Article 10 Preliminary Scoping Statement

Bull Run Wind Energy Center

Case 15-F-0377

Clinton County, New York

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Exhibit 1 General Requirements

1.1 Applicant Information

Bull Run Energy LLC (BRE) is a Delaware limited liability company formed June 19, 2015 for the purpose of developing, owning, and operating a wind powered wholesale generating facility in Clinton County, New York. PSS Appendix 1-1 provides BRE's certificate of formation.

Bull Run Energy LLC is an affiliate of Invenergy Wind North America LLC (Invenergy). Invenergy is a power producer developing utility-scale renewable energy projects including in the New York State energy market. In New York Invenergy-owned energy projects operate under the supervision and regulatory authority of the New York State Public Service Commission (PSC) and the Federal Energy Regulatory Commission (FERC). Invenergy and BRE management offices are located in Chicago, Illinois.

Invenergy has developed 65 wind farms in the United States, Canada, and Europe including the following three New York wind farms:

- High Sheldon Wind Farm, 75 turbines in the Town of Sheldon, Wyoming County, NY
- Orangeville Wind Farm, 58 turbines in the Town of Orangeville, Wyoming County, NY
- Marsh Hill Wind Farm, 10 turbines in the Town of Jasper, Steuben County, NY

Invenergy provides wholesale electricity to the public using clean, renewable sources such as wind. This furthers the federal government's policy as articulated in 42 U.S.C. 9201 to "hasten the widespread utilization of [wind energy] systems," as well as the State of New York's renewable energy policy, which requires 50% of the State's energy to come from renewable sources such as wind by the year 2030.

BRE intends to construct, own, operate, and maintain all components of the Project, except for the interconnection switchyard which will be constructed by BRE, and then transferred to the New York Power Authority (NYPA), who will own, operate, and maintain the switchyard.

1.2 Applicant Contact Information

Applicant headquarters	Bull Run Energy LLC c/o Invenergy LLC One South Wacker Drive, Suite 1800 Chicago, Illinois 60606 (312) 224-1400
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Exhibit 2 Overview and Public Involvement

2.1 Project Facilities

BRE plans the Project to have a maximum generating capability of up to 449 megawatts (MW) from an estimated 130 – 150 wind turbines located on land leased from owners of private property located in the Towns of Clinton, Ellenburg, Altona, and Mooers in Clinton County, New York.

Project components will include commercial-scale wind turbines, access roads, an electrical collection system, meteorological towers, an operation and maintenance (O&M) building, and electrical interconnection facilities. BRE anticipates the interconnection facilities will include a 230-kV switchyard built adjacent to NYPA's Ryan-Plattsburgh 230-kV transmission line and an overhead 230-kV interconnection line.

This transmission line will be subject to Public Service Law Article VII, rather than the Article 10 process. BRE plans to submit its Article VII and Article 10 applications concurrently and as part of its PIP outreach activities BRE will describe the transmission line and the wind energy facility.

2.2 Wind Turbines

BRE will select a wind turbine model for the Project based on several factors including energy production, price, availability, expected reliability and safety, and vendor support and guarantees. To provide customers increased energy production and efficiency, wind turbine vendors regularly introduce new models with longer blades and taller towers. Consequently, BRE must design the Project for turbines it expects will be commercially available when the Project begins construction, which may differ from the turbine models currently available. Table 2.2 lists wind turbines typical of those BRE will consider for installation at the Project.

Table 2.2 Wind Turbine Models

Vendor	Model	Rotor Diameter	Hub Height	Nameplate Capacity	Tip Height (ft)
GE	2.3-126	126 m	98 m	2.3 MW	528
GE	3.2-130	130 m	110 m	3.23 MW	575
GE	3.4-137	137 m	110 m	3.40 MW	586
Siemens	SWT-2.3-120	120m	92.4m	2.3 MW	500
Vestas	V136-3.45	136m	112m	3.45 MW	591

Notes:

1. Rotor diameter is the diameter of the area swept by the wind turbine blades.
2. Hub height is the distance from the ground to the rotor's axis of rotation. Hub height is often referred to as the height of the "tower", where tower refers to the steel structure supporting the wind turbine nacelle and rotor. Vendors often offer turbine models at different hub heights. The heights shown in this table are those BRE considers most likely to be available and considered for installation at the Project.
3. Tip height is the distance from the ground to the furthest reach of the blade. Tip height = hub height + rotor diameter / 2.

Studies in the application will use the most conservative assumptions about turbine characteristics and impacts, e.g., tip height and noise emissions will be the highest and loudest of turbines BRE considers likely candidates. The application will identify the pertinent turbine characteristics assumed for noise, visual, and shadow studies.

