



Cassadaga Wind Project

Case No. 14-F-0490

1001.17 Exhibit 17

Air Emissions

EXHIBIT 17 AIR EMISSIONS

Global climate change has been recognized as one of the most important environmental challenges of our time (NYSCAC, 2010; NYSDEC, 2009, 2010). There is scientific consensus that human activity is increasing the concentration of greenhouse gases (GHGs) in the atmosphere and that this, in turn, is leading to serious climate change. By its nature, climate change will continue to impact the environment and natural resources of the State of New York (NYSDEC, 2009). Historically, New York State has been proactive in establishing goals to reduce GHG emissions. Most recently, in the 2015 State Energy Plan, New York has committed to achieving a 40% reduction in GHG emissions from 1990 levels by 2030 and reducing total carbon emissions 80% by 2050. In addition, the State Energy Plan calls for 50% of generation of electricity from renewable energy sources by 2030 (New York State Energy Planning Board, 2015). Fuel combustion accounts for approximately 89% of total GHG emissions in New York State (NYSDEC, 2009).

(a) Compliance with Applicable Federal, State, and Local Regulatory Requirements

In accordance with Section 111 of the Clean Air Act Extension of 1970, the U.S. Environmental Protection Agency (EPA) established New Source Performance Standards (NSPSs) to regulate emissions of air pollutants from new stationary sources. These standards apply to a variety of facilities including landfills, boilers, cement plants, and electric generating units fired by fossil fuels. The NYSDEC Division of Air Resources administers an air permitting program as required by the Clean Air Act and 6 NYCRR Part 201. The two most common types of permits for air contamination sources are State facility and Title V facility permits. Because wind turbines generate electricity without releasing pollutants into the atmosphere, the proposed Facility will not be subject to NSPSs, and will not require air pollution control permits under Clean Air Act or New York State law or regulation.

The 1984 State Acid Deposition Control Act required the reduction of sulfur dioxide (SO₂) emissions from existing sources and nitrogen oxides (NO_x) emission controls on new sources in New York State. SO₂ and NO_x are the primary causes of acid rain. The Acid Rain Program was created under Title IV of the 1990 Clean Air Act Amendments, with the goal of reducing emissions of SO₂ and NO_x for the environmental and public health benefits. These regulations are also not applicable to the proposed Facility, since it will generate electricity without releasing SO₂ or NO_x.

There are no applicable local regulatory requirements pertaining to air emissions.

(b) Assessment of Existing Ambient Air Quality Levels and Trends in the Region

The NYSDEC Division of Air Resources publishes air quality data for New York State annually. The most recent summary of air quality data available for the state is the *New York State Air Quality Report for 2014* (NYSDEC, 2015). Included in this report are the most recent ambient air quality data, as well as long-term air quality trends derived from data that have been collected and compiled from numerous state and private (e.g., industrial, utility) monitoring stations across the state. These trends are assessed and reported by NYSDEC regions. The proposed Facility is located in NYSDEC Region 9, which encompasses Niagara, Erie, Wyoming, Allegany, Cattaraugus, and Chautauqua Counties. There are nine monitoring stations in Region 9, five in Erie County (Buffalo, Buffalo Near Road, Amherst, Grand Isle Blvd, and Brookside Terrace), and two each in Niagara (Middleport and Niagara Falls) and Chautauqua (Dunkirk and Westfield) Counties. Dunkirk and Westfield both monitor ozone (O3), SO2, and inhalable particulates (PM2.5); Niagara Falls monitors for SO2 and PM2.5; Middleport monitors for O3; Grand Isle Blvd and Brookside Terrace both monitor for SO2; Amherst monitors for O3 and nitrogen dioxide (NO2); Buffalo Near Road monitors for carbon monoxide (CO) and PM2.5; and Buffalo monitors for SO2, PM2.5, NO2, and CO.

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. In 2014, all Region 9 sampling points were within the acceptable levels established by the NAAQS for all tested parameters (NYSDEC, 2015). No local air monitoring data is available to further characterize air quality in the immediate vicinity of the proposed Facility.

(c) Emissions by Combustion Sources Table

Wind turbines generate electricity without combusting fuel or releasing pollutants into the atmosphere. Therefore, the table required by 1001.17(c) summarizing the rate and amount of emissions is not applicable to the proposed Facility and is not included in this Application.

(d) Potential Impacts to Ambient Air Quality

A discussion of the anticipated impacts to air quality expected to result from Facility construction and operation is provided below. However, as indicated above, wind turbines generate electricity without combusting fuel or releasing pollutants into the atmosphere. Therefore, the specific requirements of 1001.17(d) pertaining to pollutant emissions are not applicable to the proposed Facility and are not included in this Application.

Construction Related Impacts

During the site preparation and construction phases of the Facility, temporary minor adverse impacts to air quality could result from the operation of construction equipment and vehicles. Such impacts could occur as a result of emissions from engine exhaust and from the generation of fugitive dust during earth moving activities and travel on unpaved roads. The increased dust and exhaust emissions will not be of a magnitude or duration that would significantly impact local air quality. Any impacts from fugitive dust emissions from travel on unpaved roads are anticipated to be short-term and localized and will be corrected quickly using dust control measures. Please Exhibit 12 for additional information on potential dust-related impacts and control measures during construction.

