



HIGH RIVER ENERGY CENTER

Case No. 17-F-0597

1001.17 Exhibit 17

Air Emissions

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Exhibit 17: Air Emissions

This Exhibit will track the requirements of proposed Stipulation 17, dated August 26, 2019, and therefore, the requirements of 16 NYCRR § 1001.17. This Exhibit contains a discussion of potential temporary impacts to ambient air quality resulting from the construction of the Project, typical of a commercial construction project. Such impacts could occur as a result of emissions from engine exhaust, from the generation of fugitive dust during earth moving activities, and travel on unpaved roads. There will be no back-up generator installed for operation of the Project. An identification of appropriate control and mitigation measures to minimize potential adverse impacts will be provided.

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

Federal Regulatory Requirements

Section 111 of the Clean Air Act (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 New Source Performance Standards (NSPS) and are found in Title 40 of the Code of Federal Regulations (40 CFR) Part 60. The NSPS are developed and implemented by the 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. There are no NSPS which apply to solar panels, as solar panels do not emit air pollutants or greenhouse gases (GHGs) while in operation.

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 National Ambient Air Quality Standards (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. NESHAPs are found in 40 CFR Part 61 and 63. There are no NESHAPs which apply to solar panels.

The Acid Rain Program (ARP) was established by Title IV of the 1990 Clean Air Act Amendments. It requires major emission reductions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x), the primary precursors of acid rain from the power sector. The SO₂ program sets a cap on the total amount of SO₂ 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 ARP will not apply to the Project because it will not burn fossil fuels or emit either SO_s or NO_x.

State Regulatory Requirements

(i) 2015 New York State Energy Plan (SEP)

The SEP, adopted by the New York State Energy Planning Board pursuant to New York State Energy Law § 6-104 in June 2015, provides a wide range of goals for New York's energy system (Senate Bill S6599). The SEP is based on five Guiding Principles: market transformation, community engagement, private sector investment, innovation and technology, and customer value and choice. The SEP, among other things, "sets out specific initiatives to increase renewables and... decrease GHG emissions" (SEP at 11). Its goals include attracting private investment in New York's energy sector and combating climate change. The SEP calls for reducing statewide GHG emissions 40% from 1990 levels and generating 50% of the State's electricity from renewable resources by 2030 (SEP at 112). According to the SEP, large-scale renewables have several immediate benefits for the State: "economic development and jobs for communities across the State, greater stability in customer bills, [and] cleaner air..." (SEP at 71).

(ii) Clean Energy Standard (CES)

In August 2016, the New York State Public Service Commission (NYPSC) adopted the CES to ensure that New York will achieve the SEP's 50% by 2030 goal (NYPSC, 2016). The chief focus of the CES initiative is on building new renewable resource power generation facilities (CES at 78) (NYPSC, 2016). The CES also sought to reduce the "total emissions of air pollutants resulting from fossil fuel combustion" (CES at 3).

The CES employs two related mechanisms to reach the SEP's renewables goal. First, it requires load-serving entities (LSEs) to obtain an increasing percentage of their electricity needs from renewables. LSEs demonstrate compliance by purchasing renewable energy credits (RECs) from renewable resources (CES at 14). Second, to ensure that an increasing amount of RECs are available to LSEs, the CES authorizes the New York State Energy Research and Development Authority (NYSERDA) to procure RECs from renewables (CES at 16). Renewables sited within New York are eligible to sell RECs regardless of their location within the State (CES at 106).

The NYPSC's highest projection for the amount of utility-scale solar that would need to be installed to help reach the 50% renewables mandate was approximately 6,900 Megawatts (MW) (CES,

Appendix G at 17, 19). The NYPSC noted that even if 100% of those projects were sited on New York agricultural lands, only about 0.16% of such lands would be converted to utility-scale solar (CES, Appendix G at 20).

(iii) New York State Climate Leadership and Community Protection Act

Recently, the New York State legislature passed the Climate Leadership and Community Protection Act (CL&CPA) was passed and signed into law (Senate Bill S6599). The CL&CPA increases the State's renewable energy penetration goal to 70% by 2030, with 6 gigawatts of solar generation by 2025. The CL&CPA ultimately requires 100% carbon-free electricity by 2040.

(iv) Title V

The New York State Department of Environmental Conservation (NYSDEC) Division of Air Resources (DAR) administers an air permitting program under New York State statutes and regulations (most notably, 6 NYCRR Part 201) and the CAA. Prior to commencing construction, a major stationary source (i.e., facility whose potential air pollution emissions exceeds certain thresholds) must obtain a Title V Facility Permit, which contains all regulatory requirements applicable to all sources at the facility. Solar arrays generate electricity without emitting air pollutants. Therefore, the Project will not require a Title V Facility Permit.

