CO_2 capture has been applied to processes in the petroleum refining and natural gas processing industries and to exhausts from gas-fired industrial boilers, it is more difficult to apply to power plant gas turbine exhausts, which have considerably larger flow volumes and considerably lower CO_2 concentrations. The Obama Administration's Interagency Task Force on Carbon Capture and Storage confirmed this in a report on the status of development of CCS systems:

> "Current technologies could be used to capture CO_2 from new and existing fossil energy power plants; however, they are not ready for widespread implementation primarily because they have not been demonstrated at the scale necessary to establish confidence for power plant application. Since the CO_2 capture capacities used in current industrial processes are generally much smaller than the capacity required for the purposes of GHG emissions mitigation at a typical power plant, there is considerable uncertainty associated with capacities at volumes necessary for commercial deployment."[7]

Another challenge of CO_2 capture is conservation of water resources. Adding CO_2 separation facilities and compression equipment significantly increases the cooling water requirements of a generating station. Studies have indicated that a natural gas fired combined cycle facility with CCS may have an increased water consumption of nearly double that of a similar facility without CCS.

Based on the information presented in this section, carbon capture has not been demonstrated on a commercially viable scale on a project similar to the proposed Danskammer Energy Center and hence is technically infeasible for this application.

<u>CO_2 Transport and Storage</u> **–** Even if it is assumed that CO_2 capture and compression could feasibly be achieved for the proposed Project, the high-volume CO_2 stream generated would need to be transported to a facility capable of storing it by an existing pipeline. The nearest CO_2 pipelines to the Project are in northern Michigan and southern Mississippi.

<u>CO_2 Storage</u> – Even if it is assumed that CO_2 capture and compression could feasibly be achieved for the proposed Project and that the CO_2 could be transported economically, the feasibility of CCS technology would still depend on the availability of a suitable sequestration site. The suitability of potential storage sites is a function of volumetric capacity of their geologic formations, CO_2 trapping mechanisms within formations (including dissolution in brine, reactions with minerals to form solid carbonates, and/or adsorption in porous rock), and potential environmental impacts resulting from injection of CO_2 into the formations. Potential environmental impacts resulting from CO_2 injection that still require assessment before CCS technology can be considered feasible include:

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[7] *Report of the Interagency Task Force on Carbon Capture and Storage* at 50 (Aug. 2010).

- Uncertainty concerning the significance of dissolution of CO_2 into brine;

- Risks of brine displacement resulting from large-scale CO_2 injection, including a pressure leakage risk for brine into underground drinking water sources and/or surface water;

- Risks to fresh water as a result of leakage of CO_2, including the possibility for damage to the biosphere, underground drinking water sources, and/or surface water; and,

- Potential effects on wildlife.

Based on the suitability factors described above, the suitability of the Newark Basin, which is the closest geologic area to the proposed Project to store a substantial portion of the large volume of CO_2 generated by a facility comparable in size to the proposed Project has yet to be fully demonstrated. As concluded in the 2010 Report of the Interagency Task Force on Carbon Capture and Storage that while there is currently estimated to be a large volume of potential storage sites, "to enable widespread, safe, and effective CCS, CO_2 storage should continue to be field-demonstrated for a variety of geologic reservoir classes" and that "scale-up from a limited number of demonstration projects to wide scale commercial deployment may necessitate the consideration of basin-scale factors (e.g., brine displacement, overlap of pressure fronts, spatial variation in depositional environments, etc.)".

Based on the abovementioned U.S. EPA guidance regarding technical feasibility and the conclusions of the Interagency Task Force for the CO_2 capture component alone (let alone a detailed evaluation of the technical feasibility of right-of-ways to build a pipeline or storage sites), CCS has been determined to not be technically feasible. Thus, CCS technology should be eliminated from further consideration as a potential feasible control technology for purposes of this BACT analysis.

Electrical Generation Efficiency – Other than capture and sequestration of GHG emitted by combustion, the only known option for reducing GHG emissions is through maximization of the energy released during the combustion process and then through the maximization of the use or capture of that energy. To minimize GHG emissions, it is desirable to use less fuel to generate a given amount of electrical energy. There are several factors that may be examined that affect the amount of GHG produced per MW-hour of energy produced. The following energy efficiency practices were considered for the Project:

Use of Low Carbon Fuel – The first aspect to evaluate with regard to an energy efficient process is the source of fuel. 40 CFR Part 98 provides emission factors for GHG from the combustion of various fuels. Natural gas is listed as the third cleanest fuel with respect to CO_2 emissions, the third cleanest fuel with respect to CH_4 emissions, and the cleanest fuel with respect to N_2O emissions. The two cleaner fuels with respect to CO_2 emissions (coke oven gas and biogas) are not feasible sources of fuel for the Project. Therefore, with regard to fuels that can be utilized by the Project, natural gas produces the lowest GHG emissions profile. The proposed combustion turbine unit will primarily burn natural gas.

Turbine Design/Selection – In a combined cycle configuration, a HRSG is used to recover what would otherwise be waste heat lost to the atmosphere in the hot turbine exhaust. Use of heat recovery from the turbine exhaust to produce steam to power a steam turbine which generates additional electric power is the single most effective means of increasing the efficiency of combustion turbines used for electric power generation. In applications where process heat is needed, the steam produced in the HRSG can also be used to provide heat to plant processes in addition to or instead of being used to produce additional electricity. This "cogeneration" technology is not applicable to electric power generation unless there is a co-located steam host or other means of using additional recoverable waste heat.

The driving factor in the evaluation of energy efficiency is the core efficiency of the selected combustion turbine. However, in the EAB's decision in the La Paloma Energy Center case, it was concluded that "combined cycle combustion turbines with efficient turbine design are the most energy efficient way to generate electricity" and that minor differences in efficiency and GHG emission rates between different combustion turbine models are acceptable. The Project is proposing to install a single "J" Class turbine in combined-cycle configuration, the most efficient class of combustion turbines commercially available. The combined cycle heat rate of the proposed unit compares very favorably to the heat rate limits included in recent permits for other comparable combined cycle units which are summarized in Appendix C.

Periodic Maintenance and Tune-up – Periodic tune-up of the turbine helps to maintain optimal thermal efficiency. After several months of continuous operation of the combustion turbine, fouling and degradation results in a loss of thermal efficiency. A periodic maintenance program consisting of inspection of key equipment components and tune up of the combustor will restore performance to near original conditions. The facility will implement an extensive inspection and maintenance program.

Instrumentation and Controls – Proper instrumentation ensures efficient turbine operation to minimize fuel consumption and resulting GHG emissions. Today's Mitsubishi "J" Class turbines, like the one being proposed for this Project, come from the manufacturer with a digital control package included. These systems control turbine operation, including fuel and air flow, to optimize combustion for control of criteria pollutant emissions (NO_x and CO) in addition to maintaining high operating efficiency to minimize fuel usage over the full range of operating conditions and loads.

4.8.2.2 Auxiliary Boiler

The only feasible option for reducing GHG emissions from the auxiliary boiler is to use natural gas and to limit the hours of annual operation, both of which are proposed in this PSD permit application. Natural gas has the lowest pollutant emissions amongst feasible fuels.

4.8.2.3 Emergency Diesel Engines

The emergency engines provide electricity and/or fire protection during a loss of power or fire at the facility. In accordance with National Fire Protection Agency (NFPA) requirements under NFPA-20 (Standard for the Installation of Stationary Pumps for Fire Protection), emergency fire pump engines must be either diesel or electric engines and cannot be spark-ignited engines (i.e., natural gas, propane or gasoline). Furthermore, NFPA-20 emergency fire pump engines must have a dedicated diesel fuel tank. Spark ignition engines are not suitable for fire protection due to their unreliability as compared to diesel engines.

Similar to fire pump engines, a diesel generator is required for reliability and safety purposes during an emergency. Unlike a diesel engine, an electric engine cannot be used as an emergency generator since that equipment, by design, operates only when electricity is available.

Like the other project sources, CCS could theoretically capture and store CO_2 emissions from the emergency engines. However, based upon the technical deficiencies of the current CCS technology and the lack of suitable sequestration facilities near the Project, CCS was eliminated as a BACT option for GHG control. Since spark ignition engines were eliminated as technically feasible, diesel engines are the lowest emitting technology available. Thus, the only feasible option for reducing GHG emissions from the emergency diesel engines is to limit annual operation of the units.

4.8.3 Determination of BACT for GHG

4.8.3.1 Combined Cycle Combustion Turbine

BACT for GHG emissions has been determined to be the application of advanced combined-cycle technology with natural gas firing as the primary fuel with USLD firing limited to certain operating periods. In accordance with BACT requirements, BACT must be established as a federally enforceable emission rate. The recently permitted GHG emission rates in Appendix C take into account degradation in turbine performance over the expected lifetime of each project. The majority of the GHG BACT decisions in Appendix C apply several degradation factors initially established by the Bay Area Air Quality Management District for the permitting of the Russell City Energy Center. These degradation factors have been approved in numerous recent PSD permits issued by U.S. EPA and other PSD-delegated agencies. Since these degradation factors have been approved by U.S. EPA, they are proposed to be applied to this Project in order to establish the GHG BACT emission rate. The following is a discussion of these factors and the proposed GHG BACT emission rate:

- The first factor accounts for design margin to reflect the likelihood that the equipment as constructed and installed may not fully achieve the optimal vendor specified design performance. A design margin of 3.3 percent is taken into account for this purpose.

- The second factor accounts for performance margin to reflect normal wear and tear of the combustion turbine over its useful life. A performance margin of 6.0 percent is taken into account for this purpose.

- The third factor accounts for degradation of auxiliary plant equipment (i.e., HRSG, steam turbine, ancillary pumps and motors, etc.) to reflect normal wear and tear. An auxiliary equipment degradation margin of 3.0 percent is taken into account for this purpose.

These three factors are expected to compound upon each preceding factor such that the overall degradation in plant performance is estimated to be 12.8 percent over the useful life of the combustion turbine.

Several of the Projects identified in Appendix C have been permitted with a heat rate limit. Most of these limits have been established solely for a natural gas-fired operating condition, without duct firing, at ISO conditions. The proposed Mitsubishi 501JAC CTG has a new and clean designed heat rate (in combined cycle mode) for the Project of 6,140 Btu/KW-hr HHV on a gross-output basis when firing natural gas at full load ISO conditions without duct firing. Applying the 12.8 percent performance degradation and margin factor discussed above, yields a gross heat rate of 6,925 Btu/KW-hr when firing natural gas at full load ISO conditions without duct firing. This gross heat rate is amongst the lowest heat rates identified for recent combined cycle combustion Projects and is proposed as GHG BACT for the Project. Note that the heat rate limits for three recent Projects proposed with GE 7HA.02 combustion turbines are 7,047 Btu/KW-hr (Gross, HHV), 7,368 Btu/KW-hr (Gross, HHV) and, 6,901 Btu/KW-hr (Gross, HHV) for the Colorado Bend II, Moxie Freedom, and Middlesex Energy Center Projects, respectively. Thus, the Project design has been optimized such that it will perform in-line with recent Projects proposed with similar combustion turbines.

The Project proposes as BACT, the following energy efficiency processes, practices, and designs for the proposed combustion turbine:

- Use of combined cycle power generation technology
- Use of natural gas as the primary fuel
- Efficient turbine design
- Periodic maintenance and tune up
- Instrumentation and controls

The Project is proposing the following GHG BACT limits:

- Heat rate of 6,925 Btu/KW-hr Gross (HHV) at ISO conditions during natural gas operation and at baseload without duct firing; and
- Total annual GHG emissions for the combined cycle combustion turbine including duct firing, backup ULSD operation, and operation at part loads, will be limited to 1,927,496 tons CO_2e per year

The proposed heat rate above is corrected to ISO conditions of:

- Ambient Dry Bulb Temperature: 59°F
- Ambient Relative Humidity: 60%
- Barometric Pressure: 14.7 psia

- Fuel (natural gas) Higher Heating Value: 23,152 Btu/lb

The Project will utilize 40 CFR Part 75 monitoring methodology along with 40 CFR Part 98 emission factors for CH_4 and N_2O to determine compliance. Compliance with the heat rate limit at base load on natural gas without duct firing will be based on an initial performance test. Compliance with the annual tons/year limit will be based on a rolling monthly total.

Note that the Project also will comply with the U.S. EPA's 40 CFR Part 60, Subpart TTTT that will limit CO_2 emissions from new natural gas base load combustion turbines to 1,000 pounds CO_2/MW-hr of electricity generated on a gross basis (12-month rolling average). Based upon this U.S. EPA rule, a GHG emissions performance standard of 1,000 lb CO_2e per gross MW-hr is intended to reflect degradation of the equipment over time and the emissions associated with turndowns, startup, and shutdown. The Project will also comply with the NYSDEC regulation for major electric generating facilities, 6 NYCRR Part 251, that requires facilities to meet an output based emission limit of 925 lb CO2 /MW-hr (gross).

Therefore, taking into account the efficiency metric for the combined-cycle power plant of pounds of CO_2 per gross MW-hr of electrical generation, the capability of HRSG duct firing, the inherent degradation in turbine performance over the life of the Project, and the inclusion of startup and shutdowns over the course of a year of operation, it has been concluded that the Project will meet the NSPS TTTT limit on a 365-day rolling average during Project operation. The NSPS TTTT and the NYSDEC Part 251 regulation limits are consistent with the lifetime annual operation of the Project that includes degradation of the equipment over time and the emissions associated with turndowns, startup, shutdown, and part load operation that are incorporated into this annual limit.

4.8.3.2 Auxiliary Boiler

The Project proposes to burn natural gas as the fuel and limit total operation to 4,800 hours per year. Total annual CO_2e emissions from the auxiliary boiler will be limited to 26,959 tons/year.

4.8.3.3 Diesel Internal Combustion Engines

The Project proposes to limit the total operating hours for the emergency diesel generator and fire pump to 250 hours per year each. Total annual CO_2e emissions from the emergency diesel generator and emergency diesel fire pump will be limited to 399 and 47 tons/year, respectively.

4.9 Summary of Control Technology Proposals

Tables 4–1 through 4-5 provide a summary of the control technology proposals for the Project for listed regulated pollutants.

Table 4-1: Summary of Proposed Emissions - Combustion Turbine/Duct Burner (Gas Firing)

Pollutant	LAER/BACT	Method	Basis
NO_x	2.0 ppm (with and without duct firing)	SCR and Dry Low-NOx Burner	LAER
VOC	0.7 ppm (without duct firing) 1.6 ppm (with duct firing)	Oxidation catalyst & good combustion practices	LAER
CO	1.0 ppm (without duct firing) 2.0 ppm (with duct firing)	Oxidation catalyst & good combustion practices	BACT
PM/PM-10/ PM-2.5 [1]	0.0040 lb/MMBtu (without duct firing) 0.0055 lb/MMBtu (with duct firing)	Low-sulfur fuels	BACT
SO_2	0.5 grains sulfur per 100 scf of natural gas	Low-sulfur fuels	NSPS (KKKK)
H_2SO_4	0.0014 lb/MMBtu (with and without duct firing)	Low-sulfur fuels	BACT
GHG	6,925 Btu/kWh (gross) at ISO conditions and 100% load (without duct firing) 1,927,496 tons/year of CO2e	Clean fuels and thermal efficiency	BACT
NH_3	5 ppm	N/A	OTHER

Notes:

"ppm" refers to ppmvd @ 15% O_2; lb/MMBtu limits are HHV basis. All ppm values are one-hour averages.

Facility may exceed short-term limits during defined startup and shutdown periods.

All proposed emission limits (in units of ppm and lb/MMBtu) do not serve as the basis for determining annual emission limits. Refer to Appendix B for potential annual emissions calculations.

[1]Includes filterables, condensables, and sulfates.

Table 4-2: Summary of Proposed Emissions - Combustion Turbine/Duct Burner (ULSD Firing)

Pollutant	LAER/BACT	Method	Basis
NO_x	4.0 ppm	SCR and Water injection	LAER
VOC	2.0 ppm	Oxidation catalyst & good combustion practices	LAER
CO	2.0 ppm	Oxidation catalyst & good combustion practices	BACT
PM/PM-10/ PM-2.5 [1]	0.0089 lb/MMBtu	Low-sulfur fuels	BACT
SO_2	0.0015% sulfur, by weight	Low-sulfur fuels	NSPS (KKKK)
H_2SO_4	0.0015% sulfur, by weight	Low-sulfur fuels	BACT
GHG	See Table 4-1	Clean fuel and thermal efficiency	BACT
NH_3	5 ppm	N/A	OTHER

Notes:

"ppm" refers to ppmvd @ 15% O_2; lb/MMBtu limits are HHV basis. All ppm values are one-hour averages.

Facility may exceed short-term limits during defined startup and shutdown periods.

All proposed emission limits (in units of ppm and lb/MMBtu) do not serve as the basis for determining annual emission limits. Refer to Appendix B for potential annual emissions calculations.

[1]Includes filterables, condensables, and sulfates.

Table 4-3: Summary of Proposed Emissions - Auxiliary Boiler

Pollutant	LAER/BACT	Method	Basis
NO_x	0.0086 lb/MMBtu (gas firing)	Ultra-Low NOx burner & FGR	LAER
VOC	0.0017 lb/MMBtu (gas firing)	Good combustion practices	LAER
CO	0.037 lb/MMBtu (gas firing)	Good combustion practices	BACT
PM/PM-10/ PM-2.5	0.0074 lb/MMBtu (gas firing)	Low-sulfur fuels	BACT
SO_2	0.50 grains Sulfur/100 standard cubic feet (scf) (gas firing)	Low-sulfur fuels	OTHER
H_2SO_4	0.50 grains Sulfur/100 scf (gas firing)	Low-sulfur fuels	BACT
GHG (CO_2e)	26,959 tons/year	Clean fuels, limited operation	BACT

Table 4-4: Summary of Proposed Emissions - Emergency Diesel Generator

Pollutant	LAER/BACT	Method	Basis
NO_x	4.8 g/hp-hr	Limited operation	LAER
VOC	0.28 g/hp-hr	Good combustion practices & limited operation	LAER
CO	2.6 g/hp-hr	Good combustion practices & limited operation	BACT
PM/PM-10/ PM-2.5	0.15 g/hp-hr	Low-sulfur fuels	BACT
SO_2	0.0015% Sulfur fuel, by weight	Low-sulfur fuels	OTHER
H_2SO_4	0.0015% Sulfur fuel, by weight	Low-sulfur fuels	BACT
GHG (CO_2e)	399 tons/year	Limited operation	BACT

Table 4-5: Summary of Proposed Emissions - Emergency Diesel Fire Pump

Pollutant	LAER/BACT	Method	Basis
NO_x	3.0 g/hp-hr	Limited operation	LAER
VOC	0.12 g/hp-hr	Good combustion practices & limited operation	LAER
CO	2.6 g/hp-hr	Good combustion practices & limited operation	BACT
PM/PM-10/ PM-2.5	0.15 g/hp-hr	Low-sulfur fuels	BACT
SO_2	0.0015% Sulfur fuel, by weight	Low-sulfur fuels	OTHER
H_2SO_4	0.0015% Sulfur fuel, by weight	Low-sulfur fuels	BACT
GHG (CO_2e)	47 tons/year	Limited operation	BACT

5.0 AIR QUALITY MODELING ANALYSIS

Danskammer Energy is proposing to construct an approximately 536-MW primarily natural gas fired 1-on-1 combined cycle power facility on land at the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York. The proposed Project (combustion turbine) will be primarily fueled by natural gas with ULSD as a backup fuel for up to the full load equivalent of 720 hours per year.

As discussed in Sections 3.5 through 3.7, NO_x, PM-10, PM-2.5, and CO exceed the pollutant specific PSD significant emission rates (SER) and, consequently, an air dispersion modeling analysis is required for these pollutants. Furthermore, an air quality assessment to determine the potential impact of the Project emissions on the NAAQS/NYAAQS has also been prepared.

The air quality modeling analysis is required to demonstrate that the Danskammer Energy Center will be compliant with all applicable PSD increment levels, NAAQS and NYAAQS. The air quality impact of the proposed Project was modeled using potential emission rates to determine if the Project yielded significant air quality impacts (i.e., maximum modeled concentrations greater than the PSD significant impact concentrations). The significance modeling was performed for multiple combustion turbine operating loads and a range of ambient temperatures. The pollutant-specific "worst-case" operating scenarios determined from the significance modeling analysis were used in all subsequent modeling, including multiple source NAAQS/NYAAQS modeling analyses.

5.1 Regional Description

The proposed Danskammer Energy Center will be located on an approximately 180+ acre parcel that is controlled by Danskammer Energy. The Project site is located within the Town of Newburgh, Orange County, New York. The Danskammer-owned property in the area of the Project site is bordered to the northwest by the Tilcon Materials Inc. quarry and the Hudson River to the northeast and east, and to the south by Riverview Power, LLC's Roseton Generating Station. The CSX Transportation rail road tracks transect the eastern portion of the property (west of the plant) in a northwest/southeast orientation, and the property is bordered to the west by a single-story house and Danskammer Road.

Figure 5-1 presents the proposed Project's location on the U.S. Geological Survey (USGS) 7.5-minute topographic map for the surrounding area. Land use classifications per the USGS within the surrounding area are provided in Table 5-1. The proposed Project will be located at approximately 41°34'18.26" North Latitude, 73°58'0.22" West Longitude, North American Datum 1983 (NAD83). The approximate Universal Transverse Mercator (UTM) coordinates of the Project are 586,145 meters Easting, 4,602,744 meters Northing, in Zone 18, NAD83.

5.2 Background Ambient Air Quality

Consistent with the Project's Air Quality Modeling Protocol (see Appendix E) that was approved by the NYSDEC on June 20, 2019, background ambient air quality data was obtained from various approved existing monitoring locations. Based on a review of the locations of NYSDEC ambient air quality monitoring sites, the closest NYSDEC monitoring sites were used to represent the current background air quality in the site area.

Background data for CO and NO_2 was obtained from a monitoring station located in Bronx County, New York (U.S. EPA AIRData # 36-005-0133), approximately 79 km south of the proposed Project. The monitor is located at the Botanical Gardens (Pfizer Plant Research Lab, 200th Street and Southern Boulevard). This monitor is located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area in the lower Hudson Valley. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the Project area. Thus, this monitor would be considered to conservatively represent the ambient air quality within the Project area.

Background data for PM-10 was obtained from a monitoring station located in Bronx County, New York (U.S. EPA AIRData # 36-005-0110), approximately 84 km south of the proposed Project. The monitor is located at IS 52 (681 Kelly Street). This monitor is also located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area in the lower Hudson Valley. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the Project area. Thus, this monitor would also be considered to conservatively represent the ambient air quality within the Project area.

Background data for SO_2 was obtained from the Mt. Ninham monitoring station located in Putnam County, New York (U.S. EPA AIRData # 36-079-0005), and approximately 25 km east-southeast of the proposed Project. The monitor is located on Gypsy Trail Road in Kent. This monitor's close proximity to the Project would qualify it to be representative of the ambient air quality within the Project area.

Background data for PM-2.5 was obtained from a Newburgh monitoring station located in Orange County, New York (U.S. EPA AIRData # 36-071-0002), and approximately 9 km south-southwest of the proposed Project. The monitor is located at the Public Safety Building (55 Broadway). This monitor's close proximity to the Project would qualify it to be representative of the ambient air quality within the Project area.

The monitoring data for the most recent three years (2016 – 2018) are presented and compared to the NAAQS in Table 5-2. The maximum measured concentrations for each of these pollutants during the last three years are all below applicable standards and were used in the NAAQS analysis.

5.3 Modeling Methodology

An air quality modeling analysis was performed consistent with the procedures found in the following documents: Guideline on Air Quality Models (Revised) (U.S. EPA, 2017), New Source Review Workshop Manual (U.S. EPA, 1990), Screening Procedures for Estimating the Air Quality Impact of Stationary Sources (U.S. EPA, 1992), and DAR-10: NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis (NYSDEC, 2006).

The modeling methodology used for assessing the proposed Project's air quality impact was detailed in the Air Quality Modeling Protocol submitted to the NYSDEC on May 15, 2019 and approved by the NYSDEC in a comment letter dated June 20, 2019. A copy of the NYSDEC's comment letter on the Air Quality Modeling Protocol can be found in Appendix D and a copy of the Air Quality Modeling Protocol is located in Appendix E.

5.3.1 Model Selection

The U.S. EPA has compiled a set of preferred and alternative computer models for the calculation of pollutant impacts. The selection of a model depends on the characteristics of the source, as well as the nature of the surrounding study area. Of the four classes of models available, the Gaussian type model is the most widely used technique for estimating the impacts of nonreactive pollutants.

The AERMOD model was designed for assessing pollutant concentrations from a wide variety of sources (point, area, and volume). AERMOD is currently recommended for modeling studies in rural or urban areas, flat or complex terrain, and transport distances less than 50 kilometers, with one hour to annual averaging times.

AERMOD (version 19191) was used for the modeling of the Project's potential emissions to determine the maximum ambient air concentrations.

5.3.2 Urban/Rural Area Analysis

A land cover classification analysis was performed to determine whether the urban source modeling option in AERMOD should be used in quantifying ground-level concentrations. The urban option in AERMOD accounts for the effects of increased surface heating on pollutant dispersion under stable atmospheric conditions. Essentially, the urban convective boundary layer forms in the night when stable rural air flows onto a warmer urban surface. The urban surface is warmer than the rural surface because the urban surface cools at a slower rate than the rural surface when the sun sets. The methodology utilized to determine whether the Project is located in an urban or rural area is described below.

The USGS topo map (see Figure 5-2) covering the area within a 3-kilometer radius of the site was reviewed and indicated that the majority of the surrounding area includes wooded areas, agricultural areas, parks, non-densely packed structures, and water. Additionally, the "AERMOD Implementation Guide" published on April 17, 2018 cautions users against applying the Land Use Procedure on a source-by-source basis and instead consider the potential for urban heat island influences across the modeling domain. This approach is consistent with the fact that the urban heat island is not a localized effect, but is more regional in character.

The land use classifications within an area defined by a 3-km radius from the site and within a 10 km x 10 km modeling domain were analyzed using USGS National Land Cover Database (NLCD) 2011 data, where urban classifications are based on land use category 23 (developed, medium intensity) and category 24 (developed, high intensity). The land use within the 3-km area has 7% urban classification and the modeling domain has 9% urban classification as shown on Figure 5-3. Table 5-1 provides the detailed land use classifications within a 3-kilometer radius of the site as well as a 10 kilometer by 10 kilometer domain.

The area within 3 kilometers of the proposed site as well as the 10 kilometer by 10 kilometer modeling domain is predominantly rural (as illustrated by Figure 5-3 and Table 5-1) and would not be subject to an urban heat island effect. Because the area is not subject to an urban heat island effect, the Urban Source option in AERMOD was not utilized.

5.3.3 Good Engineering Practice Stack Height

Section 123 of the Clean Air Act (CAA) required the United States Environmental Protection Agency (U.S. EPA) to promulgate regulations to assure that the degree of emission limitation for the control of any air pollutant under an applicable State Implementation Plan (SIP) was not affected by (1) stack heights that exceed Good Engineering Practice (GEP) or (2) any other dispersion technique. The U.S. EPA provides specific guidance for determining GEP stack height and for determining whether building downwash will occur in the Guidance for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations), (U.S. EPA, 1985). GEP is defined as "…the height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, and wakes that may be created by the source itself, or nearby structures, or nearby terrain "obstacles"."

The GEP definition is based on the observed phenomenon of atmospheric flow in the immediate vicinity of a structure. It identifies the minimum stack height at which significant adverse aerodynamics (downwash) are avoided. The U.S. EPA GEP stack height regulations (40 CFR 51.100) specify that the GEP stack height (H_{GEP}) be calculated in the following manner:

$$H_{GEP} = H_B + 1.5L$$

Where: H_B = the height of adjacent or nearby structures, and

L = the lesser dimension (height or projected width of the adjacent or nearby structures).

A detailed plot plan of the proposed Project is shown in Figure 5-4. A GEP stack height analysis has been conducted using the U.S. EPA approved Building Profile Input Program with PRIME (BPIPPRM, version 04274). Controlling structures include the steam turbine generation building (80 feet above grade), the air cooled condenser (120 feet above grade), and the heat recovery steam generator (121 feet above grade).

In addition to the proposed Danskammer Energy Center structures, the air quality modeling analysis includes the building structures associated with the existing Danskammer Generating Station, as part of the existing facility will not be razed until after the Danskammer Energy

Center is operational. The existing precipitator building (structure shown in red with a hatched line on Figure 5-4) and exhaust stack could be razed after the Danskammer Energy Center is operational. Thus, the air quality modeling analysis was conducted for two phases of the Project. The first phase will consist of an interim operational time period that the existing Danskammer Generating Station structures remain in place while the new Danskammer Energy Center is commercially operating. The second phase will consist of an option where a portion of the existing Danskammer Generating Station could be razed.

The maximum GEP stack height for the CT/HRSG stack was calculated to be 362.4 feet (110.46 meters) above grade. As discussed in Section 3.9.4.2.1, current plans call for the construction of a single 200 foot stack to serve the proposed combustion turbine. Direction-specific downwash parameters for the combustion turbine exhaust stack were determined using BPIPPRM. Direction-specific downwash parameters for the additional ancillary equipment exhaust stacks to be modeled (i.e., auxiliary boiler, emergency diesel generator, and emergency diesel fire pumps) were also determined using BPIPPRM. Any direction-specific building downwash parameters were input to the PSD modeling analysis. Electronic input and output files for the BPIPPRM model have been provided on the DVD-ROM contained in Appendix G.

5.3.4 Meteorological Data

For any NYSDEC Part 201/231 and/or New York PSL Article 10 air quality modeling analysis conducted using the AERMOD model, two meteorological datasets are required: 1) hourly surface data and 2) upper air sounding data. According to the Guideline on Air Quality Models (Revised) (2017), the meteorological data used in an air quality modeling analysis should be selected based on its spatial and climatological representativeness of a proposed facility site and its ability to accurately characterize the transport and dispersion conditions in the area of concern. The spatial and climatological representativeness of the meteorological data are dependent on four factors:

1. The proximity of the meteorological monitoring site to the area under consideration;
2. The complexity of the terrain;
3. The exposure of the meteorological monitoring site; and,
4. The period of time during which data were collected.

One (1) hourly surface dataset and one (1) upper air sounding dataset were used in modeling the proposed Project to be located in the Town of Newburgh, Orange County. The closest source of representative hourly surface meteorological data is the Hudson Valley Regional Airport located in the Town of Wappinger, NY. This meteorological station is located approximately 9 km to the northeast of the proposed Danskammer Energy Center at an elevation of approximately 150 feet above mean sea level.

The Hudson Valley Regional Airport meteorological tower location is such that the recorded data are free of interferences caused by nearby natural or manmade structures and provides an excellent representation of dispersion characteristics within the local area. Figure 5-6 shows the location of the Hudson Valley Regional Airport meteorological tower in relation to the Project site. A wind rose displaying the composite wind rose for the most recent five year period (2014 – 2018) of wind speed and direction is shown in Figure 5-5. Over the five (5) year period, predominant winds varied from the north, west-southwest, and south-southeast. The average wind speed over the five years is 2.64 meters per second. Calm winds during the five years had an average frequency of 2.13 percent. Additionally, the wind data recorded at the Hudson Valley Regional Airport meteorological tower is consistent from year to year indicating a stable climatic regime with few extreme conditions.

Concurrent upper air sounding data from Albany International Airport (WBAN 54775) in New York was used with the hourly surface dataset to create the meteorological dataset required for the modeling analysis. Albany International Airport is approximately 132 kilometers to the north of the Project site. Based on an examination of the spatial distribution of seasonal and annual mixing heights using Holzworth's Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States (U.S. EPA, 1972), upper air meteorological conditions in the Albany area are considered representative of the air regime at the Project site.

Both the surface and upper air sounding data were processed by the NYSDEC using AERMOD's meteorological processor, AERMET (version 18081). The meteorological data at the Hudson Valley Regional Airport is recorded by an Automated Surface Observing System (ASOS) that records 1-minute measurements of wind direction and wind speed along with hourly surface observations. The U.S. EPA AERMINUTE program was used by the NYSDEC to process 1-minute ASOS wind data (2014 – 2018) in order to generate hourly averaged wind speed and wind direction data to supplement the standard hourly ASOS observations. The hourly averaged wind speed and direction data generated by AERMINUTE was merged with the aforementioned hourly surface data. This fully processed, five year (2014-2018) meteorological dataset was provided by the NYSDEC on March 5, 2019. The output from AERMET was used as the meteorological database for the modeling analysis and consists of a surface data file and a vertical profile data file.

The meteorological data recorded at the Hudson Valley Regional Airport meteorological tower and upper air data recorded from the Albany International Airport in Albany, are most representative of the air regime at the Project site and were suitable to be used in an atmospheric dispersion modeling study because:

- Due to the relative proximity of the Hudson Valley Regional Airport meteorological tower to the Project site, overall climatological conditions would be expected to be quite similar;
- The meteorological tower is well sited and in an area free of obstructions to wind flow;
- The monitoring station at the Hudson Valley Regional Airport continues to operate; and,
- The quality of the available data is good, exceeding U.S. EPA data recovery guidelines and displaying consistency from year to year of the available data record.

5.4 Receptor Grid

The AERMOD model requires receptor data consisting of location coordinates and ground-level elevations. The receptor generating program, AERMAP (version 18081), was used to develop a complete receptor grid to a distance of 20 kilometers from the proposed Project. AERMAP uses digital elevation model (DEM) or the National Elevation Dataset (NED) data obtained from the USGS. The preferred elevation dataset based on NED was used in AERMAP to process the receptor grid. This is currently the preferred data to be used with AERMAP as indicated in the U.S. EPA AERMOD Implementation Guide published April 17, 2018. AERMAP was utilized to determine the representative elevation for each receptor using 1/3 arc second NED files that were obtained for an area covering at least 20 kilometers in all directions from the Facility.

The following rectangular (i.e., Cartesian) receptors were used to assess the air quality impact of the proposed Project:

- Ultrafine grid receptors (70 meter spacing) for a 1 km (east-west) x 1 km (north-south) grid centered on the proposed Project site;

- Fine grid receptors (100 meter spacing) for a 10 km x 10 km grid centered on the proposed Project site;

- Coarse-grid receptors (500 meter spacing) for a 20 km x 20 km grid centered on the proposed Project site; and

- Coarse-grid receptors (1,000 meter spacing) for a 40 km x 40 km grid centered on the proposed Project site.

5.4.1 Property Line Receptors

The Project has a fenced property line that precludes public access to the site. The existing Danskammer Generating Station site is surrounded by security fencing and access to the site by vehicles is limited to a single gated roadway, which is always manned by a security guard.

The riverbank of the Hudson River is a natural barrier along the eastern side of the property. The public does not have access to the riverbank of the Hudson River along the property line of the Danskammer Generating Station. Danskammer Energy has security personnel, video surveillance, 24-hour roving patrols, and will have no trespassing signs along the property and the riverbank to preclude public access.

Ambient air is therefore defined as the area at and beyond the fence and the riverbank of the Hudson River. The modeling receptor grid includes receptors spaced at 25-meter intervals along the entire fence line. Any Cartesian receptors located within the fence line were removed.

5.5 Equipment/Fuels

The Danskammer Energy Center will include one (1) MHPS 501JAC combustion turbine. Hot exhaust gases from the combustion turbine will flow into a HRSG, which will be equipped with a natural gas fired duct burner. The HRSG will produce steam to be used in the steam turbine. Upon leaving the HRSG, the turbine exhaust gases will be directed to a single exhaust stack. Other ancillary equipment at the proposed Project will include a 96 MMBtu/hr natural gas fired auxiliary boiler, a 2.3 MMBtu/hr diesel fire pump, a 19.2 MMBtu/hr emergency diesel generator and the existing 2.4 MMBtu/hr diesel fire pump.

Danskammer Energy is proposing to utilize pipeline quality natural gas as the primary fuel for the combustion turbine and duct burner, with ULSD (with a maximum sulfur content of 0.0015%, by weight) as backup.

Emissions from the combined cycle unit will be controlled by the use of dry low-NO_x burner technology (during natural gas firing), water injection (during ULSD firing), and SCR for NO_x control, an oxidation catalyst for CO and VOC control, and the use of clean low-sulfur fuels (i.e., natural gas and ULSD) to minimize emissions of SO_2, PM/PM-10/PM-2.5, and H_2SO_4. Spent steam from the steam turbine will be sent to an air cooled condenser (ACC) where it will be cooled to a liquid state and returned to the HRSG. It should be noted that the ACC has no emissions.

5.5.1 Operation

The combined cycle unit will be operated to follow electrical demand (i.e., dispatch mode), but will be designed and permitted to operate on a continuous basis. The combined cycle unit typically will not operate at steady-state below 50% load and the duct burner will not operate below base load conditions for the combustion turbine.

The combustion turbine is proposed to operate up to 8,760 hours per year. The duct burner is proposed to operate up to the fuel load equivalent of 4,380 hours per year. The auxiliary boiler is proposed to operate up to 4,800 hours per year. Up to the full load equivalent of 720 hours per year of combustion turbine operation are proposed on ULSD. The emergency diesel generator and the emergency diesel fire pumps are proposed to operate up to 250 hours per year each. Therefore, proposed emergency equipment will meet the definition of an “emergency power generating stationary internal combustion engine” under 6 NYCRR 200.1(cq).

5.5.2 Selection of Sources for Modeling

The emission source responsible for most of the potential emissions from the Danskammer Energy Center is the combustion turbine. This unit was included in and is the main focus of the modeling analyses. The modeling includes consideration of operation over a range of turbine loads, ambient temperatures, and operating scenarios. Initial modeling of the turbine by itself was conducted to identify those operating conditions for each pollutant and averaging period that yield the maximum modeled impacts. Subsequent modeling incorporating other emissions units at the facility or other facilities includes the turbine operating conditions that yield the maximum modeled impacts. Modeling conducted for PM-10 and PM-2.5 includes filterable and condensable PM.

Ancillary sources (emergency diesel generator, fire pumps, and auxiliary boiler) were included in the modeling for appropriate pollutants and averaging periods. The emergency equipment may operate for up to one hour in any day for readiness testing and maintenance purposes. Operation of the emergency equipment for longer periods of time in an emergency mode will not be expected to occur when the turbine is operating. In order to facilitate startup of the CTG and steam turbine generator, as well as for maintenance purposes, the auxiliary boiler may operate simultaneously with the combustion turbine.

Although only limited operation is expected from the emergency equipment, initial modeling to assess short-term and annual facility impacts assumed concurrent operation of the emergency equipment for readiness testing with the combustion turbine.

5.5.3 Exhaust Stack Configuration and Emission Parameters

The general arrangement plan for the proposed Project is presented in Figure 5-4. Depending upon electrical demand, the facility can operate at loads ranging from approximately 50 percent to 100 percent of full capacity. Combustion turbine performance and emissions are affected by ambient temperature with combustion turbine fuel consumption, power output and emissions (on a lb/hr basis) increasing at lower ambient temperatures.

Because of the different emission rates and exhaust characteristics, a matrix of operating modes is employed in the various analyses presented in this Chapter, including air quality impact analysis for both short-term and annual averaging periods. Exhaust and emission parameters for three (3) ranges of ambient temperatures (-5°Fahrenheit (F) to 0°F, 50°F to 59°F, and 92°F to 100°F), three (3) sets of combustion turbine loads (50 percent to 60 percent, 75 percent, and 100 percent), duct burner operation, and two fuels (natural gas and ULSD) (a total of 25 operating scenarios) are accounted for in this air permit application.

Exhaust characteristics of the turbine/HRSG stack during different operating scenarios are provided in Table 5-3. Table 5-4 presents the potential emission rates for each of the operating scenarios. Emission rates and stack parameters for the range of ambient temperatures and load combinations were used to determine the “worst-case” operating scenario for the turbines.

Other ancillary combustion equipment at the proposed Project includes a natural gas fired auxiliary boiler, emergency diesel fire pumps, and an emergency diesel generator. The modeled emission rates and stack parameters for the auxiliary equipment are provided in Tables 5-5 through 5-7.

5.5.4 Secondary Formation of PM-2.5

PM-2.5 is emitted directly from the Project emissions sources and formed in the atmosphere from Project PM-2.5 precursor emissions (NO_x and SO_2). Therefore, to account for the total air quality impact of PM-2.5, the modeled concentrations of primary PM-2.5 from the Project sources should be summed with a conservative concentration representative of PM-2.5 formed from Project PM-2.5 precursor emissions. Appropriate secondary PM-2.5 concentrations were determined based on the Project emissions and the air quality modeling results included in the U.S. EPA's Modeled Emission Rates for Precursors (MERPs) guidance (April 30, 2019), as described in the following paragraphs.

For the 24-hour averaging period, the PM-2.5 impacts were based on the daily 24-hour impact from a hypothetical NO_x source and a hypothetical SO_2 source that were identified from multiple model simulation results contained in the U.S. EPA MERPs guidance. For NO_x, the eastern US (EUS) hypothetical source located at Franklin County, Massachusetts (source #4) with a surface release (L), annual NO_x emissions of 500 tons per year (tpy), and a maximum impact of 0.05 μg/m^3 was used.

Therefore, the estimated impact on the 24-hour secondary PM-2.5 formation from the Project's NO_x emissions was determined as follows:

(143.5 tpy NO_x from Project/500 tpy NO_x) × 0.05 μg/m^3 = 0.0144 μg/m^3 PM-2.5 concentration

For SO_2, the EUS hypothetical source located at Franklin County, Massachusetts (source #4) with a surface release (L), annual SO_2 emissions of 500 tpy, and a maximum impact of 0.25 μg/m^3 was used. Therefore, the estimated impact on the 24-hour secondary PM-2.5 formation from the Project's SO_2 emissions was determined as follows:

(24.4 tpy SO_2 from Project/500 tpy SO_2) × 0.25 μg/m^3 = 0.012 μg/m^3 PM-2.5 concentration

As a result, the estimated total impact on the 24-hour secondary PM-2.5 formation is based on the combined concentrations from NO_x and SO_2 secondary formation. This concentration of

0.026 ug/m^3 was added to the 24-hour PM-2.5 model results in order to accurately capture the total PM-2.5 impacts from the Project.

For the annual averaging period, this analysis was based on the annual average impact from a hypothetical NO_x source and a hypothetical SO_2 source that were identified from multiple model simulation results contained in the U.S. EPA MERPs guidance. For NO_x, the eastern US (EUS) hypothetical source located at Franklin County, Massachusetts (source #4) with a surface release (L), annual NO_x emissions of 500 tpy, and a maximum impact of 0.007 μg/m^3 was used. Therefore, the estimated impact on the annual secondary PM-2.5 formation from the Project's NO_x emissions was determined as follows:

(143.5 tpy NO_x from Project/500 tpy NO_x) × 0.007 μg/m^3 = 0.002 μg/m^3 PM-2.5 concentration

For SO_2, the EUS hypothetical source located at Franklin County, Massachusetts (source #4) with a surface release (L), annual SO_2 emissions of 500 tpy, and a maximum impact of 0.009 μg/m^3 was used. Therefore, the estimated impact on the annual secondary PM-2.5 formation from the Project's SO_2 emissions was determined as follows:

(24.4 tpy SO_2 from Project/500 tpy SO_2) × 0.009 μg/m^3 = 0.0004 μg/m^3 PM-2.5 concentration

As a result, the estimated total impact on the annual secondary PM-2.5 formation is based on the combined concentrations from NO_x and SO_2 secondary formation. This concentration of 0.0024 ug/m^3 was added to the annual PM-2.5 model results in order to accurately capture the total PM-2.5 impacts from the Project.

5.5.5 Start-Up/Shutdown Scenarios

Startup and shutdown of a combustion turbine are short-term, transitional modes of operation for the combined cycle unit. In combined cycle operation, where the exhaust gases are directed through a HRSG to produce steam for a steam turbine generator, additional startup time is necessary in order to reduce thermal shock and excessive wear in both the HRSG and the steam turbine. Emission rates of some pollutants may be higher during startup and shutdown operations because emissions controls are not fully effective unless a minimum threshold operating load and or control device temperature is attained. The need for additional modeling to account for predicted short-term Project impacts during startup and shutdown of the combined cycle unit was assessed for those criteria pollutants whose short-term emission rates during startup may exceed those during normal operation and for which a short-term NAAQS has been defined (i.e., for CO and NO_2). Furthermore, in order to facilitate startup of the CTG and steam turbine generator, as well as for maintenance purposes, the auxiliary boiler may operate simultaneously with the combustion turbine. Thus, combustion turbine startup conditions with auxiliary boiler operation were included in the startup modeling analysis.

The Project will require cold starts, which are typically based on one startup after 48 hours or more of shutdown, warm starts (based on 8 hours to 48 hours of shutdown), and hot starts (based on 1 hour to 8 hours of shutdown). The startup durations for the combustion turbine will vary from 0.5 to 0.8 hours based upon the type of start and fuel while the shutdown durations will last less than 0.5 hours. Emission during startup and shutdown periods and associated stack parameters were based on vendor data and are shown in Table 5-8.

Only warm and hot starts were evaluated for 1-hour $NO_{2,}$ 1-hour CO, and 8-hour CO since the number of cold gas-fired starts (10) and the number of oil-fired starts (10) can be deemed to occur infrequently (i.e., transient events).

Because the startup/shutdown durations will be shorter than all of the averaging periods modeled, the modeled concentrations were determined based on the combination of the startup conditions for the appropriate amount of startup time and the worst-case full-load pollutant and averaging period specific operating scenario determined in the combustion turbine load analysis.

Because the startup durations are shorter than the averaging periods modeled, the modeled concentrations were determined based on the combination of the startup/shutdown conditions for the appropriate amount of time and the worst-case load pollutant- and averaging period-specific operating scenario determined in the combustion turbine load analysis. For example (for a 1-hour averaging period), if a startup lasts 30 minutes, the emissions during the startup are combined with the prorated (30 minutes) emissions from the worst case load operating scenario.

Since SO_2 emissions are strictly dependent upon fuel flow (and are lower during startup/shutdown than continuous operation), SO_2 startup/shutdown periods were not modeled for short-term averaging periods. Further, since PM-10 and PM-2.5 emissions are lower during startup/shutdown than during normal operation, PM-10 and PM-2.5 startups were also not modeled. The worst-case startup emissions for CO and NO_2 were modeled since these pollutants have higher emissions during startup when compared to normal operation for short-term (1-hour and 8-hour for CO and 1-hour for NO_2) averaging periods.

5.5.6 1-Hour NO_2 Modeling

The air quality modeling analysis for the 1-hour NO_2 NAAQS was performed consistent with the guidance and procedures established in the recently published and revised U.S. EPA Guideline on Air Quality Models (U.S. EPA, January 17, 2017), the U.S. EPA guidance memorandum titled Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 NAAQS (U.S. EPA, September 30, 2014), and the guidance memorandum from Tyler Fox (EPA OAQPS) titled Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 NAAQS (U.S. EPA, March 1, 2011,) (Memorandums). Based upon the discussion in the memorandums regarding the treatment of intermittent sources, only equipment or operating scenarios that "are continuous or frequent enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations" were included in the 1-hour NO_2 modeling analysis.

This methodology, per the examples provided in the Memorandums, would exempt any facility equipment or operating scenarios from 1-hour NO_2 compliance modeling that does not operate on a normal daily or routine schedule. For example, emergency diesel generator and fire pumps are not expected to be tested more than once per week (with test durations limited to no more than 60 minutes) and are not expected to contribute significantly to the annual distribution of maximum 1-hour concentrations. For these reasons, and consistent with the Memorandums, the 1-hour NO_2 modeling does not include emergency equipment. As previously discussed, startup and shutdown conditions that are expected to contribute to the annual distribution of daily maximum concentrations due to their frequency on a yearly basis were included in the air quality modeling analysis for the 1-hour NO_2 standard.

The 1-hour NO_2 modeling analysis utilized the U.S. EPA Tier 3 modeling approach for 1-hour NO_2 modeling assessment results using the AERMOD Plume Volume Molar Ratio Method (PVMRM) that adjusts NO_x emissions to estimate more realistic ambient NO_2 concentrations by modeling the conversion of NO_x to NO_2. Note that the Tier 2 screening approach for initial modeling results using the Ambient Ratio Method 2 (ARM2) proved to be too conservative for this Project.

PVMRM incorporates three sets of data into the calculation of 1-hour NO_2 concentrations. Those are source-specific in-stack NO_2/NO_x emission rate ratios, an ambient NO_2/NO_x concentration ratio, and hourly average background ozone concentrations.

The PVMRM option for modeling conversion of NO to NO_2 incorporated a default NO_2/NO_x ambient equilibrium concentration ratio of 0.90.

5.5.6.1 In Stack NO_2/NO_x Concentration Ratio

NO_x consists primarily of nitric oxide (NO) and NO_2, plus small amounts of other compounds. Combustion sources produce NO_x by the following three mechanisms:

1. Thermal NO_x is produced by the thermal dissociation and subsequent reaction of nitrogen and oxygen (O_2) molecules in the combustion air;

2. Fuel NO_x is produced by the reaction of fuel-bound nitrogen compounds with O_2 molecules in the combustion air; and,

3. Prompt NO_x is produced by the formation of hydrogen cyanide (HCN) via the reaction of nitrogen radicals and hydrocarbons (HC), followed by the oxidation of HCN to NO.

NO_2 is produced by the oxidation of NO by O_2. This oxidation reaction is favored by a high O_2 concentration. Since the reaction is exothermic, NO_2 formation is also favored by low temperature. Hence, rapid cooling of combustion products in the presence of a high O_2 concentration will promote conversion of NO to NO_2. Essentially all of the NO_x formed by natural gas and distillate oil combustion sources is thermal NO_x because these fuels have little or no chemically bound fuel nitrogen. NO_x from fuel combustion typically consists of 90 to 95 percent NO. The balance is primarily NO_2.

The U.S. EPA NO_2/NO_x In-Stack Ratio (ISR) Database (U.S. EPA, 2019) was reviewed to determine representative NO_2/NO_x ratios for large combustion turbines with DLN combustors and emission control devices, including SCR and oxidation catalysts. The U.S. EPA ISR database includes NO_2/NO_x ratios that range from 0.008 to 0.01 for large combustion turbines with DLN combustors and SCR that are representative of normal operation of the Danskammer Energy Center. The U.S. EPA ISR database includes NO_2/NO_x ratios that range from 0.03 to 0.17 for large combustion turbines with DLN combustors with no add-on control devices that are representative of the operation of the Danskammer Energy Center during startup and shutdown periods. In addition to the U.S. EPA ISR data, the equipment vendor information for the NO_2/NO_x ratio from an uncontrolled combustion turbine ranges from 0.083-0.091 as provided in the equipment vendor document Gas Turbine Emissions Control (GE Power Systems, 2001). Thus, based upon the maximum NO_2/NO_x ratio provided in the vendor and U.S. EPA data, a conservative in-stack NO_2/NO_x ratio of 0.20 for the combustion turbine was used in the 1-hour NO_2 modeling analysis.

The modeling analysis for the auxiliary boiler conservatively utilized the national default in-stack NO_2/NO_x ratio of 0.5.

5.5.6.2 Hourly Average Background Ozone Concentrations

Based on review of the locations of NYSDEC ambient air quality monitoring sites, the closest "regional" NYSDEC monitoring sites were used to represent the current background ozone air quality in the site area. Background data for ozone from 2014 – 2018 was obtained from a monitoring station located at Valley Central High School, Montgomery, New York (Monitor ID: 36-071-5001), approximately 21 km west-southwest of the Project. The NYSDEC provided the hourly ozone monitoring concentrations from the existing monitoring station located at Valley Central High School for use in the modeling assessment.

When hourly ozone data was missing from the Valley Central High School monitor, missing hours were substituted using the ozone monitoring data from the Millbrook, New York (Monitor ID: 36-027-0007) monitor, approximately 30 km north-northeast of the Project. Lastly, for any hours that had missing data from both the Valley Central High School and Millbrook monitors, missing hours were substituted using ozone monitoring data from the Mt. Ninham, New York (Monitor ID: 36-079-000) monitor. The NYSDEC provided the hourly ozone monitoring concentrations from the existing monitoring stations located at Millbrook and Mt. Ninham for use in the modeling assessment.

5.6 Combustion Turbine Load Screening Modeling Analysis

To determine the worst case operating scenario for the proposed combined cycle combustion turbine, a detailed load screening analysis was performed. As discussed in Section 5.5, twenty-five (25) combinations of load conditions and ambient operating temperatures were used to determine the worst-case operating scenario for the turbines for each modeled pollutant and averaging period.

The load screening analyses results can be found in Appendix F, Tables F-1 and F-2, for each of the Project operational phases as discussed in the building downwash Section 5.3.3. These tables show maximum modeled concentrations of all pollutants for all averaging periods to be less than their respective Significant Impact Levels (SILs), except for 1-hour NO_2 and 24-hour PM-10/PM-2.5, and annual PM-2.5.

Of the twenty-five (25) operating scenarios, the worst case operating scenarios (i.e., operating scenarios which yielded the highest modeled concentrations for each pollutant and each averaging period) were as follows:

- 1-hour and 8-hour CO: Case 1 (natural gas with duct burning)
- 1-hour, 3-hour SO_2,and 24-hour SO_2: Case 1 (natural gas with duct burning)
- Annual SO_2: Case 1 (natural gas with duct burning); Case 4 (natural gas without duct burning), Case 15 (ULSD)
- 24-hour PM-10: Case 21 (ULSD)
- Annual PM-10: Case 1 (natural gas with duct burning); Case 4 (natural gas without duct burning), Case 17 (ULSD)
- 1-hour NO_2: Case 23 (ULSD)
- Annual NO_2: Case 1 (natural gas with duct burning); Case 4 (natural gas without duct burning), Case 15 (ULSD)
- 24-hour PM-2.5: Case 21 (ULSD)
- Annual PM-2.5: Case 1 (natural gas with duct burning); Case 4 (natural gas without duct burning), Case 17 (ULSD)

For short-term averaging periods, the single worst-case modeled operating scenario cases are provided. For annual averaging periods, a combination of the worst-case modeled operating scenarios are provided based on operating scenarios that include operation of the duct burner and operation on ULSD. The annual operation of the combustion turbine on ULSD and operation of the natural gas fired duct burner are limited to less than 8,760 hours per year. Thus, the modeling analysis for the annual averaging period was based on the worst-case combination of operating scenarios for the combustion turbine operating on natural gas with and without the duct burner and operation on ULSD. The annual operation of the combustion turbine on natural gas with the duct burner was prorated by 4,380 hours per year and the annual operation of the combustion turbine on ULSD was prorated by 720 hours per year. Note that these operational restrictions are included in the annual potential to emit calculations for the Project as provided in Appendix B.

5.7 Maximum Modeled Facility Concentrations

The first step in an air quality modeling analysis is to determine if the Project will result in significant impacts for any criteria pollutant. The U.S EPA and NYSDEC SILs are presented in Table 3-1.

To determine if the overall operations will have significant air quality concentrations (i.e., maximum modeled concentrations greater than the SILs), the following Project operating scenarios were modeled using the worst-case combustion turbine operating scenarios identified in Section 5.6 for comparison to the SILs:

- The annual emission rate for the combined-cycle turbine is based on 8,760 hours per year, with up to 4,380 hours of operation of the natural gas fired duct burner and up to 720 hours of operation on ULSD;
- The auxiliary boiler will operate up to 4,800 hours per year; and
- The diesel-fired fire-water pumps and diesel-fired emergency generator are expected to operate 250 hours per year per unit (operability testing, typically 1 hour per week intermittently). Modeled emission rates for the diesel generator and the fire-water pump engines were normalized based on 1 hour of operation within the averaging periods for PM-2.5 modeling. The short-term modeling analyses for CO and SO_2 were conservatively based on the emergency engines operating all hours of the hourly to daily averaging periods. Similarly, the annual emission rates were annualized based on 250 hours per year.

Table 5-9 presents the maximum modeled air quality concentrations during normal operations of the proposed Project calculated by AERMOD for either future building downwash scenario assessed per the discussion in Section 5.3.3. As shown in this table, the maximum concentrations are below the applicable SILs, except for 1-hour NO_2, 24-hour PM-10/PM-2.5, and annual PM-2.5. Further, Table 5-10 shows that none of the pollutants exceed any applicable PSD Class II increment, nor when combined with a representative background concentration, exceed any applicable NAAQS/NYAAQS. Figures 5-7 through 5-18 show the locations of the maximum modeled concentrations for each pollutant and averaging period.

Under longstanding U.S. EPA guidance and interpretations, the SILs are used to determine if a source makes or could make a significant contribution to a predicted violation of a NAAQS or PSD increment. If a source is predicted to have maximum impacts that are below the SILs, then a cumulative (or multisource) impact analysis that includes other facilities is not required, and the impacts of the Project are considered to be *de minimis* or insignificant. By showing that maximum predicted Project impacts will be below the corresponding SILs for SO_2 and CO, the Project is exempt from the requirement to conduct any additional analyses to demonstrate compliance with the NAAQS or PSD increments for these pollutants. Additionally, the modeled impacts for annual NO_2 and PM-10 are below the corresponding SILs and thus, the Project is also exempt from the requirement to conduct additional analysis for the annual NO_2 and PM-10 averaging periods.

5.7.1 Startup/Shutdown Modeling Analysis

The results of the startup modeling analysis are summarized in Tables 5-11 and 5-12, respectively. The maximum modeled impacts are compared to the SILs in Table 5-11 and to the Class II PSD increments and NAAQS/NYAAQS in Table 5-12. As shown in Table 5-11, the maximum modeled startup/shutdown periods do not exceed any applicable SIL, except 1-hour NO_2. Additionally, none of the pollutants exceed any applicable PSD Class II increment, nor when combined with a representative background concentration, exceed any applicable NAAQS/NYAAQS. Note that the startup/shutdown modeling included simultaneous operation of the auxiliary boiler.

5.8 Area of Impact Determination

The maximum modeled concentrations of 24-hour PM-10/PM-2.5, annual PM-2.5, and 1-hour NO_2 have been determined to be above their respective SILs. Therefore, they are the only pollutants/averaging periods determined to have a significant area of impact (AOI), thus requiring additional impact assessments. The additional impact assessment required is a multiple source NAAQS and PSD Class II increment modeling assessment.

The areas of impact for the aforementioned pollutants under normal operations are as follows:

- 1-hour NO_2 AOI = 18,260 meters;

- 24-hour PM-10 AOI = 550 meters;
- 24-hour PM-2.5 AOI = 6,500 meters; and
- Annual PM-2.5 AOI = 760 meters.

Figures 5-7 and 5-9 show the modeled significant impact areas for the 1-hour NO_2 and 24-hour PM-2.5 standards, respectively.

5.9 Class I Impacts

Proposed major sources greater than 50 kilometers from a Class I area may be eligible for an exemption from the requirement to perform a Class I area modeling analysis. The Class I areas closest to the proposed project are the Lye Brook National Wilderness Area (NWA) in Vermont and Edwin B. Forsythe National Wildlife Refuge (NWR) at Brigantine, New Jersey, located approximately 181 kilometers to the north-northeast and approximately 228 kilometers to the south, respectively. The Federal Land Managers (FLM) for these Class I areas were notified by letter and requested for a determination if assessments of impacts in the Class I areas would be required. The FLMs reviewed the proposed Project's details and related correspondence and confirmed that Class I analyses for the proposed Project are not required. (See Appendix D for copies of the relevant correspondence).

5.10 Toxic Ambient Air Contaminant Analysis

Air quality modeling was conducted for potential toxic (non-criteria) air pollutant emissions from the proposed combustion turbine and ancillary equipment. The modeling methodology used in the toxic air pollutant analysis was the same methodology used in the criteria pollutant air quality analyses. Maximum modeled short-term and annual concentrations of each toxic air pollutant were compared to the NYSDEC's short-term guideline concentration (SGC) and annual guideline concentration (AGC), respectively. The NYSDEC SGCs and AGCs used in the analysis are listed in the DAR-1 tables that were published by the NYSDEC in August 2016.

Potential toxic air pollutant emissions from the operation of the combustion turbine, duct burner and auxiliary boiler were quantified based on U.S. EPA AP-42 emission factors and Ventura Air Pollution Control District emission factors. Potential toxic air pollutant emissions from the emergency diesel generator and fire pumps were based on emission factors from AP-42.

Appendix F, Table F-3 presents the potential toxic air pollutant emissions rates for each of the proposed sources.

Unit concentrations for the 1-hour and annual averaging periods were calculated for the combustion turbine/duct burner, auxiliary boiler, emergency diesel generator, and fire pumps. The maximum toxic air pollutant-specific emission rate was multiplied by the modeled unit concentration to determine the maximum pollutant-specific concentration. The maximum 1-hour and annual unit concentrations calculated for each emission unit are shown in Appendix F, Tables F-4 and F-5, respectively. These tables also present the overall maximum results of multiplying the modeled 1-hour and annual unit concentrations by the appropriate toxic air pollutant-specific emissions rates.

The annual concentrations were adjusted to account for annual operating restrictions (e.g., the combustion turbine concentrations for ULSD firing were adjusted by multiplying the concentration by 720/8,760 to reflect the operating limit of up to 720 hours of ULSD firing/year). Note that summing the individual maximum source concentrations, regardless of time and location, provides a conservative estimate of the actual toxic air pollutant concentrations resulting from the Project. Also presented in Tables F-4 and F-5, are the NYSDEC SGCs and AGCs. As shown in each of the tables, all of the maximum modeled toxic air pollutants are well below their corresponding NYSDEC SGC and AGC.

5.11 PSD Additional Impacts Analyses

5.11.1 Impact to Soil and Vegetation

A component of the PSD review includes an analysis to determine the potential air quality impacts on sensitive vegetation types that may be present in the vicinity of the proposed Project. The evaluation of potential impacts on vegetation was conducted in accordance with U.S. EPA's A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals (U.S. EPA, 1980). Calculated air quality concentrations of various constituents from the proposed Project are added to ambient background concentrations and compared to screening concentrations (levels at which change has been reported) to provide an assessment regarding the potential for adversely impacting vegetation with significant commercial and/or recreational value.

Screening concentrations used in this assessment represent the minimum ambient concentrations reported in the scientific literature for which adverse effects (e.g., visible damage or growth hindrance) to plants have been reported. Of the potential pollutants emitted by the proposed Project, vegetative screening concentrations are available for SO_2, NO_2, and CO. Screening concentrations for other potential constituents generated by the Project (e.g., particulate matter) are not currently available. Table 5-13 presents a comparison of the maximum modeled concentrations plus background to the screening concentrations. Inspection of the table reveals that the proposed Danskammer Energy Center will not adversely impact vegetation in the site area.

5.11.2 Impact on Visibility

A Level-1 screening analysis was performed based upon procedures described in U.S. EPA's Workbook for Plume Visual Impact Screening and Analysis (U.S. EPA, 1988). The screening procedure involves calculation of three plume contrast coefficients using emissions of NO_x, PM/PM-10, and sulfates (i.e., H_2SO_4). The Level-1 screening procedure determines the light scattering impacts of particulates, including sulfates and nitrates, with a mean diameter of two micrometers with a standard deviation of two micrometers. The analysis was run assuming that all emitted particulate will be as PM-10/PM-2.5, which results in a conservative assessment of visibility impact. These coefficients consider plume/sky contrast, plume/terrain contrast, and sky/terrain contrast.

A modified Level-1 screening analysis using the EPA VISCREEN (Version 13190) model was performed for the worst possible operating scenario. The visibility assessment for the surrounding area was performed for an observer at the visual range of 40 kilometers from the Project site. The results of this analysis are presented in Table 5-14 and indicate that the Project will not impact visibility in the area surrounding the Project.

Electronic output files from the VISCREEN model have been provided on the DVD-ROM contained in Appendix G.

5.11.3 Impact on Industrial, Commercial, and Residential Growth

The proposed Project's location within an industrial area will result in minimal impact to services, existing land uses, and infrastructure. The Project will utilize natural gas as the primary fuel with provisions to use ULSD for up to 720 hours as a backup fuel. The Project will interconnect to an existing 115-kilovolt (kV) substation within the 180± acre parcel. Accordingly, all Project structures will be located entirely on the 180± acre parcel, and as a consequence, impacts to nearby commercial, industrial, and residential land uses will be minimal.

The existing roads and services will easily be able to handle the estimated 30 person workforce, who will be spread over 3 shifts. The existing employee base of power plant operational staff located in the Hudson Valley is expected to provide for the estimated 30 person operating staff at the Project without significant in-migration. Since the required operating staff is expected to currently reside in the Hudson Valley, there is no expected incremental increase of municipal service costs attributed to the operations employees. Field construction activities are expected to have an approximate 27-33 month duration.

The Project is designed to result in low emission levels of air contaminants. The electricity generated by the Project will be directed to the power distribution system managed by the New York Independent System Operator (NYISO). Finally, because the air emissions from the Project are low, new industry desiring to locate in the area will not be prohibited due to unacceptable air pollution levels caused by the proposed plant. Therefore, the proposed Project should have no effect on either existing or future industrial, commercial, or residential growth in the region.

5.12 Threatened and Endangered Species

Appendix H includes a detailed analysis of impacts to threatened and endangered species by the Project.

5.13 Environmental Justice

Appendix I includes a detailed analysis of environmental justice. This Appendix contains a thorough analysis of environmental justice per NYSDEC Part 487 requirements.

Table 5-1: Land Use Classification Analysis

NLCD Category Code	NLCD Category Description	Classification	3 km Radius		10 km x 10 km Domain	
			Area (Acres)	%	Area (Acres)	%
11	Open Water	Rural	1,698	24%	3,389	13%
21	Developed, Open Space	Rural	720	10%	3,884	15%
22	Developed, Low Intensity	Rural	534	8%	2,463	10%
23	Developed, Medium Intensity	Urban	360	5%	1,773	7%
24	Developed, High Intensity	Urban	109	2%	499	2%
31	Barren Land (Rock/Sand/Clay)	Rural	43	1%	87	0%
41	Deciduous Forest	Rural	2,199	31%	7,081	28%
42	Evergreen Forest	Rural	154	2%	281	1%
43	Mixed Forest	Rural	93	1%	609	2%
52	Shrub/Scrub	Rural	49	1%	244	1%
71	Grasslands/Herbaceous	Rural	10	0%	50	0%
81	Pasture/Hay	Rural	618	9%	1,591	6%
82	Cultivated Crops	Rural	195	3%	1,973	8%
90	Woody Wetlands	Rural	91	1%	979	4%
95	Emergent Herbaceous Wetlands	Rural	116	2%	354	1%

Table 5-2: Maximum Measured Ambient Air Quality Concentrations

Pollutant	Averaging Period	Maximum Ambient Concentrations (μg/m³)			NAAQS (μg/m³)
		2016	2017	2018	
SO_2	1-Hour [1]	6.3	15.5	7.9	196
	24-Hour	3.9	3.7	**4.2**	365
	Annual	**0.6**	0.6	0.3	80
NO_2	1-Hour [2]	104.9	105.3	101.5	188
	Annual	**29.3**	28.0	27.1	100
CO	1-Hour	2,024	403	**2,300**	40,000
	8-Hour	1,150	345	**1,380**	10,000
PM-10	24-Hour	**32**	27	30	150
PM-2.5 [3]	24-Hour	20.0	13.9	16.0	35
	Annual	6.1	6.1	6.4	12

[1] 1-hour 3-year average 99th percentile value for SO_2 is **9.9** ug/m³.

[2] 1-hour 3-year average 98th percentile value for NO_2 is **103.9** ug/m³.

[3] 24-hour 3-year average 98th percentile value for PM-2.5 is **16.6** ug/m³; Annual 3-year average value for PM-2.5 is **6.2** ug/m³.

High second-high short term (1-, 3-, 8-, and 24-hour) and maximum annual average concentrations presented for all pollutants other than PM-2.5 and 1-hour SO_2 and NO_2.

Bold values represent the proposed background values for use in any necessary NAAQS/NYAAQS analyses.

Monitored background concentrations obtained from the NYSDEC website.

Table 5-3: Modeled Combustion Turbine Source Parameters – Gas Firing

Operating Case	Fuel	Ambient Temperature (°F)	Operating Load (%)	Duct Burner Operation (On/Off)	Modeling Stack Parameters		
					Exhaust Temperature (K)	Exhaust Velocity (m/s) [1]	Exhaust Flow (acfm)
Case 1	Gas	-5	100%	On	344.26	16.79	1,373,334
Case 2	Gas	-5	75%	Off	353.15	17.30	1,415,282
Case 3	Gas	-5	50%	Off	352.04	14.30	1,169,834
Case 4	Gas	0	100%	Off	350.37	16.95	1,385,881
Case 5	Gas	50	100%	On	344.26	16.68	1,363,993
Case 6	Gas	50	100%	Off	350.37	16.80	1,373,899
Case 7	Gas	50	75%	Off	350.37	15.61	1,276,702
Case 8	Gas	50	50%	Off	347.04	12.47	1,019,522
Case 9	Gas	59	100%	Off	352.04	17.02	1,392,317
Case 10	Gas	92	100%	On	350.93	17.78	1,454,186
Case 11	Gas	100	100%	On	356.48	18.08	1,478,960
Case 12	Gas	100	100%	Off	362.04	18.28	1,495,081
Case 13	Gas	100	75%	Off	354.82	14.99	1,226,302
Case 14	Gas	100	55%	Off	350.37	12.46	1,019,064

[1] Based on an internal stack diameter of 23 feet.

Notes:

ACFM – Actual Cubic Feet per Minute

K – Degrees Kelvin

m/s – Meters per Second

Table 5-3: Modeled Combustion Turbine Source Parameters - ULSD Firing

Operating Case	Fuel	Ambient Temperature (°F)	Operating Load (%)	Duct Burner Operation (On/Off)	Modeling Stack Parameters		
					Exhaust Temperature (K)	Exhaust Velocity (m/s) [1]	Exhaust Flow (acfm)
Case 15	ULSD	-5	100%	Off	370.93	20.63	1,686,959
Case 16	ULSD	0	100%	Off	372.59	21.13	1,728,323
Case 17	ULSD	50	100%	Off	370.93	21.05	1,721,368
Case 18	ULSD	59	100%	Off	370.93	21.09	1,724,902
Case 19	ULSD	100	100%	Off	373.71	19.33	1,580,538
Case 20	ULSD	-5	75%	Off	369.26	19.14	1,565,227
Case 21	ULSD	-5	60%	Off	363.15	16.12	1,318,234
Case 22	ULSD	50	75%	Off	364.82	17.16	1,403,517
Case 23	ULSD	50	60%	Off	359.82	14.34	1,172,929
Case 24	ULSD	100	75%	Off	366.48	15.74	1,287,702
Case 25	ULSD	100	60%	Off	359.26	13.02	1,064,751

[1] Based on a stack diameter of 23 feet.

Notes:

ACFM – Actual Cubic Feet per Minute

K – Degrees Kelvin

m/s – Meters per Second

Table 5-4: Combustion Turbine Emission Rates

Operating Case	Modeled Emission Rate (g/s)			
	NO_x	CO	PM-10/PM-2.5	SO_2
Case 1	4.06	2.47	2.75	0.78
Case 2	3.26	1.00	1.55	0.63
Case 3	2.43	0.74	1.22	0.47
Case 4	3.31	1.01	1.55	0.63
Case 5	3.97	2.42	2.71	0.76
Case 6	3.23	0.98	1.52	0.62
Case 7	2.89	0.88	1.39	0.55
Case 8	2.23	0.68	1.10	0.43
Case 9	3.23	0.98	1.54	0.63
Case 10	4.03	2.46	2.78	0.77
Case 11	3.62	2.21	2.12	0.69
Case 12	3.28	1.00	1.56	0.63
Case 13	2.67	0.82	1.29	0.52
Case 14	2.15	0.66	1.06	0.42
Case 15	7.26	2.21	3.60	0.71
Case 16	7.26	2.21	3.65	0.71
Case 17	7.19	2.19	3.64	0.71
Case 18	7.18	2.19	3.64	0.71
Case 19	6.43	1.95	3.25	0.63
Case 20	6.54	1.99	3.34	0.63
Case 21	5.64	1.71	2.86	0.55
Case 22	5.83	1.78	3.01	0.57
Case 23	5.03	1.54	2.56	0.49
Case 24	5.20	1.59	2.68	0.50
Case 25	4.50	1.37	2.28	0.44

Table 5-5: Auxiliary Boiler Exhaust Characteristics and Emissions

Pollutant	Emissions Rate (g/s)
Emission Parameter	
NO_x	0.10
CO	0.45
PM-10/PM-2.5	0.09
SO_2	0.017
Exhaust Parameter	
Exhaust Height (ft above grade)	50
Exhaust Height (m above grade)	15.2
Exhaust Temperature (deg F)	305
Exhaust Velocity (ft/sec)	51.6
Exhaust Velocity (m/sec)	15.7
Inner Diameter (ft)	3.0
Inner Diameter (m)	0.91

Table 5-6: Emergency Diesel Generator Exhaust Characteristics and Emissions

Pollutant	Emission Rate (g/s)
Emission Parameter	
NO_x	3.58
CO	1.94
PM-10/PM-2.5	0.11
SO_2	0.0037
Exhaust Parameter	
Exhaust Height (ft above grade)	15
Exhaust Height (m above grade)	4.57
Exhaust Temperature (deg F)	965
Exhaust Velocity (ft/sec)	114.2
Exhaust Velocity (m/sec)	34.8
Inner Diameter (ft)	1.5
Inner Diameter (m)	0.46

Table 5-7: Emergency Diesel Fire Pump Exhaust Characteristics and Emissions

Pollutant	Existing Diesel Fire Pump	Proposed Diesel Fire Pump
	Emission Rate (g/s)	
Emission Parameter		
NO_x	0.81	0.27
CO	0.27	0.24
PM-10/PM-2.5[a]	0.042	0.014
SO_2	0.0005	0.0004
Exhaust Parameter		
Exhaust Height (ft above grade)	16	15
Exhaust Height (m above grade)	4.88	4.57
Exhaust Temperature (deg F)	853	1,076
Exhaust Velocity (ft/sec)	195.0	161.2
Exhaust Velocity (m/sec)	59.4	49.1
Inner Diameter (ft)	0.5	0.5
Inner Diameter (m)	0.15	0.15

Table 5-8: Combustion Turbine Modeled Emission Rates and Exhaust Parameters During Startup/Shutdown Periods

Event	Elapsed Time (min)	Stack NO_x (lb/event)	Stack NO_x (lb/hr)	Stack CO (lb/event)	Stack CO (lb/hr)	Stack Exhaust Velocity (m/s)	Stack Exhaust Temperature (Degrees F)
Warm Startup	35	48	48	350	350	8.21	165
Hot Startup	30	43	43	129	129	8.21	165
Shutdown	12.5	64	64	160	160	11.82	165

	Type of Startup or Shutdown Event		
	Warm Startup	Hot Startup Startup	Shutdown
Duration of Turbine at 0% load prior to Start-up (hours)	8	4	--
Maximum Duration of Start-up or Shut-down Event (hours)	0.6	0.5	0.2
Maximum Number per Year	52	200	272

Table 5-9: Maximum Modeled Concentrations Due to Normal Operations Compared to Significant Impact Levels (SILs)

Pollutant	Averaging Period	Significant Impact Level ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)
CO	1-Hour	2,000	531
	8-Hour	500	211
SO_2	1-Hour	7.8	4.9
	3-Hour	25	3.5
	24-Hour	5	1.7
	Annual	1	0.06
PM-10	24-Hour	5	6.0
	Annual	1	0.2
PM-2.5	24-Hour	1.2	3.9 [3]
	Annual	0.2	0.2 [4]
NO_2	1-Hour	7.5	23.6 [1,2]
	Annual	1	0.6 [1]

[1] Includes use of PVMRM.

[2] Based upon maximum 1st highest maximum daily 1-hour results averaged over 5-years.

[3] Based upon maximum 1st highest 24-hour results averaged over 5-years, including secondary formation.

[4] Maximum annual results averaged over 5-years, including secondary formation. Note that the maximum modeled impact is below the SIL for the operational scenario that includes downwash from buildings associated with the existing Danskammer Generating Station.

Table 5-10: Facility Maximum Modeled Concentrations Due to Normal Operations Compared to PSD Increments and NAAQS/NYAAQS

Pollutant	Averaging Period	Class II PSD Increment ($\mu g/m^3$)	NAAQS/NYAAQS ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)
CO	1-Hour	-	40,000	531	2,300.0	2,831.0
	8-Hour	-	10,000	211	1,380.0	1,591.0
SO_2	1-Hour	-	196	4.5 [3]	9.9	14.4
	3-Hour	512	1,300	3.5	15.5	19.0
	24-Hour	91	-/365	1.7	4.2	5.9
	Annual	20	-/80	0.06	0.6	0.7
PM-10	24-Hour	30	150	6.0	32.0	38.0
	Annual	17	-	0.2	-	-
PM-2.5	24-Hour	9	35	1.7 [4]	16.6	18.3
	Annual	4	12	0.20 [5]	6.2	6.4
NO_2	1-Hour	-	188	20.8 [1,2]	103.9	124.7
	Annual	25	100	0.6 [1]	29.3	29.9

[1] Includes use of PVMRM.

[2] Maximum 8th highest maximum daily 1-hour results averaged over 5-years.

[3] Maximum 4th highest maximum daily 1-hour results averaged over 5-years.

[4] Maximum 8th highest maximum daily 24-hour results averaged over 5-years, including secondary formation.

[5] Maximum annual results averaged over 5-years, including secondary formation.

Table 5-11: Maximum Modeled Concentrations During Startup/Shutdown Compared to Significant Impact Levels (SILs)

Pollutant	Averaging Period	Significant Impact Level ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)
CO	1-Hour	2,000	565
	8-Hour	500	212
NO_2	1-Hour	7.5	55.9 [1,2]

[1] Includes use of PVMRM.

[2] Based upon maximum 1st highest maximum daily 1-hour results averaged over 5-years.

Table 5-12: Maximum Modeled Concentrations During Startup/Shutdown Compared to PSD Increments and NAAQS/NYAAQS

Pollutant	Averaging Period	Class II PSD Increment (μg/m³)	NAAQS/NYAAQS (μg/m³)	Maximum Modeled Concentration (μg/m³)	Background Concentration (μg/m³)	Total Concentration (μg/m³)
CO	1-Hour	-	40,000	565	2,300	2,865
	8-Hour	-	10,000	212	1,380	1,592
NO_2	1-Hour	-	188	48.1 [1,2]	103.9	152.0

[1] Includes use of PVMRM.

[2] Maximum 8th highest maximum daily 1-hour results averaged over 5-years.

Table 5-13: Comparison of Maximum Modeled Concentrations of Pollutants to Vegetation Screening Concentrations

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m³)	Background Concentration [7] (µg/m³)	Total Concentration [1] (µg/m³)	Vegetation Screening Concentrations [6] (µg/m³)		
					Sensitive	Intermediate	Resistant
SO_2	1-Hour	4.5	9.9	14.4	917	-	-
	3-Hour	3.5	9.9[c]	13.4	786	2,096	13,100
NO_2	4-Hour	20.8 [2]	103.9 [3]	124.7	3,760	9,400	16,920
	8-Hour	20.8 [2]	103.9 [3]	124.7	3,760	7,520	15,040
	Annual	0.6	29.3	29.9	-	94	-
CO	1-Week	211 [5]	1,380 [4]	1,591	1,800,000	-	18,000,000

[1] Total concentration = maximum modeled facility concentration + background concentration.

[2] Maximum modeled concentration conservatively based on 1-hour averaging period.

[3] Maximum background concentration conservatively based on 1-hour averaging period.

[4] Maximum background concentration conservatively based on 8-hour averaging period.

[5] Maximum modeled concentration conservatively based on 8-hour averaging period.

[6] Screening concentrations found in Table 3.1 of "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals" (EPA, 1980).

[7] Background concentrations represent the highest second-highest short term (1-, 3-, 8-, and 24-hour) and maximum annual concentrations recorded during the latest three years of available monitoring data (2016-2018).

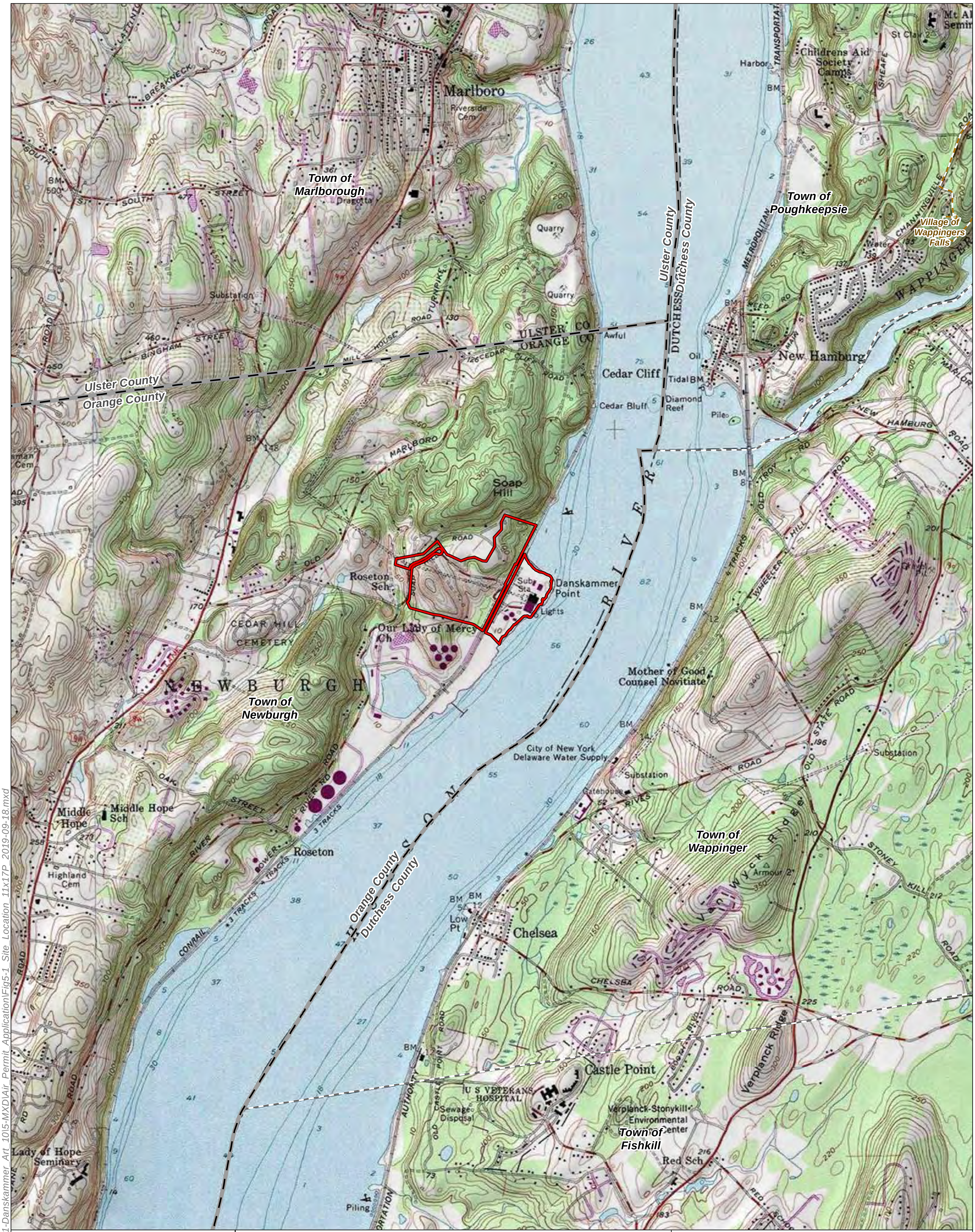
(-) No screening concentration available.

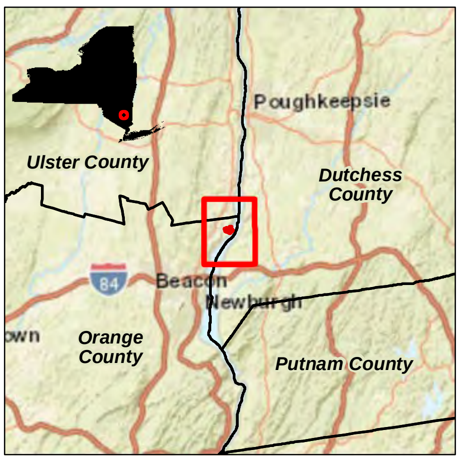
Table 5-14: VISCREEN Analysis Results

Background	Theta (degrees)	Azimuth (degrees)	Distance (km)	Alpha (degrees)	Delta E [1]		Contrast [2]	
					Criteria	Plume	Criteria	Plume
Inside Surrounding Area								
Sky	10	84	40	84	2	0.435	0.05	0.006
Sky	140	84	40	84	2	0.215	0.05	-0.007
Terrain	10	84	40	84	2	0.618	0.05	0.008
Terrain	140	84	40	84	2	0.123	0.05	0.005
Outside Surrounding Area								
Sky	10	0	1	168	2	0.573	0.05	0.006
Sky	140	0	1	168	2	0.144	0.05	-0.005
Terrain	10	0	1	168	2	1.188	0.05	0.012
Terrain	140	0	1	168	2	0.355	0.05	0.011

[1] Color difference parameter (dimensionless).

[2] Visual contrast against background parameter (dimensionless).





- Project Area
- Village Boundary
- Municipal Boundary
- County Boundary

Data: Rextag, 2019
Base Map: USGS 7.5-Minute Topographic Quadrangle

0 2,000 4,000
Feet

Danskammer Energy, LLC

Danskammer Energy Center

Figure 5-1
Site Location Topographic Map

Town of Newburgh
Orange County, NY

Prepared on 9/18/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\Air_Permit_Application\Fig5-1_Site_Location_11x17P_2019-09-18.mxd

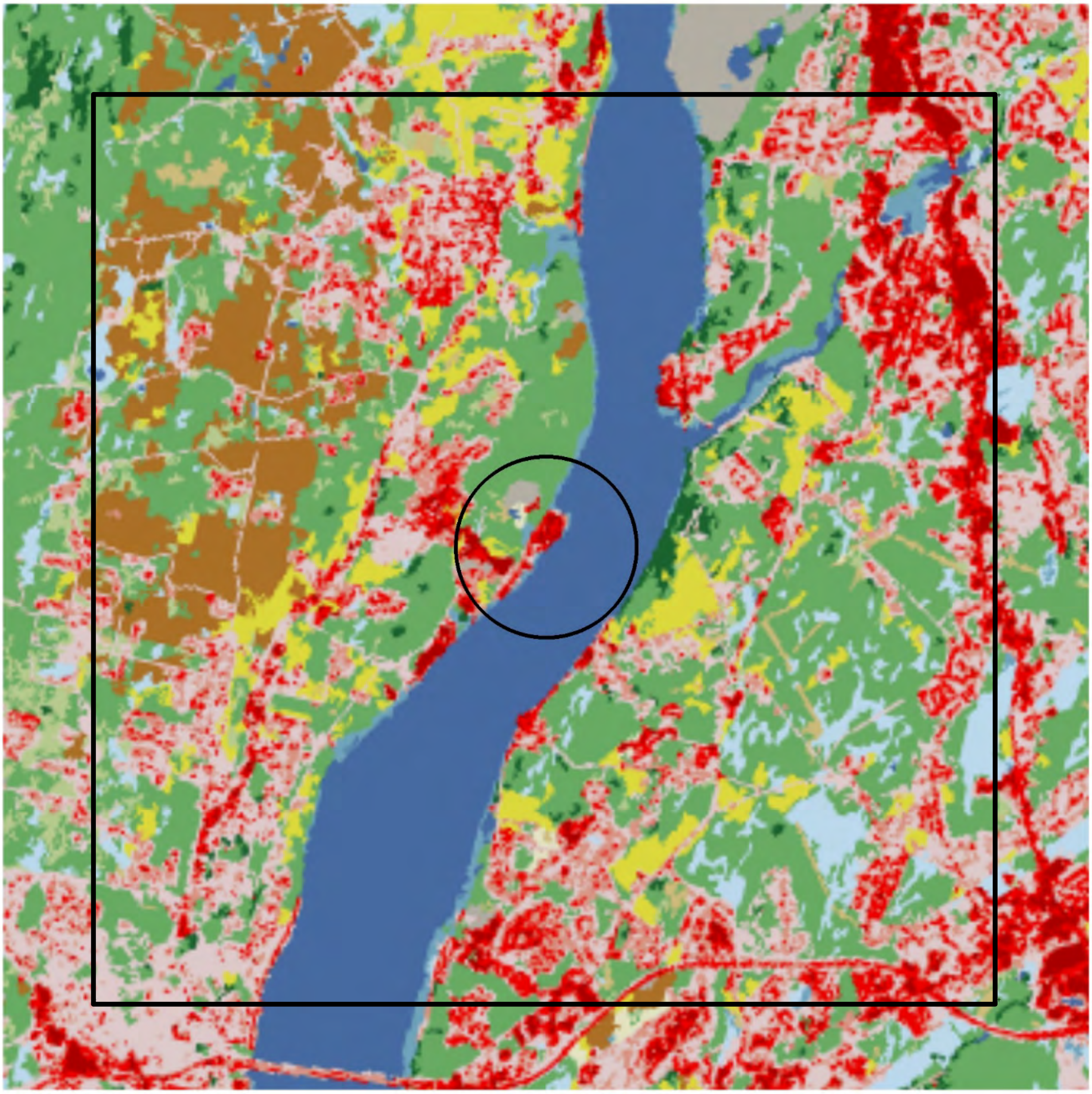
3-KM Radius

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

USGS TOPOGRPHIC MAP OF THE DANSKAMMER ENERGY CENTER SITE

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-2	**NOVEMBER 2019**



1-KM Radius

10 KM Domain

NLCD Land Cover Classification Legend

11	Open Water
12	Perennial Ice/ Snow
21	Developed, Open Space
22	Developed, Low Intensity
23	Developed, Medium Intensity
24	Developed, High Intensity
31	Barren Land (Rock/Sand/Clay)
41	Deciduous Forest
42	Evergreen Forest
43	Mixed Forest
51	Dwarf Scrub*
52	Shrub/Scrub
71	Grassland/Herbaceous
72	Sedge/Herbaceous*
73	Lichens*
74	Moss*
81	Pasture/Hay
82	Cultivated Crops
90	Woody Wetlands
95	Emergent Herbaceous Wetlands

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LANDUSE WITHIN 5 KM OF DANSKAMMER ENERGY CENTER SITE

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-3	NOVEMBER 2019

0 40 80 160 240 FEET
1"= 80'

PRELIMINARY - NOT FOR CONSTRUCTION

USERNAME $$$$$$SYTIME$$$$ $$$$$$$$$$$$$$DGNSPEC$$$$$$$$$$$$$$$$$$$$

INTER-DISCIPLINE REVIEW						
DISC	ARCH	CIVIL	ELECT	I&C	MECH	STRUCT
DATE						
INIT						

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
B	ISSUED FOR REVIEW	11/12/2019	RM	RM	KO	KO
A		05/08/2019				

DSGN		
DRN	AMW	
CKD		
SCALE:	1"=80.0'	

DANSKAMMER ENERGY, LLC

POWER ENGINEERS

DANSKAMMER ENERGY LLC

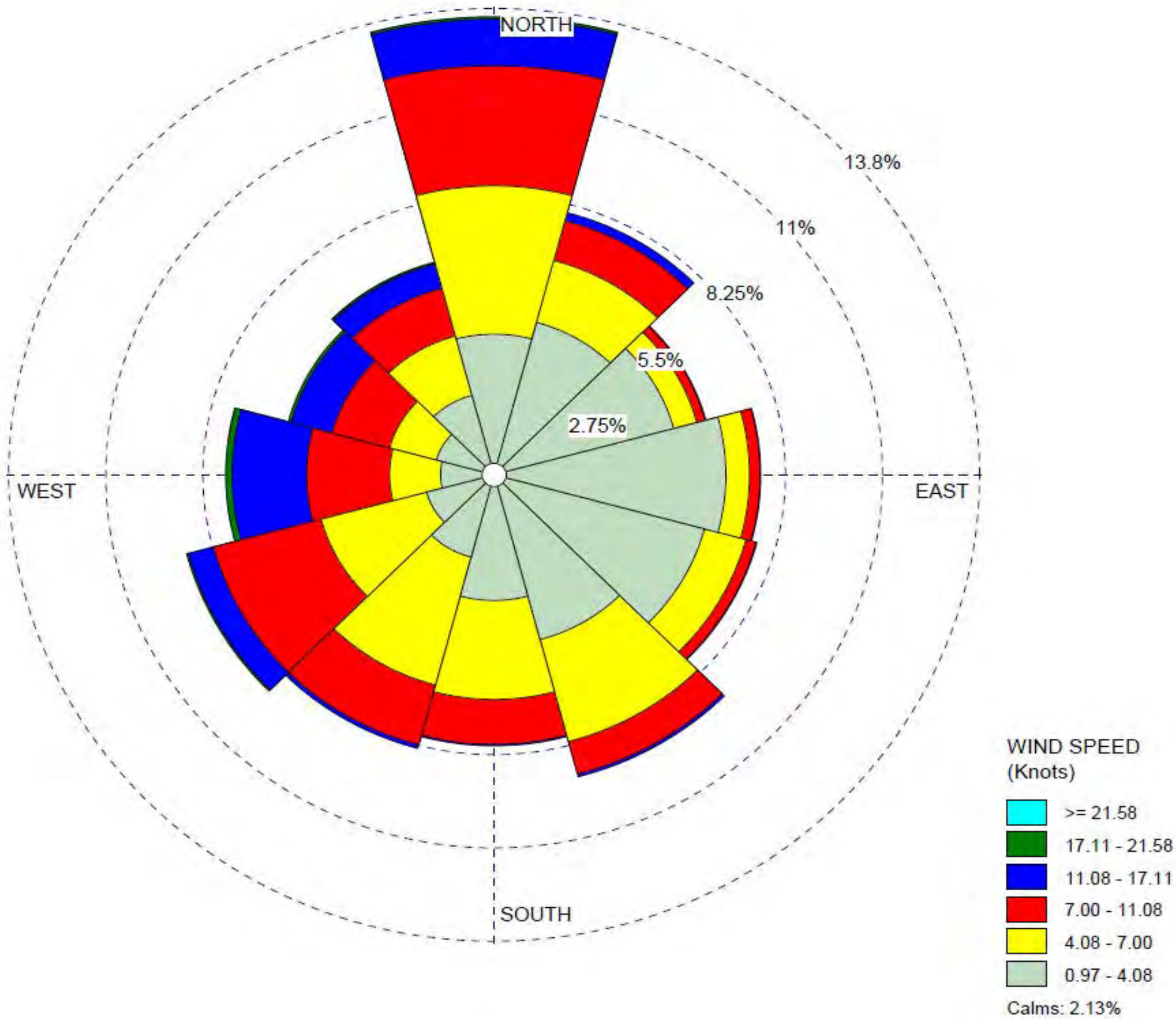
Figure 5-4: General Arrangement Plan

EMMISSION POINTS
BUILDING, EQUIPMENT & STRUCTURES

JOB NUMBER 155316
REV B
DRAWING NUMBER M110

WIND ROSE PLOT:
Hudson Valley Regional Airport

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

Start Date: 1/1/2014 - 00:00
End Date: 12/31/2018 - 23:59

CALM WINDS:

2.13%

AVG. WIND SPEED:

5.14 Knots

WRPLOT View - Lakes Environmental Software

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Lyndhurst, NJ 07071

WIND ROSE FOR THE HUDSON VALLEY AIRPORT METEOROLOGICAL TOWER (2014 – 2018)

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-5	**NOVEMBER 2019**

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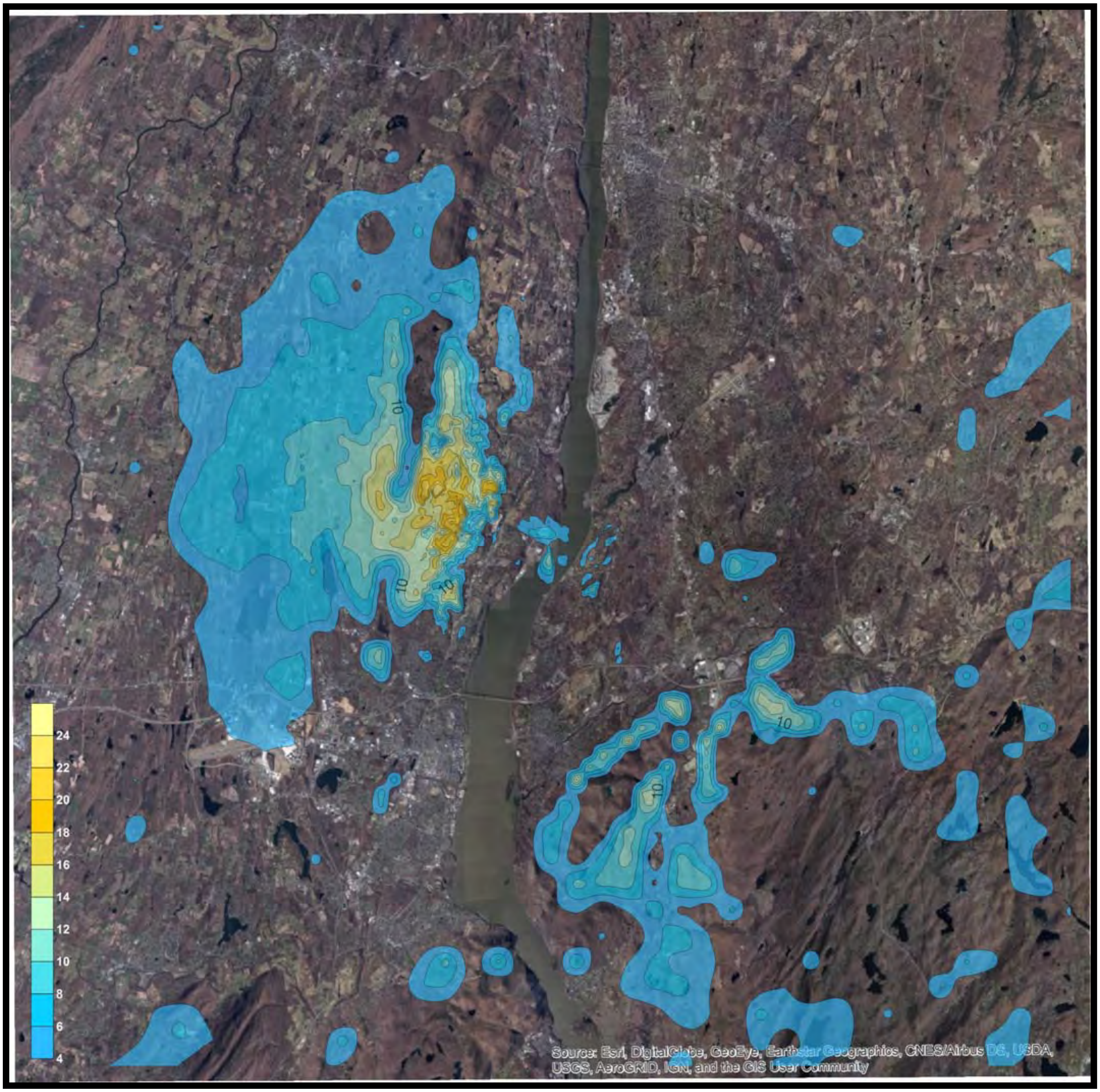
Lyndhurst, NJ 07071

LOCATION OF THE PROPOSED DANSKAMMER ENERGY CENTER AND THE HUDSON VALLEY REGIONAL AIRPORT

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-6

NOVEMBER 2019



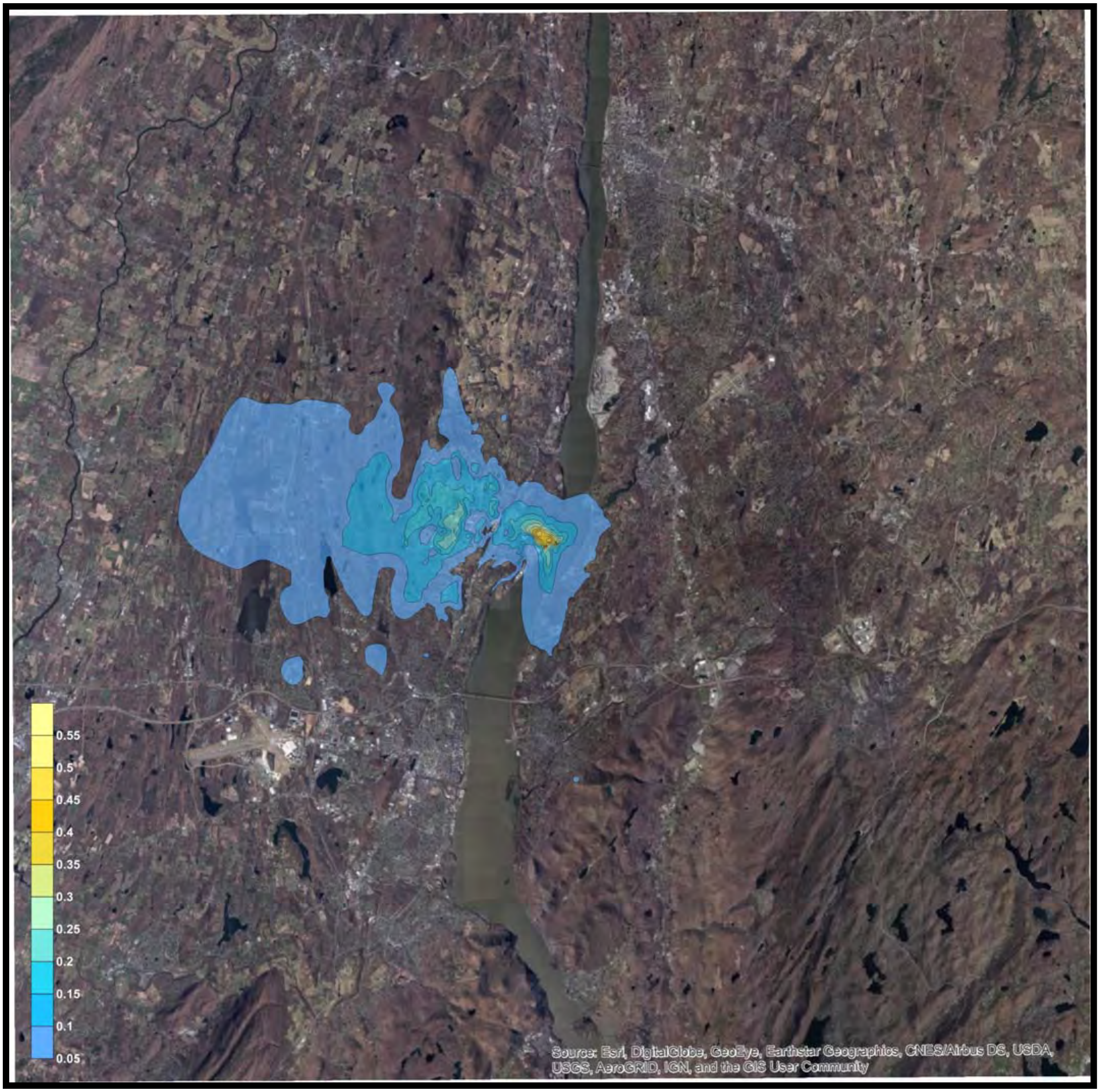
Pollutant Concentration (µg/m^3)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 1-HOUR AVERAGE NO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-7	**NOVEMBER 2019**



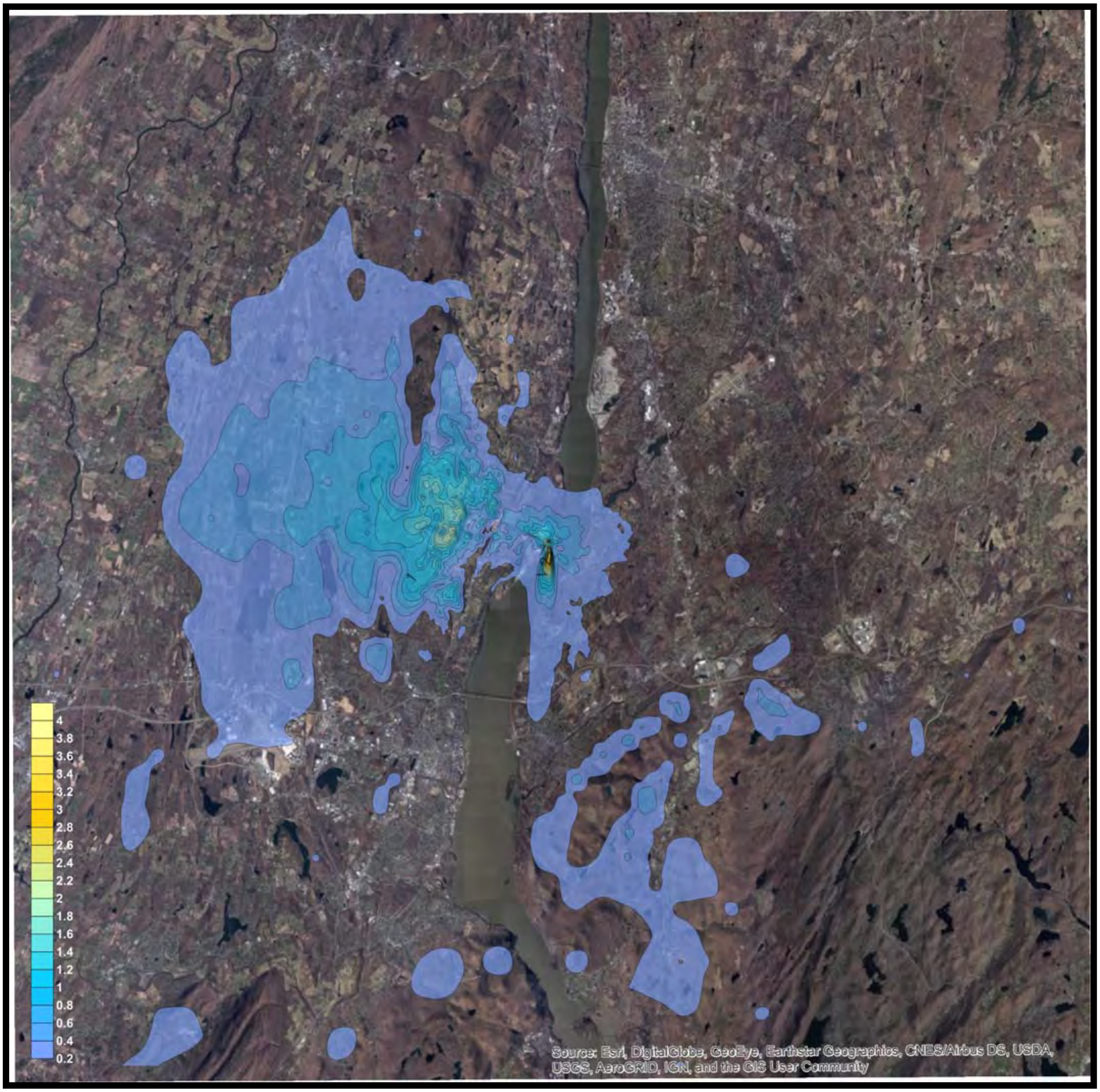
Pollutant Concentration (µg/m³)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM ANNUAL AVERAGE NO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-8	**NOVEMBER 2019**



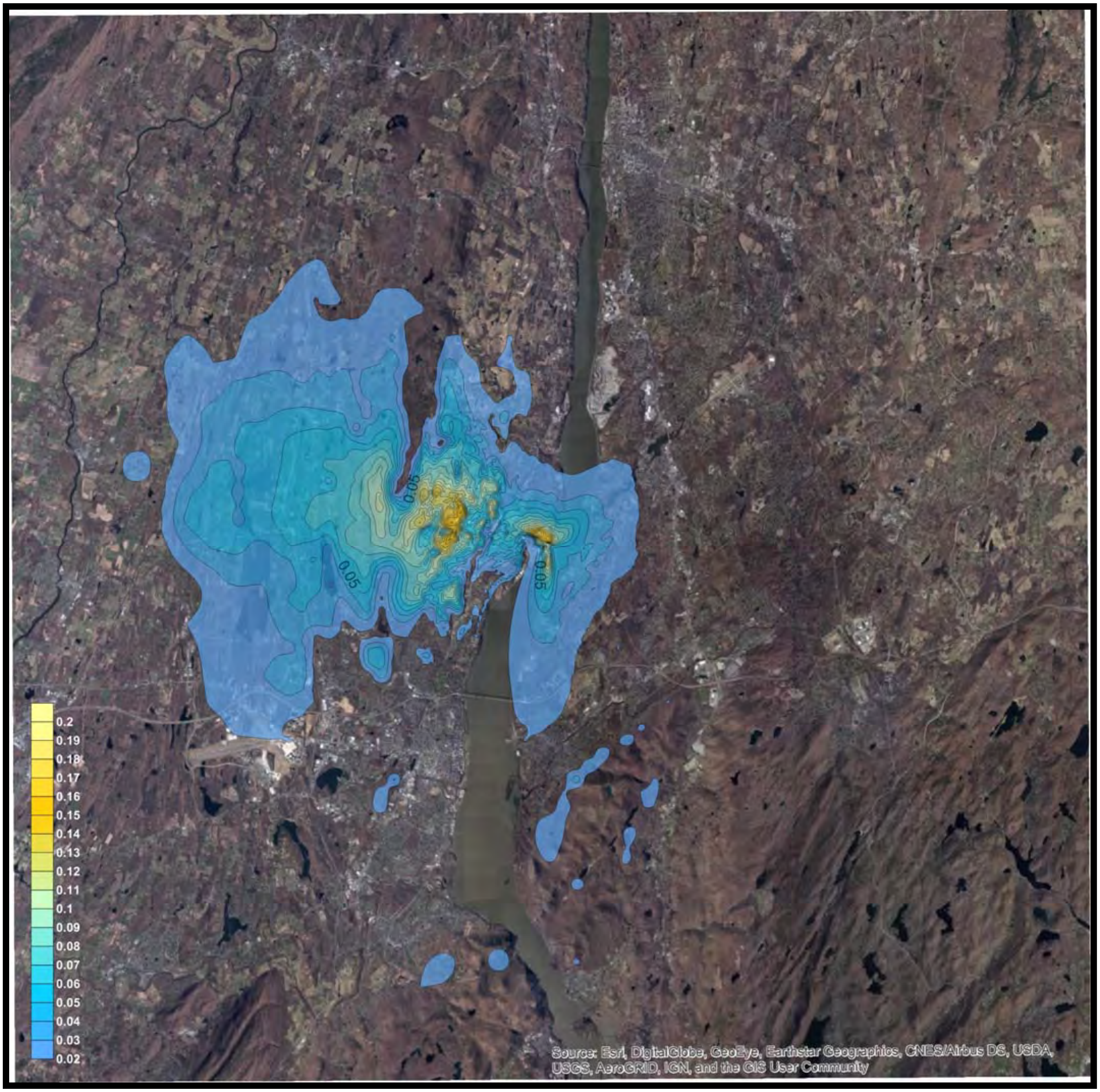
Pollutant Concentration (µg/m³)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 24-HOUR AVERAGE PM-2.5 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-9	**NOVEMBER 2019**



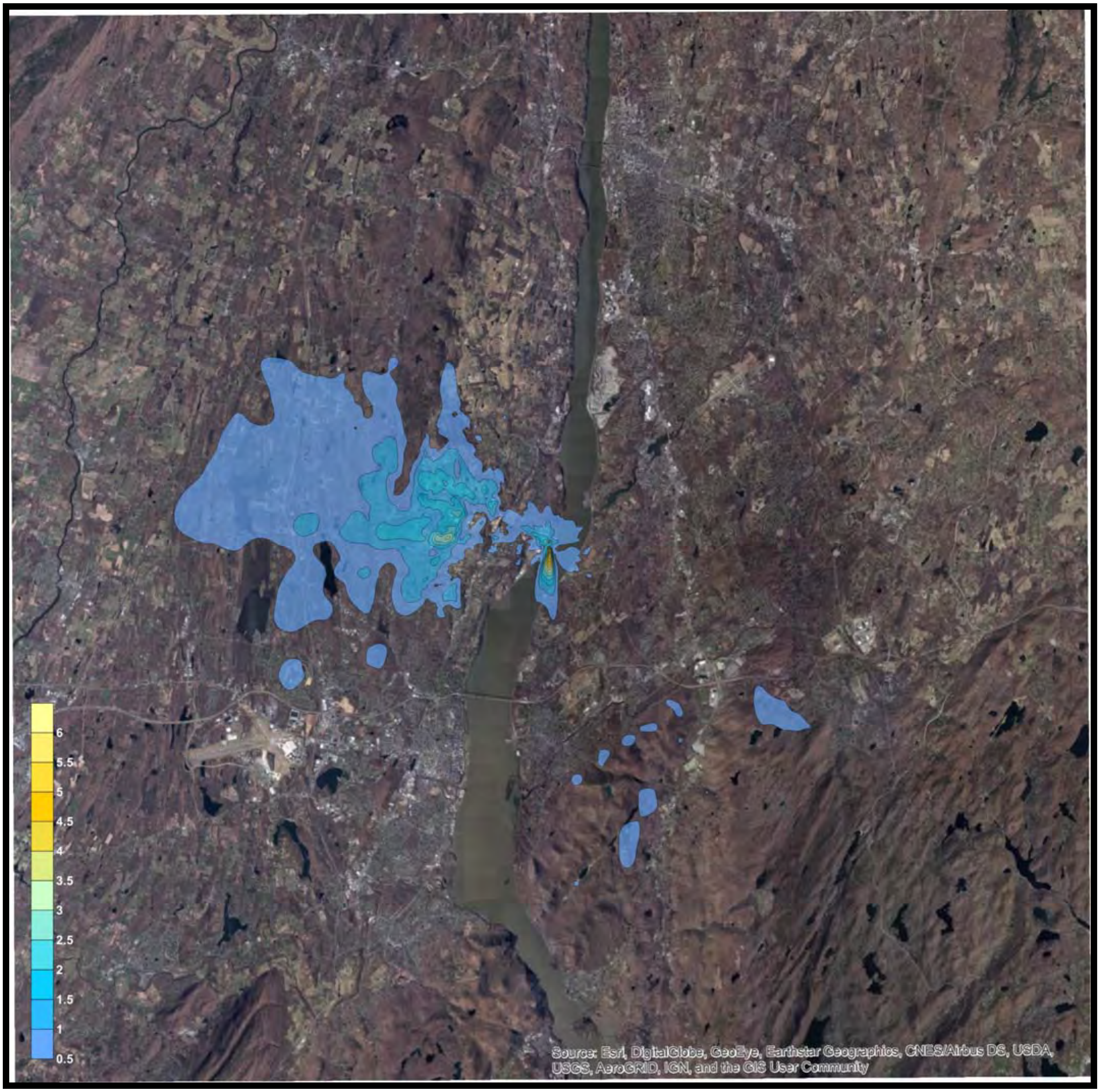
Pollutant Concentration (µg/m^3)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM ANNUAL AVERAGE PM-2.5 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-10 | **NOVEMBER 2019**



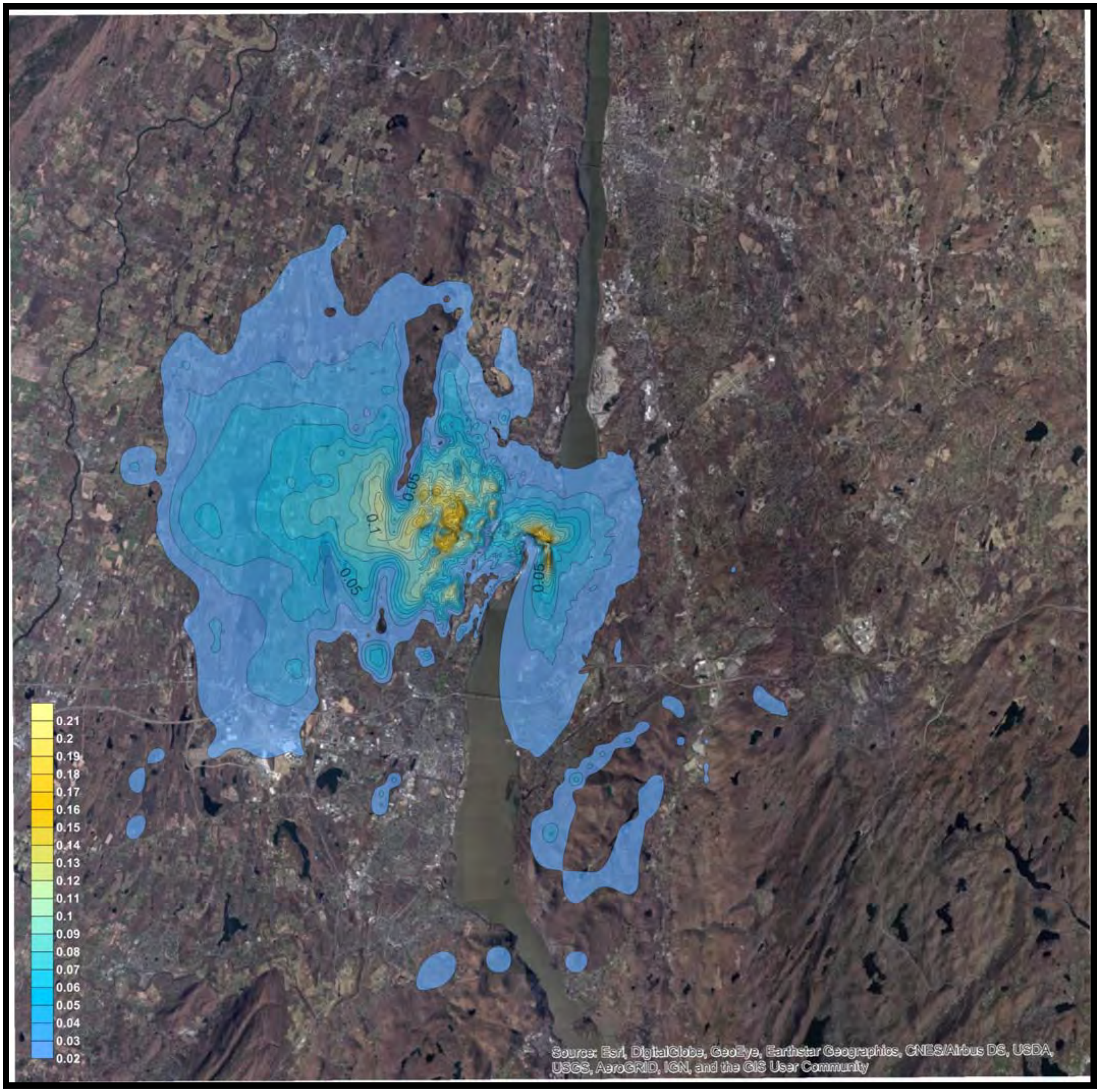
Pollutant Concentration (μg/m³)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 24-HOUR AVERAGE PM-10 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-11	**NOVEMBER 2019**