2.3 Application and PSS Contents

This Preliminary Scoping Statement (PSS) follows the outline of Public Service Law Section 1001 which describes required contents of an Article 10 application. BRE plans for its Article 10 application (the Application) to follow the same outline as used in this PSS.

To facilitate a useful review and well planned application, this PSS provides preliminary information on the design of the proposed Project as it is currently available at a relatively early stage in the Project's planning. Preliminary design information is presented in the PSS. The corresponding sections of the Application will be based on more refined design information.

The PSS contains readily-available information on each application topic, describes potential impacts, and describes more detailed information and analyses to be provided in the Application.

The PSS appendices contain maps, figures, and other information not easily presented in the body of the PSS.

2.4 Public Involvement Program

BRE's list of stakeholders includes 251 people and groups, 157 of which are area residents, and 94 of which are groups or agencies. BRE has met in person or called 70 of the 94 groups/agencies and hosted an open house to inform interested local residents. BRE advertised the open house via direct mail to every household in the Study Area, posters at town halls, announcements at town board meetings, advertisements in local newspapers, and an announcement on the Project website.

BRE maintains a Project website with information on the project, wind energy, and the Article 10 process. It also lists upcoming meetings and important Article 10 milestones.

Exhibit 2 will update the above discussion to describe PIP activities conducted between the PSS and Application submittals. The summary will identify significant issues raised by the public and affected agencies and BRE's responses and changes made to address those issues.

2.5 Basis for Making Siting Board Findings Under Public Service Law Section 168

As required by subdivision (e) of 1001.2, drawing on the entire Application, Exhibit 2 will include an assessment of the facts concerning the Project that warrant the Siting Board making the findings required by Public Service Law Section 168. Bull Run Energy will explain that in order to achieve the New York State and federal goals for the reliance on renewable resources in the electricity industry discussed in Exhibit 10, all of the State's wind resources of the quality found in the Project Area will need to be developed. The Project will significantly expand New York's

development of its wind resources by adding over 400 MW of installed wind generating capacity.

Invenergy is an experienced wind resource developer. Invenergy's extensive experience in New York in constructing, owning and operating utility-scale wind facilities in compliance with State policies and requirements will ensure that the wind resource in the Project Area will be developed in a manner that will minimize to the greatest extent practicable adverse environmental effects both during construction and in operation. The Project will be designed to comply with all State laws and regulations and all local laws except for those identified in Exhibit 31 limiting structure height and hours of construction activity. Careful placement of Project structures, including turbines, electric lines and appurtenant facilities will minimize disturbance to existing − mostly agricultural − land uses, noise and visual impacts and impacts on wildlife and other natural resources. Construction and restoration practices as have been required for Invenergy's other New York projects will be followed for this Project.

By employing up-to-date, proven wind technology the Project will be particularly beneficial to the State's electric system. Although the output of the Project may be delivered into the New England electric market for some period of time, the Project will be a beneficial addition to the State's generating capacity for several reasons. As the Department of Public Service has observed in its January 25, 2016, *Staff White Paper on Clean Energy Standard*, achieving the State's "50 by 30" renewable energy goal will require approaching renewable energy on a regional basis. *Id.,* at 5 ("neighboring states… will have a strong effect on New York markets for renewable resources") and at 13 ("Generation owners will be able to certify projects for eligibility in multiple states to facilitate their access to the highest value markets."). In New York the highest value wind resources are located in the western, central and northern regions, areas of the State that have congested transmission access to Downstate New York where the demand for electricity is highest. Downstate New York's demand for renewable energy will be met with a combination of smaller scale solar, offshore-wind and land-based wind delivered from PJM or via new transmission resources. Regional trade in renewable energy will be facilitated by existing and new transmission connections between the neighboring regions of Canada, PJM and New England. New York is advantageously located to be at the crossroads of this regional trade.

The construction and operation of the Project will provide a source of jobs and revenues – both for private landowners and vendors and for local governments in the Project Area. To the extent the Project's output is sold into New England, these payments will represent an inflow of revenues from outside New York.

The Project's construction and operation will serve the public interest.

Exhibit 3 Location of Facilities

As specified in the following sections, this PSS provides maps with preliminary facility locations. Exhibit 3 of the Application will contain updated versions of the maps.

3.1 Project Location

PSS Appendix 3-1 shows the Project location relative to major roads and cities in the eastern half of upstate New York. This map's background uses information from the NYS Department of Transportation. The Project Area is defined as the boundaries of all land leased by BRE. The Study Area is defined as the lands within five miles of any point of the Project Area boundary.