Local Regulatory Requirements

There are no applicable local regulatory requirements in the Town of Florida or Montgomery County pertaining to air emissions.

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

The CAA requires that the EPA set NAAQS for pollutants considered harmful to public health and the environment. NAAQS apply to criteria pollutants [i.e., particulate matter with a diameter ≤ 10 microns (PM_{10}), particulate matter with a diameter ≤ 2.5 microns ($PM_{2.5}$), nitrogen dioxide (NO_2), SO_2 , carbon monoxide (CO), ozone (O_3), and lead (Pb)]. Each NAAQS is expressed in terms of a pollutant concentration level and an associated averaging period.

NYSDEC DAR monitors criteria pollutant and air toxics concentrations at more than 50 sites across New York State. These sites are part of the federally-mandated National Air Monitoring Stations Network and the State and Local Air Monitoring Stations Network. Various private industrial facilities and utilities also monitor air pollution levels. The DAR publishes an annual

summary of air quality data for the State. The most recent summary available is the New York State Air Quality Report for 2018 (NYSDEC, 2018). This report summarizes the ambient air quality levels and trends by NYSDEC region. The Project would be located in NYSDEC Region 4¹, where there are two sites that monitor for the following pollutants:

- Loudonville in Albany County (Site Number: 0101-33), which reports ambient air concentration data for SO₂, PM_{2.5}, CO, and O₃.
- Albany County HD in Albany County (Site Number: 0101-13), which reports ambient air concentration data for PM_{2.5}.

In 2018, the ambient air quality data collected at the Region 4 monitoring stations were within the acceptable levels defined by the NAAQS for the monitored pollutants (NYSDEC, 2018).

No additional local air monitoring data is available to further define air quality in the immediate vicinity of the Project.

17(c) Emissions by Combustion Sources at the Facility

The Project's solar arrays would generate electricity without combusting fuel. Therefore, a table indicating the rates and amount of emissions as specified by 16 NYCRR § 1001.17 (c) is not applicable to the Project and is not included in this Exhibit.

17(d) Assessment of the Potential Impacts to Ambient Air Quality That May Result from Pollutant Emissions from the Facility

The Project's solar arrays would generate electricity without releasing pollutants into the ambient air. Therefore, operation of the Project would not increase the concentrations of air pollutants in the ambient air or contribute to an exceedance of an air quality standard. The anticipated impacts to air quality resulting from Project construction and operation are discussed below.

Construction Related Impacts

Temporary, local, and minor impacts to air quality could result from the operation of construction equipment and vehicles typical of construction projects. Impacts from fugitive dust created during site preparation and travel on newly created access roads could occur. Diesel generators may provide temporary electrical service to the construction trailers and during solar panel

¹ Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady, and Schoharie Counties

commissioning. Construction trailers would require only modest amount of electrical power for lighting, heating, cooling, computers, etc. Commissioning activities that require the use of generators typically occur for limited duration and during daylight hours. Additionally, engine exhaust emissions from construction vehicles will occur. Fugitive dust and exhaust emissions would be at low levels and for limited durations and would 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 in the Exhibit 12.

It is anticipated that none of these sources of temporary emissions would require an air permit or registration. The construction contractor will be instructed not to leave generators idling when they are not actively providing power. In addition, mufflers will be maintained. As a result, adverse impacts to air quality are not anticipated.

Operation Related Impacts

Operation of the Project would not generate vented or fugitive air emissions. When operating, the Project would instead displace air emissions from fossil fuel-fired power plants. See Exhibit 8 for the analysis required by the Article 10 regulations.

To supplement that analysis, Integrated Planning Model (IPM) v.5.15 (EPA, 2015a), provides forecasted emissions and generation data through 2050. Using an in-house program, this data was used to analyze the New York Independent System Operator (NYISO) through 2050. EPA's model predicts that all oil and coal units are retired by the date when the Project enters service. Because the calculated emissions rates are based solely on a natural gas system, the total displaced emissions are likely more conservative than reality. The average emission rates project for these New York State power plants in 2023 are equal to the following².

- 1,124 pounds per megawatt hour (lb/MWh) of carbon dioxide equivalents (CO₂e)
- 1.914 lb/MWh of NO_x
- 5.60E-04 lb/MWh of SO₂

² EPA Integrated Planning Model v.5.15 was used to calculate the project emissions displacement from 2023 to 2050. In the model, the Region Group utilized was NYISO, and the Fuel Type utilized was Natural Gas. Only sources with calculated net capacity factors between 5% and 75% were included in the analysis.