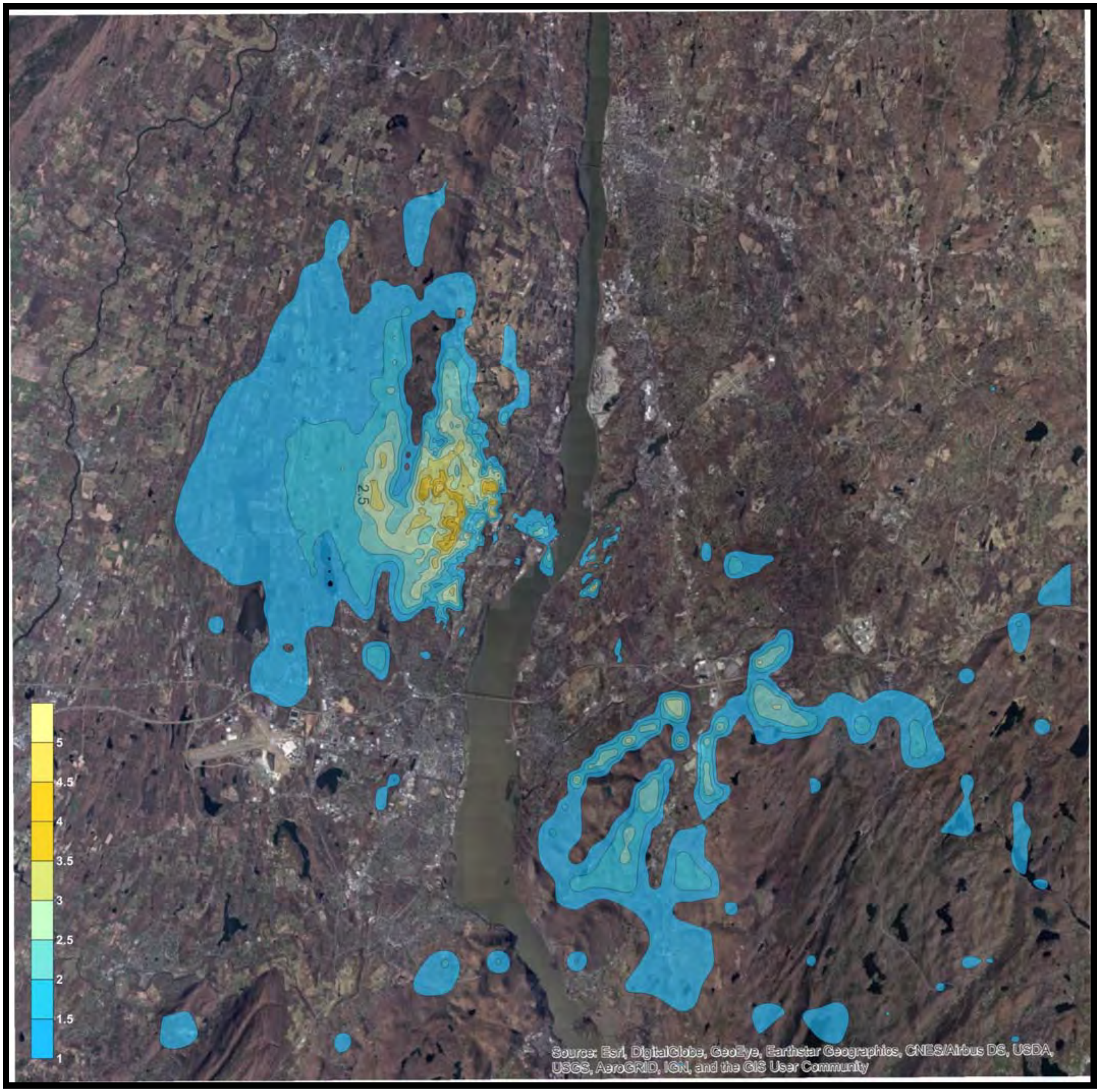
Pollutant Concentration (μg/m³)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM ANNUAL AVERAGE PM-10 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-12	NOVEMBER 2019



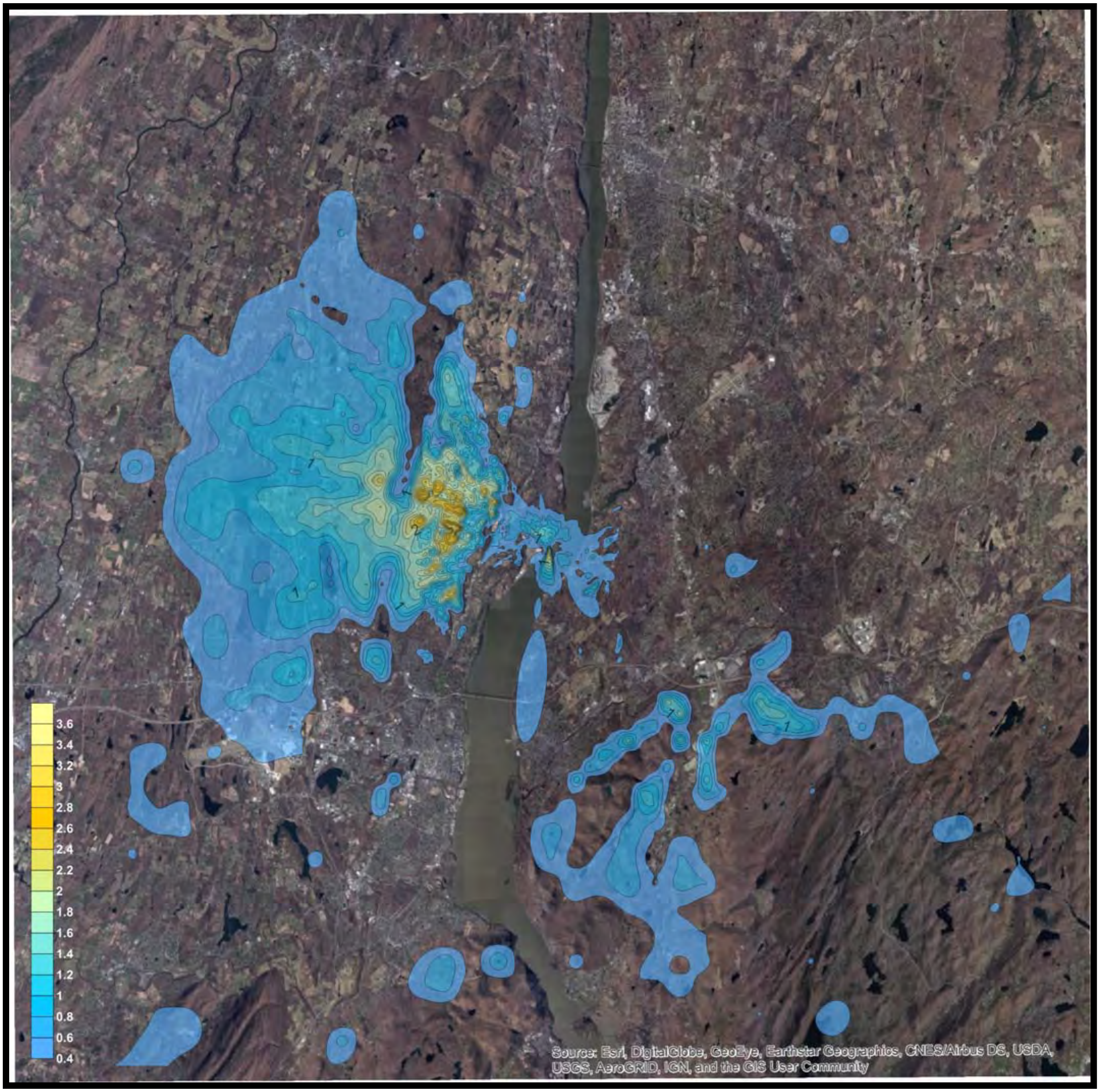
Pollutant Concentration (µg/m³)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 1-HOUR AVERAGE SO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-13 | **NOVEMBER 2019**



Pollutant Concentration (μg/m³)

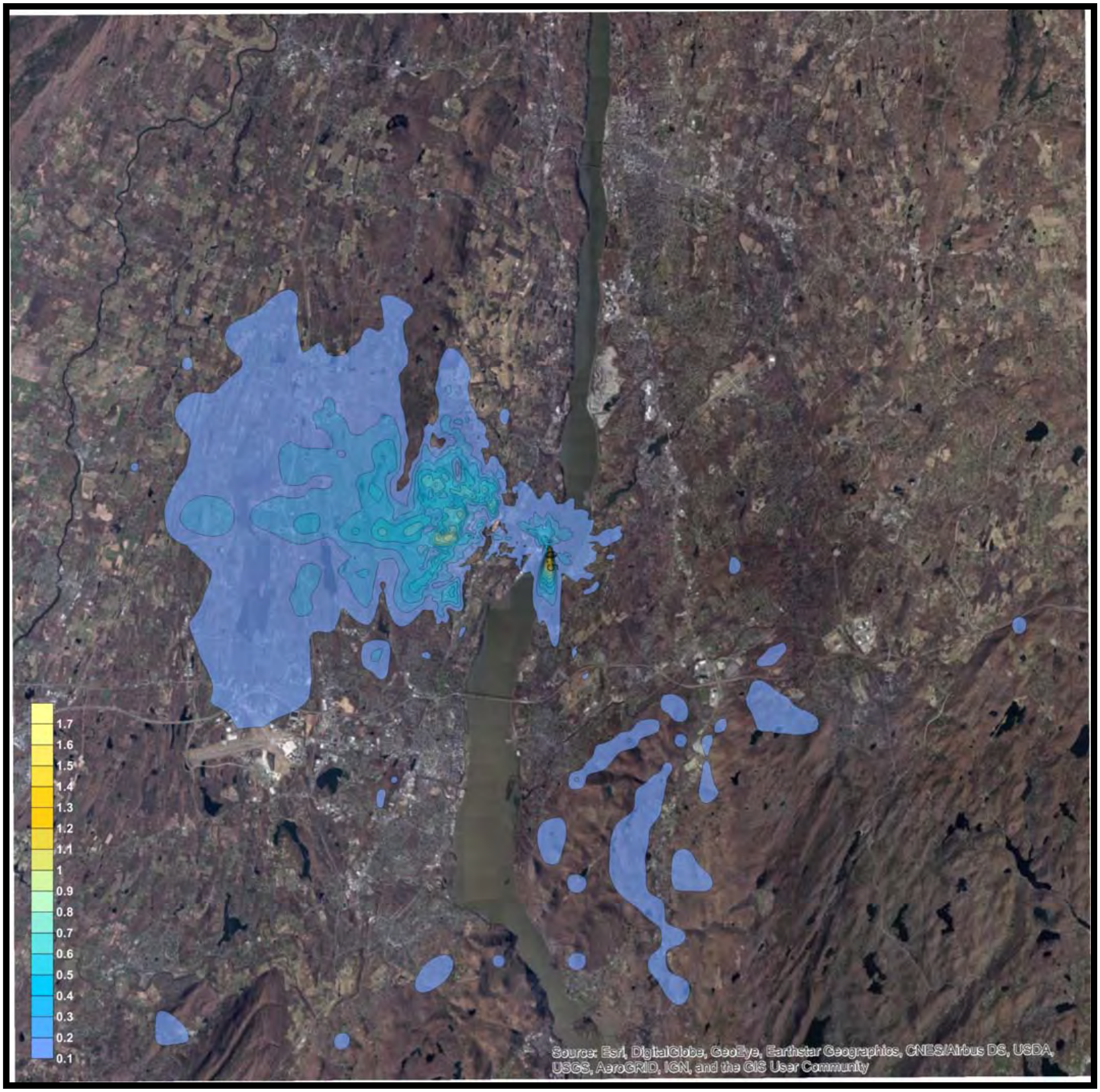
TRC

1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 3-HOUR AVERAGE SO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-14	**NOVEMBER 2019**



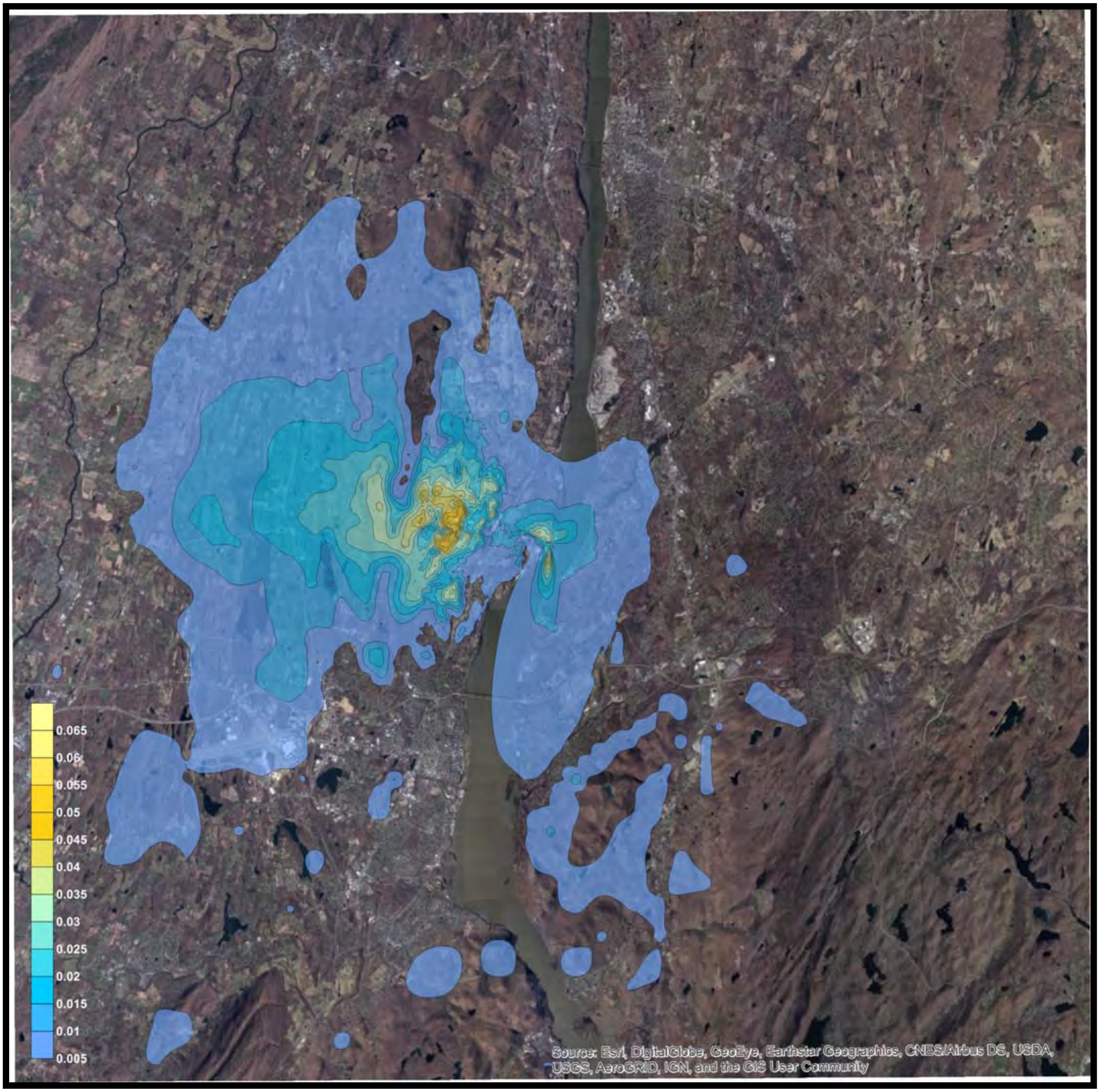
Pollutant Concentration (μg/m³)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 24-HOUR AVERAGE SO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-15	**NOVEMBER 2019**



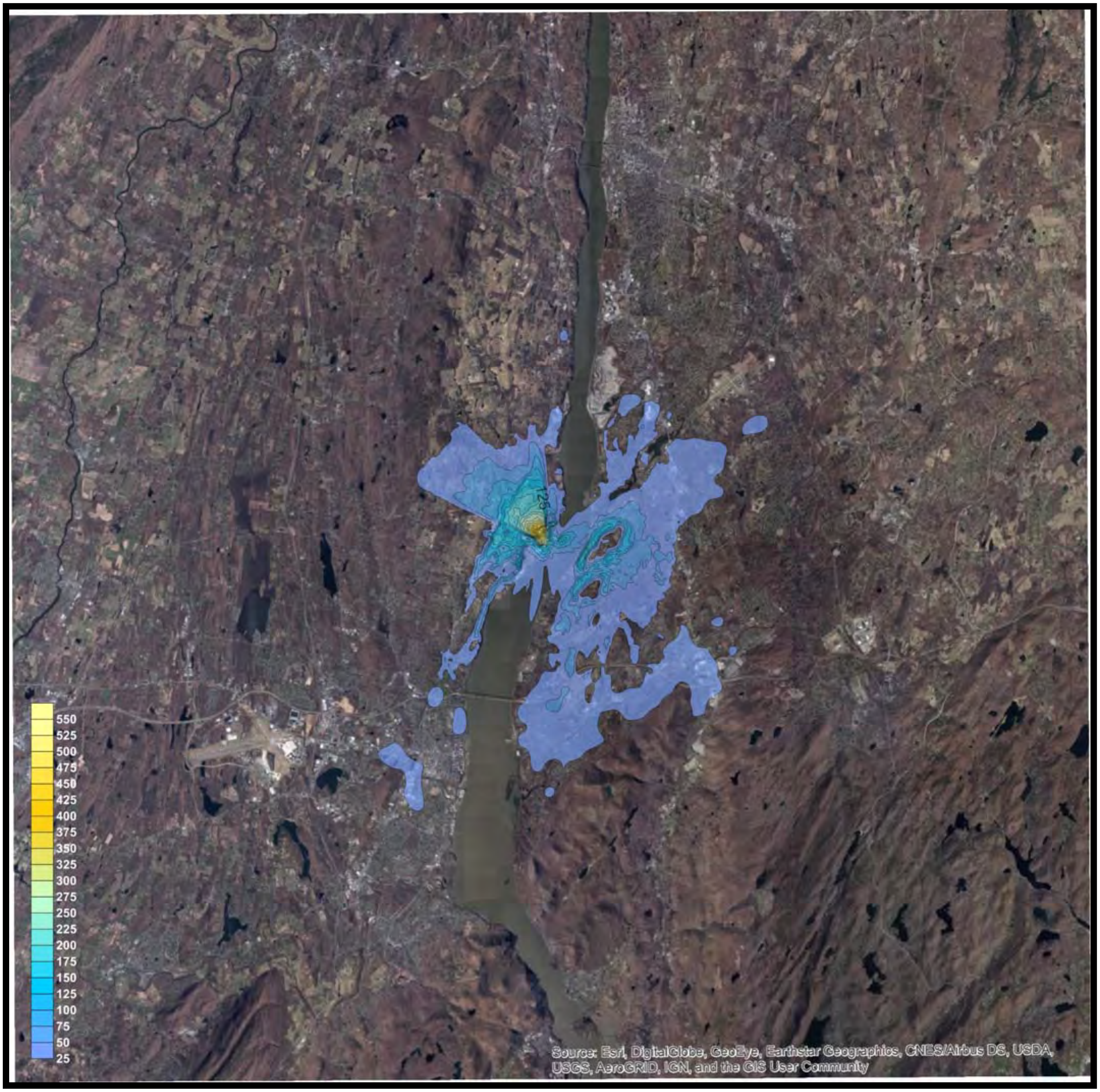
Pollutant Concentration (µg/m^3)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM ANNUAL AVERAGE SO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-16	**NOVEMBER 2019**



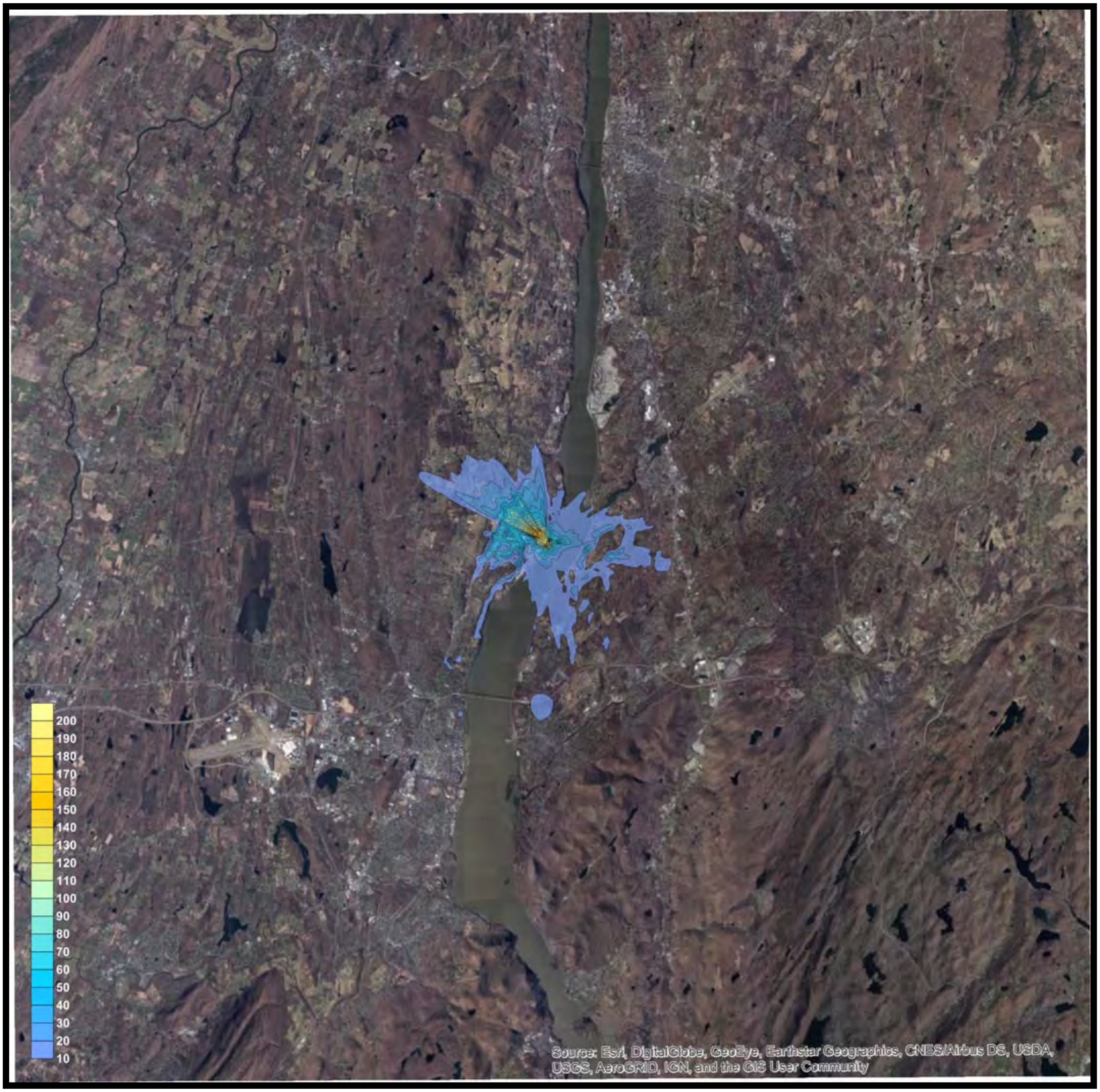
Pollutant Concentration (µg/m³)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 1-HOUR AVERAGE CO CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-17	**NOVEMBER 2019**



Pollutant Concentration (μg/m^3)

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 8-HOUR AVERAGE CO CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 5-18	**NOVEMBER 2019**

6.0 MULTISOURCE MODELING DEMONSTRATION

As demonstrated in Section 5, a cumulative impact assessment is required for 24-hour PM-10/PM-2.5, annual PM-2.5, and 1-hour NO_2. The total modeled concentrations from the proposed Danskammer Energy Center were determined to be greater than the SILs for these pollutants and averaging periods. Thus, a cumulative impact assessment to demonstrate compliance with the NAAQS and PSD Class II increments is required.

The first step of conducting a cumulative NAAQS/PSD Class II increment analysis is to determine the pollutant specific area(s) of impact of the proposed Project. The area of impact corresponds to the distance at which the model calculated pollutant concentrations fall below the SILs. As shown in Section 5.8, the maximum modeled area of impact for the Project is 18.26 km for 1-hour NO_2. The second step is obtaining an off-site major source emissions inventory for sources within the area of impact plus those that are nearby to the Project. The U.S. EPA guidance for nearby sources provided in Guideline on Air Quality Models (Revised) (U.S. EPA, 2017) defined these sources as:

> *Individual sources located in the vicinity of the source(s) under consideration for emissions limits that are not adequately represented by ambient monitoring data. Typically, sources that cause a significant concentration gradient in the vicinity of the source(s) under consideration for emissions limits are not adequately represented by background ambient monitoring. The number of nearby sources to be explicitly modeled in the air quality analysis is expected to be few except in unusual situations. In most cases, the few nearby sources will be located within the first 10 to 20 km from the source(s) under consideration.*

Thus, the NYSDEC was consulted and a request for sources within 30 km of the proposed Project was issued. This distance incorporates nearby sources within the significant impact area and those within the recommended 10-20 km distance from the proposed Project. Additional sources within 20-30 km from the proposed Project were requested to conservatively represent the sources that may cause a significant concentration gradient within the vicinity of the proposed Project.

Upon request, and taken from its Air Facility System (AFS) database, the NYSDEC Central Office in Albany provided a comprehensive inventory of sources located within a 30 kilometer radius of the proposed Project.

6.1 Offsite Emissions Inventory

The multisource modeling inventory consists of three main parts – (1) source locations and base elevations, (2) source stack parameters (height, diameter, exhaust velocity, and exhaust temperature), and (3) source pollutant emission rates. The source locations provided by NYSDEC were confirmed by identifying the UTM coordinates listed in the AFS source list and by conducting an address and aerial map match to confirm the coordinates were as accurate as possible. Base elevations were confirmed conducting an address to map search in order to confirm those elevations were as accurate as possible.

As requested, the inventory information provided by NYSDEC included the source name and description; the permitted emission rates; facility and stack numbers; stack location coordinates; the stack height and diameter; and the exhaust gas flow rate, exit temperature and exit velocity. Upon receipt, the data from the AFS system were processed, and missing data were identified. The source inventory was completed using additional equipment design and emissions data obtained from review of NYSDEC issued Part 201 operating air permits for the sources. Figure 6-1 provides a map of the sources included in the NYSDEC inventory.

The source inventory for the NAAQS analysis included all sources that were provided by NYSDEC, and included individual emissions equipment/processes that emit NO_2 and/or PM-10/PM-2.5. The cumulative source inventory methodology did not take into account the NYSDEC's DAR-10 Guidance for screening of sources using the gradient method for sources that cause a significant concentration gradient within the vicinity of the source. Thus, the source inventory is comprehensive and when modeled, will conservatively represent the air quality from nearby sources because there will likely be double counting of background air quality concentrations from those that are included in the existing monitored ambient background discussed in Section 6.3 and from the modeled nearby source inventory (i.e., the air quality impacts from nearby sources are included in both the background air quality monitoring data and the multisource modeled concentrations).

6.1.1 PSD Increment Inventory

PSD increment is the amount of pollution an area is allowed to increase. PSD increments prevent the air quality in areas that attain the NAAQS from deteriorating to the level set by the NAAQS. A PSD increment, on the other hand, is the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a pollutant. The baseline concentration is defined for each pollutant and, in general, is the ambient concentration existing at the time that the first complete PSD permit application affecting the area is submitted. Significant deterioration is said to occur when the amount of new pollution would exceed the applicable PSD increment. The major source baseline date in New York for PM-2.5 is October 20, 2010.

A conservative approach for the PSD Class II increment analysis offsite source inventory was followed. The entire background source inventory that was included as nearby sources for the NAAQS analysis were also considered to be PSD increment-consuming sources with the exception of two sources. The PM-2.5 increment modeling excluded the source contributions from the Roseton Generating Station and Chemprene because these facilities have not been subject to PSD review as an initial or modified PSD source since October 20, 2010.

The list of facility emissions and stack exhaust parameters that were included in the multisource NAAQS and PSD Class II increment modeling analyses are provided in Table 6-1.

6.2 Multisource Modeling Methodology

The multisource modeling was conducted in accordance with the single source modeling methodology used for assessing the proposed Project's air quality impact as detailed in the Air Quality Modeling Protocol submitted to the NYSDEC on May 15, 2019 and approved by the NYSDEC in a comment letter dated June 20, 2019. A copy of the NYSDEC's comment letter on the Air Quality Modeling Protocol can be found in Appendix D and a copy of the Air Quality Modeling Protocol is located in Appendix E.

Additional methodology beyond that required for single source modeling was required to perform the multisource NAAQS analysis. The following methodologies were applied to the multisource air quality modeling analyses.

6.2.1 1-Hour NO_2 Modeling

The multisource air quality modeling analysis for the 1-hour NO_2 NAAQS was performed consistent with the guidance and procedures established in the Guideline on Air Quality Models (U.S. EPA, 2017), the U.S. EPA guidance memorandum titled Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard (U.S. EPA, September 30, 2014), and the U.S. EPA guidance memorandum titled Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 NAAQS (U.S. EPA, March 1, 2011).

The 1-hour NO_2 modeling approach is to combine monitored background and modeled concentrations by season and hour-of-day pairing. As stated in the U.S EPA Memorandum:

> *"We believe that an appropriate methodology for incorporating background concentrations in the cumulative impact assessment for the 1-hour NO_2 standard would be to use multiyear averages of the 98th-percentile of the available background concentrations by season and hour-of-day…"*

> *"…we recommend that background values by season and hour-of-day used in this context should be based on the 3rd highest values for each season and hour of day combination , whereas the 8th-highest value should be used if values vary by hour-of-day only.…"*

Thus, the demonstration of the 1-hour NO_2 NAAQS, by combining monitored and modeled concentrations, was accomplished on an hour-of-day by season approach. This approach results in a set of 96 three (3) year average 98th percentile background values by hour-of-day and season that were added to the modeled concentrations for comparison with the 1-hour NO_2 NAAQS using the BACKGROUND keyword in AERMOD.

Based on review of the locations of NYSDEC ambient air quality monitoring sites, the closest "regional" NYSDEC monitoring site was used to represent the current background NO_2 air quality in the site area. Background data for NO_2 from 2016 – 2018 was obtained from a monitoring station located in Bronx, New York (Monitor ID: 36-005-0133), approximately 79 km south of the Project. The NYSDEC prepared the seasonal and hour of day NO_2 monitoring concentrations from the existing NO_2 monitoring station located for use in the modeling assessment.

The 1-hour NO_2 modeling analysis utilized the U.S. EPA Tier 3 modeling approach for 1-hour NO_2 modeling assessment results using the AERMOD Plume Volume Molar Ratio Method (PVMRM) which adjusts NO_x emissions to estimate more realistic ambient NO_2 concentrations by modeling the conversion of NO_x to NO_2. PVMRM incorporates three sets of data into the calculation of 1-hour NO_2 concentrations. Those are source-specific in-stack NO_2/NO_x emission rate ratios, an ambient NO_2/NO_x concentration ratio, and hourly average background ozone concentrations.

The PVMRM option for modeling conversion of NO to NO_2 incorporated a default NO_2/NO_x ambient equilibrium ratio of 0.90.

6.2.2 In Stack NO_2/NO_x Concentration Ratio

NO_x consists primarily of nitric oxide (NO) and nitrogen dioxide (NO_2), plus small amounts of other compounds. NO_2 is produced by the oxidation of NO by O_2. This oxidation reaction is favored by a high O_2 concentration. Since the reaction is exothermic, NO_2 formation is also favored by low temperature. Hence, rapid cooling of combustion products in the presence of a high O_2 concentration will promote conversion of NO to NO_2. Essentially all of the NO_x formed by natural gas and distillate oil combustion sources is thermal NO_x because these fuels have little or no chemically bound fuel nitrogen. NO_x from fuel combustion typically consists of 90 to 95 percent NO. The balance is primarily NO_2.

The 1-hour NO_2 modeling analysis for the offsite sources conservatively utilized the national default in-stack NO_2/NO_x ratio of 0.5, with the exception of sources that have boilers.

The U.S. EPA NO_2/NO_x In-Stack Ratio (ISR) Database (U.S. EPA, 2019) was reviewed to determine representative NO_2/NO_x ratios for boilers without SCR or oxidation catalysts (i.e., uncontrolled boilers). The U.S. EPA ISR database includes NO_2/NO_x ratios that range from 0.0013 to 0.035 for uncontrolled boilers. In addition to the U.S. EPA ISR data, the U.S. EPA provides an NO_2/NO_x ratio of 0.05 for fossil fuel boilers in AP-42, Section 1.3. Other sources of information regarding NO_2/NO_x ratios were reviewed and indicated that 0.10 is a recommended default in-stack ratio for uncontrolled boilers. This is the recommended ratio per the San Joaquin Valley Air Pollution Control District document Assessment of Non-Regulatory Options in AERMOD - OLM and PVMRM (September 2010), and the California Air Pollution Control Officer's Guidance Document Modeling Compliance of the Federal 1-Hour NO_2 NAAQS (October, 2011). Thus, based upon the maximum NO_2/NO_x ratio provided in the State agency and U.S. EPA test data, an in-stack NO_2/NO_x ratio of 0.10 for the offsite inventory boilers was used in the 1-hour NO_2 modeling analysis.

6.2.3 Hourly Average Background Ozone Concentrations

Based on review of the locations of NYSDEC ambient air quality monitoring sites, the closest "regional" NYSDEC monitoring sites were used to represent the current background ozone air quality in the site area. Section 5.5.6.2 describes the background ozone data for the single source analysis that was also utilized for the multisource NAAQS analysis.

6.3 Background Air Quality

The appropriate regional background concentrations for the NAAQS compliance demonstration are summarized in Section 5.2. The background component of the NAAQS analysis is designed to account for distant or minor sources that were not explicitly modeled in the nearby source inventory.

6.4 Multiple Source Impact Modeling Results

This section presents a summary of the modeling results for the NAAQS and PSD increment analysis for those specific pollutants and averaging periods for which the proposed Project resulted in impacts above the SILs. The results of the single source modeling analyses identified that the 24-hour PM-10, 24-hour and annual PM-2.5, and 1-hour NO_2 impacts were above the Class II SILs and thus, a further demonstration including offsite sources was required to demonstrate compliance with the NAAQS and PSD Class II increments for these pollutants and averaging periods.

The NAAQS multisource modeling results are summarized in Table 6-2. Furthermore, the PSD Class II Increment modeling results are summarized in Table 6-3. The following section details the results of the NAAQS and PSD Class II multisource modeling assessments for each pollutant.

6.4.1 PM-2.5 and PM-10 NAAQS Compliance

Multiple source modeling was performed to assess the impacts of the Project plus nearby sources of PM-10/PM-2.5, including representative ambient monitored background PM-10/PM-2.5 concentrations. As shown in Table 6-2, the modeled multiple source impacts demonstrate compliance with the NAAQS. Specifically, the modeled concentration for 24-hour PM-2.5 from all sources combined, plus ambient background equals 23.0 $\mu g/m^3$, which is well below the 24-hour PM-2.5 NAAQS of 35 $\mu g/m^3$. Similarly, the modeled annual concentration for PM-2.5 from all sources combined, plus ambient background equals 7.4 $\mu g/m^3$, which is well below the annual PM-2.5 NAAQS of 12 μg/m^3. Additionally, the modeled PM-10 concentration from all sources combined, plus ambient background equals 46.2 μg/m^3, is well below the 24-hour PM-10 NAAQS of 150 μg/m^3. Thus, the results of the multiple source modeling demonstrate that the Project will not cause or significantly contribute to an exceedance of the PM-10/PM-2.5 NAAQS.

6.4.2 1-Hour NO_2 NAAQS Compliance

Multiple source modeling was performed to assess the impacts of the Project plus other major sources of NO_2 in the surrounding region, including conservative ambient monitored background data as discussed in Section 5.2. The modeling was conducted to demonstrate that the total combined impacts of the Project and the other permitted sources in the region, plus the background concentrations, will comply with the 1-hour NAAQS for NO_2. Multiple source impacts were modeled using the worst-case normal operating scenario for the single source modeling, with all other sources at maximum permitted emission rates.

Table 6-2 summarizes the results of the multiple source impact modeling analyses for the 1-hour NO_2 NAAQS. The results of the multiple source modeling analyses indicate that there are potential exceedances of the NAAQS within the SIA. When a violation of the NAAQS is predicted at receptor(s) in the SIA, a source is not considered to have caused or contributed to the violation if its own impact is insignificant (i.e., the source's contribution to the modeled violations is less than the SIL) at the violating receptor at the time of the predicted violation.

A rigorous step-wise procedure was used to evaluate the modeling results and demonstrate that the Danskammer Energy Center emissions do not significantly contribute to modeled exceedances. This process was accomplished by performing iterative modeling runs applying the MAXDCONT option within AERMOD for those receptors with modeled impacts that exceeded the NAAQS, in order to calculate the individual source contributions to the total modeling results.

The maximum modeled 1-hour NO_2 concentration was 235 μg/m^3, which occurred 4.1 km to the west of the Project, and which the Danskammer Energy Center contributed 0.7 ug/m^3. The maximum contribution by the Danskammer Energy Center during normal operation to a modeled exceedance of the NAAQS was 2.2 μg/m^3. Thus, the Project contribution to all modeled exceedances of the NAAQS is well below the 1-hour NO_2 SIL, and as such demonstrates compliance with the 1-hour NO_2 NAAQS.

Thus, the results of the multiple source modeling for 1-hour NO_2 NAAQS demonstrate that the Danskammer Energy Center will not cause or significantly contribute to a modeled exceedance of the NO_2 NAAQS.

6.4.3 PM-2.5 PSD Class II Increment Compliance

The PSD Class II Increment concentrations are presented in Table 6-3. The maximum (highest 2nd-highest) 24-hour PM-2.5 increment consumption was determined to be 8.4 $\mu g/m^3$ compared to an available increment of 9 $\mu g/m^3$, while the maximum annual PM-2.5 increment consumption was 1.2 $\mu g/m^3$ compared to an available increment of 4 $\mu g/m^3$. Thus, the results of the multiple source modeling demonstrate compliance for 24-hour and annual PM-2.5 PSD Class II increments.

6.4.4 24-Hour PM-10 PSD Class II Increment Compliance

The major source baseline date for PM-10 is November 15, 1978. The emission inventory for the PM-10 PSD increment modeling conservatively includes all the sources included in the PM-10 NAAQS modeling analysis. The highest second-highest modeled 24-hour PM-10 concentration is 14.2 $\mu g/m^3$ and is below the 24-hour PM-10 PSD Class II increment of 30.0 $\mu g/m^3$, demonstrating compliance with the short-term PM-10 PSD Class II increment.

6.5 Modeling Data Files

All modeling data files for the PSD modeling analyses to determine the maximum ambient ground-level concentrations from the proposed Project are included on DVD-ROM in Appendix G.

Table 6-1. Multisource NAAQS Modeling Inventory

DEC ID	Facility Name	SOURCE ID	Emission Point ID	AERMOD ID	UTM E (m)	UTM N (m)	BASE ELEVATION (ft)	BASE ELEVATION (m)	STACK HEIGHT (ft)	STACK HEIGHT (m)	EXIT TEMP (K)	EXIT TEMP (F)	EXIT VELOCITY (ft/s)	EXIT VELOCITY (m/s)	STACK DIAMETER (in)	STACK DIAMETER (m)	NOx Emissions (lb/hr)	NOx Emissions (g/s)	PM10/PM2.5 Emissions (lb/hr)	PM10/PM2.5 Emissions (g/s)
3334800111	GLOBAL COMPANIES LLC - NEWBURGH TERMINAL	VCU - Vapor Combustion Unit	00001	GCNEW001	582,768	4,593,310	0	0.00	13	3.96	1144.3	1600	100.00	30.48	12	0.30	2.28	0.29	0.00	0.00
3334800087	GLOBAL COMPANIES - NORTH TERMINAL	Open Flare	LRVCU	GCNORTH	582,737	4,593,153	0	0.00	16	4.88	1255.4	1800	81.49	24.84	6	0.15	0.57	0.07	0.57	0.07
3334800084	METAL CONTAINER CORP	Cupper Process - PM	EP030	METAL001	575,505	4,593,311	401	122.22	41	12.50	294.3	70	13.00	3.96	90	2.29	0.00	0.00	1.07	0.13
3334800084	METAL CONTAINER CORP	Thermal Oxidizer - NOx	EP999	METAL002	575,505	4,593,311	401	122.22	75	22.86	1033.2	1400	60.00	18.29	80	2.03	6.28	0.79	0.00	0.00
3334800084	METAL CONTAINER CORP	12.55 mmBtu NG Boiler	BLR02	METAL003	575,505	4,593,311	401	122.22	40	12.19	422.0	300	60.00	18.29	18	0.46	1.23	0.16	0.09	0.01
3334800084	METAL CONTAINER CORP	12.55 mmBtu NG Boiler	BLR01	METAL004	575,505	4,593,311	401	122.22	40	12.19	422.0	300	60.00	18.29	18	0.46	1.23	0.16	0.09	0.01
3334800082	GLOBAL COMPANIES - CARGO TERMINAL	Open Flare	00001	GCCARGO	582,341	4,591,844	0	0.00	18	5.49	1144.3	1600	100.00	30.48	18	0.46	5.71	0.72	0.00	0.00
3334600075	ROSETON GENERATING STATION	32.66 mmBtu/hr NG Boiler	0000B	ROSETON1	585,396	4,602,677	12	3.66	28	8.53	492.6	427	53.00	16.15	24	0.61	1.63	0.21	0.24	0.03
3334600075	ROSETON GENERATING STATION	7927 mmBtu/hr NG/Oil Boiler	00001	ROSETON2	585,404	4,602,738	12	3.66	260	79.25	402.6	265	60.00	18.29	276	7.01	1585.40	199.76	73.68	9.28
3334600075	ROSETON GENERATING STATION	7691 mmBtu/hr NG/Oil Boiler	00002	ROSETON3	585,472	4,602,760	12	3.66	260	79.25	402.6	265	60.00	18.29	276	7.01	1538.20	193.81	73.68	9.28
3333600022	US ARMY GARRISON	3 x NG/Oil Fired Boilers	STK02	USARMY01	587,383	4,582,544	5	1.52	144	43.89	390.9	244	25.00	7.62	120	3.05	73.47	9.26	9.62	1.21
3333600022	US ARMY GARRISON	58.1 mmBtu/hr NG/Oil Boiler	STK03	USARMY02	587,383	4,582,544	5	1.52	50	15.24	509.3	457	25.00	7.62	40	1.02	8.30	1.05	1.37	0.17
3333600022	US ARMY GARRISON	58.1 mmBtu/hr NG/Oil Boiler	STK04	USARMY03	587,383	4,582,544	5	1.52	50	15.24	509.3	457	25.00	7.62	40	1.02	8.30	1.05	1.37	0.17
3333600022	US ARMY GARRISON	14.47 mmBtu/hr NG/Oil Boiler	STK05	USARMY04	587,383	4,582,544	5	1.52	54	16.46	509.3	457	25.00	7.62	39	0.99	2.07	0.26	0.34	0.04
3134600019	DUTCHESS CO RESOURCE RECOVERY FACILITY	228 tons per day MSW Burner	FLUE1	DUTCHRR1	588,051	4,611,175	52	15.85	200	60.96	477.6	400	80.00	24.38	48	1.22	55.59	7.00	2.76	0.35
3134600019	DUTCHESS CO RESOURCE RECOVERY FACILITY	228 tons per day MSW Burner	FLUE2	DUTCHRR2	588,051	4,611,175	52	15.85	200	60.96	477.6	400	80.00	24.38	48	1.22	55.59	7.00	2.76	0.35
3132800025	GLOBAL FOUNDRIES EAST FISHKILL FACILITY	72 mmBtu/hr NG/Oil Boiler	00001	GFEASTF1	598,191	4,599,739	263	80.16	57	17.37	449.8	350	51.57	15.72	36	0.91	10.29	1.30	1.70	0.21
3132800025	GLOBAL FOUNDRIES EAST FISHKILL FACILITY	72 mmBtu/hr NG/Oil Boiler	00002	GFEASTF2	598,191	4,599,739	263	80.16	57	17.37	449.8	350	51.57	15.72	36	0.91	10.29	1.30	1.70	0.21
3132800025	GLOBAL FOUNDRIES EAST FISHKILL FACILITY	72 mmBtu/hr NG/Oil Boiler	00003	GFEASTF3	598,191	4,599,739	263	80.16	57	17.37	449.8	350	51.57	15.72	36	0.91	10.29	1.30	1.70	0.21
3132800025	GLOBAL FOUNDRIES EAST FISHKILL FACILITY	72 mmBtu/hr NG/Oil Boiler	00004	GFEASTF4	598,191	4,599,739	263	80.16	57	17.37	449.8	350	51.57	15.72	36	0.91	10.29	1.30	1.70	0.21
3132800025	GLOBAL FOUNDRIES EAST FISHKILL FACILITY	72 mmBtu/hr NG/Oil Boiler	00005	GFEASTF5	598,191	4,599,739	263	80.16	57	17.37	449.8	350	51.57	15.72	36	0.91	10.29	1.30	1.70	0.21
3132800025	GLOBAL FOUNDRIES EAST FISHKILL FACILITY	72 mmBtu/hr NG/Oil Boiler	00006	GFEASTF6	598,191	4,599,739	263	80.16	57	17.37	449.8	350	51.57	15.72	36	0.91	10.29	1.30	1.70	0.21
3132800025	GLOBAL FOUNDRIES EAST FISHKILL FACILITY	72 mmBtu/hr NG/Oil Boiler	00007	GFEASTF7	598,191	4,599,739	263	80.16	57	17.37	449.8	350	51.57	15.72	36	0.91	10.29	1.30	1.70	0.21
3132800025	GLOBAL FOUNDRIES EAST FISHKILL FACILITY	72 mmBtu/hr NG/Oil Boiler	00008	GFEASTF8	598,191	4,599,739	263	80.16	57	17.37	449.8	350	51.57	15.72	36	0.91	10.29	1.30	1.70	0.21
3130200017	CHEMPRENE INC	Catalytic Oxidizer	00009	CHEMPRE1	587,562	4,596,470	186	56.69	41	12.50	549.8	530	28.00	8.53	72	1.83	0.21	0.03	0.00	0.00
3130200017	CHEMPRENE INC	Fabric Filter	00001	CHEMPRE2	587,562	4,596,470	186	56.69	32	9.75	294.3	70	50.93	15.52	18	0.46	0.00	0.00	0.44	0.06
3130200017	CHEMPRENE INC	Fabric Filter	00003	CHEMPRE3	587,562	4,596,470	186	56.69	24	7.32	299.8	80	67.91	20.70	15	0.38	0.00	0.00	0.41	0.05
3130200017	CHEMPRENE INC	Fabric Filter	00004	CHEMPRE4	587,562	4,596,470	186	56.69	26	7.92	294.3	70	57.83	17.63	15	0.38	0.00	0.00	0.35	0.04
3130200017	CHEMPRENE INC	Fabric Filter	00005	CHEMPRE5	587,562	4,596,470	186	56.69	26	7.92	294.3	70	69.98	21.33	21	0.53	0.00	0.00	0.82	0.10
3130200017	CHEMPRENE INC	Catalytic Oxidizer	00006	CHEMPRE6	587,562	4,596,470	186	56.69	41	12.50	549.8	530	28.00	8.53	72	1.83	0.21	0.03	0.00	0.00
3130200017	CHEMPRENE INC	20.9 mmBtu/hr NG/Oil Boiler	00007	CHEMPRE7	587,562	4,596,470	186	56.69	35	10.67	422.0	300	37.14	11.32	24	0.61	2.99	0.38	0.49	0.06
3130200017	CHEMPRENE INC	20.9 mmBtu/hr NG/Oil Boiler	00008	CHEMPRE8	587,562	4,596,470	186	56.69	35	10.67	422.0	300	37.14	11.32	24	0.61	2.99	0.38	0.49	0.06

Table 6-2: Multisource Maximum Modeled NAAQS Concentrations

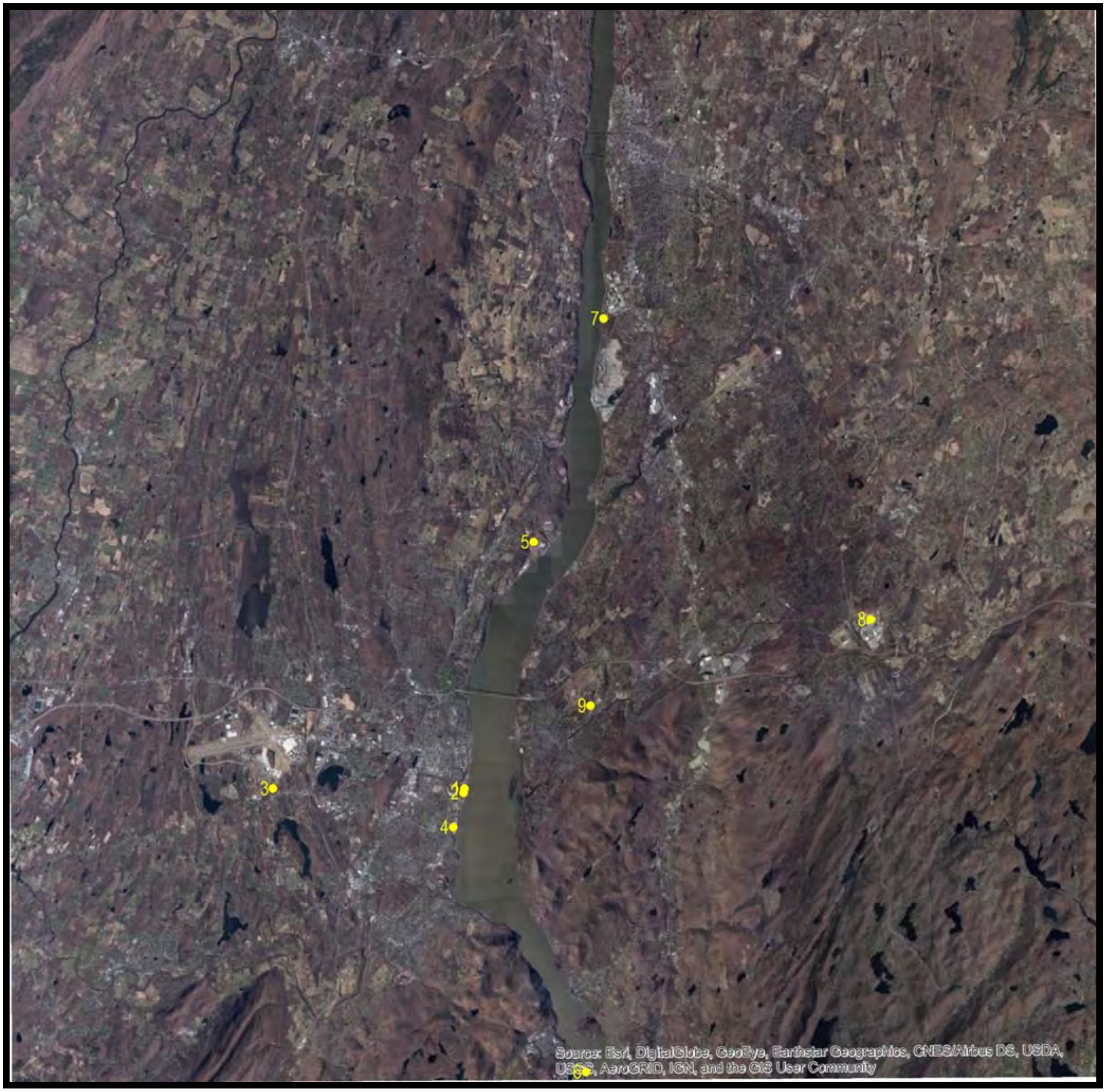
Pollutant	Averaging Period	NAAQS/NYAAQS (ug/m³)	Maximum Modeled Multisource Concentration (μg/m³)	Background Concentration (ug/m³)	Total Concentration (μg/m³)
PM-2.5	24-Hour	35	6.4	16.6	23.0
PM-10	24-Hour	150	14.2	32.0	46.2
PM-2.5	Annual	12	1.2	6.2	7.4
NO_2	1-Hour	188	235	-- [1]	235

Notes:

[1] Included in maximum modeled concentration based on results of PVMRM modeling assessment using AERMOD with background concentrations that vary by season and hour of day, as discussed in Section 6.2.

Table 6-3: Multisource Maximum Modeled PSD Increment Concentrations

Pollutant	Averaging Period	PSD Class II Increment (ug/m³)	Maximum Modeled Concentration (μg/m³)
PM-2.5	24-Hour	9	8.4
PM-10	24-Hour	30	14.2
PM-2.5	Annual	4	1.2



1. GLOBAL COMPANIES LLC - NEWBURGH TERMINAL
2. GLOBAL COMPANIES - NORTH TERMINAL
3. METAL CONTAINER CORP
4. GLOBAL COMPANIES - CARGO TERMINAL
5. ROSETON GENERATING STATION
6. US ARMY GARRISON
7. DUTCHESS CO RESOURCE RECOVERY FACILITY
8. GLOBAL FOUNDRIES EAST FISHKILL FACILITY
9. CHEMPRENE INC

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MULTISOURCE NAAQS AND PSD INCREMENT MODELING INVENTORY SOURCES

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE 6-1	**NOVEMBER 2019**

7.0 REFERENCES

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GE Energy Services, 2001. Gas Turbine Emissions Control (GE Power Systems, 2001).

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APPENDIX A

NYSDEC AIR PERMIT APPLICATION FORMS

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID	Application ID	Application Type
3 - 3 3 4 6 - 0 0 0 1 1	- - /	× State Facility Title V

Section I - Certification

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information required to complete this application, I believe the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Responsible Official William Reid	Title CEO
Signature W. R.	Date 11-11-19

Professional Engineer Certification

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments as they pertain to the practice of engineering. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Professional Engineer Jay Sarker	NYS License No. 091067
Signature J Sarker	Date 11/15/19

STATE OF NEW YORK
JAY SARKER
LICENSED PROFESSIONAL ENGINEER

Section II - Identification Information

Type of Permit Action Requested

New Renewal × Significant Modification Administrative Amendment Minor Modification

Application for the construction of a new facility × Application involves the construction of new emission unit(s)

Facility Information

Name Danskammer Energy Center	
Location Address 994 River Road	
× City / Town / Village Newburgh	Zip 12550

Owner/Firm Information

Name Danskammer Energy LLC			Business Taxpayer ID
Street Address 994 River Road			
City Newburgh	State/Province NY	Country US	Zip 12550

Owner Classification: Federal State Municipal × Corporation/Partnership Individual

Owner/Firm Contact Information

Name Ed Hall			Phone 845-563-9110
E-mail Address ehall@danskammerenergy.com			Fax
Affiliation Danskammer Energy LLC			Title
Street Address 994 River Road			
City Newburgh	State/Province NY	Country US	Zip 12550

Facility Contact Information

Name Ed Hall			Phone 845-563-9110
E-mail Address ehall@danskammerenergy.com			Fax
Affiliation Danskammer Energy LLC			Title
Street Address 994 River Road			
City Newburgh	State/Province NY	Country US	Zip 12550

New York State Department of Environmental Conservation
Air Permit Application

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
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Project Description ☒ Continuation Sheet(s)

Danskammer Energy, LLC (Danskammer Energy) is proposing to construct an approximately 536-megawatt (MW) primarily natural gas fired 1-on-1 combined cycle power facility (Danskammer Energy Center) on land at the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York. The Station's existing generators will be retired once the combined cycle plant is complete. The proposed Danskammer Energy Center will result in a new modern energy center through installation of state-of-the-art power generation equipment.

Section III - Facility Information

Facility Classification

☐ Hospital ☐ Residential ☐ Educational/Institutional ☐ Commercial ☐ Industrial ☒ Utility

Affected States (Title V Applications Only)

Vermont ☐ Massachusetts Rhode Island Pennsylvania Tribal Land: ___________________

☐ New Hampshire ☐ Connecticut ☐ New Jersey ☐ Ohio Tribal Land: ___________________

SIC Code(s)			NAICS Code(s)			
4911			221112			

Facility Description ☐ Continuation Sheet(s)

The Danskammer Energy Center (DEC) will consist of one (1) Mitsubishi M501JAC combustion turbine. Hot exhaust gases from the combustion turbine will flow into one (1) heat recovery steam generator (HRSG). The HRSG will be equipped with a natural gas fired duct burner. The HRSG will produce steam to be used in the steam turbine. Upon leaving the HRSG, the turbine exhaust gases will be directed to one (1) exhaust stack. Other ancillary combustion equipment includes a natural gas fired auxiliary boiler, exempt emergency diesel fire pumps, an exempt emergency diesel generator, and an exempt fuel oil storage tank. Danskammer Energy is proposing to utilize pipeline quality natural gas as the primary fuel for the combustion turbine and duct burners with ultra-low sulfur distillate fuel oil (ULSD) as a backup fuel for up to 720 full load hours per year.

Compliance Statements (Title V Applications Only)

I certify that as of the date of this application the facility is in compliance with all applicable requirements. ☐ Yes ☐ No

If one or more emission units at the facility are not in compliance with all applicable requirements at the time of signing this application (the 'NO' box must be checked), the noncomplying units must be identified in the "Compliance Plan" block on page 8 of this form along with the compliance plan information required. For all emission units at the facility that are operating <u>in compliance</u> with all applicable requirements, complete the following:

☐ This facility will continue to be operated and maintained in such a manner as to assure compliance for the duration of the permit, except those emission units referenced in the compliance plan portion of this application.

☐ For all emission units subject to any applicable requirements that will become effective during the term of the permit, this facility will meet such requirements on a timely basis.

☐ Compliance certification reports will be submitted at least once per year. Each report will certify compliance status with respect to each applicable requirement, and the method used to determine the status.

Facility Applicable Federal Requirements ☒ Continuation Sheet(s)

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	200	6						
6	NYCRR	201	6						
6	NYCRR	202	1	1					
6	NYCRR	215	2						

Facility State Only Requirements ☒ Continuation Sheet(s)

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	201	1	4					
6	NYCRR	201	5						
6	NYCRR	211		2					
6	NYCRR	242	1	5					

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Facility Compliance Certification

× Continuation Sheet(s)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
40	CFR	52	A	21	J				

× Applicable Federal Requirement
State Only Requirement

Capping	CAS Number	Contaminant Name

Monitoring Information

× Work Practice Involving Specific Operations | Ambient Air Monitoring | Record Keeping/Maintenance Procedures

Compliance Activity Description

Danskammer Energy LLC is proposing to burn natural gas as the primary fuel in the combustion turbine and duct burner with up to the full load equivalent of 720 hours of ULSD as a backup fuel. The sulfur content of the ULSD will be less than 15 ppm Sulfur by weight.

Work Practice Type Code	Process Material Code	Process Material Description	Reference Test Method
4	20	ULSD Fuel Oil	ASTM Method D2492 or equivalent

Monitored Parameter Code	Monitored Parameter Description	Manufacturer's Name/Model Number
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
15		22	PPM by weight

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
1	Maximum	14	As Delivered	10	Upon Request

Facility Emissions Summary

× Continuation Sheet(s)

CAS Number	Contaminant Name	Potential to Emit (tons/yr)	Actual Emissions (pounds/yr)
0NY075 - 00 - 5	PM-10	81.5	
0NY750 - 02 - 5	PM-2.5	81.5	
007446 - 09 - 5	Sulfur Dioxide	24.4	
0NY210 - 00 - 0	Oxides of Nitrogen	143.5	
000630 - 08 - 0	Carbon Monoxide	115.6	
007439 - 92 - 1	Lead (elemental)	0.02	
0NY998 - 00 - 0	Total Volatile Organic Compounds	58.6	
0NY100 - 00 - 0	Total Hazardous Air Pollutants	8.9	
0NY750 - 00 - 0	Carbon Dioxide Equivalents	1,954,952	
07664-93-9	Sulfuric Acid	22.1	
07664-41-7	Ammonia	116.7	
106-99-0	1,3 Butadiene	0.025	

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Section IV - Emission Unit Information

Emission Unit Description	☒ Continuation Sheet(s)
Emission Unit	U - D E C 0 1

Emission unit U-DEC01 represents a Mitsubishi 501JAC combustion turbine rated at 3,302 MMBtu/hr when firing natural gas and 3,315 MMBtu/hr when firing ULSD at 0 degrees F and 100% load. The HRSG will be equipped with a natural gas fired duct burner rated at 744 MMBtu/hr.

Building Information ☐ Continuation Sheet(s)

Building ID	Building Name	Length (ft)	Width (ft)	Orientation
HRSG	Heat Recover Steam Generator			
AuxBoil	Auxiliary Boiler Building			

Emission Unit Emissions Summary ☐ Continuation Sheet(s)

Emission Unit: -

CAS Number	Contaminant Name			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS Number	Contaminant Name			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS Number	Contaminant Name			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
CAS Number	Contaminant Name			
ERP (lbs/yr)	Potential to Emit		Actual Emissions	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)

New York State Department of Environmental Conservation
Air Permit Application

DEC ID
3-3346-00011

Emission Point Information ☐ Continuation Sheet(s)

Emission Point	DEC01					
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
11	200	79	276	174		
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
55.9	1,392,317	586.145	4602.744			
Emission Point	DEC02					
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
20	50	20	36	305		
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
51.6	21,900	585.985	4602.902	AuxBoil		
Emission Point	DECEG					
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
20	15		18	965		
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
114.2	12,105	586.000	4602.918			

Emission Source/Control Information ☒ Continuation Sheet(s)

Emission Source ID	Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
TURB1	C						
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
3,315	K	MMBtu/hr					
Emission Source ID	Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
SCR01	K				33	Selective Catalytic Reduction	
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
Emission Source ID	Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model Number
0XC01	K				110	Oxidation Catalyst	
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

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Process Information			☒ Continuation Sheet(s)
Emission Unit	U-DEC01	Process	001

Process Description

Process 001 for Emission Unit U-DEC01 represents natural gas firing in the combustion turbine without operation of the duct burner. For this process, dry-Low NOx burners and SCR are used to control NOx emissions and an oxidation catalyst is used to control CO and VOC emissions.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01				

	Operating Schedule		Building	Floor/Location
☐ Confidential ☒ Operating at Maximum Capacity	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

DEC01						

Emission Source/Control Identifier(s)

TURB1	DLN01	SCR01	OXC01			

Emission Unit	U-DEC01	Process	002

Process Description

Process 002 for Emission Unit U-DEC01 represents natural gas firing in the combustion turbine with operation of the duct burner. For this process, dry-Low NOx burners and SCR are used to control NOx emissions and an oxidation catalyst is used to control CO and VOC emissions.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01				

	Operating Schedule		Building	Floor/Location
☐ Confidential ☐ Operating at Maximum Capacity	Hours/Day	Days/Year		
	24	365		

Emission Point Identifier(s)

DEC01						

Emission Source/Control Identifier(s)

TURB1	DLN01	SCR01	OXC01			

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Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements							☒ Continuation Sheet(s)		
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Cl.	Subcl.
U-DEC01	DEC01	001-003	TURB1	40	CFR	60	A						
U-DEC01	DEC01	001-003	TURB1	40	CFR	60	KKKK						
U-DEC01	DEC01	001-003	TURB1	40	CFR	60	TTTT						
U-DEC01	DEC01	001-003	TURB1	6	NYCRR	201	6						

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements							☐ Continuation Sheet(s)		
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Cl.	Subcl.
U-DEC01	DEC01	001-003	TURB1	6	NYCRR	201	251	3					

Emission Unit Compliance Certification ☒ Continuation Sheet(s)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6						

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS Number	Contaminant Name
U-DEC01	DEC01	001/002	TURB1	NY210-00-0	Oxides of Nitrogen

Monitoring Information

☒ Continuous Emission Monitoring ☐ Monitoring of a Process or Control Device Parameters as a Surrogate
☐ Intermittent Emission Testing ☐ Work Practice Involving Specific Operations
☐ Ambient Air Monitoring ☐ Record Keeping/Maintenance Procedures

Compliance Activity Description

2.0 ppmvd (corrected to 15% O2) NOx emission limit for the combustion turbine firing natural gas and with or without operation of the natural gas fired duct burner. This limit applies at all normal operating loads and excludes periods of startup and shutdown. A CEMs will monitor NOx emissions The emission limit represents LAER.

Work Practice Type Code	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 75

Monitored Parameter Code	Monitored Parameter Description	Manufacturer's Name/Model Number
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.0		275	ppmvd (dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-hr Block Average	1	Continuous	13	Quarterly (Calendar)

DEC ID											
3	-	3	3	4	6	-	0	0	0	1	1

Supporting Documentation and Attachments	
Required Supporting Documentation	Date of Document
× List of Exempt Activities (attach form)	
× Plot Plan	
× Process Flow Diagram	
Methods Used to Determine Compliance (attach form)	
× Emissions Calculations	
Optional Supporting Documentation	Date of Document
× Air Quality Model	
Confidentiality Justification	
Ambient Air Quality Monitoring Plan or Reports	
Stack Test Protocol	
Stack Test Report	
Continuous Emissions Monitoring Plan	
× Lowest Achievable Emission Rate (LAER) Demonstration	
× Best Available Control Technology (BACT) Demonstration	
Reasonably Available Control Technology (RACT) Demonstration	
× Toxic Impact Assessment (TIA)	
Environmental Rating Demonstration	
Operational Flexibility Protocol/Description of Alternate Operating Scenarios	
Title IV Permit Application	
× Emission Reduction Credit (ERC) Quantification (attach form)	
× Baseline Period Demonstration	
× Use of Emission Reduction Credits (attach form)	
× Analysis of Contemporaneous Emissions Increase/Decrease	
Other Supporting Documentation	Date of Document

DEC ID											
3	-	3	3	4	6	-	0	0	0	1	1

Section II - Identification Information

Project Description (continuation)

The proposed Project is located in a U.S. EPA designated attainment area for sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), particulate matter (PM) with an aerodynamic diameter less than 10 micrometers (m) (PM-10), particulate matter with an aerodynamic diameter less than 2.5 m (PM-2.5), and ozone. The existing Danskammer Generating Station is a fossil fuel fired steam electric plant with a heat input capacity greater than 250 MMBtu/hr with potential emissions greater than 100 tons per year of any regulated criteria air pollutant. Thus, the existing facility is considered a major stationary source based upon the 6 New York Codes, Rules and Regulations (NYCRR) Part 231 (Part 231) New Source Review (NSR) regulation. Major modifications to existing major sources are subject to 6 NYCRR Part 231 and U.S. EPA Prevention of Significant Deterioration (PSD) review, if net emissions increases are above the significant increase thresholds. The proposed net emission increases for one or more criteria air pollutants may exceed the Part 231 significant increase thresholds and as such, the proposed Danskammer Energy Center will be subject to Part 231 and PSD review.

A discussion of the NSR applicability analysis, including an analysis of ERCs, is provided in the Part 201/231 Application support document, Section 3. A detailed evaluation of BACT and LAER control technology requirements is provided in Section 4.

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Section III - Facility Information

Facility Applicable Federal Requirements (continuation)									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	200	7						
6	NYCRR	201	3						
6	NYCRR	201	7						
6	NYCRR	202	2						
6	NYCRR	207							
6	NYCRR	211							
6	NYCRR	215							
6	NYCRR	221							
6	NYCRR	231	6						
6	NYCRR	231	8						
6	NYCRR	231	13						
6	NYCRR	243							
6	NYCRR	244							
6	NYCRR	245							
6	NYCRR	614							
6	NYCRR	225	1						
40	CFR	60	Kb						
40	CFR	60	IIII						
40	CFR	75							
40	CFR	52	HH						

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Section III - Facility Information

Facility State Only Requirements (continuation)									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	251							
19	ECL	0301							

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Section III - Facility Information

Facility Compliance Certification (continuation)									
Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
40	NYCRR	211		2					

☐ Applicable Federal Requirement
☐ State Only Requirement
☐ Capping

CAS No.	Contaminant Name

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

Compliance demonstrated during initial testing and upon request.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR 60, Appendix A, Method 9

Parameter Code	Parameter Description	Manufacturer Name/Model No.
	Opacity	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
20		136	Percent

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
18	6 minutes	13	Single Occurence	10	Upon Request

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Section III - Facility Information

Facility Compliance Certification (continuation)									
Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

		CAS No.	Contaminant Name
☒ Applicable Federal Requirement ☐ State Only Requirement	☐ Capping		Sulfur Content

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☒ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The ULSD sulfur content is limited to 0.0015% by weight per 6 NYCRR Part 225. The sulfur content of the ULSD will be certified by the vendor. The sulfur content of 0.0015% by weight represents BACT for sulfur acid emissions from the emergency diesel generator and emergency fire pump.

Work Practice	Process Material		Reference Test Method
Type	Code	Description	
04	007	ULSD	

Parameter		Manufacturer Name/Model No.
Code	Description	
32	Sulfur Content	

Limit		Limit Units	
Upper	Lower	Code	Description
0.0015		57	Percent by Weight

Averaging Method		Monitoring Frequency		Reporting Requirements	
Code	Description	Code	Description	Code	Description
01	Maximum	11	Per Delivery	8	Semiannually

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Section III - Facility Information

Facility Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

- ☒ Applicable Federal Requirement
- ☐ State Only Requirement
- ☐ Capping

CAS No.	Contaminant Name
	Sulfur Content

Monitoring Information

- ☐ Continuous Emission Monitoring
- ☐ Intermittent Emission Testing
- ☐ Ambient Air Monitoring
- ☐ Monitoring of Process or Control Device Parameters as a Surrogate
- ☒ Work Practice Involving Specific Operations
- ☐ Record Keeping/Maintenance Procedures

Description

To satisfy NSPS and BACT requirements for SO2 and sulfur acid, the combustion turbine, duct burner, and the auxiliary boiler will not fire natural gas with a sulfur content greater than 0.5 grains/100 scf. The sulfur content of the natural gas will be verified through a certification or analysis provided by the fuel supplier and monitored by the facility. The facility will keep the records onsite for a minimum of five years and those records will be made available to the Department upon request.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
04	12	Natural Gas	

Parameter Code	Parameter Description	Manufacturer Name/Model No.
32	Sulfur Content	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.5		13	Grains per 100 dscf

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Maximum	16	as required - see monitoring description	10	upon request by regulatory agency

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Section III - Facility Information

Facility Emissions Summary (continuation)				
CAS No.	Contaminant Name	PTE (lbs/yr)	PTE Range	Actual (lbs/yr)
56-49-5	3-Methylchloranthrene	0.01		
57-97-6	7,12 - Dimethylbenz(a)anthracene	0.06		
83-32-9	Acenaphthene	0.03		
208-96-8	Acenapthylene	0.06		
75-07-0	Acetaldehyde	1,137		
107-02-8	Acrolein	185		
120-12-7	Anthracene	0.02		
07440-38-2	Arsenic	27		
56-55-3	Benz(a)anthracene	0.01		
71-43-2	Benzene	456		
50-32-8	Benzo(a)pyrene	0.01		
205-99-2	Benzo(b)fluoranthene	0.01		
191-24-2	Benzo(g,h,i)perylene	0.01		
207-08-9	Benzo(k)fluoranthene	0.01		
07740-41-7	Beryllium	0.8		
07740-43-9	Cadmium	15.4		
07740-47-3	Chromium	31.3		
218-01-9	Chrysene	0.01		
07740-48-4	Cobalt	0.3		
53-70-3	Dibenzo(a,h)anthracene	0.01		
106-46-7	Dichlorobenzene	4.3		
100-41-4	Ethylbenzene	915		
206-44-0	Fluoranthene	0.04		
7782-96-5	Fluorene	0.11		
50-00-0	Formaldehyde	6,099		
110-54-3	Hexane	6.14		
193-39-5	Indeno(1,2,3-cd)pyrene	0.01		
07439-92-1	Lead	35.2		
07439-96-5	Manganese	1,887		
07439-97-6	Mercury	3.8		

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Section III - Facility Information

Facility Emissions Summary (continuation)				
CAS No.	Contaminant Name	PTE		Actual (lbs/yr)
		(lbs/yr)	Range	
133-02-7	Xylene	1,839		
91-20-3	Naphthalene	119.1		
0770-02-0	Nickel	18.5		
130498-29-2	PAH	155.1		
85-01-8	Phenanthrene	0.3		
75-56-9	Propylene Oxide	821		
129-00-0	Pyrene	0.04		
07782-49-2	Selenium	59.8		
108-88-3	Toluene	3,716		

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Section IV - Emission Unit Information

Emission Unit Description (continuation)	
Emission Unit	U-DEC02

Danskammer Energy is proposing to install and operate one (1) auxiliary boiler. The auxiliary boiler will have a maximum heat input of 96.0 MMBtu/hr (HHV) and will combust natural gas. Auxiliary boiler operation will not exceed the equivalent of 4,800 hours per year of full load operation and be permitted to operate simultaneously with the combustion turbines. The proposed boiler will be equipped with low-NOx burners to control NOx emissions. Low sulfur fuels will minimize the formation of PM/PM-10/PM-2.5 and SO2. Good combustion practices and design will minimize CO and VOC emissions.

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Section IV - Emission Unit Information

Emission Unit Description (continuation)	
Emission Unit	U - D E C E G

Emission Unit U-DECEG represents one emergency diesel generator combusting ULSD. Maximum operation of the emergency diesel generator will be limited to 250 hours per year.

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Section IV - Emission Unit Information

Emission Unit Description (continuation)	
Emission Unit	U - D E C F P

Emission Unit U-DECFP represents one emergency fire pump combusting ULSD. Maximum operation of the fire pump will be limited to 250 hours per year.

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Section IV - Emission Unit Information

Emission Point Information (continuation)

Emission Unit	U-DECFP			Emission Point	DECFP	
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
20	15		6	1076		
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (km)	NYTM (N) (km)	Building	Distance to Property Line (ft)	Date of Removal
161.2	1,899	585.998	4602.837			

Emission Unit	-			Emission Point		
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (km)	NYTM (N) (km)	Building	Distance to Property Line (ft)	Date of Removal

Emission Unit	-			Emission Point		
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (km)	NYTM (N) (km)	Building	Distance to Property Line (ft)	Date of Removal

Emission Unit	-			Emission Point		
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (km)	NYTM (N) (km)	Building	Distance to Property Line (ft)	Date of Removal

Emission Unit	-			Emission Point		
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section Length (in)	Cross Section Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (km)	NYTM (N) (km)	Building	Distance to Property Line (ft)	Date of Removal

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Section IV - Emission Unit Information

Emission Source/Control (continuation)

Emission Unit: U-DEC01

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
DLN01	K				102	Dry Low-NOx Burner	

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
WI01	K				526	Water Injection	

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

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Section IV - Emission Unit Information

Emission Source/Control (continuation)

Emission Unit: U-DEC02

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
AUXB1	C						

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
96	25	MMBtu/hr				

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
LNB01	K				102	Low NOx Burner	

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

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Section IV - Emission Unit Information

Emission Source/Control (continuation)							
Emission Unit	U-DECEG						
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
DECEG	C						
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
2,000	91	Kilowatts					
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units		Waste Feed		Waste Type		
	Code	Description	Code	Description	Code	Description	

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Section IV - Emission Unit Information

Emission Source/Control (continuation)							
Emission Unit	U-DECFP						
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
DECFP	C						
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
327	30	horsepower					
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description
Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
Design Capacity	Design Capacity Units Code	Design Capacity Units Description		Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

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Section IV - Emission Unit Information

Process Information (continuation)

Emission Unit	U-DEC01	Process	003

Description

Process 003 for Emission Unit U-DEC01 represents ULSD firing in combined cycle combustion turbine. For this process, water injection and Selective Catalytic Reduction are used to control NOx emissions. An oxidation catalyst will be used to control emissions of carbon monoxide and VOC.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
1-02-006-01				

	Operating Schedule		Building	Floor/Location
	Hrs/Day	Days/Yr		
☐ Confidential ☒ Operating at Maximum Capacity	24	365		

Emission Point Identifier(s)

DEC01						

Emission Source/Control Identifier(s)

TURB1	SCR01	OXC01	WI01			

Emission Unit	U-DEC02	Process	001

Description

Process 001 for Emission Unit U-DEC02 represents natural gas firing in the auxiliary boiler.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
1-02-006-02				

	Operating Schedule		Building	Floor/Location
	Hrs/Day	Days/Yr		
☐ Confidential ☒ Operating at Maximum Capacity	24	365	AUXB	GROUND

Emission Point Identifier(s)

DEC02						

Emission Source/Control Identifier(s)

AUXB1	LNB01					

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Section IV - Emission Unit Information

Process Information (continuation)

Emission Unit	U-DECEG	Process	001

Description

Emergency diesel generator firing ULSD.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01				

	Operating Schedule		Building	Floor/Location
☐ Confidential ☐ Operating at Maximum Capacity	Hrs/Day	Days/Yr		

Emission Point Identifier(s)

DEGEG						

Emission Source/Control Identifier(s)

DECEG						

Emission Unit	E-DECFP	Process	001

Description

Emergency fire pump firing ULSD.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2-01-002-01				

	Operating Schedule		Building	Floor/Location
☐ Confidential ☐ Operating at Maximum Capacity	Hrs/Day	Days/Yr		

Emission Point Identifier(s)

DECFP						

Emission Source/Control Identifier(s)

DECFP						

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	001	TURB1	000630-08-0	Carbon Monoxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 1.0 ppmvd (corrected to 15% O2) CO emission limit when firing natural gas from the combustion turbine without operation of the duct burner. The emission limits applies at all normal operating loads, and excludes periods of startup and shutdown. The facility will use CEMs to monitor CO emissions from the combustion turbine. This emission limit represents BACT.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
1.0		275	ppmvd (dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	13	Quarterly

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	002	TURB1	000630-08-0	Carbon Monoxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 2.0 ppmvd (corrected to 15% O2) CO emission limit when firing natural gas from the combustion turbine with operation of the duct burner. The emission limits applies at all normal operating loads, and excludes periods of startup and shutdown. The facility will use CEMs to monitor CO emissions from the combustion turbine. This emission limit represents BACT.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.0		275	ppmvd (dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	13	Quarterly

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	003	TURB1	000630-08-0	Carbon Monoxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 2.0 ppmvd (corrected to 15% O2) CO emission limit from the combustion turbine when firing ULSD. The emission limits applies at all normal operating loads, and excludes periods of startup and shutdown. The facility will use CEMs to monitor CO emissions from the combustion turbine. This emission limit represents BACT.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.0		275	ppmvd (dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	13	Quarterly

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	001	TURB1		

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will achieve a heat rate of 6,925 Btu/KW-hr Gross (HHV) at ISO conditions during natural gas operation and at baseload without duct firing. This heat rate will be demonstrated during an initial performance test.

The heat rate above is corrected to ISO conditions of:
- Ambient Dry Bulb Temperature: 59°F
- Ambient Relative Humidity: 60%
- Barometric Pressure: 14.7 psia
- Fuel (natural gas) Higher Heating Value: 23,152 Btu/lb

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
6,925		07	BTU per kilowatt-hour

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	251	3	a					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	001/002/003	TURB1	000124-38-9	Carbon Dioxide

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will achieve an emission rate of 925 pounds of CO2 per MW hour gross electrical output (output-based limit). These emission limits are measured on a 12-month rolling average basis, calculated by dividing the annual total of CO2 emissions over the relevant 12-month period by the annual total (gross) MW generated (output-based limit).

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
925			pounds CO2 per MW-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
17	Annual maximum rolled monthly	01	Continuous	13	Quarterly

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	001/002	TURB1	007664-93-9	Sulfuric Acid

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0014 lb/MMBtu Sulfuric Acid emission limit from the combustion turbine during natural gas firing (with or without operation of the natural gas fired duct burner). The emission limit applies at all normal operating loads and excludes periods of startup and shutdown. Stack testing will be used to demonstrate compliance with the BACT emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA Approved

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0014		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	003	TURB1	007664-93-9	Sulfuric Acid

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0015 lb/MMBtu Sulfuric Acid emission limit from the combustion turbine during ULSD firing. The emission limit applies at all normal operating loads and excludes periods of startup and shutdown. Stack testing will be used to demonstrate compliance with the BACT emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA Approved

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0015		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	200	7						

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	001/002/003	TURB1	007664-41-7	Ammonia

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 5.0 ppmvd (corrected to 15% O2) ammonia emission limit when firing natural gas from the combustion turbine without operation of the duct burner. This limit will also apply when firing ULSD. The emission limits applies at all normal operating loads, and excludes periods of startup and shutdown. The facility will use CEMs to monitor ammonia emissions from the combustion turbine.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR 75 & 40 CFR 60, Appendices A/B/F

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
5.0		275	ppmvd (dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	13	Quarterly

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	003	TURB1	0NY210-00-0	Oxides of Nitrogen

Monitoring Information

☒ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 4.0 ppmvd (corrected to 15% O2) NOx emission limit when firing fuel oil from the combustion turbine. The emission limits applies at all normal operating loads, and excludes periods of startup and shutdown. The facility will use CEMs to monitor NOx emissions from the combustion turbine. This emission limit represents LAER.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 75

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
4.0		275	ppmdv (dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
47	3-Hour Block Average	01	Continuous	13	Quarterly

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	001	TURB1	0NY075-00-0	Particulates

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0040 lb/MMBtu PM emission limit from the combustion turbine during natural gas firing without operation of the duct burner. The emission limit applies at all normal operating loads and excludes periods of startup and shutdown. Stack testing will be used to demonstrate compliance with the BACT emission limit. Testing methods for particulate matter will quantify the emissions of PM-10 and PM-2.5 and both filterable and condensable particulate matter will be included.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA Reference Method 5, Methods 201/201A/202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0040		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	002	TURB1	ONY075-00-0	Particulates

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0055 lb/MMBtu PM emission limit from the combustion turbine during natural gas firing with operation of the duct burner. The emission limit applies at all normal operating loads and excludes periods of startup and shutdown. Stack testing will be used to demonstrate compliance with the BACT emission limit. Testing methods for particulate matter will quantify the emissions of PM-10 and PM-2.5 and both filterable and condensable particulate matter will be included.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA Reference Method 5, Methods 201/201A/202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0055		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	003	TURB1	ONY075-00-0	Particulates

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0089 lb/MMBtu PM emission limit from the combustion turbine during ULSD firing. The emission limit applies at all normal operating loads and excludes periods of startup and shutdown. Stack testing will be used to demonstrate compliance with the BACT emission limit. Testing methods for particulate matter will quantify the emissions of PM-10 and PM-2.5 and both filterable and condensable particulate matter will be included.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA Reference Method 5, Methods 201/201A/202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0089		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	001	TURB1	0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.7 ppmvd (dry, corrected to 15% O2) VOC emission limit from the combustion turbine during natural gas firing without operation of the duct burner. The emission limit applies at all normal operating loads and excludes periods of startup and shutdown. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.7		275	ppmvd(dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

DEC ID
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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	002	TURB1	0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 1.6 ppmvd (dry, corrected to 15% O2) VOC emission limit from the combustion turbine during natural gas firing with operation of the duct burner. The emission limit applies at all normal operating loads and excludes periods of startup and shutdown. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
1.6		275	ppmvd(dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC01	DEC01	003	TURB1	0NY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 2.0 ppmvd (dry, corrected to 15% O2) VOC emission limit from the combustion turbine during ULSD firing. The emission limit applies at all normal operating loads and excludes periods of startup and shutdown. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.0		275	ppmvd(dry, corrected to 15% O2)

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

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Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC02	DEC02	001	AUXB1	000630-08-0	Carbon Monoxide

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☒ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.037 lb/MMBtu CO emission limit from the auxiliary boiler during natural gas firing. The facility will use vendor emission guarantees and/or stack testing to ensure compliance with the BACT emission limit, as required.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 10

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.037		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3346-00011

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC02	DEC02	001	AUXB1	0NY210-00-0	Oxides of Nitrogen

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0086 lb/MMBtu NOx emission limit from the auxiliary boiler during natural gas firing. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 7E

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0086		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

Continuation Sheet ____ of ____

DEC ID
3-3346-00011

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC02	DEC02	001	AUXB1	ONY075-00-0	Particulates

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☒ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0074 lb/MMBtu PM emission limit from the auxiliary boiler during natural gas firing. The facility will use vendor emission guarantees and/or stack testing to ensure compliance with the BACT emission limit for PM-10/PM-2.5, as required.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			EPA Reference Method 5, 201A/201, and 202

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0074		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3-3346-00011

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DEC02	DEC02	001	AUXB1	ONY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☒ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☐ Record Keeping/Maintenance Procedures

Description

The facility will maintain a 0.0017 lb/MMBtu VOC emission limit from the auxiliary boiler during natural gas firing. Stack testing will be used to demonstrate compliance with the LAER emission limit.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method
			40 CFR Part 60, Appendix A, Method 25A, Method 18

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.0017		07	lb/MMBtu

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	17	Once during the term of the permit	01	once / batch or monitoring occurrence

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3346-00011

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DECEG	DECEG	001	DECEG	000630-08-0	Carbon Monoxide

Monitoring Information

- ☐ Continuous Emission Monitoring
- ☐ Intermittent Emission Testing
- ☐ Ambient Air Monitoring
- ☐ Monitoring of Process or Control Device Parameters as a Surrogate
- ☐ Work Practice Involving Specific Operations
- ☒ Record Keeping/Maintenance Procedures

Description

Facility will operate an emergency generator engine that will be certified to meet the federal emission standards under 40 CFR 60 Subpart IIII for the current model years. Thus the engine will maintain a CO emission rate of 2.6 g/hp-hr in accordance with 40 CFR 60.4202(a)(2) and 40 CFR 89.112(a), Table 1. Compliance with these federal limits is also considered BACT. Compliance will be demonstrated via certification by the vendor and adherence to vendor specified maintenance recommendations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.6		319	g/hp-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	16	as required - see monitoring description	16	as required - see monitoring description

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 4 6 - 0 0 0 1 1

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DECEG	DECEG	001	DECEG	ONY210-00-0	Oxides of Nitrogen

Monitoring Information

- ☐ Continuous Emission Monitoring
- ☐ Intermittent Emission Testing
- ☐ Ambient Air Monitoring
- ☐ Monitoring of Process or Control Device Parameters as a Surrogate
- ☐ Work Practice Involving Specific Operations
- ☒ Record Keeping/Maintenance Procedures

Description

Facility will operate an emergency generator engine that will be certified to meet the federal emission standards under 40 CFR 60 Subpart IIII for the current model years. Thus, the engine will maintain a NOx + HC emission rate of 4.8 g/hp-hr in accordance with 40 CFR 60.4202(a)(2) and 40 CFR 89.112(a), Table 1. Compliance with these federal limits is also considered LAER. Compliance will be demonstrated via certification by the vendor and adherence to vendor specified maintenance recommendations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
4.8		319	g/hp-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	16	as required - see monitoring description	16	as required - see monitoring description

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3346-00011

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DECEG	DECEG	001	DECEG	ONY075-00-0	Particulates

Monitoring Information

☐ Continuous Emission Monitoring ☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Intermittent Emission Testing ☐ Work Practice Involving Specific Operations
☐ Ambient Air Monitoring ☒ Record Keeping/Maintenance Procedures

Description

Facility will operate an emergency generator engine that will be certified to meet the federal emission standards under 40 CFR 60 Subpart IIII for the current model years. Thus, the engine will maintain a PM emission rate of 0.15 g/hp-hr in accordance with 40 CFR 60.4202(a)(2) and 40 CFR 89.112(a), Table 1. Compliance with these federal limits is also considered BACT. Compliance will be demonstrated via certification by the vendor and adherence to vendor specified maintenance recommendations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.15		319	g/hp-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	16	as required - see monitoring description	16	as required - see monitoring description

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3-3346-00011

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DECEG	DECEG	001	DECEG	ONY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☒ Record Keeping/Maintenance Procedures

Description

Facility will operate an emergency generator engine that will be certified to meet the federal emission standards under 40 CFR 60 Subpart IIII for the current model years. Thus, the engine will maintain a NOx + HC emission rate of 4.8 g/hp-hr and a VOC emission rate limit of 0.28 g/hp/hr in accordance with 40 CFR 60.4202(b)(2) and 40 CFR 89.112(a), Table 1. Compliance with these federal limits is also considered LEAR. Compliance will be demonstrated via certification by the vendor and adherence to vendor specified maintenance recommendations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.28		319	g/hp-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	16	as required - see monitoring description	16	as required - see monitoring description

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID											
3	-	3	3	4	6	-	0	0	0	1	1

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DECFP	DECFP	001	DECFP	000630-08-0	Carbon Monoxide

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☒ Record Keeping/Maintenance Procedures

Description

To comply with 40 CFR Part 60, Subpart IIII, the fire pump engine must meet the emission standards per Table 4 of this Subpart. The fire pump engine has a CO emission rate limit of 2.6 g/hp-hr. Compliance with this federal limit is also considered BACT. Compliance will be demonstrated via certification by the vendor and adherence to vendor specified maintenance recommendations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
2.6		319	g/hp-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	16	as required - see monitoring description	16	as required - see monitoring description

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

DEC ID
3-3346-00011

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DECFP	DECFP	001	DECFP	ONY210-00-0	Oxides of Nitrogen

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☒ Record Keeping/Maintenance Procedures

Description

Facility will operate an emergency fire pump engine that will be certified to meet the federal emission standards under 40 CFR 60 Subpart IIII for the current model years. Thus, the engine will maintain a NOx + HC emission rate of 3.0 g/hp-hr. Compliance with these federal limits is also considered LAER. Compliance will be demonstrated via certification by the vendor and adherence to vendor specified maintenance recommendations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
3.0		319	g/hp-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	16	as required - see monitoring description	16	as required - see monitoring description

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3-3346-00011

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)									
Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	8	7					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DECFP	DECFP	001	DECFP	ONY075-00-0	Particulates

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☒ Record Keeping/Maintenance Procedures

Description

To comply with 40 CFR Part 60, Subpart IIII, the fire pump engine must meet the emission standards per Table 4 of this Subpart. The fire pump engine has a particulate matter limit of 0.15 g/hp-hr. Compliance with this federal limit is also considered BACT. Compliance will be demonstrated via certification by the vendor and adherence to vendor specified maintenance recommendations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.15		319	g/hp-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	16	as required - see monitoring description	16	as required - see monitoring description

Continuation Sheet ____ of ____

New York State Department of Environmental Conservation
Air Permit Application Form

DEC ID
3 - 3 3 4 6 - 0 0 0 1 1

Section IV - Emission Unit Information

Emission Unit Compliance Certification (continuation)

Rule Citation

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	231	6	5					

☒ Applicable Federal Requirement ☐ State Only Requirement ☐ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
U-DECFP	DECFP	001	DECFP	ONY998-00-0	VOC

Monitoring Information

☐ Continuous Emission Monitoring
☐ Intermittent Emission Testing
☐ Ambient Air Monitoring
☐ Monitoring of Process or Control Device Parameters as a Surrogate
☐ Work Practice Involving Specific Operations
☒ Record Keeping/Maintenance Procedures

Description

Facility will operate an emergency fire pump engine that will be certified to meet the federal emission standards under 40 CFR 60 Subpart IIII for the current model years. Thus, the engine will maintain a NOx + HC emission rate of 3.0 g/hp-hr and a VOC emission rate limit of 0.12 g/hp/hr. Compliance with these federal limits is also considered LEAR. Compliance will be demonstrated via certification by the vendor and adherence to vendor specified maintenance recommendations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
0.12		319	g/hp-hr

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
08	1-Hour Average	16	as required - see monitoring description	16	as required - see monitoring description

Continuation Sheet ____ of ____

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air Resources, Bureau of Stationary Sources
625 Broadway, Albany, New York 12233-3254
P: (518) 402-8403 | F: (518) 402-9035
www.dec.ny.gov

USE OF EMISSION REDUCTION CREDITS (ERC) FORM *

☒ FACILITY ☐ BROKER / ☒ USING ☐ PURCHASING ERC (check appropriate boxes)
(Facility) / (Broker) Name: Danskammer Energy Center DEC ID#: 3-3346-00011
Address: 994 River Road, Newburgh, NY 12550
Proposed Project Description: Repowering of existing Danskammer Generating Station site.
Contact Name:__________ Phone #:__________
Name of Authorized Representative:__________ Title:__________
Signature of Authorized Representative:__________ Date: / /

☒ FACILITY ☐ BROKER / ☒ CREATING ☐ TRANSFERRING ERC (check appropriate boxes)
(Facility) / (Broker) Name: Danskammer Generating Station DEC ID#: 3-3346-00011
Address: 994 River Road, Newburgh, NY 12550

ERC Emission Source ID#(s) / ERC tpy: U-D0001 / U-D0002 ; U-D0003 / ____ ;
U-D0004 / ____ ; ____ / ____ ; **or**

ERC Emission Unit ID#(s) / ERC tpy: ____ / ____ ; ____ / ____ ;
____ / ____ ; ____ / ____ ;

Reduction Mechanism: Emission Unit Shutdown
Name of Authorized Representative:__________ Title:__________
Signature of Authorized Representative:__________ Date: / /

AMOUNT OF EMISSION REDUCTION CREDIT BEING ☒ USED / ☐ TRANSFERRED

(complete all that apply)

Pollutant	offsets	netting	Pollutant	offsets	netting
NOx	____ tpy	44.2 tpy	PM-10	____ tpy	2.9 tpy
VOC	____ tpy	2.1 tpy	PM-2.5	____ tpy	2.9 tpy
SO_2	____ tpy	27.1 tpy			

***NOTE:** Any previous Use of ERC Forms associated with the ERCs being used or transferred with this transaction must be attached.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air Resources, Bureau of Stationary Sources
625 Broadway, Albany, New York 12233-3254
P: (518) 402-8403 | F: (518) 402-9035
www.dec.ny.gov

EMISSION REDUCTION CREDIT (ERC) QUANTIFICATION FORM

(Use This Form For Part 231 Nonattainment Contaminants Only)

(NOTE: NO_x, VOC & PM-10 EMISSION REDUCTIONS PRIOR TO 11/15/90 CANNOT BE APPROVED)

Name of Facility Creating ERC(s): Danskammer Generating Station

Address: 994 River Road, Newburgh, NY 12550

DEC ID#: 3-3346-00011 Emission Source ID#: U-D0001,U-D0002,U-D0003,U-D0004

Contact Name: ____________ Title: ____________ Phone #: ____________

NOTE: Contact name and phone number will be entered into the NYS ERC Registry which is available on DEC's website.

____________________ (print name of facility's authorized representative) **certify that the information contained herein is true to the best of my knowledge, information and belief.**

Signature: ____________ Title: ____________ Date: ___/___/___

Reduction Type (check one box): ☐ **Past** ☒ **Future* (Note: Must be linked to proposed major facility or modification to be eligible for approval – Ref: 231-10.1(o))**

***Provide The Following Information For The Facility Proposing To Use The Future ERC(s):**

Facility Name: Danskammer Energy Center DEC ID#: 3-3346-00011

Address: 994 River Road, Newburgh, NY 12550

Preparer's Name: ____________ Title: ____________

FOR DEC USE ONLY

Approved ERCs

VOC: ______TPY NO_X: ______TPY Permit Number: ____________

PM-10: ______TPY ENB Notice Date: ___/___/___

Reviewer's Name: ____________ Permit Mod Issuance Date: ___/___/___

Signature: ____________ Permit Surrender Date: ___/___/___

Date: ___/___/___ ERC Approval Letter Date: ___/___/___

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Determination of the Baseline Period for the reduction(s)

A.1 Emission Reduction Nonattainment Contaminant (circle **all** that apply to a specific emission reduction action at an emission source):

NO_x VOC PM-10

A.2 Emission Reduction Date: 04 / 01 / 2023

NOTE: The emission reduction date is the date that the emission reduction(s) physically occurred (past reduction), or the date the reduction(s) is/are scheduled to occur (future reduction).

A.3 Describe action(s) taken (or to be taken) to reduce emissions for which ERC(s) is/are requested:
Emission unit shutdown of existing Danskammer Generating Station

A.4 Baseline Period (231-4.1(b)(7)) for the emission reduction(s): 12 / 01 / 2014 to 11 / 30 / 2016

Line A.4 NOTES:

1. The same Baseline Period must be used for all applicable contaminants identified in A.1 above.

2. For an emission reduction which has physically occurred (past reduction), the Baseline Period consists of any 24 consecutive months within the five (5) years immediately preceding the emission reduction date (Line A.2 above).

3. For a future emission reduction, the Baseline Period consists of any 24 consecutive months within the five (5) years immediately preceding the date of receipt by the Department of the permit application for the project which proposes to use the emission reduction credits as emission offsets or for netting purposes.

Determination of Baseline Actual Emissions for the reduction(s)

B.1 Enter the Baseline Actual Emissions (231-4.1(b)(4)) in tons per year (tpy) for each applicable nonattainment contaminant (attach data summaries and calculations):

NO_x 44.2 VOC 2.1 PM-10 _______

B.2 State Register or Federal Register publication notice date proposing any RACT, MACT or other control requirement (OCR) that may be applicable to the emission source for which ERCs are requested:

Contaminant	RACT Date	MACT Date	OCR Date *
NO_x	/ /	/ /	/ /
VOC	/ /	/ /	/ /
PM-10	/ /	/ /	/ /

*- Identify OCR that applies: ________

B.3 Emission Reduction Date (from Line A.2 on page 2) ____/____/____

B.4 What are the Baseline Actual Emissions reflecting RACT, if applicable (tpy)? (see notes)

NO_x _______ VOC _______ PM-10 _______

B.5 What are the Baseline Actual Emissions reflecting MACT, if applicable (tpy)? (see notes)

NO_x _______ VOC _______ PM-10 _______

B.6 What are the Baseline Actual Emissions reflecting OCR, if applicable (tpy)? (see notes)

NO_x _______ VOC _______ PM-10 _______

Lines B.4, B.5 and B.6 NOTES.

1. Attach data summaries and calculations.
2. For a past emission reduction that physically occurred after a State or Federal Register publication date proposing an applicable RACT, MACT or OCR, the Baseline Actual Emissions must be adjusted to reflect the applicable RACT, MACT or OCR.
3. For a future emission reduction, if the date that the emission reduction credits are approved is after a State or Federal Register publication date proposing an applicable RACT, MACT or OCR, then the Baseline Actual Emissions must be adjusted to reflect the applicable RACT, MACT or OCR.

DEC ID#: 3-3346-00011 Emission Source ID#: U-D0001,U-D0002,U-D0003,U-D0004

Determination of Emission Reduction Credit(s)

B.7 Enter the lesser of the Baseline Actual Emissions from Lines B.1, B.4, B.5 or B.6 (tpy):

NO_x 44.2 VOC 2.1 PM-10 ______

B.8 Enter the future Potential-To-Emit (PTE) as defined in 6 NYCRR Part 200 (tpy):

NO_x 0 VOC 0 PM-10 ______

B.9 Subtract Line B.8 from Line B.7. These are the emission reduction credits (tpy). If Line B.8 is greater than Line B.7, enter zero.

NO_x 44.2 VOC 2.1 PM-10 ______

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air Resources, Bureau of Stationary Sources
625 Broadway, Albany, New York 12233-3254
P: (518) 402-8403 | F: (518) 402-9035
www.dec.ny.gov

EMISSION REDUCTION CREDIT (ERC) QUANTIFICATION FORM

(Use This Form For Attainment (PSD) ERC Netting Purposes Only – Ref: 231-8.2)

(NOTE: Emission reduction must be Contemporaneous (231-4.1(b)(13)) to be approved)

Name of Facility Creating and Using ERC(s) for Netting: Danskammer Energy Center

Address: 994 River Road, Newburgh, NY 12550

DEC ID#: 3-3346-00011 Emission Source ID#: U-D0001,U-D0002,U-D0003,U-D0004

Contact Name: ____________ Title: ____________ Phone #: ____________

____________ (print name of facility's authorized representative) **certify that the information contained herein is true to the best of my knowledge, information and belief.**

Signature: ____________ Title: ____________ Date: ___/___/___

Reduction Type (check one box): ☐ **Past** ☒ **Future (Note: Must be linked to proposed modification at existing major facility to be eligible for approval - Ref: 231-10.1(o))**

Preparer's name: ____________ Title: ____________

FOR DEC USE ONLY

Approved ERCs for PSD Netting

NO_x: ______TPY PM-2.5: ______TPY Permit Number: ____________

PM-10: ______TPY PM: ______TPY ENB Notice Date: ___/___/___

CO: ______TPY SO_2: ______TPY Permit Mod Issuance/Surrender Date: ___/___/___

Other Applicable Regulated NSR Contaminant – (See Appendix) ____:_____ TPY, _____:_____TPY

Reviewer's Name: ____________

Signature: ____________ Date: ___/___/___

DEC ID#: 3-3346-00011 Emission Source ID#: U-D0001,U-D0002,U-D0003,U-D0004

Determination of the Baseline Period for the reduction(s)

A.1 Emission Reduction Regulated NSR Contaminant (circle **all** that apply to a specific emission reduction action at an emission source):

NO_x PM-2.5 PM-10 PM CO SO_2

Other Applicable Regulated NSR Contaminant - (See Appendix): CO2e : ______; H2SO4 : ______

A.2 Emission Reduction Date: 04/ 01 / 2023

NOTE: The emission reduction date is the date that the emission reduction(s) physically occurred (past reduction), or the date the reduction(s) is/are scheduled to occur (future reduction).

A.3 Describe action(s) taken (or to be taken) to reduce emissions for which ERC(s) is/are requested:

A.4 Baseline Period (231-4.1(b)(7)) for the emission reduction(s): 12 / 01 / 2014 to 11 / 30 / 2016

Line A.4 NOTES:

1. The same Baseline Period must be used for all applicable contaminants identified in A.1 above.
2. For an emission reduction which has physically occurred (past reduction), the Baseline Period consists of any 24 consecutive months within the five (5) years immediately preceding the emission reduction date (Line A.2 above).
3. For a future emission reduction, the Baseline Period consists of any 24 consecutive months within the five (5) years immediately preceding the date of receipt by the Department of the permit application for the project which proposes to use the emission reduction credits for netting purposes.

DEC ID#: 3-3346-00011 Emission Source ID#: U-D0001,U-D0002,U-D0003,U-D0004

Determination of Baseline Actual Emissions for the reduction(s)

B.1 Enter the Baseline Actual Emissions (231-4.1(b)(4)) in tons per year (tpy) for each applicable Regulated NSR Contaminant (attach data summaries and calculations):

NO_x ______ PM-2.5 2.9 PM-10 2.9 PM 2.9 CO 9.2 SO_2 27.1

Other Applicable Regulated NSR Contaminant - (See Appendix): CO2e : 47,304 ;
H2SO4 : 2.1

B.2 State Register or Federal Register publication notice date proposing any RACT, MACT or other control requirement (OCR) that may be applicable to the emission source for which ERCs are requested:

Contaminant	RACT Date	MACT Date	OCR Date*
NO_x	/ /	/ /	/ /
PM-2.5	/ /	/ /	/ /
PM-10	/ /	/ /	/ /
PM	/ /	/ /	/ /
CO	/ /	/ /	/ /
SO_2	/ /	/ /	/ /
Other:			
________	/ /	/ /	/ /
________	/ /	/ /	/ /

* - Identify OCR that applies:____

B.3 Emission Reduction Date (from Line A.2 on page 2) ______/______/______

B.4 What are the Baseline Actual Emissions reflecting RACT, if applicable (tpy)? (see notes)

NO_x ______ PM-2.5 ______ PM-10 ______ PM ______ CO ______ SO_2______

Other Applicable Regulated NSR Contaminant - (See Appendix): ______:______;
______: ______

DEC ID#: 3-3346-00011 Emission Source ID#: U-D0001,U-D0002,U-D0003,U-D0004

B.5 What are the Baseline Actual Emissions reflecting MACT, if applicable (tpy)? (see notes)

NO_x ______ PM-2.5 ______ PM-10 ______ PM ______ CO ______ SO_2______

Other Applicable Regulated NSR Contaminant - (See Appendix): _____:_____; _____: _____

B.6 What are the Baseline Actual Emissions reflecting OCR, if applicable (tpy)? (see notes)

NO_x ______ PM-2.5 ______ PM-10 ______ PM ______ CO ______ SO_2______

Other Applicable Regulated NSR Contaminant - (See Appendix): _____:_____; _____: _____

Lines B.4, B.5 and B.6 NOTES:

1. Attach data summaries and calculations.
2. For a past emission reduction that physically occurred after a State or Federal Register publication date proposing an applicable RACT, MACT or OCR, the Baseline Actual Emissions must be adjusted to reflect the applicable RACT, MACT or OCR.
3. For a future emission reduction, if the date that the emission reduction credits are approved is after a State or Federal Register publication date proposing an applicable RACT, MACT or OCR, then the Baseline Actual Emissions must be adjusted to reflect the applicable RACT, MACT or OCR.

DEC ID#: 3-3346-00011 Emission Source ID#: U-D0001,U-D0002,U-D0003,U-D0004

Determination of Emission Reduction Credit(s)

B.7 Enter the lesser of the Baseline Actual Emissions from Lines B.1, B.4, B.5 or B.6 (tpy):

NO_x ______ PM-2.5 2.9 PM-10 2.9 PM 2.9 CO 9.2 SO_2 27.1

Other Applicable Regulated NSR Contaminant - (See Appendix): CO2e: 47,304; H2SO4: 2.1

B.8 Enter the future Potential-To-Emit (PTE) as defined in 6 NYCRR Part 200 (tpy):

NO_x ______ PM-2.5 0 PM-10 0 PM 0 CO 0 SO_2 0

Other Applicable Regulated NSR Contaminant - (See Appendix): CO2e: 0; H2SO4: 0

B.9 Subtract Line B.8 from Line B.7. These are the emission reduction credits (tpy). If Line B.8 is greater than Line B.7, enter zero.

NO_x ______ PM-2.5 2.9 PM-10 2.9 PM 2.9 CO 9.2 SO_2 27.1

Other Applicable Regulated NSR Contaminant - (See Appendix): CO2e: 47,304; H2SO4: 2.1

APPENDIX

Carbon monoxide
Nitrogen oxides
Sulfur dioxide
Particulate matter
Particulate matter: PM-10 emissions (including condensibles)
Particulate matter: PM-2.5 emissions (including condensibles)
Lead (elemental)
Fluorides
Sulfuric acid mist
Hydrogen sulfide (H_2S)
Total reduced sulfur (including H_2S)
Reduced sulfur compounds (including H_2S)
Municipal waste combustor organics (measured as total tetra through octa-chlorinated dibenzo-p-dioxin and dibenzofurans)
Municipal waste combustor metals (measured as particulate matter)
Municipal waste combustor acid gases (measured as sulfur dioxide and hydrogen chloride)
Municipal solid waste landfills emissions (measured as nonmethane organic compounds)
Greenhouse gases
Any other regulated NSR contaminant

APPENDIX B

EMISSION CALCULATIONS

Table B-1
Danskammer Energy, LLC

Total Proposed Equipment Potential-to-Emit (PTE) Summary

Source	Potential Annual Emissions (tons/yr)												
	NO_x	CO	VOC	SO_2	PM-10	PM-2.5	H_2SO_4	CO2e	CH4	NH_3	Pb	Maximum Individual HAP	Total HAPs
Combined Cycle Unit Steady-State Basis	136.6	62.6	28.5	24.1	79.7	79.7	22.1	1,927,496	34.7	116.7	1.7E-02		
Combined Cycle Unit Start-Up/Shutdown[(1)]	0.3	42.0	29.1		0.0	0.0							
Auxiliary Boiler	2.0	8.5	0.4	0.3	1.7	1.7	0.024	26,959	0.5		1.1E-04		
Diesel Generator	3.5	1.9	0.2	3.67E-03	1.11E-01	1.11E-01	3.67E-04	399	0.02		0.0E+00		
Fire Pump (New)	0.3	0.2	0.01	4.34E-04	1.35E-02	1.35E-02	4.34E-05	47	0.002		0.0E+00		
Fire Pump (Existing)	0.8	0.3	0.04	4.66E-04	4.13E-02	4.13E-02	4.66E-05	51	0.002		0.0E+00		
ULSD Storage Tank			0.27										
Total Project PTE	**143.5**	**115.6**	**58.6**	**24.4**	**81.5**	**81.5**	**22.1**	**1,954,952.2**	**35.3**	**116.7**	**1.76E-02**	**3.0**	**8.9**

(1) Combined cycle unit start-up/shutdown emissions are added to the baseline steady-state PTE values if the total start-up/shutdown emissions are more than the steady-state full load equivalent during the period of unit off-line downtime and duration of the start-up (and previous shutdown). For start-up/shutdown emissions noted above as "N/A" for certain pollutants, the start-up/shutdown emissions addition to the baseline steady-state PTE is not applicable since mass emissions of these pollutants are fuel input based (lb/MMBtu) and the full load, steady-state basis represents the worst-case scenario for PTE emissions.

Table B-2
Danskammer Energy, LLC
PSD/NNSR Netting Analysis

Pollutant	Baseline Period[1]	Baseline Actual Emissions (BAE) (ERC)[2] tons/yr	Project Emission Potential[3] NSR Step 1 (PEP) tons/yr	Contemporaneous[4] Emission Increases tons/yr	Project Net Emission Increase NSR Step 2 (PEP - ERC)[5] tons/yr	PSD/NNSR Significant Net Emission Rate Thresholds[6] tons/yr	Subject to PSD/NNSR?
NO_x	December 2014 - November 2016	44.2	143.5	0.0	99.3	40	NNSR
CO	December 2014 - November 2016	9.2	115.6	0.0	106.4	100	PSD
SO_2	December 2014 - November 2016	27.1	24.4	0.0	(2.6)	40	No
PM-10	December 2014 - November 2016	2.9	81.5	0.0	78.6	15	PSD
PM-2.5	December 2014 - November 2016	2.9	81.5	0.0	78.6	10	PSD
VOC	December 2014 - November 2016	2.1	58.6	0.0	56.5	40	NNSR
H2SO4	December 2014 - November 2016	2.1	22.1	0.0	20.0	7	PSD
GHG	December 2014 - November 2016	47,303.9	1,954,952	0.0	1,907,648.2	75,000	PSD

Notes:
1. Per 6 NYCRR 231-4(b)(7), "baseline period" is defined for an ERC which is scheduled to occur in the future, as any 24 consecutive months within the five years immediately preceding date of receipt by the department of the permit application, which proposes to use the ERC.
2. Per 6 NYCRR 231-10.2, ERCs are quantified as the difference between BAE and subsequent PTE. The existing units will be retired so the existing unit post Project PTE is zero.
(i) Baseline actual emissions based upon EPA Clean Air Markets Data and NYSDEC Emission Statement Data.
(ii) Baseline emissions conservatively do not include existing auxiliary fuel burning equipment that will be retired.
3. For new units, Project Emission Potential (PEP) is defined as potential to emit. (See future operating assumptions below)
4. Per 6 NYCRR 231-4(b)(13), "contemporaneous" is defined as the period beginning five years prior to the scheduled commence construction date of the new or modified emission source, and ending with the scheduled commence operation date.
5. The net emissions increase is defined under 6 NYCRR 231-4.1(b)(30) as the aggregate increase in emissions of a regulated NSR contaminant in tpy at an existing major facility resulting from the sum of:
(i) the project emission potential of the modification (PEP);
(ii) every creditable emission increase at the facility, which is contemporaneous and for which an emission offset was not obtained; and (No creditable contemporary increases occurred)
(iii) any ERC at the facility, or portion thereof, selected by the applicant which is contemporaneous and which was not previously used as part of an emission offset, an internal offset, or relied upon in the issuance of a permit under this Part.
6. Significant net emission increase threshold from NYCRR 231-13.

Project Emissions Potential Operational Assumptions
1. Operation of One (1) MHPS 501JAC for up to 8,760 hours per year.
2. Operation of natural gas fired duct burner for up to 4,380 hours per year (Full Load Equivalent).
3. Operation of MHPS 501JAC for up to 720 hours per year on ULSD (Full Load Equivalent).
4. Up to 262 startup and shutdowns per year on natural gas and up to 10 on ULSD.
5. Auxiliary Equipment includes the following equipment and operating hours:
(a) 96 mmBtu/hr Natural Gas Fired auxiliary boiler for 4,800 hours per year.
(b) 327 hp emergency diesel fire pump for 250 hours per year.
(c) 2,000 kW emergency diesel generator for up to 250 hours per year.

Table B-3
Danskammer Energy, LLC

Natural Gas and Oil Firing Design Scenarios

		Design Scenario											
		1	2	3	4	5	6	7	8	9	10	11	12
Combustion Turbine Parameters													
CT Fuel Type	--	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Ambient Temperature	°F	-5	-5	-5	0	50	50	50	50	59	92	100	100
CT Percent Load Rate	%	100%	75%	50%	100%	100%	100%	75%	50%	100%	100%	100%	100%
CT Heat Input Capacity, HHV	MMBtu/hr	3,299	3,171	2,437	3,302	3,230	3,232	2,890	2,239	3,240	3,278	3,277	3,278
Gas-Fired Duct Burner Parameters													
DB Operation (Y/N)	--	Y	N	N	N	Y	N	N	N	N	Y	Y	N
DB Heat Input Capacity, HHV	MMBtu/hr	726.4	0.0	0.0	0.0	720.9	0.0	0.0	0.0	0.0	744.1	336.0	0.0
HRSG Exhaust Composition													
Ar	mol %	0.92%	0.93%	0.94%	0.93%	0.92%	0.93%	0.93%	0.93%	0.93%	0.90%	0.90%	0.91%
N_2	mol %	73.56%	74.48%	74.76%	74.31%	73.13%	73.89%	74.02%	74.17%	73.70%	71.72%	71.83%	72.16%
O_2	mol %	8.29%	11.00%	11.79%	10.51%	8.37%	10.55%	10.94%	11.34%	10.57%	8.31%	9.46%	10.44%
CO_2	mol %	5.81%	4.58%	4.21%	4.81%	5.73%	4.72%	4.54%	4.36%	4.69%	5.57%	4.99%	4.54%
H_2O	mol %	11.41%	9.00%	8.29%	9.45%	11.86%	9.92%	9.56%	9.21%	10.11%	13.50%	12.81%	11.95%
Molecular Weight	lb/lbmol	28.24	28.40	28.44	28.37	28.19	28.31	28.33	28.35	28.29	27.99	28.02	28.07
Exhaust Temperature	°F	160.00	176.00	174.00	171.00	160.00	171.00	171.00	165.00	174.00	172.00	182.00	192.00
Exhaust Flow Rate	lb/hr	5,140,000	5,193,000	4,312,000	5,120,000	5,096,000	5,065,000	4,710,000	3,800,000	5,105,000	5,292,000	5,304,000	5,289,000
Total Stack Emission Rates (Controlled)													
NO_x	ppmvd @ 15% O_2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CO	ppmvd @ 15% O_2	2.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0
VOC	ppmvd @ 15% O_2	1.6	0.7	0.7	0.4	1.6	0.7	0.7	0.7	0.7	1.6	1.6	0.7
NH_3	ppmvd @ 15% O_2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
NO_x	lb/hr	32.20	25.90	19.30	26.30	31.50	25.60	22.90	17.70	25.60	32.00	28.70	26.00
CO	lb/hr	19.60	7.90	5.90	8.00	19.20	7.80	7.00	5.40	7.80	19.50	17.50	7.90
VOC	lb/hr	9.00	3.20	2.40	3.20	8.80	3.10	2.80	2.20	3.10	8.90	8.00	3.20
SO_2	lb/hr	6.20	5.00	3.70	5.00	6.00	4.90	4.40	3.40	5.00	6.10	5.50	5.00
PM/PM-10/PM-2.5 - with sulfates	lb/hr	21.80	12.30	9.70	12.30	21.50	12.10	11.00	8.70	12.20	22.10	16.80	12.40
SO_3	lb/hr	3.49	2.81	2.08	2.81	3.38	2.76	2.48	1.91	2.81	3.43	3.09	2.81
H_2SO_4	lb/hr	5.60	4.52	3.39	4.59	5.50	4.49	4.02	3.11	4.51	5.60	5.03	4.56
NH_3	lb/hr	29.80	23.90	17.90	24.30	29.10	23.70	21.20	16.40	23.70	29.60	26.60	24.00
CO_2	lb/hr	478,600	386,700	289,700	392,500	469,800	384,200	343,500	266,100	385,200	478,200	429,600	389,700
N_2O	lb/hr	0.89	0.70	0.54	0.73	0.87	0.71	0.64	0.49	0.71	0.89	0.80	0.72
CH4	lb/hr	8.87	6.99	5.37	7.28	8.71	7.13	6.37	4.94	7.14	8.87	7.97	7.23
CO2e	lb/hr	479,086	387,083	289,994	392,899	470,277	384,590	343,849	266,371	385,591	478,686	430,037	390,096
NO_x	lb/MMBtu	0.0080	0.0082	0.0079	0.0080	0.0080	0.0079	0.0079	0.0079	0.0079	0.0080	0.0079	0.0079
CO	lb/MMBtu	0.0049	0.0025	0.0024	0.0024	0.0049	0.0024	0.0024	0.0024	0.0024	0.0048	0.0048	0.0024
VOC	lb/MMBtu	0.0022	0.0010	0.0010	0.0010	0.0022	0.0010	0.0010	0.0010	0.0010	0.0022	0.0022	0.0010
SO_2	lb/MMBtu	0.0015	0.0016	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
PM/PM-10/PM-2.5 - with sulfates	lb/MMBtu	0.0054	0.0039	0.0040	0.0037	0.0054	0.0037	0.0038	0.0039	0.0038	0.0055	0.0046	0.0038
H_2SO_4	lb/MMBtu	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014

		Design Scenario												
		13	14	15	16	17	18	19	20	21	22	23	24	25
Combustion Turbine Parameters														
CT Fuel Type	--	NG	NG	ULSD	ULSD	USLD	ULSD	ULSD	ULSD	ULSD	ULSD	ULSD	ULSD	ULSD
Ambient Temperature	°F	100	100	-5	0	50	59	100	-5	-5	50	50	100	100
CT Percent Load Rate	%	75%	55%	100%	100%	100%	100%	100%	75%	60%	75%	60%	75%	60%
CT Heat Input Capacity, HHV	MMBtu/hr	2,684	2,163	3,315	3,315	3,315	3,315	2,960	2,989	2,583	2,685	2,314	2,400	2,075
Gas-Fired Duct Burner Parameters														
DB Operation (Y/N)	--	N	N	N	N	N	N	N	N	N	N	N	N	N
DB Heat Input Capacity, HHV	MMBtu/hr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HRSG Exhaust Composition														
Ar	mol %	0.91%	0.91%	0.91%	0.91%	0.90%	0.90%	0.88%	0.91%	0.91%	0.90%	0.90%	0.88%	0.88%
N_2	mol %	72.25%	72.38%	72.47%	72.56%	72.13%	71.94%	70.44%	72.65%	72.61%	72.26%	72.17%	70.57%	70.44%
O_2	mol %	10.65%	11.08%	10.79%	10.98%	10.94%	10.92%	10.66%	11.13%	11.05%	11.16%	10.99%	10.89%	10.67%
CO_2	mol %	4.44%	4.25%	5.86%	5.75%	5.70%	5.69%	5.58%	5.67%	5.71%	5.57%	5.67%	5.44%	5.57%
H_2O	mol %	11.75%	11.39%	9.96%	9.79%	10.32%	10.55%	12.44%	9.64%	9.72%	10.11%	10.26%	12.21%	12.44%
Molecular Weight	lb/lbmol	28.08	28.10	28.49	28.50	28.44	28.41	28.19	28.51	28.51	28.45	28.44	28.20	28.19
Exhaust Temperature	°F	179.00	171.00	208.00	211.00	208.00	208.00	213.00	205.00	194.00	197.00	188.00	200.00	187.00
Exhaust Flow Rate	lb/hr	4,428,000	3,729,000	5,912,000	6,032,000	6,022,000	6,028,000	5,440,000	5,514,000	4,722,000	4,994,000	4,230,000	4,521,000	3,812,000
Total Stack Emission Rates (Controlled)														
NO_x	ppmvd @ 15% O_2	2.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
CO	ppmvd @ 15% O_2	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
VOC	ppmvd @ 15% O_2	0.7	0.7	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NH_3	ppmvd @ 15% O_2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
NO_x	lb/hr	21.20	17.10	57.60	57.60	57.10	57.00	51.00	51.90	44.80	46.30	39.90	41.30	35.70
CO	lb/hr	6.50	5.20	17.50	17.50	17.40	17.40	15.50	15.80	13.60	14.10	12.20	12.60	10.90
VOC	lb/hr	2.60	2.10	10.00	10.00	10.00	9.90	8.90	9.00	7.80	8.10	7.00	7.20	6.20
SO_2	lb/hr	4.10	3.30	5.60	5.60	5.60	5.60	5.00	5.00	4.40	4.50	3.90	4.00	3.50
PM/PM-10/PM-2.5 - with sulfates	lb/hr	10.20	8.40	28.60	29.00	28.90	28.90	25.80	26.50	22.70	23.90	20.30	21.30	18.10
SO_3	lb/hr	2.31	1.86	3.15	3.15	3.15	3.15	2.81	2.81	2.48	2.53	2.19	2.25	1.97
H_2SO_4	lb/hr	3.73	3.01	5.08	5.08	5.08	5.08	4.54	4.58	3.96	4.11	3.55	3.68	3.18
NH_3	lb/hr	19.70	15.80	26.60	26.70	26.40	26.40	23.60	24.00	20.70	21.40	18.50	19.10	16.50
CO_2	lb/hr	319,100	257,100	538,000	537,900	538,000	538,000	480,300	485,100	419,300	435,800	375,600	389,500	336,700
N_2O	lb/hr	0.59	0.48	0.73	0.73	0.73	0.73	0.65	0.66	0.57	0.59	0.51	0.53	0.46
CH4	lb/hr	5.92	4.77	7.31	7.31	7.31	7.31	6.53	6.59	5.69	5.92	5.10	5.29	4.57
CO2e	lb/hr	319,424	257,361	538,400	538,300	538,400	538,400	480,658	485,461	419,612	436,124	375,880	389,790	336,951
NO_x	lb/MMBtu	0.0079	0.0079	0.0174	0.0174	0.0172	0.0172	0.0172	0.0174	0.0173	0.0172	0.0172	0.0172	0.0172
CO	lb/MMBtu	0.0024	0.0024	0.0053	0.0053	0.0052	0.0052	0.0052	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
VOC	lb/MMBtu	0.0010	0.0010	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
SO_2	lb/MMBtu	0.0015	0.0015	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017
PM/PM-10/PM-2.5 - with sulfates	lb/MMBtu	0.0038	0.0039	0.0086	0.0087	0.0087	0.0087	0.0087	0.0089	0.0088	0.0089	0.0088	0.0089	0.0087
H_2SO_4	lb/MMBtu	0.0014	0.0014	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015

1. The estimated values for heat consumption is margined to account for equipment variations, site operating conditions and life-cycle operating parameters. The lb/MMBtu emission rates are calculated using unmargined heat consumption.