3.2 Study Area and Point of Interconnection

PSS Appendix 3-2 shows the Study Area and Point of Interconnection to the existing electric grid (POI) relative to the local region. This map shows all areas in the U.S. and Canada within 5 miles of the Project Area.

This map also shows federal, county, state, town, and Adirondack Park borders; state lands, major roads, electric transmission lines and substations, the planned POI, and urban areas. This map's background uses information from the NYS Department of Transportation.

3.3 Project Layout

PSS Appendix 3-3 shows a preliminary Project layout with locations of wind turbines, access roads, the O&M building, the construction laydown yard, and POI switchyard. This layout shows the best information available at the time of the PSS. Exhibit 3 of the application will include an updated layout map with proposed locations of Project components, including wind turbines, access roads, and the electrical collection system.

3.4 Taxing Jurisdictions

PSS Appendix 3-4 maps proposed wind turbine locations relative to the following taxing jurisdictions:

- Counties
- Towns
- School Districts
- Fire Districts

Exhibit 4 Land Use

4.1 Comprehensive Plans

Ellenburg, Mooers, and Altona have comprehensive plans developed in the 1990's to support their adoption of zoning laws. None of these comprehensive plans considered wind development as a possibility, as they were developed before commercial wind farms existed in New York State. Energy generation in general was not contemplated in any of the comp plans. The Town of Clinton does not have zoning and does not have a comprehensive plan.

The Town of Altona approved its comprehensive plan in 1993. The plan contemplates residential growth as the primary development form in the foreseeable future. With limited population and developed facilities, large scale commercial development was not anticipated, and energy generation was not mentioned at all. The general trend for land use that the residents preferred was some growth, maintenance of rural character, and protection of the environment. Industrial and commercial development should be encouraged, but guided and controlled.

The Town of Ellenburg adopted its comprehensive plan in 1990. Like Altona, it expected slight growth, and foresaw little commercial potential due to limited population, and no public water or sewer, or trucking routes. It notes that agriculture is an important land use in the town, but that some farms on marginal soils have folded in recent years and ceased crop production. Support of agriculture as a land use is clear in the comprehensive plan.

The Town of Mooers adopted its comprehensive plan in 1996. It describes a faster residential population growth than Altona or Ellenburg has experienced, predominantly in the eastern portion of the Town of Mooers, due to its greater proximity to the Northway and employment centers in Plattsburgh and Champlain. However, commercial development prospects in Mooers were considered slight, for the same reasons cited by Altona and Ellenburg. Compared to Ellenburg and Altona, Mooers' comprehensive plan places less emphasis on agriculture.

4.2 Zoning

PSS Appendix 4-1 shows the town zoning districts.

4.3 Project Area Land Cover

Land cover in the Project Area is presented in a map included with the Site Characterization Report provided as PSS Appendix 22-1.

4.4 Utility Infrastructure

Exhibit 4 will include a map showing the Project Area, Study Area, and existing overhead electric transmission lines, buried gas transmission lines, and FAA-licensed microwave transmission links. For purposes of this map electric transmission lines will be those with

voltages of 34.5 kV and higher, and gas transmission lines will be those operating at pressures of 200 psi and higher.

4.5 Project Area Land Ownership and Uses

Exhibit 4 will include maps showing the tax parcels on which BRE proposes Project components and tax parcels located within 2,000 feet of the Project component parcels. The exhibit will indicate the tax ID and the owner of record for these parcels. Parcel boundaries, tax ID numbers, and owner names will be the most recent data available from the Clinton County Real Property Office. The maps will be shaded to show land uses per commonly used classification codes such as agricultural, forested, public lands, etc.

The maps will also show any expected future land uses changes; however, at this time, based on discussion with the Clinton County Planning Department and the respective town zoning and code officers, no notable developments or land use changes, other than the Project, are proposed or expected in the Project Area.

4.6 Agricultural Districts

Agricultural Districts are a designation authorized by the NYS Department of Ag and Markets which aims to help support agricultural operations and help prevent conversion of farmland to non-agricultural uses. Agricultural Districts are not zoning districts *per se*, but include several benefits to farmers such a preferential real estate taxes; lawsuit protection for farmers to conduct farming operations without risk of suit; and protection against overly restrictive local laws against farming.

PSS Appendix 4-2 shows the boundaries of designated agricultural districts in the Study Area. Note that Clinton County manages the agricultural districts in its county as a single consolidated county-wide agricultural district rather than on a town-by-town basis.