Using these emission rates, a maximum generating capacity of 90 megawatts (MW), and an annual capacity factor of approximately 20 percent (20%), Table 17-1 provides a timeline of projected emissions displaced by the Facility from 2023 to 2050³.

**Table 17-1. High River Energy Center Displaced Emissions Summary
from 2023 to 2050**

Year	CO ₂ (lb/MWh)	NO _x (lb/MWh)	SO ₂ (lb/MWh)	CO ₂ (tons)	NO _x (tons)	SO ₂ (tons)
2023	1,124	1.91	5.60E-04	88,616	150.6	0.0442
2025	1,120	1.90	5.35E-04	88,317	149.8	0.0422
2030	1,138	1.68	3.73E-04	89,709	132.5	0.0294
2040	1,101	2.07	4.46E-04	86,840	163.2	0.0352
2050	1,074	1.97	7.15E-04	84,658	155.3	0.0564

The emissions displaced will vary slightly on an annual basis depending on the average emission rates from the electric grid and the actual capacity factor of the Project. The projected annual emission displacement is based on the calculation of emissions data from the EPA Integrated Planning Model v.5.15. The displacement of GHG emissions from fossil fuel power plants is an important goal of New York State.

On December 16, 2011, the EPA issued the final rule regulating mercury (Hg) and other toxic metal emissions from Electric Generating Units (EGUs). The rule and subsequent amendments are codified at Title 40 CFR Subpart UUUUU. This subpart established emission limits for new and existing EGUs that fire either coal or oil-derived fuels. Limits are not prescribed for EGUs that fire natural gas because they do not emit toxic metals. EPA's IPM model predicts that all oil and coal EGUs will be retired prior to the date on which High River Energy Center commences commercial operation. Hence, for the purpose of this Exhibit, it is assumed that operation of the Project would not result in displacement of Pb or Hg emissions.

The expected displaced emissions can be compared to the emissions typical of passenger cars. Based on a Motor Vehicle Emission Simulator (MOVES) 2014b (EPA, 2015b) computer model simulation, the estimated CO₂e and NO_x emission rates for passenger cars driven in New York

³ For example: (90 MW x 8,760 h x 0.2 x 1,1244 lb CO₂e/MWh)/2,000 lb/ton = 88,616 tons CO₂e

State from 2023 to 2050 are summarized in Table 2. Note that the emissions profile (i.e., the amount of one pollutant emitted relative to the emissions of other pollutants) of passenger cars is different than the emissions profile of non-baseload power plants.

The Federal Highway Administration (FHWA) reports that an average motor vehicle in New York State travels 12,610 miles per year (USDOT, 2000). Assuming that the average distance traveled per year does not change significantly, it is estimated that operation of the facility in 2023 would displace CO₂e and NO_x emissions from the operation of approximately 22,559 and 177,014 passenger cars⁴ respectively. Estimates for additional years are provided in Table 17-2.

Table 17-2. High River Energy Center Displaced Vehicles Summary 2023 to 2050

Year	CO ₂ (tons)	NO _x (tons)	CO ₂ (g/VMT)*	NO _x (g/VMT)*	CO ₂ Vehicle Offset†	NO _x Vehicle Offset†
2023	88,616	150.6	282.6	0.0612	22,559	177,014
2025	88,317	149.8	252.7	0.0477	25,143	225,923
2030	89,709	132.5	214.3	0.0305	30,116	312,417
2040	86,840	163.2	187.7	0.0191	33,284	614,698
2050	84,658	155.3	186.0	0.0181	32,744	617,323

* gram per vehicle mile traveled.

† Number of passenger cars which are predicted to emit CO₂ or NO_x equivalent to the emissions displaced by operation of the Facility, assuming average passenger car travels 12,610 miles per year.

In New York State in 2017, the average residential customer consumed 6.9 megawatt-hours (MWh) of electricity. During the ten-year period 2008 – 2017, transmission and distribution losses in New York State averaged 5.24% (EIA, 2018). Using the maximum Project generating capability of 90 MW, and an annual capacity factor of approximately 20 percent (20%), the Facility would be expected to supply the annual electrical power needs of approximately 21,655 households.

17(e) Offsite Consequence Analysis for Ammonia Stored On-Site

Ammonia will not be stored or used on-site during Facility construction or operation.

⁴ For example, (88,616 ton/year CO₂e x 2,000 lb/ton x 453.59 gram/lb) / (12,610 miles/car-year x 282.6 gram/mile) = 22,559 cars

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