Constants	Units	Value
Fuel Heating Values		
Natural Gas HHV	Btu/SCF	1,036
ULSD Fuel Oil HHV	Btu/Gal	139,117
Fuel Sulfur Content		
Natural Gas Sulfur Content	grains/100 SCF	0.50
ULSD Fuel Oil Sulfur Content	ppm by weight	15
Duct Burner Capacity Rating		
Maximum Heat Input Rating	MMBtu/hr (HHV)	744.14
SO_2 to SO_3 Conversion Rate	%	45%
GHG 40 CFR 98 Emissions Factors (natural gas)		
N_2O	2.20E-04	lb/MMBtu
CH_4	2.20E-03	lb/MMBtu
GHG 40 CFR 98 Emissions Factors (distillate oil)		
CT - N_2O	1.32E-03	lb/MMBtu
CT - CH_4	6.61E-03	lb/MMBtu
GHG Global Warming Potentials		
CO_2	1	
N_2O	298	
CH_4	25	

Table B-4
Danksammer Energy, LLC

Net PTE Increase Analysis for Start-Up/Shutdown Periods

CC Units Off-Line Period Durations:

	Natural Gas		ULSD	
Cold	48	hrs (minimum)	48	hrs (minimum)
Warm	8	hrs (minimum)	8	hrs (minimum)
Hot	4	hrs (minimum)	4	hrs (minimum)
Start-Up Event Durations:				
Cold	0.6	hrs	0.8	hrs
Warm	0.6	hrs	0.8	hrs
Hot	0.5	hrs	0.8	hrs
Shutdown Event Duration:	0.2	hrs	0.2	hrs
No. of Start-Up/Shutdown Events:				
Cold	**10**	Events	**2**	Events
Warm	**52**	Events	**3**	Events
Hot	**200**	Events	**5**	Events

Natural Gas

		Sample	Cold S/U Scenario			Warm S/U Scenario			Hot S/U Scenario		
	Units	Calc	NO_x	CO	VOC	NO_x	CO	VOC	NO_x	CO	VOC
PTE Baseline Emission Rate - 1 Unit	lbs/hr	(1)	25.6	7.8	3.1	25.6	7.8	3.1	25.6	7.8	3.1
PTE 'Reduction' for Off-Line Period	lbs/event	(2)	1,249.1	380.6	151.3	225.1	68.6	27.3	120.5	36.7	14.6
Start-Up Emissions - 1 Unit	lbs/event	(3)	54.0	443.0	106.0	48.0	350.0	95.0	43.0	129.0	71.0
Shutdown Emissions - 1 Unit	lbs/event	(4)	64.0	160.0	133.0	64.0	160.0	133.0	64.0	160.0	133.0
SU/SD Event Total Emissions	lbs/event	(5)	118.0	603.0	239.0	112.0	510.0	228.0	107.0	289.0	204.0
PTE 'Increase' per SU/SD Event	tons/event	(6)	0.0	0.1	0.0	0.0	0.2	0.1	0.0	0.1	0.1
Total Annual PTE 'Increase'	tons/yr	(7)	0.0	1.1	0.4	0.0	11.5	5.2	0.0	25.2	18.9

Oil

		Sample	Cold S/U Scenario			Warm S/U Scenario			Hot S/U Scenario		
	Units	Calc	NO_x	CO	VOC	NO_x	CO	VOC	NO_x	CO	VOC
PTE Baseline Emission Rate - 1 Unit	lbs/hr	(1)	25.6	7.8	3.1	25.6	7.8	3.1	25.6	7.8	3.1
PTE 'Reduction' for Off-Line Period	lbs/event	(2)	1,256.0	382.7	152.1	232.0	70.7	28.1	129.6	39.5	15.7
Start-Up Emissions - 1 Unit	lbs/event	(3)	220.0	1,334.0	827.0	135.0	1,094.0	815.0	52.0	308.0	641.0
Shutdown Emissions - 1 Unit	lbs/event	(4)	171.0	214.0	214.0	171.0	214.0	214.0	171.0	214.0	214.0
SU/SD Event Total Emissions	lbs/event	(5)	391.0	1,548.0	1,041.0	306.0	1,308.0	1,029.0	223.0	522.0	855.0
PTE 'Increase' per SU/SD Event	tons/event	(6)	0.0	0.6	0.4	0.0	0.6	0.5	0.0	0.2	0.4
Total Annual PTE 'Increase'	tons/yr	(7)	0.0	1.2	0.9	0.1	1.9	1.5	0.2	1.2	2.1

(1) - Steady-State PTE Emission Rate = PTE per Unit (tons/yr) * 2,000 lbs/ton * yr/Max Unit hrs * No. of Units
(2) - PTE 'Reduction' for Off-Line Period = (1) * (Shutdown Duration + Off-Line Duration + Start-Up Duration)
(3) - Start-Up Emissions per Unit provided by vendor
(4) - Shutdown Emissions per Unit provided by vendor
(5) - SU/SD Event Total Emissions = ((3)+(4)) * No. of Units
(6) - PTE 'Increase per SU/SD Event = zero if (5)-(2) <= 0; or ((5)-(2)) * ton/2,000 lbs if (5)-(2) > 0
(7) - Total Annual PTE 'Increase' = (6) * No. of Events per Year per Start-Up Type

Table B-5
Danskammer Energy, LLC

Combined Cycle Unit(s) Annual Emissions Summary

No. of Combined Cycle Units =	**1**
Total Annual Full Load CT Operation(hrs/yr) =	**8,760**
Total Annual Maximum DB Operation (hrs/yr)=	**4,380**
Maximum oil firing (hrs/yr)=	**720**

	Emission Rates (lb/hr)			Steady-State	Start-Up &	PTE
	Gas		Oil	PTE	Shutdown	Total
Pollutant	w/duct burning	w/o duct burning	w/o duct burning	tons/yr	PTE Increase tons/yr	CC Unit(s) tons/yr
NO_x	31.5	25.6	57.6	136.6	0.3	**136.9**
CO	19.2	7.8	17.5	62.6	42.0	**104.7**
VOC	8.8	3.1	10.0	28.5	29.1	**57.6**
SO_2	6.0	4.9	5.6	24.1		**24.1**
PM-10/PM-2.5	21.5	12.1	29.0	79.7	0.0	**79.7**
NH_3 (24-hr avg)	29.1	23.7	26.7	116.7		**116.7**
H_2SO_4	5.5	4.5	5.1	22.1		**22.1**
CO2e	470,277	384,590	538,300	1,927,496		**1,927,496**

Note:
Potential annual emissions are based on the average annual design scenario (100% load, 50 °F ambient temperature for gas firing; 100% load and 0 °F ambient temperature for limited oil firing) and the specified annual hour limitations of plant/duct burner operation as noted above.

Table B-6
Danskammer Energy, LLC

Air Quality Modeling Data Input Parameters

	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Combustion Turbine Parameters																										
CT Fuel Type	--	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	ULSD	ULSD	USLD	ULSD	ULSD	ULSD	ULSD	ULSD	ULSD	ULSD	ULSD
Ambient Temperature	^oF	-5	-5	-5	0	50	50	50	50	59	92	100	100	100	100	-5	0	50	59	100	-5	-5	50	50	100	100
CT Percent Load Rate	%	100%	75%	50%	100%	100%	100%	75%	50%	100%	100%	100%	100%	75%	55%	100%	100%	100%	100%	100%	75%	60%	75%	60%	75%	60%
DB Operation (Y/N)	Y/N	Y	N	N	N	Y	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Stack Mass Flow Rate	lb/hr	5,140,000	5,193,000	4,312,000	5,120,000	5,096,000	5,065,000	4,710,000	3,800,000	5,105,000	5,292,000	5,304,000	5,289,000	4,428,000	3,729,000	5,912,000	6,032,000	6,022,000	6,028,000	5,440,000	5,514,000	4,722,000	4,994,000	4,230,000	4,521,000	3,812,000
Stack Temperature	^oF	160	176	174	171	160	171	171	165	174	172	182	192	179	171	208	211	208	208	213	205	194	197	188	200	187
Stack Temperature	K	344.26	353.15	352.04	350.37	344.26	350.37	350.37	347.04	352.04	350.93	356.48	362.04	354.82	350.37	370.93	372.59	370.93	370.93	373.71	369.26	363.15	364.82	359.82	366.48	359.26
Stack Volumetric Flow Rate	ACFM	1,373,334	1,415,282	1,169,834	1,385,881	1,363,993	1,373,899	1,276,702	1,019,522	1,392,317	1,454,186	1,478,960	1,495,081	1,226,302	1,019,064	1,686,959	1,728,323	1,721,368	1,724,902	1,580,538	1,565,227	1,318,234	1,403,517	1,172,929	1,287,702	1,064,751
Stack Exit Velocity	ft/s	55.09	56.77	46.93	55.59	54.72	55.11	51.21	40.90	55.85	58.33	59.33	59.97	49.19	40.88	67.67	69.33	69.05	69.19	63.40	62.79	52.88	56.30	47.05	51.66	42.71
Stack Exit Velocity	m/s	16.79	17.30	14.30	16.95	16.68	16.80	15.61	12.47	17.02	17.78	18.08	18.28	14.99	12.46	20.63	21.13	21.05	21.09	19.33	19.14	16.12	17.16	14.34	15.74	13.02
NO_x	g/s	4.06	3.26	2.43	3.31	3.97	3.23	2.89	2.23	3.23	4.03	3.62	3.28	2.67	2.15	7.26	7.26	7.19	7.18	6.43	6.54	5.64	5.83	5.03	5.20	4.50
CO	g/s	2.47	1.00	0.74	1.01	2.42	0.98	0.88	0.68	0.98	2.46	2.21	1.00	0.82	0.66	2.21	2.21	2.19	2.19	1.95	1.99	1.71	1.78	1.54	1.59	1.37
SO_2	g/s	0.78	0.63	0.47	0.63	0.76	0.62	0.55	0.43	0.63	0.77	0.69	0.63	0.52	0.42	0.71	0.71	0.71	0.71	0.63	0.63	0.55	0.57	0.49	0.50	0.44
PM/PM-10/PM-2.5	g/s	2.75	1.55	1.22	1.55	2.71	1.52	1.39	1.10	1.54	2.78	2.12	1.56	1.29	1.06	3.60	3.65	3.64	3.64	3.25	3.34	2.86	3.01	2.56	2.68	2.28

Stack Parameters		
Height Above Grade =	200.0	ft
Height Above Grade =	60.96	m
Diameter =	23.0	ft
Diameter =	7.01	m

Table B-7
Danskammer Energy, LLC

Proposed CT/DB Limits

Pollutant		Emission Limits		
		ppm	lb/MMBtu	lb/hr
NO_x	gas	2.0		
	gas w/ duct burning	2.0		
	oil	4.0		
CO	gas	1.0		
	gas w/ duct burning	2.0		
	oil	2.0		
VOC	gas	0.7		
	gas w/ duct burning	1.6		
	oil	2.0		
SO_2	gas		0.0016	5.00
	gas w/ duct burning		0.0015	6.20
	oil		0.0017	5.60
PM-10/PM-2.5	gas		0.0040	12.40
	gas w/ duct burning		0.0055	22.10
	oil		0.0089	29.00
NH_3 (24-hr avg)	gas	5.0		24.30
	gas w/ duct burning	5.0		29.80
	oil	5.0		26.70
H_2SO_4	gas		0.0014	4.59
	gas w/ duct burning		0.0014	5.60
	oil		0.0015	5.08

Table B-8
Danskammer Energy, LLC

Auxiliary Boiler Potential Emissions Summary

Boiler parameters

Heat Input Capacity (HHV)	96.0	MMBtu/hr
Fuel Firing Rate	92,664	SCF/hr
	444.8	mmscf/yr
Maximum Annual Operation	4,800	hr/yr

	Potential Emissions			
	Gas Firing			Annual (ton/yr)
Pollutant	**lb/MMBtu**	**lb/hr**	**g/s**	
NO_x	0.0086	0.83	0.10	1.98
CO	0.0370	3.55	0.45	8.52
VOC	0.0017	0.16	0.02	0.39
PM-10/PM-2.5	0.0074	0.71	0.09	1.70
SO_2	1.4E-03	0.132	0.017	0.32
H_2SO_4	1.1E-04	0.010	0.0013	0.02
CO_2	1.2E+02	11221	1414	26,931
CH_4	2.2E-03	0.212	0.027	0.51
N_2O	2.2E-04	0.021	0.003	5.08E-02
CO_2e				26,959

(1) NO_x , CO, VOC, and PM-10/PM-2.5 emissions from expected performance data.

(2) GHG emissions are based on 40 CFR Part 98, Subpart C.

(3) Emissions of SO_2 from based on mass balance of sulfur in fuel:

Gas Sulfur Content (maximum)	0.50	grains/100 SCF
Higher Heating Value (gas)	1,036	Btu/SCF
Molecular Weight of S =	32	lb/lbmol
Molecular Weight of SO_2 =	64	lb/lbmol

(4) Based on stack temperature, H_2SO_4 may form from the conversion of SO_2 to SO_3 (assumed 5% conversion).

Molecular Weight of H_2SO_4 =	98	lb/lbmol

Stack Parameters		
Exhaust Temperature	305	degrees F
Exhaust Flow	21,900	acfm
Exit Velocity	51.6	ft/s
	15.7	m/s
Stack Inner Diameter	36.0	in
	3.0	ft
	0.91	m
Stack Height	50	ft

Conversion Factors	
g/lb	453.6
lb/ton	2,000

Table B-9
Danskammer Energy, LLC
Fire Water Pump Diesel Engine Potential Emissions Summary (New Engine)

Engine parameters

Power output base load	327	hp
Heat Input Capacity (HHV)	2.3	MMBtu/hr
Annual fuel usage	4079.3	gal/yr
Maximum Annual Operation	250	hr/yr

Pollutant	Potential Emissions				
	g/bhp-hr	lb/MMBtu	lb/hr	g/s	Total Annual (ton/yr)
NO_x	3.00	0.9527	2.16	0.27	2.70E-01
CO	2.60	0.8257	1.87	0.236	2.34E-01
VOC	0.12	0.0381	0.09	0.011	1.08E-02
PM-10/PM-2.5	0.15	0.0476	0.11	0.014	1.35E-02
SO_2	0.005	0.0015	0.003	0.0004	4.34E-04
H_2SO_4		1.5E-04	3.48E-04	4.38E-05	4.34E-05
CO_2		165.79	376	47.42	47.0
N_2O		1.32E-03	3.00E-03	3.78E-04	3.75E-04
CH_4		6.61E-03	1.50E-02	1.89E-03	1.88E-03
CO_2e					47.2

Notes:

(1) NO_x, VOC, CO and PM-10/PM-2.5 emissions are based upon emission limits identified in NSPS Subpart IIII, and expected performance data.

(2) GHG emissions from 40 CFR Part 98, Appendix C

(3) Emissions of SO_2 from based on mass balance of sulfur in fuel:

Sulfur Content	15	ppm by weight
Higher Heating Value	139,117	Btu/gal
Molecular Weight of S =	32	lb/lbmol
Molecular Weight of SO_2 =	64	lb/lbmol

(4) Based on stack temperature, H_2SO_4 may form from the conversion of SO_2 to SO_3 (assumed 5% conversion).

Molecular Weight of H_2SO_4 =	98	lb/lbmol

(5) Unit will operate only during emergency situations and for limited periods per week for testing/maintenance purposes. Total annual operation due to testing/maintenance is limited to 100 hours per year.

Stack Parameters		
Exhaust Temperature	1076	degrees F
Exhaust Flow	1,899	acfm
Exit Velocity	161.2	ft/s
	49.1	m/s
Stack Inner Diameter	6.0	in
	0.5	ft
	0.15	m
Stack Height	15	ft

Conversion Factors	
g/lb	453.6
lb/ton	2,000

Table B-10
Danskammer Energy, LLC
Fire Water Pump Diesel Engine Potential Emissions Summary (Existing)

Engine parameters

Power output base load	375	hp
Heat Input Capacity (HHV)	2.4	MMBtu/hr
Annual fuel usage	4375.0	gal/yr
Maximum Annual Operation	250	hr/yr

	Potential Emissions				
Pollutant	**g/bhp-hr**	**lb/MMBtu**	**lb/hr**	**g/s**	**Total Annual (ton/yr)**
NO_x	7.80	2.6487	6.45	0.81	8.06E-01
CO	2.60	0.8829	2.15	0.271	2.69E-01
VOC	0.34	0.1155	0.28	0.035	3.51E-02
PM-10/PM-2.5	0.40	0.1358	0.33	0.042	4.13E-02
SO_2	0.005	0.0015	0.004	0.0005	4.66E-04
H_2SO_4		1.5E-04	3.73E-04	4.70E-05	4.66E-05
CO_2		165.79	404	50.86	50.5
N_2O		1.32E-03	3.22E-03	4.06E-04	4.03E-04
CH_4		6.61E-03	1.61E-02	2.03E-03	2.01E-03
CO_2e					50.6

Notes:
(1) NO_x, CO, and PM-10/PM-2.5 emissions are based upon emission limits identified in NSPS Subpart IIII.

VOC emissions based on vendor performance data.

(2) GHG emissions from 40 CFR Part 98, Appendix C
(3) Emissions of SO_2 from based on mass balance of sulfur in fuel:

Sulfur Content	15	ppm by weight
Higher Heating Value	139,117	Btu/gal
Molecular Weight of S =	32	lb/lbmol
Molecular Weight of SO_2 =	64	lb/lbmol

(4) Based on stack temperature, H_2SO_4 may form from the conversion of

SO_2 to SO_3 (assumed 5% conversion).

Molecular Weight of H_2SO_4 =	98	lb/lbmol

(5) Unit will operate only during emergency situations and for limited periods per week for testing/maintenance purposes. Total annual operation due to testing/maintenance is limited to 100 hours per year.

Stack Parameters		
Exhaust Temperature	853	degrees F
Exhaust Flow	2,297	acfm
Exit Velocity	195.0	ft/s
	59.4	m/s
Stack Inner Diameter	6.0	in
	0.5	ft
	0.15	m
Stack Height	16	ft

Conversion Factors	
g/lb	453.6
lb/ton	2,000

Table B-11
Danskammer Energy, LLC
Diesel Generator Potential Emissions Summary

Engine parameters

Number of Units	1	
Power output base load	2,000	kW
	2682	hp
Heat Input Capacity (HHV)	19.2	MMBtu/hr
	34503.2	gal/yr
Displacement per Cylinder	<10	Liters
Maximum Annual Operation	250	hr/yr

Pollutant	Potential Emissions				
	g/hp-hr	**lb/MMBtu**	**lb/hr**	**g/s**	**Annual (ton/yr)**
NO_x	4.80	1.478	28.38	3.58	3.55
CO	2.60	0.801	15.37	1.94	1.92
VOC	0.28	0.086	1.66	0.21	0.21
PM-10/PM-2.5	0.150	0.046	0.89	0.11	0.11
SO_2		1.53E-03	2.94E-02	3.70E-03	3.67E-03
H_2SO_4		1.5E-04	2.94E-03	3.70E-04	3.67E-04
CO_2		165.79	3,183.09	401.07	397.89
N_2O		1.32E-03	0.03	0.003	0.003
CH_4		6.61E-03	0.13	0.02	0.02
CO_2e					399.23

Notes:
(1) NO_x, CO, VOC and PM emissions are based on NSPS Subpart IIII,
and expected performance data.
(2) GHG emissions from 40 CFR Part 98, Appendix C
(3) Emissions of SO_2 from based on mass balance of sulfur in fuel:

Sulfur Content	15	ppm by weight
Higher Heating Value	139,117	Btu/gal
Molecular Weight of S =	32	lb/lbmol
Molecular Weight of SO_2 =	64	lb/lbmol

(4) Based on stack temperature, H_2SO_4 may form from the conversion of
SO_2 to SO_3 (assumed 5% conversion).

Molecular Weight of H_2SO_4 =	98	lb/lbmol

Stack Parameters		
Exhaust Temperature	965.0	degrees F
Exhaust Flow	12,105	acfm
Exit Velocity	114.2	ft/s
	34.8	m/s
Stack Inner Diameter	18.0	in
	1.5	ft
	0.46	m
Stack Height	15	ft

Conversion Factors	
g/lb	453.6
lb/ton	2,000

Table B-12
SUMMARY OF BASELINE ACTUAL EMISSIONS

Emissions Unit	Fuel Use kscf (NG) Fuel Oil (Kgal) Natural Gas	Fuel Use Fuel Oil	Heat Input MMBtu Natural Gas	Heat Input MMBtu Fuel Oil	Heat Input MMBtu Total	Actual Emissions (By Month) NO_X Tons Total	CO Tons Total	VOC Tons Total	SO_2 Tons Total	$PM_{10/2.5}$ Tons Total	CO2 Tons Total
Boiler 1											
Nov-14	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-14	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-15	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-15	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-15	3,600	0.0	3,687	0	3,687	0.28	0.04	0.01	0.00	0.01	219
Apr-15	29,625	0.0	30,336	0	30,336	2.28	0.36	0.08	0.01	0.11	1,798
May-15	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-15	33,177	0.0	33,973	0	33,973	2.55	0.40	0.09	0.01	0.13	2,014
Jul-15	35,546	1.5	36,399	229	36,628	2.75	0.43	0.10	0.89	0.14	2,191
Aug-15	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-15	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-15	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-15	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-15	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-16	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-16	5,627	0.0	5,762	0	5,762	0.32	0.07	0.02	0.00	0.02	342
Mar-16	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Apr-16	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-16	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-16	7,631	0.0	7,815	0	7,815	0.42	0.09	0.02	0.00	0.03	463
Jul-16	7,874	22.0	8,063	3,329	11,392	0.85	0.15	0.03	7.13	0.05	868
Aug-16	12,860	0.0	13,168	0	13,168	0.59	0.15	0.04	0.00	0.05	780
Sep-16	6,624	0.0	6,783	0	6,783	0.35	0.08	0.02	0.00	0.03	402
Oct-16	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-16	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-16	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-17	6,375	0.0	6,528	0	6,528	0.35	0.08	0.02	0.00	0.02	387
Feb-17	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-17	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Apr-17	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-17	33	0.0	34	0	34	0.00	0.00	0.00	0.00	0.00	2
Jun-17	6,745	0.0	6,907	0	6,907	0.35	0.08	0.02	0.00	0.03	410
Jul-17	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Aug-17	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-17	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-17	216	0.0	221	0	221	0.02	0.00	0.00	0.00	0.00	13
Nov-17	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-17	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-18	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-18	7,459	0.0	7,638	0	7,638	0.37	0.09	0.02	0.00	0.03	453
Mar-18	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Apr-18	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-18	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-18	25,937	0.1	26,560	11	26,570	0.91	0.31	0.07	0.29	0.10	1,586
Jul-18	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Aug-18	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-18	8,899	11.0	9,112	1,661	10,773	0.39	0.14	0.03	1.90	0.05	715
Oct-18	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-18	6	0.0	6	0	6	0.00	0.00	0.00	0.00	0.00	0
Dec-18	11,017	0.0	11,281	0	11,281	0.43	0.13	0.03	0.00	0.04	669

Table B-12
SUMMARY OF BASELINE ACTUAL EMISSIONS

Emissions Unit	Fuel Use		Heat Input			Actual Emissions (By Month)					
						NO_X	CO	VOC	SO_2	$PM_{10/2.5}$	CO2
	kscf (NG) Fuel Oil (Kgal)		MMBtu			Tons	Tons	Tons	Tons	Tons	Tons
	Natural Gas	Fuel Oil	Natural Gas	Fuel Oil	Total	Total	Total	Total	Total	Total	Total
Boiler 2											
Nov-14	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-14	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-15	59,363	0	60,787	32	60,819	4.56	0.71	0.16	2.68	0.23	3,702
Mar-15	24,167	0	24,747	0	24,747	1.86	0.29	0.07	0.01	0.09	1,468
Apr-15	-3,852	26	-3,944	3,944	0	0.00	0.02	0.00	0.00	0.01	0
May-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-15	30,252	0	30,978	0	30,978	2.32	0.36	0.08	0.01	0.11	1,837
Jul-15	37,993	0	38,905	0	38,905	2.92	0.46	0.10	0.01	0.14	2,307
Aug-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-16	7,437	0	7,616	0	7,616	0.57	0.09	0.02	0.00	0.03	451
Mar-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Apr-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-16	6,891	0	7,057	0	7,057	0.33	0.08	0.02	0.00	0.03	418
Jul-16	5,600	27	5,735	4,033	9,768	0.73	0.14	0.02	5.03	0.05	687
Aug-16	3,852	0	3,945	0	3,945	0.25	0.05	0.01	0.00	0.01	234
Sep-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-16	3,235	0	3,312	0	3,312	0.16	0.04	0.01	0.00	0.01	196
Nov-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-17	7,782	0	7,969	0	7,969	0.33	0.09	0.02	0.00	0.03	472
Feb-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Apr-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-17	35	0	36	0	36	0.00	0.00	0.00	0.00	0.00	2
Jun-17	7,026	0	7,194	0	7,194	0.35	0.08	0.02	0.00	0.03	426
Jul-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Aug-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-17	22	0	22	0	22	0.00	0.00	0.00	0.00	0.00	1
Nov-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-18	1,578	0	1,616	0	1,616	0.12	0.02	0.00	0.00	0.01	96
Feb-18	10,395	0	10,645	0	10,645	0.71	0.12	0.03	0.00	0.04	631
Mar-18	5,946	0	6,088	0	6,088	0.35	0.07	0.02	0.00	0.02	361
Apr-18	7,281	0	7,456	0	7,456	0.56	0.09	0.02	0.00	0.03	442
May-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-18	9,089	0	9,308	0	9,308	0.50	0.11	0.02	0.00	0.03	552
Jul-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Aug-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-18	6,912	0	7,078	0	7,078	0.36	0.08	0.02	0.00	0.03	420
Oct-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0

Table B-12
SUMMARY OF BASELINE ACTUAL EMISSIONS

Emissions Unit	Fuel Use		Heat Input			Actual Emissions (By Month)					
						NO_X	CO	VOC	SO_2	$PM_{10/2.5}$	CO2
	kscf (NG) Fuel Oil (Kgal)		MMBtu			Tons	Tons	Tons	Tons	Tons	Tons
	Natural Gas	Fuel Oil	Natural Gas	Fuel Oil	Total	Total	Total	Total	Total	Total	Total
Boiler 3											
Nov-14	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-14	54,478	0	55,786	0	55,786	3.35	0.65	0.15	11.07	0.21	3,307
Jan-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Apr-15	27,278	0	27,932	0	27,932	1.68	0.33	0.08	0.01	0.10	1,656
May-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-15	29,462	0	30,169	0	30,169	1.81	0.35	0.08	0.01	0.11	1,789
Jul-15	117,018	0	119,827	0	119,827	4.74	1.40	0.32	0.04	0.44	7,103
Aug-15	15,615	0	15,990	0	15,990	0.45	0.19	0.04	0.01	0.06	948
Sep-15	28,172	0	28,848	0	28,848	0.95	0.34	0.08	0.01	0.11	1,710
Oct-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-16	11,466	0	11,741	0	11,741	0.44	0.14	0.03	0.00	0.04	696
Apr-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-16	516	0	528	0	528	0.01	0.01	0.00	0.00	0.00	31
Jun-16	38,392	0	39,313	0	39,313	1.18	0.46	0.11	0.01	0.15	2,330
Jul-16	25,086	0	25,688	0	25,688	0.71	0.30	0.07	0.01	0.10	1,523
Aug-16	15,268	0	15,635	0	15,635	0.29	0.18	0.04	0.01	0.06	927
Sep-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-17	9,866	0	10,103	0	10,103	0.45	0.12	0.03	0.00	0.04	599
Mar-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Apr-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-17	16	0	16	0	16	0.00	0.00	0.00	0.00	0.00	1
Jun-17	10,962	0	11,225	0	11,225	0.48	0.13	0.03	0.00	0.04	665
Jul-17	724	0	741	0	741	0.01	0.01	0.00	0.00	0.00	44
Aug-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-17	205	0	210	0	210	0.01	0.00	0.00	0.00	0.00	12
Nov-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-18	10,325	0	10,573	0	10,573	0.52	0.12	0.03	0.00	0.04	627
Apr-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jul-18	138,651	0	141,979	0	141,979	8.52	1.66	0.38	0.04	0.53	8,416
Aug-18	61,272	0	62,743	0	62,743	3.76	0.74	0.17	0.02	0.23	3,719
Sep-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-18	19,887	0	20,364	0	20,364	1.22	0.24	0.05	0.01	0.08	1,207
Dec-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0

Table B-12
SUMMARY OF BASELINE ACTUAL EMISSIONS

Emissions Unit	Fuel Use		Heat Input			Actual Emissions (By Month)					
						NO_X	CO	VOC	SO_2	$PM_{10/2.5}$	CO2
	kscf (NG) Fuel Oil (Kgal)		MMBtu			Tons	Tons	Tons	Tons	Tons	Tons
	Natural Gas	Fuel Oil	Natural Gas	Fuel Oil	Total	Total	Total	Total	Total	Total	Total
Boiler 4											
Nov-14	72,056	0	73,786	0	73,786	4.43	0.86	0.20	0.02	0.27	4,375
Dec-14	66,946	0	68,553	0	68,553	4.11	0.80	0.18	6.95	0.25	4,425
Jan-15	77,060	0	78,910	0	78,910	4.73	0.92	0.21	0.02	0.29	4,679
Feb-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-15	97,648	0	99,991	0	99,991	6.00	1.17	0.27	0.03	0.37	5,928
Apr-15	98,736	0	101,106	0	101,106	6.07	1.18	0.27	0.03	0.38	5,993
May-15	124,682	0	127,674	0	127,674	7.66	1.50	0.34	0.04	0.47	7,568
Jun-15	251,255	0	257,285	0	257,285	15.44	3.02	0.69	20.04	0.95	16,289
Jul-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Aug-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-15	18,350	0	18,791	0	18,791	1.13	0.22	0.05	0.01	0.07	1,114
Oct-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-16	14,242	0	14,584	0	14,584	0.52	0.17	0.04	0.00	0.05	864
Apr-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jul-16	54,851	0	56,167	0	56,167	1.94	0.66	0.15	0.02	0.21	3,330
Aug-16	33,307	0	34,106	0	34,106	1.23	0.40	0.09	0.01	0.13	2,022
Sep-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Mar-17	26,691	0	27,331	0	27,331	1.04	0.32	0.07	0.01	0.10	1,620
Apr-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-17	4	0	4	0	4	0.00	0.00	0.00	0.00	0.00	0
Jun-17	21,377	0	21,890	0	21,890	0.95	0.26	0.06	0.01	0.08	1,298
Jul-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Aug-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-17	4	0	4	0	4	0.00	0.00	0.00	0.00	0.00	0
Nov-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-18	20,825	0	21,324	0	21,324	0.72	0.25	0.06	0.01	0.08	1,264
Mar-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Apr-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jul-18	36,803	0	37,686	0	37,686	1.82	0.44	0.10	0.01	0.14	2,234
Aug-18	45,925	0	47,027	0	47,027	2.10	0.55	0.13	0.01	0.17	2,788
Sep-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0

Table B-12
SUMMARY OF BASELINE ACTUAL EMISSIONS

Emissions Unit	Fuel Use		Heat Input			Actual Emissions (By Month)					
						NO_X	CO	VOC	SO_2	$PM_{10/2.5}$	CO2
	kscf (NG) Fuel Oil (Kgal)		MMBtu			Tons	Tons	Tons	Tons	Tons	Tons
	Natural Gas	Fuel Oil	Natural Gas	Fuel Oil	Total	Total	Total	Total	Total	Total	Total
Total - Sum of Boiler 1, Boiler 2, Boiler 3, Boiler 4											
Nov-14	72,056	0	73,786	0	73,786	4.43	0.86	0.20	0.02	0.27	4,375
Dec-14	121,424	0	124,338	0	124,338	7.46	1.46	0.33	18.01	0.46	7,732
Jan-15	77,060	0	78,910	0	78,910	4.73	0.92	0.21	0.02	0.29	4,679
Feb-15	59,363	0	60,787	32	60,819	4.56	0.71	0.16	2.68	0.23	3,702
Mar-15	125,415	0	128,425	0	128,425	8.13	1.50	0.34	0.04	0.48	7,615
Apr-15	151,788	26	155,431	3,944	159,375	10.02	1.89	0.43	0.05	0.60	9,447
May-15	124,682	0	127,674	0	127,674	7.66	1.50	0.34	0.04	0.47	7,568
Jun-15	344,146	0	352,406	0	352,406	22.12	4.13	0.95	20.07	1.31	21,929
Jul-15	190,557	2	195,131	229	195,359	10.40	2.29	0.52	0.94	0.73	11,601
Aug-15	15,615	0	15,990	0	15,990	0.45	0.19	0.04	0.01	0.06	948
Sep-15	46,522	0	47,639	0	47,639	2.08	0.56	0.13	0.02	0.18	2,824
Oct-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-15	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Feb-16	13,064	0	13,378	0	13,378	0.89	0.16	0.04	0.00	0.05	793
Mar-16	25,708	0	26,325	0	26,325	0.95	0.31	0.07	0.01	0.10	1,560
Apr-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-16	516	0	528	0	528	0.01	0.01	0.00	0.00	0.00	31
Jun-16	52,914	0	54,184	0	54,184	1.92	0.63	0.15	0.02	0.20	3,211
Jul-16	93,411	49	95,653	7,362	103,015	4.24	1.25	0.27	12.18	0.41	6,407
Aug-16	65,287	0	66,854	0	66,854	2.36	0.78	0.18	0.02	0.25	3,963
Sep-16	6,624	0	6,783	0	6,783	0.35	0.08	0.02	0.00	0.03	402
Oct-16	3,235	0	3,312	0	3,312	0.16	0.04	0.01	0.00	0.01	196
Nov-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-16	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-17	14,157	0	14,497	0	14,497	0.68	0.17	0.04	0.00	0.05	860
Feb-17	9,866	0	10,103	0	10,103	0.45	0.12	0.03	0.00	0.04	599
Mar-17	26,691	0	27,331	0	27,331	1.04	0.32	0.07	0.01	0.10	1,620
Apr-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
May-17	88	0	90	0	90	0.00	0.00	0.00	0.00	0.00	5
Jun-17	46,110	0	47,216	0	47,216	2.12	0.55	0.13	0.01	0.18	2,799
Jul-17	724	0	741	0	741	0.01	0.01	0.00	0.00	0.00	44
Aug-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Sep-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Oct-17	448	0	458	0	458	0.02	0.01	0.00	0.00	0.00	27
Nov-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Dec-17	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jan-18	1,578	0	1,616	0	1,616	0.12	0.02	0.00	0.00	0.01	96
Feb-18	38,678	0	39,607	0	39,607	1.80	0.46	0.11	0.01	0.15	2,348
Mar-18	16,271	0	16,661	0	16,661	0.87	0.20	0.04	0.01	0.06	988
Apr-18	7,281	0	7,456	0	7,456	0.56	0.09	0.02	0.00	0.03	442
May-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Jun-18	35,027	0	35,867	11	35,878	1.41	0.42	0.10	0.29	0.13	2,138
Jul-18	175,454	0	179,665	0	179,665	10.33	2.11	0.48	0.05	0.67	10,649
Aug-18	107,197	0	109,770	0	109,770	5.86	1.29	0.29	0.03	0.41	6,507
Sep-18	15,811	11	16,191	1,661	17,851	0.75	0.22	0.05	1.90	0.07	1,134
Oct-18	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0
Nov-18	19,893	0	20,370	0	20,370	1.22	0.24	0.05	0.01	0.08	1,207
Dec-18	11,017	0	11,281	0	11,281	0.43	0.13	0.03	0.00	0.04	669

Table B-12
SUMMARY OF BASELINE ACTUAL EMISSIONS

	Baseline Actual Emissions - Annual Average of 24-Month Total Emissions					
	NO_X	CO	VOC	SO_2	$PM_{10/2.5}$	CO2e
	Tons/Yr	Tons/Yr	Tons/Yr	Tons/Yr	Tons/Yr	Tons/Yr
Total - Sum of Boiler 1, Boiler 2, Boiler 3, Boiler 4						
Nov-14						
Dec-14						
Jan-15						
Feb-15						
Mar-15						
Apr-15						
May-15						
Jun-15						
Jul-15						
Aug-15						
Sep-15						
Oct-15						
Nov-15						
Dec-15						
Jan-16						
Feb-16						
Mar-16						
Apr-16						
May-16						
Jun-16						
Jul-16						
Aug-16						
Sep-16						
Oct-16						
Nov-16	44.25	9.21	2.10	27.05	2.92	47,303.93
Dec-16	40.52	8.48	1.93	18.05	2.69	43,437.80
Jan-17	38.49	8.10	1.84	18.04	2.57	41,528.34
Feb-17	36.43	7.80	1.78	16.70	2.48	39,976.97
Mar-17	32.89	7.21	1.64	16.68	2.29	36,979.74
Apr-17	27.88	6.27	1.43	16.66	1.99	32,256.15
May-17	24.05	5.52	1.26	16.64	1.75	28,474.97
Jun-17	14.05	3.73	0.85	6.61	1.19	18,909.93
Jul-17	8.86	2.59	0.59	6.14	0.83	13,131.44
Aug-17	8.63	2.50	0.56	6.14	0.80	12,657.44
Sep-17	7.59	2.22	0.50	6.13	0.71	11,245.58
Oct-17	7.60	2.22	0.50	6.13	0.71	11,259.20
Nov-17	7.60	2.22	0.50	6.13	0.71	11,259.20
Dec-17	7.60	2.22	0.50	6.13	0.71	11,259.20
Jan-18	7.66	2.23	0.50	6.13	0.71	11,307.08
Feb-18	8.12	2.38	0.54	6.14	0.76	12,084.71
Mar-18	8.07	2.33	0.53	6.14	0.74	11,798.50
Apr-18	8.35	2.37	0.54	6.14	0.76	12,019.52
May-18	8.35	2.37	0.53	6.14	0.75	12,003.92
Jun-18	8.10	2.26	0.51	6.27	0.72	11,467.28
Jul-18	11.14	2.69	0.62	0.21	0.85	13,588.31
Aug-18	12.90	2.94	0.67	0.22	0.93	14,860.23
Sep-18	13.09	3.01	0.69	1.16	0.95	15,226.41
Oct-18	13.01	2.99	0.68	1.16	0.95	15,128.35
Nov-18	13.63	3.11	0.71	1.17	0.98	15,732.07
Dec-18	13.84	3.17	0.73	1.17	1.01	16,066.44

APPENDIX C

RACT/BACT/LAER CLEARINGHOUSE SEARCH RESULTS

Table C-1: Combined Cycle Gas Turbine NOx Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	CCGT Rating	Fuel	EMISSION LIMIT PPM	PERMIT LIMIT BASIS
CHICKAHOMINY POWER	CHARLES CITY, VA	5/21/2019	4070 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	3863 MMBTU/HR	NATURAL GAS	2.0	LAER
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	2737.7 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
RENAISSANCE ENERGY CENTER	GREENE, PA	8/27/2018	2665.9 MMBTU/HR	NATURAL GAS	2.0	LAER
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	3474 MMBTU/HR	NATURAL GAS	2.0	LAER
NEW COVERT GENERATING FACILITY	VAN BUREN, MI	7/30/2018	1230 MW	NATURAL GAS	2.0	BACT-PSD
SHADY HILLS COMBINED CYCLE FACILITY	PASCO, FL	7/27/2018	3266.9 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	3658 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
INDECK NILES LLC	CASS, MI	6/26/2018	3421 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	3482 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	3459.6 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	3231 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
MONTGOMERY COUNTY POWER STATIOIN	MONTGOMERY, TX	3/30/2018	2635 MMBTU/HR	NATURAL GAS	2.0	LAER
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	3496.2 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
RENOVO ENERGY CENTER, LLC	CLINTON, PA	1/26/2018	3630 MMBTU/HR	NATURAL GAS	2.0	LAER
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	3544 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	3320 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	3602 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	3516 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	3055 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	3025 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
GAINES COUNTY POWER PLANT	GAINES, TX	4/28/2017	426 MW	NATURAL GAS	2.0	BACT-PSD
HILLTOP ENERGY CENTER, LLC	GREENE, PA	4/12/2017	3509 MMBTU/HR	NATURAL GAS	2.0	LAER
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	3131 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	3338 MMBTU/HR	NATURAL GAS	2.0	LAER
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	3462 MMBTU/H	NATURAL GAS	2.0	LAER
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	3227 MMBTU/HR	NATURAL GAS	2.0	N/A
NECHES STATION	CHEROKEE, TX	3/24/2016	231 MW	NATURAL GAS	2.0	BACT-PSD
OKEECHOBEE CLEAN ENERGY CENTER	OKEECHOBEE, FL	3/9/2016	3096 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
DECORDOVA STEAM ELECTRIC STATION	HOOD, TX	3/8/2016	231 MW	NATURAL GAS	2.0	BACT-PSD
TENASKA PA PARTNERS/WESTMORELAND GEN FAC	WESTMORELAND, PA	2/12/2016	3147 MMBTU/H	NATURAL GAS	2.0	LAER
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	3304.3 MMBTU/HR	NATURAL GAS	2.0	LAER
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	2544 MMBTU/HR	NATURAL GAS	2.0	LAER
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	286 MW	NATURAL GAS	2.0	BACT-PSD
FGE EAGLE PINES PROJECT	CHEROKEE, TX	11/4/2015	321 MW	NATURAL GAS	2.0	BACT-PSD
LON C. HILL POWER STATION	NUECES, TX	10/2/2015	195 MW	NATURAL GAS	2.0	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	3727 MMBTU/HR	NATURAL GAS	2.0	LAER
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	2725 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
EAGLE MOUNTAIN STEAM ELECTRIC STATION	TARRANT, TX	6/18/2015	210 MW	NATURAL GAS	2.0	LAER
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	2022 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	2144 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
COLORADO BEND ENERGY CENTER	WHARTON, TX	4/1/2015	1100 MW	NATURAL GAS	2.0	BACT-PSD
S R BERTRON ELECTRIC GENERATING STATION	HARRIS, TX	12/19/2014	240 MW	NATURAL GAS	2.0	BACT-PSD
VICTORIA POWER STATION	VICTORIA, TX	12/1/2014	197 MW	NATURAL GAS	2.0	BACT-PSD
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	2419.61 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
TRINIDAD GENERATING FACILITY	HENDERSON, TX	11/20/2014	497 MW	NATURAL GAS	2.0	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	3278.5 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	235 MW	NATURAL GAS	2.0	BACT-PSD
CEDAR BAYOU ELECTRIC GENERATION STATION	CHAMBERS, TX	8/29/2014	225 MW	NATURAL GAS	2.0	BACT-PSD
WEST DEPTFORD ENERGY STATION	GLOUCESTER, NJ	7/18/2014	20282 MMCF/YR	NATURAL GAS	2.0	LAER

Table C-1: Combined Cycle Gas Turbine NOx Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FREEPORT LNG PRETREATMENT FACILITY	BRAZORIA, TX	7/16/2014	87 MW	NATURAL GAS	2.0	BACT-PSD
TENASKA BROWNSVILLE GENERATING STATION	CAMERON, TX	4/29/2014	274 MW	NATURAL GAS	2.0	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	725 MW	NATURAL GAS	2.0	LAER
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	2258 MMBTU/HR	NATURAL GAS	2.0	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	1000 MW	NATURAL GAS	2.0	LAER
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX, NJ	3/7/2014	33691 MMCF/YR	NATURAL GAS	2.0	LAER
TROUTDALE ENERGY CENTER, LLC	MULTNOMAH, OR	3/5/2014	2988 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
FUTURE POWER PA/GOOD SPRINGS NGCC FACILITY	SCHUYLKILL, PA	3/4/2014	2267 MMBTU/H	NATURAL GAS	2.0	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	2449 MMBTU/HR	NATURAL GAS	2.0	LAER
CALCASIEU PASS LNG PROJECT	CAMERON, LA	9/21/2018	921 MMBTU/HR	NATURAL GAS	2.5	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	8322 MMBTU/HR	NATURAL GAS	3.0	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	554 MMBTU/HR	NATURAL GAS	3.0	BACT-PSD
NECHES STATION	CHEROKEE, TX	3/24/2016	232 MW	NATURAL GAS	9.0	BACT-PSD
JACKSON GENERATING STATION	JACKSON, MI	4/2/2019	420 MW	NATURAL GAS	25.0	BACT-PSD
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	3256 MMBTU/HR	ULSD	4.0	LAER
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	3462 MMBTU/HR	ULSD	4.0	LAER
RENOVO ENERGY CENTER, LLC	CLINTON, PA	1/26/2018	3673 MMBTU/HR	ULSD	4.0	LAER
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	2511 MMBTU/HR	ULSD	5.0	LAER
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	NA	ULSD	6.0	LAER

Table C-2: Combined Cycle Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Fuel	CCGT Rating	EMISSION LIMIT PPM	PERMIT LIMIT BASIS
CHICKAHOMINY POWER	CHARLES CITY, VA	5/21/2019	NATURAL GAS	4070 MMBTU/HR	0.70	BACT-PSD
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	NATURAL GAS	3863 MMBTU/HR	0.70	LAER
C4GT, LLC	CHARLES CITY, VA	4/26/2018	NATURAL GAS	3482 MMBTU/HR	0.70	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	NATURAL GAS	3227 MMBTU/HR	0.70	N/A
WEST DEPTFORD ENERGY STATION	GLOUCESTER, NJ	7/18/2014	NATURAL GAS	20282 MMCF/YR	0.70	LAER
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	NATURAL GAS	2144 MMBTU/H	0.84	BACT-PSD
RENAISSANCE ENERGY CENTER	GREENE, PA	8/27/2018	NATURAL GAS	2665.9 MMBTU/HR	1.00	LAER
NEW COVERT GENERATING FACILITY	VAN BUREN, MI	7/30/2018	NATURAL GAS	1230 MW	1.00	BACT-PSD
SEMINOLE GENERATING STATION	PUTNAM, FL	3/21/2018	NATURAL GAS	3514 MMBTU/HR	1.00	BACT-PSD
RENOVO ENERGY CENTER, LLC	CLINTON, PA	1/26/2018	NATURAL GAS	3630 MMBTU/HR	1.00	LAER
DANIA BEACH ENERGY CENTER	BROWARD, FL	12/4/2017	NATURAL GAS	4000 MMBTU/HR	1.00	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3544 MMBTU/H	1.00	BACT-PSD
HILLTOP ENERGY CENTER, LLC	GREENE, PA	4/12/2017	NATURAL GAS	3509 MMBTU/HR	1.00	LAER
CHOCOLATE BAYOU STEAM GENERATING (CBSG) STATION	BRAZORIA, TX	2/17/2017	NATURAL GAS	50 MW	1.00	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	NATURAL GAS	3338 MMBTU/HR	1.00	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	NATURAL GAS	8040 H/YR	1.00	LAER
OKEECHOBEE CLEAN ENERGY CENTER	OKEECHOBEE, FL	3/9/2016	NATURAL GAS	3096 MMBTU/HR	1.00	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	NATURAL GAS	3304.3 MMBTU/HR	1.00	LAER
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	NATURAL GAS	2544 MMBTU/HR	1.00	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	NATURAL GAS	286 MW	1.00	LAER
S R BERTRON ELECTRIC GENERATING STATION	HARRIS, TX	12/19/2014	NATURAL GAS	240 MW	1.00	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	NATURAL GAS	235 MW	1.00	LAER
WEST DEPTFORD ENERGY STATION	GLOUCESTER, NJ	7/18/2014	NATURAL GAS	20282 MMCF/YR	1.00	LAER
CPV ST. CHARLES	CHARLES, MD	4/23/2014	NATURAL GAS	725 MEGAWATT	1.00	LAER
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	NATURAL GAS	2258 MMBTU/HR	1.00	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	NATURAL GAS	33691 MMCF/YR	1.00	LAER
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	NATURAL GAS	2449 MMBTU/H	1.00	THER CASE-BY-CA
CALCASIEU PASS LNG PROJECT	CAMERON, LA	9/21/2018	NATURAL GAS	921 MM BTU/H	1.10	BACT-PSD
TENASKA PA PARTNERS/WESTMORELAND GEN FAC	WESTMORELAND, PA	2/12/2016	NATURAL GAS	3147 MMBTU/H	1.40	LAER
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	NATURAL GAS	2022 MMBTU/H	1.40	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	NATURAL GAS	3727 MMBTU/HR	1.50	LAER
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	NATURAL GAS	1000 MW	1.60	LAER
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	NATURAL GAS	2737.7 MMBTU/HR	2.00	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	NATURAL GAS	3459.6 MMBTU/H	2.00	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	NATURAL GAS	3231 MMBTU/H	2.00	BACT-PSD
MONTGOMERY COUNTY POWER STATIOIN	MONTGOMERY, TX	3/30/2018	NATURAL GAS	2635 MMBTU/HR	2.00	LAER
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	NATURAL GAS	3496.2 MMBTU/HR	2.00	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3320 MMBTU/H	2.00	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3602 MMBTU/H	2.00	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	NATURAL GAS	3516 MMBTU/H	2.00	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	NATURAL GAS	3055 MMBTU/H	2.00	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	NATURAL GAS	3025 MMBTU/H	2.00	BACT-PSD
HILLTOP ENERGY CENTER, LLC	GREENE, PA	4/12/2017	NATURAL GAS	4367 MMBTU/HR	2.00	LAER
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	NATURAL GAS	3131 MMBTU/H	2.00	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	NATURAL GAS	3462 MMBTU/H	2.00	LAER
NECHES STATION	CHEROKEE, TX	3/24/2016	NATURAL GAS	232 MW	2.00	BACT-PSD
NECHES STATION	CHEROKEE, TX	3/24/2016	NATURAL GAS	231 MW	2.00	BACT-PSD
DECORDOVA STEAM ELECTRIC STATION	HOOD, TX	3/8/2016	NATURAL GAS	231 MW	2.00	BACT-PSD

Table C-2: Combined Cycle Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FGE EAGLE PINES PROJECT	CHEROKEE, TX	11/4/2015	NATURAL GAS	321 MW	2.00	BACT-PSD
LON C. HILL POWER STATION	NUECES, TX	10/2/2015	NATURAL GAS	195 MW	2.00	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	NATURAL GAS	2725 MMBTU/H	2.00	BACT-PSD
EAGLE MOUNTAIN STEAM ELECTRIC STATION	TARRANT, TX	6/18/2015	NATURAL GAS	210 MW	2.00	LAER
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	NATURAL GAS	2419.61 MMBTU/HR	2.00	BACT-PSD
FREEPORT LNG PRETREATMENT FACILITY	BRAZORIA, TX	7/16/2014	NATURAL GAS	87 MW	2.00	BACT-PSD
TENASKA BROWNSVILLE GENERATING STATION	CAMERON, TX	4/29/2014	NATURAL GAS	274 MW	2.00	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	NATURAL GAS	725 MW	2.00	LAER
FUTURE POWER PA/GOOD SPRINGS NGCC FACILITY	SCHUYLKILL, PA	3/4/2014	NATURAL GAS	2267 MMBTU/H	2.00	BACT-PSD
GAINES COUNTY POWER PLANT	GAINES, TX	4/28/2017	NATURAL GAS	426 MW	3.50	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	NATURAL GAS	8322 MMBTU/H	4.00	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	NATURAL GAS	554 MMBTU/H	4.00	BACT-PSD
COLORADO BEND ENERGY CENTER	WHARTON, TX	4/1/2015	NATURAL GAS	1100 MW	4.00	BACT-PSD
VICTORIA POWER STATION	VICTORIA, TX	12/1/2014	NATURAL GAS	197 MW	4.00	BACT-PSD
TRINIDAD GENERATING FACILITY	HENDERSON, TX	11/20/2014	NATURAL GAS	497 MW	4.00	BACT-PSD
TROUTDALE ENERGY CENTER, LLC	MULTNOMAH, OR	3/5/2014	NATURAL GS	2988 MMBTU/H	2.00	BACT-PSD
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	ULSD	3256 MMBTU/HR	2.00	LAER
RENOVO ENERGY CENTER, LLC	CLINTON, PA	1/26/2018	ULSD	3673 MMBTU/HR	2.00	LAER
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	ULSD	3338 MMBTU/HR	2.00	LAER
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	ULSD	2511 MMBTU/HR	2.00	BACT-PSD

Table C-3: Combined Cycle Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Fuel	CCGT Rating	EMISSION LIMIT PPM	PERMIT LIMIT BASIS
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	NATURAL GAS	3863 MMBTU/HR	0.9	BACT-PSD
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	NATURAL GAS	2544 MMBTU/HR	0.9	BACT-PSD
WEST DEPTFORD ENERGY STATION	GLOUCESTER, NJ	7/18/2014	NATURAL GAS	20282 MMCF/YR	0.9	BACT-PSD
CHICKAHOMINY POWER	CHARLES CITY, VA	5/21/2019	NATURAL GAS	4070 MMBTU/HR	1.0	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	NATURAL GAS	3482 MMBTU/HR	1.0	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	NATURAL GAS	3227 MMBTU/HR	1.0	N/A
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	NATURAL GAS	270 MW	1.5	BACT-PSD
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	NATURAL GAS	2737.7 MMBTU/HR	2.0	BACT-PSD
RENAISSANCE ENERGY CENTER	GREENE, PA	8/27/2018	NATURAL GAS	2665.9 MMBTU/HR	2.0	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	NATURAL GAS	3474 MMBTU/HR	2.0	BACT-PSD
NEW COVERT GENERATING FACILITY	VAN BUREN, MI	7/30/2018	NATURAL GAS	1230 MW	2.0	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	NATURAL GAS	3658 MMBTU/HR	2.0	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	NATURAL GAS	3459.6 MMBTU/H	2.0	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	NATURAL GAS	3231 MMBTU/H	2.0	BACT-PSD
MONTGOMERY COUNTY POWER STATIOIN	MONTGOMERY, TX	3/30/2018	NATURAL GAS	2635 MMBTU/H	2.0	BACT-PSD
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	NATURAL GAS	3496.2 MMBTU/HR	2.0	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3544 MMBTU/H	2.0	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3320 MMBTU/H	2.0	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3602 MMBTU/H	2.0	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	NATURAL GAS	3516 MMBTU/H	2.0	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	NATURAL GAS	3055 MMBTU/H	2.0	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	NATURAL GAS	3025 MMBTU/H	2.0	BACT-PSD
GAINES COUNTY POWER PLANT	GAINES, TX	4/28/2017	NATURAL GAS	426 MW	2.0	BACT-PSD
HILLTOP ENERGY CENTER, LLC	GREENE, PA	4/12/2017	NATURAL GAS	3509 MMBTU/HR	2.0	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	NATURAL GAS	3131 MMBTU/H	2.0	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	NATURAL GAS	3338 MMBTU/HR	2.0	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	NATURAL GAS	3462 MMBTU/H	2.0	BACT-PSD
TENASKA PA PARTNERS/WESTMORELAND GEN FAC	WESTMORELAND, PA	2/12/2016	NATURAL GAS	3147 MMBTU/H	2.0	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	NATURAL GAS	3304.3 MMBTU/HR	2.0	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	NATURAL GAS	286 MW	2.0	BACT-PSD
FGE EAGLE PINES PROJECT	CHEROKEE, TX	11/4/2015	NATURAL GAS	321 MW	2.0	BACT-PSD
LON C. HILL POWER STATION	NUECES, TX	10/2/2015	NATURAL GAS	195 MW	2.0	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	NATURAL GAS	3727 MMBTU/HR	2.0	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	NATURAL GAS	2725 MMBTU/H	2.0	BACT-PSD
EAGLE MOUNTAIN STEAM ELECTRIC STATION	TARRANT, TX	6/18/2015	NATURAL GAS	210 MW	2.0	LAER
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	NATURAL GAS	2022 MMBTU/H	2.0	BACT-PSD
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	NATURAL GAS	2144 MMBTU/H	2.0	BACT-PSD
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	NATURAL GAS	2419.61 MMBTU/HR	2.0	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	NATURAL GAS	3278.5 MMBTU/H	2.0	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	NATURAL GAS	235 MW	2.0	BACT-PSD
CEDAR BAYOU ELECTRIC GENERATION STATION	CHAMBERS, TX	8/29/2014	NATURAL GAS	225 MW	2.0	BACT-PSD
TENASKA BROWNSVILLE GENERATING STATION	CAMERON, TX	4/29/2014	NATURAL GAS	274 MW	2.0	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	NATURAL GAS	725 MW	2.0	BACT-PSD
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	NATURAL GAS	2258 MMBTU/HR	2.0	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	NATURAL GAS	33691 MMCF/YR	2.0	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	NATURAL GAS	2449 MMBTU/H	2.0	THER CASE-BY-CA
FUTURE POWER PA/GOOD SPRINGS NGCC FACILITY	SCHUYLKILL, PA	3/4/2014	NATURAL GAS	2267 MMBTU/H	3.0	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	NATURAL GAS	8322 MMBTU/H	4.0	BACT-PSD

Table C-3: Combined Cycle Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	NATURAL GAS	554 MMBTU/H	4.0	BACT-PSD
NECHES STATION	CHEROKEE, TX	3/24/2016	NATURAL GAS	231 MW	4.0	BACT-PSD
DECORDOVA STEAM ELECTRIC STATION	HOOD, TX	3/8/2016	NATURAL GAS	231 MW	4.0	BACT-PSD
COLORADO BEND ENERGY CENTER	WHARTON, TX	4/1/2015	NATURAL GAS	1100 MW	4.0	BACT-PSD
S R BERTRON ELECTRIC GENERATING STATION	HARRIS, TX	12/19/2014	NATURAL GAS	240 MW	4.0	BACT-PSD
VICTORIA POWER STATION	VICTORIA, TX	12/1/2014	NATURAL GAS	197 MW	4.0	BACT-PSD
TRINIDAD GENERATING FACILITY	HENDERSON, TX	11/20/2014	NATURAL GAS	497 MW	4.0	BACT-PSD
FREEPORT LNG PRETREATMENT FACILITY	BRAZORIA, TX	7/16/2014	NATURAL GAS	87 MW	4.0	BACT-PSD
SHADY HILLS COMBINED CYCLE FACILITY	PASCO, FL	7/27/2018	NATURAL GAS	3266.9 MMBTU/HOUR	4.3	BACT-PSD
DANIA BEACH ENERGY CENTER	BROWARD, FL	12/4/2017	NATURAL GAS	4000 MMBTU/HR	4.3	BACT-PSD
OKEECHOBEE CLEAN ENERGY CENTER	OKEECHOBEE, FL	3/9/2016	NATURAL GAS	3096 MMBTU/HR	4.3	BACT-PSD
CALCASIEU PASS LNG PROJECT	CAMERON, LA	9/21/2018	NATURAL GAS	921 MM BTU/H	5.0	BACT-PSD
NECHES STATION	CHEROKEE, TX	3/24/2016	NATURAL GAS	232 MW	9.0	BACT-PSD
CEDAR BAYOU ELECTRIC GENERATING STATION	CHAMBERS COUNTY, TX	3/31/2015	NATURAL GAS	187 MW	15.0	BACT-PSD
TROUTDALE ENERGY CENTER, LLC	MULTNOMAH, OR	3/5/2014	NATURAL GS	2988 MMBTU/H	3.3	BACT-PSD
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	ULSD	3256 MMBTU/HR	1.8	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	ULSD	3462 MMBTU/H	2.0	BACT-PSD
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	ULSD	2511 MMBTU/HR	2.0	BACT-PSD

Table C-4: Combined Cycle Gas Turbine PM-10/PM-2.5 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Fuel	CCGT Rating	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	NATURAL GAS	3863 MMBTU/HR	0.0022	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	NATURAL GAS	3227 MMBTU/HR	0.0030	N/A
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3544 MMBTU/H	0.0036	BACT-PSD
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	NATURAL GAS	2419.61 MMBTU/HR	0.0037	BACT-PSD
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	NATURAL GAS	2544 MMBTU/HR	0.0038	BACT-PSD
TENASKA PA PARTNERS/WESTMORELAND GEN FAC	WESTMORELAND, PA	2/12/2016	NATURAL GAS	3147 MMBTU/HR	0.0039	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3320 MMBTU/H	0.0040	BACT-PSD
RENAISSANCE ENERGY CENTER	GREENE, PA	8/27/2018	NATURAL GAS	2665.9 MMBTU/HR	0.0043	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	NATURAL GAS	3231 MMBTU/H	0.0050	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	NATURAL GAS	3338 MMBTU/HR	0.0050	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	NATURAL GAS	3025 MMBTU/H	0.0050	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	NATURAL GAS	3055 MMBTU/H	0.0050	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	NATURAL GAS	3459.6 MMBTU/H	0.0052	BACT-PSD
CHICKAHOMINY POWER	CHARLES CITY, VA	5/21/2019	NATURAL GAS	4070 MMBTU/HR	0.0054	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	NATURAL GAS	2725 MMBTU/H	0.0055	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3602 MMBTU/H	0.0057	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	NATURAL GAS	3304.3 MMBTU/HR	0.0059	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	NATURAL GAS	3278.5 MMBTU/H	0.0061	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	NATURAL GAS	2449 MMBTU/H	0.0062	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	NATURAL GAS	3727 MMBTU/HR	0.0063	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	NATURAL GAS	3482 MMBTU/HR	0.0065	BACT-PSD
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	NATURAL GAS	2022 MMBTU/H	0.0068	BACT-PSD
WEST DEPTFORD ENERGY STATION	GLOUCESTER, NJ	7/18/2014	NATURAL GAS	20282 MMCF/YR	0.0069	BACT-PSD
HILLTOP ENERGY CENTER, LLC	GREENE, PA	4/12/2017	NATURAL GAS	3509 MMBTU/HR	0.0072	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	NATURAL GAS	3516 MMBTU/H	0.0073	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	NATURAL GAS	3131 MMBTU/H	0.0080	BACT-PSD
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	NATURAL GAS	2144 MMBTU/H	0.0085	BACT-PSD
CALCASIEU PASS LNG PROJECT	CAMERON, LA	9/21/2018	NATURAL GAS	921 MM BTU/H	0.0103	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	NATURAL GAS	554 MMBTU/H	0.0140	BACT-PSD
WEST DEPTFORD ENERGY STATION	GLOUCESTER, NJ	7/18/2014	NATURAL GAS	20282 MMCF/YR	10 LB/H	BACT-PSD
NEW COVERT GENERATING FACILITY	VAN BUREN, MI	7/30/2018	NATURAL GAS	1230 MW	10.7 LB/H	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	NATURAL GAS	3462 MMBTU/H	11.7 LB/H	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	NATURAL GAS	33691 MMCF/YR	12.7 LB/H	OTHER CASE-BY-CASE
MONTGOMERY COUNTY POWER STATIOIN	MONTGOMERY, TX	3/30/2018	NATURAL GAS	2635 MMBTU/H	125.7 TON/YR	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	NATURAL GAS	33691 MMCF/YR	13 LB/H	OTHER CASE-BY-CASE
NECHES STATION	CHEROKEE, TX	3/24/2016	NATURAL GAS	232 MW	13.4 LB/H	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	NATURAL GAS	33691 MMCF/YR	14 LB/H	OTHER CASE-BY-CASE
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	NATURAL GAS	33691 MMCF/YR	14.6 LB/H	OTHER CASE-BY-CASE
FREEPORT LNG PRETREATMENT FACILITY	BRAZORIA, TX	7/16/2014	NATURAL GAS	87 MW	15.22 LB/H	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	NATURAL GAS	3658 MMBTU/HR	16 LB/H	BACT-PSD
LON C. HILL POWER STATION	NUECES, TX	10/2/2015	NATURAL GAS	195 MW	16 LB/HR	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	NATURAL GAS	286 MW	17.9 LB/H	BACT-PSD
NECHES STATION	CHEROKEE, TX	3/24/2016	NATURAL GAS	231 MW	19.35 LB/H	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	NATURAL GAS	8322 MMBTU/H	19.8 LB/H	BACT-PSD
FGE EAGLE PINES PROJECT	CHEROKEE, TX	11/4/2015	NATURAL GAS	321 MW	21.4 LB/H	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	NATURAL GAS	270 MW	25.1 LB/H	BACT-PSD
THE EMPIRE DISTRICT ELECTRIC COMPANY	CHEROKEE, KS	7/14/2015	NATURAL GAS	250 MW	30.2 LB/H	OTHER CASE-BY-CASE
DECORDOVA STEAM ELECTRIC STATION	HOOD, TX	3/8/2016	NATURAL GAS	231 MW	35.47 LB/H	BACT-PSD

Table C-4: Combined Cycle Gas Turbine PM-10/PM-2.5 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

EAGLE MOUNTAIN STEAM ELECTRIC STATION	TARRANT, TX	6/18/2015	NATURAL GAS	210 MW	35.47 LB/H	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	NATURAL GAS	1000 MW	38 LB/H	BACT-PSD
JACKSON GENERATING STATION	JACKSON, MI	4/2/2019	NATURAL GAS	420 MW	4.9 LB/HR	BACT-PSD
COLORADO BEND ENERGY CENTER	WHARTON, TX	4/1/2015	NATURAL GAS	1100 MW	43 LB/H	BACT-PSD
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	ULSD	3256 MMBTU/HR	0.0083	BACT-PSD
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	ULSD	2511 MMBTU/HR	0.01697	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	ULSD	3462 MMBTU/H	0.02080	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	ULSD	3338 MMBTU/HR	0.04150	BACT-PSD

Table C-5: Combined Cycle Gas Turbine H2SO4 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Fuel	CCGT Rating	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3602 MMBTU/H	0.00052	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	NATURAL GAS	3227 MMBTU/HR	0.00053	N/A
TENASKA PA PARTNERS/WESTMORELAND GEN FAC	WESTMORELAND, PA	2/12/2016	NATURAL GAS	3147 MMBTU/HR	0.00060	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	NATURAL GAS	3482 MMBTU/HR	0.00063	BACT-PSD
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	NATURAL GAS	2544 MMBTU/HR	0.00083	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3320 MMBTU/H	0.00090	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	NATURAL GAS	3304.3 MMBTU/HR	0.00090	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	NATURAL GAS	3727 MMBTU/HR	0.00090	BACT-PSD
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	NATURAL GAS	2737.7 MMBTU/HR	0.00095	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	NATURAL GAS	3459.6 MMBTU/H	0.00100	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	NATURAL GAS	2449 MMBTU/H	0.00100	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	NATURAL GAS	3462 MMBTU/HR	0.00104	BACT-PSD
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	NATURAL GAS	3496.2 MMBTU/HR	0.00109	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	NATURAL GAS	3544 MMBTU/H	0.00110	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	NATURAL GAS	3516 MMBTU/H	0.00110	BACT-PSD
CHICKAHOMINY POWER	CHARLES CITY, VA	5/21/2019	NATURAL GAS	4070 MMBTU/HR	0.00120	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	NATURAL GAS	3055 MMBTU/H	0.00121	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	NATURAL GAS	3025 MMBTU/H	0.00122	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	NATURAL GAS	2725 MMBTU/H	0.00125	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	NATURAL GAS	3658 MMBTU/HR	0.00130	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	NATURAL GAS	3278.5 MMBTU/H	0.00131	BACT-PSD
FUTURE POWER PA/GOOD SPRINGS NGCC FACILITY	SCHUYLKILL, PA	3/4/2014	NATURAL GAS	2267 MMBTU/H	0.00150	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	NATURAL GAS	3231 MMBTU/H	0.00220	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	NATURAL GAS	3131 MMBTU/H	0.00222	BACT-PSD
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	NATURAL GAS	2258 MMBTU/HR	0.00320	BACT-PSD
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	NATURAL GAS	2258 MMBTU/HR	0.00320	BACT-PSD
WEST DEPTFORD ENERGY STATION	GLOUCESTER, NJ	7/18/2014	NATURAL GAS	20282 MMCF/YR	0.74 LB/H	OTHER CASE-BY-CASE
NEW COVERT GENERATING FACILITY	VAN BUREN, MI	7/30/2018	NATURAL GAS	1230 MW	1 LB/H	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	NATURAL GAS	1000 MW	12.5 LB/H	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	NATURAL GAS	725 MW	2.2 LB/H	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	NATURAL GAS	33691 MMCF/YR	2.79 LB/H	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	NATURAL GAS	8322 MMBTU/H	4.6 LB/H	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	NATURAL GAS	286 MW	4.6 LB/H	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	NATURAL GAS	270 MW	9.7 LB/H	BACT-PSD
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	ULSD	2544 MMBTU/HR	0.00091	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	ULSD	3462 MMBTU/HR	0.00123	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	ULSD	3338 MMBTU/HR	0.00130	BACT-PSD

Table C-6: Combined Cycle Gas Turbine CO2 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	CCGT Rating	EMISSION LIMIT LB/MW-HR	PERMIT LIMIT BASIS
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	3544 MMBTU/HR	775	BACT-PSD
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	2419.61 MMBTU/HR	792	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	3658 MMBTU/HR	794	BACT-PSD
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	2544 MMBTU/HR	809	BACT-PSD
CHICKAHOMINY POWER	CHARLES CITY, VA	5/21/2019	4069 MMBTU/HR	812	BACT-PSD
KILLINGLY ENERGY CENTER	WINDHAM, CT	12/10/2018	3863 MMBTU/HR	816	BACT-PSD
SR BERTRON ELECTRIC GENERATING STATION	HARRIS, TX	9/15/2015	718 MW	825	BACT-PSD
CEDAR BAYOU ELECTRIC GENERATING STATION	CHAMBERS, TX	9/15/2015	1436 MW	825	BACT-PSD
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	3496.2 MMBTU/HR	826	BACT-PSD
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	2737.7 MMBTU/HR	829	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	3055 MMBTU/HR	833	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	3025 MMBTU/HR	833	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	2725 MMBTU/HR	833	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	3516 MMBTU/HR	846	BACT-PSD
SHADY HILLS COMBINED CYCLE FACILITY	PASCO, FL	7/27/2018	3266.9 MMBTU/HR	850	BACT-PSD
DANIA BEACH ENERGY CENTER	BROWARD, FL	12/4/2017	4000 MMBTU/HR	850	BACT-PSD
OKEECHOBEE CLEAN ENERGY CENTER	OKEECHOBEE, FL	3/9/2016	3096 MMBTU/HR	850	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	286 MW	865	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	235 MW	869	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	725 MW	878	BACT-PSD
HILLTOP ENERGY CENTER, LLC	GREENE, PA	4/12/2017	3509 MMBTU/HR	879	OTHER CASE-BY-CASE
COLORADO BEND ENERGY CENTER	WHARTON, TX	4/1/2015	1100 MW	879	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	3278.5 MMBTU/HR	880	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	3482 MMBTU/HR	883	BACT-PSD
MONTGOMERY COUNTY POWER STATIOIN	MONTGOMERY, TX	3/30/2018	2635 MMBTU/HR	884	BACT-PSD
FGE EAGLE PINES PROJECT	CHEROKEE, TX	11/4/2015	321 MW	886	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	8040 H/YR	888	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	3227 MMBTU/HR	890	OTHER CASE-BY-CASE
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	2449 MMBTU/HR	895	BACT-PSD
EAGLE MOUNTAIN STEAM ELECTRIC STATION	TARRANT, TX	7/19/2016	462 MW	917	BACT-PSD
LON C. HILL POWER STATION	NUECES, TX	10/28/2014	700 MW	920	BACT-PSD
NECHES STATION	CHEROKEE, TX	3/24/2016	231 MW	924	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	33691 MMCF/YR	925	BACT-PSD
ROCKWOOD ENERGY CENTER	COLORADO, TX	3/18/2016	889 MW	929	BACT-PSD
AUSTIN ENERGY, SAND HILL ENERGY CENTER	TRAVIS, TX	9/29/2014	NA	930	BACT-PSD
TRINIDAD GENERATING FACILITY	HENDERSON, TX	3/1/2016	497 MW	937	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	1000 MW	946	BACT-PSD
WEST DEPTFORD ENERGY STATION	GLOUCESTER, NJ	7/18/2014	20282 MMCF/YR	947	BACT-PSD
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	2258 MMBTU/HR	951	BACT-PSD
GAINES COUNTY POWER PLANT	GAINES, TX	4/28/2017	426 MW	960	BACT-PSD
DECORDOVA STEAM ELECTRIC STATION (DECORDOVA STATION)	HOOD, TX	10/4/2016	213 MW	966	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	3231 MMBTU/HR	1000	BACT-PSD

Table C-6: Combined Cycle Gas Turbine CO2 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

CHOCOLATE BAYOU STEAM GENERATING (CBSG) STATION	BRAZORIA, TX	2/17/2017	50 MW	1000	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	3727 MMBTU/HR	1000	BACT-PSD
TROUTDALE ENERGY CENTER, LLC	MULTNOMAH, OR	3/5/2014	2988 MMBTU/HR	1000	BACT-PSD
NECHES STATION	CHEROKEE, TX	3/24/2016	232 MW	1341	BACT-PSD
JACKSON GENERATING STATION	JACKSON, MI	4/2/2019	420 MW	1000257 TONS/YR	BACT-PSD
THE EMPIRE DISTRICT ELECTRIC COMPANY	CHEROKEE, KS	7/14/2015	250 MW	1022755.9 TONS/YR	BACT-PSD
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	2258 MMBTU/HR	1318647 TONS/YR	BACT-PSD
NEW COVERT GENERATING FACILITY	VAN BUREN, MI	7/30/2018	1230 MW	1425081 TONS/YR	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	3304.3 MMBTU/HR	1629115 TONS/YR	BACT-PSD
TENASKA PA PARTNERS/WESTMORELAND GEN FAC	WESTMORELAND, PA	2/12/2016	3147 MMBTU/HR	1881905 TONS/YR	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	3131 MMBTU/HR	2045634.5 TONS/YR	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	8322 MMBTU/HR	2097001 TONS/YR	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	554 MMBTU/HR	312321 TONS/YR	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	3338 MMBTU/HR	3352086 TONS/YR	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	3474 MMBTU/HR	4026000 TONS/YR	BACT-PSD
ROLLING HILLS GENERATING, LLC	VINTON, OH	5/20/2015	2022 MMBTU/HR	7471 BTU/KW-H	BACT-PSD

Table C-7: Natural Gas Auxiliary Boiler NOx Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	HEAT INPUT MMBTU/HR	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	55	0.0060	LAER
CRICKET VALLEY ENERGY CENTER	USA, NY	2/3/2016	60	0.0085	LAER
CPV TOWANTIC, LLC	NEW HAVEN, CT	11/30/2015	92	0.0086	LAER
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	YORK, PA	6/15/2015	62	0.0086	LAER
EAGLE MOUNTAIN STEAM ELECTRIC STATION	TARRANT, TX	6/18/2015	73	0.010	LAER
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	98	0.010	LAER
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX, NJ	3/10/2016	80	0.010	LAER
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	42	0.010	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	93	0.010	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	45	0.010	LAER
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	78	0.011	BACT-PSD
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	112	0.011	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	96	0.011	LAER
RENOVO ENERGY CENTER, LLC	CLINTON, PA	1/26/2018	30	0.011	LAER
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	27	0.011	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	92	0.011	LAER
PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	ORANGE, TX	11/6/2015	96	0.011	BACT-PSD
TENASKA BROWNSVILLE GENERATING STATION	CAMERON, TX	4/29/2014	90	0.011	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	93	0.011	LAER
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	80	0.011	LAER
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	60	0.013	BACT-PSD
CHEYENNE PRAIRIE GENERATING STATION	LARAMIE, WY	7/16/2014	25	0.018	BACT-PSD
RENAISSANCE ENERGY CENTER	GREENE, PA	8/27/2018	88	0.020	LAER
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	38	0.020	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	38	0.020	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	99	0.020	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	34	0.020	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	80	0.027	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	45	0.035	BACT-PSD
TROUTDALE ENERGY CENTER, LLC	MULTNOMAH, OR	3/5/2014	40	0.035	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	100	0.036	BACT-PSD
PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	ORANGE, TX	11/6/2015	40	0.036	BACT-PSD
S R BERTRON ELECTRIC GENERATING STATION	HARRIS, TX	12/19/2014	80	0.036	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	62	0.040	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	62	0.040	BACT-PSD
PETMIN USA INCORPORATED	ASHTABULA, OH	2/6/2019	15	0.042	BACT-PSD
SHADY HILLS COMBINED CYCLE FACILITY	PASCO, FL	7/27/2018	60	0.050	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	84	0.050	BACT-PSD
OKEECHOBEE CLEAN ENERGY CENTER	OKEECHOBEE, FL	3/9/2016	100	0.050	BACT-PSD

Table C-8: Natural Gas Auxiliary Boiler VOC Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	HEAT INPUT MMBTU/HR	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	60	0.0015	LAER
CHEYENNE PRAIRIE GENERATING STATION	LARAMIE, WY	7/16/2014	25	0.0017	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	93	0.0020	LAER
CPV ST. CHARLES	CHARLES, MD	4/23/2014	93	0.0020	LAER
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	42	0.0030	LAER
HARRISON POWER	HARRISON, OH	4/19/2018	80	0.0031	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	45	0.0033	LAER
HARRISON POWER	HARRISON, OH	4/19/2018	45	0.0036	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	62	0.0040	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	62	0.0040	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	92	0.0040	LAER
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX, NJ	3/10/2016	80	0.0040	LAER
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	YORK, PA	6/15/2015	62	0.0040	LAER
RENOVO ENERGY CENTER, LLC	CLINTON, PA	1/26/2018	30	0.0050	N/A
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	27	0.0050	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	13	0.0050	LAER
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	55	0.0050	LAER
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	60	0.0050	BACT-PSD
TROUTDALE ENERGY CENTER, LLC	MULTNOMAH, OR	3/5/2014	40	0.0050	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	80	0.0050	OTHER CASE-BY-CASE
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	98	0.0050	LAER
CANFOR SOUTHERN PINE - CONWAY MILL	HORRY, SC	5/21/2019	29	0.0054	BACT-PSD
BELK CHIP-N-SAW FACILITY	FAYETTE, AL	5/26/2016	60	0.0054	BACT-PSD
LENZING FIBERS, INC.	MOBILE, AL	1/22/2014	100	0.0054	BACT-PSD
GREEN BAY PACKAGING, INC. - SHIPPING CONTAINER DIVISION	BROWN, WI	9/6/2018	35	0.0055	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	34	0.0059	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	38	0.0060	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	38	0.0060	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	99	0.0060	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	100	0.0080	BACT-PSD
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	78	0.0080	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	84	0.0080	BACT-PSD
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	112	0.0080	BACT-PSD

Table C-9: Natural Gas Auxiliary Boiler CO Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	HEAT INPUT MMBTU/HR	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	80	0.004	OTHER CASE-BY-CASE
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	60	0.016	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	93	0.020	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	80	0.031	BACT-PSD
RENOVO ENERGY CENTER, LLC	CLINTON, PA	1/26/2018	NA	0.036	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX, NJ	3/10/2016	NA	0.036	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	45	0.036	BACT-PSD
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	112	0.037	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	96	0.037	BACT-PSD
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	78	0.037	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	27	0.037	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	92	0.037	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	13	0.037	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	42	0.037	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	55	0.037	BACT-PSD
S R BERTRON ELECTRIC GENERATING STATION	HARRIS, TX	12/19/2014	80	0.037	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	98	0.037	BACT-PSD
CANFOR SOUTHERN PINE - CONWAY MILL	HORRY, SC	5/21/2019	29	0.038	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	45	0.038	BACT-PSD
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	60	0.038	BACT-PSD
CHEYENNE PRAIRIE GENERATING STATION	LARAMIE, WY	7/16/2014	25	0.038	BACT-PSD
TROUTDALE ENERGY CENTER, LLC	MULTNOMAH, OR	3/5/2014	40	0.040	BACT-PSD
RENAISSANCE ENERGY CENTER	GREENE, PA	8/27/2018	88	0.055	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	38	0.055	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	38	0.055	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	99	0.055	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	34	0.055	BACT-PSD
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	YORK, PA	6/15/2015	62	0.060	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	100	0.075	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	84	0.077	BACT-PSD
SHADY HILLS COMBINED CYCLE FACILITY	PASCO, FL	7/27/2018	60	0.080	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	62	0.080	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	62	0.080	BACT-PSD
DANIA BEACH ENERGY CENTER	BROWARD, FL	12/4/2017	100	0.080	BACT-PSD
DTE GAS COMPANY--MILFORD COMPRESSOR STATION	OAKLAND, MI	6/3/2016	6	0.080	BACT-PSD
OKEECHOBEE CLEAN ENERGY CENTER	OKEECHOBEE, FL	3/9/2016	100	0.080	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	93	0.080	BACT-PSD

Table C-10: Natural Gas Auxiliary Boiler PM-10/PM-2.5 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	HEAT INPUT MMBTU/HR	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX, NJ	3/10/2016	80	0.005	BACT-PSD
THE EMPIRE DISTRICT ELECTRIC COMPANY	CHEROKEE, KS	7/14/2015	18.6	0.005	BACT-PSD
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	YORK, PA	6/15/2015	62.1	0.005	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	80	0.005	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	97.5	0.005	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	80	0.006	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	99.9	0.007	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	83.5	0.007	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	92.4	0.007	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	13.31	0.007	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	55.4	0.007	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	44.55	0.007	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	61.5	0.007	BACT-PSD
DTE GAS COMPANY--MILFORD COMPRESSOR STATION	OAKLAND, MI	6/3/2016	6	0.008	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	42	0.008	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	45	0.008	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	37.8	0.008	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	37.8	0.008	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	34	0.008	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	26.8	0.010	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	99	0.060	BACT-PSD

Table C-11: Natural Gas Auxiliary Boiler H2SO4 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	HEAT INPUT MMBTU/HR	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	YORK, PA	6/15/2015	62	0.00005	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	45	0.00008	BACT-PSD
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	112	0.00010	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	13	0.00010	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	55	0.00010	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	98	0.00010	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	38	0.00011	BACT-PSD
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	60	0.00011	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	99	0.00011	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	27	0.00011	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	34	0.00012	BACT-PSD
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	78	0.00020	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	80	0.00022	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	38	0.00023	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX, NJ	3/10/2016	80	0.00025	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	80	0.00090	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	96	0.00104	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	92	0.00110	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	42	0.00400	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	45	0.00400	BACT-PSD
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	60	0.00550	BACT-PSD

Table C-12: Natural Gas Auxiliary Boiler CO2 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	HEAT INPUT MMBTU/HR	EMISSION LIMIT (LB/MMBTU) (Tons/Year)	PERMIT LIMIT BASIS
THE EMPIRE DISTRICT ELECTRIC COMPANY	CHEROKEE, KS	7/14/2015	19	116.9	BACT-PSD
TROUTDALE ENERGY CENTER, LLC	MULTNOMAH, OR	3/5/2014	40	117.0	BACT-PSD
HARRISON COUNTY POWER PLANT	HARRISON, WV	3/27/2018	78	117.1	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	62	117.1	BACT-PSD
DTE MARIETTA	WASHINGTON, OH	3/31/2014	97	117.1	BACT-PSD
CHEYENNE PRAIRIE GENERATING STATION	LARAMIE, WY	7/16/2014	25	117.1	BACT-PSD
PETMIN USA INCORPORATED	ASHTABULA, OH	2/6/2019	15	117.6	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	84	118.3	BACT-PSD
PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	ORANGE, TX	11/6/2015	40	118.5	BACT-PSD
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	60	119.0	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	80	119.0	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	99	120.0	BACT-PSD
BROOKE COUNTY POWER PLANT	BROOKE, WV	9/18/2018	112	132.0	BACT-PSD
GREEN BAY PACKAGING, INC. - SHIPPING CONTAINER DIVISION	BROWN, WI	9/6/2018	35	160.0	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	96	22,500	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	100	25,623	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	45	2,818	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	80	5,009	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	27	7,845	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	38	4,502	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	38	4,456	BACT-PSD
DTE GAS COMPANY--MILFORD COMPRESSOR STATION	OAKLAND, MI	6/3/2016	6	6,155	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	13	44,107	BACT-PSD
PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	ORANGE, TX	11/6/2015	96	119,195	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	55	13,561	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	34	4,008	BACT-PSD
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	60	17,313	BACT-PSD
MARSHALLTOWN GENERATING STATION	MARSHALL, IA	4/14/2014	60	17,313	BACT-PSD
LENZING FIBERS, INC.	MOBILE, AL	1/22/2014	100	112,508	BACT-PSD

Table C-13: Emergency Diesel Generator NOx Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT G/HP-HR	PERMIT LIMIT BASIS
PETMIN USA INCORPORATED	ASHTABULA, OH	2/6/2019	3131 HP	0.5	BACT-PSD
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	3755 HP	0.5	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	2346 HP	4.2	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	2947 HP	4.2	BACT-PSD
MIDWEST FERTILIZER COMPANY LLC	POSEY, IN	3/23/2017	3600 HP	4.4	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	2206 HP	4.8	BACT-PSD
INWOOD	BERKELEY, WV	9/15/2017	900 HP	4.8	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	3353 HP	4.8	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	1341 HP	4.8	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	1500 KW	4.8	LAER
SHADY HILLS COMBINED CYCLE FACILITY	PASCO, FL	7/27/2018	1500 KW	4.8	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	2000 KW	4.8	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	1341 HP	4.8	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	1341 HP	4.8	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	NA	4.8	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	1860 HP	4.8	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	2682 HP	4.8	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	2206 HP	4.8	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	1529 HP	4.8	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	1529 HP	4.8	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	5/9/2017	1500 KW	4.8	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	5/9/2017	1500 KW	4.8	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	3729 KW	4.8	BACT-PSD
CAMERON LNG FACILITY	CAMERON, LA	2/17/2017	3353 HP	4.8	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	2922 HP	4.8	BACT-PSD
METHANEX - GEISMAR METHANOL PLANT	ASCENSION, LA	12/22/2016	2346 HP	4.8	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	1500 KW	4.8	LAER
GRAYLING PARTICLEBOARD	CRAWFORD, MI	8/26/2016	1600 KW	4.8	BACT-PSD
LAKE CHARLES METHANOL FACILITY	CALCASIEU PARISH, LA	6/30/2016	4023 HP	4.8	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	3000 KW	4.8	N/A
MAGNOLIA LNG FACILITY	CALCASIEU, LA	3/21/2016	1340 HP	4.8	BACT-PSD
HOLBROOK COMPRESSOR STATION	CALCASIEU, LA	1/22/2016	1341 HP	4.8	BACT-PSD
BENTELER STEEL TUBE FACILITY	CADDO, LA	6/4/2015	2922 HP	4.8	BACT-PSD
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	2015.7 HP	4.8	BACT-PSD
PERRYMAN GENERATING STATION	HARFORD, MD	7/1/2014	1300 HP	4.8	LAER
COVE POINT LNG TERMINAL	CALVERT, MD	6/9/2014	1550 HP	4.8	LAER

Table C-13: Emergency Diesel Generator NOx Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

LAKE CHARLES CHEMICAL COMPLEX	CALCASIEU, LA	5/23/2014	2682 HP	4.8	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX LDPE UNIT	CALCASIEU, LA	5/23/2014	2682 HP	4.8	BACT-PSD
G2G PLANT	CALCASIEU, LA	5/23/2014	5364 HP	4.8	BACT-PSD
G2G PLANT	CALCASIEU, LA	5/23/2014	5364 HP	4.8	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	2250 KW	4.8	LAER
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	750 KW	4.8	LAER
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	1000 KW	4.9	LAER
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	2000 KW	5.5	LAER
DONLIN GOLD PROJECT	BETHEL CENSUS AREA, AK	6/30/2017	1500 KW	6.0	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	1100 KW	8.9	BACT-PSD

Table C-14: Emergency Diesel Generator VOC Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT G/HP-HR	PERMIT LIMIT BASIS
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	NA	0.02	LAER
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	2000 KW	0.2	LAER
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	2015.7 HP	0.3	BACT-PSD
HOLBROOK COMPRESSOR STATION	CALCASIEU, LA	1/22/2016	1341 HP	0.3	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	2922 HP	0.3	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	1341 HP	0.3	BACT-PSD
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	3755 HP	0.3	BACT-PSD
MIDWEST FERTILIZER COMPANY LLC	POSEY, IN	3/23/2017	3600 HP	0.4	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	1529 HP	0.6	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	1529 HP	0.6	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	2947 HP	0.6	BACT-PSD
BEAUMONT TERMINAL	JEFFERSON, TX	6/8/2016	NA	1.1	BACT-PSD
WILDHORSE TERMINAL	LINCOLN, OK	6/29/2017	700 HP	3.0	BACT-PSD
WILDHORSE TERMINAL	LINCOLN, OK	6/29/2017	275 HP	3.0	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	5000 HP	3.0	BACT-PSD
FIRST QUALITY TISSUE LOCK HAVEN PLT	CLINTON, PA	7/27/2017	2500 HP	3.5	N/A
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	2206 HP	4.8	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	3353 HP	4.8	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	1341 HP	4.8	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	2000 KW	4.8	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	1860 HP	4.8	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	2206 HP	4.8	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	3000 KW	4.8	N/A
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	2346 HP	4.8	BACT-PSD
BENTELER STEEL TUBE FACILITY	CADDO, LA	6/4/2015	2922 HP	4.8	BACT-PSD
COVE POINT LNG TERMINAL	CALVERT, MD	6/9/2014	1550 HP	4.8	LAER
LAKE CHARLES CHEMICAL COMPLEX	CALCASIEU, LA	5/23/2014	2682 HP	4.8	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX LDPE UNIT	CALCASIEU, LA	5/23/2014	2682 HP	4.8	BACT-PSD
G2G PLANT	CALCASIEU, LA	5/23/2014	5364 HP	4.8	BACT-PSD
G2G PLANT	CALCASIEU, LA	5/23/2014	5364 HP	4.8	BACT-PSD
PERDUE GRAIN AND OILSEED, LLC	CHESAPEAKE, VA	7/12/2017	760 HP	NA	BACT-PSD
CAMERON LNG FACILITY	CAMERON, LA	2/17/2017	3353 HP	NA	BACT-PSD

Table C-15: Emergency Diesel Generator CO Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT G/HP-HR	PERMIT LIMIT BASIS
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	1000 KW	0.3	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	2000 KW	0.6	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	3353 HP	2.6	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	1341 HP	2.6	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	1500 KW	2.6	BACT-PSD
SHADY HILLS COMBINED CYCLE FACILITY	PASCO, FL	7/27/2018	1500 KW	2.6	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	2000 KW	2.6	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	1341 HP	2.6	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	1341 HP	2.6	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	2682 HP	2.6	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	2206 HP	2.6	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	2206 HP	2.6	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	1529 HP	2.6	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	1529 HP	2.6	BACT-PSD
FIRST QUALITY TISSUE LOCK HAVEN PLT	CLINTON, PA	7/27/2017	2500 BHP	2.6	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	5/9/2017	1500 KW	2.6	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	5/9/2017	1500 KW	2.6	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	5000 HP	2.6	BACT-PSD
MIDWEST FERTILIZER COMPANY LLC	POSEY, IN	3/23/2017	3600 HP	2.6	BACT-PSD
CAMERON LNG FACILITY	CAMERON, LA	2/17/2017	3353 HP	2.6	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	2922 HP	2.6	BACT-PSD
METHANEX - GEISMAR METHANOL PLANT	ASCENSION, LA	12/22/2016	2346 HP	2.6	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	2947 HP	2.6	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	1500 KW	2.6	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	8/26/2016	1600 KW	2.6	BACT-PSD
LAKE CHARLES METHANOL FACILITY	CALCASIEU PARISH, LA	6/30/2016	4023 HP	2.6	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	3000 KW	2.6	N/A
MAGNOLIA LNG FACILITY	CALCASIEU, LA	3/21/2016	1340 HP	2.6	BACT-PSD
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	3000 KW	2.6	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	2346 HP	2.6	BACT-PSD
BENTELER STEEL TUBE FACILITY	CADDO, LA	6/4/2015	2922 HP	2.6	BACT-PSD
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	2015.7 HP	2.6	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	1100 KW	2.6	BACT-PSD
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	3755 HP	2.6	BACT-PSD
COVE POINT LNG TERMINAL	CALVERT, MD	6/9/2014	1550 HP	2.6	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX	CALCASIEU, LA	5/23/2014	2682 HP	2.6	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX LDPE UNIT	CALCASIEU, LA	5/23/2014	2682 HP	2.6	BACT-PSD
G2G PLANT	CALCASIEU, LA	5/23/2014	5364 HP	2.6	BACT-PSD

Table C-15: Emergency Diesel Generator CO Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

G2G PLANT	CALCASIEU, LA	5/23/2014	5364 HP	2.6	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	2250 KW	2.6	BACT-PSD
DONLIN GOLD PROJECT	BETHEL CENSUS AREA, AK	6/30/2017	1500 KW	3.3	BACT-PSD

Table C-16: Emergency Diesel Generator PM-10/PM-2.5 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT G/HP-HR	PERMIT LIMIT BASIS
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	2000 KW	0.03	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	1000 KW	0.04	BACT-PSD
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	3755 HP	0.08	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	3353 HP	0.15	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	1341 HP	0.15	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	1341 HP	0.15	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	NA	0.15	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	1860 HP	0.15	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	2206 HP	0.15	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	2206 HP	0.15	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	1529 HP	0.15	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	1529 HP	0.15	BACT-PSD
DONLIN GOLD PROJECT	BETHEL CENSUS AREA, AK	6/30/2017	1500 KW	0.15	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	5/9/2017	1500 KW	0.15	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	5/9/2017	1500 KW	0.15	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	5000 HP	0.15	BACT-PSD
MIDWEST FERTILIZER COMPANY LLC	POSEY, IN	3/23/2017	3600 HP	0.15	BACT-PSD
CAMERON LNG FACILITY	CAMERON, LA	2/17/2017	3353 HP	0.15	BACT-PSD
METHANEX - GEISMAR METHANOL PLANT	ASCENSION, LA	12/22/2016	2346 HP	0.15	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	2947 HP	0.15	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	8/26/2016	1600 KW	0.15	BACT-PSD
LAKE CHARLES METHANOL FACILITY	CALCASIEU PARISH, LA	6/30/2016	4023 HP	0.15	BACT-PSD
MAGNOLIA LNG FACILITY	CALCASIEU, LA	3/21/2016	1340 HP	0.15	BACT-PSD
HOLBROOK COMPRESSOR STATION	CALCASIEU, LA	1/22/2016	1341 HP	0.15	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	2346 HP	0.15	BACT-PSD
BENTELER STEEL TUBE FACILITY	CADDO, LA	6/4/2015	2922 HP	0.15	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX	CALCASIEU, LA	5/23/2014	2682 HP	0.15	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX LDPE UNIT	CALCASIEU, LA	5/23/2014	2682 HP	0.15	BACT-PSD
G2G PLANT	CALCASIEU, LA	5/23/2014	5364 HP	0.15	BACT-PSD
G2G PLANT	CALCASIEU, LA	5/23/2014	5364 HP	0.15	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	2250 KW	0.15	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	2682 HP	0.17	BACT-PSD
COVE POINT LNG TERMINAL	CALVERT, MD	6/9/2014	1550 HP	0.17	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	250 HP	0.18	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	1100 KW	0.24	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	2922 HP	0.25	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	3000 KW	0.30	N/A

Table C-17: Emergency Diesel Generator H2SO4 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	3000 KW	0.0001	N/A
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	1000 KW	0.0002	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	2000 KW	0.0002	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	1860 HP	0.0007	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	2250 KW	0.0019	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	1529 HP	0.0035	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	1529 HP	0.0035	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	2346 HP	0.0084	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	2947 HP	0.0132	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	1475.1 HP	0.0226	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	2206 HP	0.0247	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	2206 HP	0.0525	BACT-PSD

Table C-18: Emergency Diesel Generator CO2 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT	PERMIT LIMIT BASIS
PETMIN USA INCORPORATED	ASHTABULA, OH	2/6/2019	158 HP	9.09 T/YR	BACT-PSD
PETMIN USA INCORPORATED	ASHTABULA, OH	2/6/2019	3131 HP	181.6 T/YR	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	3353 HP	200 T/YR	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	1341 HP	80 T/YR	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	1500 KW	241 T/YR	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	2000 KW	161 T/YR	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	1341 HP	383 T/YR	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	1341 HP	383 T/YR	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	NA	981 T/YR	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	1860 HP	109.2 T/YR	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	250 HP	163.6 LB/MMBTU	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	2682 HP	163.6 LB/MMBTU	BACT-PSD
LONG RIDGE ENERGY GENERATION LLC - HANNIBAL POWER	MONROE, OH	11/7/2017	2206 HP	116.8 T/YR	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	2206 HP	120 T/YR	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	1529 HP	445 T/YR	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	1529 HP	445 T/YR	BACT-PSD
DONLIN GOLD PROJECT	BETHEL CENSUS AREA, AK	6/30/2017	1500 KW	2781 T/YR	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	5/9/2017	1500 KW	209 T/YR	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	5/9/2017	1500 KW	70 T/YR	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	5000 HP	1289 T/YR	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	2922 HP	928 T/YR	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	2947 HP	858 T/YR	BACT-PSD
GRAYLING PARTICLEBOARD	CRAWFORD, MI	8/26/2016	1600 KW	223 T/YR	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	3000 KW	163.6 LB/MMBTU	N/A
HOLBROOK COMPRESSOR STATION	CALCASIEU, LA	1/22/2016	1341 HP	77 T/YR	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	2000 KW	81 T/YR	BACT-PSD
GOLDEN PASS LNG EXPORT TERMINAL	JEFFERSON, TX	9/11/2015	750 HP	40 HR/YR	BACT-PSD
MOXIE FREEDOM GENERATION PLANT	LUZERNE, PA	9/1/2015	1000 KW	44 T/YR	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	2346 HP	683 T/YR	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	1100 KW	474 T/YR	BACT-PSD
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	3755 HP	432 T/YR	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX	CALCASIEU, LA	5/23/2014	2682 HP	56 T/YR	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX LDPE UNIT	CALCASIEU, LA	5/23/2014	2682 HP	56 T/YR	BACT-PSD
MAG PELLET LLC	WHITE, IN	4/24/2014	620 HP	382 T/YR	BACT-PSD
DTE MARIETTA	WASHINGTON, OH	3/31/2014	1141 HP	65.3 T/YR	BACT-PSD

Table C-19: Emergency Diesel Fire Pump Engine NOx Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT G/HP-HR	PERMIT LIMIT BASIS
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	460 HP	2.6	LAER
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	373 HP	2.6	BACT-PSD
MOTOR VEHICLE ASSEMBLY PLANT	BEXAR, TX	9/23/2018	214 KW	3.0	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	300 HP	3.0	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	402 HP	3.0	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	422 HP	3.0	LAER
SHADY HILLS COMBINED CYCLE FACILITY	PASCO, FL	7/27/2018	347 HP	3.0	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	399 HP	3.0	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	3.0	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	3.0	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	375 HP	3.0	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	300 HP	3.0	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	315 HP	3.0	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	320 HP	3.0	BACT-PSD
FLAT ROCK ASSEMBLY PLANT	WAYNE, MI	3/22/2018	250 BHP	3.0	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	250 HP	3.0	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	410 HP	3.0	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	300 HP	3.0	BACT-PSD
DONLIN GOLD PROJECT	BETHEL CENSUS AREA, AK	6/30/2017	252 HP	3.0	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	460 HP	3.0	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	1.66 MMBTU/H	3.0	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	165 HP	3.0	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	311 HP	3.0	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	422 HP	3.0	LAER
INDORAMA LAKE CHARLES FACILITY	CALCASIEU, LA	8/3/2016	425 HP	3.0	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	N/A	3.0	N/A
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	15 GAL/HR	3.0	LAER
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	305 HP	3.0	LAER
LAUDERDALE PLANT	BROWARD, FL	8/25/2015	29 MMBTU/H	3.0	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	140 HP	3.0	BACT-PSD
BENTELER STEEL TUBE FACILITY	CADDO, LA	6/4/2015	288 HP	3.0	BACT-PSD
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	251 HP	3.0	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	260 HP	3.0	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	300 HP	3.0	BACT-PSD
PERRYMAN GENERATING STATION	HARFORD, MD	7/1/2014	350 HP	3.0	LAER
COVE POINT LNG TERMINAL	CALVERT, MD	6/9/2014	350 HP	3.0	LAER

Table C-19: Emergency Diesel Fire Pump Engine NOx Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	CALCASIEU, LA	5/23/2014	500 HP	3.0	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	300 HP	3.0	LAER
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	477 HP	3.0	LAER
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	2.7 MMBTU/H	3.0	LAER
GRAIN PROCESSING CORPORATION	DAVIESS, IN	12/8/2015	425 HP	9.5	BACT-PSD

Table C-20: Emergency Diesel Fire Pump Engine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT G/HP-HR	PERMIT LIMIT BASIS
GRAIN PROCESSING CORPORATION	DAVIESS, IN	12/8/2015	425 HP	0.1	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	CALCASIEU, LA	5/23/2014	500 HP	0.1	BACT-PSD
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	460 HP	0.1	LAER
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	460 HP	0.1	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	399 HP	0.1	BACT-PSD
ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	ARECIBO, PR	4/10/2014	335 HP	0.2	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	327 HP	0.2	LAER
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	315 HP	0.2	LAER
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	250 HP	0.2	LAER
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	251 HP	0.3	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	140 HP	0.4	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	311 HP	0.4	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	300 HP	0.4	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	300 HP	0.4	BACT-PSD
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	373 HP	0.5	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	260 HP	1.1	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	1.1	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	1.1	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	165 HP	1.3	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	402 HP	3.0	BACT-PSD
MOTOR VEHICLE ASSEMBLY PLANT	BEXAR, TX	9/23/2018	214 KW	3.0	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	375 HP	3.0	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	300 HP	3.0	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	315 HP	3.0	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	320 HP	3.0	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	410 HP	3.0	BACT-PSD
CAMERON LNG FACILITY	CAMERON, LA	2/17/2017	460 HP	3.0	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	376 HP	3.0	N/A
EMBERCLEAR GTL MS	ADAMS, MS	5/8/2014	325 HP	3.0	BACT-PSD
COVE POINT LNG TERMINAL	CALVERT, MD	6/9/2014	350 HP	3.9	LAER

Table C-21: Emergency Diesel Fire Pump Engine CO Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT G/HP-HR	PERMIT LIMIT BASIS
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	315 HP	0.5	BACT-PSD
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	460 HP	0.5	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	260 HP	1.2	BACT-PSD
GRAIN PROCESSING CORPORATION	DAVIESS, IN	12/8/2015	425 HP	2.0	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	327 HP	2.6	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	402 HP	2.6	BACT-PSD
MOTOR VEHICLE ASSEMBLY PLANT	BEXAR, TX	9/23/2018	214 KW	2.6	BACT-PSD
CPV THREE RIVERS ENERGY CENTER	GRUNDY, IL	7/30/2018	422 HP	2.6	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	399 HP	2.6	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	2.6	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	2.6	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	375 HP	2.6	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	300 HP	2.6	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	315 HP	2.6	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	320 HP	2.6	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	250 HP	2.6	BACT-PSD
DANIA BEACH ENERGY CENTER	BROWARD, FL	12/4/2017	422 HP	2.6	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	410 HP	2.6	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	300 HP	2.6	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	300 HP	2.6	BACT-PSD
DONLIN GOLD PROJECT	BETHEL CENSUS AREA, AK	6/30/2017	252 HP	2.6	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	460 HP	2.6	BACT-PSD
CAMERON LNG FACILITY	CAMERON, LA	2/17/2017	460 HP	2.6	BACT-PSD
MONSANTO LULING PLANT	ST. CHARLES PARISH, LA	1/9/2017	600 HP	2.6	BACT-PSD
MONSANTO LULING PLANT	ST. CHARLES PARISH, LA	1/9/2017	600 HP	2.6	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	260 HP	2.6	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	311 HP	2.6	BACT-PSD
CPV FAIRVIEW ENERGY CENTER	CAMBRIA, PA	9/2/2016	422 HP	2.6	BACT-PSD
INDORAMA LAKE CHARLES FACILITY	CALCASIEU, LA	8/3/2016	425 HP	2.6	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	376 HP	2.6	N/A
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX, NJ	3/10/2016	360 HP	2.6	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	305 HP	2.6	BACT-PSD
LAUDERDALE PLANT	BROWARD, FL	8/25/2015	300 HP	2.6	BACT-PSD
BENTELER STEEL TUBE FACILITY	CADDO, LA	6/4/2015	288 HP	2.6	BACT-PSD
KEYS ENERGY CENTER	PRINCE GEORGE'S, MD	10/31/2014	300 HP	2.6	BACT-PSD
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	373 HP	2.6	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	CALCASIEU, LA	5/23/2014	500 HP	2.6	BACT-PSD
CPV ST. CHARLES	CHARLES, MD	4/23/2014	300 HP	2.6	BACT-PSD
LAUDERDALE PLANT	BROWARD, FL	4/22/2014	300 HP	2.6	BACT-PSD
ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	ARECIBO, PR	4/10/2014	335 HP	2.6	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	477 HP	2.6	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	250 HP	2.6	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	371 HP	2.6	OTHER CASE-BY-CASE

Table C-21: Emergency Diesel Fire Pump Engine CO Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	251 HP	2.6	BACT-PSD
COVE POINT LNG TERMINAL	CALVERT, MD	6/9/2014	350 HP	3.0	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	165 HP	3.7	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	140 HP	3.7	BACT-PSD

Table C-22: Emergency Diesel Fire Pump Engine PM-10/PM-2.5 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT G/HP-HR	PERMIT LIMIT BASIS
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	373 HP	0.08	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	315 HP	0.11	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX, NJ	3/10/2016	360 HP	0.13	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	311 HP	0.15	BACT-PSD
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	402 HP	0.15	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	399 HP	0.15	BACT-PSD
MIDDLESEX ENERGY CENTER, LLC	MIDDLESEX, NJ	7/19/2016	327 HP	0.15	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	460 HP	0.15	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	375 HP	0.15	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	300 HP	0.15	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	315 HP	0.15	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	320 HP	0.15	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	410 HP	0.15	BACT-PSD
DONLIN GOLD PROJECT	BETHEL CENSUS AREA, AK	6/30/2017	252 HP	0.15	BACT-PSD
CAMERON LNG FACILITY	CAMERON, LA	2/17/2017	460 HP	0.15	BACT-PSD
INDORAMA LAKE CHARLES FACILITY	CALCASIEU, LA	8/3/2016	425 HP	0.15	BACT-PSD
BENTELER STEEL TUBE FACILITY	CADDO, LA	6/4/2015	288 HP	0.15	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	260 HP	0.15	BACT-PSD
EMBERCLEAR GTL MS	ADAMS, MS	5/8/2014	325 HP	0.15	BACT-PSD
ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	ARECIBO, PR	4/10/2014	335 HP	0.15	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	477 HP	0.15	BACT-PSD
PSEG FOSSIL LLC SEWAREN GENERATING STATION	MIDDLESEX COUNTY, NJ	3/7/2014	250 HP	0.15	OTHER CASE-BY-CASE
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	371 HP	0.15	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	300 HP	0.15	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	300 HP	0.15	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	CALCASIEU, LA	5/23/2014	500 HP	0.15	BACT-PSD
COVE POINT LNG TERMINAL	CALVERT, MD	6/9/2014	350 HP	0.17	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	250 HP	0.18	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	305 HP	0.18	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	140 HP	0.23	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	165 HP	0.25	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	376 HP	0.30	N/A
MOTOR VEHICLE ASSEMBLY PLANT	BEXAR, TX	9/23/2018	214 KW	0.41	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	260 HP	0.99	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	1.00	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	1.00	BACT-PSD

Table C-23: Emergency Diesel Fire Pump Engine H2SO4 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT LB/MMBTU	PERMIT LIMIT BASIS
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	140 HP	0.00003	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	376 HP	0.00010	N/A
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	460 HP	0.00010	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	300 HP	0.00014	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	300 HP	0.00014	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	311 HP	0.00015	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	315 HP	0.00019	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	260 HP	0.00071	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	320 HP	0.00073	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	371 HP	0.00078	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	410 HP	0.00150	BACT-PSD
WILDCAT POINT GENERATION FACILITY	CECIL, MD	4/8/2014	477 HP	0.00154	BACT-PSD
MATTAWOMAN ENERGY CENTER	PRINCE GEORGE'S, MD	11/13/2015	305 HP	0.00220	BACT-PSD

Table C-24: Emergency Diesel Fire Pump Engine CO2 Emission Limits from EPA'S RACT/BACT/LAER Clearinghouse

FACILITY	LOCATION	PERMIT DATE	Engine Rating	EMISSION LIMIT	PERMIT LIMIT BASIS
PTTGCA PETROCHEMICAL COMPLEX	BELMONT, OH	12/21/2018	402 HP	23 T/YR	BACT-PSD
BELLE RIVER COMBINED CYCLE POWER PLANT	ST. CLAIR, MI	7/16/2018	399 BHP	86 T/YR	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	85.6 T/YR	BACT-PSD
MEC NORTH, LLC AND MEC SOUTH LLC	CALHOUN, MI	6/29/2018	300 HP	85.6 T/YR	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	375 HP	28 T/YR	BACT-PSD
PLAQUEMINES PLANT 1	IBERVILLE PARISH, LA	5/2/2018	300 HP	28 T/YR	BACT-PSD
C4GT, LLC	CHARLES CITY, VA	4/26/2018	315 HP	1040 T/YR	BACT-PSD
HARRISON POWER	HARRISON, OH	4/19/2018	320 HP	18.67 T/YR	BACT-PSD
IRONUNITS LLC - TOLEDO HBI	LUCAS, OH	2/9/2018	250 HP	163.6 LB/MMBTU	BACT-PSD
GUERNSEY POWER STATION LLC	GUERNSEY, OH	10/23/2017	410 HP	29 T/YR	BACT-PSD
OREGON ENERGY CENTER	LUCAS, OH	9/27/2017	300 HP	87 T/YR	BACT-PSD
TRUMBULL ENERGY CENTER	TRUMBULL, OH	9/7/2017	300 HP	87 T/YR	BACT-PSD
DONLIN GOLD PROJECT	BETHEL CENSUS AREA, AK	6/30/2017	252 HP	216 T/YR	BACT-PSD
PALLAS NITROGEN LLC	COLUMBIANA, OH	4/19/2017	460 HP	123 T/YR	BACT-PSD
INDECK NILES, LLC	CASS, MI	1/4/2017	1.66 MMBTU/H	13.58 T/YR	BACT-PSD
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	OTTAWA, MI	12/5/2016	500 H/YR	55.6 T/YR	BACT-PSD
SOUTH FIELD ENERGY LLC	COLUMBIANA, OH	9/23/2016	311 HP	90 T/YR	BACT-PSD
GREENSVILLE POWER STATION	GREENSVILLE, VA	6/17/2016	376 HP	104 T/YR	N/A
CRICKET VALLEY ENERGY CENTER	DUTCHESS, NY	2/3/2016	460 HP	115 T/YR	BACT-PSD
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA, PA	12/23/2015	15 GAL/HR	9 T/YR	BACT-PSD
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	TRUMBULL, OH	8/25/2015	140 HP	41 T/YR	BACT-PSD
GUADALUPE GENERATING STATION	GUADALUPE, TX	12/2/2014	1.92 MMBTU/HR	15.71 T/YR	BACT-PSD
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MARSHALL, WV	11/21/2014	251 HP	309 LB/H	BACT-PSD
NTE OHIO, LLC	BUTLER, OH	11/5/2014	260 HP	75 T/YR	BACT-PSD
CRONUS CHEMICALS, LLC	DOUGLAS, IL	9/5/2014	373 HP	72 T/YR	BACT-PSD
ROCK SPRINGS FERTILIZER COMPLEX	SWEETWATER, WY	7/1/2014	200 HP	58 T/YR	BACT-PSD
LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	CALCASIEU, LA	5/23/2014	500 HP	10 T/YR	BACT-PSD
INDECK WHARTON ENERGY CENTER	WHARTON, TX	5/12/2014	175 HP	5.34 T/YR	BACT-PSD
ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	ARECIBO, PR	4/10/2014	335 HP	91.3 T/YR	BACT-PSD
SALEM HARBOR STATION REDEVELOPMENT	ESSEX, MA	1/30/2014	2.7 MMBTU/H	162.85 LB/MMBTU	BACT-PSD

APPENDIX D

AGENCY CORRESPONDENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air Resources, Bureau of Air Quality Analysis and Research
625 Broadway, Albany, New York 12233-3259
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June 20, 2019

M E M O R A N D U M

TO: John Kent, NYSDEC

FROM: Elvira Brankov, NYSDEC

SUBJECT: **Danskammer Energy, LLC – Air Quality Dispersion Modeling Protocol**

I reviewed the Atmospheric Dispersion Modeling Protocol submitted May 15, 2019 by TRC Companies on behalf of Danskammer Energy Center located in Town of Newburgh, New York.

The protocol was submitted to satisfy the air quality assessment requirements of both 6 NYCRR Part 231/ U.S. EPA's Prevention of Significant Deterioration (PSD) and Article 10 of New York State's Public Service Law review process.

Danskammer Energy is proposing to install a new combustion turbine at the site of its existing facility in the Town of Newburg, NY. The combustion turbine will be primarily natural gas-fired with distillate fuel oil (ultra-low sulfur diesel) as backup fuel. In addition to the turbine, the facility plans to install a Heat Recovery Steam Generator (HRSG) equipped with natural gas-fired duct burners and supporting auxiliary equipment which may include natural gas-fired auxiliary boiler(s), emergency diesel fire pump(s) and emergency diesel generator(s).

Danskammer Energy is planning to retire the existing generators once the new plant is complete and eliminate some of the existing buildings. The proposed modeling will reflect this by consisting of two phases: one with the existing buildings in place and the second phase will consider the final landscape and buildout where a portion of the existing Danskammer Generating Station is razed.

The modeling methodologies proposed in this Protocol are acceptable and in accordance with NYSDEC's Dispersion Modeling Procedures for Air Quality Impact Analysis (DAR-10) and the USEPA's Guideline on Air Quality Models. However, the

Impact and Assessment and Meteorology (IAM) Section of NYSDEC has a few comments that need to be addressed in the modeling report:

1. It was not clear in the Protocol if there is a physical fence surrounding the facility. If natural barriers such as the river front is used as the property boundary in modeling, a justification is needed to explain why the public has no access to the river bank. Are there buoys or patrolling boats to prevent public access?

2. The Protocol provides only preliminary emission rates expected from the new turbine and no emission rates for any other equipment that may be installed and operated at the facility. All the emission rates will need to be listed in the Modeling Report in both engineering units (annual emissions in tons per year or lb/hr) as well as modeling units in grams/second. The emission rates and other source parameters are subject to approval from the NYSDEC Regional office staff.

3. Table 3-1 in the Protocol provides the preliminary exhaust characteristics of the turbine/HRSG stack during different operating scenarios. The table does not list all operating loads suggested in Section 3.4 of the protocol and it is not clear what is the significance of ambient temperature of 0F and 59F and operating load of 55%. Please explain or correct if it is a typo.

4. For Section 3.5 in the Protocol, “Secondary formation of PM2.5”, please refer to the latest EPA guidance issued April 30, 2019 “Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program”. Specifically, Section 4.1.1 in that guidance has several PSD permit application scenarios to illustrate how to use MERPs. Please follow scenario D and provide a justification for your choice of representative hypothetical source.

5. The value of the annual SO2 impact of the hypothetical source used in the Protocol page 3-4 is incorrect. It should be 0.009 ug/m3 instead of 0.005ug/m3.

6. Section 5.8 of the Protocol proposes excluding any emergency diesel generators or fire pumps from 1-hr NO2 modeling because this equipment is not expected to be tested more than once a week and the test durations would be limited to no more than 30 minutes. This may need to be included in the permit as a permit operating condition.

7. If the Tier 3 approach to 1-hour NO2 modeling is utilized, additional information and justification will be required, and consultation with IAM section of NYSDEC is encouraged prior to commencing the modeling.