In addition to emissions from construction vehicles and equipment, two temporary emissions sources that may result from Facility construction include on-site concrete batch plant and fuel-fired generators. Depending on the proximity of an acceptable ready-mix concrete plant, the Facility may require the use of an on-site concrete batch plant. If an on-site concrete batch plant is used, the Balance of Plant (BOP) contractor will be required to obtain any air quality/emissions permits for its operation. However, in the Applicant's experience the limited air emissions from a temporary concrete batch plant do not require an air quality/emission permit. Nevertheless, the BOP contractor will be obligated to limit the operation of the temporary concrete batch plant to the extent needed for construction and shall not allow the batch plant to remain operational/idling for any extended periods of time in order to minimize adverse impacts. Therefore, adverse impacts to air quality are not anticipated and additional control or mitigation measures are not required.

Fuel-fired generators may be used by the BOP contractor to provide temporary electrical service to the construction trailers that are typically located at the contractor staging/laydown yard. Diesel generators may also be used during turbine commissioning activities. Turbine commissioning activities that require the use of diesel generators typically span a period of only 2-3 months and only occur during daylight hours. Therefore, generator use for commissioning activities is considered very limited. In the Applicant's experience fuel-fired generators do not require any air emissions permits given their limited emissions. Cassadaga Wind will instruct the BOP contractor to not leave fuel fired generators idling when they are not in active use providing power to a source in order to minimize adverse impacts. Therefore, adverse impacts to air quality are not anticipated and additional control or mitigation measures are not required.

Operation-Related Impacts

The operation of this Facility is anticipated to have a positive impact on air quality by producing electricity with zero emissions (except for very small emissions from vehicles servicing the Facility). Electricity delivered to the grid from wind energy projects can off-set the generation of energy at existing conventional power plants. According to a 2008 U.S. Department of Energy National Renewable Energy Laboratory report, "Wind energy is a preferred power source

on an economic basis, because the operating costs to run the turbines are very low and there are no fuel costs. Thus, when the wind turbines produce power, this power source will displace generation at fossil fueled plants, which have higher operating and fuel costs." On a long-term basis, wind generated power also reduces the need to construct and operate new fossil fueled power plants (Jacobsen & High, 2008).

Natural gas is the most frequent marginal fuel unit in New York's power pool, or the one that is turned on or off as the load fluctuates (Patton et al., 2015). When the proposed Facility is generating power, electricity generation from natural gas would be reduced within the region, thereby eliminating the associated emissions.

The USEPA's Emissions and Generation Resource Integrated Database (EPA eGRID) provides comprehensive data on the environmental characteristics of almost all electric power generated in the United States. Data from eGRID are organized in to subregions, including the upstate New York subregion. Utilizing these data to calculate emissions offsets provides a region-specific analysis of environmental air-quality benefits that will result from Facility operation. According the 2012 eGRID data released in 2015, the five largest sources of electricity generation in upstate New York are: natural gas (30.4%), hydroelectric (29.4%), nuclear (28.9%), coal (5.5%), and wind (3.6%). The average non-baseload output emission rates for the upstate New York eGRID subregion in 2012 were approximately equal to the following: CO₂ at 1,228.56 lbs/MWh, NO_x at 1.0062 pounds (lbs)/MWh, and SO₂ at 2.3801 lbs/MWh (USEPA eGRID, 2015). Using these figures and assuming maximum annual electricity generation of 126 MW and a capacity factor of 36%, the Facility will annually displace approximately:

- 244,086.4 tons of CO₂
- 199.9 tons of NO_x
- 472.9 tons of SO₂

Annual displacement of mercury and lead compounds resulting from offsets of conventional power plants was calculated using the Abraxas Emissions Calculator (Abraxas Energy Consulting, 2016), which utilizes data on average pollutant emissions by state. Although the eGRID data are more region-specific than the Abraxas Emissions Calculator and are therefore likely more accurate, information on mercury and lead emissions is not available through eGRID. Assuming maximum annual electricity generation of 126 MW and a capacity factor of 36%, the Facility is anticipated to annually displace approximately:

- 2,254.8 tons of mercury compounds
- 5,452.2 tons of lead compounds

(e) Offsite Consequence Analysis for Ammonia Stored Onsite

No ammonia will be stored onsite during Facility construction or operation. Therefore, the offsite consequence analysis required by 1001.17(e) is not applicable to the proposed Facility and is not be included in this Application.

REFERENCES

- Abraxas Energy Consulting. 2016. *Emissions Calculator*. Available at: <http://www.abraxasenergy.com/energy-resources/toolbox/emissions/>. (Accessed March 2016).
- Jacobsen, D. and C. High. 2008. *Wind Energy and Air Emissions Reduction Benefits: A Primer*. U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, National Renewable Energy Laboratory. Golden, CO. NREL/SR-500-42616. February 2008.
- New York State Climate Action Council (NYSCAC). 2010. *Climate Action Plan Interim Report*. November 9, 2010
- NYSDEC. 2009. *Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements*. DEC Policy. Issued July 15, 2009.
- NYSDEC. 2010. *Climate Change and DEC Action*. DEC Policy CP-49. Issued October 22, 2010.
- NYSDEC. 2015. *New York State Ambient Air Quality Report for 2014*. Bureau of Air Quality Surveillance.
- New York State Energy Planning Board. 2015. *2015 New York State Energy Plan*. June 25, 2015.
- Patton, D.B., P.L. VanSchaick, and J. Chen. 2015. *2014 State of the Market Report for the New York ISO Markets*. Prepared by Potomac Economics, Market Monitoring Unit for the NYISO. May 2015.
- United States Environmental Protection Agency (USEPA). 2015. *eGRID Subregion Output Emission Rates*. Available at: http://www2.epa.gov/sites/production/files/2015-10/documents/egrid2012_summarytables_0.pdf. (Accessed: March, 2016).