4.7 Flood Zones

PSS Appendix 4-3 shows FEMA flood zone designations in the Project Area.

Generally speaking, FEMA maps identify two flood zones in the Project Area. The first lies within 100 feet of the banks of the perennial creeks and rivers, and the other lies within ten feet of the shore of Lake Roxanne. FEMA shows these areas to have a 1% annual chance of flooding. No other lands in the Project Area are deemed at risk of flooding by FEMA.

4.8 Critical Environmental Areas

Article 10 regulation 1001.4(g) requires maps showing critical environmental areas designed pursuant to SEQRA. Counties and other local agencies may designate certain areas as “critical areas” if they judge them to have exceptional quality relating to human health, cultural history, natural setting, or ecological sensitivity and they want to protect them from change. The NYS DEC lists and maps critical areas that counties or local agencies may have identified.

BRE's review of the NYSDEC website listing critical areas found no critical areas in Clinton or Franklin Counties, a finding confirmed by BRE's consultation with the Clinton County Planning Department.

Article 10 regulation 1001.4(g) also addresses inland waterways, coastal or waterfront areas, and groundwater management zones. None of these features exist in the Project Area.

4.9 Recreation, Scenic, and Conservation Areas

PSS Appendix 4-4 shows state lands, areas under conservation easement with The Nature Conservancy, the Adirondack Park boundary line, and other identified historic, recreational, scenic, or culturally important areas. Sites on this map were identified from a variety of public sources, including:

- The Adirondack Park boundary line (the "blue line") is drawn using shape file data provided to BRE by the Adirondack Park Agency in fall 2015.
- DEC maps of Conservation Easement lands
- DEC Public Fishing Area maps
- NYS DOT maps of Scenic Byways

Potential impacts to the resources shown in PSS Appendix 4-4 will be discussed in Exhibit 24.

4.10 Aerial Photographs and Vegetation Clearing

A set of aerial photographs taken by BRE in November 2015 will be provided as part of the preliminary design drawings in Exhibit 11. Refer to PSS Section 11 for more information on this submittal.

4.11 Project Compatibility with Existing and Planned Land Uses

Although no wind turbines exist in the Project Area, many nearby farms outside the Project Area do host wind turbines, providing an important income to the host landowners and farmers.

As discussed in PSS Section 4.1, towns in the Project Area enacted comprehensive plans approximately 20 years ago and did not foresee energy development as a possibility. The Clinton County Land Use Plan, developed in 1979, did however, explicitly state the goal of 'development and utilization of alternate energy sources,' but did not elaborate on this goal. Two much more recent documents that also support this view were developed in 2011 by the North Country Economic Development Council, and in 2013 by the North Country Planning Consortium. Both feature renewable energy development prominently in their stated goals, for both its economic benefits and greenhouse gas-reducing potential. Both documents explicitly recognize the plentiful wind of the North Country as one if its natural resources to be tapped for the benefit of all. The proposed Project, therefore, is consistent with both older and recent planning documents.

Agriculture remains an important land use in portions of the Project Area. To minimize impacts to agriculture uses, BRE will comply with NYS Department of Ag and Markets' July 2013 edition of the *Guidelines for Agricultural Mitigation for Wind Power Projects* when planning and constructing facilities in active agricultural fields.

4.12 Community Character

The Project Area is rural, with forestry, agriculture, and hunting serving as primary land uses and shaping the community character. But wind energy is also part of the community character, as four wind farms operate in the immediate area. The oldest was constructed eight years ago, and the newest, directly adjacent to the Project Area, employs wind turbines of a similar size (3.0 MW) to the ones proposed by BRE. Consequently, the Project is consistent with and will not alter the community character.

Exhibit 5 Electric System Effects

5.1 System Reliability Impact Study

Exhibit 5 will include a copy of a System Reliability Impact Study (SRIS) performed by the NYISO. If the NYISO does not complete the SRIS before the time of the Application, BRE will provide the NYISO feasibility study and a date on which BRE expects NYISO will complete the SRIS.

5.2 Potential Impacts on Electric Transmission System

As part of the interconnection request and review process, the NYISO is reviewing the potential impacts of the Project to the reliability of the electric transmission system and will identify any upgrades needed to maintain system reliability.

Exhibit 5 will include a text discussion of (i) potential significant impacts of the Project on electric transmission system reliability, (ii) benefits and detriments of the Project on ancillary services and the electric transmission system, (iii) any reasonable alternatives to mitigate any potential adverse impacts of the Project on the electric system, and (iv) effects of the Project on transfer capability.