8. Please provide a list of non-criteria pollutants emitted from the facility as well as their emission rates.

9. Receptor grid for modeling: we suggest the initial receptor grid to be centered on the facility and constructed with following receptor spacing:

   70 m receptor spacing from the facility (or facility fence line) out 1 km,
   100 m spacing from 1 km to 2 km,
   250 m spacing from 2 km to 5 km,
   500 m spacing from 5 km to 10 km, and
   1000 m spacing out to 20 km if necessary.
   If modeling results show significant impacts at the outer edge of the initial grid, then the grid should be extended accordingly to ensure that the area of maximum modeled impacts is captured. If necessary, nested receptor grid(s) with 100 m increment spacing could be added to provide additional details for any area of maximum impacts beyond the inner receptor grid of 2 km. Additional discrete receptors may be required at sensitive locations such as schools, hospitals, or in Environmental Justice communities.

cc: M. Valis, NYSDEC
G. Sweikert, NYSDEC Region 3
M. Higgins, NYSDEC
D. Ometz, TRC
M. Keller, TRC
A. Colecchia, EPA Region 2

TRC

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November 15, 2019

Mr. John Kent
NYSDEC – Division of Air Resources
625 Broadway
Albany, NY 12233-3254

Subject: Danskammer Energy, LLC
Danskammer Energy Center
Town of Newburgh, Orange County, New York
Request for Waiver from Pre-Construction Ambient Air Quality Monitoring

Dear Mr. Kent:

This letter serves as a request on behalf of Danskammer Energy, LLC (Danskammer Energy) to the New York State Department of Environmental Conservation ("NYSDEC") for a waiver from the requirement to perform one year of pre-application ambient air quality monitoring for the proposed combined cycle power facility to be located in the Town of Newburgh, Orange County, New York in accordance with Prevention of Significant Deterioration (PSD) of Air Quality regulations 6 NYCRR 231-12.3. Those regulations state that major new or modified facilities having annual emissions of regulated air contaminants in excess of significant emission rates (SER) must provide an analysis of air quality data in the area of the proposed facility that, in general, consist of continuous air quality monitoring data gathered over a year preceding receipt of the application. As fully described below, this request is for a waiver from the pre-application ambient monitoring data requirement for the air contaminants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than 10 micrometers (μm) (PM-10), and less than 2.5 micrometers (PM-2.5).

Pursuant to 6 NYCRR 231-12.4(b), a waiver from pre-application ambient air quality monitoring may be granted when an applicant makes an acceptable showing that:

(1) representative existing ambient air monitoring data exists in the affected area and is of the quality and nature which demonstrates the current conditions of the area's air quality; or

(2) representative ambient air monitoring data exists from a prior time period which can be demonstrated to be conservative (i.e., higher) in establishing the current conditions of the area's air quality.

See also, 40 CFR 52.21.1670 (approved Part 231 at 75 Fed. Reg. 70, 140 (Nov. 17, 2010)) ("applicant makes an acceptable showing that representative existing ambient monitoring data exists in the affected area of the quality and nature which demonstrates the current conditions of the air quality of the area"); New Source Review Workshop Manual (Draft, October 1990) at C.18 ("To be acceptable, such data must be judged by the permitting agency to be representative of the air quality for the area in which the proposed project would construct and operate"). As shown below, representative data satisfying these requirements exists.

Danskammer Energy is also requesting an exemption from the pre-application ambient monitoring requirement for lead (Pb) because it will be emitted in amounts less than its SER; for fluorides, hydrogen sulfide, total reduced sulfur, and reduced sulfur compounds because they are not anticipated as a product of natural gas combustion (i.e., from the combustion turbine/duct burner and auxiliary boiler) and fuel oil combustion (i.e., from the combustion turbine, auxiliary boiler, emergency diesel generator, and emergency diesel fire pump); and for sulfuric acid (H_2SO_4) mist because there is no approved monitoring technique available.

Project Description

Danskammer Energy, LLC (Danskammer Energy) is proposing to construct an approximately 536-megawatt (MW) primarily natural gas fired 1-on-1 combined cycle power facility (Danskammer Energy Center or Project) on land at the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York. The Station's existing generators will be retired once the combined cycle plant is complete. The proposed Danskammer Energy Center will result in a new modern energy center through installation of state-of-the-art power generation equipment. The proposed facility (combustion turbine) will be primarily fueled by natural gas with ultra-low sulfur diesel (ULSD) as a backup fuel for up to 720 hours per year.

Emissions from the combined cycle unit will be controlled by the use of dry low-NO_x burner technology (during natural gas firing), water injection (during ULSD firing), and selective catalytic reduction (SCR) for NO_x control, an oxidation catalyst for CO and volatile organic compounds (VOCs) control, and the use of clean low-sulfur fuels (i.e., natural gas and ULSD) to minimize emissions of SO_2, PM/PM-10/PM-2.5, and H_2SO_4. Exhaust gases from the combined cycle unit after emission controls will be dispersed to the atmosphere via one (1) individual stack. Spent steam from the steam turbine will be sent to an air cooled condenser (ACC) where it will be cooled to a liquid state and returned to the HRSG.

Facility Emissions

The proposed facility is located in an attainment area for SO_2, NO_2, CO, PM-10, and PM-2.5. The proposed facility will potentially emit more than 100 tons per year of several air pollutants, and will be subject to PSD permitting for these constituents.

Under PSD regulations, an air quality dispersion modeling analysis is required to ensure that CO, PM-10, PM-2.5, SO_2, and NO_2 emissions from the proposed facility will be compliant with NAAQS and applicable PSD increments.

As detailed in the NSR applicability analysis presented in Section 3 of the NYSDEC Part 201/231 air permit application, the proposed facility is projected to have annual emissions in excess of PSD SERs for CO, NO_x, particulates (PM/PM-10/PM-2.5), and H_2SO4. The emissions of SO_2 and lead are below their SERs.

Existing Background Ambient Air Quality Data

Based on review of the locations of NYSDEC ambient air quality monitoring sites, the closest "regional" NYSDEC monitoring sites will be used to represent the current background air quality in the site area. Background data for CO and NO_2 was obtained from a monitoring station located in Bronx County, New York (EPA AIRData # 36-005-0133), approximately 79 km south of the proposed facility. The monitor is located at the Botanical Gardens (Pfizer Plant Research Lab, 200th Street and Southern Boulevard). This monitor is located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area in the lower Hudson Valley. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the project area. Thus, this monitor would be considered to conservatively represent the ambient air quality within the project area.

Background data for PM-10 was obtained from a monitoring station located in Bronx County, New York (EPA AIRData # 36-005-0110), approximately 84 km south of the proposed facility. The monitor is located at IS 52 (681 Kelly Street). This monitor is also located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area in the lower Hudson Valley. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the project area. Thus, this monitor would also be considered to conservatively represent the ambient air quality within the project area.

Background data for PM-2.5 was obtained from a Newburgh monitoring station located in Orange County, New York (EPA AIRData # 36-071-0002), and approximately 9 km south-southwest of the proposed facility. The monitor is located at the Public Safety Building (55 Broadway). This monitor's close proximity to the Project would qualify it to be representative of the ambient air quality within the project area.

The monitoring data for the most recent three years (2016-2018) are presented in Table 1 while Figure 2 displays the locations of the aforementioned air quality monitors in relation to the proposed facility.

Monitoring Waiver Request

In summary, Danskammer Energy is requesting a waiver from the requirement to perform pre-application ambient air quality monitoring for CO, NO_2, PM-10, and PM-2.5 because there exists acceptable quality assured ambient air quality data from alternate locations that satisfy the requirements of 6 NYCRR 231-12.4(b) and 40 CFR 52.21.1670. Further, Danskammer Energy is requesting an exemption from the requirement to perform pre-application ambient monitoring for SO_2 and lead because they will be emitted in amounts less than the SERs; for fluorides, hydrogen sulfide, total reduced sulfur, and reduced sulfur compounds because they are not anticipated to be emitted from the Project; and for H_2SO_4 because there is no approved monitoring technique available.

Please feel free to contact me (201) 508-6954 should you have any questions regarding this monitoring exemption request.

Sincerely,
TRC

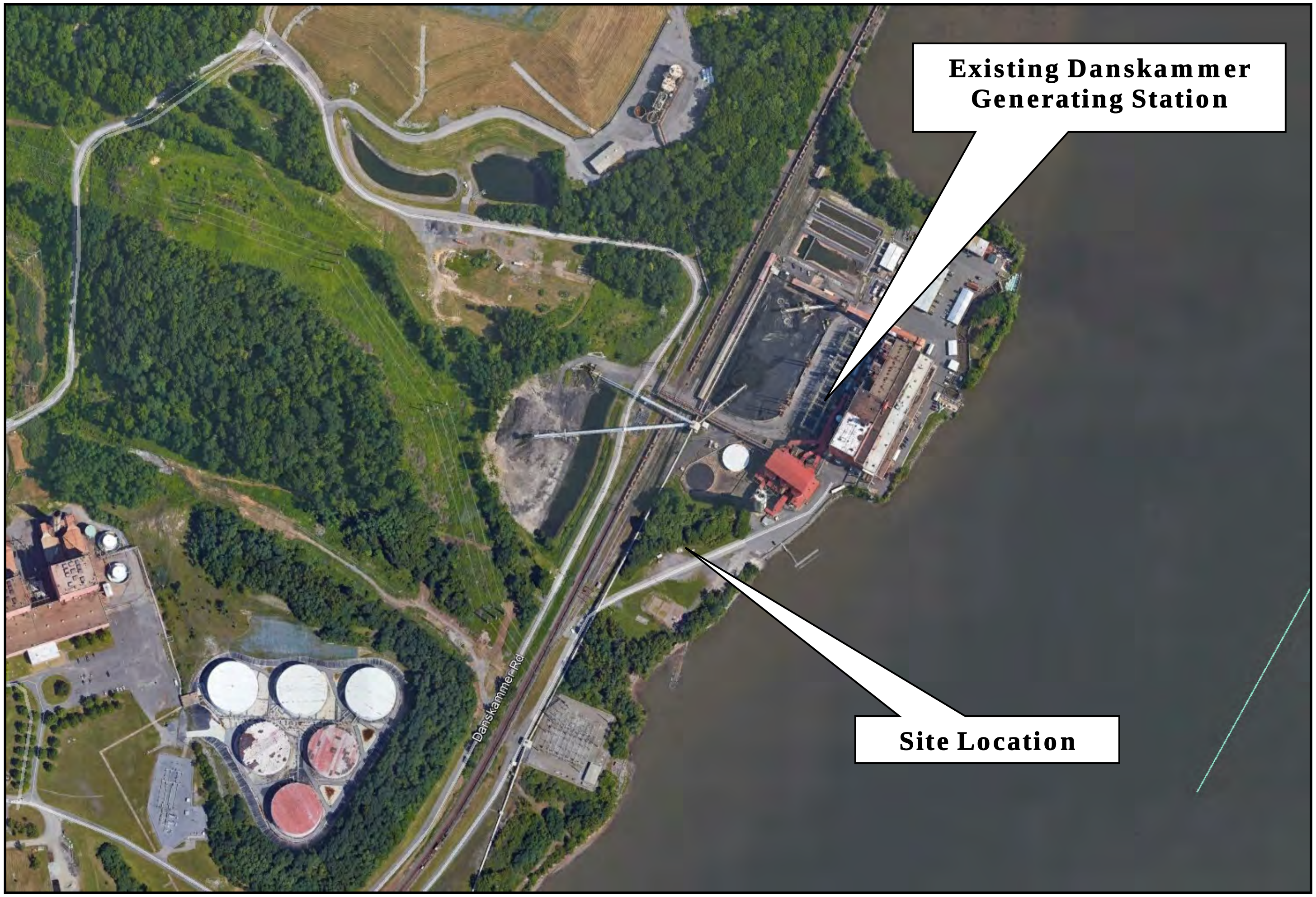
Michael D. Keller
Principal – Power Generation and Air Quality

cc: J. Garcia, Danskammer Energy
D. Ometz, TRC

Table 1
Ambient Concentrations of Criteria Pollutants
Proposed to be Used to Represent Site Conditions

Pollutant	Averaging Period	Maximum Ambient Concentrations ($\mu g/m^3$)			NAAQS ($\mu g/m^3$)
		2016	2017	2018	
NO_2	1-Hour[a]	104.9	105.3	101.5	188
	Annual	**29.3**	28.0	27.1	100
CO	1-Hour	2,024	403	**2,300**	40,000
	8-Hour	1,150	345	**1,380**	10,000
PM-10	24-Hour	**32**	27	30	150
PM-2.5[b]	24-Hour	20.0	13.9	16.0	35
	Annual	6.1	6.1	6.4	12

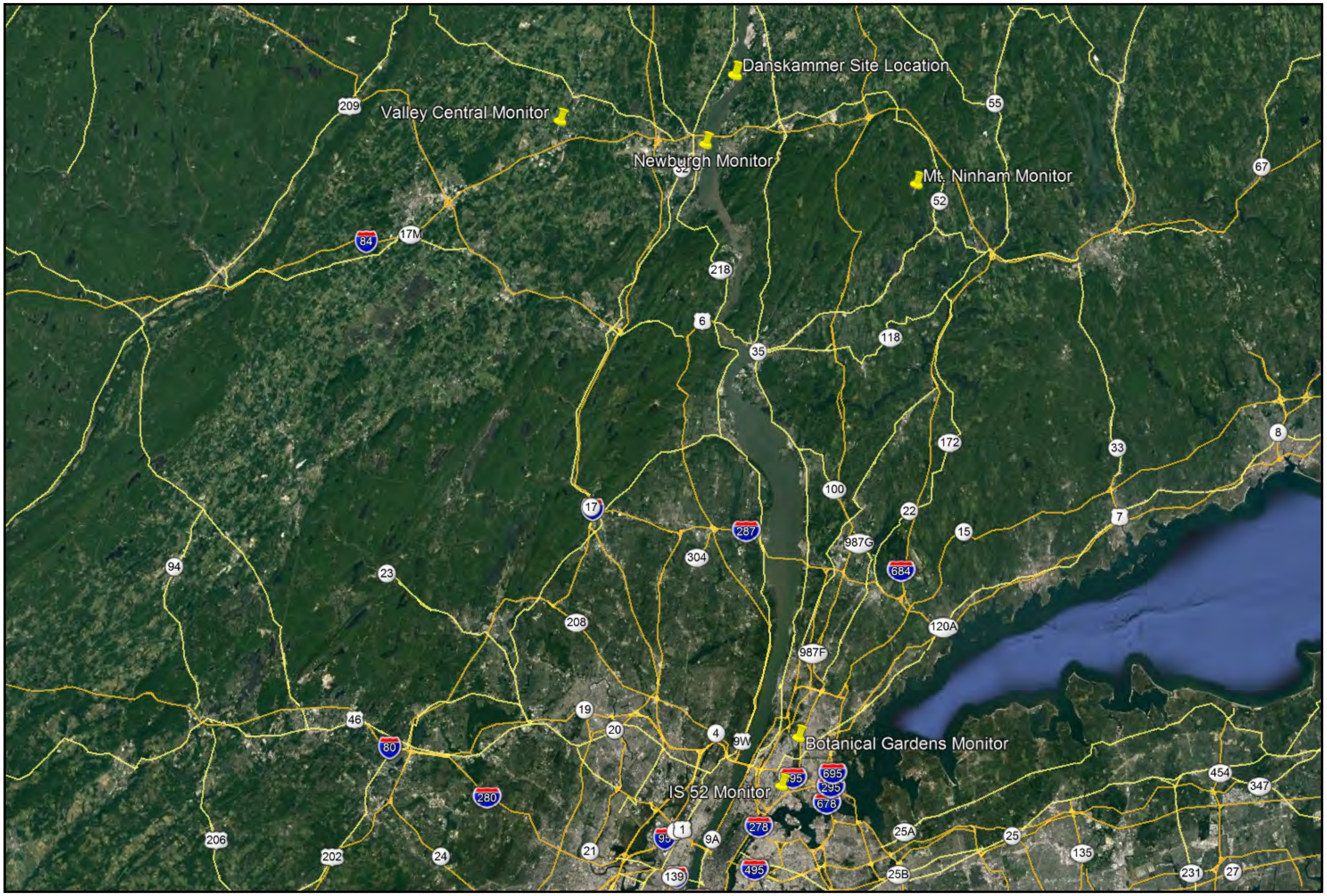
[a] 1-hour 3-year average 98th percentile value for NO_2 is **103.9** ug/m^3.
[b] 24-hour 3-year average 98th percentile value for PM-2.5 is **16.6** ug/m^3; Annual 3-year average value for PM-2.5 is **6.2** ug/m^3.
High second-high short term (1-, 3-, 8-, and 24-hour) and maximum annual average concentrations presented for all pollutants other than PM-2.5 and 1-hour NO_2.
Bold values represent the proposed background values for use in any necessary NAAQS/NYAAQS analyses.
Monitored background concentrations obtained from the NYSDEC website.



Danskammer Energy, LLC
Danskammer Energy Center
Town of Newburgh, Orange County, New York

Figure 1. Site Location Aerial Photograph

Source: Google Earth, 2018



Danskammer Energy, LLC
Danskammer Energy Center
Town of Newburgh, Orange County, New York

Figure 2. Background Ambient Air Quality Monitors

Source: Google Earth, 2018

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July 25, 2019
mk004-19

Ms. Catherine Collins
Environmental Engineer
United States Department of the Interior
U.S. Fish & Wildlife Service
National Wildlife Refuge System
7333 W. Jefferson Ave., Suite 375
Lakewood, Colorado 80235-2017

Subject: **Danskammer Energy, LLC**
Danskammer Energy Center
Town of Newburgh, Orange County, New York
Need for Class I Area Air Quality and Air Quality Related Values (AQRV) Analyses for the Brigantine Wilderness Class I Area

Dear Ms. Collins:

TRC has been retained by Danskammer Energy, LLC (Danskammer Energy) to prepare a prevention of significant deterioration (PSD) permit application for a proposed approximately 536-megawatt (MW) combined cycle power facility to be constructed in the Town of Newburgh, Orange County, New York. The approximate Universal Transverse Mercator (UTM) coordinates of the Danskammer Energy Center are 586,180 meters Easting, 4,602,785 meters Northing, in Zone 18, NAD83.

Danskammer Energy is proposing to install one (1) Mitsubishi M501JAC combustion turbine at the facility. The combustion turbine will be primarily natural gas-fired with distillate fuel oil with a sulfur concentration of no greater than 15 ppm ("ultra-low sulfur diesel" or "ULSD") as backup fuel. A dry low NO_x burner and Selective Catalytic Reduction (SCR) will be used, in addition to water injection when firing ULSD, to reduce nitrogen oxides (NO_x) emissions from the combustion turbine. The firing of primarily natural gas and ULSD as backup in the combustion turbine will minimize emissions of particulate matter with an aerodynamic diameter less than 10 microns (PM-10), sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4). Additionally, an oxidation catalyst will be installed to control the emissions of carbon monoxide (CO) and volatile organic compounds (VOC).

Exhaust gas from the combustion turbine will flow into an adjacent heat recovery steam generator (HRSG) equipped with a natural gas-fired duct burner. The HRSG will produce steam to be used in the steam turbine generator. Combustion products will be discharged through one (1) exhaust stack. Supporting auxiliary equipment includes a natural gas fired auxiliary boiler, an emergency diesel generator, and two (2) emergency diesel fire pumps.

Estimated potential short-term (24-hour) maximum emissions and annual emissions are presented in Table 1. The PM-10 emission rates presented in Table 1 include filterable and condensable particulates.

Table 1: Estimated Potential Emissions

Pollutant	**Combustion Turbine Maximum Short-Term Emissions (lb/hr)**			**Annual Emissions[1] (tpy)**	**Annual Emissions[2] (tpy)**
	Natural Gas Fired with Duct Burner	**Natural Gas Fired without Duct Burner**	**ULSD Fired**		
Nitrogen Oxides (NO_x)	32.2	26.3	57.6	139.4	252.3
Sulfur Dioxide (SO_2)	6.2	5.0	5.6	24.7	24.5
Particulate Matter with an aerodynamic diameter less than 10 microns (PM-10)	22.1	12.4	29.0	81.5	127.0
Sulfuric Acid Mist (H_2SO_4)	5.6	4.6	5.1	22.5	22.3

[1]Annual emissions based on one (1) Mitsubishi M501JAC combustion turbine operating 8,040 hours per year on natural gas and 720 hours per year on ULSD at the respective maximum short-term emission rates. Annual emissions include up to 4,380 hours of operation with the duct burner.
[2]Annual emissions based on one (1) Mitsubishi M501JAC combustion turbine hypothetically operating 8,760 hours per year on ULSD at the ULSD short-term emission rate (solely for comparison to FLAG Q/D guidance, and not for permitting).

The Brigantine Wilderness Class I area located in the Edwin B. Forsythe National Wildlife Refuge in New Jersey is approximately 228 km south of the proposed facility. Following the Draft Revised FLAG guidance (2010), TRC believes that the proposed facility may be eligible for an exemption from the requirement to perform a Class I area AQRV modeling analysis because of its inherent low emissions and distance to the Class I area. We understand that the maximum short-term emission rates are used in the exemption analysis. Assuming full year operation (8,760 hours) of the combined cycle combustion turbine firing ULSD yields a (emission in tpy)/(distance in km) ratio (426.2 tons per year/228 km) of approximately 1.9.

It is our understanding that according to the Q/D test, the FLM should consider this source (which is located greater than 50 km from the Brigantine Wilderness Class I area) and has a ratio of annual equivalent emissions (Q in tons per year) divided by distance (D in km) from the Brigantine Wilderness Class I area (km) < 10, as having negligible impacts with respect to Class I visibility impacts and that there would not be any Class I AQRV impact analyses required from this source.

With this letter, TRC, on behalf of Danskammer Energy, is formally requesting a determination that there is no need to perform a Class I area AQRV analysis for the Brigantine Wilderness Area as part of the facility's PSD Air Permit application. If you should require additional information on the proposed Project or have any questions, please do not hesitate to contact me at (201) 508-6954 or mkeller@trccompanies.com.

Sincerely,

TRC

Michael D. Keller

Michael D. Keller
Principal – Power Generation and Air Quality

cc: J. Garcia, Danskammer Energy
D. Ometz, TRC
TRC Project File 289081

W:\keller\mk004-19.ltr.doc

Keller, Michael

From: Collins, Catherine <catherine_collins@fws.gov>
Sent: Thursday, July 25, 2019 4:49 PM
To: Keller, Michael
Subject: Re: [EXTERNAL] Danskammer Energy, LLC - Need for Class I AQRV Analyses for Brigantine Wilderness Area

Thank you for sending the information regarding the Danskammer Energy Center project. The proposed project is for a Mitsubishi M501JAC natural gas and ULSD fired combustion turbine at their facility located in Newburgh New York. Danskammer will install the combustion turbine and will use a dry low NOx burner and Selective Catalytic Reduction (SCR), and water injection to control NOx emissions.

Based on the emission identified in the document and distance from the Class I area(s) listed below, the Fish and Wildlife Service anticipates that modeling would not show any significant additional impacts to air quality related values (AQRV) at the Class I area(s) administered by the FWS. Therefore, we are not requesting that a Class I AQRV analysis be included in the PSD permit application. Our screening of this analysis does not indicate agreement with any AQRV analysis protocols or conclusions applicants may make independent of Federal Land Manager review. Please note that we are specifically addressing the need for an AQRV analysis for Class I areas managed by the Fish and Wildlife Service.

Class I Area:

Brigantine Wilderness Area located in the EB Forsythe NWR

Distance to Facility in kilometers

228 km

Annual Emissions (based on short term maximum emission rates adjusted to an annual emission rate) in tons per year (tpy)

+ 252.3	Nitrogen Oxides NOx
+ 24.5	Sulfur Oxides SOx
+ 127.00	Total Fine particulate matter PM-10
+ 22.3	Sulfuric Acid Mist (H2SO4)

Total Emissions = 426.8 tons per year

The state and/or EPA may have a different opinion regarding the need for a Class I increment analysis. Should the emissions or the nature of the project change significantly, please contact me, so that we might re-evaluate the revised proposed project.

Thank you for keeping us informed and involving the Fish and Wildlife Service in the project review.

Catherine Collins, Environmental Engineer

U.S. Fish and Wildlife Service
Branch of Air and Water Resources
7333 W. Jefferson Ave., Suite 375
Lakewood, CO 80235-2034
303-914-3807
(303) 969-5444 fax
Catherine_Collins@fws.gov

On Thu, Jul 25, 2019 at 9:56 AM Keller, Michael <MKeller@trccompanies.com> wrote:

> Ms. Collins,
>
> TRC, on behalf of Danskammer Energy, LLC, is formally requesting a determination (see attachment) that there is no need to perform Class I air quality related values analysis for the Brigantine Wilderness Class I area as part of the facility's PSD permit application.
>
> If you have any questions, please call or email.
>
> Thanks for your attention.
>
> Michael
>
> **Michael D. Keller**
> Principal – Power Generation and Air Quality
>
> 1200 Wall Street West, 5th Floor, Lyndhurst, NJ 07071
>
> **T** 201.508.6954 | MKeller@TRCcompanies.com
>
> LinkedIn | Twitter | Blog | TRCcompanies.com
>
> **Please note that our domain name and email addresses have changed**

Request for Applicability of Class I Area Modeling Analysis
Eastern Region, U.S. Forest Service

Facility Name (Company Name)	Danskammer Generating Station Repowering – Danskammer Energy Center
New Facility or Modification?	Modification
Source Type/BART Applicability	Dual-Fuel Combined Cycle Power Generating Facility
Project Location (County/State/ Lat. & Long. in decimal degrees)	Orange County, New York (41.572 N. lat, 73.966 W. lon)

Application Contacts

Applicant		*Consultant*		*Air Agency Permit Engineer*	
Company	Danskammer Energy, LLC	**Company**	TRC	**Agency**	NYSDEC Region 3
Contact	Jan Garcia	**Contact**	Michael Keller	**Contact**	George Sweikert
Address	994 River Road Newburgh, NY 12550	**Address**	1200 Wall Street West 5th Floor Lyndhurst, NJ 07071	**Address**	21 South Putt Corners Road New Paltz, NY 12561-1696
Phone #	845-563-9117, ext. 4826	**Phone #**	201-508-6954	**Phone #**	845-256-3045
Email	jgarcia@danskammerenergy.com	**Email**	mkeller@trccompanies.com	**Email**	George.sweikert@dec.ny.gov

Briefly Describe the Proposed Project

Approximate 536 MW dual-fuel 1-on-1 combined cycle power generating facility

Proposed Emissions and BACT

Criteria Pollutant	***Emissions***		***Emission Factor (AP-42, Stack Test, Other?)***	***Proposed BACT***
	Maximum hourly (lb/hr)	***Proposed Annual (tons/yr)***		
Nitrogen Oxides	32.2 (gas), includes duct burner; 57.6 (oil)	136.9	2.0 ppm (gas) 4.0 ppm (oil) (vendor)	Dry low NOx with SCR, including water injection for ULSD
Sulfur Dioxide	6.2 (gas), includes duct burner; 5.6 (oil)	24.1	0.0015 lb/mmBtu (gas) 0.0017 lb/mmBtu (oil) (vendor)	Low sulfur fuels (15 ppm S ULSD)
Particulate Matter	22.1 (gas), includes duct burner; 29.0 (oil)	79.7	0.0055 lb/mmBtu (gas) 0.0089 lb/mmBtu (oil) (vendor)	Low sulfur fuels
Sulfuric Acid Mist	5.6 (gas), includes duct burner; 5.1 (oil)	22.1	0.0014 lb/mmBtu (gas) 0.0015 lb/mmBtu (oil) (vendor)	Low sulfur fuels

For Additional Information or Questions, Contact Ralph Perron
(802) 222-1444 or rperron@fs.fed.us

Proximity to U.S. Forest Service Class I Areas			
Class I Area	Lye Brook Wilderness		
Distance from Facility (km)	181		

Keller, Michael

From: Perron, Ralph -FS <ralph.perron@usda.gov>
Sent: Friday, August 9, 2019 11:55 AM
To: Keller, Michael
Cc: Ometz, Darin
Subject: RE: Danskammer Energy, LLC - Class I AQRV Analyses for Lye Brook Wilderness Area
Attachments: Request for Determination_Lye Brook_080819.docx

Hi Michael,

Thank you for sending the information about the proposed modification for the Danskammer Generating Station Repowering – Danskammer Energy Center, LLC, located in Orange County, NY. Based on proposed total emissions of Nitrogen Oxides, Sulfur Dioxide, Particulate Matter, and Sulfuric Acid Mist of 263 tons per year, and the distance of 181 km to the Lye Brook Class I Area, in the Green Mountain National Forest, the US Forest Service will not be requesting AQRV analyses of this project.

Please keep us informed of any significant changes in this project, as well as any other proposal which may have an impact on the Lye Brook Class I Area.

Ralph Perron
Air Quality Specialist
Forest Service
Eastern Region
p: 603-536-6228
c: 802-222-1444
ralph.perron@usda.gov
71 White Mountain Drive
Campton, NH 03223
www.fs.fed.us
Caring for the land and serving people

From: Keller, Michael [mailto:MKeller@trccompanies.com]
Sent: Thursday, August 08, 2019 4:46 PM
To: Perron, Ralph -FS <ralph.perron@usda.gov>
Cc: Ometz, Darin <DOmetz@trccompanies.com>
Subject: Danskammer Energy, LLC - Need for Class I AQRV Analyses for Lye Brook Wilderness Area

Ralph,

Per your request, please see the attached completed document.
If you have any questions, please call or email.
Thanks for your continued attention.

Michael

Michael D. Keller
Principal – Power Generation and Air Quality
Office Practice Leader

APPENDIX E

AIR QUALITY MODELING PROTOCOL

AIR QUALITY MODELING PROTOCOL

Prepared for

Danskammer Energy, LLC
Danskammer Energy Center
Town of Newburgh, Orange County,
New York

Submitted to

New York State
Department of Environmental Conservation

Prepared by

TRC
1200 Wall Street West, 5th Floor
Lyndhurst, New Jersey 07071

May 2019

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1.0 INTRODUCTION

Danskammer Energy, LLC (Danskammer Energy) is proposing to construct an approximately 536-megawatt (MW) primarily natural gas fired 1-on-1 combined cycle power facility (Danskammer Energy Center or Project) on land at the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York. The Station's existing generators will be retired once the combined cycle plant is complete. The proposed Danskammer Energy Center will result in a new modern energy center through installation of state-of-the-art power generation equipment. The proposed facility (combustion turbine) will be primarily fueled by natural gas with ultra-low sulfur diesel (ULSD) as a backup fuel for up to 720 hours per year.

The proposed Project is located in a United States Environmental Protection Agency (U.S. EPA) designated attainment area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter (PM) with an aerodynamic diameter less than 10 micrometers (μm) (PM-10), particulate matter with an aerodynamic diameter less than 2.5 μm (PM-2.5), and ozone. The existing Danskammer Generating Station is a fossil fuel fired steam electric plant with a heat input capacity greater than 250 mmBtu/hr with potential emissions greater than 100 tons per year of any regulated criteria air pollutant. Thus, the existing facility is considered a major stationary source based upon the 6 New York Codes, Rules and Regulations (NYCRR) Part 231 (Part 231) New Source Review (NSR) regulation. Major modifications to existing major sources are subject to 6 NYCRR Part 231 and U.S. EPA Prevention of Significant Deterioration (PSD) review, if net emissions increases are above the significant increase thresholds. The proposed net emission increases for one or more criteria air pollutants may exceed the Part 231 significant increase thresholds and as such, the proposed Danskammer Energy Center will be subject to Part 231 and PSD review.

Further, the project is subject to Article 10 of New York State's Public Service Law (PSL) and therefore, potential environmental impacts of the project will be assessed and discussed in an Article 10 Application to be reviewed by the New York State Board on Electric Generation Siting and the Environment. This protocol is prepared to satisfy the air quality assessment requirements of both the Article 10 review process as well as the Part 231/PSD construction permit review process. The additional Article 10 air quality assessment requirements are presented in Section 6.

Non-attainment New Source Review (NNSR) rules will apply to nitrogen oxides (NO_{x}) and volatile organic compound (VOC) emissions (as precursors to the pollutant ozone). Because the facility is located in an area within the ozone transport region, modifications at major facilities emitting more than 40 tons per year of NO_x or VOC are subject to NNSR for these pollutants. A detailed NNSR applicability assessment will be provided in the New York State Department of Environmental Conservation (NYSDEC) Part 201/231 Air Permit Application for the Project. Danskammer Energy expects that emissions of NO_x, PM-10, and PM-2.5 will exceed the pollutant specific PSD/NNSR significant emission rates (SER) and, consequently, an air dispersion modeling analysis will be required for these pollutants. Furthermore, an air quality assessment to determine the potential impact of the project emissions on the National Ambient Air Quality Standards (NAAQS), and New York Ambient Air Quality Standards (NYAAQS) will also be prepared based on Part 201 and New York PSL Article 10 requirements.

The air quality analysis will be required to demonstrate that the Danskammer Energy Center will be compliant with all applicable PSD increment levels and NAAQS / NYAAQS. Initially, the air quality impact of the proposed facility will be modeled using potential emission rates to determine if the facility will yield significant air quality impacts (i.e., maximum modeled concentrations greater than the PSD significant impact concentrations). The significance modeling will be performed for multiple combustion turbine operating loads. The pollutant-specific "worst-case" operating scenario determined from the significance modeling analysis will be used in all subsequent modeling, including any PSD increment and multiple source NAAQS/NYAAQS analyses, if necessary.

On February 5, 2019, representatives from Danskammer Energy, LLC (Danskammer Energy) and TRC Companies (TRC), Danskammer Energy's environmental consultants on the project, attended a pre-application meeting with representatives of the NYSDEC in New Paltz, New York. The meeting was held to discuss key issues related to the permitting of the proposed facility. This modeling protocol has been prepared to describe the techniques that are proposed for completing the air quality modeling analyses for both the New York PSL Article 10 and the NYSDEC Part 201/231 and U.S. EPA PSD requirements that will be required to demonstrate that Danskammer Energy will comply with requirements related to ambient impacts, such as compliance with ambient air quality standards, PSD increments (for the Part 201/231 air permit application), and state ambient guideline concentrations for air toxics. The proposed modeling procedures are intended to be consistent with guidance provided by U.S. EPA in the "Guideline on Air Quality Models" which appears in the Code of Federal Regulations (CFR) at Appendix W of 40 CFR Part 51, and by NYSDEC in "NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis" (DAR-10).

2.0 AREA DESCRIPTION

The proposed Danskammer Energy Center would be located on an approximately 180± acre parcel that is controlled by Danskammer Energy. The project site is located within the Town of Newburgh, Orange County, New York. The Danskammer-owned property in the area of the Project site is bordered to the northwest by the Tilcon Materials Inc. quarry and the Hudson River to the northeast and east, and to the south by Riverview Power, LLC's Roseton Generating Station. The CSX Transportation rail road tracks transect the eastern portion of the property (west of the plant) in a northwest/southeast orientation, and the property is bordered to the west by a single-story house and Danskammer Road.

Figure 2-1 presents the proposed facility's location on the U.S. Geological Survey (USGS) 7.5-minute topographic map for the surrounding area. The proposed facility will be located at approximately 41° 34' 19.6" North Latitude, 73° 57' 58.5" West Longitude, North American Datum 1983 (NAD83). The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 586,180 meters Easting, 4,602,785 meters Northing, in Zone 18, NAD83. Figure 2-2 shows an aerial photograph of the facility location and the surrounding area.

Preliminary Project Area

N
W E
S

0 1,000 2,000
Feet

Base Map: USGS 7.5-Minute Topographic Quadrangle

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

Site Location Map

USGS TOPOGRAPHIC MAP OF THE DANSKAMMER ENERGY CENTER SITE

DANSKAMMER ENERGY CENTER
NEWBURGH, NY

FIGURE 2-1	**MARCH 2019**

Preliminary Project Area

Proposed Danskammer Energy Center

1 Air Cooled Condensors

2 Steam Turbine

3 Combustion Turbine

4 Heat Steam Recovery Generator

5 Stack

115kV Substation

N W E S

0 500 Feet

Base Map: Esri and its contributors

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

Site Location Aerial Photograph

PRELIMINARY PROJECT AREA
DANSKAMMER ENERGY CENTER SITE

DANSKAMMER ENERGY CENTER
NEWBURGH, NY

FIGURE 2-2 | **MARCH 2019**

3.0 FACILITY DESCRIPTION

3.1 Equipment/Fuels

The Danskammer Energy Center will consist of one (1) Mitsubishi M501JAC combustion turbine at the proposed facility site. Hot exhaust gases from the combustion turbine will flow into one (1) heat recovery steam generator (HRSG). The HRSG will be equipped with a natural gas fired duct burner. The HRSG will produce steam to be used in the steam turbine. Upon leaving the HRSG, the turbine exhaust gases will be directed to one (1) exhaust stack. Other ancillary combustion equipment at the proposed facility may include natural gas fired auxiliary boiler(s), emergency diesel fire pump(s), and emergency diesel generator(s). Note that the ancillary equipment engineering design information, including the equipment emissions and exhaust specifications, will be provided in the NYSDEC Part 201/231 Air Permit Application for the Project.

Danskammer Energy is proposing to utilize pipeline quality natural gas as the primary fuel for the combustion turbine and duct burners with ultra-low sulfur distillate fuel oil (with a maximum sulfur content of 0.0015%, by weight) as a backup fuel for up to 720 full load hours per year.

Emissions from the combined cycle unit will be controlled by the use of dry low-NO_x burner technology (during natural gas firing), water injection (during ULSD firing), Selective Catalytic Reduction (SCR) for NO_x control, an oxidation catalyst for carbon monoxide (CO) and VOC control, and the use of clean low-sulfur fuels (i.e., natural gas and ULSD) to minimize emissions of SO_2, PM/PM-10/PM-2.5, and sulfuric acid (H_2SO_4). Spent steam from the steam turbine will be sent to an air cooled condenser (ACC) where it will be cooled to a liquid state and returned to the HRSG.

3.2 Operation

The combined cycle unit will be operated to follow electrical demand (i.e., dispatch mode) but will be designed and permitted to operate on a continuous basis. The combined cycle unit typically will not operate at steady-state below 50% load. The HRSG steam production will follow the combustion turbine load. The combustion turbine/duct burner is proposed to operate 8,760 hours per year with up to 720 full load hours per year for the combustion turbine operating on ULSD.

Proposed emergency equipment such as a diesel fire pump or emergency generator will operate for no more than 250 hours/year, and therefore, will meet the definition of an “emergency power generating stationary internal combustion engine” under 6 NYCRR 200.1(cq).

3.3 Selection of Sources for Modeling

The emission source responsible for most of the potential emissions from the proposed Danskammer Energy Center is the combustion turbine. This unit will be included in and is the main focus of the modeling analyses. The modeling will include consideration of operation over a range of turbine loads, ambient temperatures, and operating scenarios. Initial modeling of the turbine by itself will be conducted to identify those operating conditions for each pollutant and averaging period that yield the maximum modeled impacts. Any subsequent modeling incorporating other emissions units at the facility or other facilities will include the turbine operating conditions that yield the maximum modeled impacts.

Ancillary sources such as emergency diesel generator(s), fire pump(s), and auxiliary boiler(s) will also be included in the modeling for appropriate pollutants and averaging periods. Note that emergency equipment may operate for up to one-half hour in any day for readiness testing and maintenance purposes. Operation of the emergency equipment for longer periods of time in an emergency mode would not be expected to occur when the turbine is operating.

Although only limited operation would be expected from the emergency equipment, modeling to assess short-term facility impacts will assume concurrent operation of the emergency equipment for readiness testing (i.e., up to 1-hour per day) with the combustion turbine.

3.4 Exhaust Stack Configuration and Emission Parameters

The preliminary general arrangement plan for the proposed facility is presented in Figure 3-1. The final general arrangement plan that will be based on the optimized engineering design for the facility will be provided in the Part 201/231 Air Permit Application. Preliminary exhaust characteristics of the turbine/HRSG stack during different operating scenarios are provided in Table 3-1. Exhaust parameters are presented for gas/ULSD firing at three (3) ambient temperatures (-5 degrees Fahrenheit, 50 degrees Fahrenheit, and 100 degrees Fahrenheit), three loads (50%, 75%, and 100%), with and without duct firing. Table 3-2 presents the preliminary potential emission rates for each of the operating scenarios. Emission rates and stack parameters for the range of ambient temperatures and load combinations will be used to determine the "worst-case" operating scenario for the turbines.

As discussed in Section 3.1, other ancillary combustion equipment at the proposed facility may include natural gas fired auxiliary boiler(s), emergency diesel fire pump(s), and emergency diesel generator(s). Note that the ancillary equipment engineering design information, including the equipment emissions and exhaust specifications, will be provided in the NYSDEC Part 201/231 Air Permit Application for the Project. Note that emergency diesel generator(s) and emergency diesel fire pump(s) will be included in the modeling analysis for appropriate pollutants and averaging periods when used for readiness testing (i.e., up to 1-hour per day).

3.5 Secondary Formation of PM-2.5

PM-2.5 is emitted directly from the Project emissions sources and formed in the atmosphere from Project PM-2.5 precursor emissions (NO_x and SO_2). Therefore, to account for the total air quality impact of PM-2.5, the modeled concentrations of primary PM-2.5 from the Project sources should be summed with a conservative concentration representative of PM-2.5 formed from Project PM-2.5 precursor emissions. Appropriate secondary PM-2.5 concentrations will be determined based on the project emissions and the air quality modeling results included in the U.S. EPA's Modeled Emission Rates for Precursors (MERPs) guidance, as described in the following paragraphs.

For the 24-hour averaging period, the PM-2.5 impacts will be based on the daily 24-hour impact from a hypothetical NO_x source and a hypothetical SO_2 source that were identified from multiple model simulation results contained in the U.S. EPA MERPs guidance. For NO_x, the eastern US (EUS) hypothetical source located at Franklin County, Massachusetts (source #4) with a surface release (L), annual NO_x emissions of 500 tons per year (tpy), and a maximum impact of 0.05 $\mu g/m^3$ will be used.

Therefore, the estimated impact on the 24-hour secondary PM-2.5 formation from the project's NO_x emissions will be determined as follows:

(tpy NO_x from Project/500 tpy NO_x) × 0.05 µg/m3 = PM-2.5 concentration ($\mu g/m^3$)

For SO_2, the EUS hypothetical source located at Franklin County, Massachusetts (source #4) with a surface release (L), annual SO_2 emissions of 500 tpy, and a maximum impact of 0.25 $\mu g/m^3$ will be used. Therefore, the estimated impact on the 24-hour secondary PM-2.5 formation from the project's SO_2 emissions will be determined as follows:

(tpy SO_2 from Project/500 tpy SO_2) × 0.25 µg/m3 = PM-2.5 concentration ($\mu g/m^3$)

As a result, the estimated total impact on the 24-hour secondary PM-2.5 formation will be based on the combined concentrations from NO_x and SO_2 secondary formation. This concentration will be combined with the final 24-hour PM-2.5 model results in order to accurately capture the total PM-2.5 impacts from the project.

For the annual averaging period, this analysis will be based on the annual average impact from a hypothetical NO_x source and a hypothetical SO_2 source that were identified from multiple model simulation results contained in the U.S. EPA MERPs guidance. For NO_x, the eastern US (EUS) hypothetical source located at Franklin County, Massachusetts (source #4) with a surface release (L), annual NO_x emissions of 500 tpy, and a maximum impact of 0.007 $\mu g/m^3$ will be used. Therefore, the estimated impact on the annual secondary PM-2.5 formation from the project's NO_x emissions will be determined as follows:

(tpy NO_x from Project/500 tpy NO_x) × 0.007 μg/m3 = PM-2.5 concentration ($\mu g/m^3$)

For SO_2, the EUS hypothetical source located at Frankin County, Massachusetts (source #4) with a surface release (L), annual SO_2 emissions of 500 tpy, and a maximum impact of 0.005 $\mu g/m^3$ will used. Therefore, the estimated impact on the annual secondary PM-2.5 formation from the project's SO_2 emissions will be determined as follows:

(tpy SO_2 from Project/500 tpy SO_2) × 0.005 $\mu g/m^3$ = PM-2.5 concentration ($\mu g/m^3$)

As a result, the estimated total impact on the annual secondary PM-2.5 formation will be based on the combined concentrations from NO_x and SO_2 secondary formation. This concentration will be combined with the final annual PM-2.5 model results in order to accurately capture the total PM-2.5 impacts from the project.

3.6 Good Engineering Practice Stack Height

Section 123 of the Clean Air Act (CAA) Amendments required the U.S. EPA to promulgate regulations to assure that the degree of emission limitation for the control of any air pollutant under an applicable State Implementation Plan (SIP) was not affected by (1) stack heights that exceed Good Engineering Practice (GEP) or (2) any other dispersion technique. The U.S. EPA provides specific guidance for determining GEP stack height and for determining whether building downwash will occur in the Guidance for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations), (EPA-450/4-80-023R, June, 1985). GEP is defined as "...the height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, and wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles."

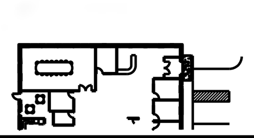
The GEP definition is based on the observed phenomenon of atmospheric flow in the immediate vicinity of a structure. It identifies the minimum stack height at which significant adverse aerodynamics (downwash) are avoided. The U.S. EPA GEP stack height regulations specify that the GEP stack height be calculated in the following manner:

$$H_{GEP} = H_B + 1.5L$$

Where: H_B = the height of adjacent or nearby structures, and
L = the lesser dimension (height or projected width of the adjacent or nearby structures).

A preliminary site plan for the proposed facility is shown in Figure 3-1, which has been overlain on a facility aerial map of the existing Danskammer Generating Station. A GEP stack height analysis will be conducted using the U.S. EPA approved Building Profile Input Program (BPIP) with PRIME (BPIPPRM, version 04274). Building, structure, and tank dimensions and locations relative to the modeled sources will be obtained from engineering drawings of the planned facility and input into BPIP. The exhaust stacks for all sources at the facility will not exceed the greater of the GEP formula height calculated by BPIP or 65 meters (213 feet). The direction-specific building downwash parameters obtained from the BPIPPRM model will be input to the PSD and Part 201/231 modeling analysis.

In addition to the proposed Danskammer Energy Center structures, the air quality modeling analysis will also include the building structures associated with the existing Danskammer Generating Station, as part of the facility will not be razed until after the Danskammer Energy Center is operational. Current plans call for the existing precipitator building (structure shown in red with a hatched line on Figure 3-1) and exhaust stack to be razed after the Danskammer Energy Center is operational to allow for the existing Danskammer Generating Station to operate for as long as possible. Thus, the air quality modeling analysis will be conducted for two phases of the Project. The first phase will consist of the interim operational time period that the existing Danskammer Generating Station structures remain in place while the new Danskammer Energy Center is commercially operating. The second phase will consist of the final Danskammer Energy Center buildout where a portion of the existing Danskammer Generating Station is razed.



0 40 80 160 240 FEET
1"= 80'

NOT FOR CONSTRUCTION

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INTER-DISCIPLINE REVIEW

DISC	ARCH	CIVIL	ELECT	I&C	MECH	STRUCT
DATE	--------	--------	--------	--------	--------	--------
INIT	---	---	---	---	---	---

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
OPEN		05/08/2019				

DSGN
DRN AMW
CKD
SCALE: 1"=80.0'

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Figure 3-1: Preliminary Site Plan

EMMISSION POINTS
BUILDING, EQUIPMENT & STRUCTURES

JOB NUMBER 155316
REV A
DRAWING NUMBER M110

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Table 3-1: Preliminary Combustion Turbine Source Parameters

Operating Case	Fuel	Ambient Temperature (°F)	Operating Load (%)	Duct Burner Operation (On/Off)	Modeling Stack Parameters		
					Exhaust Temperature (K)	Exhaust Velocity (m/s)[a]	Exhaust Flow (acfm)
Case1	Gas	-5	100	On	344.26	16.79	1,373,334
Case2	Gas	-5	75	Off	352.04	17.26	1,411,826
Case3	Gas	-5	50	Off	352.04	14.30	1,169,834
Case4	Gas	0	100	Off	350.37	16.95	1,385,881
Case5	Gas	50	100	On	344.26	16.68	1,363,993
Case6	Gas	50	100	Off	350.37	16.80	1,373,899
Case7	Gas	50	75	Off	350.93	15.63	1,278,726
Case8	Gas	50	50	Off	347.04	12.47	1,019,522
Case9	Gas	59	100	Off	352.04	17.02	1,392,317
Case10	Gas	100	100	On	356.48	18.08	1,478,960
Case11	Gas	100	100	Off	362.04	18.28	1,495,081
Case12	Gas	100	75	Off	357.04	15.09	1,233,978
Case13	Gas	100	55	Off	354.82	12.62	1,031,984

[a]Based on an internal stack diameter of 23 feet.

Notes: ACFM – Actual Cubic Feet per Minute
K – Degrees Kelvin
m/s – Meters per Second

Table 3-1: Preliminary Combustion Turbine Source Parameters (continued)

Operating Case	Fuel	Ambient Temperature (°F)	Operating Load (%)	Duct Burner Operation (On/Off)	Modeling Stack Parameters		
					Exhaust Temperature (K)	Exhaust Velocity (m/s)[a]	Exhaust Flow (acfm)
Case14	ULSD	-5	100	Off	370.93	20.63	1,686,959
Case15	ULSD	0	100	Off	372.59	21.13	1,728,323
Case16	ULSD	50	100	Off	371.48	21.08	1,723,944
Case17	ULSD	59	100	Off	372.59	21.19	1,732,649
Case18	ULSD	100	100	Off	376.48	19.47	1,592,280
Case19	ULSD	-5	75	Off	369.26	19.14	1,565,227
Case20	ULSD	-5	60	Off	363.15	16.12	1,318,234
Case21	ULSD	50	75	Off	365.37	17.19	1,405,653
Case22	ULSD	50	60	Off	359.82	14.34	1,172,929
Case23	ULSD	100	75	Off	372.59	16.01	1,309,164
Case24	ULSD	100	60	Off	367.04	13.30	1,087,791

[a]Based on a stack diameter of 23 feet.

Notes: ACFM – Actual Cubic Feet per Minute
K – Degrees Kelvin
m/s – Meters per Second

Table 3-2: Preliminary Combustion Turbine Emission Rates

Operating Case	Modeled Emission Rate (g/s)			
	NO_x	CO	PM-10/PM-2.5	SO_2
Case1	4.06	2.47	2.75	0.78
Case2	3.26	1.99	1.55	0.63
Case3	2.43	1.49	1.22	0.47
Case4	3.31	2.02	1.55	0.63
Case5	3.97	2.42	2.71	0.76
Case6	3.23	1.97	1.52	0.62
Case7	2.89	1.75	1.39	0.55
Case8	2.23	1.36	1.10	0.43
Case9	3.23	1.97	1.54	0.63
Case10	3.62	2.21	2.12	0.69
Case11	3.28	1.99	1.56	0.63
Case12	2.67	1.63	1.29	0.52
Case13	2.15	1.31	1.06	0.42
Case14	7.26	2.21	3.60	0.71
Case15	7.26	2.21	3.65	0.71
Case16	7.19	2.19	3.64	0.71
Case17	7.18	2.19	3.64	0.71
Case18	6.43	1.95	3.25	0.63
Case19	6.54	1.99	3.34	0.63
Case20	5.64	1.71	2.86	0.55
Case21	5.83	1.78	3.01	0.57
Case22	5.03	1.54	2.56	0.49
Case23	5.20	1.59	2.68	0.50
Case24	4.50	1.37	2.28	0.44

4.0 REGULATORY REQUIREMENTS

Air quality modeling requirements are specified under U.S. EPA and NYSDEC regulatory programs including PSD and NNSR programs, and the NYCRR for preconstruction permits, minor source operating permits, and major source operating permits. All applicable requirements that include air quality impact assessments are outlined in this section.

4.1 New Source Review

The NSR program consists of the NNSR and PSD programs. Applicability of these programs to the proposed Project is determined based upon the attainment status and the Project potential emissions. New York's NNSR requires the use of lowest achievable emission rate (LAER) controls and compliance with emission offset requirements should facility emissions exceed applicable thresholds. PSD requires the application of best available control technology (BACT) on a pollutant by pollutant basis should facility emissions exceed applicable thresholds. An emissions analysis will be provided in the NYSDEC Part 201/231 Air Permit Application to demonstrate applicability, by pollutant, of the PSD/NNSR requirements to the Project.

4.2 Attainment Status

The U.S. EPA has established National Ambient Air Quality Standards for each of the following criteria air pollutants: PM-10, PM-2.5, SO_2, ozone (O_3), NO_2, CO, and lead (Pb). Areas in which the NAAQS are being met are referred to as attainment areas. Areas in which the NAAQS are not being met are referred to as non-attainment areas. Areas that were formerly non-attainment areas but are now in attainment and covered by a maintenance plan are referred to as maintenance areas. Areas for which sufficient data are not available to determine a classification are referred to as unclassifiable. The federal attainment status designations of areas in New York with respect to NAAQS are listed at 40 CFR 81.333. The facility is located in Orange County in the Hudson Valley Intrastate Air Quality Control Region (AQCR).

The location of the proposed facility is in an area currently designated as attainment for SO_2, NO_2, CO, PM-10, PM-2.5, and ozone. Orange County, however, is located in the ozone transport region, and under this designation for 8-hour ozone, modifications at existing major facilities with net emissions increases more than 40 tons per year of NO_x and/or more than 40 tons per year of VOC, respectively, are subject to Part 231 NNSR for these pollutants and require the application of LAER controls and emission offset requirements.

4.2.1 Prevention of Significant Deterioration

New York has adopted the PSD program which is administered through the NYSDEC permitting process under 6 NYCRR Part 231, and applies to a new or modified major facility located in an attainment area. Any fossil fuel fired steam electric plant with a heat input capacity greater than 250 mmBTU/hr with potential emissions greater than 100 tons per year of any regulated criteria air pollutant (or 100,000 tons per year of greenhouse gases) is considered a “major” source and is subject to the PSD regulations. The existing Danskammer Generating Station is an existing major source. The addition of the Danskammer Energy Center (coupled with the retirement of the Station’s existing generators) constitutes a major modification because emissions increases of one or more criteria air pollutants will exceed the PSD Significant Emission Rates. As such, the Danskammer Energy Center will be subject to PSD review.

Facilities subject to PSD must perform an air quality analysis (which includes atmospheric dispersion modeling) and a best available control technology (BACT) demonstration for those pollutants that exceed the pollutant specific Significant Project Thresholds identified in the regulations. The PSD SERs and NNSR thresholds are provided in Table 4-1. (Note that since NO_x and VOC are precursors to ozone formation, NO_x and VOC emissions will be controlled to the more stringent LAER emission levels if they exceed the NNSR thresholds).

Dispersion modeling for the PSD requirements consists of three analyses: a significance analysis, a NAAQS/NYAAQS analysis, and a PSD increment analysis. The significance analysis compares the maximum-modeled ambient concentrations from the proposed facility to the significant impact levels (SILs) listed in Table 4-2 for each pollutant. If the modeled concentrations for the proposed facility are less than the SILs, then more detailed NAAQS/NYAAQS and PSD increment analyses are not required under PSD regulations. However, if the modeled concentrations are greater than the SILs, then NAAQS/NYAAQS and PSD increment analyses are required for that pollutant. The NAAQS and PSD increments are listed in Table 4-2 while the NYAAQS are listed in Table 4-3.

4.2.2 Preconstruction Ambient Air Quality Monitoring Exemption

As discussed previously, PSD regulations require an applicant to perform an air quality analysis for those criteria pollutants emitted in quantities exceeding the SERs (and for which there are NAAQS) shown in Table 4-1. This analysis can include the collection of up to one year of ambient air quality monitoring data.

Pursuant to the NYSDEC’s PSD regulations (6 NYCRR Section 231-12.4), NYSDEC may exempt a proposed PSD source, otherwise subject to the one-year pre-construction ambient monitoring requirement, if existing quality assured ambient air quality data are available from alternate locations that are representative of, or conservative, as compared to conditions at the proposed facility location.

A preconstruction monitoring exemption request will be provided to the NYSDEC for its review and approval since Danskammer Energy is proposing to utilize existing quality assured ambient air quality data from locations that are representative of conditions at the proposed facility site.

4.2.3 New York State Requirements

Applicable NYSDEC air regulations are identified below:

- Part 200 defines general terms and conditions, requires sources to restrict emissions, and allows NYSDEC to enforce NSPS, PSD, and NESHAP. Part 200 is a general applicable requirement; no action is required by the facility.

- Part 201 requires existing and new sources to evaluate minor or major source status and evaluate and certify compliance with all applicable requirements. The proposed facility will represent a major Part 201 source, seeking a construction permit under Part 201 with this application, and may apply for a Title V operating permit under 201-6 for the new facility at the time of air permit application or within one year of commencing operation.

- Part 202-1 requires a source to conduct emissions testing upon the request of NYSDEC. Permit conditions covering construction of the proposed facility will likely require stack testing as a condition of receiving its certificate to operate.

- Part 202-2 requires sources to submit annual emission statements for emissions tracking and fee assessment. Pollutants are required to be reported in an emission statement if certain annual thresholds are exceeded. Facility emissions will be reported as required.

- Part 211-3 defines general opacity limits for sources of air pollution in New York State. General applicable requirement facility-wide visible emissions are limited to 20% opacity (6-minute average) except for one continuous six-minute period per hour of not more than 57% opacity. Note that the opacity requirements under Part 227-1 (see below) are more restrictive and supersede the requirements of Part 211-3.

- Part 225-1 regulates sulfur content of fossil fuels. The proposed fuel oil fired combustion equipment for the Danskammer Energy Center project will use 0.0015% sulfur ULSD.

- Part 227-1.2 sets a 0.10 lb/mmBtu particulate limit for oil-fired stationary combustion installations with a maximum heat input capacity exceeding 250 mmBtu/hr. The combustion turbine at the Danskammer Energy Center will comply with this emission limit when operating on ULSD.

- Visible emissions (opacity) for stationary fuel-burning equipment are regulated under 6 NYCRR Subpart 227-1.3. Facility stationary combustion installations must be operated so that the following opacity limits are not violated; 227-1.3(a) 20% opacity (six minute average), except for one six-minute period per hour of not more than 27% opacity.

- Part 227-2 sets NO_x RACT emission limits for combustion sources. Danskammer Energy expects that the BACT/LAER emissions limits established under Part 231 will be equal to or lower than the 227-2 RACT limits.

- Part 231 requires New Source Review of new major sources and/or major modifications of existing facilities in both attainment and non-attainment areas in New York State.

- Part 242 establishes the New York State component of the CO_2 Budget Trading Program. Program requirements, including allowance allocations, account reconciliation, monitoring and reporting and regulatory timelines are addressed in these rules.

- Parts 243, 244, and 245 implement the US EPA's Cross-State Air Pollution Rule (CSAPR) and allow the NYSDEC to distribute CSAPR allowances to regulated entities in New York. These rules implement the transport rules annual NO_x and SO_2 trading program and the NOx ozone season trading program. Program requirements, including items such as allowance allocations and regulatory timelines are addressed in these rules.

- Part 251 establishes carbon dioxide (CO_2) emission standards for new major electric generating facilities (defined as facilities that have a generating capacity of at least 25 megawatts (MW)), and for increases in capacity of at least 25 MW at existing electric generating facilities.

- Under 6 NYCRR 257, New York's ambient air quality standards, project emissions must be such as not to exceed state ambient air standards for SO_2, PM, CO, photo-chemical oxidants, NO_2, fluorides, beryllium, and hydrogen sulfide.

In addition to the previously discussed emissions and applicability related regulations, the proposed facility will also be required to incorporate the New York State air quality requirements where applicable to the air quality assessment. These requirements are specified in:

- DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants; and
- DAR-10 NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis.

Table 4-1: PSD Significant Modification Thresholds and Non-attainment NSR Major Modification Thresholds

Pollutant	PSD Significant Modification Thresholds[a] (tons per year)	NNSR Major Modification Thresholds[a] (tons per year)
Carbon Monoxide	100	NA
Sulfur Dioxide	40	NA
Particulate Matter (PM)	25	NA
Particulate Matter less than 10 microns (PM-10)	15	NA
Particulate Matter less than 2.5 microns (PM-2.5)	10	NA
Nitrogen Oxides	40	40[c]
Ozone (VOC)	40	40[c]
Greenhouse Gases (GHG)	75,000[b]	NA
Lead	0.6	NA
Fluorides	3	NA
Sulfuric Acid Mist	7	NA
Hydrogen Sulfide	10	NA
Total Reduced Sulfur (including H_2S)	10	NA
Reduced Sulfur Compounds (including H_2S)	10	NA

Note: Pursuant to 6 NYCRR 231-13.1
[b]CO_2 NSR threshold for a major modification to an existing major source.
[c]As precursors to ozone – ozone transport region threshold.

Table 4-2: National Ambient Air Quality Standards, PSD Increments, Significant Monitoring Concentrations, and Significant Impact Levels

Pollutant	Averaging Period	NAAQS[a] (μg/m³)	Class II PSD Increment (μg/m³)	Significant Monitoring Concentrations (μg/m³)	Significant Impact Level (μg/m³)
Carbon Monoxide (CO)	1-Hour 8-Hour	40,000 10,000	-- --	-- 575	2,000 500
Nitrogen Dioxide (NO_2)	1-Hour Annual	188 100	-- 25	-- 14	7.5 1
Ozone (VOC)	8-Hour	137	--	--	--
Coarse Particulate Matter (PM-10)	24-Hour Annual	150 --	30 17	10 --	5 1
Fine Particulate Matter (PM-2.5)	24-Hour Annual	35 12	9 4	-- --	1.2 0.2
Sulfur Dioxide (SO_2)	1-Hour 24-Hour Annual 3-Hour	196 365 80 1,300	-- 91 20 512	-- 13 -- --	7.8 5 1 25
Lead (Pb)	3-Month	0.15	--	0.1	--

Note: (--) indicates there are no standards for this pollutant.
[a]All short-term (1-hr, 3-hr, 8-hr, and 24-hr) standards except ozone, PM-2.5,PM-10, and 1-hour SO_2 and NO_2 are not to be exceeded more than once per year. For 8-hr ozone, U.S. EPA uses the average of the annual 4th highest 8-hour daily maximum concentrations from each of the last three years of air quality monitoring data to determine a violation of the standard. For 24-hour PM-10, U.S. EPA uses the 6th highest 24-hour maximum concentration from the last three years of air quality monitoring data to determine a violation of the standards. For 24-hour PM-2.5, U.S. EPA uses the 98th percentile 24-hour maximum concentration from the last three years of air quality monitoring data to determine a violation of the standard. For the 1-hour NO_2 NAAQS, compliance would be determined by the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area and for the 1-hour SO_2 NAAQS, compliance would be determined with the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area.

Table 4-3: New York Ambient Air Quality Standards

Pollutant	Averaging Period	NYAAQS (ug/m^3)
Sulfur Dioxide (SO_2)	3-Hour	1,300[1]
	24-Hour	365[1]
	Annual	80[2]
Nitrogen Dioxide (NO_2)	Annual	100[2]
Particulate (PM-10)	24-Hour	150[3]
Fine Particulate (PM-2.5)	24-Hour	N/A
	Annual	N/A
Total Suspended Particulate (TSP)	24-Hour	250[1]
	Annual	65[4]
Carbon Monoxide (CO)	1-Hour	40,000[1]
	8-Hour	10,000[1]
Ozone (O_3)	1-Hour	160[1]
	8-hour	N/A
Lead (Pb)	Quarterly	N/A
Gaseous Fluorides (as F)[5]	12-Hour	3.70[2]
	24-Hour	2.85[2]
	1-Week	1.65[2]
	1-Month	0.80[2]
Beryllium	1-Month	0.01[2]
Hydrogen Sulfide[5]	1-Hour	14[2]
Settleable Particulates[5]	Annual	0.40[6]
	Annual	0.60[7]

[1] Not to be exceeded more than once per year.
[2] Not to be exceeded.
[3] Fourth highest concentration over a three year period.
[4] Geometric mean of the 24-hour average concentrations over 12-month period.
[5] Pollutant will not be emitted from the proposed facility.
[6] Units of milligrams per square centimeter per month. Fifty percent of monthly values should not exceed.
[7] Units of milligrams per square centimeter per month. Eighty four percent of monthly values should not exceed.

Source: 6 NYCRR Part 257

5.0 MODELING METHODOLOGY

Air quality dispersion modeling will be performed consistent with the procedures found in the following documents: Guideline on Air Quality Models (Revised) (U.S. EPA, 2017), New Source Review Workshop Manual (U.S. EPA, 1990), Screening Procedures for Estimating the Air Quality Impact of Stationary Sources (U.S. EPA, 1992), and DAR-10: NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis (NYSDEC, 2006).

5.1 Model Selection

The U.S. EPA has compiled a set of preferred and alternative computer models for the calculation of pollutant impacts. The selection of a model depends on the characteristics of the source, as well as the nature of the surrounding study area. Of the four classes of models available, the Gaussian type model is the most widely used technique for estimating the impacts of nonreactive pollutants.

The U.S. EPA AERMOD model is proposed to be used. The AERMOD model was designed for assessing pollutant concentrations from a wide variety of sources (point, area, and volume). AERMOD is currently recommended for modeling studies in rural or urban areas, flat or complex terrain, and transport distances less than 50 kilometers, with one hour to annual averaging times.

AERMOD (version 18081) will be used for the modeling of the proposed facility's potential emissions to determine the maximum ambient air concentrations. The regulatory default option will be used in the dispersion modeling analysis.

5.2 Surrounding Area and Land Use

A land cover classification analysis was performed to determine whether the urban source modeling option in AERMOD should be used in quantifying ground-level concentrations. The urban option in AERMOD accounts for the effects of increased surface heating on pollutant dispersion under stable atmospheric conditions. Essentially, the urban convective boundary layer forms in the night when stable rural air flows onto a warmer urban surface. The urban surface is warmer than the rural surface because the urban surface cools at a slower rate than the rural surface when the sun sets. The methodology utilized to determine whether the facility is located in an urban or rural area is described below.

The USGS topo map (see Figure 5-1) covering the area within a 3-kilometer radius of the site was reviewed and indicated that the majority of the surrounding area includes wooded areas, agricultural areas, parks, non-densely packed structures, and water. Additionally, the

"AERMOD Implementation Guide" published on August 3, 2015 cautions users against applying the Land Use Procedure on a source-by-source basis and instead consider the potential for urban heat island influences across the modeling domain. This approach is consistent with the fact that the urban heat island is not a localized effect, but is more regional in character.

The land use classifications within an area defined by a 3-km radius from the site and within a 10 km x 10 km modeling domain were analyzed using USGS NLCD 2011 data, where urban classifications are based on land use category 23 (developed, medium intensity) and category 24 (developed, high intensity). The land use within the 3-km area has 7% urban classification and the modeling domain has 9% urban classification. Table 5-1 provides the detailed land use classifications within a 3-kilometer radius of the site as well as a 10 kilometer by 10 kilometer domain.

The area within 3 kilometers of the proposed site as well as the 10 kilometer by 10 kilometer modeling domain is predominantly rural (as illustrated by Figure 5-1 and Table 5-1) and would not be subject to an urban heat island effect. Because the area is not subject to an urban heat island effect, the Urban Source option in AERMOD will not be utilized.

5.3 Meteorological Data

For any NYSDEC Part 201/231 and/or New York PSL Article 10 air quality modeling analysis conducted using the AERMOD model, two meteorological datasets are required: 1) hourly surface data and 2) upper air sounding data. According to the Guideline on Air Quality Models (Revised) (2017), the meteorological data used in an air quality modeling analysis should be selected based on its spatial and climatological representativeness of a proposed facility site and its ability to accurately characterize the transport and dispersion conditions in the area of concern. The spatial and climatological representativeness of the meteorological data are dependent on four factors:

1. The proximity of the meteorological monitoring site to the area under consideration;
2. The complexity of the terrain;
3. The exposure of the meteorological monitoring site; and,
4. The period of time during which data were collected.

This protocol presents one (1) hourly surface dataset and one (1) upper air sounding dataset for use in modeling the proposed Project to be located in the Town of Newburgh, Orange County. The closest source of representative hourly surface meteorological data is the Hudson Valley Regional Airport located in Wappingers Falls, NY. This meteorological station is located approximately 9 km to the northeast of the proposed Danskammer Energy Center at an elevation of approximately 150 feet above mean sea level.

The Hudson Valley Regional Airport meteorological tower location is such that the recorded data are free of interferences caused by nearby natural or manmade structures and provides an excellent representation of dispersion characteristics within the local area. Figure 5-3 shows the location of the Hudson Valley Regional Airport meteorological tower in relation to the facility site. A wind rose displaying the composite wind rose for the most recent five year period (2014 – 2018) of wind speed and direction is shown in Figure 5-2. Over the five (5) year period, predominant winds varied from the north, southwest, and southeast. The average wind speed over the five years is 2.64 meters per second. Calm winds during the five years had an average frequency of 2.13 percent. Additionally, the wind data recorded at the Hudson Valley Regional Airport meteorological tower is consistent from year to year indicating a stable climatic regime with few extreme conditions.

Concurrent upper air sounding data from Albany International Airport (WBAN 54775) in New York was used with the hourly surface dataset to create the meteorological dataset required for the modeling analysis. Albany International Airport is approximately 132 kilometers to the north of the facility site. Based on an examination of the spatial distribution of seasonal and annual mixing heights using Holzworth's <u>Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States</u> (U.S. EPA, 1972), upper air meteorological conditions in the Albany area are considered representative of the air regime at the facility site.

Both the surface and upper air sounding data were processed by the NYSDEC using AERMOD's meteorological processor, AERMET (version 18081). The meteorological data at the Hudson Valley Regional Airport is recorded by an Automated Surface Observing System (ASOS) that records 1-minute measurements of wind direction and wind speed along with hourly surface observations. The U.S. EPA AERMINUTE program was used by the NYSDEC to process 1-minute ASOS wind data (2014 – 2018) in order to generate hourly averaged wind speed and wind direction data to supplement the standard hourly ASOS observations. The hourly averaged wind speed and direction data generated by AERMINUTE was merged with the aforementioned hourly surface data. This fully processed, five year (2014-2018) meteorological dataset was provided to TRC by the NYSDEC on March 5, 2019. The output from AERMET will be used as the meteorological database for the modeling analysis and consists of a surface data file and a vertical profile data file.

TRC has concluded that the meteorological data recorded at the Hudson Valley Regional Airport meteorological tower and upper air data recorded from the Albany International Airport in Albany, are most representative of the air regime at the facility site and are suitable to be used in an atmospheric dispersion modeling study because:

- Due to the relative proximity of the Hudson Valley Regional Airport meteorological tower to the facility site, overall climatological conditions would be expected to be quite similar;
- The meteorological tower is well sited and in an area free of obstructions to wind flow;
- The monitoring station at the Hudson Valley Regional Airport continues to operate; and,
- The quality of the available data is good, exceeding U.S. EPA data recovery guidelines and displaying consistency from year to year of the available data record.

5.4 Land Cover Analyses

As noted above, the AERMOD modeling system uses AERMET to process meteorological data. Values of three surface characteristics (surface roughness length, Bowen ratio, and albedo) are required inputs for AERMET. Albedo is a measure of the reflectivity of the surface; Bowen ratio is a measure of the heat and moisture fluxes (i.e., flows) from the surface; and, roughness length is a measure of terrain roughness (obstacles to wind flow) as “seen by” surface wind.

The U.S. EPA’s AERSURFACE tool was used by the NYSDEC to determine the needed surface characteristic values. AERSURFACE was developed by the U.S. EPA to provide realistic and objectively determined surface characteristic values for use in the AERMET meteorological preprocessor.

Current U.S. EPA guidance calls for the use of surface parameters based on the area surrounding the meteorological measurement site. Section 5.3 previously discussed and justified the selection of surface level meteorological data from the Hudson Valley Regional Airport meteorological tower as representative of the facility site.

In order to compare the land use surrounding the Hudson Valley Regional Airport meteorological tower and the facility site and the associated surface parameters, AERSURFACE was run for each site. A single 360 degree wide sector was used in each case for the purpose of obtaining average values of surface roughness length for the area surrounding each site. Figures 5-4 and 5-5 present the surface parameters within 5-kilometers of the facility site and Hudson Valley Regional Airport meteorological tower, respectively. Table 5-2 provides the resulting monthly values for each of the surface parameters, the ratio of the monthly values at each site, and annual averages of the surface parameter values and ratios.

Review of the values in Table 5-2 show that: (1) the monthly albedo values are identical at each site; (2) the Bowen ratio is slightly higher at the meteorological tower site but always within 24 percent of the value at the Project site location; and (3) surface roughness lengths are more variable, as would be expected, since surface roughness is determined based on a more limited area. Natural logarithms were used to compare the respective surface roughness lengths at the two sites consistent with the manner in which this parameter is used by AERMOD.

Based on these comparisons, it is concluded that differences in land cover surrounding the Hudson Valley Regional Airport meteorological tower and Project site will not have any significant effect on the associated surface parameters used in AERMOD and that the land cover surrounding the Hudson Valley Regional Airport meteorological tower is suitably representative of land cover at the Project site.

5.5 Sources

The proposed facility will consist of various types of emission sources. The AERMOD technical manual will be used to set up the various sources to develop a logical and comprehensive modeling assessment. The following identifies the types of sources and how they will be assessed.

- Combustion Turbine Exhaust Stack – Single point source
- Ancillary Equipment Exhaust Stacks – Single point sources

5.6 Load Analysis

The proposed Project's combustion turbine will be operated over a range of loads. The NYSDEC Part 201/231 Air Permit Application will provide a detailed discussion of all the sources at the proposed facility and how they are assessed in the air quality analyses. The combustion turbine operating cases will be modeled to determine which case is the "worst-case" operating scenario for each pollutant and averaging period. These "worst-case" loads will then be used for any subsequent NAAQS or PSD increment modeling, including additional facility sources and potentially offsite sources.

5.7 Startups/Shutdowns

Startup is a short-term, transitional mode of operation for the combined cycle unit. In combined cycle operation, where the exhaust gases are directed through a HRSG to produce steam for a steam turbine generator, additional startup time is necessary in order to reduce thermal shock and excessive wear in both the HRSG and the steam turbine. Emission rates of some pollutants may be higher during startup operations because emissions controls may not become fully effective until a minimum threshold operating load and/or control device temperature is attained. The need for additional modeling to account for predicted short-term facility impacts during startup of the combined cycle unit will be assessed for those criteria pollutants whose short-term emission rates during startup may exceed those during normal operation and for which a short-term NAAQS or PSD increment has been defined (i.e., for CO and NO_2).

The facility will require "cold starts," which are typically based on one startup after 48 hours or more of shutdown, warm starts (based on 8 hours to 48 hours of shutdown), and hot starts (based on 1 hour to 8 hours of shutdown). In combined cycle operation, where the exhaust gases are directed through a HRSG to provide steam to a steam turbine, additional startup time is necessary in order to reduce thermal shock and excessive wear in both the HRSG and the steam turbine. The startup durations for the combustion turbine will vary from 0.5 to 0.8 hours based upon the type of start and fuel while the shutdown durations will last less than 0.5 hours.

The worst-case startup/shutdown emissions for CO and NO_x will be modeled if the pollutant(s) has higher emissions during startup and shutdown conditions when compared to normal operation. Preliminary startup emissions and associated stack parameters have been estimated based on vendor data and are shown in Table 5-3.

Only warm and hot starts are proposed to be evaluated for 1-hour NO_2, 1-hour CO, and 8-hour CO since the number of cold gas-fired starts (10) and the number of oil-fired starts (10) can be deemed to occur infrequently (i.e., transient events).

Because the startup/shutdown durations will be shorter than all of the averaging periods modeled, the modeled concentrations will be determined based on the combination of the startup conditions for the appropriate amount of startup time and the worst-case full-load pollutant and averaging period specific operating scenario determined in the combustion turbine load analysis.

In summary, the worst-case startup/shutdown emissions for CO and NO_x will be modeled if the pollutant(s) have higher emissions during startup and shutdown conditions when compared to normal operation for short-term averaging periods.

5.8 1-Hour NO_2 Modeling

The air quality modeling analysis for the 1-hour NO_2 NAAQS will be performed consistent with the guidance and procedures established in the recently published and revised U.S. EPA "Guideline on Air Quality Models" (January 17, 2017), the September 30, 2014 guidance memorandum titled "Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 NAAQS", and the March 1, 2011 guidance memorandum from Tyler Fox (EPA OAQPS) titled "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 NAAQS" (Memorandums). Based upon the discussion in the memorandums regarding the treatment of intermittent sources, it is proposed that only equipment or operating scenarios that "are continuous or frequent enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations" will be included in the 1-hour NO_2 modeling analysis.

This methodology, per the examples provided in the Memorandums, would exempt any facility equipment or operating scenarios from 1-hour NO_2 compliance modeling that does not operate on a normal daily or routine schedule. For example, emergency diesel generators and fire pumps are not expected to be tested more than once per week (with test durations limited to no more than 30 minutes) and are not expected to contribute significantly to the annual distribution of maximum 1-hour concentrations. For these reasons, and consistent with the Memorandums, it is proposed that 1-hour NO_2 modeling will not include any emergency diesel generators, or fire pumps.

NO_2 emissions during a gas fired cold startup of the combustion turbine will occur only for a limited number of events (10). Further, NO_2 emissions during ULSD startups of the combustion turbine will also occur only for a limited number of events (10). According to the previously mentioned U.S. EPA guidance (September 30, 2014 and March 1, 2011 guidance memorandums, respectively), intermittent operations such as startup scenarios are to be treated differently. The guidance recommends that "...compliance demonstrations for the 1-hour NO_2 NAAQS can be limited to those emissions that are continuous enough or frequent enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations". The combustion turbine startups (cold starts on gas and ULSD starts) are not relatively continuous. The guidance memorandums also reference the example of "a large base-load power plant that may experience startup/shutdown events on a relatively infrequent basis...may be appropriate to consider under this guidance". It is clear from the U.S. EPA guidance memorandum that intermittent scenarios such as cold startups on gas and ULSD startups should not be treated in the same way that normal continuous scenarios are treated. Thus, the cold natural gas and ULSD startup scenarios for the combustion turbine will not be included in the 1-hour NO_2 modeling analyses.

As previously discussed, startup and shutdown conditions that are expected to contribute to the annual distribution of daily maximum concentrations due to their frequency on a yearly basis will be included in the air quality modeling analysis for the 1-hour NO_2 standard.

The following tiered screening options will be applied for the various analyses per the guidance specified in the recently finalized "Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter", published final in the Federal Register on January 17, 2017, and the U.S. EPA Memorandum "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard" section entitled Approval and Application of Tiering Approach for NO_2 (found on pages 5 through 8 of the memorandum). The applicant proposes to use the Tier 2 screening approach for initial modeling results using the Ambient Ratio Method 2 (ARM2), which provides estimates of representative equilibrium ratios of NO_2/NO_x values based on ambient levels of NO_2

and NO_x derived from national data from the U.S. EPA's Air Quality System. The national default for ARM2 is proposed to be used, and includes a minimum ambient NO_2/NO_x ratio of 0.5 and maximum ambient NO_2/NO_x ratio of 0.9. This method will be applied to both the SIL and NAAQS/increment analyses, respectively for the 1-hour and annual averages. Note that the use of the Tier 3 screening approach applying PVMRM may be utilized should the Tier 2 method prove too conservative during the single source and or any potential multisource Part 201/231 or NYSDPS Article 10 modeling analyses for NAAQS compliance.

5.9 Receptor Grid

5.9.1 Basic Grid

The AERMOD model requires receptor data consisting of location coordinates and ground-level elevations. The receptor generating program, AERMAP (version 18081), will be used to develop a complete receptor grid to a distance of 16 kilometers (10 miles) from the proposed facility. AERMAP uses digital elevation model (DEM) or the National Elevation Dataset (NED) data obtained from the USGS. The preferred elevation dataset based on NED data will be used in AERMAP to process the receptor grid. This is currently the preferred data to be used with AERMAP as indicated in the U.S. EPA AERMOD Implementation Guide published April 17, 2018. AERMAP will be run to determine the representative elevation for each receptor using 1/3 arc second NED files that will be obtained for an area covering at least 16 kilometers in all directions from the Facility.

The following rectangular (i.e., Cartesian) receptors will be used to assess the air quality impact of the proposed facility:

- Consistent with DAR-10 guidance, ultrafine grid receptors (70 meter spacing) for a 5 km (east-west) x 5 km (north-south) grid centered on the proposed facility site;
- Fine grid receptors (200 meter spacing) for a 10 km x 10 km grid centered on the proposed facility site; and
- Coarse-grid receptors (500 meter spacing) for a 16 km x 16 km grid centered on the proposed facility site.

Receptors will be placed along the facility fence line or property boundary every 25 meters. Grid receptors within the fenced plant property will be excluded from the grid as public access will be precluded in this area.

5.10 Background Ambient Air Quality

Based on review of the locations of NYSDEC ambient air quality monitoring sites, the closest "regional" NYSDEC monitoring sites will be used to represent the current background air quality in the site area. Background data for CO and NO_2 was obtained from a monitoring station located in Bronx County, New York (U.S. EPA AIRData # 36-005-0133), approximately 79 km south of the proposed facility. The monitor is located at the Botanical Gardens (Pfizer Plant Research Lab, 200th Street and Southern Boulevard). This monitor is located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area in the lower Hudson Valley. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the project area. Thus, this monitor would be considered to conservatively represent the ambient air quality within the project area.

Background data for PM-10 was obtained from a monitoring station located in Bronx County, New York (U.S. EPA AIRData # 36-005-0110), approximately 84 km south of the proposed facility. The monitor is located at IS 52 (681 Kelly Street). This monitor is also located in one of the five boroughs of New York City that has a higher population density and higher density of industrial facilities than the Town of Newburgh area in the lower Hudson Valley. Further, this monitor is located in an area with a greater amount of mobile and point sources of air emissions as compared to the project area. Thus, this monitor would also be considered to conservatively represent the ambient air quality within the project area.

Background data for SO_2 was obtained from the Mt. Ninham monitoring station located in Putnam County, New York (U.S. EPA AIRData # 36-079-0005), and approximately 25 km east-southeast of the proposed facility. The monitor is located on Gypsy Trail Road in Kent. This monitor's close proximity to the Project would qualify it to be representative of the ambient air quality within the project area.

Background data for PM-2.5 was obtained from a Newburgh monitoring station located in Orange County, New York (U.S. EPA AIRData # 36-071-0002), and approximately 9 km south-southwest of the proposed facility. The monitor is located at the Public Safety Building (55 Broadway). This monitor's close proximity to the Project would qualify it to be representative of the ambient air quality within the project area.

The monitoring data for the most recent three years (2016 – 2018) are presented and compared to the NAAQS in Table 5-4. The maximum measured concentrations for each of these pollutants during the last three years are all below applicable standards and are proposed to be used in a NAAQS analysis should one be required.

5.11 NAAQS/NYAAQS Analysis

Should modeled concentrations be greater than the SILs for one or more pollutants subject to PSD review, NAAQS/NYAAQS analyses for those pollutants will be performed. The first step of conducting the NAAQS/NYAAQS analysis will be to determine the pollutant specific area(s) of impact of the proposed Project. The area of impact corresponds to the distance at which the model calculated pollutant concentrations fall below the SILs. The second step is obtaining off-site major source inventories within the area of impact plus a distance to be determined based upon discussions with NYSDEC. Discussions with NYSDEC will be centered on the development of an off-site source inventory and the procedures recommended for preparing a multiple source inventory. These off-site major sources would be included in the NAAQS/NYAAQS modeling analysis along with all sources at the proposed facility. The resultant concentrations will then be added to the representative background concentration for comparison to the NAAQS/NYAAQS. If the modeled concentration plus the background concentration is less than the NAAQS/NYAAQS, the proposed facility is considered acceptable relative to the NAAQS/NYAAQS. Danskammer Energy will demonstrate that its modeled impact plus representative background concentrations will be in compliance with the NAAQS/NYAAQS presented in Tables 4-2 and 4-3, respectively.

5.12 PSD Increment Analysis

The proposed facility is located in a PSD Class II area. Danskammer Energy will demonstrate that emissions from the proposed facility would not cause or contribute to air pollution in violation of any PSD increments (for SO_2, NO_2, and PM-10/PM-2.5) presented in Table 4-2. Danskammer Energy will demonstrate that its modeled impact will be in compliance with the Class II PSD increments presented in Table 4-2.

5.13 Additional Impact Analyses

In addition to assessing impacts on the NAAQS and PSD increments, facilities subject to PSD review must assess the potential impact for the area as a result of growth, and the potential impacts to soils, vegetation, and visibility in the area surrounding the proposed facility.

5.13.1 Assessment of Impacts Due to Growth

The proposed facility will be reviewed to assess the potential for affecting local and regional industrial, commercial, and residential growth. Factors that will be examined include the effects the transient working force will have during construction. If an increase in the permanent working force is required, the effects on the local growth will also be examined. Other effects to growth that will be examined include the air quality constraints the emissions from the proposed facility will have on precluding new growth, and the potential for drawing new industrial growth due to the electricity generated.

5.13.2 Assessment of Impacts on Soils and Vegetation

Pursuant to PSD regulations, an assessment of the potential impacts of the proposed facility on soils and vegetation will be prepared. The methodology outlined in A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals, U.S. EPA 450/2-81-078 will be used. This assessment will compare the maximum-modeled facility impacts plus background to pollutant-specific concentration levels. These pollutant-specific concentration levels are minimum pollutant concentration levels at which damage to the natural vegetation and predominant crops could occur. Therefore, if the maximum-modeled concentrations are less than the pollutant-specific concentration levels, then no damage to vegetation will be anticipated. The specific impact criteria levels to be used for the comparison will be identified for predominant soil and vegetation types based upon a review of the current literature.

5.13.3 Impact on Visibility

An assessment of the proposed facility's potential impact on visibility within the surrounding area will be performed using the U.S. EPA VISCREEN model (version 13190).

5.13.4 Impacts on Class I Areas

There are two (2) Class I areas within 300 km of the proposed facility: the Brigantine Wilderness area located in the Edwin B. Forsythe National Wildlife Refuge in New Jersey, approximately 228 kilometers south of the proposed facility and the Lye Brook Wilderness area in Vermont, approximately 175 kilometers north of the proposed facility. The Federal Land Manager (FLM) for each of these Class I areas will be notified by letter and requested to determine if assessments of impacts in the Class I areas will be required. Copies of both the letter and the FLM's response will be included in the agency correspondence appendices of the NYSDEC Part 201/231 Air Permit Application.

5.14 Modeling Submittal

The NYSDEC Part 201/231 Air Permit Application for the proposed Project will include a section detailing the modeling methodology and results from the modeling analysis. All final stack parameters and emission rates will be presented in the technical support document to the Part 201/231 Air Permit Application. All modeling input and output files used in the analysis will be submitted in electronic format (DVD-ROM) to the reviewing agencies.

Table 5-1: Land Use Classification Analysis

NLCD Category Code	NLCD Category Description	Classification	3 km Radius		10 km x 10 km Domain	
			Area (Acres)	%	Area (Acres)	%
11	Open Water	Rural	1,698	24%	3,389	13%
21	Developed, Open Space	Rural	720	10%	3,884	15%
22	Developed, Low Intensity	Rural	534	8%	2,463	10%
23	Developed, Medium Intensity	Urban	360	5%	1,773	7%
24	Developed, High Intensity	Urban	109	2%	499	2%
31	Barren Land (Rock/Sand/Clay)	Rural	43	1%	87	0%
41	Deciduous Forest	Rural	2,199	31%	7,081	28%
42	Evergreen Forest	Rural	154	2%	281	1%
43	Mixed Forest	Rural	93	1%	609	2%
52	Shrub/Scrub	Rural	49	1%	244	1%
71	Grasslands/Herbaceous	Rural	10	0%	50	0%
81	Pasture/Hay	Rural	618	9%	1,591	6%
82	Cultivated Crops	Rural	195	3%	1,973	8%
90	Woody Wetlands	Rural	91	1%	979	4%
95	Emergent Herbaceous Wetlands	Rural	116	2%	354	1%

Table 5-2: Comparison of Surface Parameters for the Hudson Valley Regional Airport Meteorological Tower and the Facility Site

Month	Danskammer Generating Station			Hudson Valley Regional Airport			Ratio of Surface Parameters		
	Albedo (r_a)	**Bowen Ratio (Bo_a)**	**Surface Roughness Length (zo_a)**	**Albedo (r_s)**	**Bowen Ratio (Bo_s)**	**Surface Roughness Length (zo_s)**	**Albedo (r_a/r_s)**	**Bowen Ratio (Bo_a/Bo_s)**	**Surface Roughness Length ($\ln zo_a/\ln zo_s$)**
1	0.16	0.61	0.020	0.17	0.80	0.062	0.94	0.76	1.41
2	0.16	0.61	0.020	0.17	0.80	0.062	0.94	0.76	1.41
3	0.15	0.42	0.023	0.16	0.53	0.071	0.94	0.79	1.43
4	0.15	0.42	0.023	0.16	0.53	0.071	0.94	0.79	1.43
5	0.15	0.42	0.023	0.16	0.53	0.071	0.94	0.79	1.43
6	0.16	0.37	0.025	0.16	0.49	0.091	1.00	0.76	1.54
7	0.16	0.37	0.025	0.16	0.49	0.091	1.00	0.76	1.54
8	0.16	0.37	0.025	0.16	0.49	0.091	1.00	0.76	1.54
9	0.16	0.61	0.025	0.16	0.80	0.087	1.00	0.76	1.51
10	0.16	0.61	0.025	0.16	0.80	0.087	1.00	0.76	1.51
11	0.16	0.61	0.025	0.16	0.80	0.087	1.00	0.76	1.51
12	0.16	0.61	0.020	0.17	0.80	0.062	0.94	0.76	1.41
Annual Average	0.16	0.50	0.023	0.16	0.66	0.078	0.97	0.77	1.47

Table 5-3: Preliminary Combustion Turbine Modeled Emission Rates and Exhaust Parameters During Startup on Natural Gas

Event	Elapsed Time (min)	Stack NO_x (lb/event)	Stack NO_x (lb/hr)	Stack CO (lb/event)	Stack CO (lb/hr)	Stack Exhaust Velocity (m/s)	Stack Exhaust Temperature (Degrees F)
Cold Startup	35	68	68	443	443	8.20	165
Warm Startup	35	60	60	350	350	8.20	165
Hot Startup	30	54	54	129	129	8.20	165
Shutdown	12.5	89	89	160	160	11.82	165

	Type of Startup or Shutdown Event			
	Cold Startup	Warm Startup	Hot Startup	Shutdown
Duration of Turbine at 0% load prior to Start-up (hours)	48	8	4	--
Maximum Duration of Start-up or Shut-down Event (hours)	0.6	0.6	0.5	0.2
Maximum Number per Year	10	52	260	322

Note: Due to the infrequency of cold startups, modeling of these transient events for 1-hour NO_2, 1-hour CO, and 8-hour CO is not proposed.

Table 5-4: Maximum Measured Ambient Air Quality Concentrations

Pollutant	Averaging Period	Maximum Ambient Concentrations ($\mu g/m^3$)			NAAQS ($\mu g/m^3$)
		2016	2017	2018	
SO_2	1-Hour[a] 24-Hour Annual	6.3 3.9 **0.6**	15.5 3.7 0.6	7.9 **4.2** 0.3	196 365 80
NO_2	1-Hour[b] Annual	104.9 **29.3**	105.3 28.0	101.5 27.1	188 100
CO	1-Hour 8-Hour	2,024 1,150	403 345	**2,300** **1,380**	40,000 10,000
PM-10	24-Hour	**32**	27	30	150
PM-2.5[c]	24-Hour Annual	20.0 6.1	13.9 6.1	16.0 6.4	35 12

[a]1-hour 3-year average 99th percentile value for SO_2 is **9.9** ug/m3.
[b]1-hour 3-year average 98th percentile value for NO_2 is **103.9** ug/m3.
[c]24-hour 3-year average 98th percentile value for PM-2.5 is **16.6** ug/m3; Annual 3-year average value for PM-2.5 is **6.2** ug/m3.
High second-high short term (1-, 3-, 8-, and 24-hour) and maximum annual average concentrations presented for all pollutants other than PM-2.5 and 1-hour SO_2 and NO_2.
Bold values represent the proposed background values for use in any necessary NAAQS/NYAAQS analyses.
Monitored background concentrations obtained from the NYSDEC website.

3-KM Radius

1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

USGS TOPOGRPHIC MAP OF THE DANSKAMMER ENERGY CENTER SITE

DANSKAMMER ENERGY CENTER NEWBURGH, NEW YORK

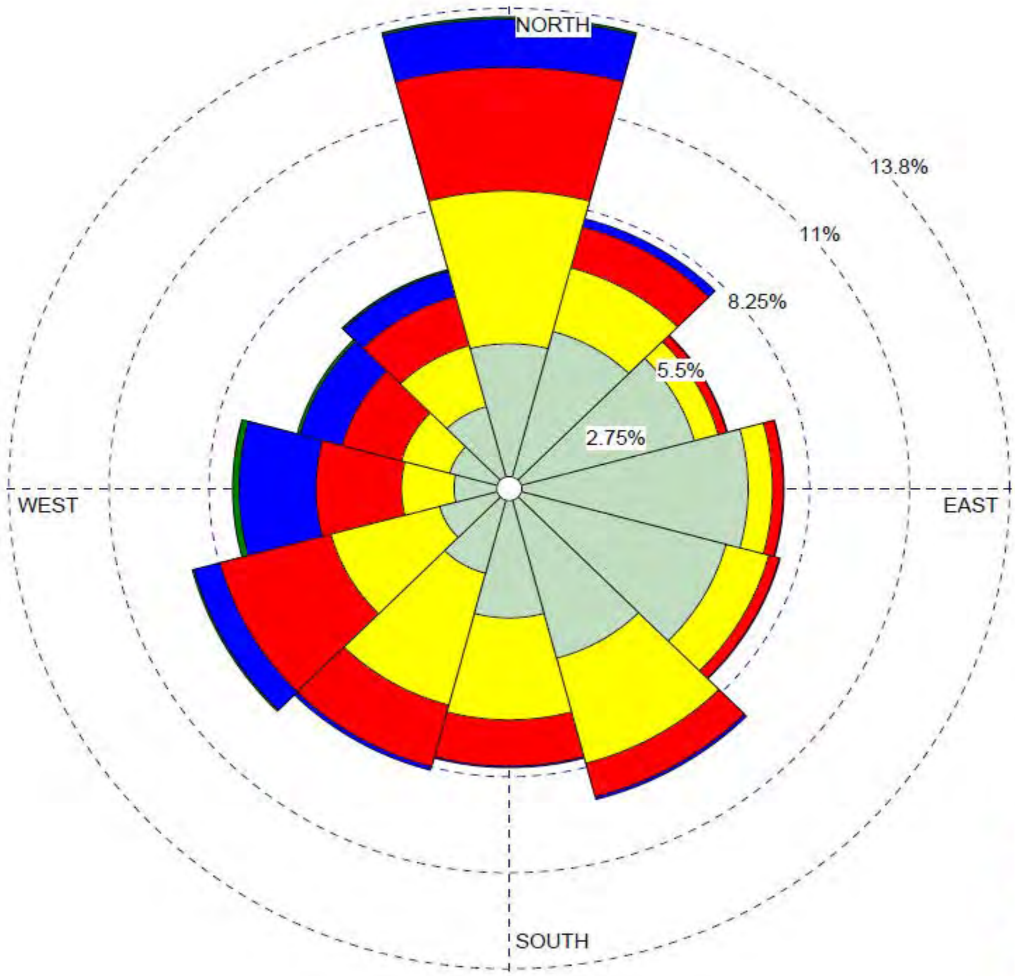
FIGURE 5-1	**APRIL 2019**

WIND ROSE PLOT:

Hudson Valley Regional Airport

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:
	Start Date: 1/1/2014 - 00:00 **End Date: 12/31/2018 - 23:59**
	CALM WINDS: **2.13%**
	AVG. WIND SPEED: **5.14 Knots**

WRPLOT View - Lakes Environmental Software

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

WIND ROSE FOR THE HUDSON VALLEY AIRPORT METEOROLOGICAL TOWER (2014 – 2018)

DANSKAMMER ENERGY CENTER NEWBURGH, NEW YORK

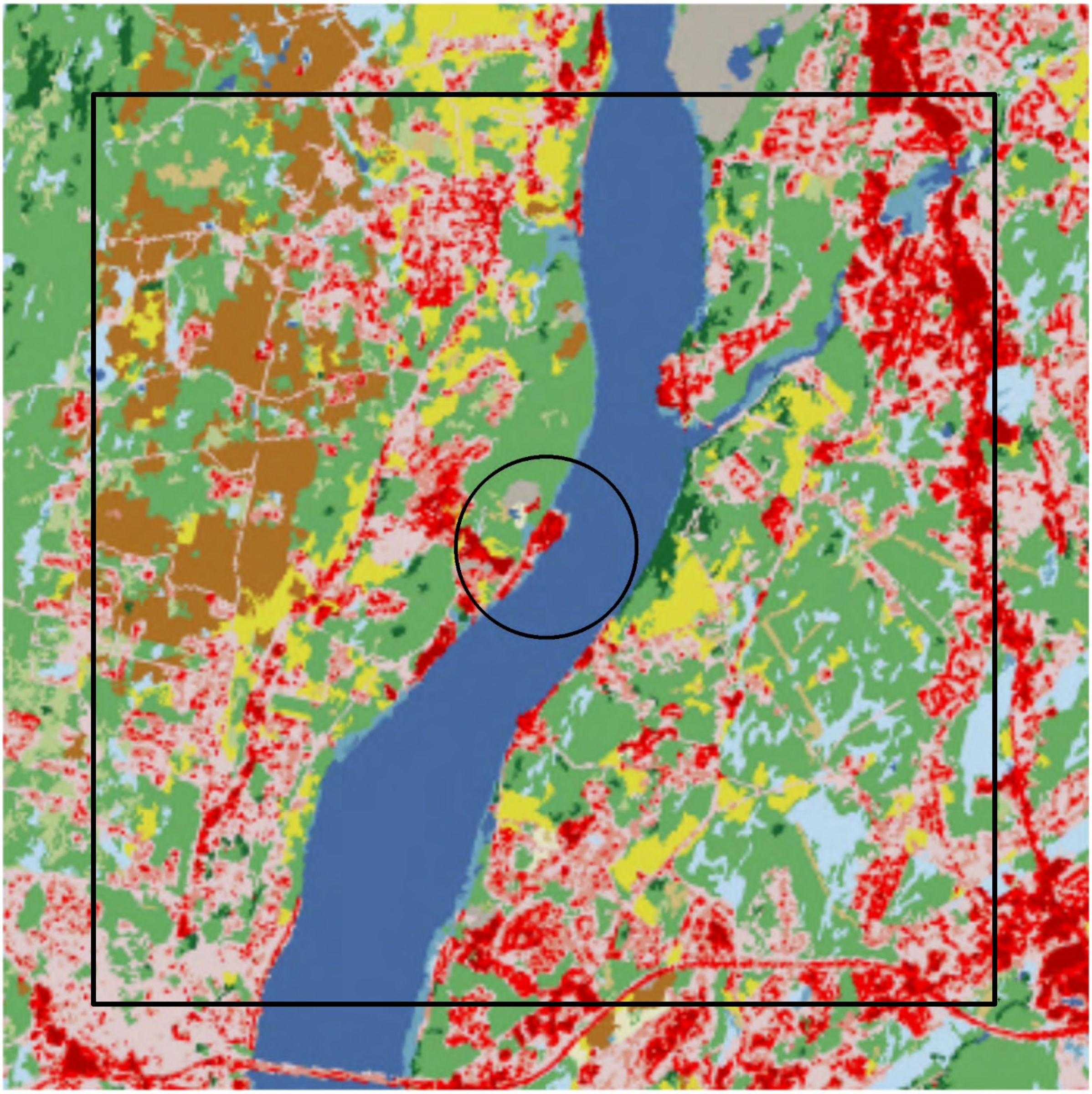
FIGURE 5-2 | **APRIL 2019**

TRC
1200 Wall Street West, 5th Fl.
Lyndhurst, NJ 07071
201-933-5541

LOCATION OF THE PROPOSED DANSKAMMER ENERGY CENTER AND THE HUDSON VALLEY REGIONAL AIRPORT

DANSKAMMER ENERGY CENTER
NEWBURGH, NEW YORK

FIGURE 5-3 **APRIL 2019**



○ 1-KM Radius

□ 10 KM Domain

NLCD Land Cover Classification Legend

- 11 Open Water
- 12 Perennial Ice/ Snow
- 21 Developed, Open Space
- 22 Developed, Low Intensity
- 23 Developed, Medium Intensity
- 24 Developed, High Intensity
- 31 Barren Land (Rock/Sand/Clay)
- 41 Deciduous Forest
- 42 Evergreen Forest
- 43 Mixed Forest
- 51 Dwarf Scrub*
- 52 Shrub/Scrub
- 71 Grassland/Herbaceous
- 72 Sedge/Herbaceous*
- 73 Lichens*
- 74 Moss*
- 81 Pasture/Hay
- 82 Cultivated Crops
- 90 Woody Wetlands
- 95 Emergent Herbaceous Wetlands

TRC
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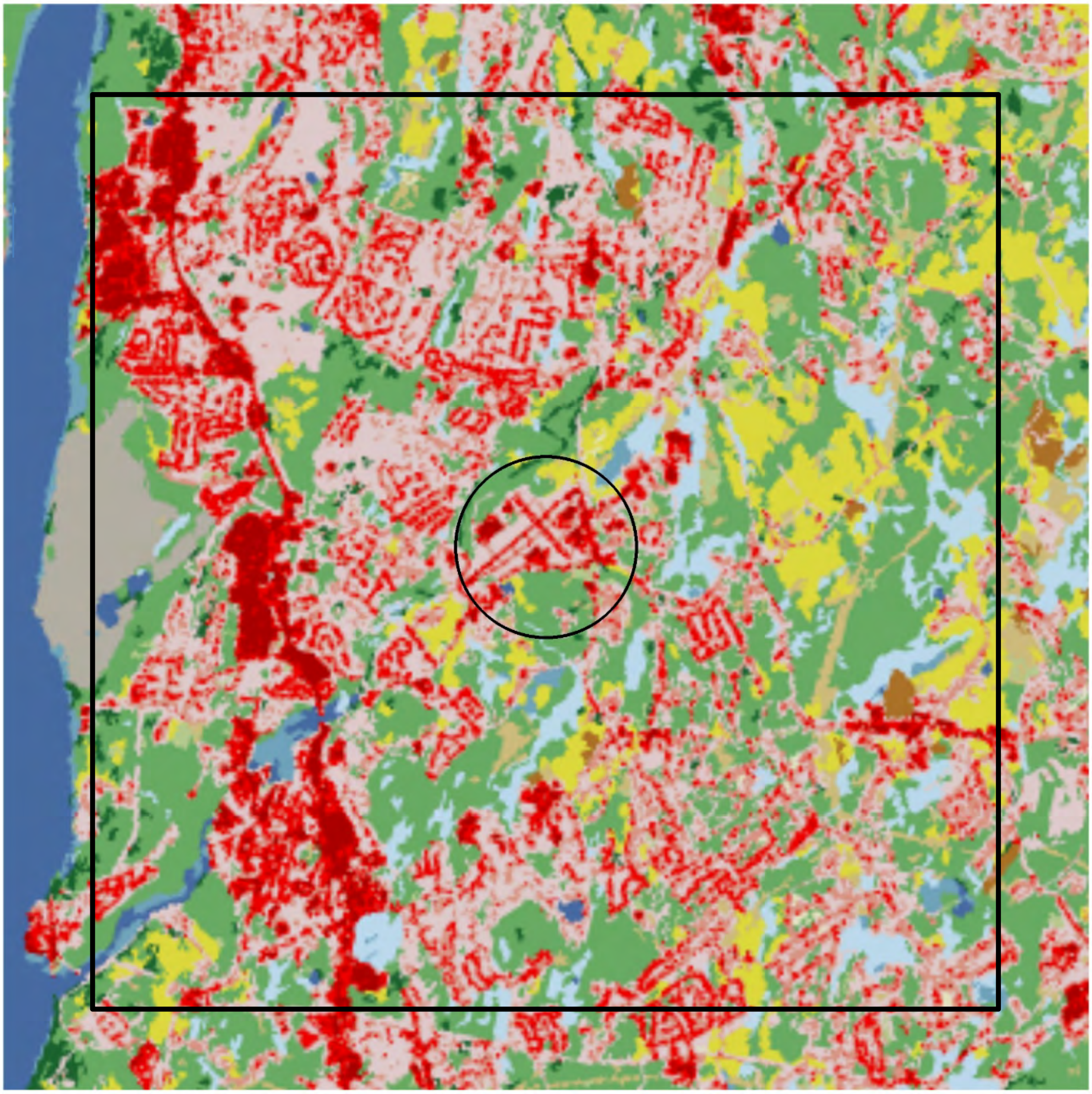
LANDUSE WITHIN 5 KM OF DANSKAMMER ENERGY CENTER SITE

**DANSKAMMER ENERGY CENTER
NEWBURGH, NEW YORK**

FIGURE 5-4 | **MARCH 2019**



○ 1-KM Radius

□ 10 KM Domain

NLCD Land Cover Classification Legend

- 11 Open Water
- 12 Perennial Ice/ Snow
- 21 Developed, Open Space
- 22 Developed, Low Intensity
- 23 Developed, Medium Intensity
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- 42 Evergreen Forest
- 43 Mixed Forest
- 51 Dwarf Scrub*
- 52 Shrub/Scrub
- 71 Grassland/Herbaceous
- 72 Sedge/Herbaceous*
- 73 Lichens*
- 74 Moss*
- 81 Pasture/Hay
- 82 Cultivated Crops
- 90 Woody Wetlands
- 95 Emergent Herbaceous Wetlands

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201-933-5541

LANDUSE WITHIN 5 KM OF HUDSON VALLEY REGIONAL AIRPORT METEOROLOGICAL TOWER

DANSKAMMER ENERGY CENTER NEWBURGH, NEW YORK

FIGURE 5-5 | **MARCH 2019**

6.0 NEW YORK STATE ARTICLE 10 ANALYSES

In addition to the air quality modeling analyses required for the NYSDEC Part 201/231 and U.S. EPA PSD requirements, the proposed Project will be required to address the following air quality issues as part of the Article 10 process:

- Acid Deposition;
- Toxic Air Pollutants;
- Accidental Releases;
- Visible Plumes; and
- Environmental Justice (EJ) analysis (NYSDEC Part 487)

This section provides a summary of the methodology to be used to address each of these air quality issues. These analyses will not be included in the NYSDEC Part 201/231 Air Permit Application but will be included in the Project's Article 10 Application.

6.1 Acid Deposition

The New York State Acid Deposition Control Act requires an applicant to quantify a proposed facility's contribution to the New York State total deposition of sulfates and nitrates at eighteen defined receptors in New York State, New England and Canada. This analysis will be performed using the procedure set forth in the March 4, 1993 memorandum from Mr. Leon Sedefian of the NYSDEC to the Impact Assessment and Meteorology (IAM) staff.

6.2 Toxic Air Pollutant Analysis

Air quality modeling will be conducted for potential toxic (non-criteria) air pollutant emissions from the proposed combustion turbine and ancillary equipment. The modeling methodology used in the toxic air pollutant analysis will be the same as used in the Part 201/231 air quality analyses. Maximum modeled short-term and annual ground level concentrations of each toxic air pollutant will be compared to the NYSDEC's short-term guideline concentration (SGC) and annual guideline concentration (AGC), respectively.

6.3 Accidental Releases

The proposed Project will be utilizing aqueous ammonia as the reducing agent in the Project's SCR systems for controlling NO_x emissions from the turbine. Because of the need for a constant supply, aqueous ammonia (a mixture containing less than 19 percent by weight ammonia in water) will be stored on-site in storage tank(s) having 110% secondary containment. The tanks will be designed in accordance with American Petroleum Institute (API) standards and other applicable state and local regulations. Due to the dilute concentration of the aqueous ammonia (less than 20%), the project's ammonia solution is not subject to the U.S. EPA Risk Management Program for hazardous materials (40 CFR Part 68).

However, as part of the Article 10 Application for the proposed Project, an assessment for the potential off-site impacts resulting from a worst-case ammonia release scenario will be examined. The accidental worst-case ammonia release scenario will be conducted using emission estimates based on U.S. EPA's Risk Management Program Guidance for Offsite Consequence Analysis (U.S. EPA, 2009). To determine the potential worst-case impact distance, the U.S. EPA-approved Areal Locations of Hazardous Atmospheres (ALOHA) model will be used. This accidental release model was developed by National Oceanic and Atmospheric Administration (NOAA) and is routinely utilized by first responders in predicting impact areas associated with hazardous material releases. It is anticipated the facility will employ passive emission control measures and/or a water suppression system, if necessary, to minimize ammonia emissions during an accidental release.

6.4 Environmental Justice Evaluation

The intent of an environmental justice (EJ) analysis is to determine whether the construction and operation of the proposed Project would have a significant adverse and disproportionate effect on an EJ area. The concept of performing an EJ analysis for the proposed facility is related to the issuance of Executive Order (EO) 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" (February 11, 1994). The order requires federal agencies to consider disproportionate adverse human health and environmental impacts on minority and low-income populations. The NYSPSC Article 10 Rules include significant requirements related to EJ review.

In order to provide a framework for preparing the EJ analysis, the NYSDEC promulgated 6 NYCRR Part 487, Analyzing Environmental Justice Issues in Siting of Major Electric Generating Facilities Pursuant to Public Service Law Article 10. Part 487 applies only to applicants seeking a Certificate for construction and operation of an action requiring review under PSL Article 10. The preliminary EJ assessment provided in the Article 10 Preliminary Scoping Statement indicates the presence of EJ areas within five (5) miles of the proposed facility. Thus, in accordance with Part 487 requirements, an air quality analysis is necessary to demonstrate that the EJ areas will not have adverse or disproportionate air quality impacts when compared to the identified reference communities. As part of the Part 487 requirements, an EJ modeling protocol will need to be approved by the NYSDEC prior to an applicant filing a final EJ analysis under Article 10.

The proposed air quality assessment for the NYSDEC Part 487 EJ air impact assessment will follow the methodology presented in Section 5 of this document. The following presents the additional methodology proposed to be followed in the EJ air quality assessment.

6.4.1 Environmental Justice Air Quality Impact Analysis

This analysis will be performed within a circular area extending from the location of the proposed facility to a radius of 10 miles (16 kilometers) and will be referred to as the EJ Air Impact Area (EJAIA). The actual distances to maximum modeled impacts for the various criteria pollutants emitted by the Project are anticipated to encompass an area smaller than the EJAIA. This analysis will examine the impacts from all criteria pollutants (except for ozone).

The relative air quality impacts will be presented in graphical form as concentration contours overlaid on a site aerial indicating the EJ area. These concentration contours will be analyzed spatially to determine if the EJ areas share a disproportionate impact of the facility air quality impacts.

6.4.2 Cumulative Impact Analysis of Air Quality

Part 487 stipulates that an Applicant subject to Article 10 shall conduct a cumulative impact analysis of air quality consistent with the requirements of Section 487.7. This analysis will be conducted for those pollutants for which the proposed action has a significant air quality impact, i.e., the maximum concentrations are above the recognized PSD SILs. For all other pollutants, if impacts are demonstrated to be below the SILs, then the impacts are not considered to be adverse and thus, no further analysis is necessary for those pollutants and averaging periods.

For pollutants with modeled impacts above the SILs, the modeling analysis will examine impacts of the Project combined with any additional Article 10 facilities that have submitted an application and are located within the EJAIA plus 10 km, and any major stationary source that has not yet commenced operations located within the EJAIA plus 10 kilometers, whose emissions exceed the significant project thresholds in Tables 4 and 6 of the NYCRR sections 231-13.4 and 231-13.6. Lastly, existing major sources within the EJAIA whose emissions exceed the significant project thresholds in Tables 4 and 6 of the NYCRR sections 231-13.4 and 231-13.6 will be included. The cumulative impact of air quality from the proposed action, existing ambient background pollutant concentrations, existing major sources, and any proposed actions within the study area with applications that are deemed administratively complete will be assessed for impact to the EJ area.

The air quality impacts associated with the EJ area will be compared and contrasted to impacts in the established reference communities pursuant to Sections 487.9 and 487.10 in order to evaluate the potential for significant and adverse disproportionate impacts in the EJ area from the proposed operation of the Danskammer Energy Center.

7.0 REFERENCES

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APPENDIX F

COMBUSTION TURBINE LOAD ANALYSIS AND TOXIC AIR POLLUTANT ASSESSMENT

Table F-1. Combustion Turbine Load Analysis (Project Phase 1 with all existing structures)

Danskammer Energy LLC - One (1) MHPS 501JAC Combined Cycle Combustion Turbine - One (1) Stack (200 feet above grade)

1-Hour	MAX XOQ	yymmddhh	UTMX	UTMY	ELEV (m)	NOx	CO	PM10	PM2.5	SO2	H2SO4	Distance (m)	Direction
CASE01	6.04051	15090119	581,959	4,604,960	162.2	24.52	14.92	NA	NA	4.71	0.00	4741	298
CASE02	5.0118	15090119	581,759	4,605,060	180.1	16.34	5.01	NA	NA	3.16	0.00	4965	298
CASE03	6.13671	15090119	581,959	4,604,960	162.2	14.91	4.54	NA	NA	2.88	0.00	4741	298
CASE04	5.33351	15090119	581,859	4,605,060	168.0	17.65	5.39	NA	NA	3.36	0.00	4877	298
CASE05	6.08057	15090119	581,959	4,604,960	162.2	24.14	14.71	NA	NA	4.62	0.00	4741	298
CASE06	5.38186	15090119	581,859	4,605,060	168.0	17.38	5.27	NA	NA	3.34	0.00	4877	298
CASE07	5.77324	15090119	581,959	4,604,960	162.2	16.68	5.08	NA	NA	3.18	0.00	4741	298
CASE08	7.42567	15090119	582,059	4,604,960	158.0	16.56	5.05	NA	NA	3.19	0.00	4653	298
CASE09	5.15128	15090119	581,859	4,605,060	168.0	16.64	5.05	NA	NA	3.25	0.00	4877	298
CASE10	5.04504	15090119	581,759	4,605,060	180.1	20.33	12.41	NA	NA	3.88	0.00	4965	298
CASE11	4.62874	15090119	581,759	4,605,060	180.1	16.76	10.23	NA	NA	3.19	0.00	4965	298
CASE12	4.27146	18052621	582,459	4,603,460	183.0	14.01	4.27	NA	NA	2.69	0.00	3766	281
CASE13	5.59175	15090119	581,859	4,605,060	168.0	14.93	4.59	NA	NA	2.91	0.00	4877	298
CASE14	7.08919	15090119	582,059	4,604,960	158.0	15.24	4.68	NA	NA	2.98	0.00	4653	298
CASE15	3.60222	15081620	582,359	4,603,360	196.6	26.15	7.96	NA	NA	2.56	0.00	3847	279
CASE16	3.53622	15081620	582,359	4,603,360	196.6	25.67	7.82	NA	NA	2.51	0.00	3847	279
CASE17	3.57295	15081620	582,359	4,603,360	196.6	25.69	7.82	NA	NA	2.54	0.00	3847	279
CASE18	3.57006	15081620	582,359	4,603,360	196.6	25.63	7.82	NA	NA	2.53	0.00	3847	279
CASE19	3.67562	15081620	582,459	4,603,360	182.0	23.63	7.17	NA	NA	2.32	0.00	3748	279
CASE20	3.86333	15081620	582,459	4,603,360	182.0	25.27	7.69	NA	NA	2.43	0.00	3748	279
CASE21	4.70574	15090119	581,759	4,605,060	180.1	26.54	8.05	NA	NA	2.59	0.00	4965	298
CASE22	4.35775	15090119	581,759	4,605,060	180.1	25.41	7.76	NA	NA	2.48	0.00	4965	298
CASE23	5.42659	15090119	581,859	4,605,060	168.0	27.30	8.36	NA	NA	2.66	0.00	4877	298
CASE24	4.6257	15090119	581,759	4,605,060	180.1	24.05	7.35	NA	NA	2.31	0.00	4965	298
CASE25	6.01903	15090119	581,959	4,604,960	162.2	27.09	8.25	NA	NA	2.65	0.00	4741	298
3-Hour	**MAX XOQ**	**yymmddhh**	**UTMX**	**UTMY**	**ELEV (m)**	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**	**H2SO4**	**Distance (m)**	**Direction**
CASE01	4.47851	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	3.49	NA	3864	280
CASE02	4.10505	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.59	NA	3864	280
CASE03	4.64611	17101421	582,559	4,603,460	158.8	NA	NA	NA	NA	2.18	NA	3667	281
CASE04	4.25702	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.68	NA	3864	280
CASE05	4.48978	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	3.41	NA	3864	280
CASE06	4.27872	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.65	NA	3864	280
CASE07	4.44386	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.44	NA	3864	280
CASE08	5.56815	17101421	582,559	4,603,460	158.8	NA	NA	NA	NA	2.39	NA	3667	281
CASE09	4.18733	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.64	NA	3864	280
CASE10	4.11311	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	3.17	NA	3864	280
CASE11	3.9443	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.72	NA	3766	281
CASE12	3.7755	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.38	NA	3766	281
CASE13	4.40525	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.29	NA	3864	280
CASE14	5.37163	17101421	582,559	4,603,460	158.8	NA	NA	NA	NA	2.26	NA	3667	281
CASE15	3.19506	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.27	NA	3766	281
CASE16	3.10214	16122724	582,259	4,603,160	195.4	NA	NA	NA	NA	2.20	NA	3921	276
CASE17	3.13865	16122724	582,259	4,603,160	195.4	NA	NA	NA	NA	2.23	NA	3921	276
CASE18	3.13449	16122724	582,259	4,603,160	195.4	NA	NA	NA	NA	2.23	NA	3921	276
CASE19	3.30587	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.08	NA	3766	281
CASE20	3.45636	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.18	NA	3766	281
CASE21	4.01169	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.21	NA	3766	281
CASE22	3.84847	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.19	NA	3766	281
CASE23	4.36155	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.14	NA	3864	280
CASE24	3.98888	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	1.99	NA	3766	281
CASE25	4.65285	17101421	582,559	4,603,460	158.8	NA	NA	NA	NA	2.05	NA	3667	281

Table F-1. Combustion Turbine Load Analysis (Project Phase 1 with all existing structures)

8-Hour	MAX XOQ	yymmddhh	UTMX	UTMY	ELEV (m)	NOx	CO	PM10	PM2.5	SO2	H2SO4	Distance (m)	Direction
CASE01	2.79816	18030224	586,159	4,602,410	-0.8	NA	6.91	NA	NA	NA	NA	350	180
CASE02	2.71578	18030224	586,159	4,602,410	-0.8	NA	2.72	NA	NA	NA	NA	350	180
CASE03	3.10073	18030224	586,099	4,602,640	0.8	NA	2.29	NA	NA	NA	NA	133	207
CASE04	2.75892	18030224	586,159	4,602,410	-0.8	NA	2.79	NA	NA	NA	NA	350	180
CASE05	2.80933	18030224	586,159	4,602,410	-0.8	NA	6.80	NA	NA	NA	NA	350	180
CASE06	2.7716	18030224	586,159	4,602,410	-0.8	NA	2.72	NA	NA	NA	NA	350	180
CASE07	2.90111	18030224	586,099	4,602,640	0.8	NA	2.55	NA	NA	NA	NA	133	207
CASE08	3.41226	18030224	586,099	4,602,640	0.8	NA	2.32	NA	NA	NA	NA	133	207
CASE09	2.74714	18030224	586,159	4,602,410	-0.8	NA	2.69	NA	NA	NA	NA	350	180
CASE10	2.67829	18030224	586,159	4,602,410	-0.8	NA	6.59	NA	NA	NA	NA	350	180
CASE11	2.63115	18030224	586,159	4,602,410	-0.8	NA	5.81	NA	NA	NA	NA	350	180
CASE12	2.58927	18030224	586,159	4,602,410	-0.8	NA	2.59	NA	NA	NA	NA	350	180
CASE13	2.9875	18030224	586,099	4,602,640	0.8	NA	2.45	NA	NA	NA	NA	133	207
CASE14	3.40205	18030224	586,099	4,602,640	0.8	NA	2.25	NA	NA	NA	NA	133	207
CASE15	2.34667	18030224	586,159	4,602,410	-0.8	NA	5.19	NA	NA	NA	NA	350	180
CASE16	2.29799	18030224	586,159	4,602,410	-0.8	NA	5.08	NA	NA	NA	NA	350	180
CASE17	2.31009	18030224	586,159	4,602,410	-0.8	NA	5.06	NA	NA	NA	NA	350	180
CASE18	2.3061	18030224	586,159	4,602,410	-0.8	NA	5.05	NA	NA	NA	NA	350	180
CASE19	2.45399	18030224	586,159	4,602,410	-0.8	NA	4.79	NA	NA	NA	NA	350	180
CASE20	2.4888	18030224	586,159	4,602,410	-0.8	NA	4.95	NA	NA	NA	NA	350	180
CASE21	2.78852	18030224	586,099	4,602,640	0.8	NA	4.77	NA	NA	NA	NA	133	207
CASE22	2.68579	18030224	586,159	4,602,410	-0.8	NA	4.78	NA	NA	NA	NA	350	180
CASE23	3.07979	18030224	586,099	4,602,640	0.8	NA	4.74	NA	NA	NA	NA	133	207
CASE24	2.84561	18030224	586,099	4,602,640	0.8	NA	4.52	NA	NA	NA	NA	133	207
CASE25	3.2805	18030224	586,099	4,602,640	0.8	NA	4.49	NA	NA	NA	NA	133	207
24-Hour	**MAX XOQ**	**yymmddhh**	**UTMX**	**UTMY**	**ELEV (m)**	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**	**H2SO4**	**Distance (m)**	**Direction**
CASE01	2.09581	18030224	586,159	4,602,410	-0.8	NA	NA	5.76	5.76	1.63	NA	350	180
CASE02	1.99297	18030224	586,159	4,602,410	-0.8	NA	NA	3.09	3.09	1.26	NA	350	180
CASE03	2.34843	18030224	586,159	4,602,410	-0.8	NA	NA	2.87	2.87	1.10	NA	350	180
CASE04	2.04452	18030224	586,159	4,602,410	-0.8	NA	NA	3.17	3.17	1.29	NA	350	180
CASE05	2.10593	18030224	586,159	4,602,410	-0.8	NA	NA	5.71	5.71	1.60	NA	350	180
CASE06	2.05946	18030224	586,159	4,602,410	-0.8	NA	NA	3.13	3.13	1.28	NA	350	180
CASE07	2.19982	18030224	586,159	4,602,410	-0.8	NA	NA	3.06	3.06	1.21	NA	350	180
CASE08	2.6946	14102324	586,099	4,602,640	0.8	NA	NA	2.96	2.96	1.16	NA	133	207
CASE09	2.02941	18030224	586,159	4,602,410	-0.8	NA	NA	3.13	3.13	1.28	NA	350	180
CASE10	1.94749	18030224	586,159	4,602,410	-0.8	NA	NA	5.41	5.41	1.50	NA	350	180
CASE11	1.88939	18030224	586,159	4,602,410	-0.8	NA	NA	4.01	4.01	1.30	NA	350	180
CASE12	1.84129	18030224	586,159	4,602,410	-0.8	NA	NA	2.87	2.87	1.16	NA	350	180
CASE13	2.2497	18030224	586,159	4,602,410	-0.8	NA	NA	2.90	2.90	1.17	NA	350	180
CASE14	2.66908	14102324	586,099	4,602,640	0.8	NA	NA	2.83	2.83	1.12	NA	133	207
CASE15	1.56774	18030224	586,159	4,602,410	-0.8	NA	NA	5.64	5.64	1.11	NA	350	180
CASE16	1.51301	18030224	586,159	4,602,410	-0.8	NA	NA	5.52	5.52	1.07	NA	350	180
CASE17	1.52674	18030224	586,159	4,602,410	-0.8	NA	NA	5.56	5.56	1.08	NA	350	180
CASE18	1.52405	18030224	586,159	4,602,410	-0.8	NA	NA	5.55	5.55	1.08	NA	350	180
CASE19	1.68626	18030224	586,159	4,602,410	-0.8	NA	NA	5.48	5.48	1.06	NA	350	180
CASE20	1.72366	18030224	586,159	4,602,410	-0.8	NA	NA	5.76	5.76	1.09	NA	350	180
CASE21	2.07427	18030224	586,159	4,602,410	-0.8	NA	NA	5.93	5.93	1.14	NA	350	180
CASE22	1.95265	18030224	586,159	4,602,410	-0.8	NA	NA	5.88	5.88	1.11	NA	350	180
CASE23	2.29871	18030224	586,159	4,602,410	-0.8	NA	NA	5.88	5.88	1.13	NA	350	180
CASE24	2.10017	18030224	586,159	4,602,410	-0.8	NA	NA	5.63	5.63	1.05	NA	350	180
CASE25	2.49194	18030224	586,099	4,602,640	0.8	NA	NA	5.68	5.68	1.10	NA	133	207

Table F-1. Combustion Turbine Load Analysis (Project Phase 1 with all existing structures)

Annual	MAX XOQ	yymmddhh	UTMX	UTMY	ELEV (m)	NOx	CO	PM10	PM2.5	SO2	H2SO4	Distance (m)	Direction
CASE01	0.0922	2015	582,459	4,603,260	170.2	0.3743	NA	0.2536	0.2536	0.0719	0.0000	3734	278
CASE02	0.08445	2015	582,459	4,603,360	182.0	0.2753	NA	0.1309	0.1309	0.0532	0.0000	3748	279
CASE03	0.09519	2015	582,459	4,603,260	170.2	0.2313	NA	0.1161	0.1161	0.0447	0.0000	3734	278
CASE04	0.08757	2015	582,459	4,603,260	170.2	0.2899	NA	0.1357	0.1357	0.0552	0.0000	3734	278
CASE05	0.09252	2015	582,459	4,603,260	170.2	0.3673	NA	0.2507	0.2507	0.0703	0.0000	3734	278
CASE06	0.08808	2015	582,459	4,603,260	170.2	0.2845	NA	0.1339	0.1339	0.0546	0.0000	3734	278
CASE07	0.09204	2015	582,459	4,603,260	170.2	0.2660	NA	0.1279	0.1279	0.0506	0.0000	3734	278
CASE08	0.10686	2015	582,559	4,603,460	158.8	0.2383	NA	0.1175	0.1175	0.0459	0.0000	3667	281
CASE09	0.08614	2015	582,459	4,603,260	170.2	0.2782	NA	0.1327	0.1327	0.0543	0.0000	3734	278
CASE10	0.08436	2015	582,459	4,603,360	182.0	0.3400	NA	0.2345	0.2345	0.0650	0.0000	3748	279
CASE11	0.082	2015	582,459	4,603,360	182.0	0.2968	NA	0.1738	0.1738	0.0566	0.0000	3748	279
CASE12	0.07927	2015	582,459	4,603,360	182.0	0.2600	NA	0.1237	0.1237	0.0499	0.0000	3748	279
CASE13	0.09151	2015	582,459	4,603,260	170.2	0.2443	NA	0.1180	0.1180	0.0476	0.0000	3734	278
CASE14	0.10415	2015	582,559	4,603,460	158.8	0.2239	NA	0.1104	0.1104	0.0437	0.0000	3667	281
CASE15	0.07006	2015	582,359	4,603,360	196.6	0.5086	NA	0.2522	0.2522	0.0497	0.0000	3847	279
CASE16	0.06897	2015	582,359	4,603,360	196.6	0.5007	NA	0.2517	0.2517	0.0490	0.0000	3847	279
CASE17	0.0695	2015	582,359	4,603,360	196.6	0.4997	NA	0.2530	0.2530	0.0493	0.0000	3847	279
CASE18	0.06945	2015	582,359	4,603,360	196.6	0.4987	NA	0.2528	0.2528	0.0493	0.0000	3847	279
CASE19	0.07115	2015	582,459	4,603,360	182.0	0.4575	NA	0.2312	0.2312	0.0448	0.0000	3748	279
CASE20	0.07375	2015	582,459	4,603,360	182.0	0.4823	NA	0.2463	0.2463	0.0465	0.0000	3748	279
CASE21	0.0836	2015	582,459	4,603,360	182.0	0.4715	NA	0.2391	0.2391	0.0460	0.0000	3748	279
CASE22	0.08079	2015	582,459	4,603,360	182.0	0.4710	NA	0.2432	0.2432	0.0461	0.0000	3748	279
CASE23	0.09105	2015	582,459	4,603,260	170.2	0.4580	NA	0.2331	0.2331	0.0446	0.0000	3734	278
CASE24	0.08338	2015	582,459	4,603,360	182.0	0.4336	NA	0.2235	0.2235	0.0417	0.0000	3748	279
CASE25	0.09591	2015	582,459	4,603,260	170.2	0.4316	NA	0.2187	0.2187	0.0422	0.0000	3734	278

Table F-2. Combustion Turbine Load Analysis (Phase 2 without some existing Danskammer Generating Station Structures)

Danskammer Energy LLC - One (1) MHPS 501JAC Combined Cycle Combustion Turbine - One (1) Stack (200 feet above grade)

1-Hour	MAX XOQ	yymmddhh	UTMX	UTMY	ELEV (m)	NOx	CO	PM10	PM2.5	SO2	Distance (m)	Direction
CASE01	5.84889	16052902	581,759	4,604,660	167.2	23.75	14.45	NA	NA	4.56	4793	293
CASE02	4.91441	15090219	582,459	4,603,260	170.2	16.02	4.91	NA	NA	3.10	3734	278
CASE03	5.96337	16052902	581,759	4,604,660	167.2	14.49	4.41	NA	NA	2.80	4793	293
CASE04	5.25213	16052902	581,759	4,604,660	167.2	17.38	5.30	NA	NA	3.31	4793	293
CASE05	5.87927	16052902	581,759	4,604,660	167.2	23.34	14.23	NA	NA	4.47	4793	293
CASE06	5.29999	16052902	581,759	4,604,660	167.2	17.12	5.19	NA	NA	3.29	4793	293
CASE07	5.67931	16052902	581,759	4,604,660	167.2	16.41	5.00	NA	NA	3.12	4793	293
CASE08	6.67495	17091624	581,759	4,604,660	167.2	14.89	4.54	NA	NA	2.87	4793	293
CASE09	5.08175	16052902	581,759	4,604,660	167.2	16.41	4.98	NA	NA	3.20	4793	293
CASE10	4.94742	15090219	582,459	4,603,260	170.2	19.94	12.17	NA	NA	3.81	3734	278
CASE11	4.59731	15090219	582,459	4,603,260	170.2	16.64	10.16	NA	NA	3.17	3734	278
CASE12	4.27146	18052621	582,459	4,603,460	183.0	14.01	4.27	NA	NA	2.69	3766	281
CASE13	5.53109	16052902	581,759	4,604,660	167.2	14.77	4.54	NA	NA	2.88	4793	293
CASE14	6.58842	18070504	581,759	4,604,660	167.2	14.17	4.35	NA	NA	2.77	4793	293
CASE15	3.60222	15081620	582,359	4,603,360	196.6	26.15	7.96	NA	NA	2.56	3847	279
CASE16	3.53622	15081620	582,359	4,603,360	196.6	25.67	7.82	NA	NA	2.51	3847	279
CASE17	3.57295	15081620	582,359	4,603,360	196.6	25.69	7.82	NA	NA	2.54	3847	279
CASE18	3.57006	15081620	582,359	4,603,360	196.6	25.63	7.82	NA	NA	2.53	3847	279
CASE19	3.67562	15081620	582,459	4,603,360	182.0	23.63	7.17	NA	NA	2.32	3748	279
CASE20	3.86333	15081620	582,459	4,603,360	182.0	25.27	7.69	NA	NA	2.43	3748	279
CASE21	4.65165	15090219	582,459	4,603,260	170.2	26.24	7.95	NA	NA	2.56	3734	278
CASE22	4.35775	15090119	581,759	4,605,060	180.1	25.41	7.76	NA	NA	2.48	4965	298
CASE23	5.39042	16052902	581,759	4,604,660	167.2	27.11	8.30	NA	NA	2.64	4793	293
CASE24	4.57946	15090219	582,459	4,603,260	170.2	23.81	7.28	NA	NA	2.29	3734	278
CASE25	5.90568	16052902	581,759	4,604,660	167.2	26.58	8.09	NA	NA	2.60	4793	293
3-Hour	**MAX XOQ**	**yymmddhh**	**UTMX**	**UTMY**	**ELEV (m)**	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**	**Distance (m)**	**Direction**
CASE01	4.28754	17101421	582,559	4,603,460	158.8	NA	NA	NA	NA	3.34	3667	281
CASE02	4.10505	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.59	3864	280
CASE03	4.46516	16122724	582,459	4,603,260	170.2	NA	NA	NA	NA	2.10	3734	278
CASE04	4.11067	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.59	3864	280
CASE05	4.32502	17101421	582,559	4,603,460	158.8	NA	NA	NA	NA	3.29	3667	281
CASE06	4.12242	16122724	582,359	4,603,160	182.3	NA	NA	NA	NA	2.56	3821	276
CASE07	4.25673	16122724	582,359	4,603,160	182.3	NA	NA	NA	NA	2.34	3821	276
CASE08	4.6782	16012106	582,759	4,604,060	170.1	NA	NA	NA	NA	2.01	3640	291
CASE09	4.18733	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	2.64	3864	280
CASE10	4.11311	17101421	582,359	4,603,460	175.8	NA	NA	NA	NA	3.17	3864	280
CASE11	3.9443	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.72	3766	281
CASE12	3.7755	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.38	3766	281
CASE13	4.24947	16122724	582,359	4,603,160	182.3	NA	NA	NA	NA	2.21	3821	276
CASE14	4.59345	16012106	582,759	4,604,060	170.1	NA	NA	NA	NA	1.93	3640	291
CASE15	3.19506	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.27	3766	281
CASE16	3.10214	16122724	582,259	4,603,160	195.4	NA	NA	NA	NA	2.20	3921	276
CASE17	3.13865	16122724	582,259	4,603,160	195.4	NA	NA	NA	NA	2.23	3921	276
CASE18	3.13449	16122724	582,259	4,603,160	195.4	NA	NA	NA	NA	2.23	3921	276
CASE19	3.30587	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.08	3766	281
CASE20	3.45636	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.18	3766	281
CASE21	4.01169	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.21	3766	281
CASE22	3.84847	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	2.19	3766	281
CASE23	4.24498	16122724	582,359	4,603,160	182.3	NA	NA	NA	NA	2.08	3821	276
CASE24	3.98888	17101421	582,459	4,603,460	183.0	NA	NA	NA	NA	1.99	3766	281
CASE25	4.54997	16122724	582,459	4,603,260	170.2	NA	NA	NA	NA	2.00	3734	278

Table F-2. Combustion Turbine Load Analysis (Phase 2 without some existing Danskammer Generating Station Structures)

8-Hour	MAX XOQ	yymmddhh	UTMX	UTMY	ELEV (m)	NOx	CO	PM10	PM2.5	SO2	Distance (m)	Direction
CASE01	2.79816	18030224	586,159	4,602,410	-0.8	NA	6.91	NA	NA	NA	350	180
CASE02	2.71578	18030224	586,159	4,602,410	-0.8	NA	2.72	NA	NA	NA	350	180
CASE03	3.10073	18030224	586,099	4,602,640	0.8	NA	2.29	NA	NA	NA	133	207
CASE04	2.75892	18030224	586,159	4,602,410	-0.8	NA	2.79	NA	NA	NA	350	180
CASE05	2.80933	18030224	586,159	4,602,410	-0.8	NA	6.80	NA	NA	NA	350	180
CASE06	2.7716	18030224	586,159	4,602,410	-0.8	NA	2.72	NA	NA	NA	350	180
CASE07	2.90111	18030224	586,099	4,602,640	0.8	NA	2.55	NA	NA	NA	133	207
CASE08	3.41226	18030224	586,099	4,602,640	0.8	NA	2.32	NA	NA	NA	133	207
CASE09	2.74714	18030224	586,159	4,602,410	-0.8	NA	2.69	NA	NA	NA	350	180
CASE10	2.67829	18030224	586,159	4,602,410	-0.8	NA	6.59	NA	NA	NA	350	180
CASE11	2.63115	18030224	586,159	4,602,410	-0.8	NA	5.81	NA	NA	NA	350	180
CASE12	2.58927	18030224	586,159	4,602,410	-0.8	NA	2.59	NA	NA	NA	350	180
CASE13	2.9875	18030224	586,099	4,602,640	0.8	NA	2.45	NA	NA	NA	133	207
CASE14	3.40205	18030224	586,099	4,602,640	0.8	NA	2.25	NA	NA	NA	133	207
CASE15	2.34667	18030224	586,159	4,602,410	-0.8	NA	5.19	NA	NA	NA	350	180
CASE16	2.29799	18030224	586,159	4,602,410	-0.8	NA	5.08	NA	NA	NA	350	180
CASE17	2.31009	18030224	586,159	4,602,410	-0.8	NA	5.06	NA	NA	NA	350	180
CASE18	2.3061	18030224	586,159	4,602,410	-0.8	NA	5.05	NA	NA	NA	350	180
CASE19	2.45399	18030224	586,159	4,602,410	-0.8	NA	4.79	NA	NA	NA	350	180
CASE20	2.4888	18030224	586,159	4,602,410	-0.8	NA	4.95	NA	NA	NA	350	180
CASE21	2.78852	18030224	586,099	4,602,640	0.8	NA	4.77	NA	NA	NA	133	207
CASE22	2.68579	18030224	586,159	4,602,410	-0.8	NA	4.78	NA	NA	NA	350	180
CASE23	3.07979	18030224	586,099	4,602,640	0.8	NA	4.74	NA	NA	NA	133	207
CASE24	2.84561	18030224	586,099	4,602,640	0.8	NA	4.52	NA	NA	NA	133	207
CASE25	3.2805	18030224	586,099	4,602,640	0.8	NA	4.49	NA	NA	NA	133	207
24-Hour	**MAX XOQ**	**yymmddhh**	**UTMX**	**UTMY**	**ELEV (m)**	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**	**Distance (m)**	**Direction**
CASE01	2.09581	18030224	586,159	4,602,410	-0.8	NA	NA	5.76	5.76	1.63	350	180
CASE02	1.99297	18030224	586,159	4,602,410	-0.8	NA	NA	3.09	3.09	1.26	350	180
CASE03	2.35121	14102324	586,159	4,602,410	-0.8	NA	NA	2.87	2.87	1.11	350	180
CASE04	2.04452	18030224	586,159	4,602,410	-0.8	NA	NA	3.17	3.17	1.29	350	180
CASE05	2.10593	18030224	586,159	4,602,410	-0.8	NA	NA	5.71	5.71	1.60	350	180
CASE06	2.05946	18030224	586,159	4,602,410	-0.8	NA	NA	3.13	3.13	1.28	350	180
CASE07	2.19982	18030224	586,159	4,602,410	-0.8	NA	NA	3.06	3.06	1.21	350	180
CASE08	2.80279	18030324	586,099	4,602,640	0.8	NA	NA	3.08	3.08	1.21	133	207
CASE09	2.02941	18030224	586,159	4,602,410	-0.8	NA	NA	3.13	3.13	1.28	350	180
CASE10	1.94749	18030224	586,159	4,602,410	-0.8	NA	NA	5.41	5.41	1.50	350	180
CASE11	1.88939	18030224	586,159	4,602,410	-0.8	NA	NA	4.01	4.01	1.30	350	180
CASE12	1.84129	18030224	586,159	4,602,410	-0.8	NA	NA	2.87	2.87	1.16	350	180
CASE13	2.2497	18030224	586,159	4,602,410	-0.8	NA	NA	2.90	2.90	1.17	350	180
CASE14	2.783	18030324	586,099	4,602,640	0.8	NA	NA	2.95	2.95	1.17	133	207
CASE15	1.56774	18030224	586,159	4,602,410	-0.8	NA	NA	5.64	5.64	1.11	350	180
CASE16	1.51301	18030224	586,159	4,602,410	-0.8	NA	NA	5.52	5.52	1.07	350	180
CASE17	1.52674	18030224	586,159	4,602,410	-0.8	NA	NA	5.56	5.56	1.08	350	180
CASE18	1.52405	18030224	586,159	4,602,410	-0.8	NA	NA	5.55	5.55	1.08	350	180
CASE19	1.68626	18030224	586,159	4,602,410	-0.8	NA	NA	5.48	5.48	1.06	350	180
CASE20	1.72366	18030224	586,159	4,602,410	-0.8	NA	NA	5.76	5.76	1.09	350	180
CASE21	2.07427	18030224	586,159	4,602,410	-0.8	NA	NA	5.93	5.93	1.14	350	180
CASE22	1.95265	18030224	586,159	4,602,410	-0.8	NA	NA	5.88	5.88	1.11	350	180
CASE23	2.29871	18030224	586,159	4,602,410	-0.8	NA	NA	5.88	5.88	1.13	350	180
CASE24	2.10017	18030224	586,159	4,602,410	-0.8	NA	NA	5.63	5.63	1.05	350	180
CASE25	2.59491	18030324	586,099	4,602,640	0.8	NA	NA	5.92	5.92	1.14	133	207

Table F-2. Combustion Turbine Load Analysis (Phase 2 without some existing Danskammer Generating Station Structures)

Annual	MAX XOQ	yymmddhh	UTMX	UTMY	ELEV (m)	NOx	CO	PM10	PM2.5	SO2	Distance (m)	Direction
CASE01	0.08638	2015	582,459	4,603,260	170.2	0.3507	NA	0.2375	0.2375	0.0674	3734	278
CASE02	0.08415	2015	582,459	4,603,260	170.2	0.2743	NA	0.1304	0.1304	0.0530	3734	278
CASE03	0.08784	2015	582,559	4,603,460	158.8	0.2135	NA	0.1072	0.1072	0.0413	3667	281
CASE04	0.08638	2015	582,459	4,603,260	170.2	0.2859	NA	0.1339	0.1339	0.0544	3734	278
CASE05	0.0865	2015	582,459	4,603,260	170.2	0.3434	NA	0.2344	0.2344	0.0657	3734	278
CASE06	0.08658	2015	582,459	4,603,260	170.2	0.2797	NA	0.1316	0.1316	0.0537	3734	278
CASE07	0.08759	2015	582,459	4,603,260	170.2	0.2531	NA	0.1218	0.1218	0.0482	3734	278
CASE08	0.10024	2016	586,089	4,602,270	-0.8	0.2235	NA	0.1103	0.1103	0.0431	495	188
CASE09	0.08552	2015	582,459	4,603,260	170.2	0.2762	NA	0.1317	0.1317	0.0539	3734	278
CASE10	0.08403	2015	582,459	4,603,260	170.2	0.3386	NA	0.2336	0.2336	0.0647	3734	278
CASE11	0.08203	2015	582,459	4,603,360	182.0	0.2969	NA	0.1739	0.1739	0.0566	3748	279
CASE12	0.07927	2015	582,459	4,603,360	182.0	0.2600	NA	0.1237	0.1237	0.0499	3748	279
CASE13	0.0882	2015	582,459	4,603,260	170.2	0.2355	NA	0.1138	0.1138	0.0459	3734	278
CASE14	0.09733	2016	586,089	4,602,270	-0.8	0.2093	NA	0.1032	0.1032	0.0409	495	188
CASE15	0.07006	2015	582,359	4,603,360	196.6	0.5086	NA	0.2522	0.2522	0.0497	3847	279
CASE16	0.06897	2015	582,359	4,603,360	196.6	0.5007	NA	0.2517	0.2517	0.0490	3847	279
CASE17	0.0695	2015	582,359	4,603,360	196.6	0.4997	NA	0.2530	0.2530	0.0493	3847	279
CASE18	0.06945	2015	582,359	4,603,360	196.6	0.4987	NA	0.2528	0.2528	0.0493	3847	279
CASE19	0.07115	2015	582,459	4,603,360	182.0	0.4575	NA	0.2312	0.2312	0.0448	3748	279
CASE20	0.07375	2015	582,459	4,603,360	182.0	0.4823	NA	0.2463	0.2463	0.0465	3748	279
CASE21	0.0836	2015	582,459	4,603,360	182.0	0.4715	NA	0.2391	0.2391	0.0460	3748	279
CASE22	0.0808	2015	582,459	4,603,360	182.0	0.4711	NA	0.2432	0.2432	0.0461	3748	279
CASE23	0.08869	2015	582,459	4,603,260	170.2	0.4461	NA	0.2270	0.2270	0.0435	3734	278
CASE24	0.08338	2015	582,459	4,603,360	182.0	0.4336	NA	0.2235	0.2235	0.0417	3748	279
CASE25	0.08897	2015	582,559	4,603,460	158.8	0.4004	NA	0.2029	0.2029	0.0391	3667	281

Table F-3: Toxic Air Pollutant Emission Rates

Equipment Parameters:	Heat Input (mmBtu/hr)
Combustion Turbine (gas firing)	3,230
Combustion Turbine (oil firing)	3,315
Duct Burner	744
Auxiliary Boiler (gas firing)	96.0
Diesel Fire Pump (Existing)	2.4
Emergency Diesel Generator	19.2
Diesel Fire Pump	2.3

Fuel Properties:		
Natural Gas Heat Content	1,036	Btu/scf
Natural Gas Sulfur Content	0.50	gr/100scf
Distillate Oil Heat Content	139	mmBtu/10^3gal
Distillate Oil Density	7.1	lb/gal
Distillate Oil Sulfur Content	0.0015%	weight %

Emission Factors & Emissions:

		Combustion Turbine [1]						Duct Burner [2]				Auxiliary Boiler [2]				Diesel Fire Pump (New) [3]			Diesel Fire Pump (Existing) [3]			Emergency Diesel Generator [4]			Total Project Potential Emissions
		Gas Firing			Oil Firing			Gas Firing				Gas Firing				Oil Firing			Oil Firing			Oil Firing			
		Emission Factor	Emission Rate		Emission Factor	Emission Rate		Emission Factor		Emission Rate		Emission Factor		Emission Rate		EF	Emission Rate		EF	Emission Rate		EF	Emission Rate		
Non-Criteria Pollutants	Note	(lb/mmBtu)	(lb/hr)	(g/s)	(lb/mmBtu)	(lb/hr)	(g/s)	(lb/mmscf)	(lb/mmBtu)	(lb/hr)	(g/s)	(lb/mmscf)	(lb/mmBtu)	(lb/hr)	(g/s)	(lb/mmBtu)	(lb/hr)	(g/s)	(lb/mmBtu)	(lb/hr)	(g/s)	(lb/mmBtu)	(lb/hr)	(g/s)	(tons/yr)
1,3-Butadiene	a	4.30E-07	1.39E-03	1.75E-04	1.60E-05	5.30E-02	6.68E-03									3.91E-05	8.88E-05	1.12E-05	3.91E-05	9.52E-05	1.20E-05				2.47E-02
2-Methylnapthalene								2.40E-05	2.32E-08	1.72E-05	2.17E-06	2.40E-05	2.32E-08	2.22E-06	2.80E-07										4.31E-05
3-Methylchloranthrene	b							1.80E-06	1.74E-09	1.29E-06	1.63E-07	1.80E-06	1.74E-09	1.67E-07	2.10E-08										3.23E-06
7,12-Dimethylbenz(a)anthracene	b							1.60E-05	1.54E-08	1.15E-05	1.45E-06	1.60E-05	1.54E-08	1.48E-06	1.87E-07										2.87E-05
Acenaphthene	b							1.80E-06	1.74E-09	1.29E-06	1.63E-07	1.80E-06	1.74E-09	1.67E-07	2.10E-08	1.42E-06	3.22E-06	4.06E-07	1.42E-06	3.46E-06	4.36E-07	4.68E-06	8.99E-05	1.13E-05	1.53E-05
Acenaphthylene	b							1.80E-06	1.74E-09	1.29E-06	1.63E-07	1.80E-06	1.74E-09	1.67E-07	2.10E-08	5.06E-06	1.15E-05	1.45E-06	5.06E-06	1.23E-05	1.55E-06	9.23E-06	1.77E-04	2.23E-05	2.84E-05
Acetaldehyde	a	4.00E-05	1.29E-01	1.63E-02				9.00E-04	8.69E-07	6.46E-04	8.15E-05	3.10E-03	2.99E-06	2.87E-04	3.62E-05	7.67E-04	1.74E-03	2.19E-04	7.67E-04	1.87E-03	2.35E-04	2.52E-05	4.84E-04	6.10E-05	5.69E-01
Acrolein	a	6.40E-06	2.07E-02	2.60E-03				8.00E-04	7.72E-07	5.75E-04	7.24E-05	2.70E-03	2.61E-06	2.50E-04	3.15E-05	9.25E-05	2.10E-04	2.65E-05	9.25E-05	2.25E-04	2.84E-05	7.88E-06	1.51E-04	1.91E-05	9.25E-02
Ammonia			23.7	2.99E+00		15.8	1.99E+00	included in combined cycle emissions estimates																	
Anthracene	b							2.40E-06	2.32E-09	1.72E-06	2.17E-07	2.40E-06	2.32E-09	2.22E-07	2.80E-08	1.87E-06	4.24E-06	5.35E-07	1.87E-06	4.55E-06	5.74E-07	1.23E-06	2.36E-05	2.98E-06	8.36E-06
Arsenic	a				1.10E-05	3.65E-02	4.59E-03	2.00E-04	1.93E-07	1.44E-04	1.81E-05	2.00E-04	1.93E-07	1.85E-05	2.34E-06										1.35E-02
Barium								4.40E-03	4.25E-06	3.16E-03	3.98E-04	4.40E-03	4.25E-06	4.08E-04	5.14E-05										7.90E-03
Benz(a)anthracene	b							1.80E-06	1.74E-09	1.29E-06	1.63E-07	1.80E-06	1.74E-09	1.67E-07	2.10E-08	1.68E-06	3.81E-06	4.81E-07	1.68E-06	4.09E-06	5.15E-07	6.22E-07	1.19E-05	1.50E-06	5.71E-06
Benzene	a	1.20E-05	3.88E-02	4.88E-03	5.50E-05	1.82E-01	2.30E-02	1.70E-03	1.64E-06	1.22E-03	1.54E-04	5.80E-03	5.60E-06	5.37E-04	6.77E-05	9.33E-04	2.12E-03	2.67E-04	9.33E-04	2.27E-03	2.86E-04	7.76E-04	1.49E-02	1.88E-03	2.28E-01
Benzo(a)pyrene	b							1.20E-06	1.16E-09	8.62E-07	1.09E-07	1.20E-06	1.16E-09	1.11E-07	1.40E-08	1.88E-07	4.27E-07	5.38E-08	1.88E-07	4.58E-07	5.77E-08	2.57E-07	4.93E-06	6.22E-07	2.88E-06
Benzo(b)fluoranthene	b							1.80E-06	1.74E-09	1.29E-06	1.63E-07	1.80E-06	1.74E-09	1.67E-07	2.10E-08	9.91E-08	2.25E-07	2.83E-08	9.91E-08	2.41E-07	3.04E-08	1.11E-06	2.13E-05	2.69E-06	5.95E-06
Benzo(g,h,i)perylene	b							1.20E-06	1.16E-09	8.62E-07	1.09E-07	1.20E-06	1.16E-09	1.11E-07	1.40E-08	4.89E-07	1.11E-06	1.40E-07	4.89E-07	1.19E-06	1.50E-07	5.56E-07	1.07E-05	1.35E-06	3.78E-06
Benzo(k)fluoranthene	b							1.80E-06	1.74E-09	1.29E-06	1.63E-07	1.80E-06	1.74E-09	1.67E-07	2.10E-08	1.55E-07	3.52E-07	4.43E-08	1.55E-07	3.77E-07	4.75E-08	2.18E-07	4.19E-06	5.27E-07	3.85E-06
Beryllium	a				3.10E-07	1.03E-03	1.29E-04	1.20E-05	1.16E-08	8.62E-06	1.09E-06	1.20E-05	1.16E-08	1.11E-06	1.40E-07										3.91E-04
Butane								2.10E+00	2.03E-03	1.51E+00	1.90E-01	2.10E+00	2.03E-03	1.95E-01	2.45E-02										3.77E+00
Cadmium	a				4.80E-06	1.59E-02	2.00E-03	1.10E-03	1.06E-06	7.90E-04	9.96E-05	1.10E-03	1.06E-06	1.02E-04	1.28E-05										7.70E-03
Chromium	a				1.10E-05	3.65E-02	4.59E-03	1.40E-03	1.35E-06	1.01E-03	1.27E-04	1.40E-03	1.35E-06	1.30E-04	1.63E-05										1.56E-02
Chrysene	b							1.80E-06	1.74E-09	1.29E-06	1.63E-07	1.80E-06	1.74E-09	1.67E-07	2.10E-08	3.53E-07	8.01E-07	1.01E-07	3.53E-07	8.59E-07	1.08E-07	1.53E-06	2.94E-05	3.70E-06	7.11E-06
Cobalt	a							8.40E-05	8.11E-08	6.03E-05	7.60E-06	8.40E-05	8.11E-08	7.78E-06	9.81E-07										1.51E-04
Copper								8.50E-04	8.20E-07	6.11E-04	7.69E-05	8.50E-04	8.20E-07	7.88E-05	9.92E-06										1.53E-03
Dibenzo(a,h)anthracene	b							1.20E-06	1.16E-09	8.62E-07	1.09E-07	1.20E-06	1.16E-09	1.11E-07	1.40E-08	5.83E-07	1.32E-06	1.67E-07	5.83E-07	1.42E-06	1.79E-07	3.46E-07	6.64E-06	8.37E-07	3.33E-06
Dichlorobenzene	a							1.20E-03	1.16E-06	8.62E-04	1.09E-04	1.20E-03	1.16E-06	1.11E-04	1.40E-05										2.15E-03
Ethane								3.10E+00	2.99E-03	2.23E+00	2.81E-01	3.10E+00	2.99E-03	2.87E-01	3.62E-02										5.57E+00
Ethylbenzene	a	3.20E-05	1.03E-01	1.30E-02				2.00E-03	1.93E-06	1.44E-03	1.81E-04	6.90E-03	6.66E-06	6.39E-04	8.06E-05										4.57E-01
Fluoranthene	b							3.00E-06	2.90E-09	2.15E-06	2.72E-07	3.00E-06	2.90E-09	2.78E-07	3.50E-08	7.61E-06	1.73E-05	2.18E-06	7.61E-06	1.85E-05	2.33E-06	4.03E-06	7.74E-05	9.75E-06	1.95E-05
Fluorene	b							2.80E-06	2.70E-09	2.01E-06	2.53E-07	2.80E-06	2.70E-09	2.59E-07	3.27E-08	2.92E-05	6.63E-05	8.35E-06	2.92E-05	7.11E-05	8.96E-06	1.28E-05	2.46E-04	3.10E-05	5.29E-05
Formaldehyde	a	2.13E-04	6.88E-01	8.67E-02	2.30E-04	7.62E-01	9.61E-02	3.60E-03	3.47E-06	2.59E-03	3.26E-04	1.23E-02	1.19E-05	1.14E-03	1.44E-04	1.18E-03	2.68E-03	3.38E-04	1.18E-03	2.87E-03	3.62E-04	7.89E-05	1.51E-03	1.91E-04	3.05E+00
Hexane	a							1.30E-03	1.25E-06	9.34E-04	1.18E-04	4.60E-03	4.44E-06	4.26E-04	5.37E-05										3.07E-03
Indeno(1,2,3-cd)pyrene	b							1.80E-06	1.74E-09	1.29E-06	1.63E-07	1.80E-06	1.74E-09	1.67E-07	2.10E-08	3.75E-07	8.51E-07	1.07E-07	3.75E-07	9.13E-07	1.15E-07	4.14E-07	7.95E-06	1.00E-06	4.45E-06
Lead	a				1.40E-05	4.64E-02	5.85E-03	5.00E-04	4.83E-07	3.59E-04	4.53E-05	5.00E-04	4.83E-07	4.63E-05	5.84E-06										1.76E-02
Manganese	a				7.90E-04	2.62E+00	3.30E-01	3.80E-04	3.67E-07	2.73E-04	3.44E-05	3.80E-04	3.67E-07	3.52E-05	4.44E-06										9.43E-01
Mercury	a				1.20E-06	3.98E-03	5.01E-04	2.60E-04	2.51E-07	1.87E-04	2.35E-05	2.60E-04	2.51E-07	2.41E-05	3.04E-06										1.90E-03
Molybdenum								1.10E-03	1.06E-06	7.90E-04	9.96E-05	1.10E-03	1.06E-06	1.02E-04	1.28E-05										1.97E-03
Naphthalene	c	1.30E-06	4.20E-03	5.29E-04	3.50E-05	1.16E-01	1.46E-02	3.00E-04	2.90E-07	2.15E-04	2.72E-05	3.00E-04	2.90E-07	2.78E-05	3.50E-06	8.48E-05	1.92E-04	2.43E-05	8.48E-05	2.06E-04	2.60E-05	1.30E-04	2.50E-03	3.14E-04	5.95E-02
Nickel	a				4.60E-06	1.52E-02	1.92E-03	2.10E-03	2.03E-06	1.51E-03	1.90E-04	2.10E-03	2.03E-06	1.95E-04	2.45E-05										9.26E-03
PAH	b	2.20E-06	7.11E-03	8.95E-04	4.00E-05	1.33E-01	1.67E-02	4.00E-04	3.86E-07	2.87E-04	3.62E-05	4.00E-04	3.86E-07	3.71E-05	4.67E-06							2.12E-04	4.07E-03	5.13E-04	7.75E-02
Pentane								2.60E+00	2.51E-03	1.87E+00	2.35E-01	2.60E+00	2.51E-03	2.41E-01	3.04E-02										4.67E+00
Phenanathrene	b							1.70E-05	1.64E-08	1.22E-05	1.54E-06	1.70E-05	1.64E-08	1.58E-06	1.98E-07	2.94E-05	6.67E-05	8.41E-06	2.94E-05	7.16E-05	9.02E-06	4.08E-05	7.83E-04	9.87E-05	1.46E-04
POM	a																								0.00E+00
Propane								1.60E+00	1.54E-03	1.15E+00	1.45E-01	1.60E+00	1.54E-03	1.48E-01	1.87E-02										2.87E+00
Propylene	a							1.55E-02	1.50E-05	1.12E-02	1.41E-03	5.30E-01	5.12E-04	4.91E-02	6.19E-03	2.58E-03	5.86E-03	7.38E-04	2.58E-03	6.28E-03	7.91E-04	2.79E-03	5.36E-02	6.75E-03	1.51E-01
Propylene Oxide	a	2.90E-05	9.37E-02	1.18E-02																					4.10E-01
Pyrene	b							5.00E-06	4.83E-09	3.59E-06	4.53E-07	5.00E-06	4.83E-09	4.63E-07	5.84E-08	4.78E-06	1.09E-05	1.37E-06	4.78E-06	1.16E-05	1.47E-06	3.71E-06	7.12E-05	8.98E-06	2.07E-05
Selenium	a				2.50E-05	8.29E-02	1.04E-02	2.40E-05	2.32E-08	1.72E-05	2.17E-06	2.40E-05	2.32E-08	2.22E-06	2.80E-07										2.99E-02
Sulfuric Acid			4.49E+00			3.01		included in combined cycle emissions estimates						1.01E-02	1.28E-03		3.48E-04	4.38E-05		0.00E+00	0.00E+00		2.94E-03	3.70E-04	
Toluene	a	1.30E-04	4.20E-01	5.29E-02				7.80E-03	7.53E-06	5.60E-03	7.06E-04	2.65E-02	2.56E-05	2.46E-03	3.09E-04	4.09E-04	9.28E-04	1.17E-04	4.09E-04	9.96E-04	1.25E-04	2.81E-04	5.40E-03	6.80E-04	1.86E+00
Vanadium								2.30E-03	2.22E-06	1.65E-03	2.08E-04	2.30E-03	2.22E-06	2.13E-04	2.69E-05										4.13E-03
Xylenes	a	6.40E-05	2.07E-01	2.60E-02				5.80E-03	5.60E-06	4.17E-03	5.25E-04	1.97E-02	1.90E-05	1.83E-03	2.30E-04	2.85E-04	6.47E-04	8.15E-05	2.85E-04	6.94E-04	8.74E-05	1.93E-04	3.71E-03	4.67E-04	9.20E-01
Zinc								2.90E-02	2.80E-05	2.08E-02	2.62E-03	2.90E-02	2.80E-05	2.69E-03	3.39E-04										5.21E-02

Notes:		
	a	indicates compound is one of U.S. EPA's list of 188 HAPs.
	b	indicates compound is subset of POM or PAH (PAH is a subset of POM)
	c	compound is listed on U.S. EPA's list of 188 HAPs and is a subset of POM or PAH.

Project Maximum Individual HAP (Formaldehyde) (tons/yr)	**3.05**
Total Project HAPs (tons/yr)	**8.94**

(1) Emissions based on AP-42 5th Edition, Tables 3.1-2a, 3.1-3, 3.1-4 and 3.1-5, except for formaldehyde which was based on MHPS Data (80 ppm at 15% O2).

(2) Emissions based on AP-42 5th Edition, Tables 1.4-2, 1.4-3, 1.4-4 , except for benzene, formaldehyde, napthalene, acetaldehyde, acrolein, propylene, toluene, xylenes, ethyl benzene and hexane which were based on Ventura County APD Combustion Emission Factors (May 2001).

(3) Emissions based on AP-42 5th Edition, Table 3.3-2 (October 1996).

(4) Emissions based on AP-42 5th Edition, Section 3.4 (October 1996).

Table F-4: Total Facility Maximum Modeled 1-Hour Toxic Air Pollutant Concentrations

	XOQ	
Emission Source	1-hour	Annual
Combustion Turbine (Gas)	7.42567	0.10686
Combustion Turbine (ULSD)	6.01903	0.09591
Auxiliary Boiler	98.35674	2.11396
Emergency Diesel Generator	230.63531	3.74285
Fire Pump (Existing)	635.37947	26.32132
Fire Pump (Proposed)	916.36202	35.11592

				1 Hour Concentrations													
	NYSDEC SGC	NYSDEC AGC	ATSDR Acute MGL	Combustion Turbine - 1 Unit				Auxiliary Boiler 1 Unit		Emergency Diesel Generator 1 Unit		Fire Pump (Existing) 1 Unit		Fire Pump (Proposed) 1 Unit		Facility	% SGC
				Gas Firing		ULSD Firing											
Non-Criteria Pollutants	(ug/m3)	(ug/m3)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(ug/m3)	
1,3-Butadiene	---	3.30E-02		1.75E-04	1.30E-03	6.68E-03	4.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-05	7.62E-03	1.12E-05	1.02E-02	**5.81E-02**	N/A
1,1,1-Trichloroethane	---	1.4		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	N/A
2-Methylnapthalene	---	7.1		2.17E-06	1.61E-05	0.00E+00	0.00E+00	2.80E-07	2.76E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.37E-05**	N/A
3-Methylchloranthrene				1.63E-07	1.21E-06	0.00E+00	0.00E+00	2.10E-08	2.07E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.28E-06**	N/A
7,12-Dimethylbenz(a)anthracene				1.45E-06	1.08E-05	0.00E+00	0.00E+00	1.87E-07	1.84E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.91E-05**	N/A
Acenaphthene				1.63E-07	1.21E-06	0.00E+00	0.00E+00	2.10E-08	2.07E-06	1.13E-05	2.61E-03	4.36E-07	2.77E-04	4.06E-07	3.72E-04	**3.26E-03**	N/A
Acenaphthylene				1.63E-07	1.21E-06	0.00E+00	0.00E+00	2.10E-08	2.07E-06	2.23E-05	5.15E-03	1.55E-06	9.86E-04	1.45E-06	1.33E-03	**7.47E-03**	N/A
Acetaldehyde	470	4.50E-01		1.64E-02	1.21E-01	0.00E+00	0.00E+00	3.62E-05	3.56E-03	6.10E-05	1.41E-02	2.35E-04	1.49E-01	2.19E-04	2.01E-01	**4.90E-01**	0.1042%
Acrolein	2.5	3.50E-01		2.68E-03	1.99E-02	0.00E+00	0.00E+00	3.15E-05	3.10E-03	1.91E-05	4.40E-03	2.84E-05	1.80E-02	2.65E-05	2.42E-02	**6.96E-02**	2.7860%
Ammonia	2400	100	11,800	2.99E+00	2.22E+01	1.99E+00	1.20E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.22E+01**	0.9239%
Anthracene	---	2.00E-02		2.17E-07	1.61E-06	0.00E+00	0.00E+00	2.80E-08	2.76E-06	2.98E-06	6.86E-04	5.74E-07	3.64E-04	5.35E-07	4.90E-04	**1.55E-03**	N/A
Arsenic	---	2.30E-04		1.81E-05	1.34E-04	4.59E-03	2.77E-02	2.34E-06	2.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.79E-02**	N/A
Barium	---	5.00E-01		3.98E-04	2.96E-03	0.00E+00	0.00E+00	5.14E-05	5.05E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**8.01E-03**	N/A
Benz(a)anthracene	---	2.00E-02		1.63E-07	1.21E-06	0.00E+00	0.00E+00	2.10E-08	2.07E-06	1.50E-06	3.47E-04	5.15E-07	3.27E-04	4.81E-07	4.40E-04	**1.12E-03**	N/A
Benzene	1300	1.30E-01		5.04E-03	3.74E-02	2.30E-02	1.38E-01	6.77E-05	6.66E-03	1.88E-03	4.33E-01	2.86E-04	1.82E-01	2.67E-04	2.45E-01	**1.00E+00**	0.0773%
Benzo(a)pyrene				1.09E-07	8.06E-07	0.00E+00	0.00E+00	1.40E-08	1.38E-06	6.22E-07	1.43E-04	5.77E-08	3.66E-05	5.38E-08	4.93E-05	**2.31E-04**	N/A
Benzo(b)fluoranthene				1.63E-07	1.21E-06	0.00E+00	0.00E+00	2.10E-08	2.07E-06	2.69E-06	6.19E-04	3.04E-08	1.93E-05	2.83E-08	2.60E-05	**6.68E-04**	N/A
Benzo(b,k)fluoranthene				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	N/A
Benzo(g,h,i)perylene				1.09E-07	8.06E-07	0.00E+00	0.00E+00	1.40E-08	1.38E-06	1.35E-06	3.10E-04	1.50E-07	9.53E-05	1.40E-07	1.28E-04	**5.36E-04**	N/A
Benzo(k)fluoranthene				1.63E-07	1.21E-06	0.00E+00	0.00E+00	2.10E-08	2.07E-06	5.27E-07	1.22E-04	4.75E-08	3.02E-05	4.43E-08	4.06E-05	**1.96E-04**	N/A
Beryllium	---	4.20E-04		1.09E-06	8.06E-06	1.29E-04	7.79E-04	1.40E-07	1.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**7.93E-04**	N/A
Butane	238000	---		1.90E-01	1.41E+00	0.00E+00	0.00E+00	2.45E-02	2.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.82E+00**	0.0016%
Cadmium	---	2.40E-04		9.96E-05	7.39E-04	2.00E-03	1.21E-02	1.28E-05	1.26E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.33E-02**	N/A
Chromium	---	45		1.27E-04	9.41E-04	4.59E-03	2.77E-02	1.63E-05	1.61E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.93E-02**	N/A
Chrysene	---	2.00E-02		1.63E-07	1.21E-06	0.00E+00	0.00E+00	2.10E-08	2.07E-06	3.70E-06	8.54E-04	1.08E-07	6.88E-05	1.01E-07	9.25E-05	**1.02E-03**	N/A
Cobalt	---	1.00E-03		7.60E-06	5.65E-05	0.00E+00	0.00E+00	9.81E-07	9.65E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.53E-04**	N/A
Copper		4.90E+02		7.69E-05	5.71E-04	0.00E+00	0.00E+00	9.92E-06	9.76E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.55E-03**	NA
Dibenzo(a,h)anthracene	---	2.00E-02		1.09E-07	8.06E-07	0.00E+00	0.00E+00	1.40E-08	1.38E-06	8.37E-07	1.93E-04	1.79E-07	1.14E-04	1.67E-07	1.53E-04	**4.62E-04**	N/A
Dichlorobenzene	---	9.00E-02		1.09E-04	8.06E-04	0.00E+00	0.00E+00	1.40E-05	1.38E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.18E-03**	N/A
Ethane	---	2900		2.81E-01	2.08E+00	0.00E+00	0.00E+00	3.62E-02	3.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**5.64E+00**	N/A
Ethylbenzene		1000		1.32E-02	9.81E-02	0.00E+00	0.00E+00	8.06E-05	7.92E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.06E-01**	N/A
Fluoranthene				2.72E-07	2.02E-06	0.00E+00	0.00E+00	3.50E-08	3.45E-06	9.75E-06	2.25E-03	2.33E-06	1.48E-03	2.18E-06	1.99E-03	**5.73E-03**	N/A
Fluorene				2.53E-07	1.88E-06	0.00E+00	0.00E+00	3.27E-08	3.22E-06	3.10E-05	7.14E-03	8.96E-06	5.69E-03	8.35E-06	7.65E-03	**2.05E-02**	N/A
Formaldehyde	30	6.00E-02		8.70E-02	6.46E-01	9.61E-02	5.78E-01	1.44E-04	1.41E-02	1.91E-04	4.40E-02	3.62E-04	2.30E-01	3.38E-04	3.09E-01	**1.24E+00**	4.1451%
Hexane	---	700		1.18E-04	8.74E-04	0.00E+00	0.00E+00	5.37E-05	5.28E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**6.16E-03**	N/A
Indeno(1,2,3-cd)pyrene				1.63E-07	1.21E-06	0.00E+00	0.00E+00	2.10E-08	2.07E-06	1.00E-06	2.31E-04	1.15E-07	7.31E-05	1.07E-07	9.83E-05	**4.06E-04**	N/A
Lead	---	3.80E-02		4.53E-05	3.36E-04	5.85E-03	3.52E-02	5.84E-06	5.74E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.58E-02**	N/A
Manganese	---	5.00E-02		3.44E-05	2.55E-04	3.30E-01	1.99E+00	4.44E-06	4.36E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.99E+00**	N/A
Mercury	6.00E-01	3.00E-01		2.35E-05	1.75E-04	5.01E-04	3.02E-03	3.04E-06	2.99E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.32E-03**	0.5526%
Molybdenum	---	1.2		9.96E-05	7.39E-04	0.00E+00	0.00E+00	1.28E-05	1.26E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.00E-03**	N/A
Naphthalene	7900	3		5.56E-04	4.13E-03	1.46E-02	8.80E-02	3.50E-06	3.45E-04	3.14E-04	7.25E-02	2.60E-05	1.65E-02	2.43E-05	2.22E-02	**2.00E-01**	0.0025%
Nickel	2.00E-01	4.20E-03		1.90E-04	1.41E-03	1.92E-03	1.16E-02	2.45E-05	2.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.40E-02**	6.9882%
OCDD				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	N/A
PAH	---	2.00E-02		9.32E-04	6.92E-03	1.67E-02	1.01E-01	4.67E-06	4.59E-04	5.13E-04	1.18E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.19E-01**	N/A
Pentane	---	70250		2.35E-01	1.75E+00	0.00E+00	0.00E+00	3.04E-02	2.99E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.73E+00**	N/A
Phenanathrene	---	2.00E-02		1.54E-06	1.14E-05	0.00E+00	0.00E+00	1.98E-07	1.95E-05	9.87E-05	2.28E-02	9.02E-06	5.73E-03	8.41E-06	7.71E-03	**3.62E-02**	N/A
POM				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	N/A
Propane	---	43000		1.45E-01	1.08E+00	0.00E+00	0.00E+00	1.87E-02	1.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.91E+00**	N/A
Propylene	---	3000		1.41E-03	1.04E-02	0.00E+00	0.00E+00	6.19E-03	6.09E-01	6.75E-03	1.56E+00	7.91E-04	5.03E-01	7.38E-04	6.76E-01	**3.35E+00**	N/A
Propylene Oxide	3100	2.70E-01		1.18E-02	8.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**8.76E-02**	0.0028%
Pyrene	---	2.00E-02		4.53E-07	3.36E-06	0.00E+00	0.00E+00	5.84E-08	5.74E-06	8.98E-06	2.07E-03	1.47E-06	9.32E-04	1.37E-06	1.25E-03	**4.26E-03**	N/A
Selenium	---	20		2.17E-06	1.61E-05	1.04E-02	6.29E-02	2.80E-07	2.76E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**6.29E-02**	N/A
Sulfuric Acid	120	1		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-03	1.26E-01	3.70E-04	8.54E-02	0.00E+00	0.00E+00	4.38E-05	4.01E-02	**2.51E-01**	0.2093%
Toluene	37000	5000		5.36E-02	3.98E-01	0.00E+00	0.00E+00	3.09E-04	3.04E-02	6.80E-04	1.57E-01	1.25E-04	7.97E-02	1.17E-04	1.07E-01	**7.72E-01**	0.0021%
Vanadium	---	2.00E-01		2.08E-04	1.55E-03	0.00E+00	0.00E+00	2.69E-05	2.64E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.19E-03**	N/A
Xylenes	22000	100		2.66E-02	1.97E-01	0.00E+00	0.00E+00	2.30E-04	2.26E-02	4.67E-04	1.08E-01	8.74E-05	5.55E-02	8.15E-05	7.47E-02	**4.58E-01**	0.0021%
Zinc	---	45		2.62E-03	1.95E-02	0.00E+00	0.00E+00	3.39E-04	3.33E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**5.28E-02**	N/A

Table F-5: Total Facility Maximum Modeled Annual Toxic Air Pollutant Concentrations

	XOQ	
Emission Source	**1-hour**	**Annual**
Combustion Turbine (Gas)	7.42567	0.10686
Combustion Turbine (ULSD)	6.01903	0.09591
Auxiliary Boiler	98.35674	2.11396
Emergency Diesel Generator	230.63531	3.74285
Fire Pump (Existing)	635.37947	26.32132
Fire Pump (Proposed)	916.36202	35.11592

			Annual Concentrations														
	NYSDEC	NYSDEC	Combustion Turbine - 1 Unit					Auxiliary Boiler		Emergency Diesel Generator		Fire Pump (Existing)		Fire Pump (Proposed)		Facility	
	SGC	AGC	Gas Firing		ULSD Firing		Maximum Annual Concentration	1 Unit		1 Unit		1 Unit		1 Unit			% AGC
Non-Criteria Pollutants	(ug/m3)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(g/sec)	(ug/m3)	(ug/m3)	
1,3-Butadiene	---	3.30E-02	1.75E-04	1.87E-05	6.68E-03	5.27E-05	6.98E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-05	9.01E-06	1.12E-05	1.12E-05	**9.01E-05**	0.2729%
1,1,1-Trichloroethane	---	1.4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.0000%
2-Methylnapthalene	---	7.1	2.17E-06	2.32E-07	0.00E+00	0.00E+00	2.32E-07	2.80E-07	3.25E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**5.57E-07**	0.0000%
3-Methylchloranthrene			1.63E-07	1.74E-08	0.00E+00	0.00E+00	1.74E-08	2.10E-08	2.43E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.18E-08**	N/A
7,12-Dimethylbenz(a)anthracene			1.45E-06	1.55E-07	0.00E+00	0.00E+00	1.55E-07	1.87E-07	2.16E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.71E-07**	N/A
Acenaphthene			1.63E-07	1.74E-08	0.00E+00	0.00E+00	1.74E-08	2.10E-08	2.43E-08	1.13E-05	1.21E-06	4.36E-07	3.27E-07	4.06E-07	4.07E-07	**1.99E-06**	N/A
Acenaphthylene			1.63E-07	1.74E-08	0.00E+00	0.00E+00	1.74E-08	2.10E-08	2.43E-08	2.23E-05	2.39E-06	1.55E-06	1.17E-06	1.45E-06	1.45E-06	**5.04E-06**	N/A
Acetaldehyde	470	4.50E-01	1.64E-02	1.75E-03	0.00E+00	0.00E+00	1.75E-03	3.62E-05	4.19E-05	6.10E-05	6.51E-06	2.35E-04	1.77E-04	2.19E-04	2.20E-04	**2.19E-03**	0.4874%
Acrolein	2.5	3.50E-01	2.68E-03	2.86E-04	0.00E+00	0.00E+00	2.86E-04	3.15E-05	3.65E-05	1.91E-05	2.04E-06	2.84E-05	2.13E-05	2.65E-05	2.65E-05	**3.72E-04**	0.1064%
Ammonia	2400	100	2.99E+00	3.19E-01	1.99E+00	1.57E-02	3.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.19E-01**	0.3191%
Anthracene	---	2.00E-02	2.17E-07	2.32E-08	0.00E+00	0.00E+00	2.32E-08	2.80E-08	3.25E-08	2.98E-06	3.18E-07	5.74E-07	4.31E-07	5.35E-07	5.36E-07	**1.34E-06**	0.0067%
Arsenic	---	2.30E-04	1.81E-05	1.93E-06	4.59E-03	3.62E-05	3.80E-05	2.34E-06	2.70E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.07E-05**	17.6954%
Barium	---	5.00E-01	3.98E-04	4.26E-05	0.00E+00	0.00E+00	4.26E-05	5.14E-05	5.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.02E-04**	0.0204%
Benz(a)anthracene	---	2.00E-02	1.63E-07	1.74E-08	0.00E+00	0.00E+00	1.74E-08	2.10E-08	2.43E-08	1.50E-06	1.61E-07	5.15E-07	3.87E-07	4.81E-07	4.82E-07	**1.07E-06**	0.0054%
Benzene	1300	1.30E-01	5.04E-03	5.38E-04	2.30E-02	1.81E-04	5.38E-04	6.77E-05	7.84E-05	1.88E-03	2.01E-04	2.86E-04	2.15E-04	2.67E-04	2.67E-04	**1.30E-03**	0.9998%
Benzo(a)pyrene			1.09E-07	1.16E-08	0.00E+00	0.00E+00	1.16E-08	1.40E-08	1.62E-08	6.22E-07	6.64E-08	5.77E-08	4.33E-08	5.38E-08	5.39E-08	**1.91E-07**	N/A
Benzo(b)fluoranthene			1.63E-07	1.74E-08	0.00E+00	0.00E+00	1.74E-08	2.10E-08	2.43E-08	2.69E-06	2.87E-07	3.04E-08	2.28E-08	2.83E-08	2.84E-08	**3.80E-07**	N/A
Benzo(b,k)fluoranthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	N/A
Benzo(g,h,i)perylene			1.09E-07	1.16E-08	0.00E+00	0.00E+00	1.16E-08	1.40E-08	1.62E-08	1.35E-06	1.44E-07	1.50E-07	1.13E-07	1.40E-07	1.40E-07	**4.24E-07**	N/A
Benzo(k)fluoranthene			1.63E-07	1.74E-08	0.00E+00	0.00E+00	1.74E-08	2.10E-08	2.43E-08	5.27E-07	5.63E-08	4.75E-08	3.57E-08	4.43E-08	4.44E-08	**1.78E-07**	N/A
Beryllium	---	4.20E-04	1.09E-06	1.16E-07	1.29E-04	1.02E-06	1.13E-06	1.40E-07	1.62E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.29E-06**	0.3070%
Butane	238000	---	1.90E-01	2.03E-02	0.00E+00	0.00E+00	2.03E-02	2.45E-02	2.84E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.87E-02**	N/A
Cadmium	---	2.40E-04	9.96E-05	1.06E-05	2.00E-03	1.58E-05	2.56E-05	1.28E-05	1.49E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.04E-05**	16.8523%
Chromium	---	45	1.27E-04	1.35E-05	4.59E-03	3.62E-05	4.86E-05	1.63E-05	1.89E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**6.76E-05**	0.0002%
Chrysene	---	2.00E-02	1.63E-07	1.74E-08	0.00E+00	0.00E+00	1.74E-08	2.10E-08	2.43E-08	3.70E-06	3.95E-07	1.08E-07	8.13E-08	1.01E-07	1.01E-07	**6.20E-07**	0.0031%
Cobalt	---	1.00E-03	7.60E-06	8.12E-07	0.00E+00	0.00E+00	8.12E-07	9.81E-07	1.14E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.95E-06**	0.1948%
Copper		4.90E+02	7.69E-05	8.22E-06	0.00E+00	0.00E+00	8.22E-06	9.92E-06	1.15E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.97E-05**	0.000004%
Dibenzo(a,h)anthracene	---	2.00E-02	1.09E-07	1.16E-08	0.00E+00	0.00E+00	1.16E-08	1.40E-08	1.62E-08	8.37E-07	8.94E-08	1.79E-07	1.34E-07	1.67E-07	1.67E-07	**4.19E-07**	0.0021%
Dichlorobenzene	---	9.00E-02	1.09E-04	1.16E-05	0.00E+00	0.00E+00	1.16E-05	1.40E-05	1.62E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.78E-05**	0.0309%
Ethane	---	2900	2.81E-01	3.00E-02	0.00E+00	0.00E+00	3.00E-02	3.62E-02	4.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**7.19E-02**	0.0025%
Ethylbenzene		1000	1.32E-02	1.41E-03	0.00E+00	0.00E+00	1.41E-03	8.06E-05	9.33E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.50E-03**	0.0002%
Fluoranthene			2.72E-07	2.90E-08	0.00E+00	0.00E+00	2.90E-08	3.50E-08	4.06E-08	9.75E-06	1.04E-06	2.33E-06	1.75E-06	2.18E-06	2.18E-06	**5.05E-06**	N/A
Fluorene			2.53E-07	2.71E-08	0.00E+00	0.00E+00	2.71E-08	3.27E-08	3.79E-08	3.10E-05	3.31E-06	8.96E-06	6.73E-06	8.35E-06	8.37E-06	**1.85E-05**	N/A
Formaldehyde	30	6.00E-02	8.70E-02	9.30E-03	9.61E-02	7.57E-04	9.30E-03	1.44E-04	1.66E-04	1.91E-04	2.04E-05	3.62E-04	2.72E-04	3.38E-04	3.38E-04	**1.01E-02**	16.8251%
Hexane	---	700	1.18E-04	1.26E-05	0.00E+00	0.00E+00	1.26E-05	5.37E-05	6.22E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**7.48E-05**	0.0000%
Indeno(1,2,3-cd)pyrene			1.63E-07	1.74E-08	0.00E+00	0.00E+00	1.74E-08	2.10E-08	2.43E-08	1.00E-06	1.07E-07	1.15E-07	8.64E-08	1.07E-07	1.07E-07	**3.43E-07**	N/A
Lead	---	3.80E-02	4.53E-05	4.84E-06	5.85E-03	4.61E-05	5.05E-05	5.84E-06	6.76E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**5.73E-05**	0.1508%
Manganese	---	5.00E-02	3.44E-05	3.68E-06	3.30E-01	2.60E-03	2.60E-03	4.44E-06	5.14E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.61E-03**	5.2194%
Mercury	6.00E-01	3.00E-01	2.35E-05	2.51E-06	5.01E-04	3.95E-06	6.26E-06	3.04E-06	3.52E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**9.78E-06**	0.0033%
Molybdenum	---	1.2	9.96E-05	1.06E-05	0.00E+00	0.00E+00	1.06E-05	1.28E-05	1.49E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.55E-05**	0.0021%
Naphthalene	7900	3	5.56E-04	5.94E-05	1.46E-02	1.15E-04	1.70E-04	3.50E-06	4.06E-06	3.14E-04	3.36E-05	2.60E-05	1.95E-05	2.43E-05	2.43E-05	**2.51E-04**	0.0084%
Nickel	2.00E-01	4.20E-03	1.90E-04	2.03E-05	1.92E-03	1.51E-05	2.03E-05	2.45E-05	2.84E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.87E-05**	1.1598%
OCDD			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	N/A
PAH	---	2.00E-02	9.32E-04	9.95E-05	1.67E-02	1.32E-04	2.23E-04	4.67E-06	5.41E-06	5.13E-04	5.48E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.83E-04**	1.4163%
Pentane	---	70250	2.35E-01	2.51E-02	0.00E+00	0.00E+00	2.51E-02	3.04E-02	3.52E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**6.03E-02**	0.0001%
Phenanathrene	---	2.00E-02	1.54E-06	1.64E-07	0.00E+00	0.00E+00	1.64E-07	1.98E-07	2.30E-07	9.87E-05	1.05E-05	9.02E-06	6.77E-06	8.41E-06	8.43E-06	**2.61E-05**	0.1307%
POM			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	N/A
Propane	---	43000	1.45E-01	1.55E-02	0.00E+00	0.00E+00	1.55E-02	1.87E-02	2.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.71E-02**	0.0001%
Propylene	---	3000	1.41E-03	1.50E-04	0.00E+00	0.00E+00	1.50E-04	6.19E-03	7.17E-03	6.75E-03	7.21E-04	7.91E-04	5.95E-04	7.38E-04	7.40E-04	**9.37E-03**	0.0003%
Propylene Oxide	3100	2.70E-01	1.18E-02	1.26E-03	0.00E+00	0.00E+00	1.26E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.26E-03**	0.4671%
Pyrene	---	2.00E-02	4.53E-07	4.84E-08	0.00E+00	0.00E+00	4.84E-08	5.84E-08	6.76E-08	8.98E-06	9.59E-07	1.47E-06	1.10E-06	1.37E-06	1.37E-06	**3.55E-06**	0.0177%
Selenium	---	20	2.17E-06	2.32E-07	1.04E-02	8.23E-05	8.25E-05	2.80E-07	3.25E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**8.29E-05**	0.0004%
Sulfuric Acid	120	1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-03	1.48E-03	3.70E-04	3.96E-05	0.00E+00	0.00E+00	4.38E-05	4.39E-05	**1.56E-03**	0.1563%
Toluene	37000	5000	5.36E-02	5.73E-03	0.00E+00	0.00E+00	5.73E-03	3.09E-04	3.58E-04	6.80E-04	7.26E-05	1.25E-04	9.42E-05	1.17E-04	1.17E-04	**6.37E-03**	0.0001%
Vanadium	---	2.00E-01	2.08E-04	2.22E-05	0.00E+00	0.00E+00	2.22E-05	2.69E-05	3.11E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**5.33E-05**	0.0267%
Xylenes	22000	100	2.66E-02	2.84E-03	0.00E+00	0.00E+00	2.84E-03	2.30E-04	2.66E-04	4.67E-04	4.99E-05	8.74E-05	6.57E-05	8.15E-05	8.17E-05	**3.30E-03**	0.0033%
Zinc	---	45	2.62E-03	2.80E-04	0.00E+00	0.00E+00	2.80E-04	3.39E-04	3.92E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**6.73E-04**	0.0015%

APPENDIX G

MODELING INPUT AND OUTPUT FILES

APPENDIX H

THREATENED AND ENDANGERED SPECIES ASSESSMENT

Contents

Appendices

(1) Characterization of State and Federally Listed Species

Danskammer Energy initiated consultation with the New York Natural Heritage Project (NYNHP), the New York State Department of Conservation (NYSDEC), and the U.S. Fish and Wildlife Service (USFWS) to determine what federally or state-listed threatened or endangered species, species of special concern (SSC), and state species of greatest conservation need (SSGCN) may occur at or adjacent to the Project Site. Based on Project-specific information received from the NYNHP, NYSDEC, USFWS, and direct on-site observations, a list of state and federally listed species was compiled that are believed or have the potential to occur within the Project Site and is summarized in Table H-1.

Table H-1. State and Federally Listed Species, SSC, and SSCN Potentially Found at the Project Site

Common Name	Scientific Name	Status	Habitat for Species Observed in Project Site?
Indiana Bat	*Myotis sodalis*	Federally Endangered (FE), State Endangered (SE)	Yes
Northern Long-eared Bat	*Myotis septentrionalis*	Federally Threatened (FT), SE	Yes
Bald Eagle	*Haliaeetus leucocephalus*	State Threatened (ST)	Yes
Shortnose Sturgeon	*Acipenser brevirostrum*	FE, SE	Yes
Atlantic Sturgeon	*Acipenser oxyrinchus*	FE	Yes
Dwarf Wedgemussel	*Alasmidonta heterodon*	FE, SE	No
Small Whorled Pogonia	*Isotria medeoloides*	FT	Yes

USFWS was initially contacted to discuss conservation measures and evaluate potential impacts to species identified within the Project Site. The USFWS Information for Planning and Consultation (IPaC) resource was used to identify threatened or endangered species, critical habitats, migratory birds, or other natural resources that may be located within the vicinity of the Project Site. The USFWS IPaC Trust Resource Report listed four species that may be located within the vicinity of the Project Site: the Indiana Bat (*Myotis sodalis*), northern long-eared bat, (*Myotis septentrionalis*), dwarf wedgemussel (*Alasmidonta heterodon*), and the small-whorled pogonia (*Isotria medeoloides*) (Appendix H-1). The Indiana bat, northern long-eared bat, and the dwarf wedgemussel are both state and federally listed species. Additionally, a perennial member of the orchid family, the small-whorled pogonia (*Isotria medeoloides*), was also identified as potentially being present in Orange County by the USFWS IPaC online resource. The small-whorled pogonia is listed as a federally threatened species and is also listed as endangered in New York State.

The NYSDEC Environmental Resource Mapper was consulted as a first step in determining the presence of rare or state-listed animals or plants, significant natural communities, or other significant habitats in the immediate vicinity of the Project. The results of the search revealed potential presence of “Rare Plants and Rare Animals,” “Significant Natural Communities,” and “Natural Communities” in that surround the Project Site.

The NYNHP identified four listed species with known locations in the vicinity of the Project Site (Appendix H-1). A maternity colony for the state and federally endangered Indiana bat was documented within 2.4 miles of the Project. The state-threatened Bald eagle has been documented at the Project site and confirmed nesting activity was observed within one mile of the Project. Two species of sturgeon, the federally and state-listed endangered shortnose sturgeon and the federally endangered Atlantic sturgeon, are both known to occur in the Hudson River and may utilize segments of the river adjacent to the Project site.

The New York Coastal Boundary mapper was reviewed for the presence of Significant Coastal Fish and Wildlife Habitats (SCFWH). The Hudson River Highlands SCFWH is located east of the Project Site boundary in the Hudson River. No in-water activities are anticipated for the Project, and no wetland areas within the Project Site will be impacted during construction, therefore impacts to listed freshwater fish and the adjacent SCFWHA are expected to be minimal. Consultation with NOAA was initiated on August 26, 2019 to provide impact determination with regard to listed fish species and essential fish habitat (Appendix H-1).

While conducting field delineations conducted by TRC, field ecologists looked for signs of habitat for the species identified in Table H-1. Field staff also observed small patches of northern hardwood forest along existing transmission lines in the western portions of the Project Site and in small patches along the Hudson River. The overstory trees observed may support the two listed species of bat and may provide suitable nesting locations and foraging access for bald eagles.

Many of the species listed as threatened, endangered, or of special concern are also identified as Species of Greatest Conservation Need. See Table H-2 below for a summary impact table containing information on the listed species identified.

Table H-2. State and Federally Listed Species with Potential to Occur within or Adjacent to the Project Site

Species Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference	Recorded Source[4]	Observed on Site	Potential Habitat within Project Site
Northern Long-Eared Bat *Myotis septentrionalis*	THR	THR	SGCN-HP	This species is primarily a forest-dependent insectivore that uses tree cavities or loose bark of trees for roosting, foraging, and raising young. This species hibernates through the late fall and early spring in caves or abandoned mines.	USFWS	No	Yes
Indiana Bat *Mytosis sodalis*	END	END	SGCN-HP	This species hibernates during winter in caves or, occasionally, in abandoned mines. During summer, they roost under the peeling bark of dead and dying trees. Indiana bats eat a variety of flying insects found along rivers or lakes and in uplands.	USWFS, NHP	No	Yes
Bald Eagle *Haliaeetus leucocephalus*	N/A	THR	SGCN	This species prefers undisturbed areas near large lakes, reservoirs, marshes, swamps, or stretches along rivers where they can breed and forage for fish.	NHP	No	Yes

Table H-2. State and Federally Listed Species with Potential to Occur within or Adjacent to the Project Site

Species Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference	Recorded Source[4]	Observed on Site	Potential Habitat within Project Site
Atlantic Sturgeon *Acipenser oxyrinchus*	N/A	END	SGCN-HP	Amphidromous fish that spawn in freshwater rivers, including the Hudson River. The species is found from the southern tip of Manhattan to the federal dam at Troy, NY.	NHP	No	No
Shortnose Sturgeon *Acipenser brevirostrum*	END	END	SGCN	Amphidromous fish that spawn in freshwater rivers, including the Hudson River. The species is found from southern tip of Manhattan to the federal dam at Troy, NY.	NHP	No	No
Dwarf wedgemussel *Alasmidonta heterodon*	END	END	SGCN-HP	Typical habitat for this mussel includes running waters of all sizes, from small brooks to large rivers. Bottom substrates include silt, sand, and gravel, which may be distributed in relatively small patches behind larger cobbles and boulders. Dwarf wedgemussels appear to select or are at least tolerant of relatively low levels of calcium in the water.	USWS	No	No

Table H-2. State and Federally Listed Species with Potential to Occur within or Adjacent to the Project Site

Species Name	Federal Status[1]	NYS Status[2]	SGCN Listing[3]	Habitat Preference	Recorded Source[4]	Observed on Site	Potential Habitat within Project Site
Small-whorled Pogonia *Isotria medeoloides*	THR	END		The species seems to require small light gaps, or canopy breaks, and generally grows in areas with sparse to moderate ground cover. It grows in mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third-growth successional stages.	USFWS	No	No

1 – "Federal Status" refers to the species listing as federally endangered (END) OR threatened (THR).

2 – "NYS Status" refers to the species listing as a state-listed endangered (END) or threatened (THR) species.

3- 'SGCN Listing' refers to if the species is state listed as a Species of Greatest Conservation Need – High Priority (SGCN-HP), Species of Greatest Conservation Need (SGCN), or a Species of Potential Conservation Need (SPCN).

4- "Recorded Source" indicates how the species was documented as occurring within the Project Site. Documentation occurred through correspondence with the USFWS, NYSDEC, or NYNHP or through field observations by contracted field survey biologists.

(2) Summary of Impacts

One special status plant was identified with potential to occur within the Project. The small whorled pogonia, a perennial orchid, is known to a single locality within the State of New York and was last observed in 1976. Based on the limited extent and lack of recent records of this species, it is considered highly unlikely that the Project will impact this species or its habitat. No plant communities observed in the Project Site are designated as significant; therefore, construction of the Project will not result in impacts to any communities which are significant or unique.

Two state and/or federally listed mammals were identified with potential to occur within the Project Site. Consultation with the NYNHP indicated known occurrences of the state and federally-endangered Indiana bat within 1.5 miles of the Project Site and a documented maternity colony used by the species within 2.5 miles (Appendix H-1). No occurrences of the state and federally-threatened northern long-eared bat have been reported by NYNHP, however habitat present within the Project Site may be suitable for this species. Both species are unlikely to occur within the Project Site due to previous development and current levels of anthropogenic disturbance on the Project Site. Project components have been sited to minimize the amount of clearing required for the Project. Where clearing is unavoidable, Danskammer Energy will adhere to seasonal clearing restrictions which minimize potential direct impacts to these species. Should either bat species be observed roosting on site, roost trees will be immediately fenced off and adjacent construction activities halted until such time as regulatory agencies can be informed and consulted for next steps.

The USFWS IPaC resource report indicated potential for bald eagles, a state-threatened and federally protected species, to occur within the vicinity of the Project Site. The NYNHP database contains records of active eagle nests within one mile of the Project Site boundary. The species is prevalent throughout New York state and may concentrate around large bodies of open water during the winter months, including the Hudson River adjacent to the Project Site. Direct impacts to bald eagles are not anticipated as a result of construction activities. Presently, no in-water work is proposed and trees which meet the nesting criteria for this species (e.g. mature coniferous trees located near water) are not present within the Project Site. Additionally, several species of migratory birds were identified with the potential to occur within the vicinity of the Project Site in the IPaC resource report (Appendix H-1). Of the species identified, none are considered species of greatest conservation need. Additionally, the Project Site is not located in any recognized migratory flyway which may concentrate large numbers of birds. The conversion of 1.55 acres of forested vegetation may indirectly impact individuals within certain avian species through minor habitat reduction; however, clearing for construction of the Project is not anticipated to impact any species at the population level.

The federally endangered dwarf wedgemussel was identified by the IPaC resource report as having the potential to occur within the vicinity of the Project Site; however, habitat for this species was not observed on the Project site. The species requires running water throughout the annual life cycle. Streams identified within the Project Site were classified as ephemeral or intermittent, which do not provide habitat for this species. Additionally, two species of sturgeon were identified by NYSDEC as having the potential to occur within areas of the Hudson River directly adjacent to the Project Site (Appendix H-1). Both Atlantic and shortnose sturgeon are known to migrate upriver and particularly use the deepest parts of the River during their migratory period. The

Hudson Highlands, a significant coastal fish and wildlife habitat area, is delineated in the waters adjacent to the Project, and encompasses the deepest channel in the Hudson River. Construction activities are not anticipated to directly or indirectly impact wetlands or waterbodies on site as there will be no in-water construction activities. Therefore, no impacts to the dwarf wedgemussle, Atlantic sturgeon, or shortnose sturgeon are anticipated to occur.

Impacts to wildlife and their various habitats have been avoided and minimized through siting of the Project. The re-development of an existing industrial site avoids impacts, such as habitat conversion, that would be associated with an undeveloped project location. For impacts that are unavoidable, timely mitigation will be developed and implemented in consultation with state and federal regulatory authorities.

Appendix H-1

Agency Consultation Packages

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To: November 12, 2018
Consultation Code: 05E1NY00-2019-SLI-0343
Event Code: 05E1NY00-2019-E-01089
Project Name: Danskammer Energy Center

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/

eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2019-SLI-0343

Event Code: 05E1NY00-2019-E-01089

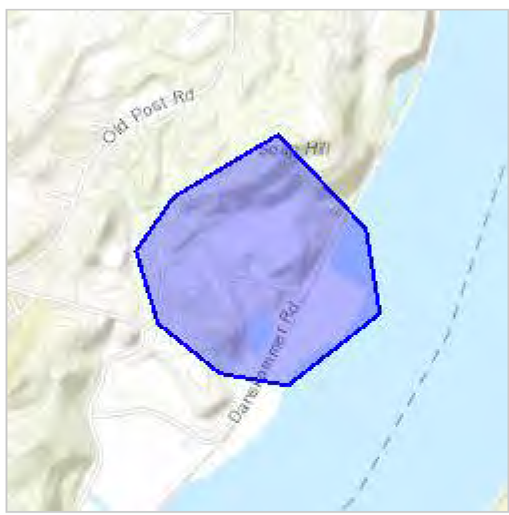
Project Name: Danskammer Energy Center

Project Type: POWER GENERATION

Project Description: Danskammer Energy, LLC ("Danskammer Energy") is proposing to repower its existing 532 megawatt (MW) Danskammer Generating Station (the "Station") located in the Town of Newburgh, Orange County, New York. The Energy Center will be located entirely on Danskammer Energy's property (the "Project Site") located on Danskammer Road in the Town of Newburgh, New York.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.57554897197372N73.96937180344142W



Counties: Orange, NY

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
Dwarf Wedgemussel *Alasmidonta heterodon* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/784 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/363/office/52410.pdf	Endangered

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/742/office/52410.pdf	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Orange County, New York

Local office

New York Ecological Services Field Office

(607) 753-9334
(607) 753-9699

3817 Luker Road
Cortland, NY 13045-9385

http://www.fws.gov/northeast/nyfo/es/section7.htm

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Indiana Bat Myotis sodalis There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
Dwarf Wedgemussel Alasmidonta heterodon No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/784	Endangered

Flowering Plants

NAME	STATUS
Small Whorled Pogonia Isotria medeoloides No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

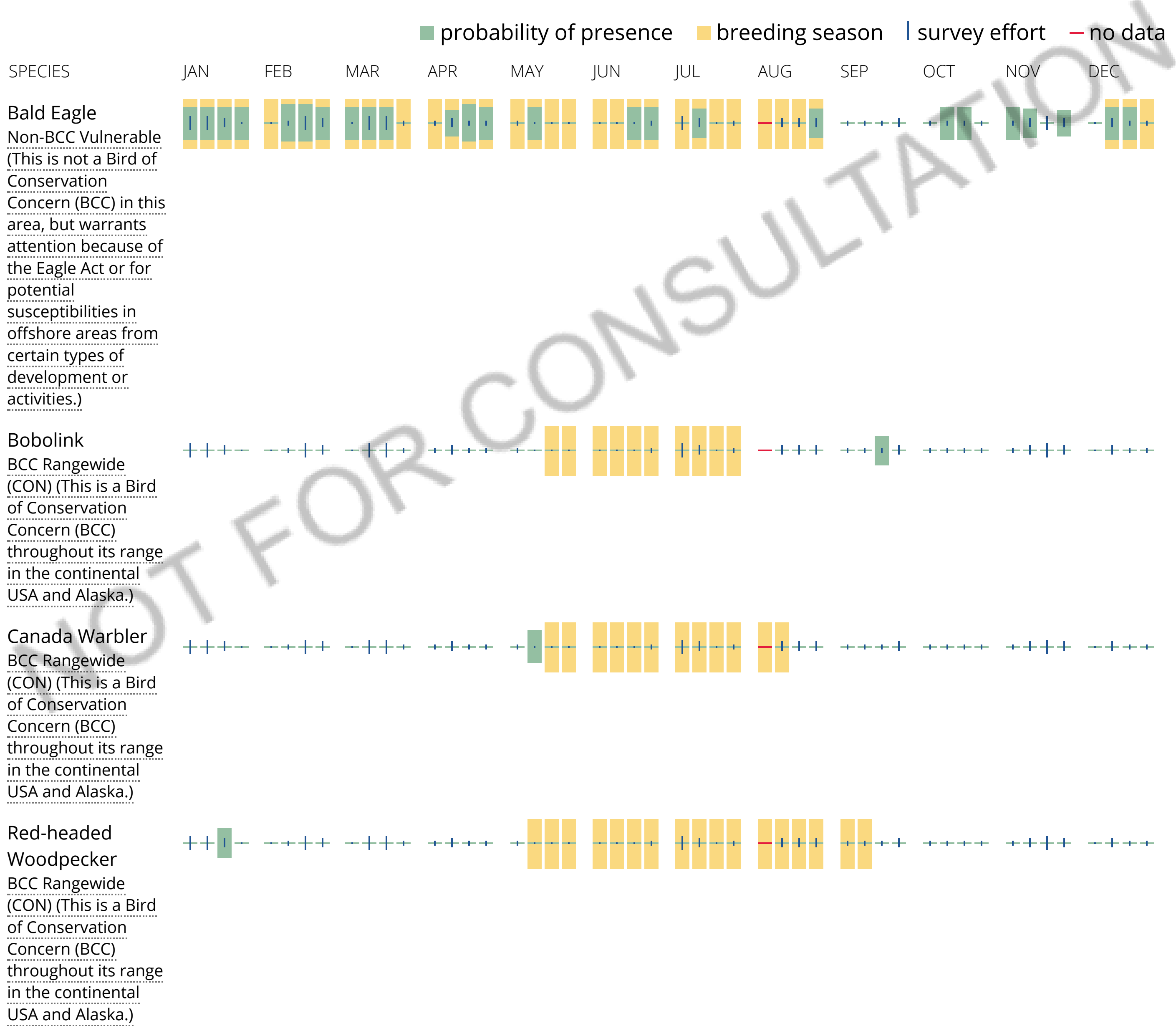
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

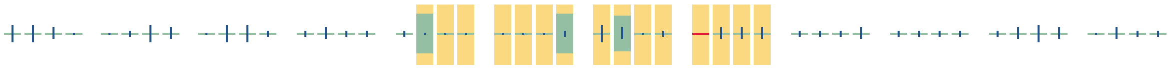
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER
- E1UBL6

FRESHWATER POND
- PUBKx

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Orange County, New York

Local office

New York Ecological Services Field Office

(607) 753-9334
(607) 753-9699

3817 Luker Road
Cortland, NY 13045-9385

http://www.fws.gov/northeast/nyfo/es/section7.htm

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The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

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Clams

NAME	STATUS
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Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

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For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
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This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush *Hylocichla mustelina* Breeds May 10 to Aug 31

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Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
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To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

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Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

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No Data (–)

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Survey Timeframe

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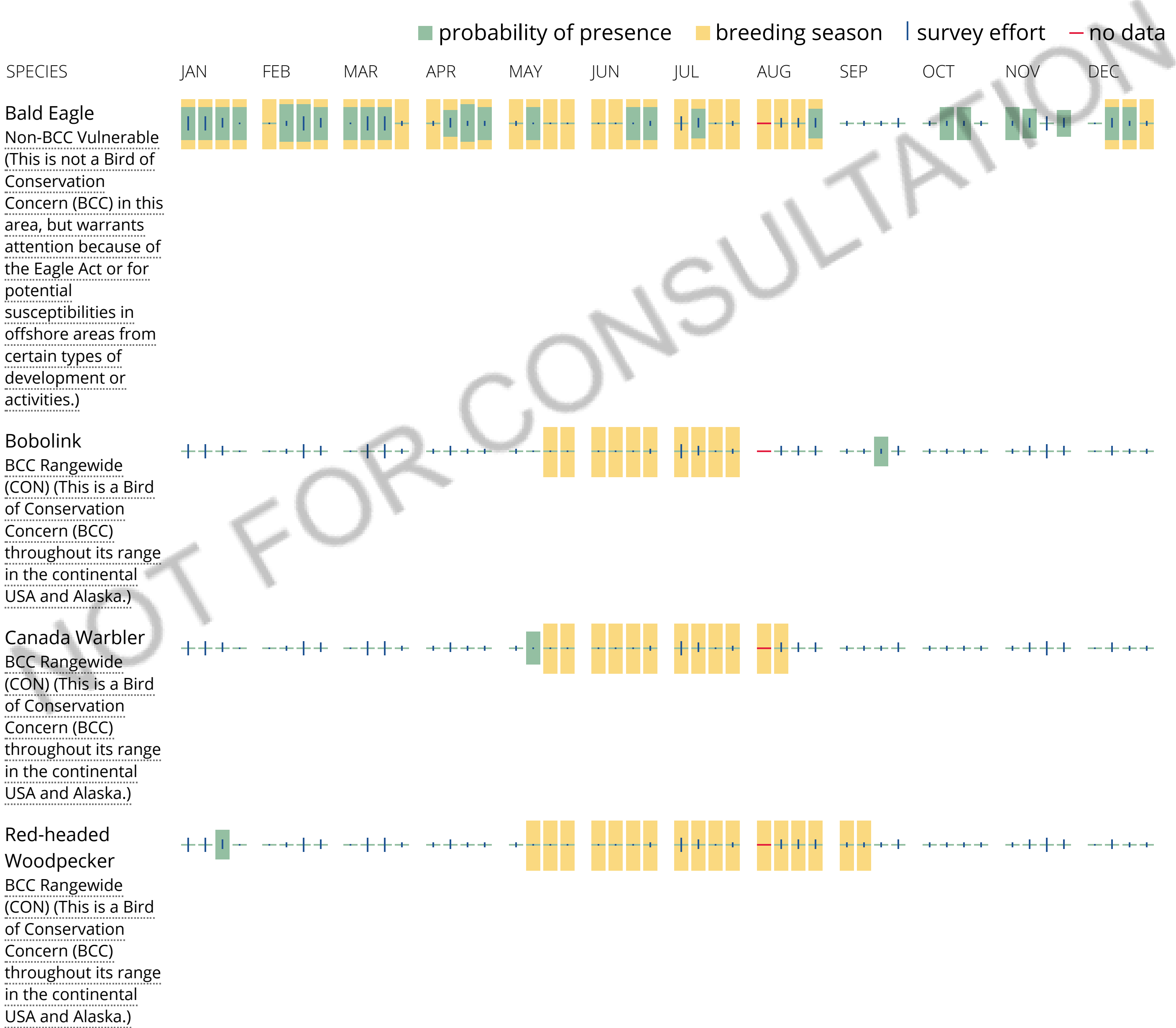

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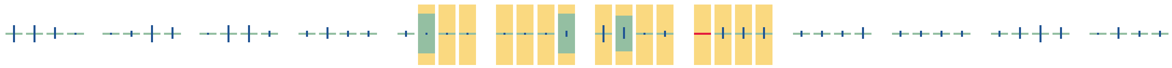
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

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What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND
- PUBHx

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

TRC
2801 Wehrle Dr., Suite 8
Williamsville, NY 14221
T 716.204.9543
TRCcompanies.com

August 26, 2019

U.S. Fish and Wildlife Service
New York Field Office
3817 Luker Road
Cortland, NY 13045

Re: Online Project Review Request, Danskammer Energy, LLC, Danskammer Energy Center, Town of Newburgh, Orange County, New York, Consultation Tracking Number 05E1NY00-2019-SLI-0343

We have reviewed the referenced project using the New York Field Office's online project review process and have followed all guidance and instructions in completing the review. We completed our review on November 12, 2018 and obtained an updated species list on July 16, 2019 and are submitting our project review package in accordance with the instructions for further review.

Danskammer Energy, LLC ("Danskammer Energy") is proposing to repower its existing nameplate 532-megawatt (MW) Danskammer Generating Station (the "Station") located in the Town of Newburgh, Orange County, New York, with a state-of-the-art natural gas fired combined cycle power generation facility (the "Project"). Using best-in-class technology, the Project will be built in a 1-on-1 combined cycle configuration, utilizing a gas combustion turbine and steam turbine generator, with a total optimal net capability of approximately 536 megawatts (the "Energy Center"). The new Energy Center intends to utilize the existing electric transmission and natural gas interconnections from the Station and will run on natural gas, with ultra-low sulfur diesel fuel oil ("ULSD") as the backup fuel. The Energy Center will be capable of operating as a baseload unit and will also include specific operational upgrades designed to support New York State's renewable energy focused electric grid. These features include quick start and enhanced ramping capability to provide important support for the reliable operation of the New York State Bulk Electric System as electricity supply from intermittent generation sources increases.

The Energy Center will be located entirely on Danskammer Energy's property (the "Project Site") located on Danskammer Road in the Town of Newburgh, New York. The proposed Project Site is located at approximately 41° 34' 18.75" North Latitude, 73° 57' 59.61" West Longitude (NAD83 coordinate system). Figure 1 shows the Project Site boundaries.

The Project Site is based on initial evaluations of where new facilities could be located. Future filings with the Siting Board may further refine the Project Site based on input from the public, stakeholders and the affected agencies through the Article 10 process and good engineering principles.

The Project Site consists primarily of developed area, successional northern hardwoods, mowed lawn, riprap/erosion control roadside, and interior of non-agricultural building land, as well as approximately 0.65 acre of palustrine forested and palustrine emergent wetland as identified during a wetland and waterbody delineation. See Figure 3 for a map showing landcover from the National Land Cover Database (NLCD). Attachment B includes representative photographs of the Project Site.

The project is expected to start construction in the first quarter of 2021 and last for 30 to 36 months.

This project review is needed for the Article 10 approval from New York State.

The enclosed project review package provides the information about the species, critical habitat, and bald eagles considered in our review, and the species conclusions table included in the package identifies our determinations for the resources that may be affected by the project. Our correspondence with the New York Natural Heritage Program (NYNHP) is included in Attachment C. The USFWS IPaC Official Species list and the Updated Species list are included as Attachment D.

For additional information, please contact me at the address listed above.

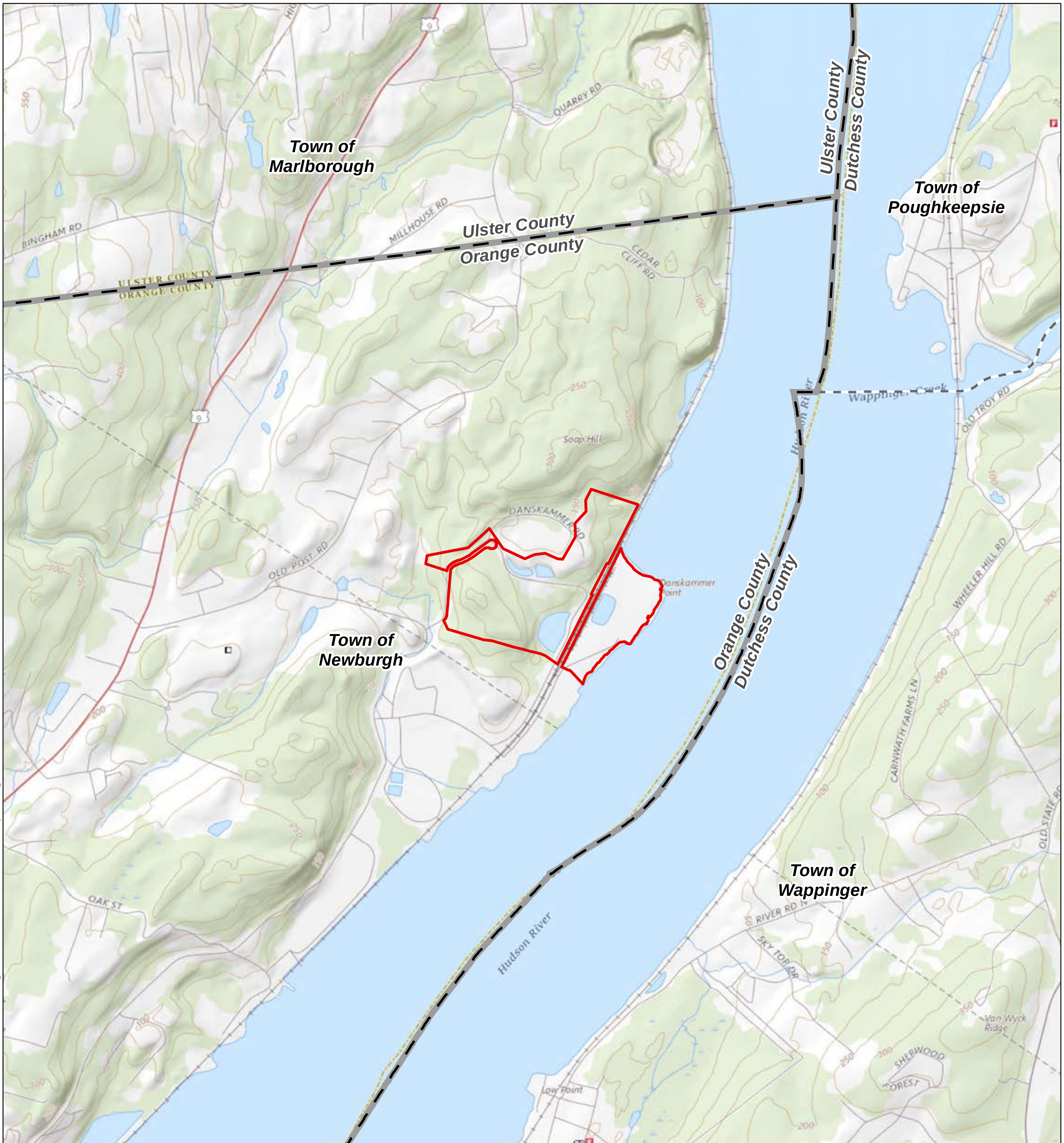
Sincerely,

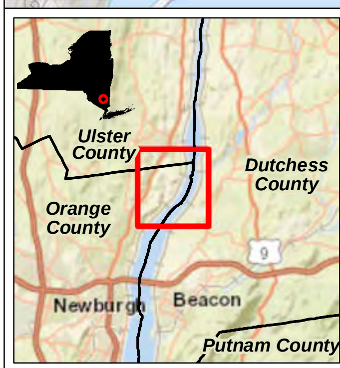
Kaitlin McCormick
Project Manager – TRC

cc: Howard Taylor (Danskammer)
Michael Keller (TRC)

Figures: Figure 1. Site Location Map
Figure 2. Wetland Delineation Map
Figure 3. NLCD Map

Attachments: Attachment A. Photograph Log
Attachment B. NYNHP Correspondence
Attachment C. USFWS, IPaC Official Species List and Updated List
Attachment D. Species Conclusion Table





Project Area
Municipal Boundary
County Boundary

Base Map: USGS/The National Map

0 1,000 2,000
Feet

Danskammer Energy, LLC

Danskammer Generating Station

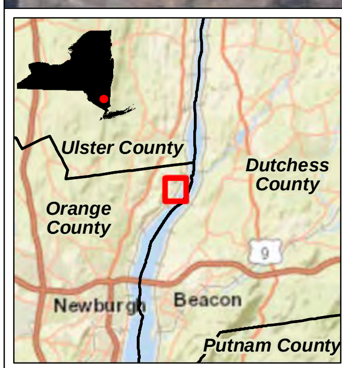
Figure 1
Site Location Map

Town of Newburgh
Orange County, NY

Prepared on 8/8/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\Figures\Wetland_Delineation_Report\Fig1 SiteLocation USGS 2019-08-08.mxd

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\Figures\Wetland_Delineation_Report\Fig2 Delin Wetlands Streams 2019-08-08.mxd



- Project Area
- Non-Jurisdictional Drainage
- Delineated Stream Line
- Delineated Waterbody/Retention Pond
- Delineated Wetland
- Estuarine and Marine Deepwater
- Municipal Boundary
- County Boundary

N W E S

Data: TRC
Base Map: Esri and its contributors

0 300 600
Feet

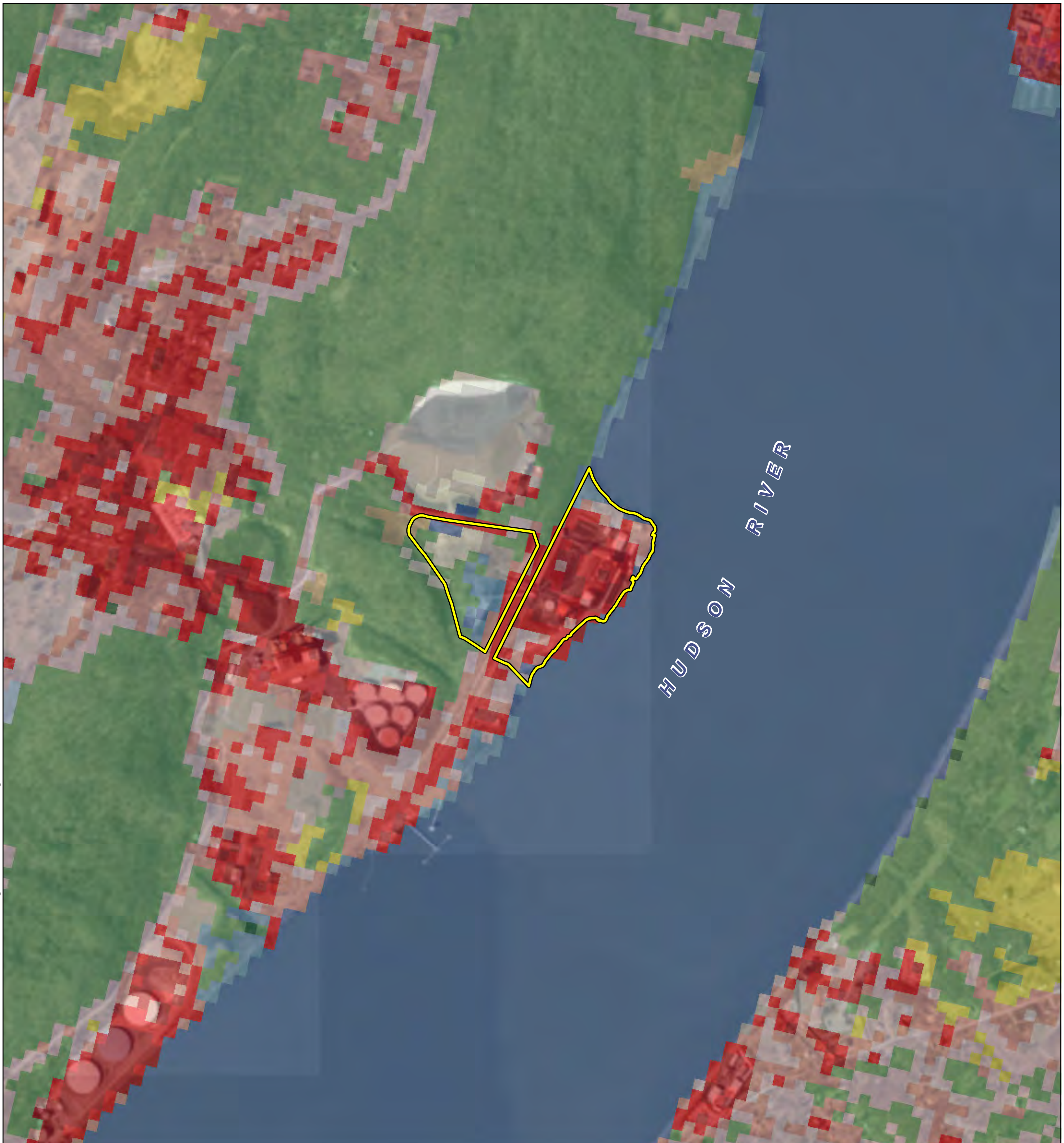
Danskammer Energy, LLC

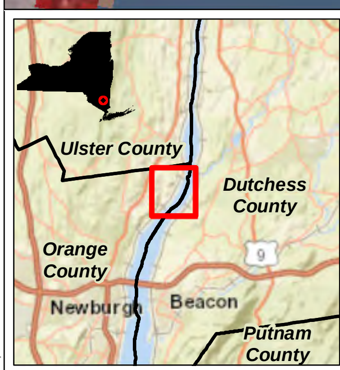
Danskammer Generating Station

Figure 2
Delineated Wetlands and Streams

Town of Newburgh
Orange County, NY

Prepared on 8/8/2019 by TRC





Project

NLCD Land Cover

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

Data Source: NLCD, 2016
Base Map: Esri and its Contributors

N W E S

0 500 1,000
Feet

Danskammer Energy, LLC

Danskammer Generating Station

Figure 3
NLCD Map

Town of Newburgh
Orange County, NY

Prepared on 7/26/2019 by TRC

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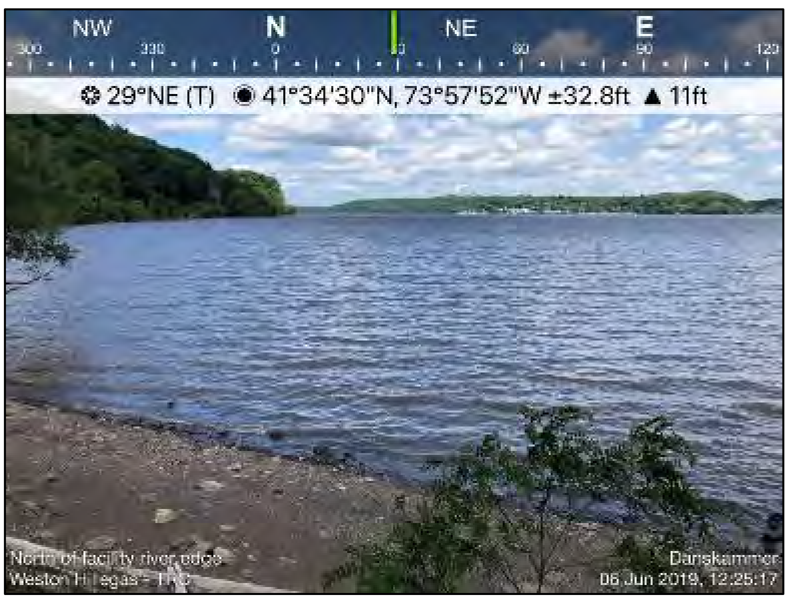
Attachment A. Photograph Log

Photograph 1. Wetland W-1 (PEM), facing northwest adjacent to railroad tracks north of Project Site. Photo taken on 6/6/19.

Photograph 2. Stream S-1, facing east, looking downstream. Photo taken on 6/6/19.

Photograph 3. Active CSX railroad adjacent to W-1 and north of Project Site, facing southwest. Photo taken on 6/6/19.



Photograph 4. View of the Hudson River north of the Project Site, facing north northeast. Photo taken on 6/6/19.

Photograph 5. Stream S-2, looking downstream, facing north northeast, with Hudson River in the background. Photo taken on 6/6/19.

Photograph 6. View of the landfill, facing north northwest, to the north of the Project Area. Photo taken on 6/6/19.

Photograph 7. View of Danskammer Energy Center, from the western parcel, inside the Project Area, facing east. Photo taken on 6/6/19.

Photograph 8. View of S-3 ephemeral drainage, along Danskammer Road, facing east southeast. Photo taken on 6/6/19.

Photograph 9. Stream S-4, in the western parcel, facing east northeast, with Danskammer Road to the east. Photo taken on 6/6/19.

Photograph 10. Lined water retention pond on the western parcel, facing east northeast. Photo taken on 6/6/19.

Photograph 11. Outfall to the western lined water retention pond to the north of Danskammer Road, due north of the western parcel, facing northwest. Photo taken on 6/6/19.

Photograph 12. View of transmission ROW within the western parcel, inside the Project Area, facing southeast. Photo taken on 6/6/19.

Attachment B. NYNHP Correspondence

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

December 4, 2018

Sean Murphy
TRC Solutions
14 Gabriel Drive
Augusta, ME 04330

Re: Danskammer Energy Centre
County: Orange Town/City: Newburgh

Dear Mr. Murphy:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 3 Office, Division of Environmental Permits at dep.r3@dec.ny.gov, (845) 256-3054.

Sincerely,

Heidi J. Krahling

Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program

1321

The following state-listed animals have been documented at or in the vicinity of the project site.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing.

For information about any permit considerations for the project, please contact the NYSDEC Region 3 Office, Department of Environmental Permits, at dep.r3@dec.ny.gov, (845) 256-3054.

The following species has been documented at the project site and nesting within one mile of the project site.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	FEDERAL LISTING	
Birds				
Bald Eagle	*Haliaeetus leucocephalus*	Threatened		5546
Breeding and Nonbreeding				1432

The following species have been documented in the Hudson River and so could occur adjacent to the project site.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	FEDERAL LISTING	
Fish				
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered	Endangered	1091
Atlantic Sturgeon	*Acipenser oxyrinchus*	No Open Season	Endangered	11464

The following species has been documented within 1.5 miles of the project site. Additional locations have been documented within 2.5 miles of the project site. Individual animals may travel 2.5 miles from documented locations. The main impact of concern is the cutting or removal of potential roost trees.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	FEDERAL LISTING	
Mammals				
Indiana Bat	*Myotis sodalis*	Endangered	Endangered	11287
Maternity colony				

This report only includes records from the NY Natural Heritage database.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

Attachment C. USFWS, IPaC Official Species List and Updated List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To: November 12, 2018
Consultation Code: 05E1NY00-2019-SLI-0343
Event Code: 05E1NY00-2019-E-01089
Project Name: Danskammer Energy Center

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/

eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2019-SLI-0343

Event Code: 05E1NY00-2019-E-01089

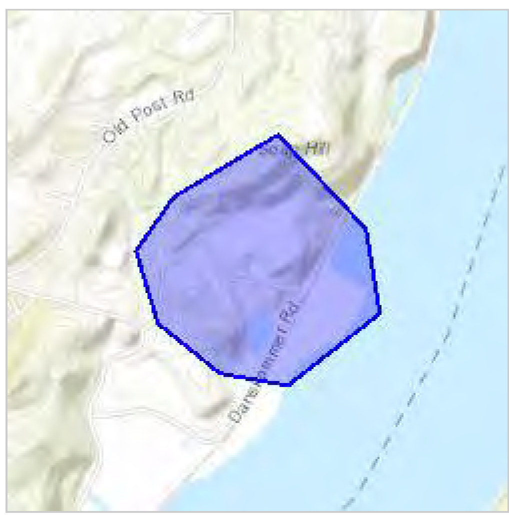
Project Name: Danskammer Energy Center

Project Type: POWER GENERATION

Project Description: Danskammer Energy, LLC ("Danskammer Energy") is proposing to repower its existing 532 megawatt (MW) Danskammer Generating Station (the "Station") located in the Town of Newburgh, Orange County, New York. The Energy Center will be located entirely on Danskammer Energy's property (the "Project Site") located on Danskammer Road in the Town of Newburgh, New York.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.57554897197372N73.96937180344142W



Counties: Orange, NY

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
Dwarf Wedgemussel *Alasmidonta heterodon* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/784 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/363/office/52410.pdf	Endangered

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/742/office/52410.pdf	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Attachment D. Species Conclusion Table

Species Conclusions Table

Project Name: Danskammer Energy Center

Date: August 22, 2019

Species Name	Potential Habitat Present?	Species Present?	Critical Habitat Present?	ESA / Eagle Act Determination (REQUIRED) (e.g. no effect, may affect but not likely to adversely affect, likely to adversely affect, no take, may affect but 4(d) rule).	Notes / Documentation Summary (include full rationale in your report)
Indiana bat (*Myotis sodalis*)	No	No	No	May affect but not likely to adversely affect	The Indiana bat is a federally and New York State listed endangered species. During the winter, Indiana bats hibernate in caves and occasionally abandoned mines. No caves or mines were identified within or in the vicinity of the Project Site. The Indiana bat mates in the fall prior to hibernation and in the spring, emerges and travels to wooded or semi-wooded habitats far from the winter hibernacula for the summer. After the spring emergence, females group to form small maternity colonies, where they give birth to their young. These colonies are located in the crevices or under loose bark in large dead or living trees. Roost trees consist of hollow trees, either dead or alive, and trees with exfoliating bark, and may be located in upland areas or floodplain forests. Occasionally man-made structures, such as sheds or bridges, will also serve as roosts. A consultation letter was sent to the NYNHP on November 5, 2018 and a response was received on December 4, 2018 (Attachment C). The response indicated that Indiana bat has been documented within 1.5 miles of the Project Site and additional locations have been documented within 2.5 miles of the Project Site. The individual animals may travel up to 2.5 miles from documented locations. The main impact of concern is the cutting or removal of potential roost trees. There is no potential roosting habitat found in the Project

					Site. Tree species observed included big-toothed aspen (*Populus grandidentata*), black locust (*Robinia pseudoacacia*), and Russian olive (*Elaeganus angustifolia*). In order to avoid adverse impacts to Indiana bats any tree clearing will be performed at times when the bats are not active (October 1 and March 31) to avoid impacts to roosting bats. Therefore, the Project may affect but is not likely to adversely affect the Indiana bat.
Northern long-eared bat (*Myotis septentrionalis*)	No	No	No	No effect	The northern long-eared bat is a federally and New York State listed threatened species. The northern long-eared bat uses caves and mines for hibernation during the winter. No caves or mines were identified within or in the vicinity of the Project Site. The northern long-eared bat is also found in wooded or semi-wooded habitat during the summer months. This bat utilizes crevices and loose bark on trees for roosting during the summer. A consultation letter was sent to the NYNHP on November 5, 2018 and a response was received on December 4, 2018. The results showed that there are no records of northern long-eared bat within the vicinity of the Project Site (see Attachment C). There is no potential roosting habitat found in the Project Site. Tree species observed included big-toothed aspen, black locust, and Russian olive. As the Project does not occur within a 150-foot radius of a known maternity roost or a within 5 miles of a hibernaculum the Project will have no effect on the northern long-eared bat.
Dwarf wedgemussel (*Alasmidonta heterodon*)	No	No	No	No effect	The dwarf wedgemussel is a federally and New York State listed endangered species. It is found embedded in fine sediment accumulated between cobbles in slow to moderate current and relatively shallow waters (40 cm) in small cool water rivers. There will be no effect on the dwarf wedgemussel or its habitat since the project will occur entirely on land. Best management practices will be utilized to ensure that no

					impacts occur to the Hudson River
Small whorled pogonia (*Isotria medeoloides*)	No	No	No	No effect	The small whorled pogonia is a federally listed threatened species and New York State proposed candidate species. It inhabits mixed-deciduous or mixed-deciduous/coniferous forests with moist, acidic soils and has only been identified once in New York State since 1976 in Schunnemunk Mountain State Park. The habitat on the Project Site is primarily developed area, successional northern hardwoods, mowed lawn, riprap/erosion control roadside, and interior of non-agricultural building land. Due to this there will be no effect on the small whorled pogonia since its preferred habitat is not present.
Bald eagle (*Haliaeetus leucocephalus*)	Yes	Yes	No	May affect but not likely to adversely affect	Bald eagles choose the tops of large trees to build nests, which they often enlarge each year. They may also nest in cliffs or on the ground, in treeless regions. Bald eagles generally avoid areas with human activities and perch in either deciduous or coniferous trees. The Hudson River is located adjacent to the site and is known foraging habitat for bald eagle. While bald eagles have been observed by plant staff perching in a small stand of trees adjacent to the river on a portion of the site, no bald eagle nests have been observed in the Project Site. Additionally, a consultation letter was sent to the NYNHP on November 5, 2018 and a response was received on December 4, 2018. The results showed that bald eagles have been documented at the Project Site and nesting within one mile of the Project Site (see Attachment C). It is unlikely that the proposed project will impact the bald eagle because there is already an existing power generating facility on-site. There will likely be some additional noise during construction but post-construction the actions at the site will be similar to what is existing, so there will be no

					impacts outside of what the eagles foraging in the vicinity of the Project Site are already used to.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

December 4, 2018

Sean Murphy
TRC Solutions
14 Gabriel Drive
Augusta, ME 04330

Re: Danskammer Energy Centre
County: Orange Town/City: Newburgh

Dear Mr. Murphy:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 3 Office, Division of Environmental Permits at dep.r3@dec.ny.gov, (845) 256-3054.

Sincerely,

Heidi J Krahling

Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program

1321

The following state-listed animals have been documented at or in the vicinity of the project site.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing.

For information about any permit considerations for the project, please contact the NYSDEC Region 3 Office, Department of Environmental Permits, at dep.r3@dec.ny.gov, (845) 256-3054.

The following species has been documented at the project site and nesting within one mile of the project site.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*FEDERAL LISTING*	
Birds				
Bald Eagle	*Haliaeetus leucocephalus*	Threatened		5546
Breeding and Nonbreeding				1432

The following species have been documented in the Hudson River and so could occur adjacent to the project site.

Fish				
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered	Endangered	1091
Atlantic Sturgeon	*Acipenser oxyrinchus*	No Open Season	Endangered	11464

The following species has been documented within 1.5 miles of the project site. Additional locations have been documented within 2.5 miles of the project site. Individual animals may travel 2.5 miles from documented locations. The main impact of concern is the cutting or removal of potential roost trees.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*FEDERAL LISTING*	
Mammals				
Indiana Bat	*Myotis sodalis*	Endangered	Endangered	11287
Maternity colony				

This report only includes records from the NY Natural Heritage database.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

TRC
2801 Wehrle Dr., Suite 8
Williamsville, NY 14221
T 716.204.9543
TRCcompanies.com

August 26, 2019

New York State Department of Environmental Conservation Region 3
Attn: Ms. Lisa Masi, Regional Wildlife Biologist
21 South Putt Corners Road
New Paltz, NY 12561
Sent online via dep.r3@dec.ny.gov

Subject: Danskammer Energy, LLC
Danskammer Energy Center
Town of Newburgh, Orange County, New York
Information Request

Dear Ms. Masi,

Danskammer Energy, LLC (the Client) is proposing to repower its Danskammer Generating Station site (the Project) on tax parcel 8-1-78.2-1 and 8-1-80, located in the Town of Newburgh, Orange County, New York. The proposed repowering will result in a new modern energy center at the existing site through the installation of a new, state-of-the art electric generator. The new facility, to be named the Danskammer Energy Center, will provide a more efficient and cost-effective facility to produce electricity while reducing existing environmental impacts on the surrounding communities and providing tax benefits into the future. The Project Site is approximately 106 acres in size and encompasses the current Danskammer Generating Station and its associated buildings. The Project Area for Danskammer includes two parcels, one the east of the operating CSX railroad tracks, where it is currently operating, and a second to the west of the CSX railroad tracks. Figure 1 shows the Project Area boundaries.

The Project Site consists primarily of developed area and successional northern hardwoods, with 0.65 acre of palustrine forested (PFO) and palustrine emergent marsh (PEM) wetlands (as identified during a wetland delineation on June 6 and 7, 2019. Dominant vegetation on the Project Site includes tulip tree (*Liriodendron tulipifera*), northern spicebush (*Lindera benzoin*), garlic mustard (*Alliaria petiolata*), and white clover (*Trifolium repens*). The Project Site is surrounded by successional northern hardwoods and developed land. See Figure 2 for a Wetland Delineation Map and Figure 3 for a map of land cover data from the National Land Cover Database. Attachment A includes representative photographs of the Project Site.

Ground disturbance associated with construction of the Project will occur only in areas that have been previously developed or disturbed. There will be approximately 45 acres of trees removed from the Project Site for installation of the Project. No work will occur in the Hudson River and best management practices will be in place for erosion and sediment control.

Required permits include: Prevention of Significant Deterioration (PSD) Permit, Major Oil Storage Facility permit, State Pollutant Discharge Elimination System (SPDES) Permit, and a Certificate of Environmental Compatibility and Public Need (Article 10 approval).

There were three wetlands (identified by TRC as W-1 through W-3) within the Project Site that were likely jurisdictional by the US Army Corps of Engineers (USACE). There were four ephemeral waterbody (S-3, S-4, S-5, and S-6) and two intermittent waterbodies (S-1 and S-2) identified within the Project Site under USACE jurisdiction. One waterbody, the Hudson River, is found within the Project Site and classified as Class A by NYSDEC. This stream will be jurisdictional to both the USACE and NYSDEC. The layout for the Project avoids wetlands and waterbodies. There are no NYSDEC-regulated wetlands or waterbodies within the Project footprint; therefore, a Freshwater Wetlands Article 24 Permit and an Article 15 Permit under the Environmental Conservation Law (ECL) will not be required.

On behalf of Danskammer Energy, TRC consulted the NYSDEC Environmental Resource Mapper as a first step in determining the presence of rare or state-listed animals or plants, significant natural communities, or other significant habitats in the immediate vicinity of the Project. The results of the search revealed the potential presence of “Rare Plants and Rare Animals” in the vicinity of the Project. No significant natural communities were identified as occurring within the vicinity of the Project.

TRC prepared a consultation letter to the New York Natural Heritage Program (NYNHP) on November 5, 2018 requesting a review and confirmation of the latest NYNHP-Information Service records for the presence of rare or state-listed plants, animals, significant natural communities, or other significant habitats in the vicinity of the Project. A response was received on December 4, 2018 indicating that the following listed species have been documented at locations in the vicinity of the Project Site (see Attachment C):

- Bald eagle (*Haliaeetus leucocephalus*) – NYS Threatened Species. The species has been documented at the project site and nesting within one mile of the project site.
- Shortnose sturgeon (*Acipenser brevirostrum*) – NYS Endangered Species. The species has been documented in the Hudson River and so could occur adjacent to the project site.
- Atlantic sturgeon (*Acipenser oxyrinchus*) – No Open Season in NYS. The species has been documented in the Hudson River and so could occur adjacent to the project site.
- Indiana bat (*Myotis sodalis*) – NYS Endangered Species. The species has been documented within 1.5 miles of the project site. Additional locations have been documented within 2.5 miles of the project site. Individual animals may travel 2.5 miles from the documented locations. The main impact of concern is the cutting or removal of potential roost trees.

TRC also received an official species list through IPaC from the United States Fish and Wildlife Service (USFWS) on November 12, 2018 (see Attachment D) indicating that four threatened, endangered, proposed and candidate species may occur within the boundary of the Project and/or may be affected by the Project. The four species include Indiana bat, northern long-eared bat (*Myotis septentrionalis*), dwarf wedgemussel (*Alasmidonta heterodon*), and small whorled pogonia (*Isotria medeoloides*). A consultation package was sent to USFWS on August 26, 2019to request a follow-up review on the species identified.

TRC is requesting herein a review and confirmation of the most up to date records for rare, threatened, endangered or state-listed species, significant natural communities, or other significant habitats in the vicinity of the Project Site and concurrence that NYSDEC agrees with TRC's determinations of effects to resources as outlined in Attachment C: Species/Community Conclusions Table. The information derived from this data request will support environmental assessments and due diligence. TRC can provide a shape (SHP) file of the Danskammer Energy Site to assist in your review if requested. As noted above, a bald eagle was identified as nesting within one mile of the Project site. TRC requests that NYSDEC share the location of this nest so that it can better be avoided during the design stages.

If you have any questions regarding the Project or the request herein, please contact me at TRC by calling 716-221-4128 or via email at KMcCormick@trccompanies.com.

Sincerely,

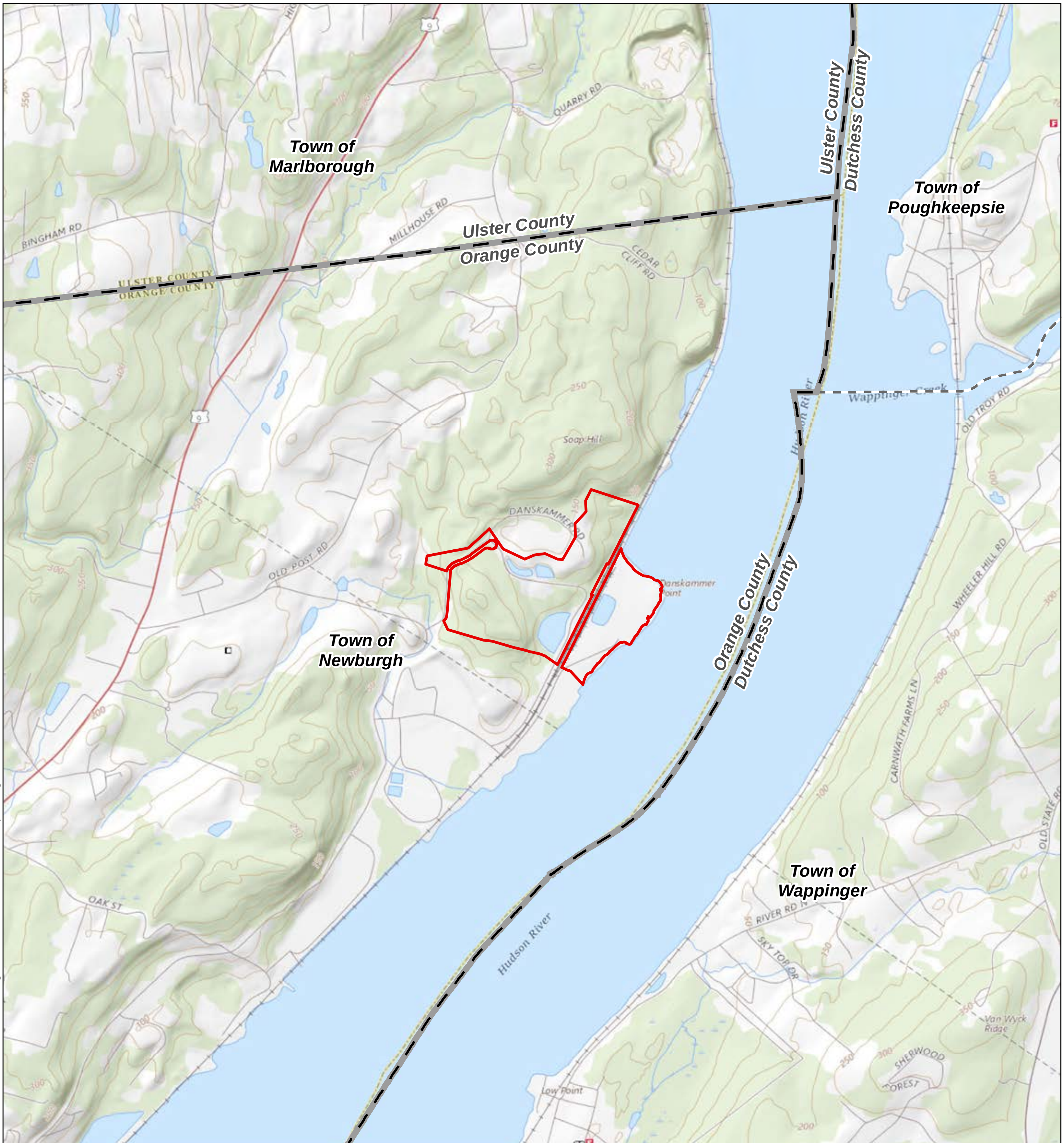
Kaitlin McCormick

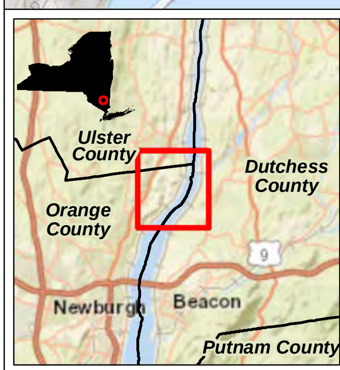
Kaitlin McCormick
Project Manager

cc: Howard Taylor (Danskammer)
Michael Keller (TRC)

Figures: Figure 1. Site Location Map
Figure 2. Wetland Delineation Map
Figure 3. NLCD Map

Attachments: Attachment A. Photograph Log
Attachment B. Species/Community Conclusions Table
Attachment C. NYNHP Correspondence
Attachment D. USFWS Response





Project Area
Municipal Boundary
County Boundary

Base Map: USGS/The National Map

0 1,000 2,000
Feet

Danskammer Energy, LLC

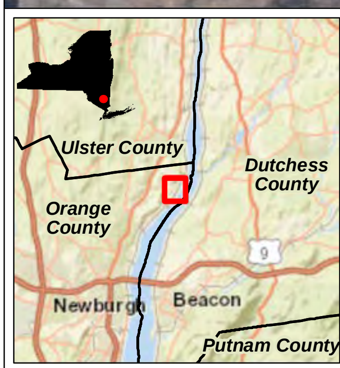
Danskammer Generating Station

Figure 1
Site Location Map

Town of Newburgh
Orange County, NY

Prepared on 8/8/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\Figures\Wetland_Delineation_Report\Fig1 SiteLocation USGS 2019-08-08.mxd



- Project Area
- Non-Jurisdictional Drainage
- Delineated Stream Line
- Delineated Waterbody/Retention Pond
- Delineated Wetland
- Estuarine and Marine Deepwater
- Municipal Boundary
- County Boundary

Data: TRC
Base Map: Esri and its contributors

N W E S

0 300 600
Feet

Danskammer Energy, LLC

Danskammer Generating Station

Figure 2
Delineated Wetlands and Streams

Town of Newburgh
Orange County, NY

Prepared on 8/8/2019 by TRC

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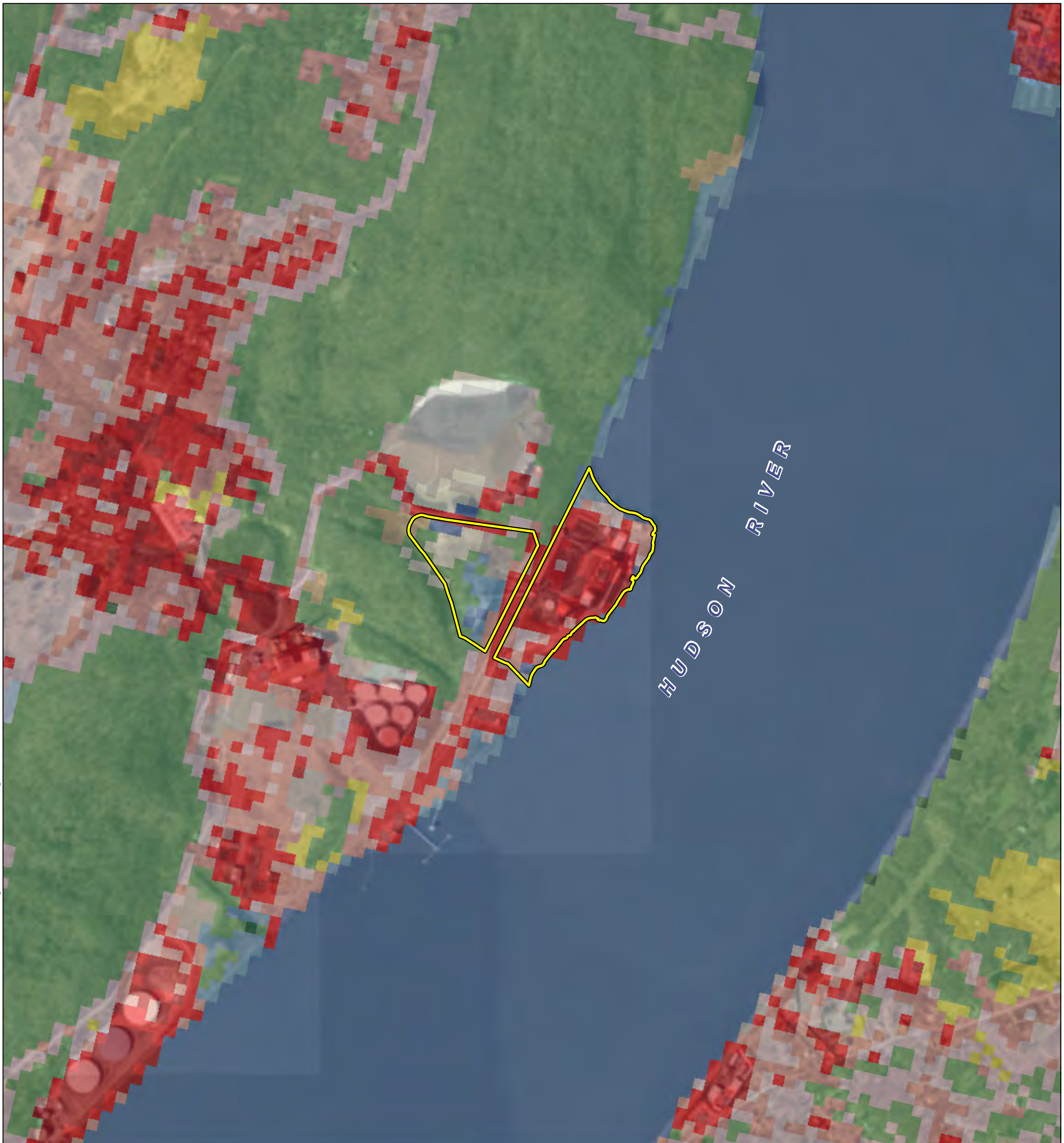
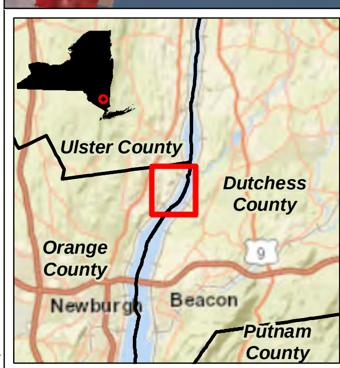




Project

NLCD Land Cover

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

N W E S

0 500 1,000
Feet

Data Source: NLCD, 2016
Base Map: Esri and its Contributors

Danskammer Energy, LLC

Danskammer Generating Station

Figure 3
NLCD Map

Town of Newburgh
Orange County, NY

Prepared on 7/26/2019 by TRC

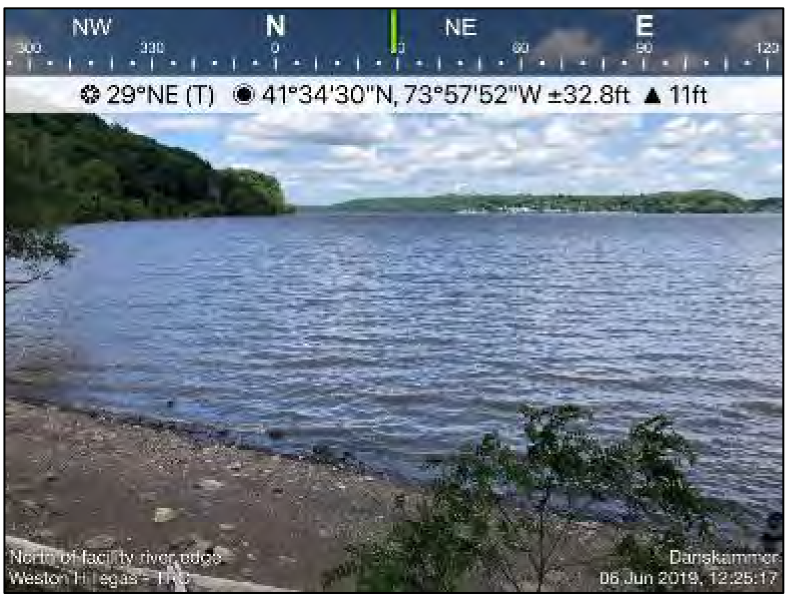
\\apaenvfile01\GIS\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\Figures\Consultation\Fig3 NLCD 2019-07-26.mxd

Attachment A. Photograph Log

Photograph 1. Wetland W-1 (PEM), facing northwest adjacent to railroad tracks north of Project Site. Photo taken on 6/6/19.

Photograph 2. Stream S-1, facing east, looking downstream. Photo taken on 6/6/19.

Photograph 3. Active CSX railroad adjacent to W-1 and north of Project Site, facing southwest. Photo taken on 6/6/19.



Photograph 4. View of the Hudson River north of the Project Site, facing north northeast. Photo taken on 6/6/19.

Photograph 5. Stream S-2, looking downstream, facing north northeast, with Hudson River in the background. Photo taken on 6/6/19.

Photograph 6. View of the landfill, facing north northwest, to the north of the Project Area. Photo taken on 6/6/19.

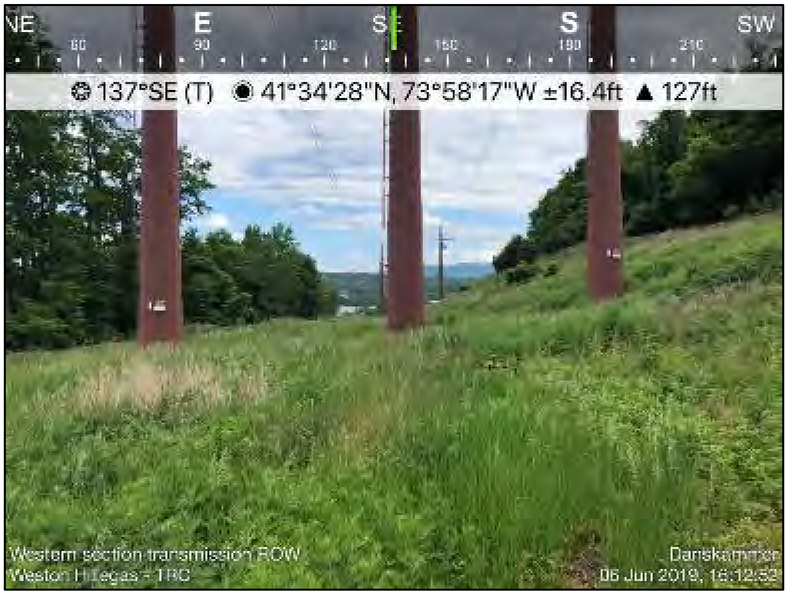
Photograph 7. View of Danskammer Energy Center, from the western parcel, inside the Project Area, facing east. Photo taken on 6/6/19.

Photograph 8. View of S-3 ephemeral drainage, along Danskammer Road, facing east southeast. Photo taken on 6/6/19.

Photograph 9. Stream S-4, in the western parcel, facing east northeast, with Danskammer Road to the east. Photo taken on 6/6/19.

Photograph 10. Lined water retention pond on the western parcel, facing east northeast. Photo taken on 6/6/19.

Photograph 11. Outfall to the western lined water retention pond to the north of Danskammer Road, due north of the western parcel, facing northwest. Photo taken on 6/6/19.



Photograph 12. View of transmission ROW within the western parcel, inside the Project Area, facing southeast. Photo taken on 6/6/19.

Attachment B. Species/Community Conclusions Table

Species/Community Conclusions Table

Project Name: Danskammer Energy, LLC
Danskammer Energy Center

Date: August 22, 2019

Species/ Community Name	Status	Comments from NYNHP	Potential Habitat Present?	Species Present?	Preferred Species Habitat	Project Effect on Species/Habitat
Bald eagle (*Haliaeetus leucocephalus*)	NYS – Threatened	Documented at the project site and nesting within one mile of the project site.	Yes	Yes	Bald eagles choose the tops of large trees to build nests, which they often enlarge each year. They may also nest in cliffs or on the ground, in treeless regions. Bald eagles generally avoid areas with human activities and perch in either deciduous or coniferous trees.	The documented bald eagle nest is located within one mile of the proposed facility. It is unlikely that the proposed project will impact the bald eagle because there is already an existing power generating facility on-site. There will likely be some additional noise during construction but post-construction the actions at the site will be similar to what is existing, so there will be no impacts outside of what the nesting eagles are already used to.
Shortnose sturgeon (*Acipenser brevirostrum*)	NYS – Endangered Federally – Endangered	Documented in the Hudson River; could occur adjacent to the project site.	No	No	In New York State, shortnose sturgeon inhabit the Hudson River estuary. Individuals may inhabit various water depths and substrate types, but they generally prefer deep pools	There will be no effect on the shortnose sturgeon or its habitat since the project will occur entirely on land. Best management practices will be utilized to ensure that no impacts occur to the

Species/ Community Name	Status	Comments from NYNHP	Potential Habitat Present?	Species Present?	Preferred Species Habitat	Project Effect on Species/Habitat
					with soft substrates and vegetated bottoms. Spawning occurs upriver from summer foraging and nursery grounds over rubble substrate with some gravel and large rocks. Juveniles are found in the river near the salt front while older individuals spend time in the lower estuary or go out to sea.[1]	Hudson River.
Atlantic sturgeon (*Acipenser oxyrinchus*)	Protected - No Open Season[2] in NYS Federally – Endangered	Documented in the Hudson River; could occur adjacent to the project site.	No	No	The Atlantic sturgeon is found in the Hudson River north to Albany but is usually confined to the deeper parts of the river. Adults spend most of their time at sea while juveniles spend the first years of their lives in freshwater streams.[3]	There will be no effect on the Atlantic sturgeon or its habitat since the project will occur entirely on land. Best management practices will be utilized to ensure that no impacts occur to the Hudson River.
Indiana bat *(Myotis sodalis)*	NYS – Endangered Federally – Endangered	Within 2.4 miles of the Project Site is a documented summer maternity colony of Indiana bat (*Myotis sodalis*). The bats	Yes	Unlikely	During the winter, Indiana bats hibernate in caves and occasionally abandoned mines. These bats need cool, humid caves with stable temperatures, under 50° F but	During the site visit in June 2019 trees that were large enough to be used as potential Indiana bat roosting habitat was identified in the vicinity of the Project Site. Tree species observed included big-

Species/ Community Name	Status	Comments from NYNHP	Potential Habitat Present?	Species Present?	Preferred Species Habitat	Project Effect on Species/Habitat
		may travel 2.5 miles or more from documented locations.			above freezing for hibernation. The Indiana bat mates in the fall prior to hibernation and in the spring, emerges and travels to wooded or semi-wooded habitats far from the winter hibernacula for the summer. After the spring emergence, females group to form small maternity colonies, where they give birth to their young. These colonies are located in the crevices or under loose bark in large dead or living trees. Roost trees consist of hollow trees, either dead or alive, and trees with exfoliating bark, and may be located in upland areas or floodplain forests. Occasionally man-made structures, such as sheds or bridges, will also serve as roosts.	toothed aspen (*Populus grandidentata*), black locust (*Robinia pseudoacacia*), and Russian olive (*Elaeganus angustifolia*). The Project will require limited tree clearing as the Site is mostly developed areas, mowed lawn, and successional northern hardwoods. Approximately 45 acres of land with trees will be cleared. Tree clearing will be performed during of the seasonal clearing restrictions for the Indiana bat (October 1 and March 31). No caves or mines are located within or in the vicinity of the Project Site. Therefore, the Project may impact potential habitat for the Indiana bat, but will not impact the species. A consultation letter was sent to the USFWS on [insert date], 2019.

Species/ Community Name	Status	Comments from NYNHP	Potential Habitat Present?	Species Present?	Preferred Species Habitat	Project Effect on Species/Habitat

[1] New York Natural Heritage Program. 2019. Online Conservation Guide for *Acipenser brevirostrum*. Available from: https://guides.nynhp.org/shortnose-sturgeon/. Accessed July 16, 2019.
[2] New York State regulations specifically do not set any open seasons, and possession and taking of the species is not permitted at any time in New York.
[3] New York Natural Heritage Program. 2019. Online Conservation Guide for *Acipenser oxyrinchus*. Available from: https://guides.nynhp.org/atlantic-sturgeon/. Accessed July 16, 2019.

Attachment C. NYNHP Correspondence

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

December 4, 2018

Sean Murphy
TRC Solutions
14 Gabriel Drive
Augusta, ME 04330

Re: Danskammer Energy Centre
County: Orange Town/City: Newburgh

Dear Mr. Murphy:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 3 Office, Division of Environmental Permits at dep.r3@dec.ny.gov, (845) 256-3054.

Sincerely,

Heidi J. Krahling

Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program

1321

The following state-listed animals have been documented at or in the vicinity of the project site.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing.

For information about any permit considerations for the project, please contact the NYSDEC Region 3 Office, Department of Environmental Permits, at dep.r3@dec.ny.gov, (845) 256-3054.

The following species has been documented at the project site and nesting within one mile of the project site.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	FEDERAL LISTING	
Birds				
Bald Eagle	*Haliaeetus leucocephalus*	Threatened		5546
Breeding and Nonbreeding				1432

The following species have been documented in the Hudson River and so could occur adjacent to the project site.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	FEDERAL LISTING	
Fish				
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered	Endangered	1091
Atlantic Sturgeon	*Acipenser oxyrinchus*	No Open Season	Endangered	11464

The following species has been documented within 1.5 miles of the project site. Additional locations have been documented within 2.5 miles of the project site. Individual animals may travel 2.5 miles from documented locations. The main impact of concern is the cutting or removal of potential roost trees.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	FEDERAL LISTING	
Mammals				
Indiana Bat	*Myotis sodalis*	Endangered	Endangered	11287
Maternity colony				

This report only includes records from the NY Natural Heritage database.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

Attachment D. USFWS Response

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To: November 12, 2018
Consultation Code: 05E1NY00-2019-SLI-0343
Event Code: 05E1NY00-2019-E-01089
Project Name: Danskammer Energy Center

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*.). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq*.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/

eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2019-SLI-0343

Event Code: 05E1NY00-2019-E-01089

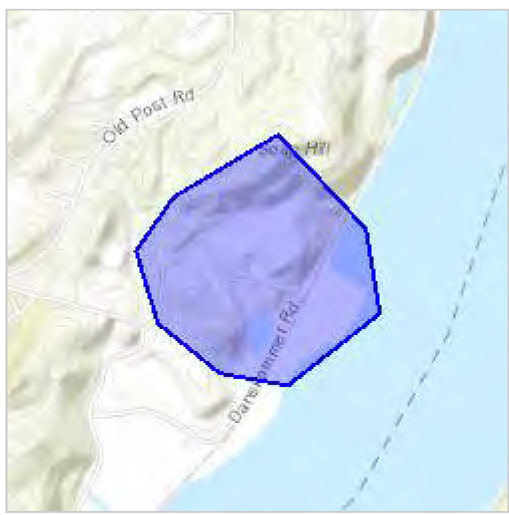
Project Name: Danskammer Energy Center

Project Type: POWER GENERATION

Project Description: Danskammer Energy, LLC ("Danskammer Energy") is proposing to repower its existing 532 megawatt (MW) Danskammer Generating Station (the "Station") located in the Town of Newburgh, Orange County, New York. The Energy Center will be located entirely on Danskammer Energy's property (the "Project Site") located on Danskammer Road in the Town of Newburgh, New York.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.57554897197372N73.96937180344142W



Counties: Orange, NY

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
Dwarf Wedgemussel *Alasmidonta heterodon* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/784 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/363/office/52410.pdf	Endangered

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/742/office/52410.pdf	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

TRC
2801 Wehrle Dr., Suite 8
Williamsville, NY 14221
T 716.204.9543
TRCcompanies.com

August 26, 2019

Ms. Karen Greene
NOAA Fisheries
55 Great Republic Drive
Gloucester, MA 01930

Re: Essential Fish Habitat, Danskammer Energy, LLC, Danskammer Energy Center, Town of Newburgh, Orange County, New York

Dear Ms. Greene,

Under the Magnuson-Stevens Fishery Conservation and Management Act, essential fish habitat (EFH) must be identified and protected for species managed under the Act. The EFH regulations define an "adverse effect" as any impact that reduces quality and/or quantity of EFH and may include direct or indirect impacts. Consultation with the National Oceanic and Atmospheric Administration (NOAA) Fisheries is required for any actions that may adversely affect EFH.

Proposed Project

Danskammer Energy, LLC (the Client) is proposing to repower its existing nameplate 532-megawatt (MW) Danskammer Generating Station site (the Project) at 41° 34' 18.75" North Latitude, 73° 57' 59.61" West Longitude (NAD83 coordinate system) on Danskammer Road in the Town of Newburgh, Orange County, New York, with a state-of-the-art natural gas fired combined cycle power generation (the Project) (see Figure 1). Using best-in-class technology, the Project will be built in a 1-on-1 combined cycle configuration, utilizing a gas combustion turbine and steam turbine generator, with a total optimal net capability of approximately 536 megawatts (the "Energy Center"). The new Energy Center intends to utilize the existing electric transmission and natural gas interconnections from the Station and will run on natural gas, with ultra-low sulfur diesel fuel oil ("ULSD") as the backup fuel. The Energy Center will be capable of operating as a baseload unit and will also include specific operational upgrades designed to support New York State's renewable energy focused electric grid. These features include quick start and enhanced ramping capability to provide important support for the reliable operation of the New York State Bulk Electric System as electricity supply from intermittent generation sources increases. The Project Site is approximately 106 acres in size and encompasses the current Danskammer Generating Station and its associated buildings. The Project Area for Danskammer includes two parcels, one the east of the operating CSX railroad tracks, where it is currently operating, and a second to the west of the CSX railroad tracks. Figure 1 shows the Project Site boundaries.

The Project Site is based the proposed general Project layout. Future filings with the Siting Board may further refine the Project Site based on input from the public, stakeholders and the affected agencies through the Article 10 process and good engineering principles. Construction is expected to begin in the first quarter of 2021 for a duration of 30 to 36 months.

Description of the Project Site
The Project Site is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action”. For this project, the action area includes tax parcels 8-1-78.2-1 and 8-1-80, located on Danskammer Road at 41°34’22” N 73°57’26” W in the Town of Newburgh, Orange County, New York. The Project location is adjacent to the Hudson River. This area is expected to encompass all the effects of the proposed Project (see Figure 1).

Essential Fish Habitat in the Project Area
A review of essential fish habitat (EFH) reveals that there is habitat for winter flounder (*Pseudopleuronectes americanus*), little skate (*Leucoraja erinacea*), Atlantic herring (*Clupea harengus*), red hake (*Urophycis chuss*), windowpane flounder (*Scophthalmus aquosus*), winter skate (*Leucoraja ocellate*), clearnose skate (*Raja eglanteria*), longfin inshore squid (*Doryteuthis pealeii*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), and summer flounder (*Paralichthys dentatus*) in the vicinity of the Project Site (Attachment C). A completed EFH Assessment Worksheet is also provided in Attachment C.

Figure 2 shows the field delineated wetland and waterbodies on the Project site. These features should not be considered EFH as there are barriers preventing the passage of fish from the Hudson River to the delineated wetlands and waterbodies.

Using the information provided, we request a consultation from NOAA Fisheries to provide EFH conservation recommendations. We have separately requested input from NOAA Fisheries Service Protected Resources Division regarding federally listed species under its jurisdiction.

For additional information, please contact me at the address listed above.

Sincerely,

Kaitlin McCormick

Kaitlin McCormick
Project Manager – TRC

cc: Howard Taylor (Danskammer)
Michael Keller (TRC)

Figures: Figure 1. Site Location Map
Figure 2. Wetland Delineation Map

Attachments: Attachment A. Photograph Log
Attachment B. Essential Fish Habitat Worksheet

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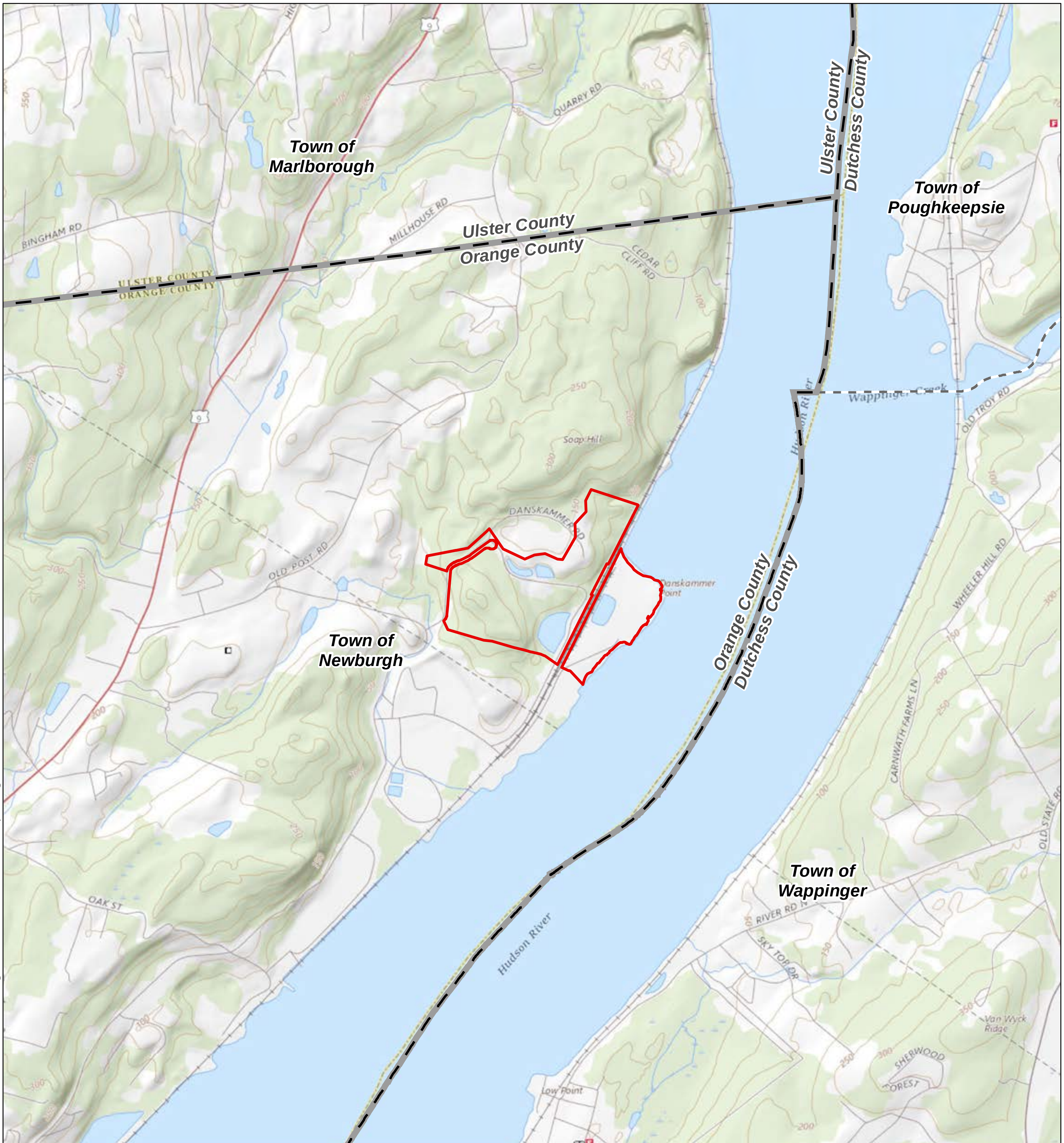
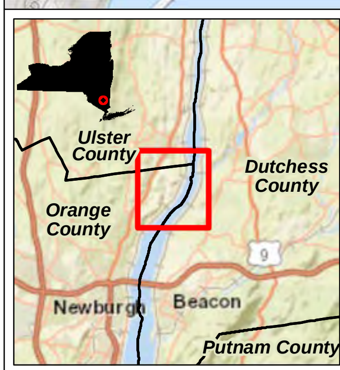




Project Area

Municipal Boundary

County Boundary

Base Map: USGS/The National Map

N W E S

0 1,000 2,000

Feet

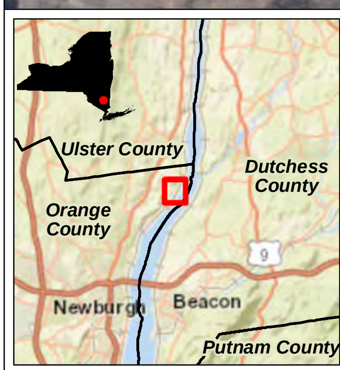
Danskammer Energy, LLC

Danskammer Generating Station

Figure 1
Site Location Map

Town of Newburgh
Orange County, NY

Prepared on 8/8/2019 by TRC



Project Area
Non-Jurisdictional Drainage
Delineated Stream Line
Delineated Waterbody/Retention Pond
Delineated Wetland
Estuarine and Marine Deepwater
Municipal Boundary
County Boundary

N
W E
S

0 300 600
Feet

Data: TRC
Base Map: Esri and its contributors

Danskammer Energy, LLC

Danskammer Generating Station

Figure 2
Delineated Wetlands and Streams

Town of Newburgh
Orange County, NY

Prepared on 8/8/2019 by TRC

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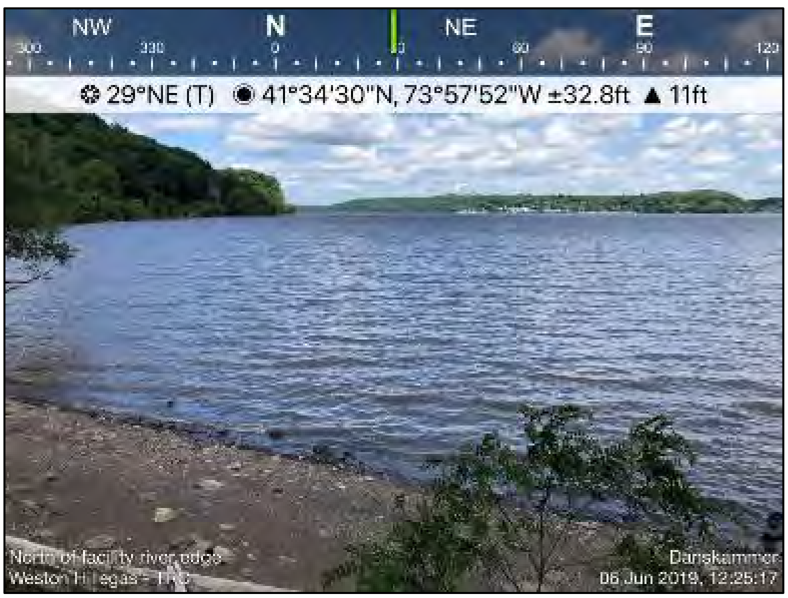
Attachment A. Photograph Log

Photograph 1. Wetland W-1 (PEM), facing northwest adjacent to railroad tracks north of Project Site. Photo taken on 6/6/19.

Photograph 2. Stream S-1, facing east, looking downstream. Photo taken on 6/6/19.

Photograph 3. Active CSX railroad adjacent to W-1 and north of Project Site, facing southwest. Photo taken on 6/6/19.



Photograph 4. View of the Hudson River north of the Project Site, facing north northeast. Photo taken on 6/6/19.

Photograph 5. Stream S-2, looking downstream, facing north northeast, with Hudson River in the background. Photo taken on 6/6/19.

Photograph 6. View of the landfill, facing north northwest, to the north of the Project Area. Photo taken on 6/6/19.

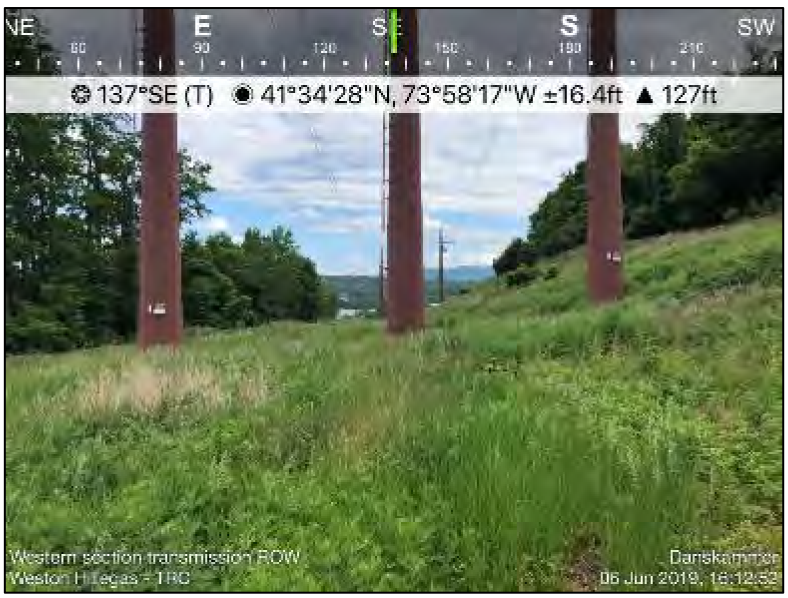
Photograph 7. View of Danskammer Energy Center, from the western parcel, inside the Project Area, facing east. Photo taken on 6/6/19.

Photograph 8. View of S-3 ephemeral drainage, along Danskammer Road, facing east southeast. Photo taken on 6/6/19.

Photograph 9. Stream S-4, in the western parcel, facing east northeast, with Danskammer Road to the east. Photo taken on 6/6/19.

Photograph 10. Lined water retention pond on the western parcel, facing east northeast. Photo taken on 6/6/19.

Photograph 11. Outfall to the western lined water retention pond to the north of Danskammer Road, due north of the western parcel, facing northwest. Photo taken on 6/6/19.



Photograph 12. View of transmission ROW within the western parcel, inside the Project Area, facing southeast. Photo taken on 6/6/19.

Attachment B. Essential Fish Habitat Worksheet

NOAA FISHERIES
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
Essential Fish Habitat (EFH) Consultation Guidance
EFH ASSESSMENT WORKSHEET

Introduction:

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates that federal agencies conduct an essential fish habitat (EFH) consultation with NOAA Fisheries regarding any of their actions authorized, funded, or undertaken that may adversely affect EFH. An adverse effect means any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

This worksheet has been designed to assist in determining whether a consultation is necessary and in preparing EFH assessments. This worksheet should be used as your EFH assessment or as a guideline for the development of your EFH assessment. At a minimum, all the information required to complete this worksheet should be included in your EFH assessment. If the answers in the worksheet do not fully evaluate the adverse effects to EFH, we may request additional information in order to complete the consultation.

An expanded EFH assessment may be required for more complex projects in order to fully characterize the effects of the project and the avoidance and minimization of impacts to EFH. While the EFH worksheet may be used for larger projects, the format may not be sufficient to incorporate the extent of detail required, and a separate EFH assessment may be developed. However, regardless of format, the analysis outlined in this worksheet should be included for an expanded EFH assessment, along with additional information that may be necessary. This additional information includes:

- the results of on-site inspections to evaluate the habitat and site-specific effects
- the views of recognized experts on the habitat or the species that may be affected
- a review of pertinent literature and related information
- an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH.

Your analysis of adverse effects to EFH under the MSA should focus on impacts to the habitat for all life stages of species with designated EFH, rather than individual responses of fish species. Fish habitat includes the substrate and benthic resources (e.g., submerged aquatic vegetation, shellfish beds, salt marsh wetlands), as well as the water column and prey species.

Consultation with us may also be necessary if a proposed action results in adverse impacts to other NOAA-trust resources. Part 6 of the worksheet is designed to help assess the effects of the action on other NOAA-trust resources. This helps maintain efficiency in our interagency coordination process. In addition, further consultation may be required if a proposed action impacts marine mammals or threatened and endangered species for which we are responsible. Staff from our Greater Atlantic Regional Fisheries Office, Protected Resources Division should be contacted regarding potential impacts to marine mammals or threatened and endangered species.

Instructions for Use:

Federal agencies must submit an EFH assessment to NOAA Fisheries as part of the EFH consultation. Your EFH assessment must include:

1) A description of the proposed action.
2) An analysis of the potential adverse effects of the action on EFH, and the managed species.
3) The federal agency's conclusions regarding the effects of the action on EFH.
4) Proposed mitigation if applicable.

In order for this worksheet to be considered as your EFH assessment, you must answer the questions in this worksheet fully and with as much detail as available. Give brief explanations for each answer.

Federal action agencies or the non-federal designated lead agency should submit the completed worksheet to NOAA Fisheries Greater Atlantic Regional Fisheries Office, Habitat Conservation Division (HCD) with the public notice or project application. Include project plans showing existing and proposed conditions, all waters of the U.S. on the project site, with mean low water (MLW), mean high water (MHW), high tide line (HTL), and water depths clearly marked and sensitive habitats mapped, including special aquatic sites (submerged aquatic vegetation, saltmarsh, mudflats, riffles and pools, coral reefs, and sanctuaries and refuges), hard bottom habitat areas and shellfish beds, as well as any available site photographs.

For most consultations, NOAA Fisheries has 30 days to provide EFH conservation recommendations once we receive a complete EFH assessment. Submitting all necessary information at once minimizes delays in review and keeps review timelines consistent. Delays in providing a complete EFH assessment can result in our consultation review period extending beyond the public comment period for a particular project.

The information contained in the HCD Consultation website and NOAA's EFH Mapper will assist you in completing this worksheet. All the information you need to determine which species and life stages are designated in your project location is accessible in the Mapper. When you first open the Mapper, choose the Greater Atlantic Region, then zoom into the area of interest and use the Location Query Tab to generate a table showing all the designated species and life stages at any given location. The tables can be printed. Just remember that EFH designations consist of a map and a text description: you need to check the text descriptions to make sure that the actual habitat conditions (e.g., depth, type of substrate) at the mapped location match the description. There are links to the text descriptions in the tables that pop up when you do a Location Query. You can also use the Mapper to display an entire EFH map for any species and life stage throughout the region and to display maps of Habitat Areas of Particular Concern (HAPCs), which are areas of particularly important EFH that receive extra scrutiny when a consultation is conducted. Spatial EFH data for your use in GIS can be downloaded by going to the Data Inventory.

Please note that there is no map for summer flounder HAPC - it exists anywhere there is submerged aquatic vegetation (SAV) - and that the map and descriptions for Atlantic salmon EFH and HAPC are reached using a link in the Warning box that opens up when you first bring up the regional map. If you have any questions, please check with the appropriate HCD staff member for your area.

EFH ASSESSMENT WORKSHEET FOR FEDERAL AGENCIES (modified 3/2016)

PROJECT NAME: Danskammer Energy Center

DATE: 07/18/2019

PROJECT NO.:

LOCATION (Water body, county, physical address):

The project is located adjacent to the Hudson River in the Town of Newburgh, Orange County, New York. The coordinates of the project site are approximately 41o 34' 18.75" North Latitude, 73o 57' 59.61" West Longitude (NAD83 coordinate system).

PREPARER: TRC Companies, Inc.

Step 1: Use NOAA's EFH Mapper to generate the list of designated EFH for federally-managed species and life stages for the geographic area of interest. Use this list as part of the initial screening process to determine if EFH for those species occurs in the vicinity of the proposed action. The list can be included as an attachment to the worksheet. Make a preliminary determination on the need to conduct an EFH consultation.

1. INITIAL CONSIDERATIONS

EFH Designations	Yes	No
Is the action located in or adjacent to EFH designated for eggs? List the species: The action is located adjacent to EFH designated for eggs for the following species: longfin inshore squid, winter flounder, red hake, and windowpane flounder.	✔	☐
Is the action located in or adjacent to EFH designated for larvae? List the species: The action is located adjacent to EFH designated for larvae for the following species: winter flounder, Atlantic herring, red hake, windowpane flounder, Atlantic butterfish, and summer flounder.	✔	☐
Is the action located in or adjacent to EFH designated for juveniles? List the species: The action is located adjacent to EFH designated for juveniles for the following species: winter flounder, little skate, Atlantic herring, red hake, windowpane flounder, winter skate, clearnose skate, bluefish, and summer flounder.	✔	☐

Is the action located in or adjacent to EFH designated for adults or spawning adults? List the species: The action is located adjacent to EFH designated for adults for the following species: winter flounder, little skate, Atlantic herring, red hake, windowpane flounder, winter skate, clearnose skate, bluefish, and summer flounder.	✔	☐
If you answered 'no' to all questions above, then an EFH consultation is not required - go to Section 5. **If you answered 'yes' to any of the above questions, proceed to Section 2 and complete the remainder of the worksheet.**		

Step 2: In order to assess impacts, it is critical to know the habitat characteristics of the site before the activity is undertaken. Use existing information, to the extent possible, in answering these questions. Identify the sources of the information provided and provide as much description as available. These should not be yes or no answers. Please note that there may be circumstances in which new information must be collected to appropriately characterize the site and assess impacts. Project plans that show the location and extent of sensitive habitats, as well as water depths, the HTL, MHW and MLW should be provided.

2. SITE CHARACTERISTICS

Site Characteristics	Description
Is the site intertidal, sub-tidal, or water column?	The site is not intertidal, sub-tidal, or water column. The site consists of an existing industrial parcel with a power generation facility located adjacent to the Hudson River.
What are the sediment characteristics?	The Project Site is upland. N/A
Is there submerged aquatic vegetation (SAV) at or adjacent to project site? If so describe the SAV species and spatial extent.	The Project Site does not include SAV as it is an upland site. SAV may occur in the Hudson River adjacent to the Project Site, but no records or studies have been conducted to determine its presence or absence.
Are there wetlands present on or adjacent to the site? If so, describe the spatial extent and vegetation types.	There are three wetlands that were delineated on the project site: one palustrine forested wetland (0.09 acre) and two palustrine emergent wetlands (0.36 acre combined) for a total of 0.46 acre of wetlands on site. These wetlands are not directly connected to the Hudson River and fish passage to these areas from the Hudson River is not possible. Figure 2 attached shows the locations of all wetlands identified on site.

Is there shellfish present at or adjacent to the project site? If so, please describe the spatial extent and species present.	No shellfish are present in the Project Site. Shellfish may occur in the Hudson River adjacent to the Project Site, but no records or studies have been conducted to determine presence or absence.
Are there mudflats present at or adjacent to the project site? If so please describe the spatial extent.	There are no mudflats present at or adjacent to the project site.
Is there rocky or cobble bottom habitat present at or adjacent to the project site? If so, please describe the spatial extent.	The Project Site is upland. No studies to characterize the substrate in the adjacent Hudson River have occurred.
Is Habitat Area of Particular Concern (HAPC) designated at or near the site? If so for which species, what type habitat type, size, characteristics?	There is no Habitat Area of Particular Concern designated at or near the site.
What is the typical salinity, depth and water temperature regime/range?	According to the Hudson River Estuary Data from Riverkeeper.org, at the Wappingers - New Hamburg station to the northeast of the Project Site, the salinity is typically around 0.1, depth is up to 60 feet deep in the channel due east of the Project Site, and temperature range is 55.4 to 83.9 degrees Fahrenheit.
What is the normal frequency of site disturbance, both natural and man-made?	The site is an active power generation plant with a railroad that is currently operating ,which runs through the project site. Since both are active, there is a high level of site disturbance on a regular basis at the project site. In-water disturbance is associated with discharge from the existing waste water treatment plant onsite, which will remain in operation, as well as stormwater discharge points and a cooling water intake. The cooling water intake will no longer be operational after the proposed Project and will be retired in place.
What is the area of proposed impact (work footprint & far afield)?	See Figure 1 for a Site Plan showing the proposed impact of the project. There will be no in-water work, so it is not anticipated that there will be impacts to the Hudson River.

Step 3: This section is used to describe the anticipated impacts from the proposed action on the physical/chemical/biological environment at the project site and areas adjacent to the site that may be affected.

3. DESCRIPTION OF IMPACTS

Impacts	Y	N	Description
Nature and duration of activity(s). Clearly describe the activities proposed and the duration of any disturbances.			Danskammer Energy, LLC (the Client) is proposing to repower its existing 532-megawatt (MW) Danskammer Generating Station site (the Project) at 41° 34' 18.75" North Latitude, 73° 57' 59.61" West Longitude (NAD83 coordinate system) on Danskammer Road in the Town of Newburgh, Orange County, New York, with a state-of-the-art natural gas fired combined cycle power generation (the Project). Using best-in-class technology, the Project will be built in a 1-on-1 combined cycle configuration, utilizing a gas combustion turbine and steam turbine generator, with a total net capability of approximately 536 megawatts (the "Energy Center"). The new Energy Center intends to utilize the existing electric transmission and natural gas interconnections from the Station and will run on natural gas, with ultra-low sulfur diesel fuel oil ("ULSD") as the backup fuel. The Energy Center will be capable of operating as a baseload unit and will also include specific operational upgrades designed to support New York State's renewable energy focused electric grid. These features include quick start and enhanced ramping capability to provide important support for the reliable operation of the New York State Bulk Electric System as electricity supply from intermittent generation sources increases. The Project Site is approximately 106 acres in size and encompasses the current Danskammer Generating Station and its associated buildings.
Will the benthic community be disturbed? If no, why not? If yes, describe in detail how the benthos will be impacted.	☐	☑	The benthic community will not be disturbed as there will be no in-water work for the project. Additionally, the design of the project avoids impacts to any wetlands and waterbodies. During construction, best management practices will be put in place to avoid any sedimentation in the water resources.
Will SAV be impacted? If no, why not? If yes, describe in detail how the SAV will be impacted. Consider both direct and indirect impacts. Provide details of any SAV survey conducted at the site.	☐	☑	SAV will not be disturbed as there will be no in-water work for the project. Additionally, the design of the project avoids impacts to any wetlands and waterbodies. During construction, best management practices will be put in place to avoid any sedimentation in the water resources.
Will salt marsh habitat be impacted? If no, why not? If yes, describe in detail how wetlands will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?	☐	☑	There is no salt marsh habitat on site so it will not be impacted.

Will mudflat habitat be impacted? If no, why not? If yes, describe in detail how mudflats will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?	☐	✔	There is no mudflat habitat on site so it will not be impacted.
Will shellfish habitat be impacted? If so, provide in detail how the shellfish habitat will be impacted. What is the aerial extent of the impact? Provide details of any shellfish survey conducted at the site.	☐	✔	Shellfish will not be impacted as there will be no in-water work for the project. Additionally, the design of the project avoids impacts to any wetlands and waterbodies. During construction, best management practices will be put in place to avoid any sedimentation in the water resources.
Will hard bottom (rocky, cobble, gravel) habitat be impacted at the site? If so, provide in detail how the hard bottom will be impacted. What is the aerial extent of the impact?	☐	✔	Hard bottom habitat will not be impacted as there will be no in-water work for the project. Additionally, the design of the project avoids impacts to any wetlands and waterbodies. During construction, best management practices will be put in place to avoid any sedimentation in the water resources.
Will sediments be altered and/or sedimentation rates change? If no, why not? If yes, describe how.	☐	✔	Sediments will not be altered nor will sedimentation rates change as there will be no in-water work for the project. Additionally, the design of the project avoids impacts to any wetlands and waterbodies. During construction, best management practices will be put in place to avoid any sedimentation in the water resources.
Will turbidity increase? If no, why not? If yes, describe the causes, the extent of the effects, and the duration.	☐	✔	Turbidity will not increase as there will be no in-water work for the project. Additionally, the design of the project avoids impacts to any wetlands and waterbodies. During construction, best management practices will be put in place to avoid any sedimentation in the water resources.

Will water depth change? What are the current and proposed depths?	☐	✔	Water depth will not change as there will be no in-water work for the project.
Will contaminants be released into sediments or water column? If yes, describe the nature of the contaminants and the extent of the effects.	☐	✔	Contaminants will not be released into sediments or the water column as part of the proposed Project. Discharges from the existing wastewater treatment plant onsite will continue in accordance within the limits required by the permit for the wastewater treatment plant.
Will tidal flow, currents, or wave patterns be altered? If no, why not? If yes, describe in detail how.	☐	✔	Tidal flow, currents, and wave patterns will not be altered as there will be no in-water work for the project.
Will water quality be altered? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration of the impact.	☐	✔	Water quality will not be altered as there will be no in-water work for the project. Additionally, the design of the project avoids impacts to any wetlands and waterbodies. During construction, best management practices will be put in place to avoid any sedimentation in the water resources.
Will ambient noise levels change? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration and degree of impact.	✔	☐	There may be a temporary increase in noise at the Project Site during construction activities. Noise sources will be on land and no change to underwater noise levels is expected. There will be no barging or vessel traffic to the site as part of construction activities. Materials and equipment will be delivered to the site via the existing rail line or truck. The new generating facility is expected to have noise levels consistent with the existing facility on the site.
Does the action have the potential to impact prey species of federally managed fish with EFH designations?	☐	✔	The action does not have the potential to impact prey species of federally managed fish with EFH designations because no in-water impacts are expected as a result of the proposed Project.

Step 4: This section is used to evaluate the consequences of the proposed action on the functions and values of EFH as well as the vulnerability of the EFH species and their life stages. Identify which species (from the list generated in Step 1) will be adversely impacted from the action. Assessment of EFH impacts should be based upon the site characteristics identified in Step 2 and the nature of the impacts described within Step 3. NOAA's EFH Mapper should be used during this assessment to determine the ecological parameters/ preferences associated with each species listed and the potential impact to those parameters.

4. EFH ASSESSMENT

Functions and Values	Y	N	Describe habitat type, species and life stages to be adversely impacted
Will functions and values of EFH be impacted for:			
Spawning If yes, describe in detail how, and for which species. Describe how adverse effects will be avoided and minimized.	☐	☑	Adverse effects will be avoided because there will be no in-water work during the construction or operation of the project.
Nursery If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	☐	☑	Adverse effects will be avoided because there will be no in-water work during the construction or operation of the project.
Forage If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	☐	☑	Adverse effects will be avoided because there will be no in-water work during the construction or operation of the project.
Shelter If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	☐	☑	Adverse effects will be avoided because there will be no in-water work during the construction or operation of the project.

Will impacts be temporary or permanent? Please indicate in description box and describe the duration of the impacts.			Not Applicable.
Will compensatory mitigation be used? If no, why not? Describe plans for mitigation and how this will offset impacts to EFH. Include a conceptual compensatory mitigation plan, if applicable.	☐	☑	Compensatory mitigation will not be used because there will be no in-water work for the project. Best management practices will be employed for erosion and sediment control on the site. Therefore, no impacts to EFH are expected.

<u>Step 5</u>: This section provides the federal agency's determination on the degree of impact to EFH from the proposed action. The EFH determination also dictates the type of EFH consultation that will be required with NOAA Fisheries.

Please note: if information provided in the worksheet is insufficient to allow NOAA Fisheries to complete the EFH consultation additional information will be requested.

5. DETERMINATION OF IMPACT

Federal Agency's EFH Determination		
Overall degree of adverse effects on EFH (not including compensatory mitigation) will be: **(check the appropriate statement)**	☑	**There is no adverse effect on EFH or no EFH is designated at the project site.** **EFH Consultation is not required.**
	☐	**The adverse effect on EFH is not substantial. This means that the adverse effects are either no more than minimal, temporary, or that they can be alleviated with minor project modifications or conservation recommendations.** **This is a request for an abbreviated EFH consultation.**
	☐	**The adverse effect on EFH is substantial.** **This is a request for an expanded EFH consultation.**

Step 6: Consultation with NOAA Fisheries may also be required if the proposed action results in adverse impacts to other NOAA-trust resources, such as anadromous fish, shellfish, crustaceans, or their habitats as part of the Fish and Wildlife Coordination Act Some examples of other NOAA-trust resources are listed below. Inquiries regarding potential impacts to marine mammals or threatened/endangered species should be directed to NOAA Fisheries' Protected Resources Division.

6. OTHER NOAA-TRUST RESOURCES IMPACT ASSESSMENT

Species known to occur at site (list others that may apply)	Describe habitat impact type (i.e., physical, chemical, or biological disruption of spawning and/or egg development habitat, juvenile nursery and/or adult feeding or migration habitat). Please note, impacts to federally listed species of fish, sea turtles, and marine mammals must be coordinated with the GARFO Protected Resources Division.
alewife	There will be no impacts to the habitat of this species as there will be no in-water work associated with this Project. Best management practices will be employed for erosion and sediment control on the site.
American eel	There will be no impacts to the habitat of this species as there will be no in-water work associated with this Project. Best management practices will be employed for erosion and sediment control on the site.
American shad	There will be no impacts to the habitat of this species as there will be no in-water work associated with this Project. Best management practices will be employed for erosion and sediment control on the site.
Atlantic menhaden	There will be no impacts to the habitat of this species as there will be no in-water work associated with this Project. Best management practices will be employed for erosion and sediment control on the site.
blue crab	There will be no impacts to the habitat of this species as it inhabits estuaries and brackish coastal lagoons, which are not present at the Project Site.
blue mussel	There will be no impacts to the habitat of this species as they live in intertidal areas, which are not present at the Project Site.
blueback herring	There will be no impacts to the habitat of this species as there will be no in-water work associated with this Project.

Eastern oyster	There will be no impacts to the Eastern oyster or its habitat as it typically lives in brackish and salty waters, which are not present in the Project Site.
horseshoe crab	There will be no impacts to the horseshoe crab or its habitat as they inhabit shallow coastal waters, which are not present in the Project Site.
quahog	There will be no impacts to the quahog or its habitat as it lives in mudflats along the Atlantic coast, which are not present at the Project Site.
soft-shell clams	There will be no impacts to the habitat of this species as there will be no in-water work associated with this Project.
striped bass	There will be no impacts to the habitat of this species as there will be no in-water work associated with this Project.
other species:	

Useful Links

National Wetland Inventory Maps

EPA's National Estuaries Program

Northeast Regional Ocean Council (NROC) Data

Mid-Atlantic Regional Council on the Ocean (MARCO) Data

Resources by State:

Maine
Eelgrass maps

Maine Office of GIS Data Catalog

Casco Bay Estuary Partnership

Maine GIS Stream Habitat Viewer

New Hampshire
New Hampshire's Statewide GIS Clearinghouse, NH GRANIT

New Hampshire Coastal Viewer

Massachusetts
Eelgrass maps

MADMF Recommended Time of Year Restrictions Document

Massachusetts Bays National Estuary Program

Buzzards Bay National Estuary Program

Massachusetts Division of Marine Fisheries

Massachusetts Office of Coastal Zone Management

Rhode Island
Eelgrass maps

Narraganset Bay Estuary Program

Rhode Island Division of Marine Fisheries

Rhode Island Coastal Resources Management Council

Connecticut

Eelgrass Maps

Long Island Sound Study

CT GIS Resources

CT DEEP Office of Long Island Sound Programs and Fisheries

CT Bureau of Aquaculture Shellfish

Maps CT River Watershed Council

New York

Eelgrass report

Peconic Estuary Program

NY/NJ Harbor Estuary

New Jersey

Submerged Aquatic Vegetation mapping

Barnegat Bay Partnership

Delaware

Partnership for the Delaware Estuary

Center for Delaware Inland Bays

Maryland

Submerged Aquatic Vegetation mapping

MERLIN

Maryland Coastal Bays Program

Virginia

Submerged Aquatic Vegetation mapping

TRC
2801 Wehrle Dr., Suite 8
Williamsville, NY 14221
T 716.204.9543
TRCcompanies.com

August 26, 2019

NOAA National Marine Fisheries Service
Protected Resources Division
55 Great Republic Drive
Gloucester, MA 01930

Attn: Mrs. Kimberly Damon-Randall

Re: Danskammer Energy Center, Town of Newburgh, Orange County, New York

Dear Mrs. Damon-Randall,

We are carrying out the proposed project as described below. This letter is to request Endangered Species Act (ESA) concurrence from your office for the proposed Danskammer Energy Center. We have made the determination that the proposed activity will have no effect on Atlantic sturgeon or shortnose sturgeon or their critical habitat, which are under the jurisdiction of the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries Service) by NMFS under the ESA of 1973, as amended. Our supporting analysis is provided below.

Proposed Project

Danskammer Energy, LLC (the Client) is proposing to repower its existing nameplate 532-megawatt (MW) Danskammer Generating Station site (the Project) at 41° 34’ 18.75” North Latitude, 73° 57’ 59.61” West Longitude (NAD83 coordinate system) on Danskammer Road in the Town of Newburgh, Orange County, New York, with a state-of-the-art natural gas fired combined cycle power generation (the Project). Using best-in-class technology, the Project will be built in a 1-on-1 combined cycle configuration, utilizing a gas combustion turbine and steam turbine generator, with a total optimal net capability of approximately 536 megawatts (the “Energy Center”). The new Energy Center intends to utilize the existing electric transmission and natural gas interconnections from the Station and will run on natural gas, with ultra-low sulfur diesel fuel oil (“ULSD”) as the backup fuel. The Energy Center will be capable of operating as a baseload unit and will also include specific operational upgrades designed to support New York State’s renewable energy focused electric grid. These features include quick start and enhanced ramping capability to provide important support for the reliable operation of the New York State Bulk Electric System as electricity supply from intermittent generation sources increases. The Project Site is approximately 106 acres in size and encompasses the current Danskammer Generating Station and its associated buildings. The Project Area for Danskammer includes two parcels, one the east of the operating CSX railroad tracks, where it is currently operating, and a second to the west of the CSX railroad tracks. Figure 1 shows the Project Site boundaries.

The Project Site is based the proposed general Project layout. Future filings with the Siting Board may further refine the Project Site based on input from the public, stakeholders and the affected agencies through the Article 10 process and good engineering principles. Construction is expected to begin in the first quarter of 2021 for a duration of 30 to 36 months.

Description of the Project Site

The Project Site is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR 402.02). For this project, the action area includes tax parcels 8-1-78.2-1 and 8-1-80, located on Danskammer Road at 41°34'22" N 73°57'26" W in the Town of Newburgh, Orange County, New York. The Project location is adjacent to the Hudson River. This area is expected to encompass all the effects of the proposed Project (see Figure 1).

See Figure 2 for a wetland delineation map and Figure 3 for a map of land cover data from the National Land Cover Database. There will be no work done in the Hudson River or any delineated features within the Project Site. Best management practices (BMPs) will be used during construction to ensure that all delineated features are protected from sedimentation or increased turbidity as a result of the activities. Since the Project is land-based and does not extend into the water, no species will be exposed to the effects of the activities.

NMFS Listed Species (and Critical Habitat) in the Action Area

There were two ESA-listed species and one critical habitat present in the vicinity of the Project Site, which can be found in Table 1 below.

Table 1. NMFS Listed Species (and Critical Habitat) in the Vicinity of the Project Site					
Species	**Life stages present**	**Seasons present**	**Behavior**	**Habitat used on Project Site**	**Physical and biological features in action area (critical habitat only)**
Atlantic sturgeon[1]	Juvenile Post yolk-sac larvae Subadult Young of year Adult	Year round	Migrating and foraging	The Hudson River is adjacent to the Project Site.	N/A
Shortnose sturgeon[2]	Juvenile Post yolk-sac larvae Subadult Young of year Adult	Year round	Migrating and foraging Over wintering	The Hudson River is adjacent to the Project Site.	N/A
Atlantic sturgeon (critical habitat)[3]	N/A	N/A	N/A	N/A	The Hudson River, which is designated as critical habitat for the Atlantic sturgeon, is located adjacent to the Project site.

[1] Federal Register 32 FR 4001
[2] Federal Register 77 FR 5880 and 77 FR 5914
[3] Critical habitat: Atlantic sturgeon (82 FR 31960); National Marine Fisheries Service (NMFS). (1998a). Final Recovery Plan for the Shortnose Sturgeon (*Acipenser brevirostrum*).

Effects Determination

Since there is no in-water work and best management practices will be used to protect the Hudson River and other delineated waterbodies on site, there will be no stressors or effects to Atlantic sturgeon, shortnose sturgeon, or any critical habitat.

Existing Wastewater Discharge Points

There are 14 existing wastewater discharge points from the currently operating facility into the Hudson River. These are permitted through the New York State Department of Environmental Conservation. Construction of the Project will not result in new discharge points or an increase in volume from the existing points.

Existing Water Intake Structure

The construction and operation of the Project facility is expected to improve local Hudson River water quality. The existing facility withdraws Hudson River water at a shoreline intake structure and discharges cooling water to the Hudson River through shoreline subsurface pipes on the south side of the existing plant. As presently designed, the proposed Project facility will use a dry cooling system through the installation of an air-cooled condenser, and it will no longer be necessary to withdraw water from the Hudson River. There would no longer be any risk to Atlantic sturgeon or shortnose sturgeon of being trapped against cooling water intake screens or racks by the force of moving water (impingement). The temperature loading from the Project facility will also cease because the noncontact cooling water discharges from the turbines' heat exchangers will be shut off. Thus, it is anticipated that there will be no new adverse effects and a reduction from existing potential effects to Atlantic sturgeon and shortnose sturgeon from ceasing use of the water intake structure.

Existing Stormwater Outfalls

There are 14 existing wastewater discharge points (Outfalls 001-005, 06A, 006-009, 011, 016, 017, and 019) and four stormwater outfalls (Outfalls 012-014, and 018). There will be no new stormwater outfalls. The four outfalls that are currently permitted will continue to be used.

Conclusions

Based on the analysis that all effects of the proposed action will be insignificant and/or discountable, we have determined that the Danskammer Energy Center will have no effect on any listed species or critical habitat under NOAA Fisheries Service jurisdiction. We certify that we have used the best scientific and commercial data available to complete this analysis. We request your concurrence with this determination.

Sincerely,

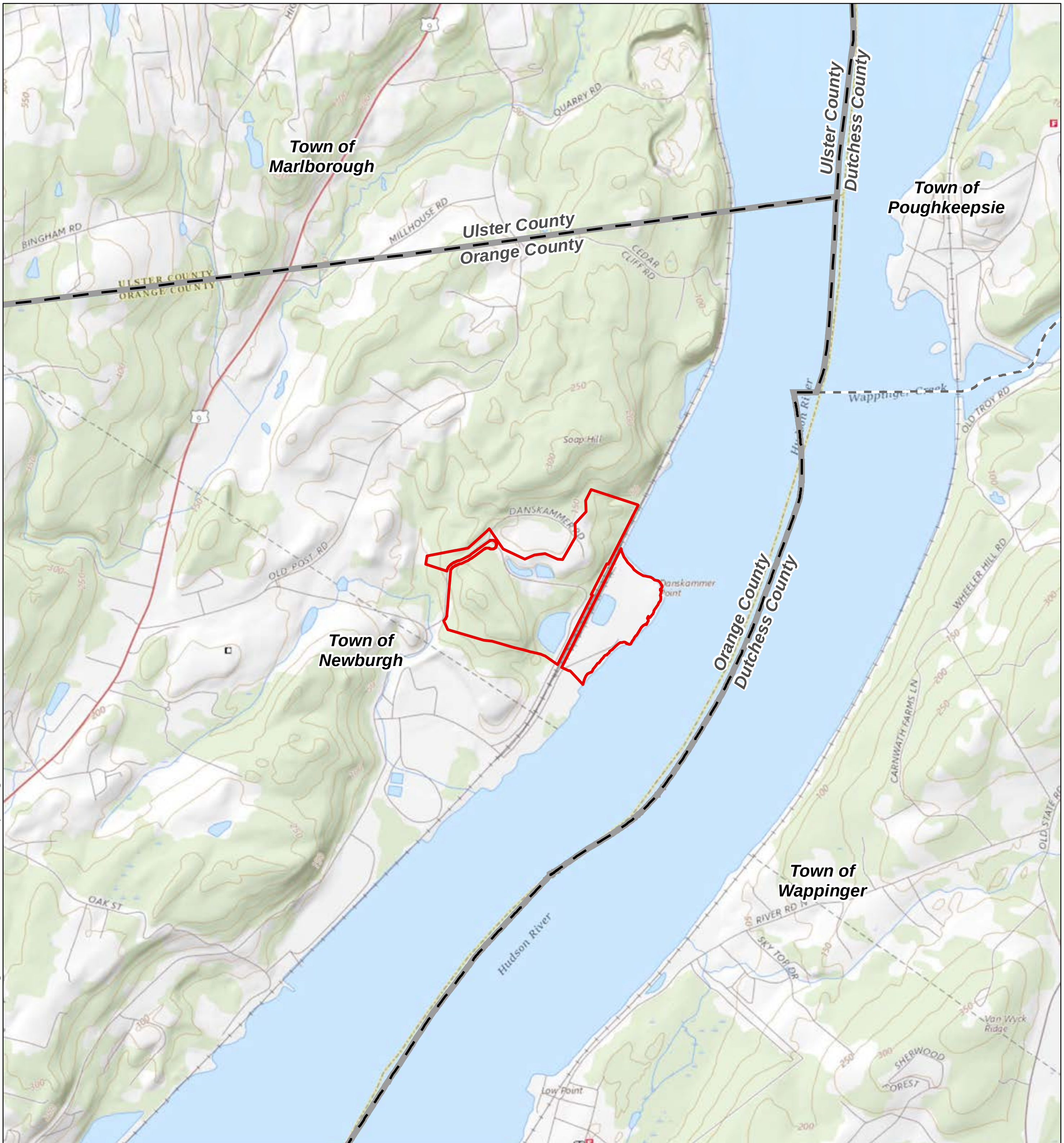
Kaitlin McCormick, MBA, CEP, PMP
Senior Project Manager

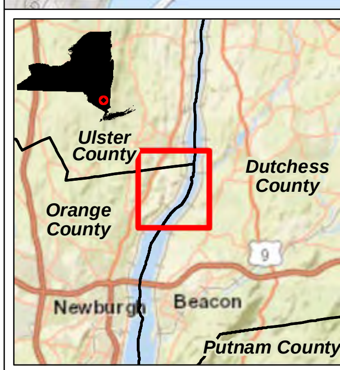
cc: Howard Taylor (Danskammer)
Michael Keller (TRC)

Figures: Figure 1. Site Location Map
Figure 2. Wetland Delineation Map
Figure 3. NLCD Map

Literature Cited

National Marine Fisheries Service (NMFS). (1998a). Final Recovery Plan for the Shortnose Sturgeon (*Acipenser brevirostrum*).





Project Area

Municipal Boundary

County Boundary

Base Map: USGS/The National Map

N W E S

0 1,000 2,000

Feet

Danskammer Energy, LLC

Danskammer Generating Station

Figure 1
Site Location Map

Town of Newburgh
Orange County, NY

Prepared on 8/8/2019 by TRC

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Project Area
Non-Jurisdictional Drainage
Delineated Stream Line
Delineated Waterbody/Retention Pond
Delineated Wetland
Estuarine and Marine Deepwater
Municipal Boundary
County Boundary

Data: TRC
Base Map: Esri and its contributors

Danskammer Energy, LLC

Danskammer Generating Station

Figure 2
Delineated Wetlands and Streams

Town of Newburgh
Orange County, NY

Prepared on 8/8/2019 by TRC

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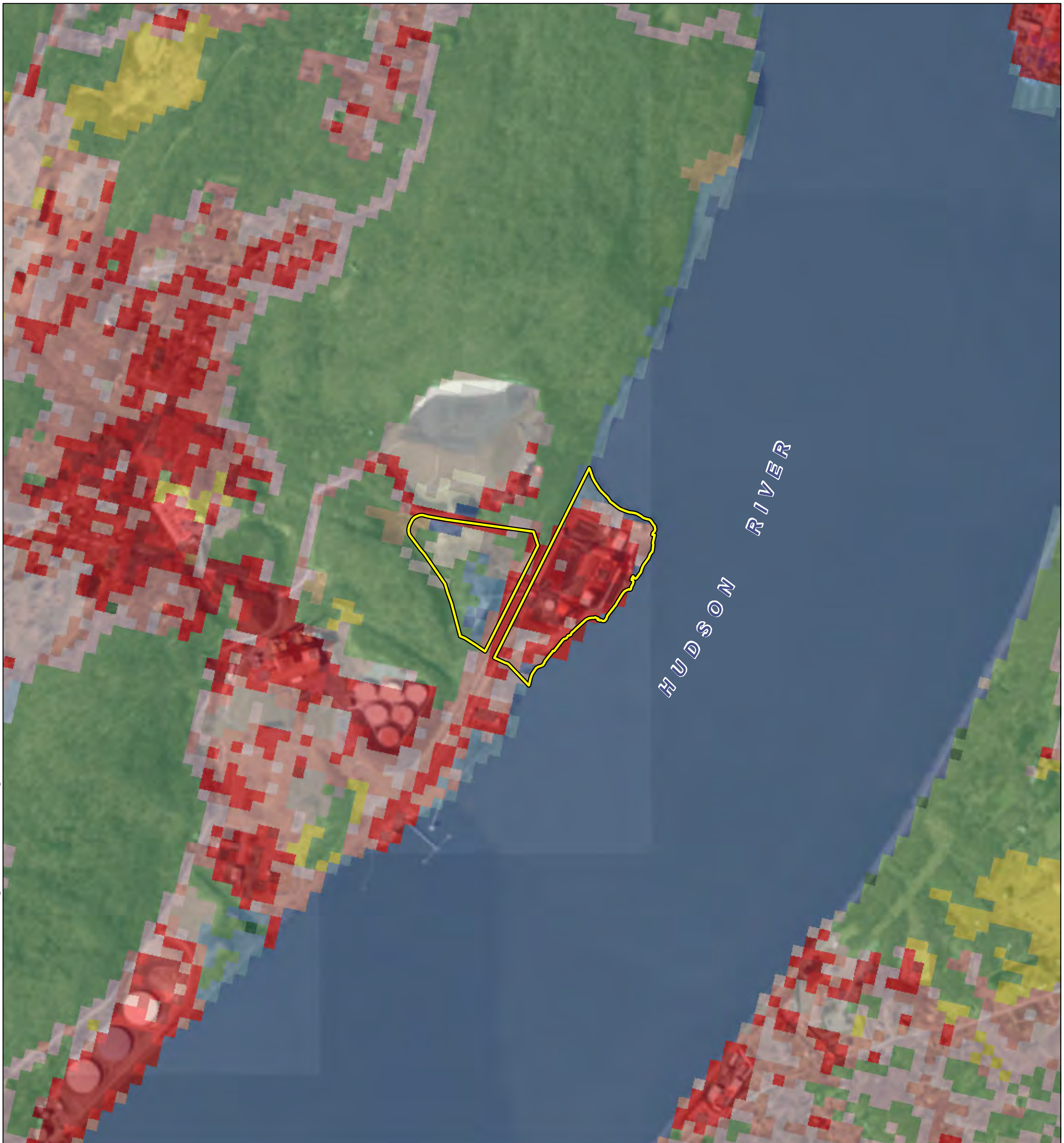

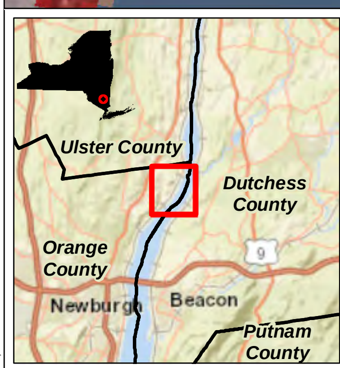

Project

NLCD Land Cover

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

Data Source: NLCD, 2016
Base Map: Esri and its Contributors

N W E S

0 500 1,000
Feet

Danskammer Energy, LLC

Danskammer Generating Station

Figure 3
NLCD Map

Town of Newburgh
Orange County, NY

Prepared on 7/26/2019 by TRC

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APPENDIX I

ENVIRONMENTAL JUSTICE ASSESSMENT

DANSKAMMER ENERGY CENTER

Appendix I

Environmental Justice

Contents

Tables

Figures

Appendices

Appendix I-1. Minority and Low Income Data

Appendix I: Environmental Justice

I(a) Environmental Justice Analysis

The intent of this environmental justice (EJ) analysis is to determine whether the construction and operation of the proposed Danskammer Energy Center (the "Project") would have a significant and adverse disproportionate effect on an "environmental justice community." The concept of performing an EJ analysis for the proposed Project is derived from Executive Order (EO) 12898, entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations* (February 11, 1994). This Presidential EO requires all federal agencies to consider disproportionate adverse human health and environmental impacts on minority and low-income populations.

In order to provide a framework for preparing the EJ analysis in the context of the siting of major electric generating facilities in New York, the New York State Department of Environmental Conservation (NYSDEC) promulgated Part 487 of Title 6 of the New York Code of Rule and Regulations (NYCRR), entitled Analyzing Environmental Justice Issues in Siting of Major Electric Generating Facilities Pursuant to Public Service Law Article 10.

Danskammer followed the criteria set forth in Part 487 in preparing this EJ assessment.

(1) Selection Of Potential Environmental Justice Communities And Comparison Areas

Identification of Environmental Justice Areas

The first step in an EJ analysis, in accordance with the criteria set forth in 6 NYCRR Section 487.4, is to identify an impact study area (ISA), which is defined as the geographic area of at least a one-half mile radius around the location of a proposed major electric generating facility in which the population is likely to be affected by at least one potentially significant adverse environmental impact resulting from the construction and/or operation of the generating facility that is different in type, scope, or magnitude compared to the population located in the broader geographic area surrounding the generating facility. The radius of the impact study area may be increased beyond the minimum half mile radius based on site-specific factors, including the nature, scope and magnitude of the environmental impacts of a project, the projected range of those impacts on various environmental resources, and the geography of the area surrounding the location of the project.

For this Project, an ISA of five miles was determined appropriate due to the fact that the Project is a repowering of an existing electric generating facility, proposed on a previously disturbed Project Site that has been used for the purpose of electric generation for over 60 years and which allows Danskammer to avoid or minimize most of the potential environmental impacts of the Project, and that the projected range of the potential environmental impacts of the Project are not likely to significantly affect environmental resources beyond five miles from the Project. With respect to air emissions specifically, the maximum and most significant air pollutant concentrations are located within five miles of the proposed Project. Thus, Danskammer determined to extend the ISA beyond the minimum prescribed half mile radius to a five mile radius.

The second step in the EJ analysis is to determine whether the ISA contains one or more EJ areas. An area is considered to be an EJ area per 6 NYCRR Part 487.5 if US Census data show there is a minority or low-income population above the EJ thresholds in the ISA, which are 51.1 percent and 23.59 percent respectively. Figure I-1 illustrates the block groups located within the five mile ISA that fall within or above the EJ thresholds for minority and low-income populations. This ISA is then compared and contrasted with a five mile reference community (RC) of adjacent communities, defined as those communities located between five and 10 miles from the proposed Project per 6 NYCRR Part 487.3(a). The RC means the geographic area contiguous to and surrounding the ISA of a radius equal to the radius of the ISA. Thus, the RC is comprised of those communities located within a five mile radius of the ISA, or within five to 10 miles from the Project. Figures I-2 and I-3 show the minority and poverty percentages for all block groups within the ISA, as well as the RC. Tables I-1 and I-2, respectively, show minority and low-income representation in each census block group that exceeds the 6 NYCRR Part 487.5 thresholds within the ISA and RC. Appendix I-1 further details minority and low-income data for each census block within the ISA and RC. In order to assess the populations of the ISA and RC, Figures I-4 and I-5 show the total population and population density of each block group.

Figure I-1 indicates that the potential EJ areas within the ISA, as detailed in Tables I-1 and I-2, include portions of the following areas (each, an “EJ Area” and collectively, the “EJ Areas”):

- City of Newburgh,
- City of Beacon,
- Town of Fishkill,
- Town of Newburgh, and
- Town of Plattekill.

For each of the identified EJ Areas, an analysis was conducted to determine whether potentially significant and adverse disproportionate environmental impact(s) related to the proposed Project are likely to affect it per 6 NYCRR Part 487.6.

Table I-1. Minority Data for ISA by Census Tract and Block Group

Census Tract	Block Group	Minority Population	Total Population	Minority Population Percentage
Census Tract 602.01	Block Group 1	1,137	2,224	**51.1**
Census Tract 2101.01	Block Group 2	501	809	**61.9**
Census Tract 2102.01	Block Group 1	369	669	**55.2**
Census Tract 2102.01	Block Group 3	759	1,122	**67.6**
Census Tract 2102.01	Block Group 4	587	970	**60.5**
Census Tract 6400.02	Block Group 1	1,417	1,902	**74.5**
Census Tract 1	Block Group 1	572	988	**57.9**
Census Tract 1	Block Group 3	860	1,650	**52.1**
Census Tract 2	Block Group 1	747	1,331	**56.1**
Census Tract 3	Block Group 1	1,180	1,447	**81.5**
Census Tract 4	Block Group 1	833	1,120	**74.4**
Census Tract 4	Block Group 2	786	919	**85.5**
Census Tract 9541	Block Group 4	514	985	**52.2**

Notes: The NYSDEC minority population percentage threshold is 51.1 percent.

Bold values indicate percentage above the NYSDEC threshold.

Source: *2010 Decentennial Census* (U.S. Census, 2011).

Table I-2. Poverty Data for ISA by Census Tract and Block Group

Census Tract	Block Group	Poverty Population	Population for Which Poverty Status has been Determined	Poverty Level Percentage
Census Tract 602.02	Block Group 3	71	301	**23.6**
Census Tract 2101.01	Block Group 1	157	572	**27.4**
Census Tract 2101.01	Block Group 2	80	291	**27.5**
Census Tract 6400.02	Block Group 1	17	59	**28.8**
Census Tract 1	Block Group 3	106	441	**24.0**
Census Tract 3	Block Group 1	106	463	**22.9**
Census Tract 4	Block Group 2	210	396	**53.0**
Census Tract 102	Block Group 4	130	461	**28.2**
Notes: The NYSDEC poverty population percentage threshold is 23.59 percent. **Bold** values indicate percentage above the NYSDEC threshold. Source: U.S. Census *2016 American Community Survey Data* (U.S. Census, 2017).				

Selection of Comparison Areas

Based upon guidance provided by the New York State Department of Health (NYSDOH) in *Updated Guidance for Health Data Review and Analysis Related to NYS Department of Environmental Conservation Environmental Justice Requirements for CP-29 and 6 NYCRR Part 487* (NYSDOH, 2017), the following comparison areas were established per 6 NYCRR Part 487.8 requirements:

- Orange County;
- A large regional comparison area consisting of New York State excluding New York City;
- An area, composed of ZIP codes, with population density similar to that of the ISA and located in the same local area; and
- An area composed of the ZIP codes within a radius of five to 10 miles from the proposed Project (the RC).

The RC means the geographic area contiguous to and surrounding the ISA of a radius equal to the radius of the ISA. Thus, the RC is comprised of those communities located within a five mile radius of the ISA, or within five to 10 miles from the Project.

The population density of the ISA is approximately 999 persons per square mile per an analysis of 2010 Census Data. Thus, per NYSDOH guidance, the following list of six ZIP codes located in the local area with similar population densities to that of the ISA are: 10535 (Jefferson Valley), 10541 (Putnam Valley), 10567 (Peekskill), 10588 (Mohegan Lake), 10928 (Highland Falls), and 10992 (Fort Montgomery).

(2) Comprehensive Demographic, Economic and Physical Descriptions

The community character and environmental setting of the ISA and the comparison areas (CAs), along with the EJ Areas, were determined through evaluation of population data and existing physical/environmental conditions.

Physical Description

A potentially significant factor in determining whether an EJ area will incur a significant and adverse disproportionate impact is to assess the existing environmental burden to the EJ area in comparison to non-EJ areas and to the RC. In order to prepare comprehensive physical descriptions for the ISA and the RC, an assessment was prepared for the number and concentration of the following within a 10-mile radius of the of the proposed Project using data obtained from a specialty environmental database company (e.g., Environmental Data Resources, Inc [EDR]).

- For industrial or municipal facilities permitted pursuant to Titles 7 or 8 of Environmental Conservation Law (ECL) Article 17 - GIS data on State Pollutant Discharge Elimination Systems (SPDES) permit sites.
- For facilities registered pursuant to Title 10 of ECL Article 17 - GIS data on registered petroleum bulk storage aboveground and underground tank facilities (PBS AST and PBS UST sites).
- For facilities permitted pursuant to ECL Article 19 - GIS data on permitted air facilities (AIRS, US AIRS [AFS]).
- For facilities permitted or registered pursuant to Titles 7 or 9 of ECL Article 27 - GIS data on registered solid waste management facilities and hazardous waste treatment storage and disposal facilities (SWF and RCRA-TSD sites).
- For facilities required to file an annual report pursuant to ECL section 27-0907(6) - GIS data on registered large quantity generators of hazardous waste (RCRA-LQG sites).

- For sites regulated pursuant to Titles 13 or 14 of ECL Article 27, (inactive hazardous waste disposal sites and brownfield cleanup sites) and for projects undertaken pursuant to Title 5 of ECL Article 56 (environmental restoration projects) - GIS data, as applicable, on National Priority List (NPL), Proposed NPL, CERCLIS, Inactive Hazardous Waste Disposal sites in New York State (State Hazardous Waste Sites or SHWS), Environmental Restoration Program sites, and Brownfields sites.
- For facilities registered pursuant to ECL Article 40 - GIS data on registered chemical bulk storage aboveground and underground tank facilities (CBS AST and CBS UST sites).
- For facilities subject to corrective action pursuant to ECL section 71-2727 - GIS data on solid or hazardous waste management facilities subject to Resource Conservation and Recovery Act corrective action (RCRA-CORRACTS sites).
- For sites participating in the Department's voluntary cleanup program - GIS data Voluntary Cleanup Program facilities (VCP sites); and
- For facilities licensed pursuant to Article 12 of the Navigation Law - GIS data on registered major oil storage facilities (MOSF sites).

Figures I-6 through I-16 present maps identifying the location of facilities that are included in each of the above categories. Table I-3 below identifies the number and concentration of the facilities for each environmental burden that are located within the ISA and the RC.

Table I-3. Existing Environmental Setting of ISA and RC

Environmental Burden	Number of Facilities in ISA	Number of Facilities in RC	Concentration of Facilities in ISA (Sites per Square Mile)	Concentration of Facilities in RC (Sites per Square Mile)
SPDES Permitted Sites	69	184	0.88	0.78
Registered PBS Sites	134	372	1.71	1.58
Sites with Air Permits	60	188	0.76	0.80
Registered SWF and RCRA-TSD facilities	23	116	0.29	0.49
Registered RCRA-LQG sites	19	47	0.24	0.20
CBS sites	21	72	0.27	0.31
RCRA-CORRACTS sites	3	8	0.04	0.03
VCP facilities	1	8	0.01	0.03
Registered MOSF	14	31	0.18	0.13
Hazardous waste disposal sites and brownfield cleanup sites	12	55	0.15	0.23
Environmental restoration projects	3	11	0.04	0.05

Notes:
RC = Reference Community located between 5 and 10 miles from Project.
ISA = Impact Study Area for Facilities located between 0 and 5 miles from Project.
Source: EDR DataMap™ Environmental Atlas™.

The concentration of facilities shown in Table I-3 that are within the ISA and the RC for each respective environmental burden are similar, which indicates that the existing environmental burdens of the ISA and RC area expected to be comparable. The proposed Project will have no net effect with respect to increasing the number or size of environmental burden facilities located within the ISA. No net change will occur in fuel storage; no significant net change will occur in waste handling and waste storage within the ISA; and no new remedial activities will occur on the Project Site.

Air toxics, also known as hazardous air pollutants (HAPs), are a wide spectrum of air pollutants that pose carcinogenic, neurological, and respiratory effects on humans. Human health risks, especially the cancer risk arising from chronic inhalation of low-dose air toxic mixtures, have been identified as a research priority by a number of US regulatory agencies. Health risks are unevenly distributed due to differential exposure burdens among different segments of the population. Thus, the United States Environmental Protection Agency (EPA) has prepared the National-Scale Air Toxics Assessment (NATA). The purpose of NATA is to identify and prioritize air toxics, emission source type, and locations that are of greatest potential concern in terms of contributing to population risk. An assessment of the latest NATA data at the most refined geographic resolution at the census tract level was prepared for the ISA and the RC. Additionally, NATA data was prepared for Orange County and New York State as additional CAs. The NATA provides data for the following health risks:

- Total Cancer Risk – Represents the total cancer risk from point sources (includes some area sources), non-point, on-road mobile, non-road mobile, and background, secondary formation of HAPs. Total risk represents the sum of all carcinogens in assessment and individual pollutant contributions to total risk (e.g., a risk value of 1.6E-05 represents a risk of 16 in a million).
- Neurological Risk – Results are presented as noncancer hazard index (HI) representing the sum of hazard quotients (HQ) for substances that affect the same target organ (neurological). Results include individual pollutant contributions to total HI.
- Respiratory Risk – Results are presented as noncancer HI representing the sum of HQ for substances that affect the same target organ (respiratory). Results include individual pollutant contributions to total HI.

Table I-4 below provides a summary of the total cancer risk, the neurological risk, and respiratory risk within the ISA and RC as well as the Orange County and New York State CAs. The total cancer risk and total respiratory risk is similar between the ISA, RC, and Orange County, with all locations having a lower risk than all of New York State. Thus, the existing environmental burden from HAPs between the ISA and RC is comparable.

Table I-4. NATA Data for ISA, RC, Orange County, and NYS

Geography	Total Respiratory Risk (Total HI)	Total Neurological Risk (Total HI)	Total Lifetime Cancer Risk
New York State	0.49	0.05	3.2E-05
Orange County	0.31	0.03	2.5E-05
ISA Tracts			
Census Tract 601	0.33	0.04	2.6E-05
Census Tract 602.01	0.34	0.04	2.7E-05
Census Tract 602.02	0.33	0.04	2.7E-05
Census Tract 603.01	0.33	0.04	2.7E-05
Census Tract 603.02	0.33	0.04	2.6E-05
Census Tract 604	0.34	0.04	2.7E-05
Census Tract 1406.02	0.34	0.04	2.8E-05
Census Tract 1407	0.35	0.05	2.8E-05
Census Tract 1408.01	0.35	0.04	2.7E-05
Census Tract 1902.03	0.35	0.05	2.8E-05
Census Tract 1902.04	0.33	0.04	2.7E-05
Census Tract 1903.01	0.33	0.04	2.7E-05
Census Tract 1904.01	0.34	0.04	2.7E-05
Census Tract 1904.02	0.33	0.04	2.7E-05
Census Tract 2101.01	0.34	0.04	2.7E-05
Census Tract 2102.01	0.34	0.04	2.6E-05
Census Tract 2103.01	0.33	0.04	2.6E-05
Census Tract 3000	0.34	0.04	2.7E-05
Census Tract 6400.02	0.34	0.04	2.7E-05
Census Tract 1	0.35	0.04	2.7E-05
Census Tract 2	0.36	0.04	2.7E-05
Census Tract 3	0.35	0.04	2.7E-05
Census Tract 4	0.34	0.04	2.6E-05
Census Tract 101.01	0.30	0.03	2.5E-05
Census Tract 101.02	0.31	0.03	2.5E-05
Census Tract 102	0.32	0.04	2.6E-05
Census Tract 103	0.34	0.04	2.6E-05
Census Tract 9538	0.33	0.04	2.7E-05

Table I-4. NATA Data for ISA, RC, Orange County, and NYS

Geography	Total Respiratory Risk (Total HI)	Total Neurological Risk (Total HI)	Total Lifetime Cancer Risk
Census Tract 9539	0.31	0.04	2.5E-05
Census Tract 9541	0.29	0.03	2.4E-05
RC Tracts			
Census Tract 501.02	0.32	0.04	2.6E-05
Census Tract 501.03	0.31	0.04	2.5E-05
Census Tract 501.04	0.30	0.03	2.5E-05
Census Tract 502.03	0.31	0.03	2.5E-05
Census Tract 502.04	0.31	0.03	2.5E-05
Census Tract 502.05	0.29	0.03	2.4E-05
Census Tract 801.03	0.33	0.04	2.7E-05
Census Tract 802.01	0.34	0.04	2.7E-05
Census Tract 802.02	0.32	0.04	2.6E-05
Census Tract 1401.01	0.35	0.04	2.8E-05
Census Tract 1402	0.34	0.04	2.7E-05
Census Tract 1403	0.36	0.04	2.8E-05
Census Tract 1404	0.35	0.05	2.8E-05
Census Tract 1405	0.35	0.04	2.8E-05
Census Tract 1901.01	0.33	0.04	2.7E-05
Census Tract 1901.02	0.34	0.05	2.8E-05
Census Tract 2201	0.36	0.04	2.9E-05
Census Tract 2202.01	0.37	0.04	2.8E-05
Census Tract 2203	0.37	0.04	2.9E-05
Census Tract 2207	0.37	0.04	2.9E-05
Census Tract 2208.01	0.36	0.04	2.8E-05
Census Tract 2209.01	0.36	0.04	2.8E-05
Census Tract 2210.01	0.35	0.04	2.8E-05
Census Tract 2211	0.36	0.04	2.9E-05
Census Tract 4100	0.35	0.04	2.8E-05
Census Tract 5.01	0.34	0.04	2.7E-05
Census Tract 5.02	0.34	0.04	2.6E-05
Census Tract 6	0.35	0.04	2.7E-05

Table I-4. NATA Data for ISA, RC, Orange County, and NYS

Geography	Total Respiratory Risk (Total HI)	Total Neurological Risk (Total HI)	Total Lifetime Cancer Risk
Census Tract 104	0.37	0.04	2.8E-05
Census Tract 105	0.41	0.04	2.9E-05
Census Tract 106	0.31	0.04	2.5E-05
Census Tract 126.01	0.33	0.04	2.7E-05
Census Tract 126.02	0.32	0.04	2.6E-05
Census Tract 127	0.34	0.04	2.6E-05
Census Tract 128	0.33	0.04	2.6E-05
Census Tract 129	0.32	0.03	2.6E-05
Census Tract 130	0.33	0.03	2.6E-05
Census Tract 131	0.32	0.03	2.5E-05
Census Tract 152	0.33	0.04	2.7E-05
Census Tract 105	0.28	0.03	2.3E-05
Census Tract 106	0.32	0.03	2.5E-05
Census Tract 107	0.32	0.03	2.6E-05
Census Tract 108	0.32	0.03	2.6E-05
Census Tract 9536	0.33	0.04	2.6E-05
Census Tract 9537	0.30	0.03	2.5E-05
Census Tract 9540	0.29	0.03	2.4E-05
Census Tract 9554	0.28	0.03	2.3E-05
Source: *2014 National-Scale Air Toxics Assessment* (EPA, 2018)			

Economic and Demographic Description

The comprehensive economic and demographic description of the ISA and four CAs was prepared following methodologies and data sources identified in the NYSDOH *Updated Guidance for Health Data Review and Analysis Related to NYS Department of Environmental Conservation Environmental Justice Requirements for CP-29 and 6 NYCRR Part 487* (NYSDOH, 2017). Demographic data, which are available from the U.S. Census Bureau, are data on the population in terms of the number of people and characteristics such as age, gender, race/ethnicity, and income. Gender is important when considering health outcomes because certain health outcomes affect only one gender (e.g., prostate cancer) or are more common in one gender than the other (e.g., breast cancer, cardiovascular disease). Also, specific age group categories are important because some health outcomes are more common in certain age groups; for example, asthma hospitalization rates are highest in young children.

Income level or the proportion of the population living in poverty is significant because certain factors that can affect rates of disease are higher or lower in poor populations. These factors include smoking and exposure to second-hand smoke, quality of housing, adequacy of nutrition, and access to and source of medical care. Rates of some health outcomes vary among racial and ethnic groups, for example, infant mortality rate and mortality rates due to cardiovascular disease, breast cancer in females, and prostate cancer.

Table I-5 provides a comprehensive list of demographic data for the ISA and each of the four CAs. As shown in the table, the gender and age distributions of the ISA are comparable to those in each of the four CAs. Regarding race/ethnicity, the ISA has comparable minority population to Orange County. The percentage of the population in poverty in the ISA (13.3 percent) to the overall population of Orange County (12.2 percent) and all of New York State, excluding New York City (11.6 percent) is comparable.

Table I-5. Demographic Data of ISA and Reference Areas

Group	Impact Study Area	5 to 10 Mile RC	Surrounding ZIP Codes with population density similar to ISA	Orange County	New York State excluding New York City
Total population	224,203	57,699	63,382	368,389	11,202,969
Population Density (persons per square mile)	999	627	921	445	207
Number of Households	84,047	20,309	22,026	126,460	4,160,305
Sex (%)					
Male	50%	49%	49%	50%	49%
Female	50%	51%	51%	50%	51%
Age distribution (%)					
Less than 5	6%	6%	5%	7%	6%
5 to 14	13%	15%	15%	15%	13%

Table I-5. Demographic Data of ISA and Reference Areas

Group	Impact Study Area	5 to 10 Mile RC	Surrounding ZIP Codes with population density similar to ISA	Orange County	New York State excluding New York City
15 to 19	8%	8%	8%	8%	7%
20 to 44	34%	31%	28%	32%	31%
45 to 64	27%	30%	32%	27%	28%
65+	13%	12%	13%	11%	15%
Race/ethnicity (%)					
One race:					
White	70%	82%	86%	77%	82%
African-American	16%	7%	5%	10%	9%
American Indian/Alaskan	1%	0%	0%	0%	0%
Asian	4%	4%	3%	2%	3%
Hawaiian/Pacific Islander	0%	0%	0%	0%	0%
Some other race	7%	4%	4%	7%	3%
Two or more races	3%	3%	2%	3%	2%
More than one race:					
Hispanic or Latino	18%	13%	13%	18%	10%
Minority (%)	39%	26%	21%	32%	23%
Median household income ($)	68,420	86,385	103,088	75,146	64,650
Persons below poverty (%)	13.3%	5.1%	4.2%	12.2%	11.6%
Source: *2010 Decennial Census* (U.S Census, 2011) and *2017 American Community Survey* (U.S. Census, 2018).					

(3) Evaluation of Significant and Adverse Environmental Impacts

To evaluate the existing environmental load profile and determine the potential impacts of the proposed Project within the EJ Areas, air quality, contaminated materials, and transportation were analyzed. These analyses are summarized below.

Air Quality

Air dispersion modeling was used to determine the potential of the Project to significantly impact the EJ Areas. In order to identify those new sources with the potential to significantly affect air quality, EPA has adopted National Ambient Air Quality Standards (NAAQS) for the protection of human health. They have also established significant impact levels (SILs) as a screening level. Based on 6 NYCRR Part 231-12.7,if a project's impacts are found to be below the SILs, then the project is determined to have the potential to insignificantly impact on air quality. If a project's air quality impacts are shown to be insignificant, then there will be no disproportionately significant and adverse burden on communities in the area because the Project has been demonstrated to meet the NAAQS per 6 NYCRR Part 231-12.7.

The Project was modeled in accordance with the procedures documented in Section 5 of this Application for air emissions modeling. Maximum calculated Project impacts were determined for various pollutants and averaging periods. Table I-6 presents the maximum modeled impacts of carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM-10 and PM-2.5), and nitrogen dioxide (NO_2) for comparison with SILs that have been established by EPA. Table I-6 also presents the sum of maximum Project impacts and representative background air quality levels as established in Section 5.2 from existing NYSDEC air quality monitoring data so that total modeled concentrations can be compared to the corresponding NAAQS.

All modeled project impacts, except for 24-hour PM-10/PM-2.5, annual PM-2.5, and 1-hour NO_2 impacts are below SILs. The sum of maximum calculated impacts and background levels are below the corresponding NAAQS for all pollutants and averaging periods. Therefore, the Project is not considered to have any adverse air quality impacts within the EJ Areas.

Table I-6. Facility Maximum Modeled Concentrations Due to Normal Operations Compared to SILs and NAAQS

Pollutant	Averaging Period	SIL ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)
CO	1-Hour	2,000	40,000	531	2,300.0	2,831.0
	8-Hour	500	10,000	211	1,380.0	1,591.0
SO_2	1-Hour	7.8	196	4.5	9.9	14.4
	3-Hour	25	1,300	3.5	15.5	19.0

	24-Hour	5	-/260	1.7	4.2	5.9
	Annual	1	-/60	0.06	0.6	0.7
PM-10	24-Hour	5	150	6.0	32.0	38.0
	Annual	1	-	0.2	-	-
PM-2.5	24-Hour	1.2	35	1.7	16.6	18.2
	Annual	0.2	12	0.20	6.2	6.4
NO_2	1-Hour	7.5	188	20.8	103.9	124.7
	Annual	1	100	0.6	29.3	29.9

Figures I-17 through I-28 show the maximum modeled impacts for all pollutants and averaging periods. The outlines of the identified EJ Areas and the Project location are also depicted on the plots. The maximum modeled Project impacts are generally modeled to occur at or near to the Project fence line or located to the west-northwest of the Project and outside the potential EJ areas. Therefore, the identified EJ Areas will not receive a disproportionately significant and adverse share of the maximum modeled Project impacts on air quality.

Potential emissions of HAPs from the Project were also modeled for comparison to the NYSDEC short-term guideline health concentrations (SGCs) and annual guideline health concentrations (AGCs). Results of the analysis as provided in Section 5 of this Application, indicated that all of the maximum modeled Project concentrations were less than their respective SGCs and AGCs and for most HAPs, only a fraction of a percentage of the SGCs and/or AGCs. All of the maximum modeled HAP concentrations were located outside the EJ Areas. Therefore, the Project is anticipated to have minimal cumulative effects with respect to any potential sources of HAPs in the ISA.

Contaminated Materials and Chemical Use

Operation of the Project as proposed, will result in the need to store ultra-low sulfur diesel (ULSD) fuel (as back-up fuel), aqueous ammonia, and other chemicals at the Project Site. While the Project will use natural gas as its primary fuel, ULSD will be used as a back-up fuel when natural gas is curtailed. ULSD will be stored in a single new 1,700,000-gallon on-Site storage tank designed, constructed, and operated in accordance with applicable laws. Storage tanks, piping, and containment systems will meet applicable codes and standards, including API Standard 650, sections 1002 and 1171.2 of the New York State Uniform Fire Prevention and Building Code. Operation of the Project would also require the storage of up to 35,000 gallons of aqueous ammonia at the Project Site for use in the Project's selective catalytic reduction system to reduce NOx emissions.

The introduction of ULSD fuel, aqueous ammonia, and other chemicals at the Project Site will not result in significant and adverse disproportionate impacts to the identified EJ Areas because the use and/or presence of regulated fuels, chemicals, and other materials is currently occurring on the Project Site (in connection with the existing Danskammer Generating Station) and throughout the entire five mile Project ISA. Therefore, because the use of hazardous and regulated materials occur throughout the ISA and are not concentrated within the EJ Areas, the introduction of ULSD, aqueous ammonia, and other chemicals at the Project Site, which is also outside the location of the EJ Areas, will not result in significant and adverse disproportionate impacts to such EJ Areas.

The use of ULSD, aqueous ammonia, and other chemicals at the Project Site will also not result in any adverse impacts inside or outside the EJ Areas. Prevention of contamination at the Project Site will be achieved through installation of state-of-the-art spill prevention equipment, the use of proper unloading procedures, the use of spill control devices, and through the practice of regular maintenance and inspections of the tanks and/or storage systems. Through implementation of the standard fueling procedures, spill control devices, inspections, and security measures identified, the Project will minimize the potential for a spill or release associated with above ground storage tanks, chemical storage areas, and oil storage systems.

The storage of ULSD or use of aqueous ammonia or other chemicals at the Project Site is also not expected to jeopardize public health. Operation of the Project on ULSD will not result in the contravention of federal or state health-based air quality standards. Moreover, while the dilute concentration of the aqueous ammonia to be used at the Project Site (less than 20 percent) is not subject to the EPA's Risk Management Program for hazardous materials (40 Code of Federal Regulations [CFR] Part 68), to assure that an accidental release of this aqueous ammonia will not adversely affect the health and safety of the community surrounding the proposed Project, Danskammer assessed the potential for off-Site impacts resulting from a worst-case ammonia release scenario (e.g., rupture of the tank wall) using the protocols established in EPA's Risk Management Program regulations (40 CFR Part 68). To predict the potential worst-case impact distance, Danskammer used the EPA-approved Areal Locations of Hazardous Atmospheres model. This accidental release model is routinely used in predicting impact areas associated with hazardous material releases. Predicted concentrations of ammonia at the closest offsite public receptor will be below 150 parts per million, which is the recommended guidance value established by the American Industrial Hygiene Association and represents the maximum airborne concentration below which nearly all individuals could be exposed for up to an hour without experiencing or developing irreversible or other serious adverse health effects. Thus, any accidental releases of ammonia will not be expected to result in any significant and adverse disproportionate impacts to residents of the identified EJ Areas.

Traffic and Transportation

Operation of the Project will not adversely impact traffic conditions in the ISA or within the EJ Areas. No significant impacts to the local roadway network as a result of the operation of the proposed Project are anticipated. During operations, Project-related traffic will involve a limited number of service vehicles, tank trucks, and employee vehicles. Parking for Project employees will continue to be provided on the Project Site.

During the peak construction phase, there will be an increase in vehicular traffic. Most of the construction traffic will be during off-peak hours. Construction workers are expected to carpool, and oversized loads will be transported by rail. The construction traffic will result in a temporary increase in peak hour traffic volumes. However, the existing road system is adequate to accommodate the projected traffic from the construction of the Project. Thus, the Project is not expected to cause significant and adverse disproportionate impacts to traffic within the EJ Areas.

Infrastructure and Solid Waste

To minimize the quantities of solid waste generated at the Project, a solid waste management program that incorporates waste minimization strategies such as recycling will be prepared and implemented, prior to operation. The Project operational staff will place appropriate containers for the recycling of newspapers, corrugated cardboard and metals throughout the Project during operations to promote recycling to the maximum extent practicable. No significant increase in waste generation is expected.

I(b) NYSDOH Health Outcome Data Analysis

(1) Evaluation of NYSDOH Health Outcome Data

The New York State Department of Health (NYSDOH), in conjunction with the NYSDEC EJ Advisory Group, issued a January 2002 report to the NYSDEC Commissioner recommending a process to assess significant and adverse disproportionate environmental impacts of NYSDEC permitting decisions to disadvantaged minority communities. Subsequently, the NYSDEC Commissioner issued CP-29 establishing requirements under NYSDEC permitting to review impacts on minority and low-income communities and to provide scrutiny in NYSDEC permitting decisions to address significant and adverse disproportionate environmental impacts.

In July 2008, the NYSDOH issued a supporting document entitled: *Guidance for Health Outcome Data (HOD) Review and Analysis Relating to NYSDEC Environmental Justice and Permitting*. Subsequently and after promulgation of the NYSDEC EJ regulation 6 NYCRR Part 487, the NYSDOH issued the *Updated Guidance for Health Data Review and Analysis Related to NYS Department of Environmental Conservation Environmental Justice Requirements for CP-29 and 6 NYCRR Part 487* (NYSDOH Guidance) (NYSDOH, 2017). The NYSDOH Guidance provides the methodology to display and evaluate existing health-related events data for the Project community and to compare that information in a qualitative and quantitative manner to data for the same health-related events in similarly configured communities apart from the Project community.

A compilation of health-related data outcomes was prepared for each of the ZIP codes located within the ISA, and the four CAs: the RC, Orange County and New York State (excluding New York City) and ZIP codes having comparable population densities as the ISA. The data was based upon the NYSDOH's Statewide Planning and Research Cooperative System (SPARCS) database and the NYS Cancer Registry. Data was compiled for asthma emergency department (ED) visits, low birth weight births, and for incidence rates of breast, colorectal, lung/bronchus, and prostate cancers. Table I-7 provides a summary of the cancer incidence rates for the ISA and the CAs. Because of the way the cancer data is assessed by NYSDOH, the cancer data for the ISA cannot be compared directly to the cancer data for the comparison areas; instead, since the expected number of cases is based on the cancer rate for New York State, the state is the comparison area for the ISA and for the three CAs. Tables I-8 and I-9 provide the asthma ED visit rates and low birth weight rates for the ISA and the CAs.

Table I-7. Cancer Incidence Data for ISA, RC, and Orange County

Cancer site	Area	Number of Cases Observed	Number of Cases Expected[1]	Standard Incidence Ratio	95% Confidence Interval Lower	95% Confidence Interval Upper
Breast (female)	ISA	708	644	1.10	1.02	1.18
	RC (5 to 10 Mile Radius)	315	267	1.18	1.05	1.32
	ZIP Codes in nearby area with similar population density as ISA	256	230	1.11	0.98	1.26
	Orange County	1,343	1,305	1.03	0.97	1.09
Colorectal (male)	ISA	249	226	1.10	0.97	1.25
	RC (5 to 10 Mile Radius)	89	95	0.94	0.76	1.16
	Zip Codes in nearby area with similar population density as ISA	77	79	0.98	0.77	1.22
	Orange County	436	449	0.97	0.88	1.07
Colorectal (female)	ISA	206	219	0.94	0.82	1.08
	RC (5 to 10 Mile Radius)	101	88	1.15	0.94	1.40
	ZIP Codes in nearby area with similar population density as ISA	84	71	1.18	0.94	1.46
	Orange County	428	425	1.01	0.91	1.11
Lung and Bronchus (male)	ISA	327	315	1.04	0.93	1.16
	RC (5 to 10 Mile Radius)	159	134	1.19	1.01	1.39
	ZIP Codes in nearby area with similar population density as ISA	111	110	1.01	0.83	1.22
	Orange County	686	620	1.11	1.03	1.19
Lung and Bronchus (female)	ISA	319	284	1.12	1.00	1.25
	RC (5 to 10 Mile Radius)	111	117	0.95	0.78	1.14

Table I-7. Cancer Incidence Data for ISA, RC, and Orange County

Cancer site	Area	Number of Cases Observed	Number of Cases Expected[1]	Standard Incidence Ratio	95% Confidence Interval Lower	95% Confidence Interval Upper
	ZIP Codes in nearby area with similar population density as ISA	124	95	1.31	1.09	1.56
	Orange County	670	552	1.21	1.12	1.31
Prostate (male)	ISA	669	728	0.92	0.85	0.99
	RC (5 to 10 Mile Radius)	240	311	0.77	0.68	0.87
	ZIP Codes in nearby area with similar population density as ISA	277	266	1.04	0.92	1.17
	Orange County	1,418	1,460	0.97	0.92	1.02

Source: *New York State Cancer Registry, Cancer Incidence by Zip Code, 2005-2009* (NYSDOH, 2010).
[1]The cancer rate for the entire state of New York and the number of people in a ZIP code are used to estimate the number of people in each ZIP code that would be expected to develop cancer within the five-year period 2005-2009 if the ZIP code had the same rate of cancer as the state.

Table I-8. Asthma ED Visits Data for ISA, RC, Orange County and NYS excluding NYC

Age group (years)	Impact Study Area			Comparison Area						95% Confidence Interval	
	Total ED Visits (2012 to 2014)	Population	Rate[1]	Area	Age Group	Total ED Visits (2012 to 2014)	Population	Rate[1]	Rate ratio[2]	lower	upper
0 to 17	1,635	49,816	109.4	5 to 10-Mile Radius (RC)	0 to 17	191	12,649	50.3	2.17	2.07	2.28
18 to 64	4,220	152,995	91.9		18 to 64	561	34,814	53.7	1.71	1.66	1.76
65+	266	27,647	32.1		65+	39	6,268	20.7	1.55	1.37	1.74
TOTAL (all ages)	6,134	238,373	85.8		TOTAL (all ages)	814	55,995	48.5	1.77	1.73	1.82
				ZIP Codes in nearby area with similar population density as ISA	0 to 17	232	15,043	51.4	2.13	2.03	2.23
					18 to 64	411	40,642	33.7	2.73	2.65	2.81
					65+	56	8,099	23.0	1.39	1.23	1.57
					TOTAL (all ages)	709	64,878	36.4	2.35	2.30	2.41
				Orange County	0 to 17	2,078	98,237	70.5	1.55	1.48	1.63
					18 to 64	5,040	231,470	72.6	1.27	1.23	1.31
					65+	379	45,694	27.6	1.16	1.02	1.31
					TOTAL (all ages)	7,497	375,401	66.6	1.29	1.26	1.32
				New York State (excluding New York City)	0 to 17	56,766	2,454,641	77.1	1.42	1.35	1.49
					18 to 64	99,945	7,033,434	47.4	1.94	1.88	2.00
					65+	10,070	1,756,592	19.1	1.68	1.48	1.89
					TOTAL (all ages)	166,781	11,244,667	49.4	1.73	1.69	1.78

Source: *SPARCS Data for Asthma ED Visits, Three Years 2012-2014* (NYSDOH, 2016).

[1] Average annual rate of ED visits per 10,000 population.

[2] Rate in impact study area is numerator; rate in CA is denominator.

Rate ratio for all ages is an age-adjusted standardized rate ratio, using 3 age groups (0-17, 18-64, 65+ years).

Table I-9. Low Birth Weight Data for ISA, RC, Orange County and NYS excluding NYC

Impact Study Area Data			CA	Comparison Area Data					
Low Birth Weight	Total Births (2014 to 2016)	Rate[1]		Low Birth Weight	Total Births (2014-2016)	Rate[1]	Rate ratio[†]	95% CI lower	95% CI upper
606	7,563	8,013	5 to 10-Mile Radius (RC)	124	1,531	8,099	0.99	0.91	1.07
			ZIP Codes in nearby area with similar population density as impact study area	119	1,556	7,648	1.05	0.97	1.13
			Orange County	985	14,274	6,901	1.16	1.07	1.26
			New York State (excluding New York City)	27,221	358,176	7,600	1.05	0.97	1.14

Source: *2014-2016 New York State Vital Statistics Data* (NYSDOH, 2018).

[1] Average annual rate of low birth weights per 100,000 births.

[†] Rate in Impact Study Area is numerator; rate in CA is denominator.

As discussed in the NYSDOH Guidance Section I(h) regarding comparisons between ISAs and CAs, the more often the observations fall into the same pattern, the greater the likelihood that the observations suggest a real difference in health status between the ISA and CAs. The NYSDOH Guidance states that, if any of the following conditions listed below are met, consideration of additional options for the permitting conditions should be reviewed as part of the permitting process because of the health outcome data displays and comparisons. The greater the number of conditions that are met, the greater the likelihood is that the health status of the community of concern (i.e., ISA) is actually lower than that found in other areas.

1. A disease rate is higher in the community of concern than in any CA population for any health outcome;
2. A disease rate is higher in the community of concern than in multiple CA populations for any health outcome;
3. The confidence intervals are greater than 1;
4. There is a pattern of higher rates of multiple health outcomes in the community of concern; and
5. Health outcomes that result from an acute exposure (e.g., asthma exacerbations) are elevated rather than those that result from a chronic exposure (e.g., cancer).

Based on an assessment of the cancer incidence data provided in Table I-7, the community of concern here, the ISA, has comparable cancer incidence ratios to the four CAs for all of the assessed cancer sites. Similarly, the rate ratio between the ISA and four CAs is close to 1.0 for low-birth weight rates as shown in Table I-9. The asthma rate ratios as shown in Table I-8 are greater than 1.5 between the ISA and the nearby CAs and the confidence intervals are greater than 1. Thus, based on the NYSDOH criteria above, the rates of asthma in the ISA meet many of the conditions listed above. However, based on the comparable cancer incidence and low-birth weight incidence rates between the ISA and four CAs, there is not a pattern of higher rates of multiple health outcomes in the ISA.

Air pollution plays a well-documented role in asthma attacks; however, the role air pollution plays in initiating asthma is still under investigation and may involve a very complex set of interactions between indoor and outdoor environmental conditions and genetic susceptibility. The California Air Resources Board (CARB) developed the CARB-funded Children's Health Study and found that children who lived in communities with high ozone levels were more likely to develop asthma than the same children living in areas with less ozone pollution.

In order to minimize and/or negate a proposed action's air quality impact on the ISA, the NYSDOH recommends that an applicant perform an evaluation and implementation of pollution prevention options, which include use of low polluting fuels; changes in work place practices, which include but are not necessarily limited to reduction in fugitive emissions; emission reductions achieved through a review and incorporation into the proposed facility' design best available control technology (BACT) and lowest achievable emission rate (LAER) technology; implementation of a holistic, or entire facility, environmental management system; and where available, the purchase of emissions offsets.

The Project will meet and exceed the above recommendations in order to mitigate any potential environmental burden to the nearby ISA and more specifically, EJ areas. The Project proposes to use the cleanest fuels presently available, which include natural gas as the primary fuel, with ULSD as the back-up fuel. The Project will also be one of the most efficient electric-generating facilities in New York, which further reduces the New York Independent System Operator system-wide average emission rate per megawatt-hour generated. The Project will be required under its applicable air permits to incorporate BACT and LAER technology, which will minimize the emissions from the Project to the lowest emission rates achievable for the combustion turbine. Further, the Project will offset its emissions of NO_x and VOC through emission reduction credits based on the shutdown of the existing Danskammer Generating Station. The above-mentioned environmental impact mitigation measures will ensure that the Project has negligible to no air quality impacts to the ISA and EJ Areas from its operation.

I(c) Cumulative Air Impacts from the Project

NYSDEC Part 487.7 requires that Danskammer conduct a cumulative impact analysis of air quality in accordance with an air modeling protocol approved by the NYSDEC and consistent with the requirements of section 487.7. A cumulative air quality modeling analysis for criteria air pollutants was conducted and incorporated the air contaminant emissions of those pollutants for which the proposed Project has a significant air quality impact (i.e., the maximum concentrations are above the recognized PSD SILs). All modeled Project impacts, except for PM-10/PM-2.5 and 1-hour NO_2 impacts, are below the SILs. Thus, the cumulative impact analysis of air quality is necessary for PM-10/PM-2.5 and 1-hour NO_2 impacts.

Danskammer conducted an air quality analysis for non-criteria air pollutants, as detailed in Section 5, which followed NYSDEC guidance for criteria air pollutants and modeling maximum Project impacts of relevant non-criteria pollutants to determine if any exceed either 10 percent of the

NYSDEC AGC if based on non-cancer effects or 100 percent of the AGC if based on a one-in-one million cancer risk. This screening was used to determine the appropriate number of chemicals included in a potential non-criteria cumulative impact analysis, which would be conducted after consultation with NYSDEC and NYSDOH. The results of the analysis indicate that all the maximum modeled Project concentrations were less than their respective SGCs and AGCs and for most HAPs, only a fraction of a percentage of the SGCs and/or AGCs. Thus, none of the non-criteria air pollutants have modeled concentrations that are 100 percent of the AGC if based on one-in-a-million cancer risk, and therefore, a cumulative non-criteria air quality assessment for carcinogenic air pollutants is not warranted per NYSDOH guidance. Similarly, none of the non-criteria air pollutants have maximum modeled concentrations greater than 10 percent of the AGC, if based on non-cancer effects, and therefore, a cumulative non-criteria air quality assessment is not necessary per NYSDOH guidance.

The cumulative impacts of the Project combined with the following facilities are included in the cumulative air quality impact analysis:

- any additional Article 10 facilities that have submitted an application that is determined compliant with Public Service Law Section 164 and are located within the EJ air impact area (EJAIA) plus 10 kilometers (km) (six miles);
- any major stationary source that has not yet commenced operations, but has received its air permit from NYSDEC, and is located within the EJAIA plus 10 km (six miles), and whose emissions exceed the significant Project thresholds are necessary to be included in a cumulative analysis; and
- existing major sources within the EJAIA whose emissions exceed the significant Project thresholds.

The EJAIA per 6 NYCRR Part 487.7(b) is defined as the larger of the distance to the furthest receptor location of maximum impact for any pollutants modeled for the proposed Project or the ISA for the Project. The location of maximum impact as detailed in Section 5 is 3.1 miles and thus per 6 NYCRR Part 487.7(b), the EJAIA is 5 miles. The cumulative impact of air quality from the Project, existing ambient background pollutant concentrations, existing major sources, and any proposed actions within the EJAIA plus six miles with applications that are deemed administratively complete are necessary to be assessed for impact to the EJ Areas.

The air quality modeling methodology for the cumulative impact analysis per NYSDEC Part 487.7 is provided in Section 6. Based on the modeling results detailed in Section 5 of the NYSDEC Part 201/231 Air Permit Application, the distance to significant air quality impacts for the aforementioned pollutants are as follows:

- 1-hour NO_2 = 11.3 miles;
- 24-hour PM-10 = 0.3 miles;
- 24-hour PM-2.5 = 4.0 miles; and
- Annual PM-2.5 = 0.5 miles.

Based on the distances to modeled significant impacts, the EJAIA was extended from the statutory requirement of 5 miles to 11.3 miles. Thus, per NYSDEC 487 requirements, a cumulative air quality assessment was conducted for existing major stationary sources within 11.3 miles of the Project. There were no major stationary sources that have not yet commenced operation or are under Article 10 review that were identified as being within 17.6 miles of the Project Site. The inventory of existing major stationary sources was coordinated with the NYSDEC and is discussed in detail in Section 6 of the NYSDEC Part 201/231 air permit application.

The modeling methodology used for assessing the proposed Project's air quality impact was detailed in the Air Quality Modeling Protocol submitted to the NYSDEC on May 15, 2019, and approved by the NYSDEC in a comment letter dated June 20, 2019 as provided in Appendix E of the NYSDEC Part 201/231 air permit application. Based on the approved modeling methodology and the inventory of existing major stationary sources, a cumulative air quality assessment was conducted. The results of the cumulative air quality assessment as detailed in Section 6 of this Application, indicate the cumulative air quality impact is well below the NAAQS for PM-10/PM-2.5. The results of the 1-hour NO_2 impact assessment indicate that there are potential NAAQS exceedances based on the total off-Site source contributions plus the existing background concentrations. The contribution to any modeled potential NAAQS exceedances for 1-hour NO_2 from the proposed Project is below the 1-hour NO_2 SILs. Thus, the Project will have insignificant impacts at any potential NAAQS exceedances for 1-hour NO_2 and the PM-10/PM-2.5 NAAQS will be met in the identified EJ Areas. Thus, the Project is not expected to have any significant and adverse disproportionate cumulative air quality impacts within the EJ Areas.

I(d) Significant and Adverse Disproportionate Impacts

As demonstrated in Sections I(a)-(c) above, construction and operation of the Project are not anticipated to result in any significant and adverse disproportionate environmental impacts in the EJ Areas. Thus, the need for mitigation measures as part of compliance with the NYSDEC Part 487 regulation is not necessary or warranted.

I(e) Mitigation Measures

Because the Project is not anticipated to result in any significant and averse disproportionate environmental impacts in the EJ Areas, no measures are necessary to avoid, minimize, or mitigate such impacts, and thus there was no need to describe the manner in which any such measures would be verified or include a statement of the cost of such measures.

I(f) Public Outreach

The Project's Public Involvement Program (PIP) Plan was implemented to ensure a comprehensive outreach and facilitate a readily accessible and understandable method of communicating with the public regarding the Project. EJ areas were identified in the Town of Plattekill, the Town of Newburgh, the City of Newburgh, the Town of Fishkill, and the City of Beacon. Danskammer has met with officials from the Town of Fishkill, the Town of Newburgh, the City of Newburgh, and the City of Beacon. A summary of coordination with each of these municipalities is provided in Table I-10. Coordination has also occurred with Orange County (which includes the Town of Plattekill, Town of Newburgh, and City of Newburgh) and Dutchess County (which includes the Town of Fishkill and City of Beacon). In addition to these meetings, four open house sessions held as part of the Article 10 process, two of which occurred in the Town of Newburgh on December 17, 2018. Public presentations were also given on the Project in the City of Newburgh and the Town of Newburgh on January 28, 2019 and the City of Beacon on July 29, 2019.

Table I-10. Outreach to EJ Areas

Date	Municipality/County	Type of Outreach
May 10, 2018	Orange County	Meeting with the Orange County Industrial Development Agency
May 29, 2018	Town of Newburgh	Meeting with the Town Supervisor
September 20, 2018	Meeting with Orange County Partnership	Meeting with Chief Executive Officer

Table I-10. Outreach to EJ Areas

Date	Municipality/County	Type of Outreach
September 27, 2018	Orange County	Meeting with the County Executive
October 16, 2018	Orange County	Meeting with the Orange County Sheriff's Department
October 16, 2018	Orange County	Meeting with the Orange County Planning Department
October 16, 2018	Orange County	Meeting with Office of Emergency Services
October 16, 2018	Orange County	Meeting with Public Works Department
October 16, 2018	Orange County	Meeting with the Orange County Partnership Board
November 27, 2018	Orange County	Meeting with Orange County Legislators
November 29, 2018	Town of Newburgh	Meeting with the Town Supervisor, Deputy Supervisor, Town Attorney, Town Engineer, and Code Compliance Supervisor
November 29, 2018	Town of Fishkill	Meeting with the Town Supervisor
December 17, 2018	Town of Newburgh	Article 10 Open House
January 23, 2019	Orange County	Call with the Industrial Development Agency
January 28, 2019	City of Newburgh	Public Presentation
January 28, 2019	Town of Newburgh	Public Presentation
February 6, 2019	City of Beacon	Meeting with Mayor and City Administrator
March 14, 2019	City of Newburgh	Meeting with City Manager
March 20, 2019	Dutchess County	Meeting with the County Executive
April 1, 2019	City of Beacon	Meeting with Beacon City Council
April 18, 2019	Orange County	Presentation at Orange County Partnership dinner
April 29, 2019	Town of Newburgh	Payment in Lieu of Taxes (PILOT) and Community Benefit Agreement Discussion with Town Supervisor
May 15, 2019	Orange County	Meeting with the Orange County Industrial Development Agency regarding the PILOT and Community Benefit Agreement
June 1, 2019	City of Newburgh	Informational booth at the Newburgh Illuminated Event
June 11, 2019	Dutchess County	Stipulation Conference, participants included a representative of Dutchess County

Table I-10. Outreach to EJ Areas

Date	Municipality/County	Type of Outreach
July 3, 2019	City of Beacon	Meeting with Town Councilor
July 3, 2019	Town of Newburgh	Informational booth at the Newburgh Community Day Event
July 10, 2019	Town of Newburgh	PILOT and Community Benefit Agreement Discussion with Town Supervisor
July 10, 2019	Orange County	Meeting with County Executive
July 15, 2019	Dutchess County	Stipulation Conference, participants included a representative of Dutchess County
July 17, 2019	Dutchess County	Stipulation Conference, participants included a representative of Dutchess County
July 22, 2019	Dutchess County	Stipulation Conference, participants included a representative of Dutchess County
July 23, 2019	Dutchess County	Stipulation Conference, participants included a representative of Dutchess County
July 24, 2019	City of Newburgh	Meeting with City Manager
July 29, 2019	City of Beacon	Presentation to Beacon City Council
July 30, 2019	Dutchess County	Stipulation Conference, participants included a representative of Dutchess County
September 16, 2019	Orange County	Discussions with multiple county legislators
September 18, 2019	Orange County	Discussion with Orange County Rules Committee
September 23, 2019	Town of Fishkill	Meeting with the Town Supervisor
September 23, 2019	Orange County	Meeting with the Orange County Partnership
September 23, 2019	Orange County	Meeting with an Orange County Legislator
September 26, 2019	Orange County	Meeting with Orange County Legislator

Recognizing that there are some areas with significant Hispanic/Spanish-speaking populations, Danskammer has also identified El Aguila as a bilingual "English/Spanish" media outlet that reaches the Hispanic/Spanish speaking community in the Hudson Valley. Public notifications for Project milestones and outreach activities have been made through either the quarterly digital magazine or in the weekly/daily updates on the website www.elaguilanews.com.

Danskammer will continue to meet with state, county, and town officials after the Application is submitted. This includes regular participation in local municipal meetings to keep municipal officials and residents updated on the status of the Project. There will also be public statement hearings as part of the Article 10 certification process that stakeholders and interested parties will be invited to attend and to provide public statements about the Project.

I(g) EJ Areas Maps

Figures I-1 through I-5 provide maps that identify the identified EJ Areas in accordance with NYSDEC Part 487 requirements. Maps of the existing environmental conditions within the EJ Areas are provided on Figures I-6 through I-16. The maximum modeled air quality impacts within each of the EJ Areas are provided on Figures I-17 through I-28.

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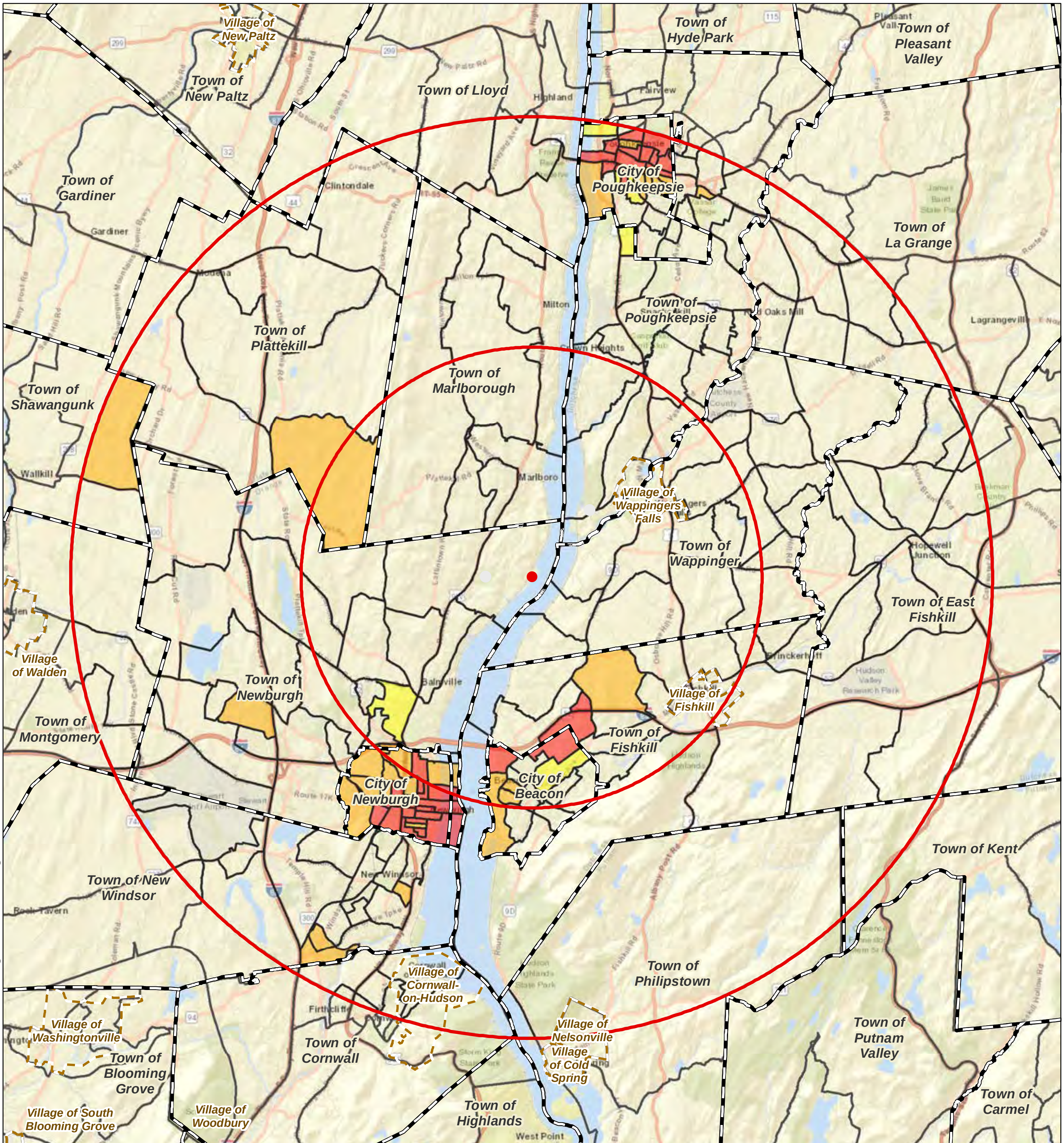
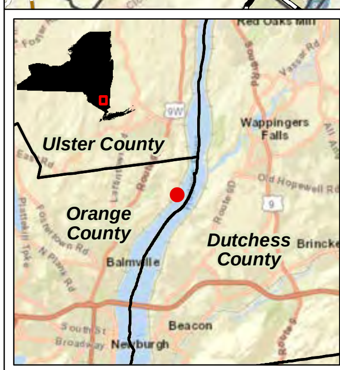




Site Location
5- and 10-Mile Radii Around Site
Poverty Alone in Excess of 23.59%
Minority Alone in Excess of 51.1%
Exceeds Both Poverty and Minority Thresholds
No Environmental Justice Thresholds Exceeded
Municipal Boundary
Village Boundary

0 1 2 3
Miles

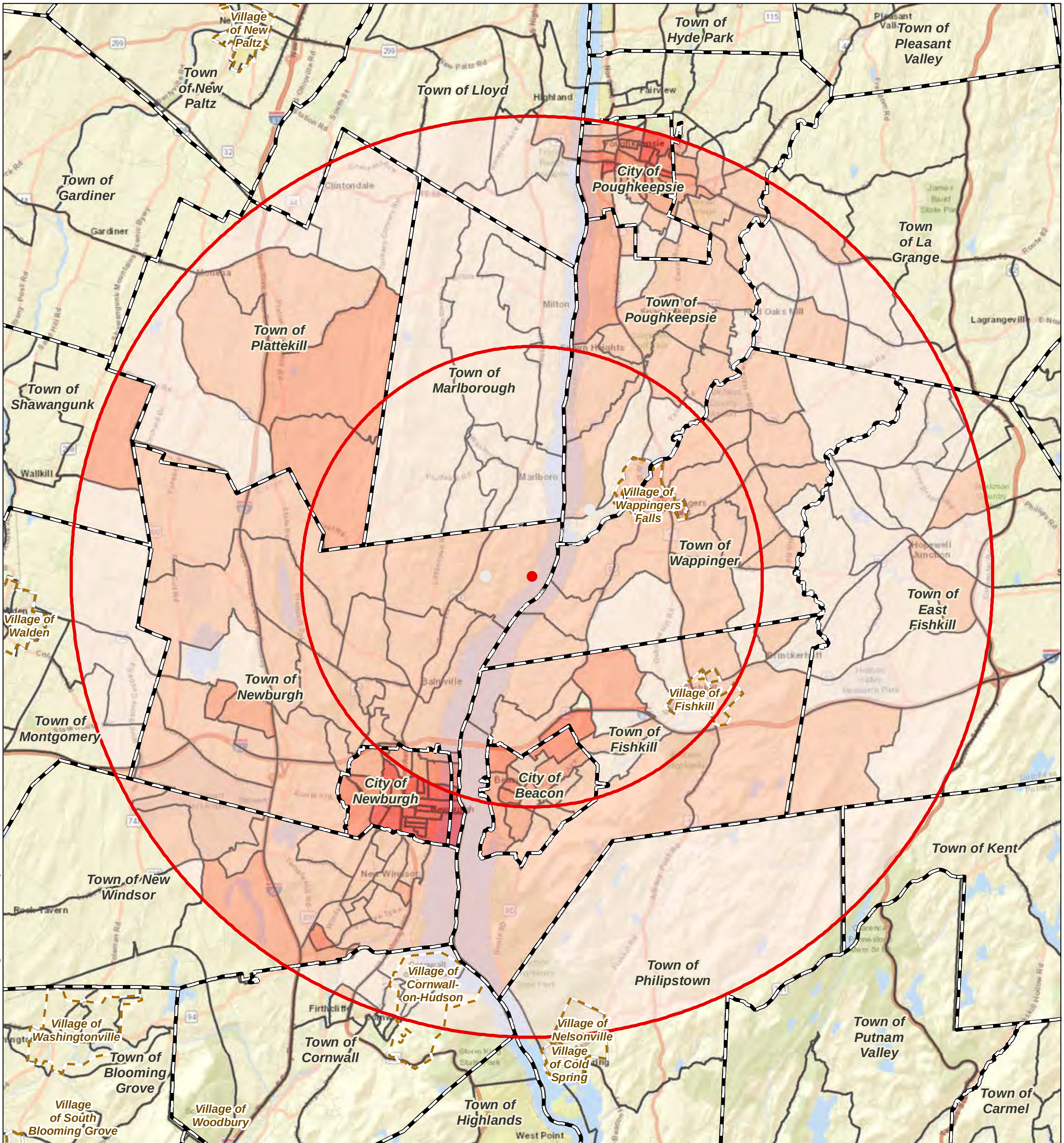
Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

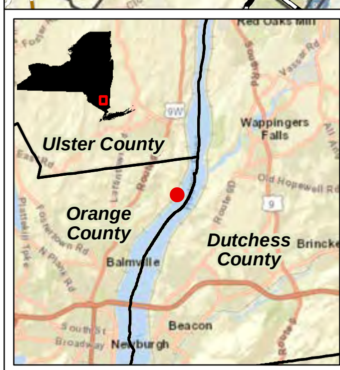
Danskammer Energy, LLC

Danskammer Energy Center
Figure I-1
Environmental Justice Screening Area
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\Fig5.2-1 EJ Screening Area 2019-08-21.mxd





- Site Location
- 5- and 10-Mile Radii Around Site

Minority Percentage

- 0- 20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- 80 - 100%
- Municipal Boundary
- Village Boundary

N W E S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

Danskammer Energy Center
Figure I-2
Environmental Justice Block Groups Minority Percentage
Town of Newburgh
Orange County, NY

Prepared on 11/29/2018 by TRC

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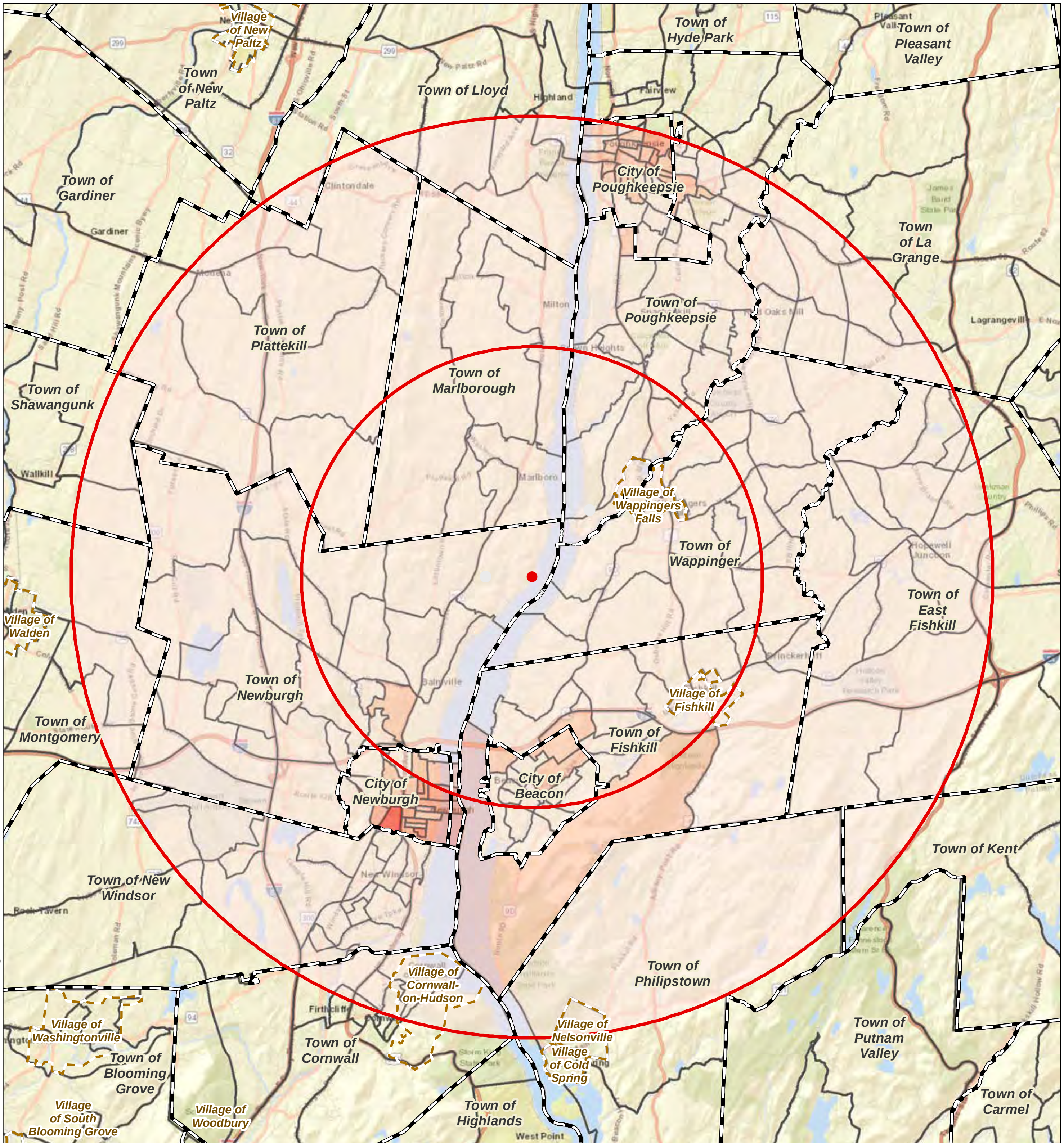

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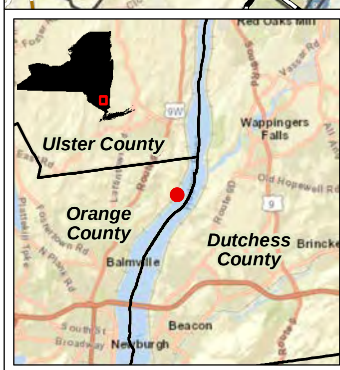


Site Location

5- and 10-Mile Radii Around Site

Percent Under Poverty Level

- 0 - 20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- 80 - 100%

Municipal Boundary

Village Boundary

Comparison Poverty Percentage:
Orange County: 11.4%
New York State: 14.8%

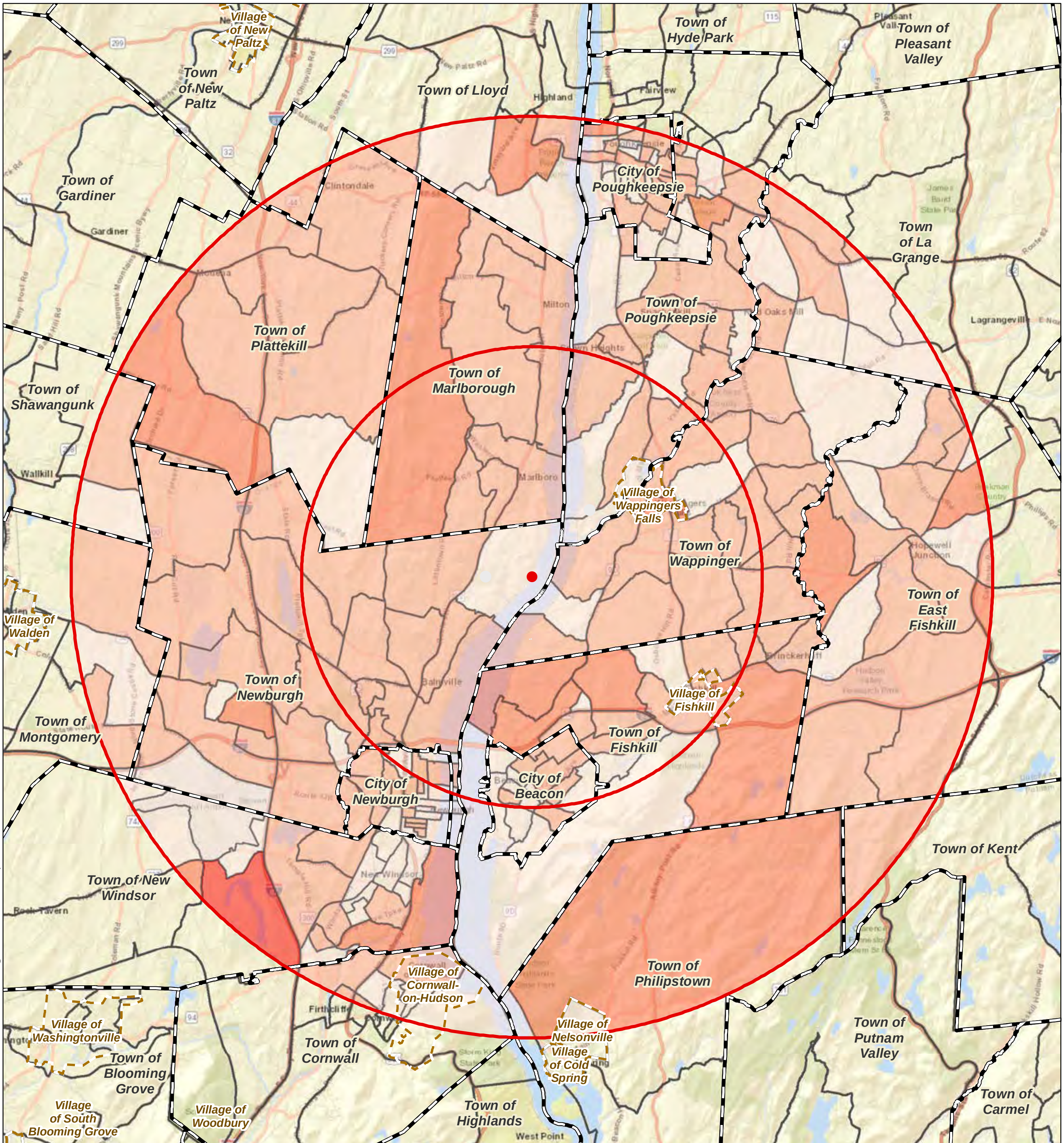
0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

Danskammer Energy Center
Figure I-3
Environmental Justice Block Groups Poverty Percent
Town of Newburgh
Orange County, NY

Prepared on 11/29/2018 by TRC



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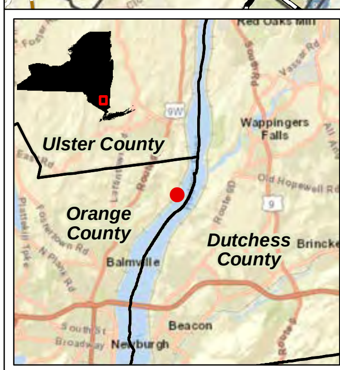


Site Location

5- and 10-Mile Radii Around Site

Total Population

0 - 1000

1001 - 2000

2001 - 3000

3001 - 4000

Municipal Boundary

Village Boundary

N W E S

0 1 2 3

Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

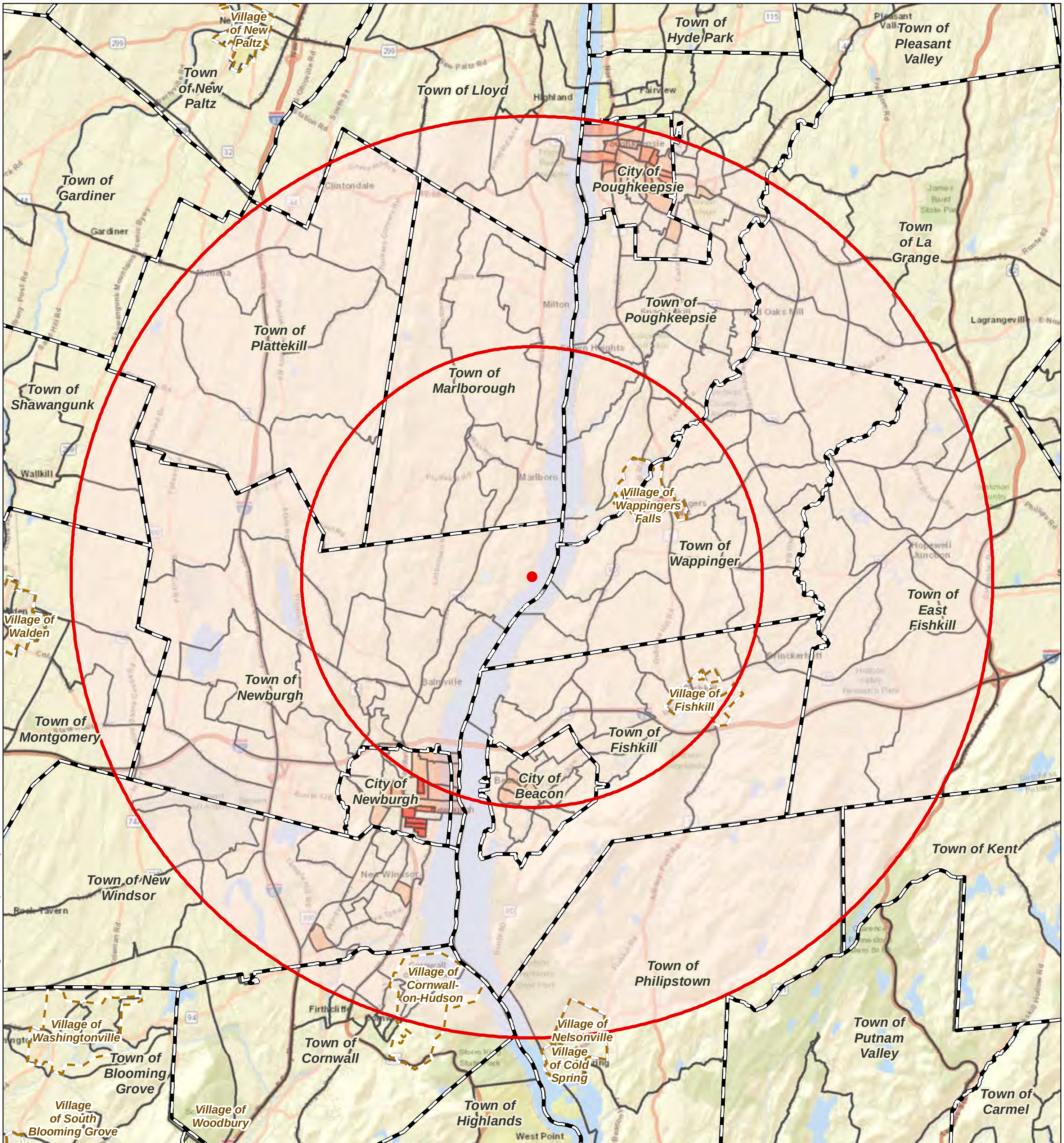
Danskammer Energy, LLC

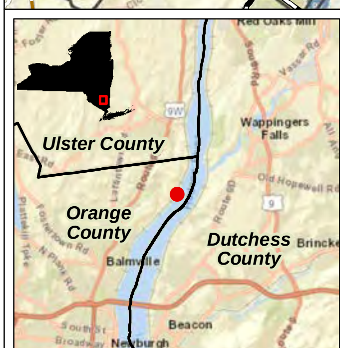
Danskammer Energy Center

Figure I-4

Environmental Justice Block Groups
Total Population
Town of Newburgh
Orange County, NY

Prepared on 11/29/2018 by TRC





- Site Location
- 5- and 10-Mile Radii Around Site

Population per Square Mile

- Less than 6,000
- 6000 - 12,000
- 12,000 - 18,000
- 18,000 - 24,000
- Greater than 24,000
- Municipal Boundary
- Village Boundary

N W E S

0 1 2 3 Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

Danskammer Energy Center

Figure I-5

Environmental Justice Block Groups Population Density
Town of Newburgh
Orange County, NY

Prepared on 11/29/2018 by TRC

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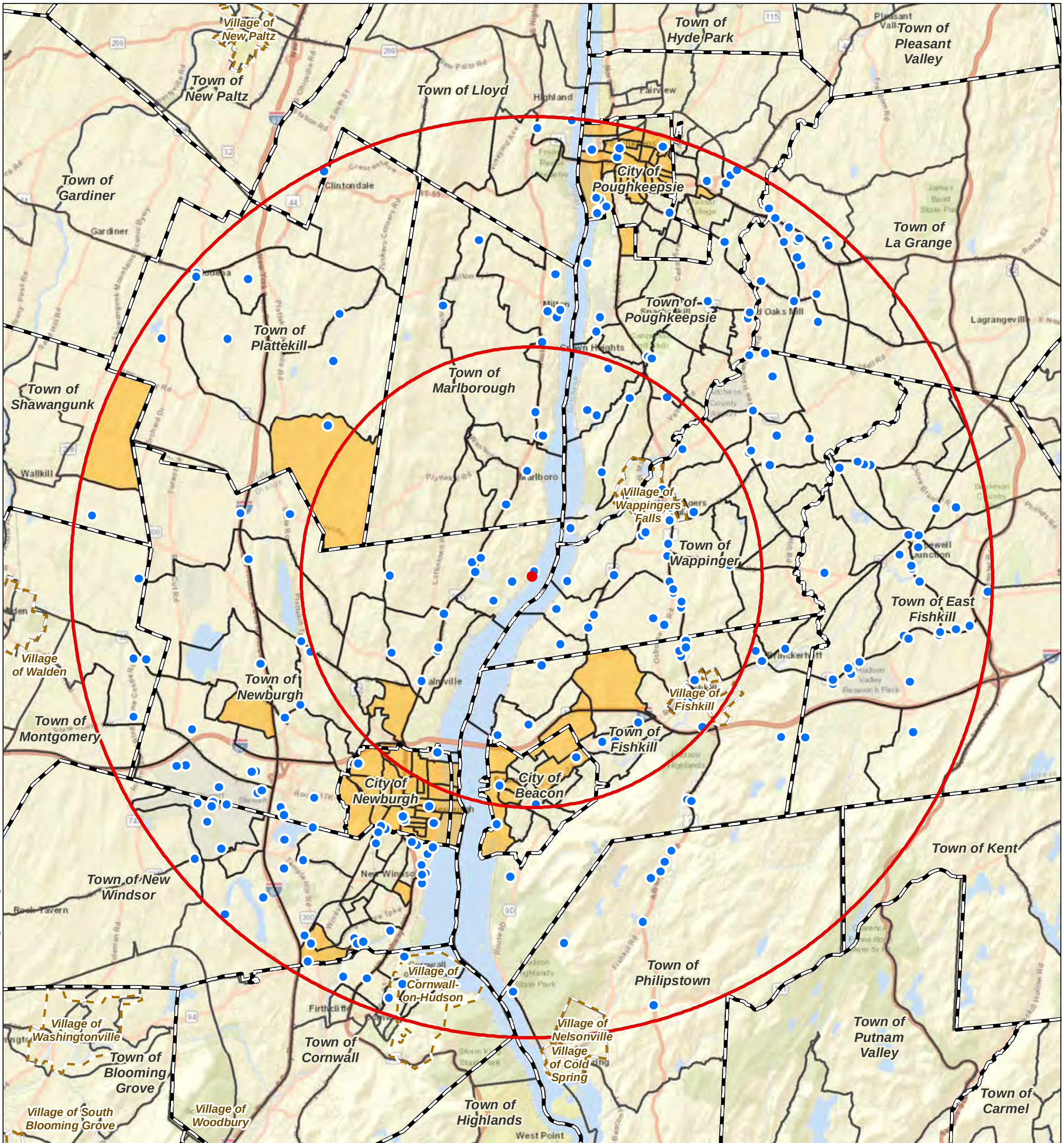

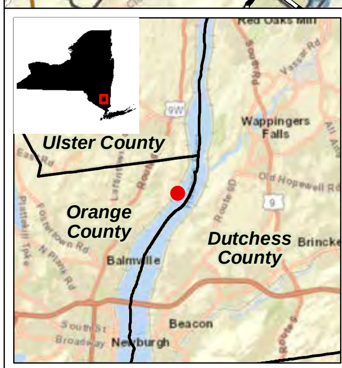

- Site Location
- SPDES Permitted Site within ISA and RC
- 5- and 10-Mile Radii Around Site
- Environmental Justice Area
- No Environmental Justice Thresholds Exceeded
- Municipal Boundary
- Village Boundary

N E S W

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

Danskammer Energy Center
Figure I-6
SPDES Permitted Sites within ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

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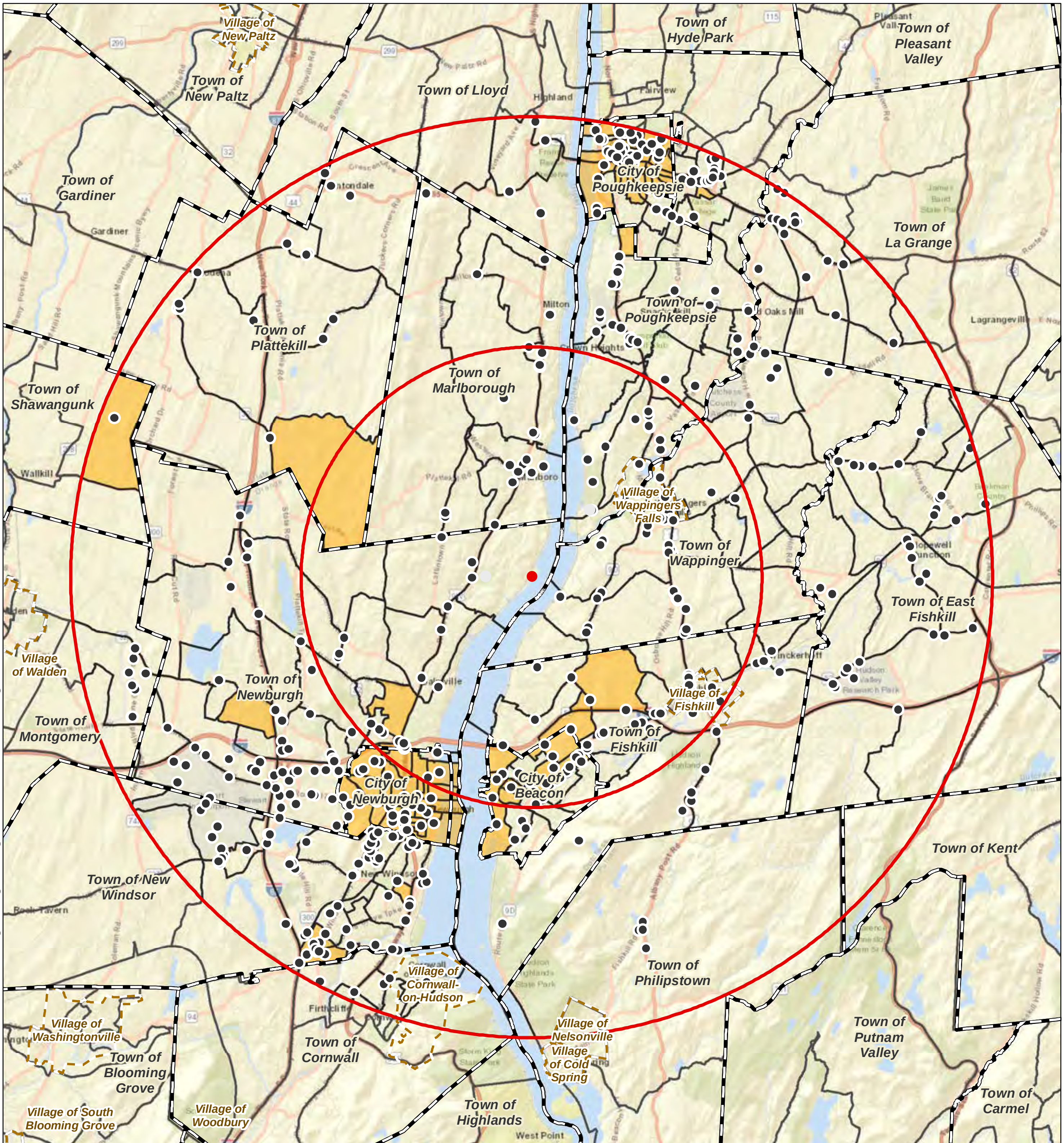
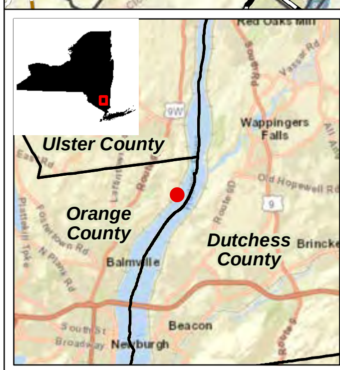




Site Location

Registered Petroleum Bulk Storage Sites within ISA and RC

5- and 10-Mile Radii Around Site

Environmental Justice Area

No Environmental Justice Thresholds Exceeded

Municipal Boundary

Village Boundary

N W E S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

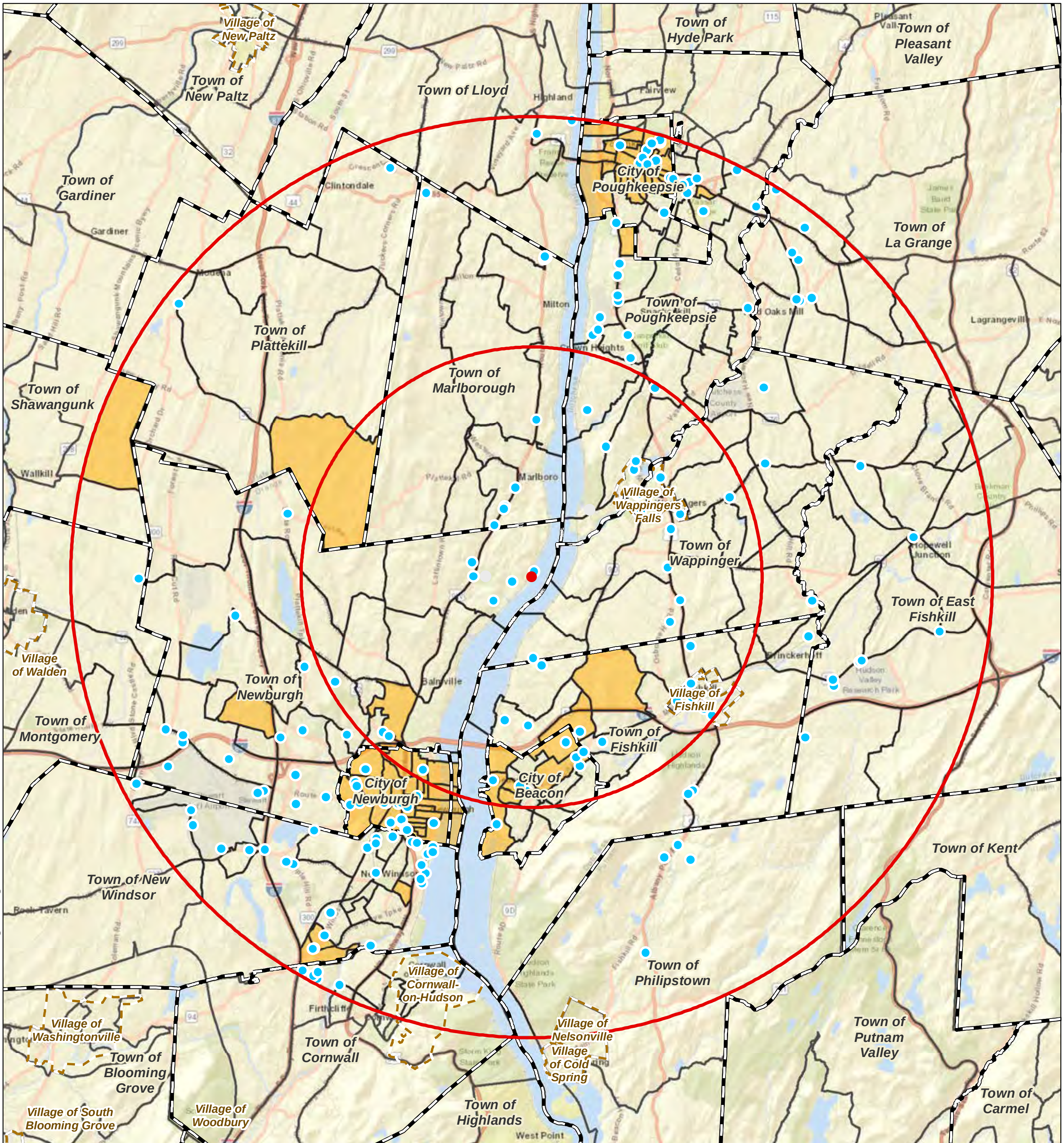
Danskammer Energy Center

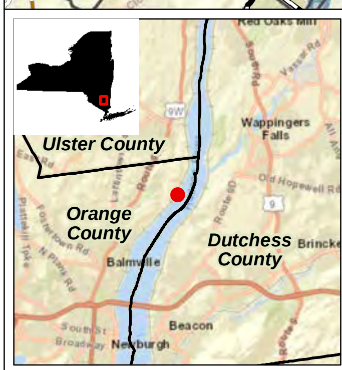
Figure I-7

Registered Petroleum Bulk Storage Sites within ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-7 Registered Petroleum Bulk Storage Sites within ISA and RC 20190821.mxd





- Site Location
- Air Permitted Sites within ISA and RC
- 5- and 10-Mile Radii Around Site
- Environmental Justice Area
- No Environmental Justice Thresholds Exceeded
- Municipal Boundary
- Village Boundary

N W E S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

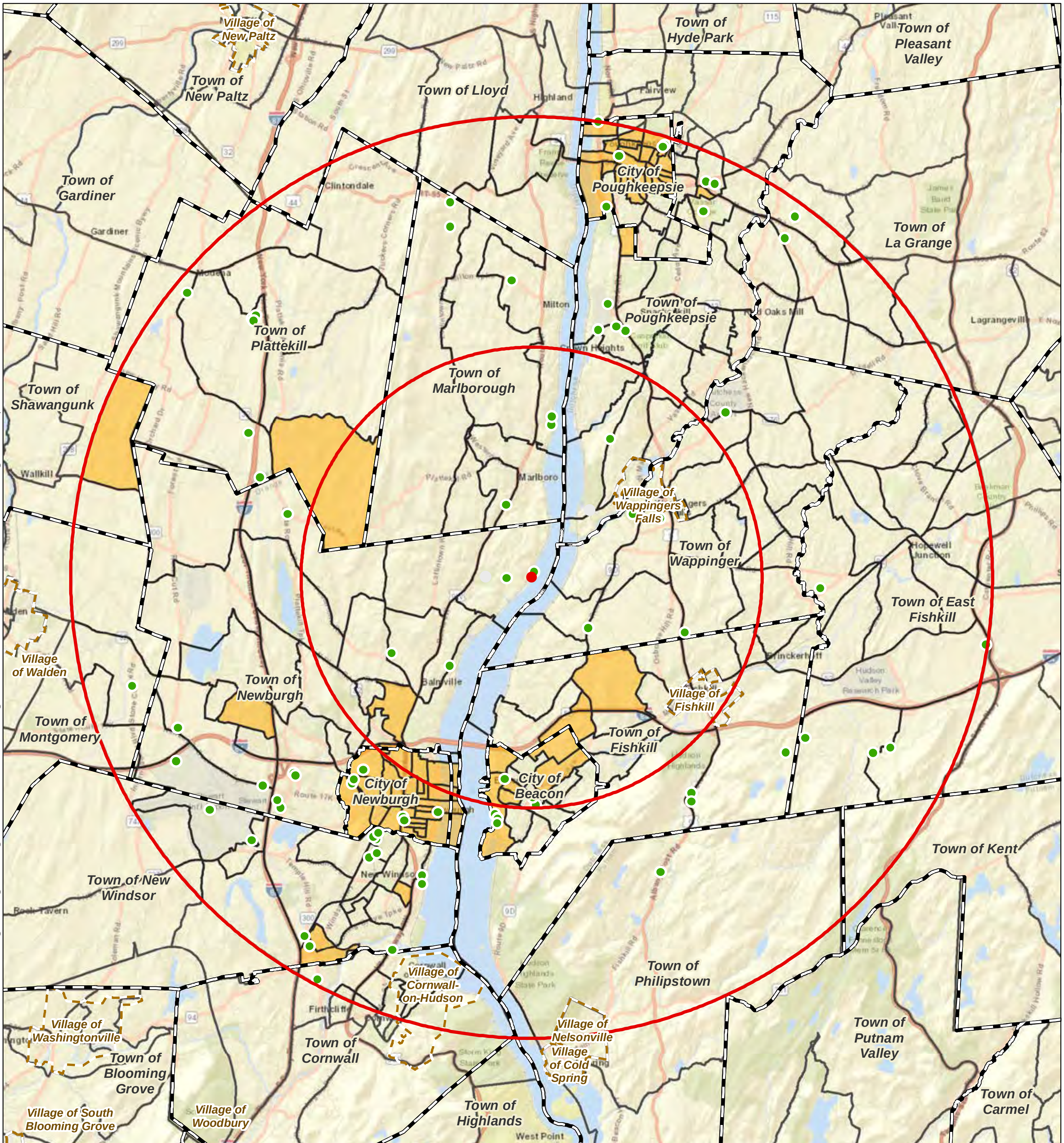
Danskammer Energy Center

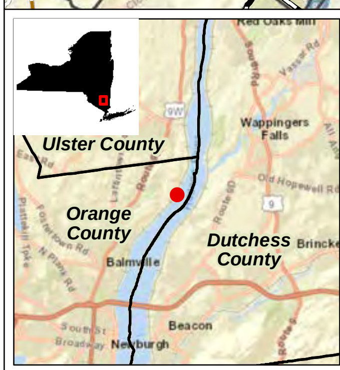
Figure I-8

Air Permitted Sites within ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-8 Air Permitted Sites within ISA and RC 20190821.mxd





Site Location

Registered Solid Waste Management and Hazardous Waste Treatment Storage and Disposal Facilities with ISA and RC

5- and 10-Mile Radii Around Site

Environmental Justice Area

No Environmental Justice Thresholds Exceeded

Municipal Boundary

Village Boundary

N
W E
S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

Danskammer Energy Center

Figure I-9

Registered Solid Waste Management and Hazardous Waste Treatment Storage and Disposal Facilities with ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-9 Registered Solid Waste Management and Hazardous Waste Treatment Storage and Disposal Facilities with ISA and RC 20190821.mxd

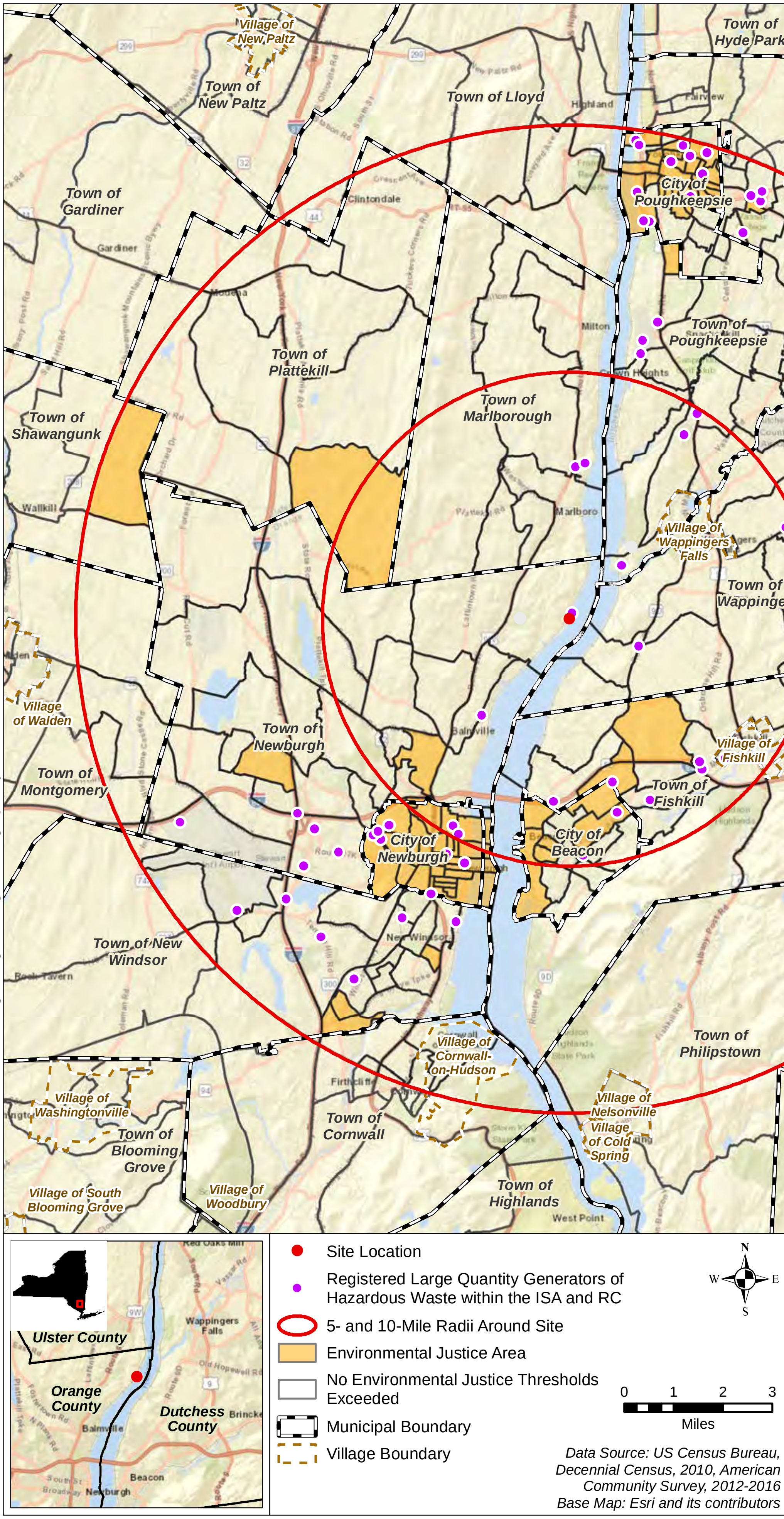


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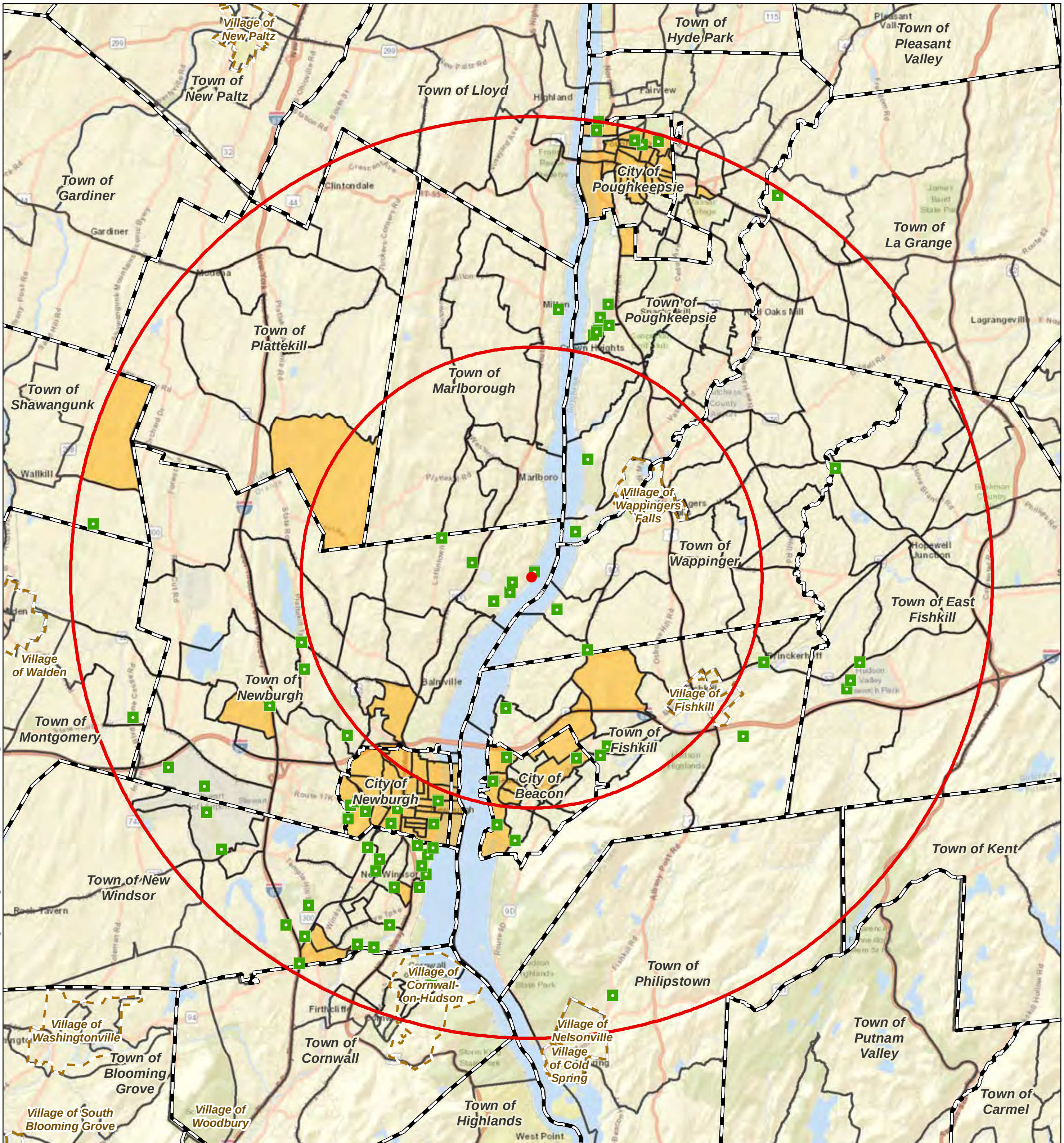
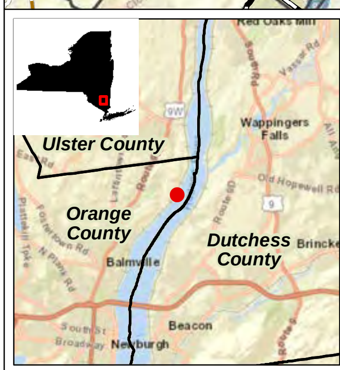
Figure I-10

Registered Large Quantity Generators of Hazardous Waste within the ISA and RC Town of Newburgh Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-10 Registered Large Quantity Generators of Hazardous Waste within the ISA and RC 20190821.mxd





- Site Location
- Chemical Bulk Storage Sites within the ISA and RC
- 5- and 10-Mile Radii Around Site
- Environmental Justice Area
- No Environmental Justice Thresholds Exceeded
- Municipal Boundary
- Village Boundary

N W E S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

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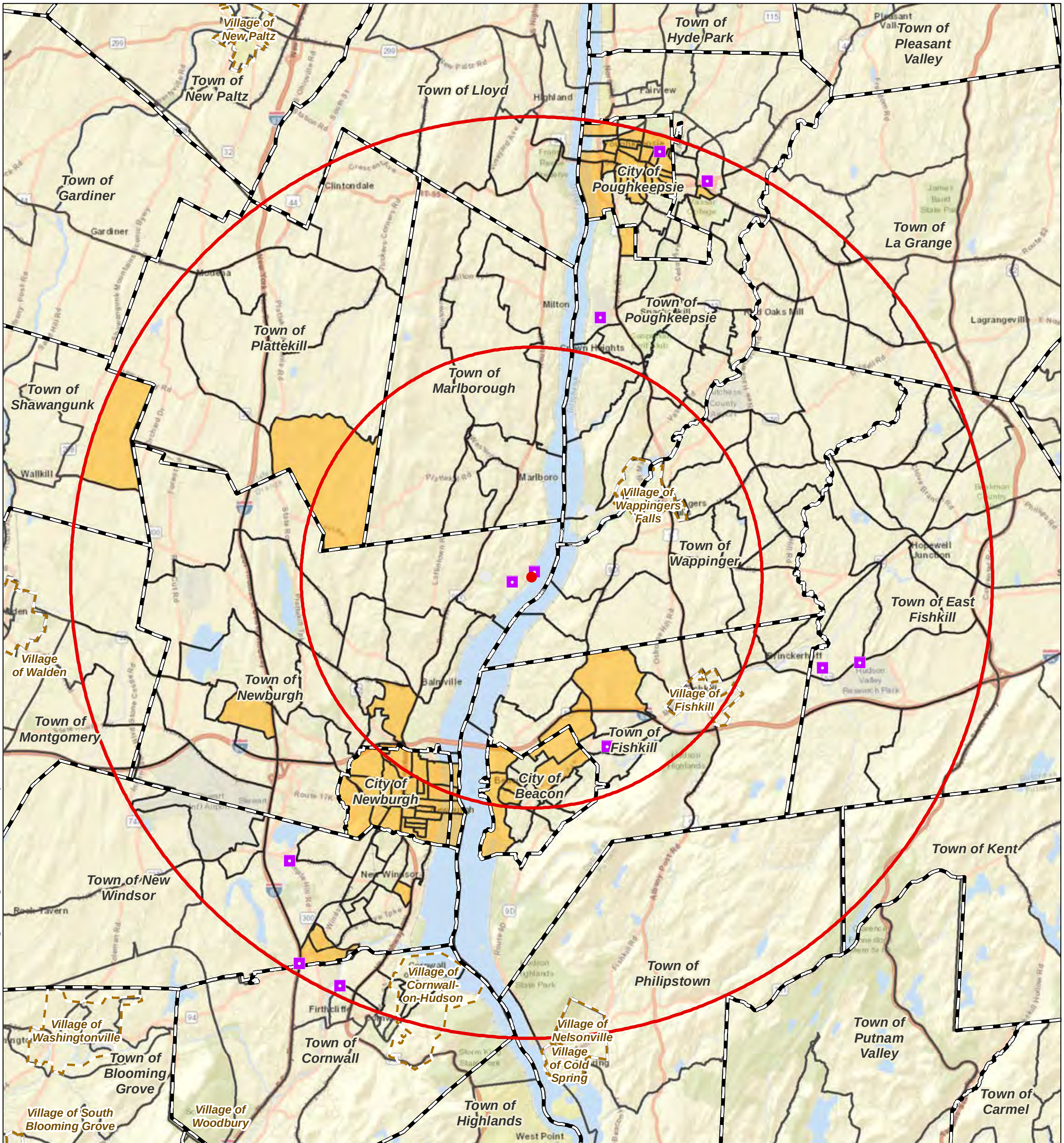
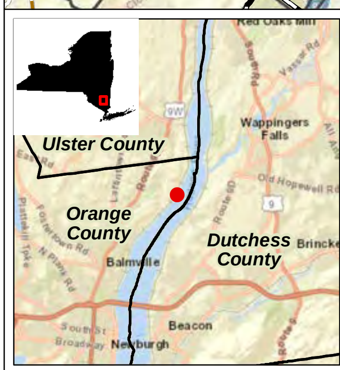
Figure I-11

Chemical Bulk Storage Sites within the ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-11 Chemical Bulk Storage Sites within the ISA and RC 20190821.mxd





- Site Location
- Facilities subject to RCRA Corrective Action within the ISA and RC
- 5- and 10-Mile Radii Around Site
- Environmental Justice Area
- No Environmental Justice Thresholds Exceeded
- Municipal Boundary
- Village Boundary

N W E S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

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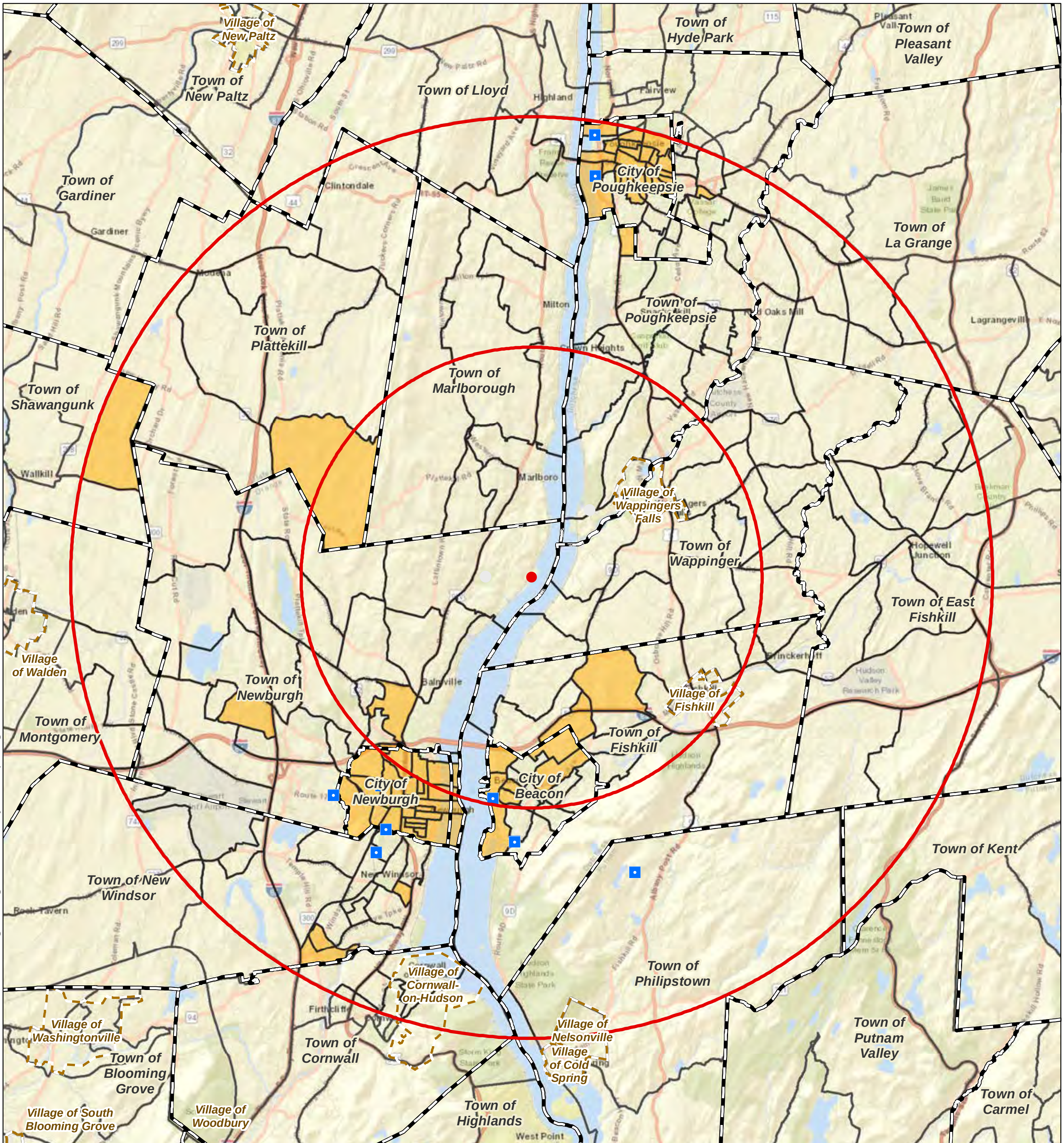
Figure I-12

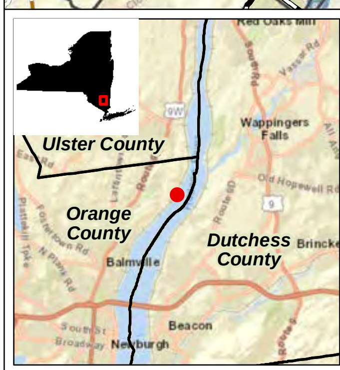
Facilities subject to RCRA Corrective Action within the ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-12 Facilities subject to RCRA Corrective Action within the ISA and RC 20190821.mxd



S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-13 Voluntary Cleanup Program Facilities within the ISA and RC 20190821.mxd



- Site Location
- Voluntary Cleanup Program Facilities within the ISA and RC
- 5- and 10-Mile Radii Around Site
- Environmental Justice Area
- No Environmental Justice Thresholds Exceeded
- Municipal Boundary
- Village Boundary

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

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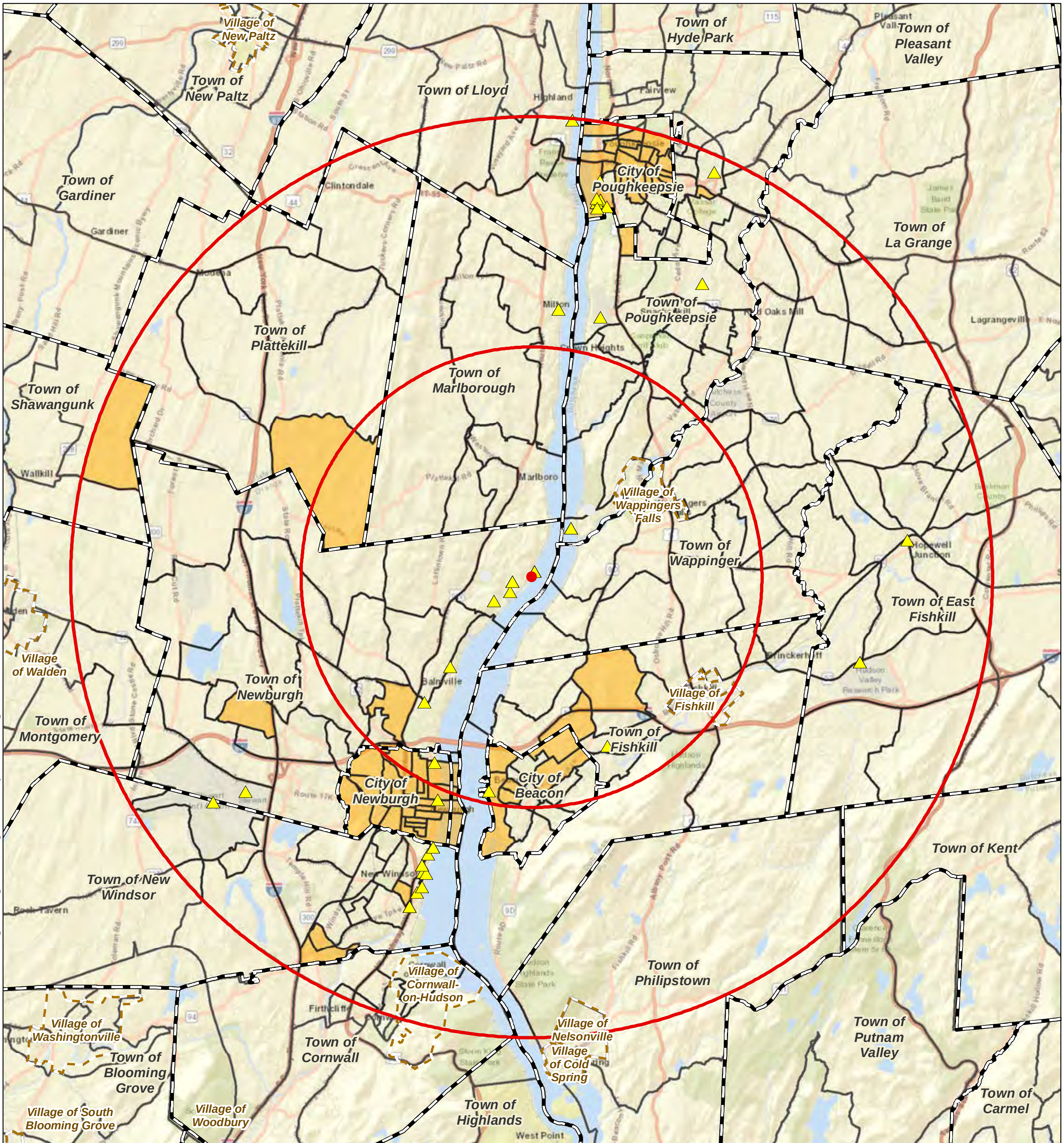
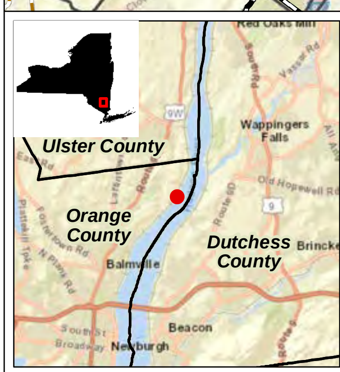
Danskammer Energy Center

Figure I-13

Voluntary Cleanup Program Facilities within the ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC





Site Location

Registered Major Oil Storage Facilities within ISA and RC

5- and 10-Mile Radii Around Site

Environmental Justice Area

No Environmental Justice Thresholds Exceeded

Municipal Boundary

Village Boundary

N W E S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

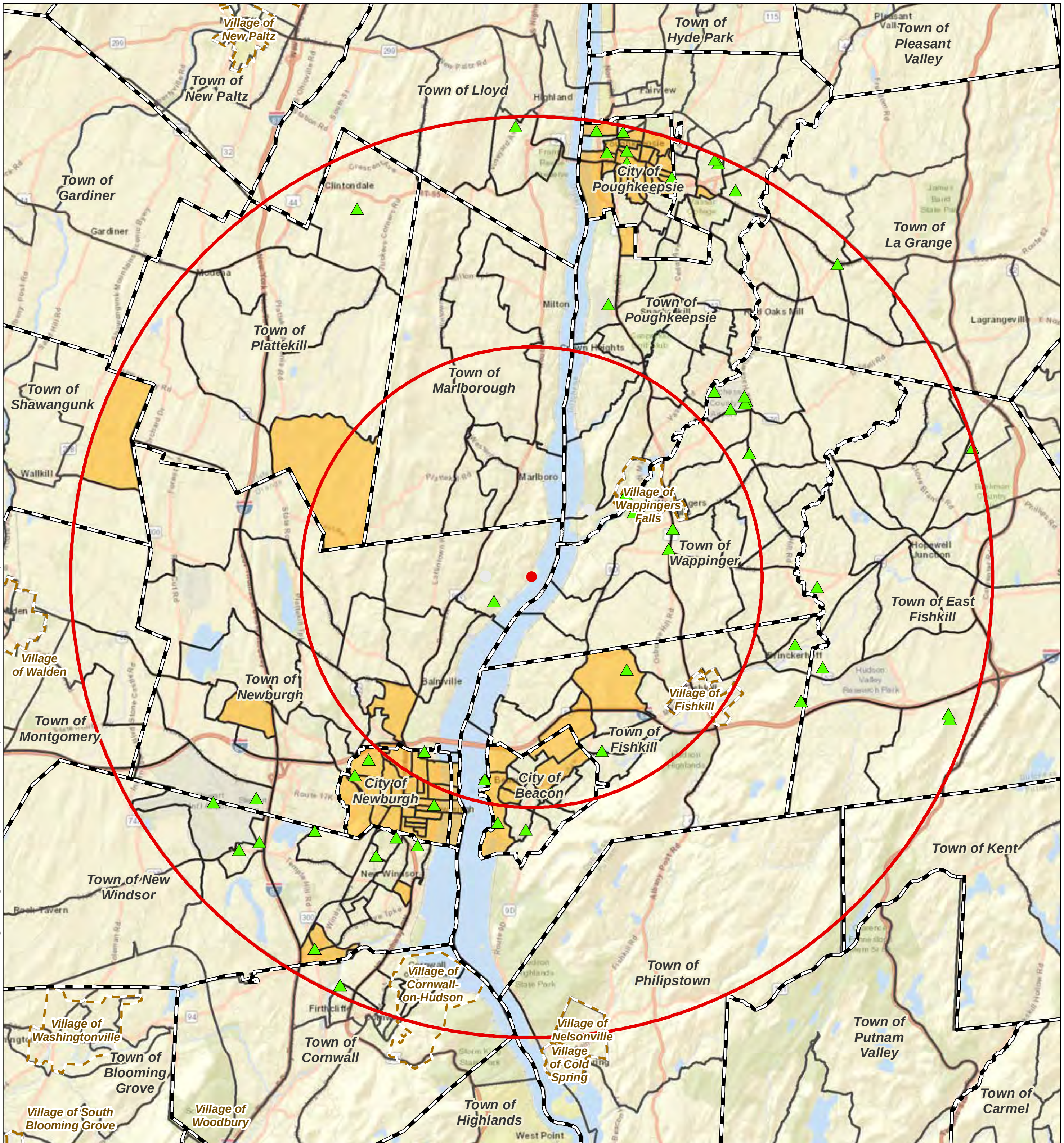
Danskammer Energy Center

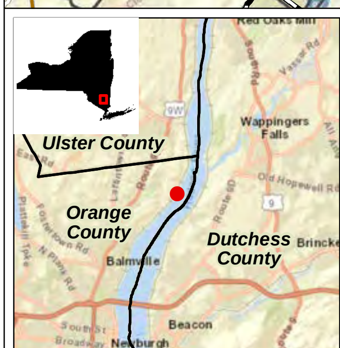
Figure I-14

Registered Major Oil Storage Facilities within ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-14 Registered Major Oil Storage Facilities within ISA and RC 20190821.mxd





- Site Location
- Hazardous Waste Disposal Sites and Brownfield Cleanup Sites within ISA and RC
- 5- and 10-Mile Radii Around Site
- Environmental Justice Area
- No Environmental Justice Thresholds Exceeded
- Municipal Boundary
- Village Boundary

N W E S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

Danskammer Energy, LLC

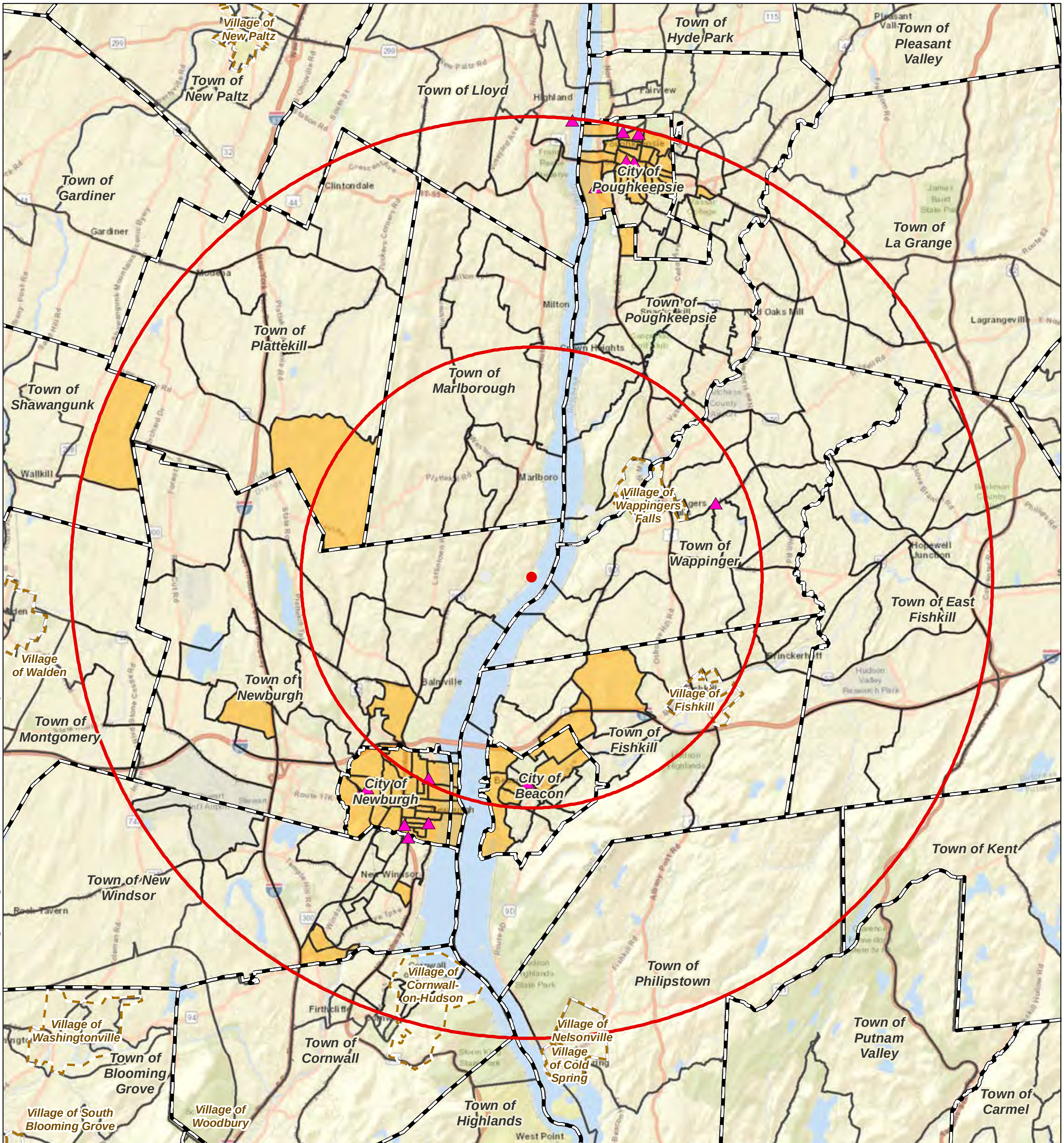
Danskammer Energy Center

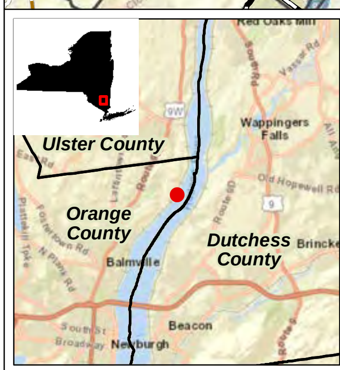
Figure I-15

Hazardous Waste Disposal Sites and Brownfield Cleanup Sites within ISA and RC
Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-15 Hazardous Waste Disposal Sites and Brownfield Cleanup Sites within ISA and RC 20190821.mxd





- Site Location
- Environmental Restoration Projects within ISA and RC
- 5- and 10-Mile Radii Around Site
- Environmental Justice Area
- No Environmental Justice Thresholds Exceeded
- Municipal Boundary
- Village Boundary

N W E S

0 1 2 3
Miles

Data Source: US Census Bureau, Decennial Census, 2010, American Community Survey, 2012-2016
Base Map: Esri and its contributors

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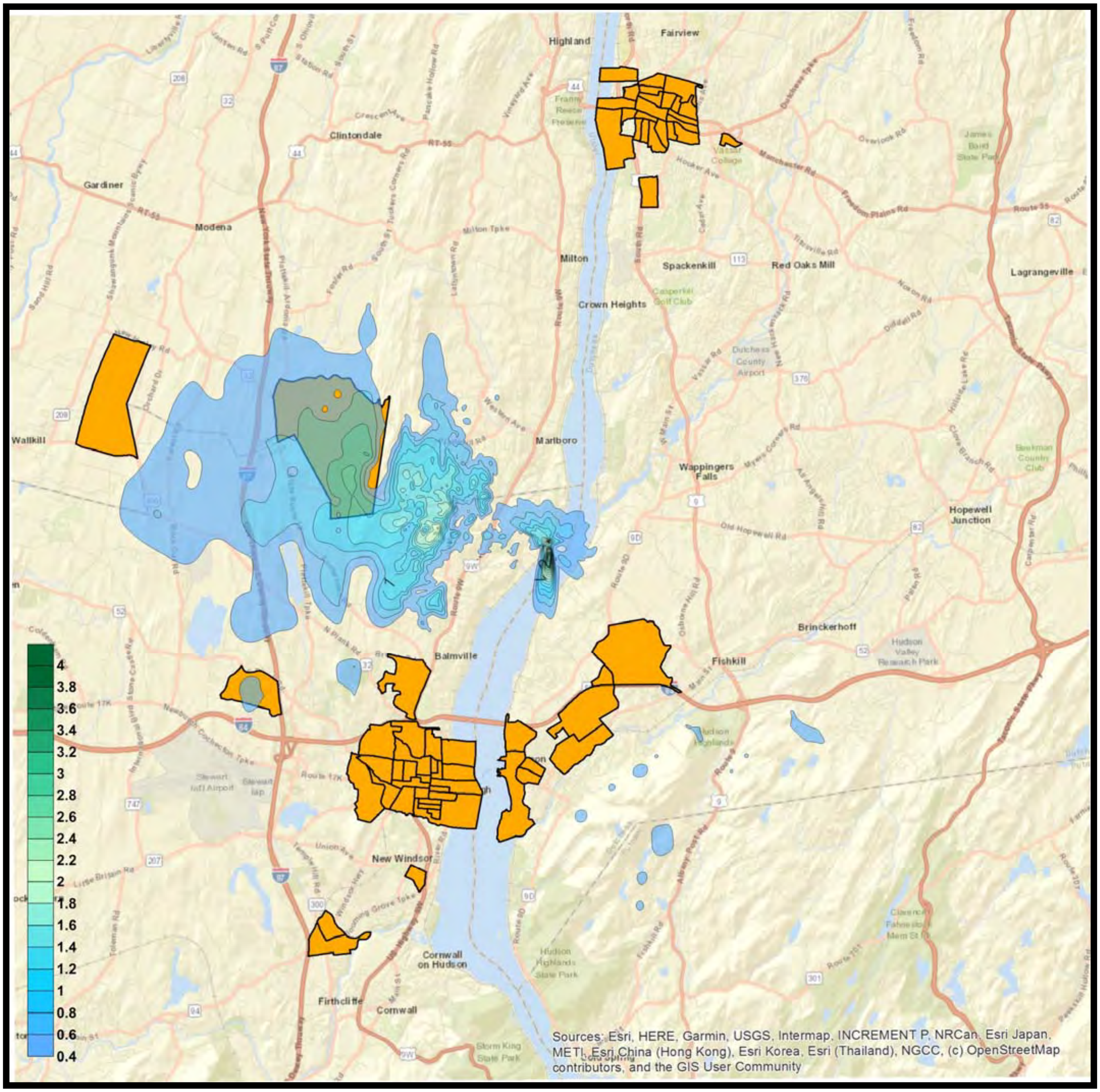
Danskammer Energy Center
Figure I-16
Environmental Restoration Projects within ISA and RC

Town of Newburgh
Orange County, NY

Prepared on 8/21/2019 by TRC

S:\1-PROJECTS\DANSKAMMER_ENERGY\289081-Danskammer_Art_10\5-MXD\EJ\EDR Figures\Fig28-16 Environmental Restoration Projects within ISA and RC 20190821.mxd



Pollutant Concentration (µg/m³)

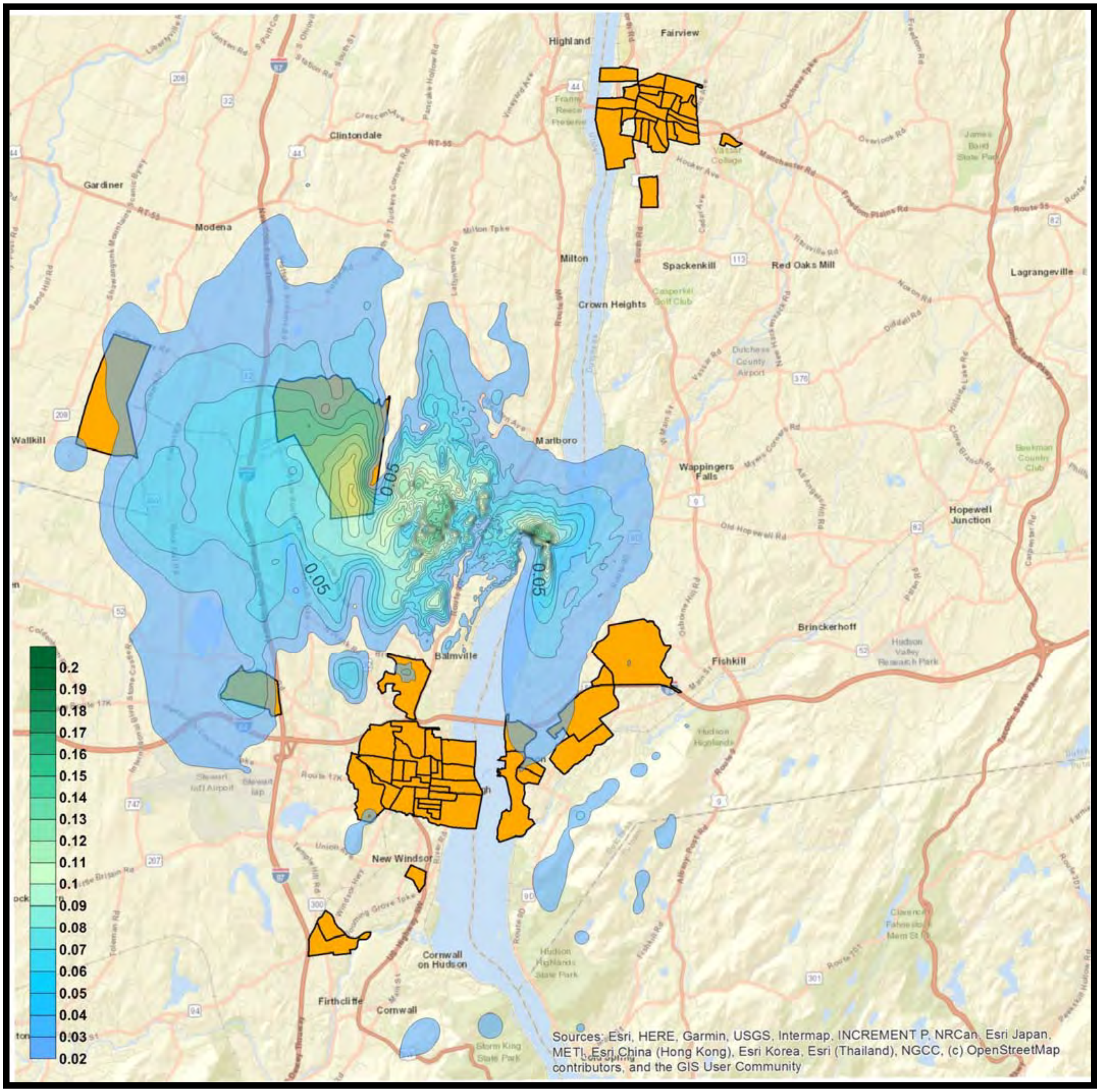
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 24-HOUR AVERAGE PM-2.5 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-17	NOVEMBER 2019



Pollutant Concentration (µg/m^3)

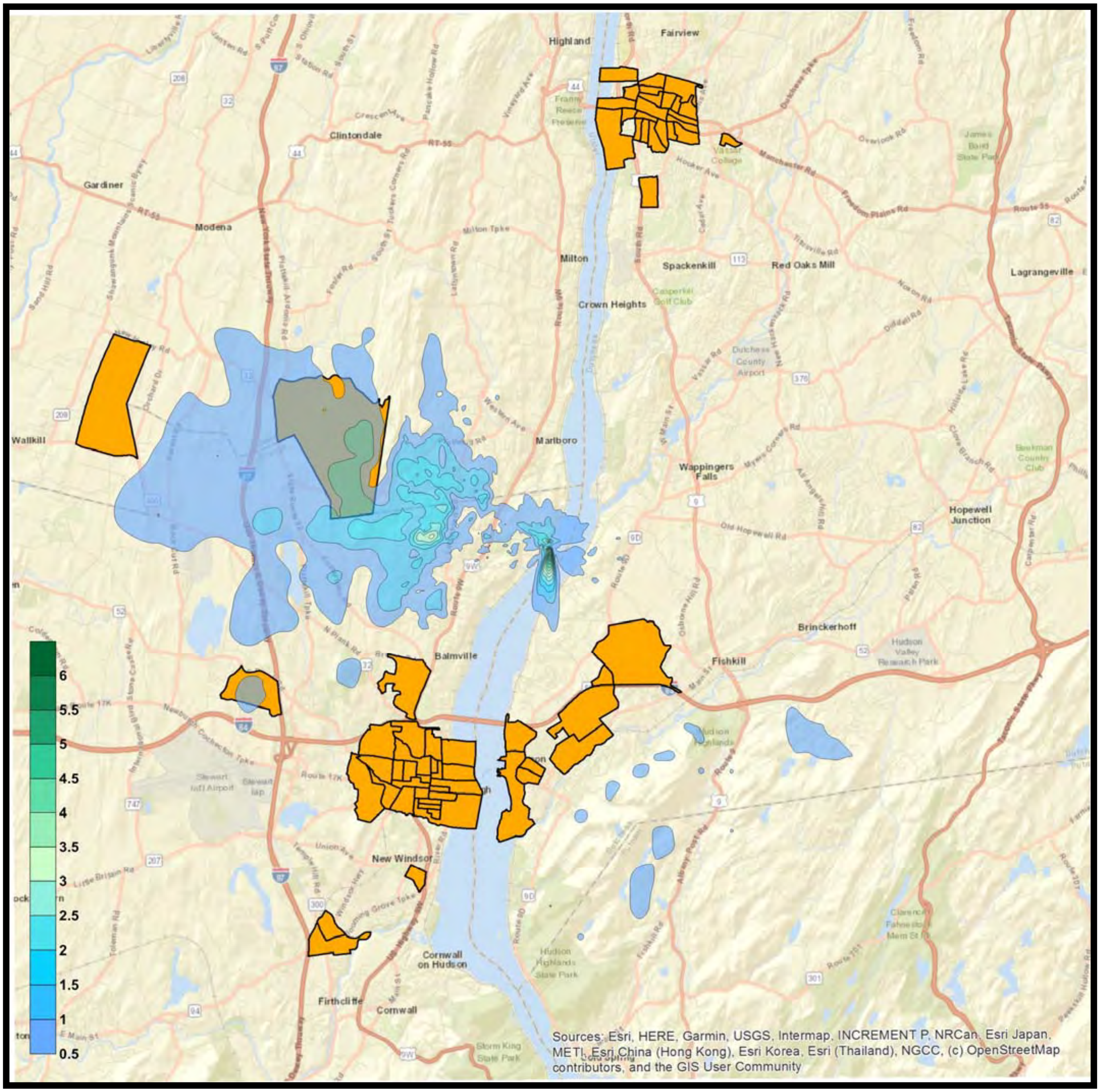
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM ANNUAL AVERAGE PM-2.5 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-18 | **NOVEMBER 2019**



Pollutant Concentration (μg/m^3)

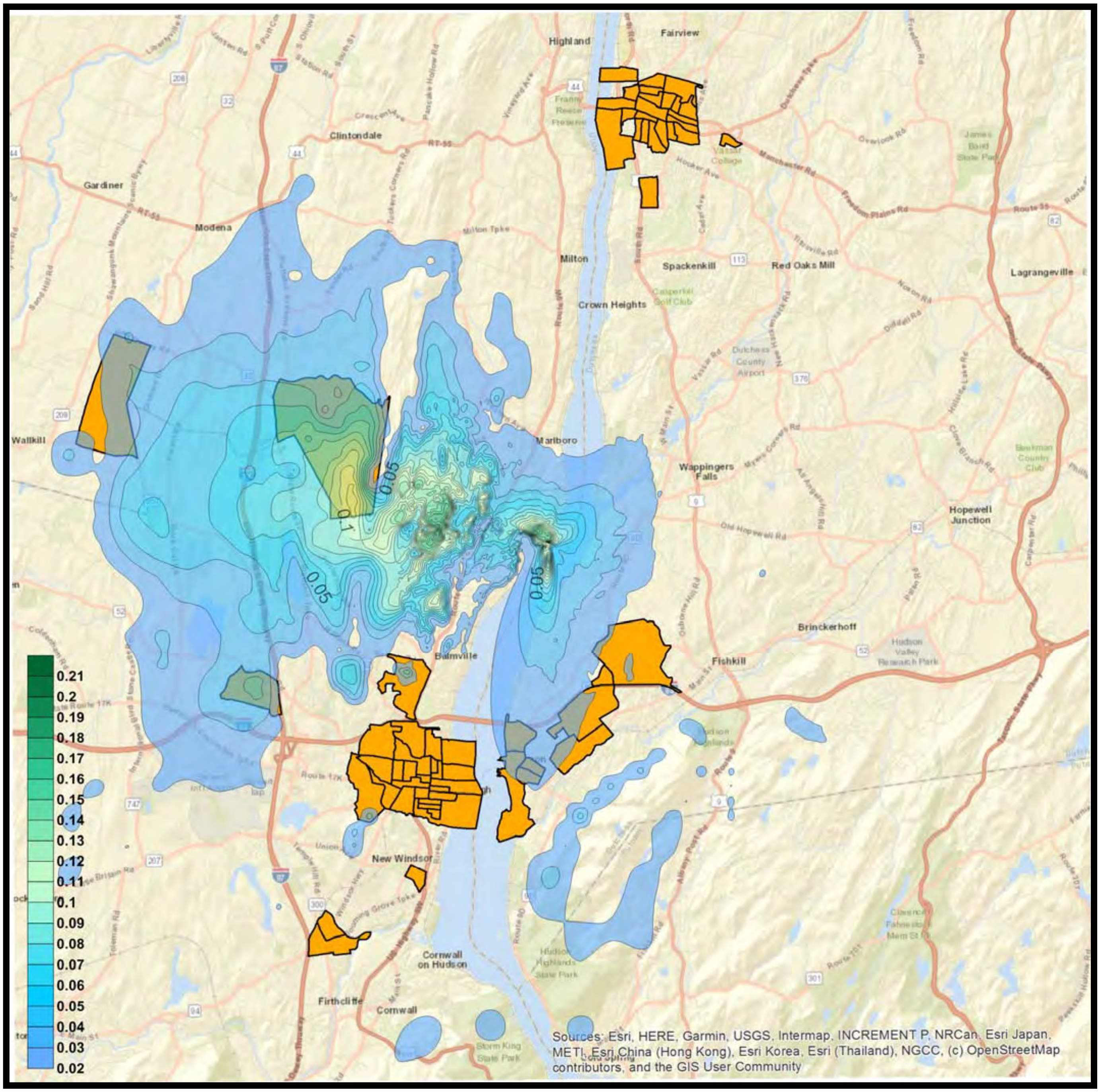
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 24-HOUR AVERAGE PM-10 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-19 | **NOVEMBER 2019**



Pollutant Concentration (µg/m³)

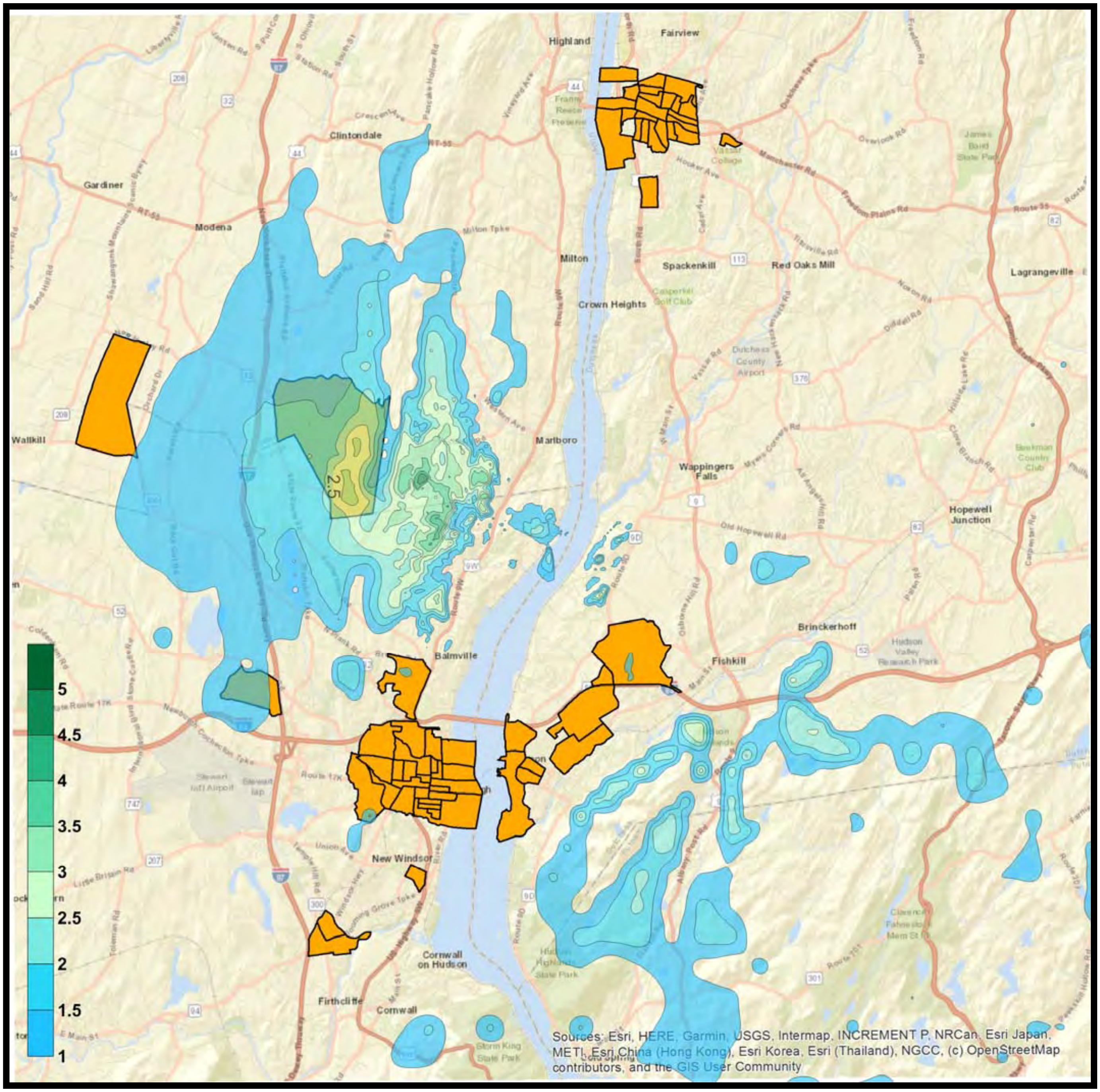
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM ANNUAL AVERAGE PM-10 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-20	NOVEMBER 2019



Pollutant Concentration (µg/m^3)

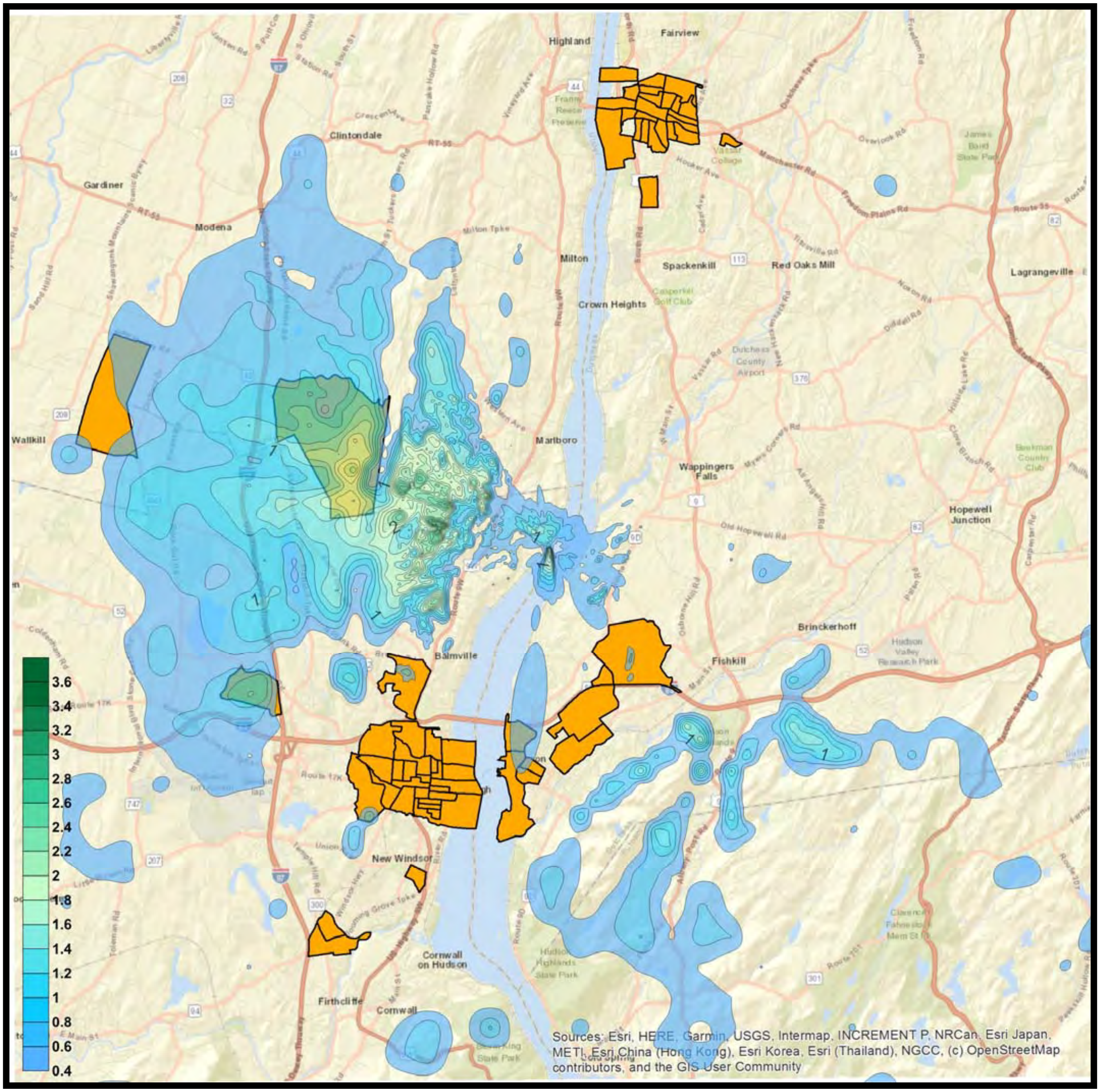
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 1-HOUR AVERAGE SO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-21	NOVEMBER 2019



Pollutant Concentration (µg/m^3)

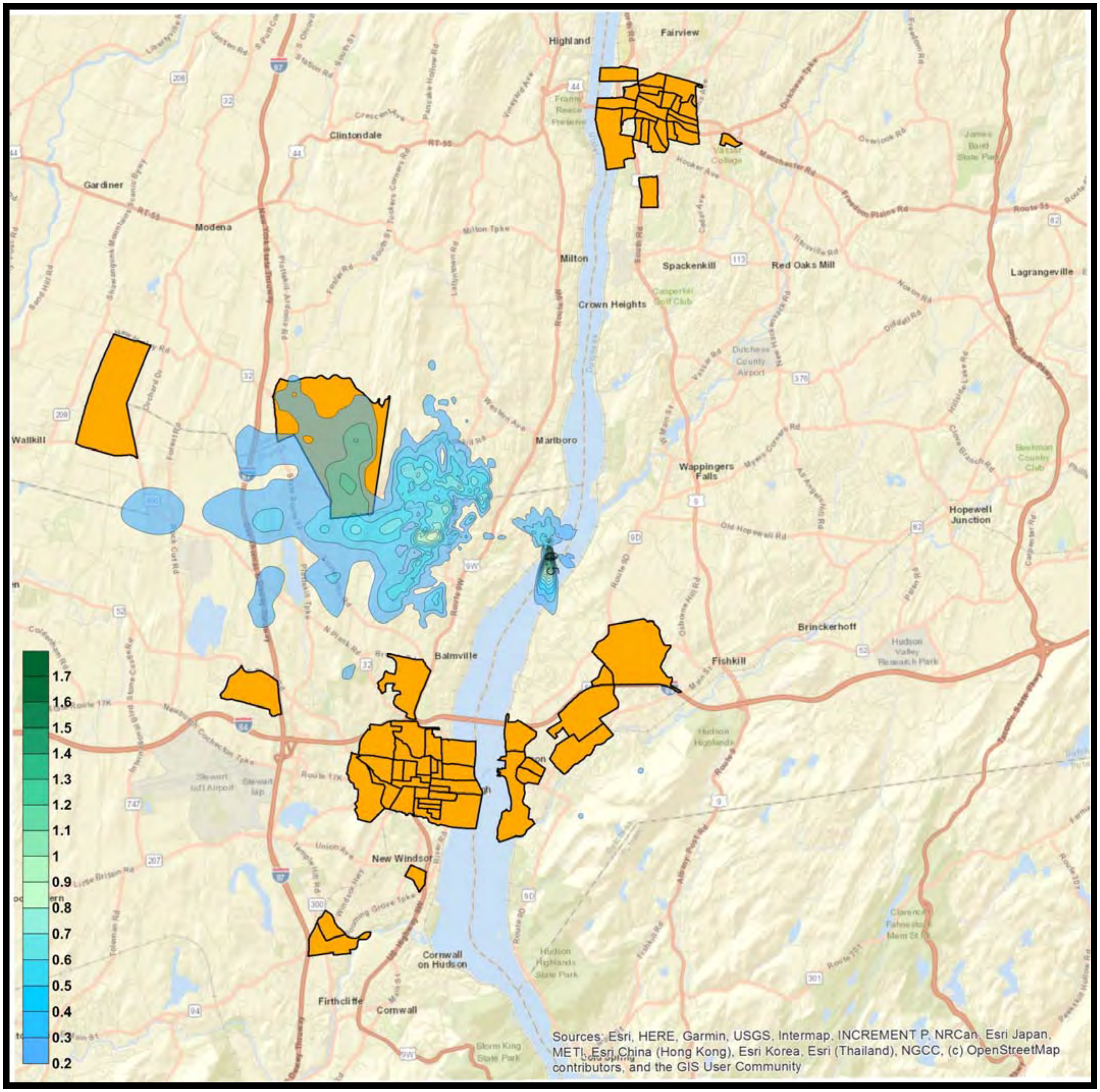
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 3-HOUR AVERAGE SO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-22	**NOVEMBER 2019**



Pollutant Concentration (µg/m^3)

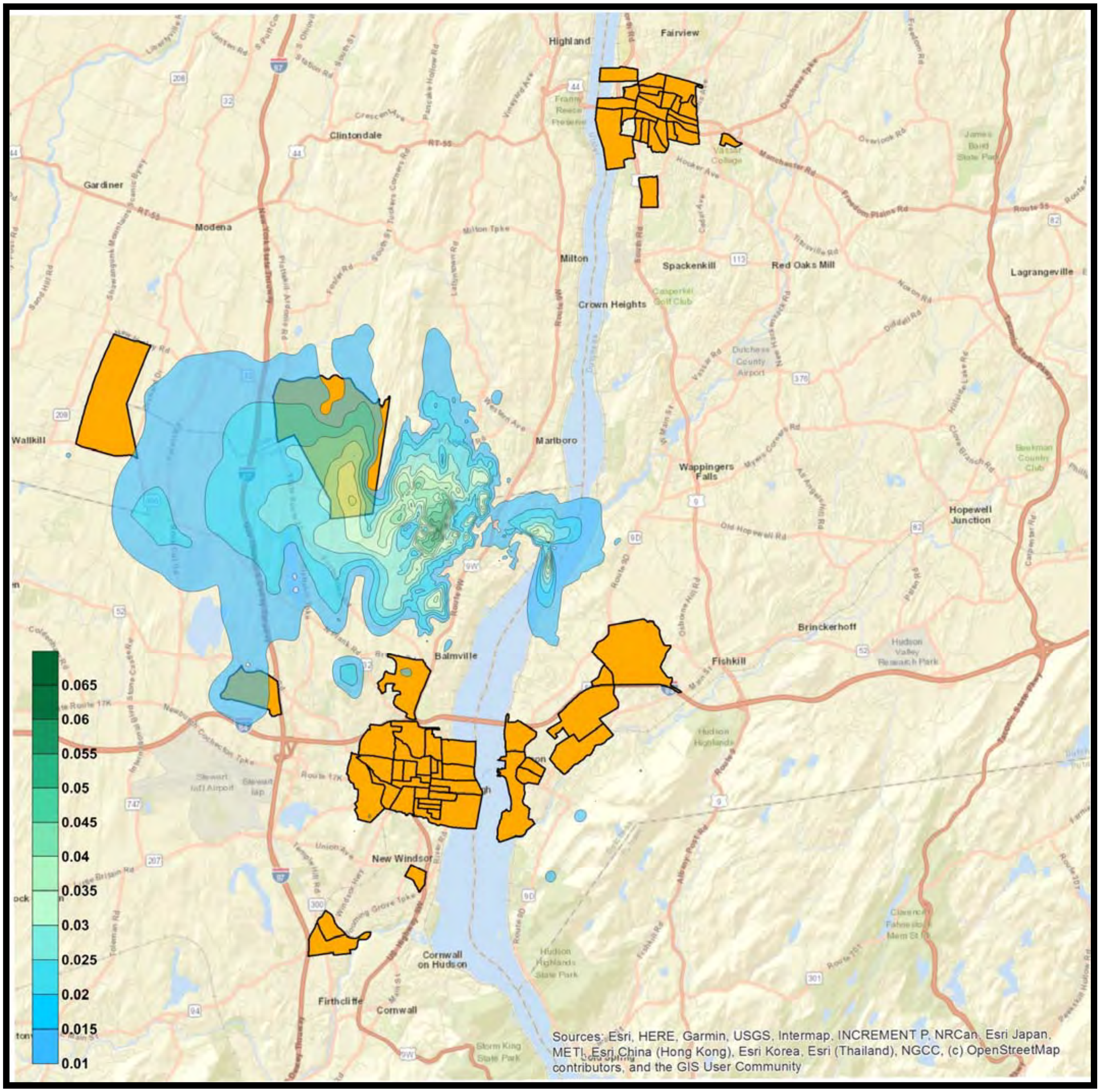
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 24-HOUR AVERAGE SO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-23 | **NOVEMBER 2019**



Pollutant Concentration (µg/m³)

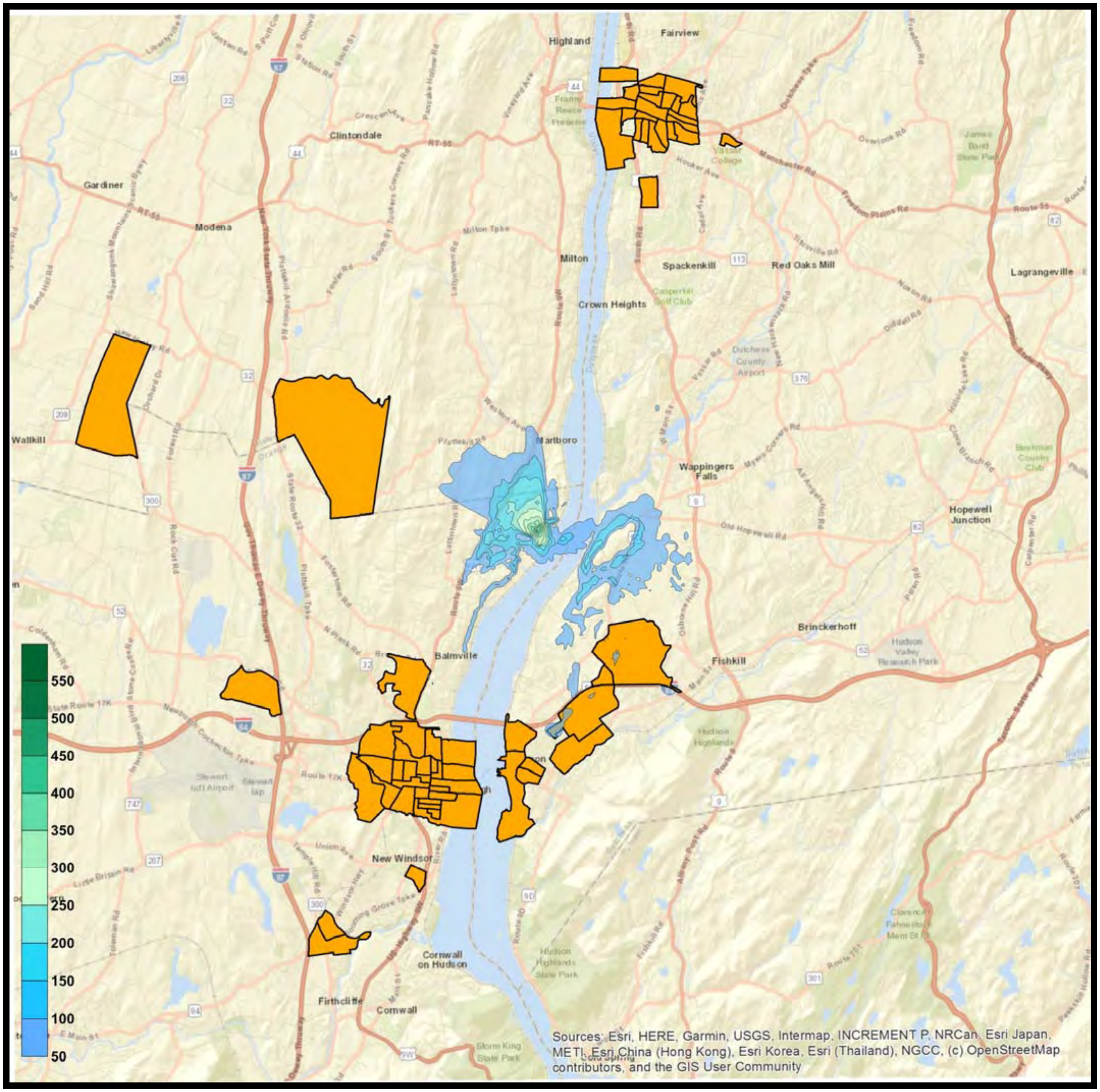
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM ANNUAL AVERAGE SO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-24	NOVEMBER 2019



Pollutant Concentration (μg/m³)

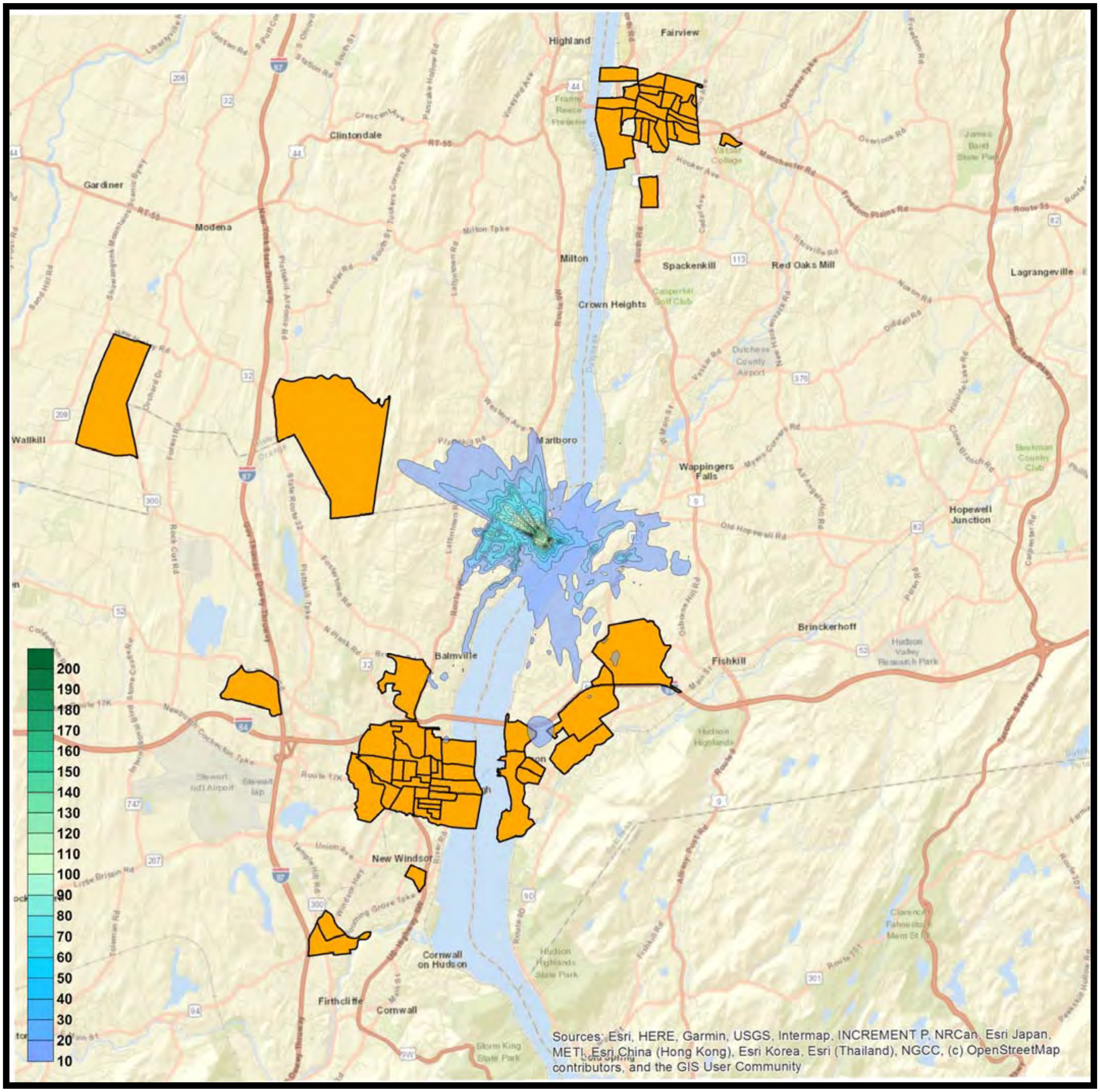
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 1-HOUR AVERAGE CO CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-25	**NOVEMBER 2019**



Pollutant Concentration (μg/m^3)

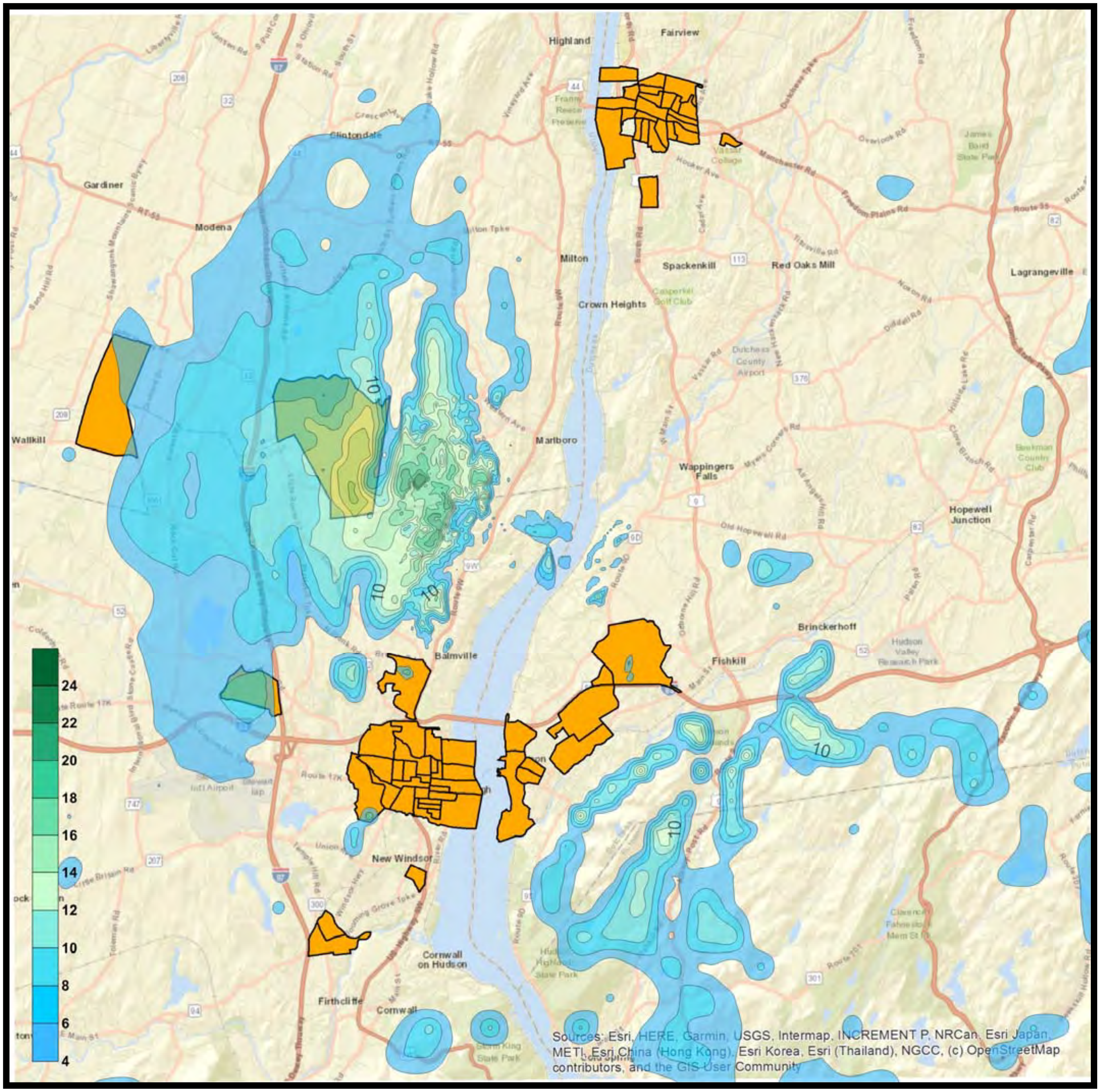
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 8-HOUR AVERAGE CO CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-26	**NOVEMBER 2019**



Pollutant Concentration (µg/m^3)

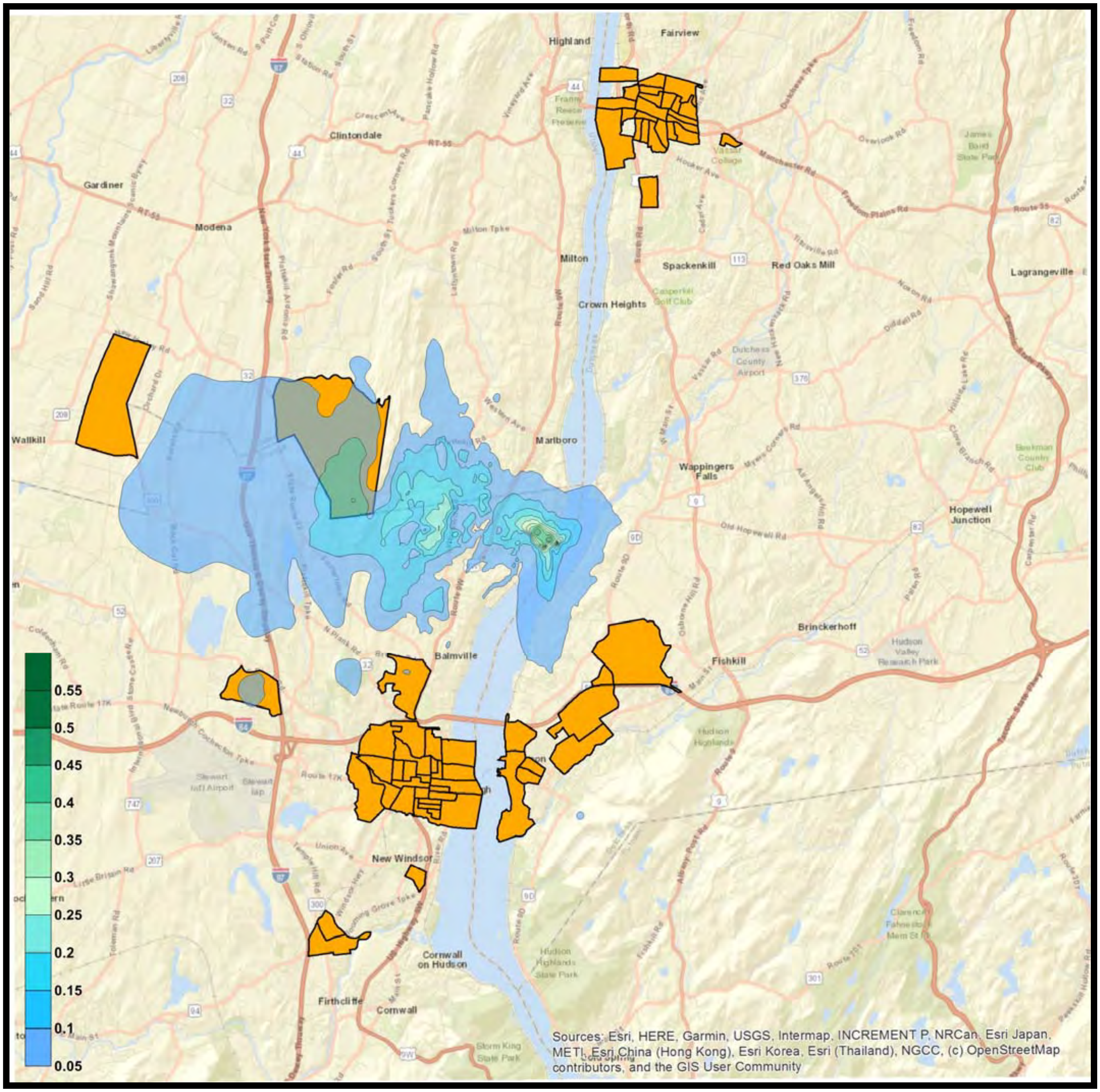
Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM 1-HOUR AVERAGE NO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-27	NOVEMBER 2019



Pollutant Concentration (μg/m^3)

Block Group Exceeds EJ Poverty and/or Minority Thresholds

TRC
1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

MAXIMUM ANNUAL AVERAGE NO_2 CONCENTRATIONS

DANSKAMMER ENERGY CENTER
TOWN OF NEWBURGH, NEW YORK

FIGURE I-28	NOVEMBER 2019

Appendix I-1

Minority and Low Income Data

Table I-1-1. Minority Data by Census Tract and Block Group

Census Tract	Block Group	Minority Population	Total Population	Minority Population Percentage
Census Tract 501.02	Block Group 1	159	1,037	15.3
Census Tract 501.02	Block Group 2	476	2,551	18.7
Census Tract 501.03	Block Group 1	153	898	17.0
Census Tract 501.03	Block Group 2	224	1,644	13.6
Census Tract 501.03	Block Group 3	197	1,074	18.3
Census Tract 501.03	Block Group 4	122	845	14.4
Census Tract 501.03	Block Group 5	190	1,111	17.1
Census Tract 501.04	Block Group 1	157	825	19.0
Census Tract 501.04	Block Group 2	589	2,774	21.2
Census Tract 501.04	Block Group 3	129	990	13.0
Census Tract 501.04	Block Group 4	252	1,882	13.4
Census Tract 502.03	Block Group 1	126	997	12.6
Census Tract 502.03	Block Group 2	225	1,372	16.4
Census Tract 502.03	Block Group 3	333	1,494	22.3
Census Tract 502.03	Block Group 4	193	1,108	17.4
Census Tract 502.04	Block Group 1	396	1,914	20.7
Census Tract 502.04	Block Group 2	179	1,064	16.8
Census Tract 502.05	Block Group 1	381	2,115	18.0
Census Tract 502.05	Block Group 2	94	1,000	9.4
Census Tract 601	Block Group 1	723	2,019	35.8
Census Tract 601	Block Group 2	1,100	2,780	39.6
Census Tract 602.01	Block Group 1	1,137	2,224	**51.1**
Census Tract 602.01	Block Group 2	182	983	18.5
Census Tract 602.01	Block Group 3	195	1,220	16.0
Census Tract 602.02	Block Group 1	318	1,321	24.1
Census Tract 602.02	Block Group 2	179	1,108	16.2
Census Tract 602.02	Block Group 3	169	841	20.1
Census Tract 602.02	Block Group 4	121	727	16.6
Census Tract 603.01	Block Group 1	256	1,160	22.1
Census Tract 603.01	Block Group 2	198	1,019	19.4
Census Tract 603.01	Block Group 3	302	1,267	23.8
Census Tract 603.01	Block Group 4	188	1,085	17.3
Census Tract 603.02	Block Group 1	853	2,182	39.1
Census Tract 604	Block Group 1	142	644	22.0
Census Tract 604	Block Group 2	565	1,527	37.0
Census Tract 801.03	Block Group 2	305	1,487	20.5
Census Tract 801.03	Block Group 3	318	1,512	21.0
Census Tract 802.01	Block Group 1	327	1,729	18.9
Census Tract 802.01	Block Group 2	120	841	14.3
Census Tract 802.01	Block Group 3	175	833	21.0

Table I-1-1. Minority Data by Census Tract and Block Group

Census Tract	Block Group	Minority Population	Total Population	Minority Population Percentage
Census Tract 802.01	Block Group 4	238	1,237	19.2
Census Tract 802.02	Block Group 1	86	771	11.2
Census Tract 802.02	Block Group 2	125	900	13.9
Census Tract 802.02	Block Group 3	148	946	15.6
Census Tract 1401.01	Block Group 4	146	968	15.1
Census Tract 1402	Block Group 3	607	1,961	31.0
Census Tract 1402	Block Group 5	428	1,235	34.7
Census Tract 1403	Block Group 1	143	632	22.6
Census Tract 1403	Block Group 2	174	735	23.7
Census Tract 1403	Block Group 3	276	790	34.9
Census Tract 1403	Block Group 4	441	1,034	42.6
Census Tract 1403	Block Group 5	626	1,498	41.8
Census Tract 1403	Block Group 6	674	1,480	45.5
Census Tract 1404	Block Group 1	420	1,567	26.8
Census Tract 1404	Block Group 2	403	1,921	21.0
Census Tract 1404	Block Group 3	411	1,730	23.8
Census Tract 1405	Block Group 1	425	1,069	39.8
Census Tract 1405	Block Group 2	107	682	15.7
Census Tract 1405	Block Group 3	347	837	41.5
Census Tract 1406.02	Block Group 1	450	1,654	27.2
Census Tract 1406.02	Block Group 2	375	1,186	31.6
Census Tract 1407	Block Group 1	349	1,829	19.1
Census Tract 1407	Block Group 2	134	796	16.8
Census Tract 1407	Block Group 3	261	1,141	22.9
Census Tract 1407	Block Group 4	538	1,919	28.0
Census Tract 1407	Block Group 5	230	927	24.8
Census Tract 1408.01	Block Group 1	276	840	32.9
Census Tract 1408.01	Block Group 2	232	1,194	19.4
Census Tract 1408.01	Block Group 3	78	770	10.1
Census Tract 1901.01	Block Group 1	308	1,501	20.5
Census Tract 1901.01	Block Group 2	343	1,386	24.7
Census Tract 1901.01	Block Group 3	204	1,176	17.3
Census Tract 1901.02	Block Group 1	324	1,013	32.0
Census Tract 1901.02	Block Group 2	159	959	16.6
Census Tract 1902.03	Block Group 1	362	1,631	22.2
Census Tract 1902.03	Block Group 2	211	909	23.2
Census Tract 1902.04	Block Group 1	340	1,321	25.7
Census Tract 1902.04	Block Group 2	283	1,167	24.3
Census Tract 1902.04	Block Group 3	298	1,333	22.4
Census Tract 1902.04	Block Group 4	277	1,328	20.9

Table I-1-1. Minority Data by Census Tract and Block Group

Census Tract	Block Group	Minority Population	Total Population	Minority Population Percentage
Census Tract 1903.01	Block Group 1	303	1,243	24.4
Census Tract 1903.01	Block Group 2	220	784	28.1
Census Tract 1903.01	Block Group 3	504	1,412	35.7
Census Tract 1904.01	Block Group 1	208	1,012	20.6
Census Tract 1904.01	Block Group 2	204	1,073	19.0
Census Tract 1904.02	Block Group 1	493	1,743	28.3
Census Tract 1904.02	Block Group 2	251	1,477	17.0
Census Tract 2101.01	Block Group 1	659	1,621	40.7
Census Tract 2101.01	Block Group 2	501	809	**61.9**
Census Tract 2101.01	Block Group 3	279	1,195	23.3
Census Tract 2101.01	Block Group 4	469	964	48.7
Census Tract 2101.01	Block Group 5	353	739	47.8
Census Tract 2102.01	Block Group 1	369	669	**55.2**
Census Tract 2102.01	Block Group 2	206	680	30.3
Census Tract 2102.01	Block Group 3	759	1,122	**67.6**
Census Tract 2102.01	Block Group 4	587	970	**60.5**
Census Tract 2102.01	Block Group 5	314	688	45.6
Census Tract 2103.01	Block Group 1	381	1,308	29.1
Census Tract 2103.01	Block Group 2	265	867	30.6
Census Tract 2103.01	Block Group 3	336	1,134	29.6
Census Tract 2103.01	Block Group 4	313	873	35.9
Census Tract 2201	Block Group 1	869	2,772	31.3
Census Tract 2201	Block Group 2	905	1,456	**62.2**
Census Tract 2201	Block Group 3	279	620	45.0
Census Tract 2201	Block Group 4	667	1,163	**57.4**
Census Tract 2202.01	Block Group 1	676	868	**77.9**
Census Tract 2202.01	Block Group 2	498	662	**75.2**
Census Tract 2202.01	Block Group 3	822	1,193	**68.9**
Census Tract 2202.01	Block Group 4	470	936	50.2
Census Tract 2203	Block Group 1	910	1,102	**82.6**
Census Tract 2203	Block Group 2	942	1,324	**71.1**
Census Tract 2203	Block Group 3	1,142	1,302	**87.7**
Census Tract 2203	Block Group 4	850	946	**89.9**
Census Tract 2207	Block Group 1	377	712	**52.9**
Census Tract 2207	Block Group 2	489	960	50.9
Census Tract 2207	Block Group 3	787	845	**93.1**
Census Tract 2208.01	Block Group 1	153	1,087	14.1
Census Tract 2208.01	Block Group 2	544	756	**72.0**
Census Tract 2208.01	Block Group 3	274	741	37.0
Census Tract 2208.01	Block Group 4	531	767	**69.2**

Table I-1-1. Minority Data by Census Tract and Block Group

Census Tract	Block Group	Minority Population	Total Population	Minority Population Percentage
Census Tract 2208.01	Block Group 5	272	726	37.5
Census Tract 2209.01	Block Group 1	638	1,209	**52.8**
Census Tract 2209.01	Block Group 2	716	1,115	**64.2**
Census Tract 2209.01	Block Group 3	517	732	**70.6**
Census Tract 2209.01	Block Group 4	500	1,220	41.0
Census Tract 2210.01	Block Group 1	129	902	14.3
Census Tract 2210.01	Block Group 2	217	759	28.6
Census Tract 2210.01	Block Group 3	250	1,119	22.3
Census Tract 2210.01	Block Group 4	119	874	13.6
Census Tract 2211	Block Group 1	1,096	1,495	**73.3**
Census Tract 2211	Block Group 2	1,007	1,232	**81.7**
Census Tract 2211	Block Group 3	838	1,141	**73.4**
Census Tract 3000	Block Group 1	255	942	27.1
Census Tract 3000	Block Group 2	1,010	2,256	44.8
Census Tract 3000	Block Group 3	526	1,272	41.4
Census Tract 3000	Block Group 4	479	1,052	45.5
Census Tract 4100	Block Group 1	602	2,189	27.5
Census Tract 4100	Block Group 2	255	1,027	24.8
Census Tract 4100	Block Group 3	386	702	**55.0**
Census Tract 6400.01	Block Group 1	0	0	0.0
Census Tract 6400.02	Block Group 1	1,417	1,902	**74.5**
Census Tract 1	Block Group 1	572	988	**57.9**
Census Tract 1	Block Group 2	442	887	49.8
Census Tract 1	Block Group 3	860	1,650	**52.1**
Census Tract 2	Block Group 1	747	1,331	**56.1**
Census Tract 2	Block Group 2	885	1,235	**71.7**
Census Tract 3	Block Group 1	1,180	1,447	**81.5**
Census Tract 3	Block Group 2	1,248	1,685	**74.1**
Census Tract 3	Block Group 3	1,081	1,306	**82.8**
Census Tract 3	Block Group 4	1,044	1,140	**91.6**
Census Tract 3	Block Group 5	1,123	1,192	**94.2**
Census Tract 4	Block Group 1	833	1,120	**74.4**
Census Tract 4	Block Group 2	786	919	**85.5**
Census Tract 4	Block Group 3	888	970	**91.5**
Census Tract 4	Block Group 4	1,060	1,119	**94.7**
Census Tract 4	Block Group 5	736	829	**88.8**
Census Tract 5.01	Block Group 1	1,712	1,821	**94.0**
Census Tract 5.01	Block Group 2	716	870	**82.3**
Census Tract 5.01	Block Group 3	419	512	**81.8**
Census Tract 5.02	Block Group 1	1,289	1,430	**90.1**

Table I-1-1. Minority Data by Census Tract and Block Group

Census Tract	Block Group	Minority Population	Total Population	Minority Population Percentage
Census Tract 5.02	Block Group 2	666	791	**84.2**
Census Tract 5.02	Block Group 3	1,122	1,232	**91.1**
Census Tract 5.02	Block Group 4	1,073	1,125	**95.4**
Census Tract 6	Block Group 1	935	1,510	**61.9**
Census Tract 6	Block Group 2	998	1,176	**84.9**
Census Tract 6	Block Group 3	589	650	**90.6**
Census Tract 101.01	Block Group 1	386	1,403	27.5
Census Tract 101.01	Block Group 2	264	1,091	24.2
Census Tract 101.01	Block Group 3	501	1,920	26.1
Census Tract 101.02	Block Group 1	240	673	35.7
Census Tract 101.02	Block Group 2	574	1,448	39.6
Census Tract 101.02	Block Group 3	353	1,455	24.3
Census Tract 101.02	Block Group 4	263	1,280	20.5
Census Tract 102	Block Group 1	395	1,541	25.6
Census Tract 102	Block Group 2	285	1,161	24.5
Census Tract 102	Block Group 3	227	1,033	22.0
Census Tract 102	Block Group 4	462	1,283	36.0
Census Tract 103	Block Group 1	317	1,215	26.1
Census Tract 103	Block Group 2	363	1,030	35.2
Census Tract 103	Block Group 3	460	1,193	38.6
Census Tract 104	Block Group 1	290	1,189	24.4
Census Tract 104	Block Group 2	348	939	37.1
Census Tract 104	Block Group 3	467	1,521	30.7
Census Tract 105	Block Group 1	256	1,290	19.8
Census Tract 105	Block Group 2	493	1,241	39.7
Census Tract 105	Block Group 3	324	708	45.8
Census Tract 105	Block Group 4	1,513	2,766	**54.7**
Census Tract 105	Block Group 5	410	1,292	31.7
Census Tract 105	Block Group 6	262	1,060	24.7
Census Tract 106	Block Group 2	305	1,838	16.6
Census Tract 106	Block Group 3	105	786	13.4
Census Tract 106	Block Group 4	182	1,080	16.9
Census Tract 126.01	Block Group 1	560	1,535	36.5
Census Tract 126.01	Block Group 2	634	1,782	35.6
Census Tract 126.02	Block Group 1	440	1,271	34.6
Census Tract 126.02	Block Group 2	471	899	**52.4**
Census Tract 126.02	Block Group 3	773	1,199	**64.5**
Census Tract 127	Block Group 1	232	798	29.1
Census Tract 127	Block Group 2	293	838	35.0
Census Tract 127	Block Group 3	200	685	29.2

Table I-1-1. Minority Data by Census Tract and Block Group

Census Tract	Block Group	Minority Population	Total Population	Minority Population Percentage
Census Tract 127	Block Group 4	359	909	39.5
Census Tract 127	Block Group 5	453	875	**51.8**
Census Tract 128	Block Group 1	207	684	30.3
Census Tract 128	Block Group 2	394	1,324	29.8
Census Tract 128	Block Group 3	878	2,259	38.9
Census Tract 128	Block Group 4	189	695	27.2
Census Tract 129	Block Group 1	137	1,258	10.9
Census Tract 129	Block Group 2	135	989	13.7
Census Tract 129	Block Group 3	101	937	10.8
Census Tract 130	Block Group 1	284	1,399	20.3
Census Tract 130	Block Group 2	202	1,041	19.4
Census Tract 130	Block Group 3	72	796	9.0
Census Tract 130	Block Group 4	142	1,132	12.5
Census Tract 131	Block Group 2	181	1,201	15.1
Census Tract 131	Block Group 5	114	960	11.9
Census Tract 152	Block Group 1	240	648	37.0
Census Tract 152	Block Group 2	454	2,570	17.7
Census Tract 152	Block Group 3	64	226	28.3
Census Tract 152	Block Group 4	280	843	33.2
Census Tract 152	Block Group 6	1,530	3,548	43.1
Census Tract 105	Block Group 2	210	1,624	12.9
Census Tract 106	Block Group 1	285	2,792	10.2
Census Tract 107	Block Group 1	67	628	10.7
Census Tract 108	Block Group 2	72	863	8.3
Census Tract 9536	Block Group 1	219	1,058	20.7
Census Tract 9536	Block Group 2	516	2,358	21.9
Census Tract 9536	Block Group 3	424	2,231	19.0
Census Tract 9537	Block Group 2	254	1,536	16.5
Census Tract 9537	Block Group 3	147	899	16.4
Census Tract 9537	Block Group 4	133	965	13.8
Census Tract 9538	Block Group 1	246	1,584	15.5
Census Tract 9538	Block Group 2	155	1,134	13.7
Census Tract 9538	Block Group 3	195	1,228	15.9
Census Tract 9539	Block Group 1	271	1,810	15.0
Census Tract 9539	Block Group 2	318	2,036	15.6
Census Tract 9539	Block Group 3	148	1,016	14.6
Census Tract 9540	Block Group 1	215	1,542	13.9
Census Tract 9540	Block Group 2	157	1,331	11.8
Census Tract 9540	Block Group 3	423	2,146	19.7
Census Tract 9541	Block Group 1	239	1,018	23.5

Table I-1-1. Minority Data by Census Tract and Block Group

Census Tract	Block Group	Minority Population	Total Population	Minority Population Percentage
Census Tract 9541	Block Group 2	443	1,790	24.7
Census Tract 9541	Block Group 3	735	1,687	43.6
Census Tract 9541	Block Group 4	514	985	**52.2**
Census Tract 9554	Block Group 2	1,020	1,940	**52.6**
Census Tract 9554	Block Group 3	111	913	12.2

Notes:

The NYSDEC minority population percentage threshold is 51.1 percent.

Bold values indicate percentage above the NYSDEC threshold.

Source: *2010 Decentennial Census* (U.S. Census, 2011)

Table I-1-2. Poverty Data by Census Tract and Block Group

Census Tract	Block Group	Poverty Population	Population for Which Poverty Status has been Determined	Poverty Level Percentage
Census Tract 501.02	Block Group 1	11	418	2.6
Census Tract 501.02	Block Group 2	20	825	2.4
Census Tract 501.03	Block Group 1	9	259	3.5
Census Tract 501.03	Block Group 2	36	447	8.1
Census Tract 501.03	Block Group 3	9	327	2.8
Census Tract 501.03	Block Group 4	0	180	0.0
Census Tract 501.03	Block Group 5	27	523	5.2
Census Tract 501.04	Block Group 1	0	302	0.0
Census Tract 501.04	Block Group 2	0	958	0.0
Census Tract 501.04	Block Group 3	13	332	3.9
Census Tract 501.04	Block Group 4	14	566	2.5
Census Tract 502.03	Block Group 1	19	318	6.0
Census Tract 502.03	Block Group 2	9	478	1.9
Census Tract 502.03	Block Group 3	70	583	12.0
Census Tract 502.03	Block Group 4	10	317	3.2
Census Tract 502.04	Block Group 1	14	543	2.6
Census Tract 502.04	Block Group 2	8	374	2.1
Census Tract 502.05	Block Group 1	38	582	6.5
Census Tract 502.05	Block Group 2	0	309	0.0
Census Tract 601	Block Group 1	0	623	0.0
Census Tract 601	Block Group 2	162	1330	12.2
Census Tract 602.01	Block Group 1	11	603	1.8
Census Tract 602.01	Block Group 2	46	365	12.6
Census Tract 602.01	Block Group 3	31	443	7.0
Census Tract 602.02	Block Group 1	60	571	10.5
Census Tract 602.02	Block Group 2	20	555	3.6
Census Tract 602.02	Block Group 3	71	301	**23.6**
Census Tract 602.02	Block Group 4	9	260	3.5
Census Tract 603.01	Block Group 1	21	387	5.4
Census Tract 603.01	Block Group 2	11	320	3.4
Census Tract 603.01	Block Group 3	24	392	6.1
Census Tract 603.01	Block Group 4	16	407	3.9
Census Tract 603.02	Block Group 1	85	1119	7.6
Census Tract 604	Block Group 1	30	378	7.9
Census Tract 604	Block Group 2	92	594	15.5
Census Tract 801.03	Block Group 2	10	541	1.8
Census Tract 801.03	Block Group 3	7	410	1.7
Census Tract 802.01	Block Group 1	12	539	2.2
Census Tract 802.01	Block Group 2	9	259	3.5
Census Tract 802.01	Block Group 3	0	254	0.0
Census Tract 802.01	Block Group 4	13	520	2.5
Census Tract 802.02	Block Group 1	0	275	0.0
Census Tract 802.02	Block Group 2	5	377	1.3
Census Tract 802.02	Block Group 3	25	264	9.5
Census Tract 1401.01	Block Group 4	0	0	0.0
Census Tract 1402	Block Group 3	58	836	6.9

Table I-1-2. Poverty Data by Census Tract and Block Group

Census Tract	Block Group	Poverty Population	Population for Which Poverty Status has been Determined	Poverty Level Percentage
Census Tract 1402	Block Group 5	41	504	8.1
Census Tract 1403	Block Group 1	0	94	0.0
Census Tract 1403	Block Group 2	11	369	3.0
Census Tract 1403	Block Group 3	45	226	19.9
Census Tract 1403	Block Group 4	26	399	6.5
Census Tract 1403	Block Group 5	149	680	**21.9**
Census Tract 1403	Block Group 6	93	627	14.8
Census Tract 1404	Block Group 1	17	498	3.4
Census Tract 1404	Block Group 2	13	711	1.8
Census Tract 1404	Block Group 3	29	570	5.1
Census Tract 1405	Block Group 1	140	588	**23.8**
Census Tract 1405	Block Group 2	12	320	3.8
Census Tract 1405	Block Group 3	82	418	19.6
Census Tract 1406.02	Block Group 1	57	557	10.2
Census Tract 1406.02	Block Group 2	52	502	10.4
Census Tract 1407	Block Group 1	14	806	1.7
Census Tract 1407	Block Group 2	0	165	0.0
Census Tract 1407	Block Group 3	0	375	0.0
Census Tract 1407	Block Group 4	9	791	1.1
Census Tract 1407	Block Group 5	16	294	5.4
Census Tract 1408.01	Block Group 1	48	256	18.8
Census Tract 1408.01	Block Group 2	41	516	7.9
Census Tract 1408.01	Block Group 3	28	282	9.9
Census Tract 1901.01	Block Group 1	25	421	5.9
Census Tract 1901.01	Block Group 2	2	473	0.4
Census Tract 1901.01	Block Group 3	29	481	6.0
Census Tract 1901.02	Block Group 1	38	385	9.9
Census Tract 1901.02	Block Group 2	0	302	0.0
Census Tract 1902.03	Block Group 1	63	653	9.6
Census Tract 1902.03	Block Group 2	31	327	9.5
Census Tract 1902.04	Block Group 1	29	429	6.8
Census Tract 1902.04	Block Group 2	9	352	2.6
Census Tract 1902.04	Block Group 3	9	538	1.7
Census Tract 1902.04	Block Group 4	0	372	0.0
Census Tract 1903.01	Block Group 1	47	518	9.1
Census Tract 1903.01	Block Group 2	24	405	5.9
Census Tract 1903.01	Block Group 3	32	731	4.4
Census Tract 1904.01	Block Group 1	19	371	5.1
Census Tract 1904.01	Block Group 2	33	406	8.1
Census Tract 1904.02	Block Group 1	99	748	13.2
Census Tract 1904.02	Block Group 2	27	550	4.9
Census Tract 2101.01	Block Group 1	157	572	**27.4**
Census Tract 2101.01	Block Group 2	80	291	**27.5**
Census Tract 2101.01	Block Group 3	15	334	4.5
Census Tract 2101.01	Block Group 4	47	455	10.3
Census Tract 2101.01	Block Group 5	34	266	12.8

Table I-1-2. Poverty Data by Census Tract and Block Group

Census Tract	Block Group	Poverty Population	Population for Which Poverty Status has been Determined	Poverty Level Percentage
Census Tract 2102.01	Block Group 1	10	198	5.1
Census Tract 2102.01	Block Group 2	13	259	5.0
Census Tract 2102.01	Block Group 3	114	583	19.6
Census Tract 2102.01	Block Group 4	54	287	18.8
Census Tract 2102.01	Block Group 5	0	282	0.0
Census Tract 2103.01	Block Group 1	28	538	5.2
Census Tract 2103.01	Block Group 2	0	258	0.0
Census Tract 2103.01	Block Group 3	21	506	4.2
Census Tract 2103.01	Block Group 4	0	315	0.0
Census Tract 2201	Block Group 1	84	337	**24.9**
Census Tract 2201	Block Group 2	268	774	**34.6**
Census Tract 2201	Block Group 3	23	294	7.8
Census Tract 2201	Block Group 4	275	745	**36.9**
Census Tract 2202.01	Block Group 1	65	249	**26.1**
Census Tract 2202.01	Block Group 2	68	326	20.9
Census Tract 2202.01	Block Group 3	94	288	**32.6**
Census Tract 2202.01	Block Group 4	54	300	18.0
Census Tract 2203	Block Group 1	249	580	**42.9**
Census Tract 2203	Block Group 2	128	475	**26.9**
Census Tract 2203	Block Group 3	111	346	**32.1**
Census Tract 2203	Block Group 4	130	319	**40.8**
Census Tract 2207	Block Group 1	25	365	6.8
Census Tract 2207	Block Group 2	63	275	**22.9**
Census Tract 2207	Block Group 3	102	393	**26.0**
Census Tract 2208.01	Block Group 1	13	521	2.5
Census Tract 2208.01	Block Group 2	80	311	**25.7**
Census Tract 2208.01	Block Group 3	87	326	**26.7**
Census Tract 2208.01	Block Group 4	98	313	**31.3**
Census Tract 2208.01	Block Group 5	67	282	**23.8**
Census Tract 2209.01	Block Group 1	12	473	2.5
Census Tract 2209.01	Block Group 2	41	360	11.4
Census Tract 2209.01	Block Group 3	0	208	0.0
Census Tract 2209.01	Block Group 4	16	481	3.3
Census Tract 2210.01	Block Group 1	18	479	3.8
Census Tract 2210.01	Block Group 2	16	362	4.4
Census Tract 2210.01	Block Group 3	0	489	0.0
Census Tract 2210.01	Block Group 4	38	419	9.1
Census Tract 2211	Block Group 1	263	746	**35.3**
Census Tract 2211	Block Group 2	99	344	**28.8**
Census Tract 2211	Block Group 3	90	383	**23.5**
Census Tract 3000	Block Group 1	21	280	7.5
Census Tract 3000	Block Group 2	82	998	8.2
Census Tract 3000	Block Group 3	31	385	8.1
Census Tract 3000	Block Group 4	69	401	17.2
Census Tract 4100	Block Group 1	17	86	19.8
Census Tract 4100	Block Group 2	47	384	12.2

Table I-1-2. Poverty Data by Census Tract and Block Group

Census Tract	Block Group	Poverty Population	Population for Which Poverty Status has been Determined	Poverty Level Percentage
Census Tract 4100	Block Group 3	70	297	**23.6**
Census Tract 6400.01	Block Group 1	0	0	0.0
Census Tract 6400.02	Block Group 1	17	59	**28.8**
Census Tract 1	Block Group 1	52	385	13.5
Census Tract 1	Block Group 2	44	260	16.9
Census Tract 1	Block Group 3	106	441	**24.0**
Census Tract 2	Block Group 1	57	507	11.2
Census Tract 2	Block Group 2	62	419	14.8
Census Tract 3	Block Group 1	106	463	**22.9**
Census Tract 3	Block Group 2	119	416	**28.6**
Census Tract 3	Block Group 3	23	339	6.8
Census Tract 3	Block Group 4	85	308	**27.6**
Census Tract 3	Block Group 5	128	344	**37.2**
Census Tract 4	Block Group 1	102	479	21.3
Census Tract 4	Block Group 2	210	396	**53.0**
Census Tract 4	Block Group 3	108	260	**41.5**
Census Tract 4	Block Group 4	141	260	**54.2**
Census Tract 4	Block Group 5	120	261	**46.0**
Census Tract 5.01	Block Group 1	243	574	**42.3**
Census Tract 5.01	Block Group 2	130	335	**38.8**
Census Tract 5.01	Block Group 3	51	144	**35.4**
Census Tract 5.02	Block Group 1	144	288	**50.0**
Census Tract 5.02	Block Group 2	102	254	**40.2**
Census Tract 5.02	Block Group 3	90	386	**23.3**
Census Tract 5.02	Block Group 4	114	174	**65.5**
Census Tract 6	Block Group 1	37	575	6.4
Census Tract 6	Block Group 2	305	539	**56.6**
Census Tract 6	Block Group 3	199	232	**85.8**
Census Tract 101.01	Block Group 1	0	634	0.0
Census Tract 101.01	Block Group 2	0	387	0.0
Census Tract 101.01	Block Group 3	5	535	0.9
Census Tract 101.02	Block Group 1	9	316	2.8
Census Tract 101.02	Block Group 2	32	476	6.7
Census Tract 101.02	Block Group 3	8	489	1.6
Census Tract 101.02	Block Group 4	5	486	1.0
Census Tract 102	Block Group 1	8	430	1.9
Census Tract 102	Block Group 2	26	392	6.6
Census Tract 102	Block Group 3	22	501	4.4
Census Tract 102	Block Group 4	130	461	**28.2**
Census Tract 103	Block Group 1	7	444	1.6
Census Tract 103	Block Group 2	7	445	1.6
Census Tract 103	Block Group 3	59	333	17.7
Census Tract 104	Block Group 1	7	484	1.4
Census Tract 104	Block Group 2	15	323	4.6
Census Tract 104	Block Group 3	54	658	8.2
Census Tract 105	Block Group 1	10	558	1.8

Table I-1-2. Poverty Data by Census Tract and Block Group

Census Tract	Block Group	Poverty Population	Population for Which Poverty Status has been Determined	Poverty Level Percentage
Census Tract 105	Block Group 2	25	355	7.0
Census Tract 105	Block Group 3	0	217	0.0
Census Tract 105	Block Group 4	55	911	6.0
Census Tract 105	Block Group 5	57	454	12.6
Census Tract 105	Block Group 6	75	440	17.0
Census Tract 106	Block Group 2	27	708	3.8
Census Tract 106	Block Group 3	0	170	0.0
Census Tract 106	Block Group 4	15	489	3.1
Census Tract 126.01	Block Group 1	10	562	1.8
Census Tract 126.01	Block Group 2	28	727	3.9
Census Tract 126.02	Block Group 1	17	579	2.9
Census Tract 126.02	Block Group 2	69	416	16.6
Census Tract 126.02	Block Group 3	89	482	18.5
Census Tract 127	Block Group 1	7	233	3.0
Census Tract 127	Block Group 2	41	376	10.9
Census Tract 127	Block Group 3	57	296	19.3
Census Tract 127	Block Group 4	21	383	5.5
Census Tract 127	Block Group 5	11	397	2.8
Census Tract 128	Block Group 1	19	248	7.7
Census Tract 128	Block Group 2	0	483	0.0
Census Tract 128	Block Group 3	76	825	9.2
Census Tract 128	Block Group 4	8	255	3.1
Census Tract 129	Block Group 1	25	414	6.0
Census Tract 129	Block Group 2	17	373	4.6
Census Tract 129	Block Group 3	0	310	0.0
Census Tract 130	Block Group 1	21	453	4.6
Census Tract 130	Block Group 2	51	349	14.6
Census Tract 130	Block Group 3	21	344	6.1
Census Tract 130	Block Group 4	24	583	4.1
Census Tract 131	Block Group 2	49	413	11.9
Census Tract 131	Block Group 5	16	522	3.1
Census Tract 152	Block Group 1	0	187	0.0
Census Tract 152	Block Group 2	0	744	0.0
Census Tract 152	Block Group 3	0	93	0.0
Census Tract 152	Block Group 4	13	362	3.6
Census Tract 152	Block Group 6	50	1195	4.2
Census Tract 105	Block Group 2	0	572	0.0
Census Tract 106	Block Group 1	48	1173	4.1
Census Tract 107	Block Group 1	0	230	0.0
Census Tract 108	Block Group 2	5	298	1.7
Census Tract 9536	Block Group 1	19	393	4.8
Census Tract 9536	Block Group 2	98	840	11.7
Census Tract 9536	Block Group 3	112	935	12.0
Census Tract 9537	Block Group 2	54	536	10.1
Census Tract 9537	Block Group 3	59	388	15.2
Census Tract 9537	Block Group 4	0	300	0.0

Table I-1-2. Poverty Data by Census Tract and Block Group

Census Tract	Block Group	Poverty Population	Population for Which Poverty Status has been Determined	Poverty Level Percentage
Census Tract 9538	Block Group 1	82	638	12.9
Census Tract 9538	Block Group 2	70	526	13.3
Census Tract 9538	Block Group 3	18	471	3.8
Census Tract 9539	Block Group 1	19	523	3.6
Census Tract 9539	Block Group 2	110	952	11.6
Census Tract 9539	Block Group 3	21	387	5.4
Census Tract 9540	Block Group 1	65	586	11.1
Census Tract 9540	Block Group 2	68	690	9.9
Census Tract 9540	Block Group 3	96	877	10.9
Census Tract 9541	Block Group 1	26	395	6.6
Census Tract 9541	Block Group 2	124	677	18.3
Census Tract 9541	Block Group 3	32	433	7.4
Census Tract 9541	Block Group 4	57	416	13.7
Census Tract 9554	Block Group 2	53	339	15.6
Census Tract 9554	Block Group 3	19	364	5.2

Notes:
The NYSDEC poverty population percentage threshold is 23.59 percent.
Bold values indicate percentage above the NYSDEC threshold.
Source: U.S. Census *2016 American Community Survey Data* (U.S. Census, 2017).

APPENDIX 17-1B

SUPPLEMENT TO DRAFT NYSDEC PART 201/231 AIR PERMIT APPLICATION

1099 Wall St. West
Suite 250B
Lyndhurst, NJ 07071

T 201.933.5541
TRCcompanies.com

December 3, 2019

Mr. George Sweikert
Regional Air Pollution Control Engineer, Region 3
New York State Department of Environmental Conservation
21 South Putt Corners
New Paltz, NY 12561

Subject: Danskammer Energy, LLC
Danskammer Energy Center
Town of Newburgh, Orange County, New York
Part 201/231 Air Permit Application
Supplemental Draft Application Materials for Title V Air Permit Modification
Permit ID: 3-3346-00011

Dear Mr. Sweikert:

TRC Environmental Corporation (TRC) submitted a Part 201/231 air permit application on November 15, 2019 to the Department on behalf of Danskammer Energy, LLC (Danskammer Energy), who is proposing to construct a new approximately 536 net megawatt (MW) primarily natural gas fired 1-on-1 combined cycle power facility (Danskammer Energy Center or Project) on the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York.

Because the Danskammer Generating Station currently operates under a Title V permit (3-3346-00011) and Danskammer Energy proposes to use future emission reduction credits associated with the shutdown of the existing Danskammer Generating Station as part of the Project, the proposed modifications will be permitted through a modification to the facility's existing Title V permit under 6 NYCRR 201-6. The proposed Project is considered to be a significant modification to an existing major source.

Danskammer Energy is submitting the enclosed supplemental application pages for the Department's review, which reflect the administrative changes associated with a significant modification to the facility Title V permit in accordance with 6 NYCRR 201-6.6(d) for the new emission source. The previously submitted Part 201/231 Air Permit Application pages associated with a Part 201-5 permit application will become obsolete with the permitting of the Project as a modification to the existing Title V permit for the Danskammer Generating Station. Please consider all the application materials submitted, both those submitted on November 15, 2019 as well as the enclosed supplemental application pages, as draft application materials.

If you have any questions concerning the enclosed application supplement, please feel free to call me at (201) 508-6954.

Sincerely,

Michael D. Keller

Michael D. Keller
Principal – Power Generation and Air Quality

cc: J. Kent, NYSDEC
M. Higgins, NYSDEC
M. Jennings, NYSDEC
M. Sanza, NYSDEC
W. Reid, Danskammer Energy
H. Taylor, Danskammer Energy
J. Garcia, Danskammer Energy
B. Colella, Barclay Damon

3.3 New York State Department of Environmental Conservation Regulations

Applicable NYSDEC air regulations are identified below:

- Part 200 defines general terms and conditions, requires sources to restrict emissions, and allows NYSDEC to enforce NSPS, PSD, and NESHAP. Part 200 is a general applicable requirement; no action is required by the Project.
- Part 200.1 defines emergency power generating stationary internal combustion engines as stationary internal combustion engines that operate as mechanical or electrical power sources only when the usual supply of power is unavailable, and operate for no more than 500 hours per year (i.e., applicable to the proposed emergency diesel generator and emergency diesel fire pumps, all of which have been assumed to operate no more than 250 hours per year, including periodic testing and maintenance activities to ensure reliability).
- Part 201 requires existing and new sources to evaluate minor or major source status and evaluate and certify compliance with all applicable requirements. The Project will represent a modified major Part 201 source, and is seeking a significant modification to the facility's existing Title V permit under 6 NYCRR 201-6.6(d). The proposed Project is considered to be a significant modification to an existing major source.
- Part 202-1 requires sources to conduct emissions testing upon the request of NYSDEC. The Project will comply with permit conditions requiring such testing.
- Part 202-2 requires sources to submit annual emission statements for emissions tracking and fee assessment. Pollutants are required to be reported in an emission statement if certain annual thresholds are exceeded. Project emissions will be reported as required.
- Part 211-3 defines general opacity limits for sources of air pollution in New York State. General applicable requirement Project-wide visible emissions are limited to 20 percent opacity (6-minute average) except for one continuous six-minute period per hour of not more than 57 percent opacity. Note that the opacity requirements under Part 227-1 (see below) are more restrictive and effectively supersede the requirements of Part 211-3.
- Part 225-1 regulates sulfur content of fossil fuels. Fuel sulfur is limited to 0.0015 percent by weight for distillate oil. Danskammer Energy proposes to use 0.0015 percent sulfur ULSD. The Project will not fire residual oil.
- Part 227-1.2 sets a 0.10 lb/MMBtu particulate matter limit for oil-fired stationary combustion installations with a maximum heat input capacity exceeding 250 MMBtu/hr. Danskammer Energy proposes to comply with this emission standard by proposing a

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3-3346-00011	- - /	State Facility × Title V

Section I - Certification

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information required to complete this application, I believe the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Responsible Official William Reid	Title CEO
Signature W- R	Date 12-2-19

Professional Engineer Certification

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments as they pertain to the practice of engineering. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Professional Engineer Jay Sarker	NYS License No. 091067
Signature [signature]	Date 12/3/19

STATE OF NEW YORK JAY SARKER 091067 LICENSED PROFESSIONAL ENGINEER

Section II - Identification Information

Type of Permit Action Requested

New Renewal × Significant Modification Administrative Amendment Minor Modification

Application for the construction of a new facility × Application involves the construction of new emission unit(s)

Facility Information

Name Danskammer Energy Center	
Location Address 994 River Road	
× City / Town / Village Newburgh	Zip 12550

Owner/Firm Information

Name Danskammer Energy LLC			Business Taxpayer ID
Street Address 994 River Road			
City Newburgh	State/Province NY	Country US	Zip 12550

Owner Classification: Federal State Municipal × Corporation/Partnership Individual

Owner/Firm Contact Information

Name Ed Hall			Phone 845-563-9110
E-mail Address ehall@danskammerenergy.com			Fax
Affiliation Danskammer Energy LLC		Title	
Street Address 994 River Road			
City Newburgh	State/Province NY	Country US	Zip 12550

Facility Contact Information

Name Ed Hall			Phone 845-563-9110
E-mail Address ehall@danskammerenergy.com			Fax
Affiliation Danskammer Energy LLC		Title	
Street Address 994 River Road			
City Newburgh	State/Province NY	Country US	Zip 12550

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Project Description
☒ Continuation Sheet(s)

Danskammer Energy, LLC (Danskammer Energy) is proposing to construct an approximately 536-megawatt (MW) primarily natural gas fired 1-on-1 combined cycle power facility (Danskammer Energy Center) on land at the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York. The Station's existing generators will be retired once the combined cycle plant is complete. The proposed Danskammer Energy Center will result in a new modern energy center through installation of state-of-the-art power generation equipment.

Section III - Facility Information

Facility Classification

☐ Hospital ☐ Residential ☐ Educational/Institutional ☐ Commercial ☐ Industrial ☒ Utility

Affected States (Title V Applications Only)

☐ Vermont ☐ Massachusetts ☐ Rhode Island ☒ Pennsylvania Tribal Land: ___________________

☐ New Hampshire ☒ Connecticut ☒ New Jersey ☐ Ohio Tribal Land: ___________________

SIC Code(s)			NAICS Code(s)			
4911			221112			

Facility Description
☐ Continuation Sheet(s)

The Danskammer Energy Center (DEC) will consist of one (1) Mitsubishi M501JAC combustion turbine. Hot exhaust gases from the combustion turbine will flow into one (1) heat recovery steam generator (HRSG). The HRSG will be equipped with a natural gas fired duct burner. The HRSG will produce steam to be used in the steam turbine. Upon leaving the HRSG, the turbine exhaust gases will be directed to one (1) exhaust stack. Other ancillary combustion equipment at the proposed facility includes a natural gas fired auxiliary boiler, exempt emergency diesel fire pumps, an exempt emergency diesel generator, and an exempt fuel oil storage tank. Danskammer Energy is proposing to utilize pipeline quality natural gas as the primary fuel for the combustion turbine and duct burners with ultra-low sulfur distillate fuel oil (ULSD) as a backup fuel for up to 720 full load hours per year.

Compliance Statements (Title V Applications Only)

I certify that as of the date of this application the facility is in compliance with all applicable requirements. ☒ Yes ☐ No

If one or more emission units at the facility are not in compliance with all applicable requirements at the time of signing this application (the 'NO' box must be checked), the noncomplying units must be identified in the "Compliance Plan" block on page 8 of this form along with the compliance plan information required. For all emission units at the facility that are operating in compliance with all applicable requirements, complete the following:

☒ This facility will continue to be operated and maintained in such a manner as to assure compliance for the duration of the permit, except those emission units referenced in the compliance plan portion of this application.

☒ For all emission units subject to any applicable requirements that will become effective during the term of the permit, this facility will meet such requirements on a timely basis.

☒ Compliance certification reports will be submitted at least once per year. Each report will certify compliance status with respect to each applicable requirement, and the method used to determine the status.

Facility Applicable Federal Requirements
☒ Continuation Sheet(s)

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	200	6						
6	NYCRR	201	6						
6	NYCRR	202	1	1					
6	NYCRR	215	2						

Facility State Only Requirements
☒ Continuation Sheet(s)

Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	NYCRR	201	1	4					
6	NYCRR	201	5						
6	NYCRR	211		2					
6	NYCRR	242	1	5					

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Request for Emission Reduction Credits

☐ Continuation Sheet(s)

Emission Source:

Emission Reduction Description

Future shutdown of existing Danskammer Generating Station emission units U-D0001, U-D0002, U-D0003, and U-D0004

Contaminant Emission Reduction Data

Baseline Period 12 / 1 / 2014 to 11 / 30 / 2016

Reduction Date	Reduction Method
Future	TBD

CAS Number	Contaminant Name	ERC (lbs/yr) Netting	ERC (lbs/yr) Offset
	Please see attached ERC quantification forms		

Facility to Use Future Reduction

Name: Danskammer Energy Center

Application ID: 3 - 3 3 4 6 - 0 0 0 1 1 /

Location Address: 994 River Road

☐ City/ ☒ Town / ☐ Village: Newburgh | State: New York | Zip: 12550

Use of Emission Reduction Credits

☐ Continuation Sheet(s)

Emission Source:

Proposed Project Description

Danskammer Energy, LLC (Danskammer Energy) is proposing to construct an approximately 536-megawatt (MW) primarily natural gas fired 1-on-1 combined cycle power facility (Danskammer Energy Center) on land at the site of its existing Danskammer Generating Station in the Town of Newburgh, Orange County, New York. The Station's existing generators will be retired once the combined cycle plant is complete. The proposed Danskammer Energy Center will result in a new modern energy center through installation of state-of-the-art power generation equipment.

Contaminant Emissions Increase Data

CAS Number	Contaminant Name	Project Emission Potential (lbs/yr)
	Please see attached application support document Appendix B	

Statement of Compliance

☒ All facilities under the ownership of this "owner/firm" are operating in compliance with all applicable requirements and state regulations including any compliance certification requirements under Section 114(a)(3) of the Clean Air Act Amendments of 1990, or are meeting the schedule of a consent order.

Source of Emission Reduction Credit - Facility

Name: Danskammer Generating Station

Permit ID: 3 - 3 3 4 6 - 0 0 0 1 1 /

Location Address: 994 River Road

☐ City/ ☒ Town / Village: Newburgh | State: New York | Zip: 12550

Emission Source	CAS Number	Contaminant Name	ERC (lbs/yr) Netting	ERC (lbs/yr) Offset
		Please see attached application support document Appendix B.		

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Supporting Documentation and Attachments	
Required Supporting Documentation	Date of Document
☒ List of Exempt Activities (attach form)	
☒ Plot Plan	
☒ Process Flow Diagram	
☒ Methods Used to Determine Compliance (attach form)	
☒ Emissions Calculations	
Optional Supporting Documentation	Date of Document
☒ Air Quality Model	
☐ Confidentiality Justification	
☐ Ambient Air Quality Monitoring Plan or Reports	
☐ Stack Test Protocol	
☐ Stack Test Report	
☐ Continuous Emissions Monitoring Plan	
☒ Lowest Achievable Emission Rate (LAER) Demonstration	
☒ Best Available Control Technology (BACT) Demonstration	
☐ Reasonably Available Control Technology (RACT) Demonstration	
☒ Toxic Impact Assessment (TIA)	
☐ Environmental Rating Demonstration	
☐ Operational Flexibility Protocol/Description of Alternate Operating Scenarios	
☐ Title IV Permit Application	
☒ Emission Reduction Credit (ERC) Quantification (attach form)	
☒ Baseline Period Demonstration	
☒ Use of Emission Reduction Credits (attach form)	
☒ Analysis of Contemporaneous Emissions Increase/Decrease	
Other Supporting Documentation	Date of Document

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Methods Used to Determine Compliance			
Emission Unit ID	Applicable Requirement	Method Used to Determine Compliance	Compliance Date
Facility	40 CFR Part 52 A	Facility will maintain fuel oil purchase records demonstrating compliance with fuel sulfur limit.	
Facility	6 NYCRR Part 211	Initial performance test and upon request.	
Facility	6 NYCRR Part 231-8	Facility will maintain fuel oil purchase records demonstrating compliance with fuel sulfur limit.	
Facility	6 NYCRR Part 231-8	The sulfur content of the natural gas will be verified through a certification or analysis provided by the vendor and monitored by the facility.	
U-DEC01	6 NYCRR Part 231-8	The facility will use CEMs to monitor CO emissions from the combustion turbine.	
U-DEC01	6 NYCRR Part 231-8	Initial performance test for demonstration of heat rate.	
U-DEC01	6 NYCRR Part 251-3	The facility will use CEMs to monitor the CO2 emissions from the combustion turbine.	
U-DEC01	6 NYCRR Part 231-8	Initial performance test for demonstrating compliance with H2SO4 emission limit for the combustion turbine firing natural gas.	
U-DEC01	6 NYCRR Part 231-8	Initial performance test for demonstrating compliance with H2SO4 emission limit for the combustion turbine firing ULSD.	
U-DEC01	6 NYCRR Part 200-7	The facility will use CEMs to monitor the ammonia emissions from the combustion turbine.	

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Methods Used to Determine Compliance			
Emission Unit ID	Applicable Requirement	Method Used to Determine Compliance	Compliance Date
U-DEC01	6 NYCRR Part 231-6	The facility will use CEMs to monitor NOx emissions from the combustion turbine.	
U-DEC01	6 NYCRR Part 231-8	Initial performance tests for demonstration of Particulate Matter emission rate during natural gas firing with and without the duct burner and during ULSD firing.	
U-DEC01	6 NYCRR Part 231-6	Initial performance tests for demonstration of VOC emission rate during natural gas firing with and without the duct burner and during ULSD firing.	
U-DEC02	6 NYCRR Part 231-8	The facility will use vendor emission guarantees and/or stack testing to verify compliance with the CO emission limit for the auxiliary boiler.	
U-DEC02	6 NYCRR Part 231-6	Initial performance test and upon request for demonstration of compliance with NOx emission limit for the auxiliary boiler.	
U-DEC02	6 NYCRR Part 231-8	The facility will use vendor emission guarantees and/or stack testing to verify compliance with the PM emission limit for the auxiliary boiler.	
U-DEC02	6 NYCRR Part 231-6	Initial performance test and upon request for demonstration of compliance with VOC emission limit for the auxiliary boiler.	
U-DECEG	6 NYCRR Part 231-8	Compliance with the CO emission limit for the emergency generator will be demonstrated via certification by the vendor and adherence to vendor certified maintenance recommendations.	
U-DECEG	6 NYCRR Part 231-6	Compliance with the NOx emission limit for the emergency generator will be demonstrated via certification by the vendor and adherence to vendor certified maintenance recommendations.	
U-DECEG	6 NYCRR Part 231-8	Compliance with the PM emission limit for the emergency generator will be demonstrated via certification by the vendor and adherence to vendor certified maintenance recommendations.	

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Methods Used to Determine Compliance

Emission Unit ID	Applicable Requirement	Method Used to Determine Compliance	Compliance Date
U-DECEG	6 NYCRR Part 231-6	Compliance with the VOC emission limit for the emergency generator will be demonstrated via certification by the vendor and adherence to vendor certified maintenance recommendations.	
U-DECFP	6 NYCRR Part 231-8	Compliance with the CO emission limit for the emergency fire pump engine will be demonstrated via certification by the vendor and adherence to vendor certified maintenance recommendations.	
U-DECFP	6 NYCRR Part 231-6	Compliance with the NOx emission limit for the emergency fire pump engine will be demonstrated via certification by the vendor and adherence to vendor certified maintenance recommendations.	
U-DECFP	6 NYCRR Part 231-8	Compliance with the PM emission limit for the emergency fire pump engine will be demonstrated via certification by the vendor and adherence to vendor certified maintenance recommendations.	
U-DECFP	6 NYCRR Part 231-8	Compliance with the VOC emission limit for the emergency fire pump engine will be demonstrated via certification by the vendor and adherence to vendor certified maintenance recommendations.	

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List of Exempt Activities

Instructions
Applicants for Title V facility permits must provide a listing of each exempt activity, as described in 6 NYCRR Part 201-3.2(c), that is currently operated at the facility. This form provides a means to fulfill this requirement. In order to complete this form, enter the number and building location of each exempt activity. Building IDs used on this form should match those used in the Title V permit application. If a listed activity is not operated at the facility, leave the corresponding information blank.

Combustion			
Rule Citation 201-3.2(c)	Description	Number of Activities	Building Location
(1)	Stationary or portable combustion installations where the furnace has a maximum heat input capacity less than 10 mmBtu/hr burning fuels other than coal or wood; or a maximum heat input capacity of less than 1 mmBtu/hr burning coal or wood. This activity does not include combustion installations burning any material classified as solid waste, as defined in 6 NYCRR Part 360, or waste oil, as defined in 6 NYCRR Subpart 225-2.		
(2)	Space heaters burning waste oil at automotive service facilities, as defined in 6 NYCRR Subpart 225-2, generated on-site or at a facility under common control, alone or in conjunction with used oil generated by a do-it-yourself oil changer as defined in 6 NYCRR Subpart 374-2.		
(3)(i)	Stationary or portable internal combustion engines that are liquid or gaseous fuel powered and located within the New York City metropolitan area or the Orange County towns of Blooming Grove, Chester, Highlands, Monroe, Tuxedo, Warwick, or Woodbury, and have a maximum mechanical power rating of less than 200 brake horsepower.		
(3)(ii)	Stationary or portable internal combustion engines that are liquid or gaseous fuel powered and located outside of the New York City metropolitan area or the Orange County towns of Blooming Grove, Chester, Highlands, Monroe, Tuxedo, Warwick, or Woodbury, and have a maximum mechanical power rating of less than 400 brake horsepower.		
(3)(iii)	Stationary or portable internal combustion engines that are gasoline powered and have a maximum mechanical power rating of less than 50 brake horsepower.		
(4)	Reserved.		
(5)	Gas turbines with a heat input at peak load less then 10 mmBtu/hour		

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Rule Citation 201-3.2(c)	Description	Number of Activities	Building Location
(6)	Emergency power generating stationary internal combustion engines, as defined in 6 NYCRR Part 200.1(cq), and engine test cells at engine manufacturing facilities that are utilized for research and development, reliability performance testing, or quality assurance performance testing. Stationary internal combustion engines used for peak shaving and/or demand response programs are not exempt.	3	
Combustion Related			
(7)	Non-contact water cooling towers and water treatment systems for process cooling water and other water containers designed to cool, store or otherwise handle water that has not been in direct contact with gaseous or liquid process streams.		
Agricultural			
(8)	Feed and grain milling, cleaning, conveying, drying and storage operations including grain storage silos, where such silos exhaust to an appropriate emissions control device, excluding grain terminal elevators with permanent storage capacities over 2.5 million U.S. bushels, and grain storage elevators with capacities above one million bushels.		
(9)	Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.		
Commercial - Food Service Industries			
(10)	Flour silos at bakeries, provided all such silos are exhausted through an appropriate emission control device.		
(11)	Emissions from flavorings added to a food product where such flavors are manually added to the product.		
Commercial - Graphic Arts			
(12)	Screen printing inks/coatings or adhesives which are applied by a hand-held squeegee. A hand-held squeegee is one that is not propelled though the use of mechanical conveyance and is not an integral part of the screen printing process.		
(13)	Graphic arts processes at facilities located outside the New York City metropolitan area or the Orange County towns of Blooming Grove, Chester, Highlands, Monroe, Tuxedo, Warwick, or Woodbury whose facility-wide total emissions of volatile organic compounds from inks, coatings, adhesives, fountain solutions and cleaning solutions are less than three tons during any 12-month period.		

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Rule Citation 201-3.2(c)	Description	Number of Activities	Building Location
(14)	Graphic label and/or box labeling operations where the inks are applied by stamping or rolling.		
(15)	Graphic arts processes which are specifically exempted from regulation under 6 NYCRR Part 234, with respect to emissions of volatile organic compounds which are not given an A rating as described in 6 NYCRR Part 212.		
Commercial - Other			
(16)	Gasoline dispensing sites registered with the department pursuant to 6 NYCRR Part 612.		
(17)	Surface coating and related activities at facilities which use less than 25 gallons per month of total coating materials, or with actual volatile organic compound emissions of 1,000 pounds or less from coating materials in any 12-month period. Coating materials include all paints and paint components, other materials mixed with paints prior to application, and cleaning solvents, combined. This exemption is subject to the following: (i) The facility is located outside of the New York City metropolitan area or the Orange County towns of Blooming Grove, Chester, Highlands, Monroe, Tuxedo, Warwick, or Woodbury; and (ii) All abrasive cleaning and surface coating operations are performed in an enclosed building where such operations are exhausted into appropriate emission control devices.		
(18)	Abrasive cleaning operations which exhaust to an appropriate emission control device.		
(19)	Ultraviolet curing operations.		
Municipal/Public Health Related			
(20)	Landfill gas ventilating systems at landfills with design capacities less than 2.5 million megagrams (3.3 million tons) and 2.5 million cubic meters (2.75 million cubic yards), where the systems are vented directly to the atmosphere, and the ventilating system has been required by, and is operating under, the conditions of a valid 6 NYCRR Part 360 permit, or order on consent.		
Storage Vessels			
(21)	Distillate fuel oil, residual fuel oil, and liquid asphalt storage tanks with storage capacities below 300,000 barrels.	1	

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Rule Citation 201-3.2(c)	Description	Number of Activities	Building Location
(22)	Pressurized fixed roof tanks which are capable of maintaining a working pressure at all times to prevent emissions of volatile organic compounds to the outdoor atmosphere.		
(23)	External floating roof tanks which are of welded construction and are equipped with a metallic-type shoe primary seal and a secondary seal from the top of the shoe seal to the tank wall.		
(24)	External floating roof tanks which are used for the storage of a petroleum or volatile organic liquid with a true vapor pressure less than 4.0 psi (27.6 kPa), are of welded construction and are equipped with one of the following: (i) a metallic-type shoe seal; (ii) a liquid-mounted foam seal; (iii) a liquid-mounted liquid-filled type seal; or (iv) equivalent control equipment or device.		
(25)	Storage tanks, including petroleum liquid storage tanks as defined in 6 NYCRR Part 229, with capacities less than 10,000 gallons, except those subject to 6 NYCRR Part 229 or Part 233.		
(26)	Horizontal petroleum or volatile organic liquid storage tanks.		
(27)	Storage silos storing solid materials, provided all such silos are exhausted through an appropriate emission control device. This exemption does not include raw material, clinker, or finished product storage silos at Portland cement plants.		
Industrial			
(28)	Processing equipment at existing sand and gravel and stone crushing plants which were installed or constructed before August 31, 1983, where water is used for operations such as wet conveying, separating, and washing. This exemption does not include processing equipment at existing sand and gravel and stone crushing plants where water is used for dust suppression.		
(29)(i)	Sand and gravel processing or crushed stone processing lines at a non-metallic mineral processing facility that are a permanent or fixed installation with a maximum rated processing capacity of 25 tons of minerals per hour or less.		

DEC ID
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Rule Citation 201-3.2(c)	Description	Number of Activities	Building Location
(29)(ii)	Sand and gravel processing or crushed stone processing lines at a non-metallic mineral processing facility that are a portable emission source with a maximum rated processing capacity of 150 tons of minerals per hour or less.		
(29)(iii)	Sand and gravel processing or crushed stone processing lines at a non-metallic mineral processing facility that are used exclusively to screen minerals at a facility where no crushing or grinding takes place.		
(30)	Reserved.		
(31)	Surface coating operations which are specifically exempted from regulation under 6 NYCRR Part 228, with respect to emissions of volatile organic compounds which are not given an A rating pursuant to 6 NYCRR Part 212.		
(32)	Pharmaceutical tablet branding operations.		
(33)	Thermal packaging operations, including, but not limited to, therimage labeling, blister packing, shrink wrapping, shrink banding, and carton gluing.		
(34)	Powder coating operations.		
(35)	All tumblers used for the cleaning and/or deburring of metal products without abrasive blasting.		
(36)	Presses used exclusively for molding or extruding plastics except where halogenated carbon compounds or hydrocarbon solvents are used as foaming agents.		
(37)	Concrete batch plants where the cement weigh hopper and all bulk storage silos are exhausted through fabric filters, and the batch drop point is controlled by a shroud or other emission control device.		
(38)	Cement storage operations not located at Portland cement plants where materials are transported by screw or bucket conveyors.		
(39)(i)	Cold cleaning degreasers with an open surface area of 11 square feet or less and an internal volume of 93 gallons or less or, having an organic solvent loss of 3 gallons per day or less.		
39(ii)	Cold cleaning degreasers that use a solvent with a VOC content or five percent or less by weight, unless subject to the requirements of 40 CFR 63 Subpart T.		

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Rule Citation 201-3.2(c)	Description	Number of Activities	Building Location
(39)(iii)	Conveyorized degreasers with an air/vapor interface smaller than 22 square feet (2 square meters), unless subject to the requirements of 40 CFR 63 Subpart T.		
(39)(iv)	Open-top vapor degreasers with an open-top area smaller than 11 square feet (1 square meter), unless subject to the requirements of 40 CFR 63 Subpart T.		
Miscellaneous			
(40)	Ventilating and exhaust systems for laboratory operations. Laboratory operations do not include processes having a primary purpose to produce commercial quantities of materials.		
(41)	Exhaust or ventilating systems for the melting of gold, silver, platinum and other precious metals.		
(42)	Exhaust systems for paint mixing, transfer, filling or sampling and/or paint storage rooms or cabinets, provided the paints stored within these locations are stored in closed containers when not in use.		
(43)	Exhaust systems for solvent transfer, filling or sampling, and/or solvent storage rooms provided the solvent stored within these locations are stored in containers when not in use.		
(44)	Research and development activities, including both stand-alone and activities within a major facility, until such time as the administrator completes a rule making to determine how the permitting program should be structured for these activities.		
(45)	The application of odor counteractants and/or neutralizers.		
(46)	Hydrogen fuel cells.		
(47)	Dry cleaning equipment that uses only water-based cleaning processes or those using liquid carbon dioxide.		
(48)	Manure spreading, handling and storage at farms and agricultural facilities.		

APPENDIX 17-2

GREENHOUSE GAS EMISSIONS ASSESSMENT

APPENDIX 17-2

GREENHOUSE GAS EMISSIONS ASSESSMENT

GREENHOUSE GAS EMISSIONS ASSESSMENT FOR THE DANSKAMMER ENERGY CENTER

There is general consensus in the scientific community that the global climate is changing as a result of increased concentrations of greenhouse gases (GHGs) in the atmosphere. As a consequence, government policies have begun to address GHG emissions at global, national, and local levels, including action from USEPA to address President Obama's Climate Action Plan to reduce carbon pollution from power plants. GHGs are those gaseous constituents of the atmosphere, from both natural and anthropogenic (i.e., resulting from the influence of human beings) emission sources, that absorb infrared radiation (heat) emitted from the earth's surface, the atmosphere, and clouds. This property causes the general warming of the earth's atmosphere, or the "greenhouse effect." Water vapor, carbon dioxide (CO_2), nitrous oxide, methane, and ozone are the primary greenhouse gases in the earth's atmosphere.

Although the contribution of any single project to climate change is infinitesimal, the combined GHG emissions from all human activity may result in, or significantly contribute to, global climate change. While the emissions of criteria pollutant and toxic air pollutant emissions are assessed in the context of health based standards and local impacts, there are no established thresholds for assessing the significance of a Project's contribution to climate change. Nonetheless, the nature of the climate change impact dictates that all sectors address GHG emissions by identifying GHG sources and practicable means to reduce them.

On July 15, 2009, the NYSDEC issued its *Draft Commissioner's Policy - Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements* (NYSDEC, 2009) (the Policy). The purpose of this Policy is to assist NYSDEC staff in reviewing how energy use and GHG emissions are identified and analyzed in an environmental impact statement, as well as to maximize energy efficiency and minimize potential climate change of the proposed action. While the Project is not subject to review under the State Environmental Quality Review Act (SEQRA), where the Policy applies directly, this Appendix to Exhibit 17 – Air Emissions, discusses how the Project intends to meet the goals of the Policy.

GHGs considered include emissions resulting directly from the proposed electric generating facility combustion turbine and auxiliary equipment, as well as indirect emissions, such as emissions from Project-generated vehicle trips. The emissions also include indirect emissions "upstream" and "downstream" from the Project in time, such as emissions associated with the construction phase of the facility itself.

1.1 DIRECT AND INDIRECT GHG EMISSIONS DURING CONSTRUCTION AND OPERATION

Construction activities for the proposed Project will result in GHG emissions from on-Site construction equipment, truck trips associated with construction material, deliveries and disposal, and construction worker trips. Large excavators, rollers, and dump trucks consume diesel fuel and produce GHGs. In addition, there are GHGs emitted during the production of construction materials and delivering them to the Site. Energy consumption is associated with all commercial construction projects. Short-term energy consumption impacts will occur during construction of the proposed electric generating facility, primarily due to the consumption of fossil fuels through the operation of power equipment and construction vehicles. Secondary usages also include fuel utilized by the contractor's employees to commute to the Site and the energy for transportation and production of building materials.

After construction, the operation of the electric generating facility consumes carbon based fuels and produces GHG on a continuous basis. Also, indirectly during facility operation, GHGs will be emitted during gasoline and diesel combustion from private vehicle use and contractor delivery trucks to and from the Project Site.

1.1.1 DIRECT OPERATIONAL EMISSIONS – STATIONARY SOURCES

The direct GHG emissions from the Danskammer Energy Center will consist of emissions from combustion and industrial processes conducted on-Site. The primary emissions from the Project will occur from combustion of natural gas in the new state of the art Mitsubishi 501JAC combustion turbine. Additional GHG emissions will be produced during operation of the ancillary equipment and the natural gas fired duct burner, including the emergency diesel generator and the emergency diesel fire pumps.

On June 12, 2012, NYSDEC adopted Part 251, CO_2 Performance Standards for Major Electric Generating Facilities, which became effective on July 12, 2012. Part 251 applies to owners and/or operators of new major electric generating facilities (defined as facilities that have a generating capacity of at least 25 megawatts (MW)) that commence construction after July 12, 2012 and for increases in capacity of at least 25 MW at existing electric generating facilities. Part 251 will apply to the Project's combustion turbine. New combined cycle units must comply with either an input based emission limit of 120 pounds of CO_2 per million British Thermal Units (MMBtu) or an output-based CO_2 emission limit of 925 pounds per megawatt hour (lb./MWh) (gross). This emission limit will be measured on a 12-month rolling average basis, calculated by dividing the annual total of CO_2 emissions over the relevant 12-month period by the annual total MW generated over the same 12-month period.

Because the Danskammer Energy Center has the potential to emit significant amounts of GHG and will be considered a major GHG emitting source, a Best Available Control Technology (BACT) analysis for GHG emissions is necessary to comply with NYSDEC regulation 6 NYCRR Part 231. BACT is defined as an emission limitation based on the maximum degree of reduction, on a case-by-case basis, taking into account energy, environmental and economic considerations. A detailed BACT assessment is provided in the NYSDEC Part 201/231 air permit application, which is included as Appendix 17-1 to Exhibit 17.

The Project proposes as BACT, the following energy efficiency processes, practices, and designs for the proposed combustion turbine:

- Use of state of the art combustion turbine technology
- Use of natural gas as the primary fuel
- Efficient turbine design
- Periodic maintenance and tune up
- Instrumentation and controls

The Project is proposing the following GHG BACT limits:

- Heat rate of 6,925 Btu/KW-hr Gross - higher heating value (HHV) at ISO conditions during natural gas operation and at baseload without duct firing; and
- Total annual GHG emissions for the combined cycle combustion turbine including duct firing, backup ULSD operation, and operation at part loads, will be limited to 1,927,496 tons carbon dioxide equivalents CO_2e per year

The Project will utilize 40 CFR Part 75 monitoring methodology along with 40 CFR Part 98 emission factors for methane (CH_4) and nitrous oxide (N_2O) to determine compliance. Compliance with the heat rate limit at base load on natural gas without duct firing will be based on an initial performance test. Compliance with the annual tons/year limit will be based on a rolling monthly total.

Note that the Project will also comply with the USEPA's 40 CFR Part 60, Subpart TTTT performance standard that will limit CO_2 emissions from new natural gas base load combustion turbine to 1,000 pounds CO_2/MW-hr of electricity generated on a gross basis (12-month rolling average). Based upon this USEPA rule, a GHG emissions performance standard of 1,000 pounds of CO_2e per gross MW-hr is intended to reflect degradation of the equipment over time and the emissions associated with turndowns, startup, and shutdown of the combustion turbine. The Project will also comply with the NYSDEC regulation for major electric generating facilities, 6 NYCRR Part 251, that requires facilities to meet an output based emission limit of 925 lb CO_2 /MW-hr (gross).

Therefore, taking into account the efficiency metric for the combined-cycle power plant of pounds of CO_2 per gross MW-hr of electrical generation, the capability of HRSG duct firing, the inherent degradation in turbine performance over the life of the Project, and the inclusion of startup and shutdowns over the course of a year of operation, it has been concluded that the Project will meet the regulatory limits on a 365-day rolling average during facility operation. The NSPS TTTT and the NYSDEC Part 251 regulation limits are consistent with the lifetime annual operation of the Project that includes degradation of the equipment over time and the emissions associated with turndowns, startup, shutdown, and part load operation that are incorporated into this annual limit.

1.1.2 DIRECT OPERATIONAL EMISSIONS – MOBILE SOURCES

Indirect emissions from non-stationary sources include trips generated by vehicles that are associated with the proposed Project but are not owned and operated by Danskammer Energy. This includes trips of commuting employees, suppliers/vendors, material delivery/removals, as well as the transportation of waste generated at the Site. To quantify these indirect emissions, the first step is to estimate net new trips to be generated by the proposed Project. Estimates of the Project's annual vehicle-miles traveled (VMT) were developed based upon the expected annual operating schedule and average round trip distances for each activity.

Emission factors in units of grams per VMT for on-road engine emissions of CO_2 were obtained for various vehicle categories based on the results of modeling using USEPA's MOVES mobile source emission factor model. Emission factors were obtained for various vehicle classes, including heavy-duty diesel vehicles and light-duty gasoline vehicles.

Emissions from on-road vehicles were calculated for the following operational related activities:

- Light-duty gasoline vehicles driven by commuting workers to and from the Project Site;
- Heavy-duty diesel vehicles and other vehicles involved in material/fuel delivery to the Project Site; and
- Light-duty gasoline vehicles driven by contractors to and from the Project Site.

Emissions were calculated for each activity as the product of the estimated VMT and the associated emission factor and are shown in Table 17-2-1.

Table 17-2-1
Operational GHG Emissions – Mobile Sources

Vehicles	Purpose	Round Trip Distance	Annual Number of Trips	Moves Emission Factor (g/VMT)	CO_2 Emissions (ton/year)
Diesel Haul Trucks	Material Delivery/Removal	200	1,825	1,995	803
Light Duty Gas Cars and Trucks	Worker Commutes and Contractors	75	10,950	444	402
				Total	1,205

Notes: Annual Number of Trips based upon average of 5 trucks per day and 30 workers/contractors commuting per day.

1.1.3 INDIRECT GREENHOUSE GAS EMISSIONS (CONSTRUCTION)

Emissions of CO_2 from nonroad construction equipment engines used during Project construction have been estimated based on the anticipated types of nonroad equipment and their associated levels of use. Emission factors in grams per horsepower-hour (g/hp-hr) for diesel and gasoline nonroad equipment engines were obtained using the most recent version of USEPA's NONROAD model. NONROAD was run to obtain annual average representative emission factors. To be conservative, the analysis made use of the default engine population distribution in NONROAD. The resulting emission estimates do not account for the greater availability of newer and lower emitting construction equipment at the Project Site. Therefore, emissions from nonroad engines are likely overestimated. Emissions for each engine were calculated as the product of the engine hp, the load factor, the hours of engine use, and the emission factor.

Emission factors in units of grams per VMT for on road engine emissions of CO_2 were obtained for various vehicle categories based on the results of modeling using EPA's MOVES mobile source emission factor model. Emission factors were obtained for various vehicle classes, including heavy-duty diesel vehicles and light-duty gasoline vehicles.

Emissions from on-road vehicles were calculated for the following construction related activities:

- Light-duty gasoline vehicles and trucks driven by commuting construction workers to and from Project work Site; and
- Heavy-duty diesel vehicles and other vehicles involved in material delivery to or removal from Project work Site.

For each vehicle category and activity, emissions were calculated as the product of the estimated VMT and the associated emission factor. The total VMT for commuting was calculated by multiplying the number of construction workers by the mileage driven per employee per day and by the expected duration of the activity. The total construction period CO_2 emissions are 21,850 tons of CO_2 as shown in Appendix 17-4 of Exhibit 17.

1.1.4 GREENHOUSE GAS EMISSIONS SUMMARY

The total annual GHG emissions from the proposed Danskammer Energy Center consist of the operational emissions from the Project stationary combustion sources, the operational mobile source emissions from material removal/delivery and worker commutes, as well as the annualized construction emissions from the Project itself. A summary of these emissions is presented below in Table 17-2-2 for the Project with a conservative assumption of a capacity factor of 100% (i.e., the Project operation is constant at the maximum turbine and duct burner load).

Table 17-2-2
GHG Emissions Summary – Maximum Facility Capacity Factor – 100%

Project Component	Emissions Category	Annualized CO_2 emissions
Combustion Turbine	Direct	1,925,594
Stationary Auxiliary Combustion Equipment	Direct	27,427
Operational Mobile Sources	Indirect	1,205
Facility Construction	Indirect	728
	Total Annualized Lifecycle Emissions	1,954,954
Notes: Lifetime operation assumed to be 30 years.		

Based on the results of electric system production modeling, as detailed in Exhibit 8, the Danskammer Energy Center is estimated to have an annual all-hours capacity factor of 70%. A summary of the annualized GHG emissions is presented in Table 17-2-3 for the Danskammer Energy Center with a predicted capacity factor of 70%.

Table 17-2-3
GHG Emissions Summary – Predicted Facility Capacity Factor – 70%

Project Component	Emissions Category	Annualized CO_2 emissions
Combustion Turbine	Direct	1,347,916
Stationary Auxiliary Combustion Equipment	Direct	19,199
Operational Mobile Sources	Indirect	1,205
Facility Construction	Indirect	728
	Total Annualized Lifecycle Emissions	1,369,048
Notes: Lifetime operation assumed to be 30 years.		

1.2 REGIONAL GREENHOUSE GAS INITIATIVE

The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort by Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to limit greenhouse gas emissions. A goal of RGGI is to reduce CO_2 emissions from power plants in the participating states, while maintaining affordability and reliability and accommodating, to the extent feasible, the diversity in policies and programs in individual states.

NYSDEC has promulgated regulations in 6 NYCRR Part 242 (CO_2 Budget Trading Program) that implement the goals of the RGGI Initiative in New York State, including a cap-and-trade system for CO_2 emissions from subject units. The Danskammer Energy Center will be subject to 6 NYCRR Part 242 and will be required to obtain a CO_2 budget permit for the combined cycle unit, to appoint an authorized account representative, to hold and surrender sufficient CO_2 allowances to cover its emissions, to certify compliance with program requirements, and to satisfy the recordkeeping and reporting requirements of 6 NYCRR Part 242.

1.3 ALTERNATIVE ANALYSIS

The Project was designed to be built on existing industrial parcels and to co-locate with existing industrial infrastructure. To maximize the efficiency of a power generation facility on a compact site, Danskammer selected an efficient, combined-cycle facility that will produce a high level of stable output, providing a baseload to the electric grid and providing consistent, reliable service.

Renewable energy sources, including wind and solar generation, are intermittent and cannot be dispatched to meet changing system demand. Such projects, while important components of a diverse energy portfolio, are not a feasible alternative to providing reliable base load generation. However, Danskammer has identified and examined wind and solar energy as alternative energy supply source alternatives.

1.3.1 SOLAR GENERATION

Development of a portion of the existing Site with solar panel arrays is an alternative option, albeit not a viable, reasonable, feasible alternative for the Applicant’s consideration. Using the assumption of 1 MW of electricity being generated for every 5+ acres of land for solar PV panels, the Applicant would need over 2,700 acres of land to be developed with solar panels to generate 536 MW of electricity, the net capacity of the proposed combined-cycle power facility. The annual capacity factor (annual MW-hr) for Solar generation in this Project area is approximately 12 percent, compared to the projected capacity factor of 70% discussed in Exhibit 8, for the Danskammer Energy Center. As such, solar power is not a practical or feasible alternative for the proposed combined-cycle power facility.

1.3.2 WIND GENERATION

As with solar, development of a portion of the existing Site with wind power is an alternative option, albeit not viable, reasonable, feasible alternatives for the Applicant’s consideration. Wind farms require large amounts of space between turbines. Some of that space is to minimize turbulence, but some is to follow ridge lines or avoid other obstacles. Much of this area is used for other purposes, such as agricultural farms. National Renewable Energy Laboratory researchers have surveyed the total land use required for 127 large-scale wind power projects (https://sciencing.com/much-land-needed-wind-turbines-12304634.html). They calculated a rough average of 4 MW per square kilometer (or about 247 acres).

Based on these calculations, a 2-MW wind turbine would require a total area of about half a square kilometer (or about 124 acres). In order to generate the 536 net MW of electric power, the total land use required for a wind farm would be over 33,000 acres, or more than 51 square miles. Therefore, the proposed Project Site is vastly insufficient in size to accommodate a wind power array to generate an equivalent 536 MW of power.

1.3.3 FOSSIL GENERATION ALTERNATIVES

By replacing older, less efficient steam-generating units with modern generating technologies, there will be an increase in energy efficient resource deployment. The Project's proposed use of the Mitsubishi 501JAC combined-cycle technology, which is designed for higher ramp rates and faster start-ups compared to the existing Danskammer units, will allow the Project to respond to rapidly increasing system demands. This will give NYISO greater flexibility in its selection of resources from within its generation portfolio to meet system demands. The proposed Project was developed in order to provide an option for the market to meet demand that is more preferable than some of the older generating facilities in the State, thus reducing the overall use of low efficiency power-generating plants. The Danskammer Energy Center's combined-cycle facility will contribute to the baseload power plants that provide the backbone for the electric supply system in New York. Regarding timing, the Project will serve as a bridge facility now, assisting the State in its planned transition to a predominantly renewable-based energy economy, while renewable and battery energy storage technology continue to evolve and become more price competitive.

Emissions of CO_2 are directly relatable to the amount and type of fuel combusted. An effective way of reducing GHG emissions is through the use of highly energy efficient combustion systems burning natural gas, which has the lowest amount of CO_2 emissions on a unitized basis compared with oil and coal. By utilizing more energy efficient combined cycle combustion turbine technology than simple cycle combustion turbines and boilers, less fuel is required to produce the same amount of electricity. Thus, by utilizing one of the most efficient combustion turbines available coupled with the use of primary natural gas combustion, the resulting CO_2 emission rates are substantially lower on a per megawatt-hour of generation basis. A comparison of CO_2 emission rates for the alternate technologies to this Project are provided in Table 17-2-4. As shown in the table, the Danskammer Energy Center will have substantially lower CO_2 emissions on a per megawatt-hour basis, other than the renewable generation alternatives of solar and wind.

Table 17-2-4
CO_2 Emissions Rates from Alternative Technologies

Technology	CO_2 Emission Rates (lb CO_2/MW-hr)
Danskammer Energy Center	718
Simple Cycle Combustion Turbine	1,308
Oil Combustion	1,772
Coal Combustion	2,115
Wind	0
Solar	0

Source: U.S. Energy Information Administration Report *Electric Power Annual 2017* (US EIA, July 2019).

1.3.4 ALTERNATIVE TECHNOLOGY CAPABILITY

As discussed in the NYISO report *Power Trends 2019* (NYISO, May 2019), the alternative energy technologies identified above have substantially differing aspects when assessing the Projects basic purpose and need of increased baseload electric generating capacity in downstate New York. Table 17-2-5 identifies the corresponding potential capacity factor of each alternative. A capacity factor is a comparison of how much electricity a generator produces, on average, relative to the maximum output it could produce at continuous, full-power operation. The intermittency of renewable resource operation influences the availability of their output, measured by the capacity factor. Generators with comparatively low fuel and operating costs are usually selected in wholesale electricity markets to consistently supply power. Lower capacity factors indicate that a generator operates less frequently, such as during peak demand periods, or that its operation depends on the intermittent availability of its fuel supply, such as hydro, solar, and wind energy.

As concluded by the NYISO in *Power Trends 2019* (NYISO, May 2019),

> *Renewable resources, such as hydro, wind, and solar energy have no fuel costs, making them more competitive in the NYISO energy market's scheduling process than older and potentially less efficient fossil generators. However, the fuel supplies of these renewable resources are variable due to changing weather conditions. The relative capacity factors of different types of generation are important considerations in planning the future fuel mix. The intermittent nature of these resources is challenging as they cannot respond to calls for additional energy in the same manner that more conventional supply resources can. As a result, even if sufficient intermittent renewable capacity is developed to produce the equivalent amount of energy as high-capacity resources such as hydro or nuclear units, that energy may not be available when it is needed by consumers.*

Table 17-2-5
Capacity Factors from Alternative Technologies

Technology	Capacity Factor
Danskammer Energy Center	70%
Onshore Wind	26%
Offshore Wind	45%
Solar	14%

Source: NYISO *Power Trends 2019* (NYISO, May 2019).
Vineyard Wind – *Construction and Operations Plan – Volume 1* (Vineyard Wind, March 2018.

As shown in the table above, the alternative energy technologies operate intermittently, resulting in lower capacity factors than a natural gas fired combined cycle facility. Thus, while the GHG emissions from the alternative technologies are minimal, the technologies inherently do not meet the same purpose and need for 536 MW of baseload generation that the Project will be able to provide the NYISO electric grid.

To illustrate the above conclusion regarding the viability of alternative energy technologies such as solar and wind, the NYISO provided the following example in *Power Trends 2019* (NYISO, May 2019):

> *The NYISO observed a record wind production level of 1,625 MW just before midnight on February 8, 2019, at which point it was serving 9% of the state's electrical demand in that hour. For all but 30 minutes of this day, wind contributed more than 1,000 MW to meet system needs. However, wind production began to decline throughout the day on February 9^th^ to a level of 629 MW at 6 p.m., meeting only 3% of system load when demand peaked at 20,275 MW. Solar resources, which are less productive in winter months, did contribute toward meeting overall load. However, the sun had already set by the time peak demand on the system was reached, leaving solar production at 0 MW.* ***Increased production from natural gas and dual-fuel resources was necessary to meet demand as production from intermittent resources declined****.*

Thus, the alternative technologies were dismissed from further consideration due to the fact that they do not meet the Project's purpose and need.

1.4 MINIMIZATION MEASURES AND MITIGATION MEASURES

The Danskammer Energy Center is being proposed to meet the immediate and future demand for electric power in the growing NYISO energy market. The resulting availability of efficient and cleaner natural gas electric power to customers in the region represents an important regional benefit, since the increased availability of natural gas fired state of the art electric generation will reduce reliance on other fuels, such as oil, that are used in the region and that have intrinsically higher CO_2 emissions per kilowatt-hour.

Pursuant to USEPA regulations, a control technology analysis was conducted for greenhouse gas emissions, with CO_2 as the focus pollutant. As demonstrated by this analysis, there are no combined cycle power plants currently utilizing carbon capture and sequestration (CCS), and although theoretically feasible, this technology is not commercially available. In addition, 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. As such, CCS was not considered a viable control option. Rather, installation of high efficiency, state-of-the-art, combustion turbine technology combusting primarily commercially available, pipeline quality natural gas in the turbine, was determined to be reflective of best available control technology. CO_2 permit levels proposed by the Project are among the lowest levels ever issued for a power plant in the U.S.

1.4.1 DISPLACEMENT OF REGIONAL EMISSIONS

While the proposed Project will result in emissions of GHGs, its operation will displace the operation of older, less efficient units that are currently in the electrical grid. An analysis was conducted in Exhibit 8 – Electric System Production Modeling, to model the impacts of the proposed repowering of the existing Danskammer Generating Station Site with the Danskammer Energy Center on the NYISO power system.

The analysis used the ABB PROMOD IV production cost modeling software to simulate the impacts of the Danskammer Energy Center in calendar year 2024. PROMOD is a production cost optimization model capable of simulating wholesale generation and transmission systems subject to operating unit characteristics, transmission constraints, and unit commitment/dispatch constraints. The NYISO controls the supply of electricity in New York State by dispatching (turning on and off) power plants that are connected to the grid as well as the import and export of electricity to and from adjoining grids. Generally, plants are dispatched on the basis of their marginal cost (i.e., lower cost units are called upon to run before more expensive units). The model considers generating unit characteristics, forced outages, transmission topology and constraints, and market system operations to simulate security-constrained economic dispatch of generating units. Additionally, the model uses load and fuel price forecasts using independent projections of electricity demand and fuel price projections as documented Exhibit 8.

The dispatch study identified the resultant displacement of emissions by unit for the NYISO grid and for the region. The study analyzed units within the NYISO, and included connections with New England (ISO-NE), Pennsylvania Jersey Maryland (PJM) and Ontario wholesale power markets. The modeling study detailed in Exhibit 8, simulated the following:

- Operation of the electric grid;
- Historical diurnal, day of the week, and seasonal patterns;
- Future load demand forecasts; and
- Specific emissions data for each unit for CO_2, NO_x and SO_2.

The modeling demonstrated that the energy generated by the Danskammer Energy Center would primarily displace electricity that would have been generated by less efficient oil, gas, and coal fired power plants. The results of the analysis demonstrate that the Project will decrease the cost of electricity in the region and reduce emissions of air pollutants by reducing the frequency that older, less efficient and higher emitting units are called upon to supply electricity to the grid.

Table 17-2-6 presents the impact of the Project on emissions in New York State and the Northeast Region of the U.S. Due to the interconnected nature of the NYISO grid and neighboring markets (PJM, ISO-NE and Ontario), the addition of the Project in NYISO impacts generation in other regions. Regional power sector emissions of NO_x, SO_2 and CO_2 decreased when the Danskammer Energy Center is in operation.

Operation of the Danskammer Energy Center resulted in an average annual CO_2 emission reduction across NYISO, PJM, Ontario and New England of 332,825 tons per year. In addition, although not considered GHGs, the analysis demonstrated that there will be substantial regional and statewide reductions of NO_x and SO_2 emissions. As presented in Table 17-2-6, the displacement of electricity produced by existing facilities with electricity produced by the Danskammer Energy Center will result in a significant benefit in GHG and other pollutant emissions. Thus, the Danskammer Energy Center will lower the global GHG emissions while also improving the air quality within New York State and the region.

Table 17-2-6
Emissions Summary

Region	Pollutant Emissions (Tons per Year)	Case without Danskammer Energy Center	Case with Danskammer Energy Center	Annual Change in Emissions
New York - NYISO	**NOx**	7,540	7,298	(242)
	SO_2	1,387	1,227	(161)
	CO_2	26,832,605	27,154,390	321,786
Northeast – NYISO, PJM, ISO-NE, Ontario	**NOx**	229,696	229,233	(463)
	SO_2	293,487	293,050	(437)
	CO_2	469,985,745	469,652,920	(332,825)

As detailed in Exhibit 10 - Consistency with Energy Planning Objectives, the Project may have the effect of displacing generation and greenhouse gas emissions from other power plants located both inside and outside of New York. Because the warming effects of greenhouse gases are global in nature and do not depend on the location of the emissions, New York's net imports of electricity from other regions also contribute to its climate footprint. This concept is detailed in the recently approved New York State bill *New York State Climate Leadership and Community Protection Act* (New York Legislature Bill S6599, 2019) (2019 New York Climate Act). The 2019 New York Climate Act sets greenhouse gas emission level limits to 60% of 1990 emissions by 2030 and 15% of 1990 emissions by 2050. The 2019 New York Climate Act includes out of state generation sources within the definition of statewide greenhouse gas emissions, defined as:

The total annual emissions of greenhouse gases produced within the state from anthropogenic sources and greenhouse gases produced outside of the state that are associated with the generation of electricity imported into the state and the extraction and transmission of fossil fuels imported into the state.

To the extent that the Danskammer Energy Center also displaces out-of-state generation by reducing net imports of electricity, the Project will contribute to the goal of reducing New York's overall energy sector GHG emissions as contained in the 2019 New York Climate Act.

1.5 REFERENCES

NYSDEC (2009). *Draft Commissioner's Policy - Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements*. July 15, 2009

NYISO (2019). *Power Trends 2019*. May, 2019

New York State Legislature (2019). *New York State Climate Leadership and Community Protection Act*. July, 2009

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Vineyard Wind (2018). *Construction and Operations Plan – Volume 1*. March, 2018

APPENDIX 17-3

OFFSITE CONSEQUENCE ANALYSIS FOR AQUEOUS AMMONIA

APPENDIX 17-3

OFFSITE CONSEQUENCE ANALYSIS FOR AQUEOUS AMMONIA

ASSESSMENT OF ACCIDENTAL AMMONIA RELEASE

Aqueous ammonia will be used as the reducing agent in the Project's selective catalytic reduction (SCR) system for controlling NO_x emissions from the combustion turbine. The oxides of nitrogen (NO_x) reduction achieved by the SCR system is affected by the ratio of ammonia (NH_3) to NO_x. Because of the need for a constant supply, aqueous ammonia (a mixture containing less than 19 percent by weight ammonia in water) utilized for the combined cycle combustion turbine will be stored on-Site in a single storage tank, with a capacity of up to 35,000 gallons. The tank will be designed in accordance with nationally recognized standards and other applicable regulations. Due to the dilute concentration of the aqueous ammonia (less than 19%), the Project's ammonia solution is not subject to the U.S. EPA Risk Management Program (RMP) for hazardous materials (40 CFR Part 68). However, to ensure the health and safety of the community surrounding the proposed Project, the potential for off-Site impacts resulting from a worst-case ammonia release scenario was assessed.

The proposed ammonia storage tank will be installed with an impervious, secondary containment area below and around the tank that has sufficient volume to contain 110% of the liquid from the tank and minimizes the exposed area while surrounding the tank. The proposed sump or containment area for the ammonia tank will have a liquid surface area of approximately 1,200 square feet.

Accidental Release Modeling

In order to assess the potential for off-Site impacts resulting from a worst-case release scenario (i.e., a rupture of the tank walls), an evaluation of this unlikely event was performed using the protocols established in U.S. EPA's Risk Management Program regulations (40 CFR Part 68). While the Project's use of 19 percent aqueous ammonia is not subject to these regulations due to its dilute concentration, the protocol provides a conservative approach to estimating the potential for off-Site impacts from releases of hazardous substances.

A determination of the potential for an off-Site impact from an accidental worst-case ammonia release scenario was conducted using emission estimates based on U.S. EPA's *Risk Management Program Guidance for Offsite Consequence Analysis* (OCA) (U.S. EPA, March 2009) developed by U.S. EPA as part of the 1990 Clean Air Act Amendments (CAAA) Title III Risk Management Program. The first step in this analysis is to determine a release rate (QR) in pounds per minute. Section 3.3 of the referenced U.S. EPA guidance specifies a method for analyzing releases of common water solutions such as aqueous ammonia. In this analysis, the use of passive and active mitigation factors (i.e., secondary containment area, sump pit baffle balls, and/or a water spray system) is allowed and used in calculating QR.

The guidance treats water solutions, such as aqueous ammonia, as a liquid release (OCA Guidance Section 3.2.3 for liquids) and first requires the calculation of a maximum pool area without the benefit of passive mitigation:

$A = QS \times DF$ OCA Equation 3-6

where:

A = Maximum Area of Pool (square feet);
QS = Quantity Released (pounds);
DF = Density Factor, 0.53 ft^2/lb per Exhibit B-3 of the OCA guidance for 20% ammonia.

The specific gravity of 19% ammonia is 0.926 (*Perry's Chemical Engineers Handbook: Seventh Edition*) (Perry's) yielding a density of 7.72 lb/gal. Therefore, the "mass released" (QS) from the 35,000-gallon ammonia storage vessel is calculated as follows:

QS = (35,000 gallons) x (7.72 pounds/gallon) = 270,200 lbs

The maximum area of the pool without spill containment, assuming a depth of one centimeter per guidance, is:

A = *QS* x *DF* = 143,206 square feet

The evaporative surface area of the containment area is calculated to be 1,206 square feet. The smaller of the two areas (i.e., 143,206 or 1,206 square feet) is used in determining the release rate (QR). Therefore, the available evaporative surface area of the diked containment area is smaller than the pool area, and is used to determine QR. Per the U.S. EPA OCA method, the following equation is used to obtain the evaporation rate in the worst-case confined spill scenario:

$QR = 1.4 \times LFA \times A$ OCA equation 3-7

where:

QR = Release rate (pounds per minute);
1.4 = Wind speed factor = $1.5^{0.78}$, where 1.5 meters per second is the wind speed for the worst case;
LFA = Liquid Factor Ambient (0.015 for 20% ammonia per Exhibit B-3);
A = Area (1,206 square feet);

therefore: *QR* = 25.33 pounds per minute for the combined cycle tank

Note that the Project will utilize 19% ammonia, and the use of 20% ammonia has been conservatively assumed for the purpose of this analysis. The Project will utilize a sump pit with baffle balls, a continuous water spray system, or other equivalent control methods to mitigate an accidental release with control efficiencies of at least 90%.

The potential worst-case release impact distance was calculated using the recommended Clean Air Act 112(r) protocols by U.S. EPA. The analysis was conducted assuming a wind speed of 1.5 m/s, F-stability (highly stable atmosphere), and a tank with a secondary containment area below and around the tank (i.e., sump area) with baffle balls or an equivalent control method to reduce the exposed surface area of the liquid in the event of a spill. Ammonia is considered neutrally buoyant with a prescribed toxic impact level of 150 ppm. The toxic impact value is based on the existing short-term exposure value from the American Industrial Hygiene Association Emergency Response Planning Guidelines Level 2 (EPRG-2). This value represents the maximum airborne concentration below which nearly all individuals could be exposed for up to an hour without experiencing or developing irreversible or other serious adverse health effects.

To predict the potential worst-case impact distance, the U.S. EPA-approved *Areal Locations of Hazardous Atmospheres* (ALOHA) model was used. This accidental release model was developed by NOAA (National Oceanic and Atmospheric Administration) and is routinely utilized by first responders in predicting impact areas associated with hazardous material releases.

ALOHA is a computer program that uses information provided by its operator and physical property data from its extensive chemical library to determine how a hazardous gas cloud might disperse in the atmosphere after an accidental chemical release. ALOHA can estimate rates of chemical release from broken gas pipes, leaking tanks, and evaporating puddles, and can model the dispersion of both neutrally-buoyant and heavier-than-air gases. ALOHA originated as an in-house tool to aid in emergency response. It was originally based on a simple model - a continuous point source with a Gaussian plume distribution. It has evolved over the years into a tool used for emergency response, planning, training, and academic purposes. It is distributed worldwide to thousands of users in government and industry.

For neutrally buoyant aqueous ammonia vapors, and utilizing a 10-minute release duration per guidance and urban conditions, the ALOHA results indicate that ground level concentrations never exceed the ERPG-2 concentration of 150 ppm at the nearest residential locations. Therefore, the defined worst-case accidental release scenario will not result in an exceedance of the ERPG-2 guideline (150 ppm) for ammonia.

APPENDIX 17-4

CONSTRUCTION PHASE AIR EMISSIONS

Table 17-4-1
Detailed Construction Period Emission Caclulations

Danskammer Energy Center
Summary of Construction Air Emissions
Emission Estimates in Tons per Year

Summary by Activity

Activity	2021 Emission Totals (Tons)								2022 Emission Totals (Tons)							
	CO_2	CO	NOx	PM_{10}	PM_{25}	SO_2	VOC	HAPS	CO_2	CO	NOx	PM_{10}	PM_{25}	SO_2	VOC	HAPS
Construction Vehicles	7,398.3	26.5	20.5	1.5	1.27	0.045	2.6	0.19	7,254.6	28.7	22.0	1.6	1.42	0.044	2.8	0.19
Worker Commuting	1,912.5	15.2	1.31	0.24	0.053	0.0127	0.34	0.37	2,332.9	18.5	1.6	0.3	0.06	0.016	0.4	0.45
Fugitive Dust Generation	0.0	0.0	0.0	20.9	2.09	0.000	0.0	0.00	0.0	0.0	0.0	20.9	2.09	0.000	0.0	0.00
TOTALS	**9,310.7**	**41.7**	**21.8**	**22.6**	**3.41**	**0.057**	**2.9**	**0.56**	**9,587.5**	**47.2**	**23.6**	**22.8**	**3.57**	**0.060**	**3.2**	**0.63**

Activity	2023 Emission Totals (Tons)							
	CO_2	CO	NOx	PM_{10}	PM_{25}	SO_2	VOC	HAPS
Construction Vehicles	2,250.5	18.6	8.7	0.76	0.60	0.016	1.1	0.07
Worker Commuting	701.0	5.6	0.5	0.09	0.02	0.005	0.1	0.13
Fugitive Dust Generation	0.0	0.0	0.0	15.69	1.57	0.000	0.0	0.00
TOTALS	**2,951.6**	**24.1**	**9.2**	**16.54**	**2.19**	**0.021**	**1.2**	**0.20**

Table 17-4-2

Danskammer Energy Center Construction Equipment Air Emissions - 2021-2022

On-site Road and Nonroad Construction Equipment	Equipment Engine HP	Fuel		SCC	Number of Operating Hours		NONROAD Emission Factor (g/hp-hr)								Engine Load Factor
		Diesel	Gasoline		2021	2022	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP	
Nonroad construction equipment															
Concrete Pump	350	x		2270006010	1,178	74	530.31	0.92	3.13	0.14	0.14	0.003	0.23	0.01	0.43
Water Truck	300	x		2270002051	4,310	4,786	536.40	0.22	0.66	0.03	0.03	0.003	0.13	0.01	0.59
Excavator	250	x		2270002036	21,329	16,345	536.39	0.19	0.67	0.03	0.03	0.003	0.14	0.01	0.59
Grader	200	x		2270002048	4,608	4,608	536.38	0.23	0.80	0.03	0.03	0.003	0.14	0.01	0.59
Cranes	300	x		2270002045	12,548	17,318	530.52	0.54	2.06	0.09	0.09	0.003	0.16	0.01	0.43
Tractor/Loader/Backhoe	135	x		2270002066	17,699	19,243	625.01	1.80	3.05	0.37	0.37	0.004	0.48	0.01	0.21
Bull Dozer	300	x		2270002069	9,216	9,216	536.36	0.59	1.45	0.09	0.09	0.003	0.15	0.01	0.59
Welding Machine	50	x		2270006025	13,602	17,021	693.46	4.40	4.67	0.62	0.62	0.004	0.79	0.01	0.21
Plate Compactor	7.5		x	2265002009	3,720	3,008	1046.72	276.76	2.06	0.11	0.11	0.019	4.95	0.23	0.55
Light Plant	25		x	2265002027	2,586	2,872	1046.44	277.38	2.06	0.12	0.12	0.019	5.02	0.23	0.72
Aerial Lift	75	x		2270003010	4,686	23,663	693.34	4.69	4.11	0.65	0.65	0.004	0.83	0.01	0.21
Air Compressor	50	x		2270006015	7,722	11,274	589.69	1.38	3.43	0.17	0.17	0.003	0.21	0.01	0.43
Forklift	40	x		2270003020	8,790	16,067	595.73	0.26	3.02	0.02	0.02	0.003	0.13	0.01	0.59
Vibratory Roller	125	x		2270002021	11,531	692	536.26	0.67	1.59	0.16	0.16	0.003	0.18	0.01	0.59
On-road construction vehicles					Number of Vehicle Miles Traveled		MOVES Emission Factors (g/VMT)								
Light duty gasoline vehicles (< 6,000 lb GVW)	150		x		57,600	57,600	443.52	3.52	0.30	0.06	0.01	0.00	0.08	0.08	
Heavy duty diesel vehicles (>6,000 lb GVW)	250	x			57,600	57,600	1994.98	1.71	6.47	0.64	0.34	0.02	0.39	0.05	
Deliveries / Removals			Round Trip Distance (mi)		Number of Vehicle Miles Traveled		MOVES Emission Factors (g/VMT)								
					2021	2022	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP	
On-road delivery and removal vehicles															
Heavy duty diesel vehicles (>6,000 lb GVW)			100		576,000	576,000	1994.98	1.71	6.47	0.64	0.34	0.02	0.39	0.05	
Construction Areas					Area under Construction (acre-months)		Western Regional Air Partnership (WRAP) Fugitive Dust Handbook Emission Factor (tons/acre-month)								
					2021	2022	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP	
Area under construction (Exposed Soils)					190	190	NA	NA	NA	0.11	0.011	NA	NA	NA	
Construction Workers					Number of Vehicle Miles Traveled		MOVES Emission Factors (g/VMT)								
					2021	2022	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP	
Worker Commutes					3,911,837	4,771,812	443.52	3.52	0.30	0.06	0.01	0.00	0.08	0.08	

On-site Road and Nonroad Construction Equipment	2021 Emission Totals (Tons)								2022 Emission Totals (Tons)							
	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAPs	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAPs
Nonroad construction equipment																
Concrete Pump	103.64	0.18	0.61	0.028	0.028	0.0006	0.045	0.002	6.52	0.01	0.04	0.002	0.002	0.0000	0.003	0.000
Water Truck	451.03	0.19	0.56	0.022	0.022	0.0022	0.113	0.010	500.92	0.21	0.62	0.025	0.025	0.0025	0.126	0.011
Excavator	1860.09	0.67	2.31	0.093	0.093	0.0092	0.473	0.043	1425.44	0.51	1.77	0.071	0.071	0.0070	0.363	0.033
Grader	321.49	0.14	0.48	0.021	0.021	0.0016	0.084	0.007	321.49	0.14	0.48	0.021	0.021	0.0016	0.084	0.007
Cranes	946.61	0.97	3.68	0.155	0.155	0.0054	0.293	0.022	1306.39	1.33	5.07	0.214	0.214	0.0074	0.404	0.030
Tractor/Loader/Backhoe	345.69	0.99	1.69	0.205	0.205	0.0020	0.265	0.007	375.84	1.08	1.83	0.223	0.223	0.0022	0.288	0.007
Bull Dozer	964.42	1.06	2.60	0.162	0.162	0.0053	0.265	0.022	964.42	1.06	2.60	0.162	0.162	0.0053	0.265	0.022
Welding Machine	109.17	0.69	0.74	0.098	0.098	0.0007	0.125	0.002	136.61	0.87	0.92	0.123	0.123	0.0008	0.156	0.002
Plate Compactor	17.71	4.68	0.03	0.002	0.002	0.0003	0.084	0.004	14.32	3.79	0.03	0.002	0.002	0.0003	0.068	0.003
Light Plant	53.69	14.23	0.11	0.006	0.006	0.0010	0.257	0.012	59.63	15.81	0.12	0.007	0.007	0.0011	0.286	0.013
Aerial Lift	56.40	0.38	0.33	0.053	0.053	0.0003	0.068	0.001	284.84	1.93	1.69	0.268	0.268	0.0017	0.343	0.005
Air Compressor	107.92	0.25	0.63	0.031	0.031	0.0006	0.039	0.002	157.56	0.37	0.92	0.046	0.046	0.0009	0.056	0.003
Forklift	136.22	0.06	0.69	0.005	0.005	0.0007	0.030	0.003	248.99	0.11	1.26	0.010	0.010	0.0012	0.055	0.005
Vibratory Roller	502.70	0.63	1.50	0.147	0.147	0.0028	0.166	0.012	30.15	0.04	0.09	0.009	0.009	0.0002	0.010	0.001
On-road construction vehicles																
Light duty gasoline vehicles (< 6,000 lb GVW)	28.16	0.22	0.02	0.004	0.001	0.0002	0.00	0.005	28.16	0.22	0.02	0.004	0.001	0.0002	0.00	0.005
Heavy duty diesel vehicles (>6,000 lb GVW)	126.67	0.11	0.41	0.041	0.022	0.0011	0.02	0.003	126.67	0.11	0.41	0.041	0.022	0.0011	0.02	0.003
Deliveries / Removals	2021 Emission Totals (Tons)								2022 Emission Totals (Tons)							
	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP
On-road delivery and removal vehicles																
Heavy duty diesel vehicles (>6,000 lb GVW)	1266.65	1.08	4.11	0.406	0.215	0.0108	0.245	0.032	1266.65	1.08	4.11	0.406	0.215	0.0108	0.245	0.032
Construction Areas	2021 Emission Totals (Tons)								2022 Emission Totals (Tons)							
	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP
Area under construction (Exposed Soils)	0.00	0.00	0.00	20.92	2.09	0.00	0.00	0.00	0.00	0.00	0.00	20.92	2.09	0.00	0.00	0.000
Construction Workers	2021 Emission Totals (Tons)								2022 Emission Totals (Tons)							
	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP
Worker Commutes	1912.47	15.17	1.31	0.24	0.05	0.01	0.34	0.37	2,332.90	18.51	1.60	0.297	0.064	0.016	0.41	0.446

Table 17-4-3

Danskammer Energy Center Construction Equipment Air Emissions - 2023

On-site Road and Nonroad Construction Equipment	Equipment Engine HP	Fuel		SCC	Number of Operating Hours	NONROAD Emission Factor (g/hp-hr)								Engine Load Factor	2023 Emission Totals (Tons)							
		Diesel	Gasoline		2023	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP		CO2	CO	NOx	PM10	PM25	SO2	VOC	HAPs
Nonroad construction equipment																						
Concrete Pump	350	x		2270006010	0	530.31	0.92	3.13	0.14	0.14	0.003	0.23	0.01	0.43	0.00	0.00	0.00	0.000	0.000	0.0000	0.000	0.000
Water Truck	300	x		2270002051	360	536.40	0.22	0.66	0.03	0.03	0.003	0.13	0.01	0.59	37.67	0.02	0.05	0.002	0.002	0.0002	0.009	0.001
Excavator	250	x		2270002036	612	536.39	0.19	0.67	0.03	0.03	0.003	0.14	0.01	0.59	53.36	0.02	0.07	0.003	0.003	0.0003	0.014	0.001
Grader	200	x		2270002048	0	536.38	0.23	0.80	0.03	0.03	0.003	0.14	0.01	0.59	0.00	0.00	0.00	0.000	0.000	0.0000	0.000	0.000
Cranes	300	x		2270002045	5,804	530.52	0.54	2.06	0.09	0.09	0.003	0.16	0.01	0.43	437.85	0.45	1.70	0.072	0.072	0.0025	0.135	0.010
Tractor/Loader/Backhoe	135	x		2270002066	7,653	625.01	1.80	3.05	0.37	0.37	0.004	0.48	0.01	0.21	149.48	0.43	0.73	0.089	0.089	0.0009	0.115	0.003
Bull Dozer	300	x		2270002069	0	536.36	0.59	1.45	0.09	0.09	0.003	0.15	0.01	0.59	0.00	0.00	0.00	0.000	0.000	0.0000	0.000	0.000
Welding Machine	50	x		2270006025	12,501	693.46	4.40	4.67	0.62	0.62	0.004	0.79	0.01	0.21	100.34	0.64	0.68	0.090	0.090	0.0006	0.115	0.002
Plate Compactor	7.5		x	2265002009	0	1046.72	276.76	2.06	0.11	0.11	0.019	4.95	0.23	0.55	0.00	0.00	0.00	0.000	0.000	0.0000	0.000	0.000
Light Plant	25		x	2265002027	2,679	1046.44	277.38	2.06	0.12	0.12	0.019	5.02	0.23	0.72	55.62	14.74	0.11	0.006	0.006	0.0010	0.267	0.012
Aerial Lift	75	x		2270003010	11,475	693.34	4.69	4.11	0.65	0.65	0.004	0.83	0.01	0.21	138.12	0.93	0.82	0.130	0.130	0.0008	0.166	0.002
Air Compressor	50	x		2270006015	7,143	589.69	1.38	3.43	0.17	0.17	0.003	0.21	0.01	0.43	99.83	0.23	0.58	0.029	0.029	0.0006	0.036	0.002
Forklift	40	x		2270003020	7,237	595.73	0.26	3.02	0.02	0.02	0.003	0.13	0.01	0.59	112.15	0.05	0.57	0.004	0.004	0.0005	0.025	0.002
Vibratory Roller	125	x		2270002021	0	536.26	0.67	1.59	0.16	0.16	0.003	0.18	0.01	0.59	0.00	0.00	0.00	0.000	0.000	0.0000	0.000	0.000
On-road construction vehicles					Number of Vehicle Miles Traveled	MOVES Emission Factors (g/VMT)																
Light duty gasoline vehicles (< 6,000 lb GVW)	150		x		43,200	443.52	3.52	0.30	0.06	0.01	0.00	0.08	0.08		21.12	0.17	0.01	0.003	0.001	0.0001	0.00	0.004
Heavy duty diesel vehicles (>6,000 lb GVW)	250	x			43,200	1994.98	1.71	6.47	0.64	0.34	0.02	0.39	0.05		95.00	0.08	0.31	0.030	0.016	0.0008	0.02	0.002
Deliveries / Removals			Round Trip Distance (mi)		Number of Vehicle Miles Traveled	MOVES Emission Factors (g/VMT)									2023 Emission Totals (Tons)							
					2023	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP		CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP
On-road delivery and removal vehicles																						
Heavy duty diesel vehicles (>6,000 lb GVW)			100		432,000	1994.98	1.71	6.47	0.64	0.34	0.02	0.39	0.05		949.99	0.81	3.08	0.305	0.161	0.0081	0.184	0.024
Construction Areas					Area under Construction (acre-months)	Western Regional Air Partnership (WRAP) Fugitive Dust Handbook Emission Factor (tons/acre-month)									2023 Emission Totals (Tons)							
					2023	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP		CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP
Area under construction (Exposed Soils)					143	NA	NA	NA	0.11	0.011	NA	NA	NA		0.00	0.00	0.00	15.692	1.569	0.0000	0.000	0.000
Construction Workers					Number of Vehicle Miles Traveled	MOVES Emission Factors (g/VMT)									2023 Emission Totals (Tons)							
					2023	CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP		CO2	CO	NOx	PM10	PM25	SO2	VOC	HAP
Worker Commutes					1,433,946	443.52	3.52	0.30	0.06	0.01	0.00	0.08	0.08		701.04	5.56	0.48	0.09	0.02	0.00	0.12	0.13