5.3 Codes and Standards

PSS Exhibit 11 addresses codes and standards to which BRE will design the Project interconnection facilities.

5.4 Commissioning

BRE will require a full inspection of the wind turbines, electrical collection system, and Project substation prior to declaring the Project ready for commercial operation. Exhibit 5 will describe the commissioning process BRE will undertake to inspect these Project components.

5.5 Maintenance of Wind Turbines

BRE will employ a site manager and several full-time technicians who will be responsible for regular scheduled maintenance of the Project's wind turbines and other facilities. To maximize Project availability, this team will work out of an Operations and Maintenance (O&M) building located in the Project Area.

Exhibit 5 will describe BRE's operations and maintenance strategy, including safety inspections, planned maintenance, environmental management, and scheduling of this work. The discussion will address inspections and maintenance plans designed to verify continued integrity of the wind turbine towers.

5.6 Type Certification

BRE will employ investment-grade equipment deemed safe, reliable and worthy of investment by Project investors and their engineering reviewers. These reviewers will base their determination on reviews of a combination of factors, which may include internal vendor design reviews, prototype testing, third-party design testing, site specific loads analysis, and third-party type certification.

In general, Invenergy finds wind turbine vendors selling equipment in the U.S. increasingly elect to verify designs through means other than third-party type certification, as the long timeframes required by third party reviewers inhibit the ability of vendors to bring forward new designs in a market where competitors are regularly offering new products. Instead, vendors might provide a combination of the other aforementioned design verification methods.

For the turbine model(s) BRE plans to consider installing at the Project, Exhibit 5 will discuss the manufacturer's plans for verifying the turbine design meets design requirements.

5.7 Interconnection Switchyard Design, Transfer, and Maintenance

BRE anticipates that pursuant to the three-party Interconnection Agreement with NYISO and the New York Power Authority (NYPA), BRE will design and construct the point of interconnection (POI) switchyard according to NYPA's standards. Further, BRE anticipates NYPA will require BRE to transfer ownership of the switchyard, including all equipment and real property on which it is located, to NYPA after the Project begins commercial operation.

Exhibit 5 will discuss plans to design, construct, and transfer ownership of the switchyard. It will also cover responsibilities for switchyard maintenance.

5.8 Maintenance of Project Electrical Collection System

Exhibit 5 will discuss plans for inspecting and maintaining the electric collection system and electrical interconnect line, including any buried and overhead collection circuits, Project substation(s), and the interconnection line. The discussion will address plans for managing vegetation along the right-of-way for these facilities, including removal of danger trees and notification of landowners before this work is performed.

5.9 Sharing of Right of Way

BRE will provide a statement as to whether it will consider sharing its aboveground facilities with other utilities, and if so, the procedure for reviewing such sharing proposals.

5.10 Equipment Availability

This section of the Application will describe the general schedule, relative to the construction start date and commercial operations date, for delivery of wind turbines, main transformer(s), and wind turbine transformers.

5.11 Blackstart Capability

The application will discuss the ability of the Project to withstand, and then begin generating electricity after, a loss of power incident.

5.12 Electric Transmission Reliability Criteria

This section will discuss reliability criteria of the Northeast Power Coordinating Council, New York State Reliability Council, and NYPA that apply to the Project.

Exhibit 6 Wind Power Facilities

6.1 Setback Requirements

Table 6.1 summarizes the setback requirements of existing local laws.

Table 6.1 Setback and Height Requirements of Local Laws

	Town of Clinton LL #1 of 2005	Town of Ellenburg LL #4 of 2005	Town of Altona LL #1 of 2006	Town of Mooers (no wind law)
Residence, year round	1,200 ft	1,000 ft	1,200 ft	n/a
Property Boundary (note 1)	500 ft	500 ft	500 ft	n/a
Roads	500 ft	500 ft	500 ft	n/a
Roads, Route 11	1,000 ft	500 ft	500 ft	n/a
Aboveground Utilities (note 2)	1.5 x Tip Height	1.5 x Tip Height	1.5 x Tip Height	n/a
Non-residential Structures	No requirement	No requirement	No requirement	n/a
Tip Height Limit	400 ft	440 ft	400 ft	n/a

Notes:
1. Property boundary setbacks only apply to parcels owned by non-participating landowners.
2. Tip height is the highest point reached by a turbine blade. Tip Height = Hub Height + Rotor Diameter / 2.

The PSS Project layout complies with the local laws' setback requirements for roads, residences, and aboveground utilities, with the following clarifications:

- Locations of residences, roads, and above-ground utilities are preliminary and have not been field-verified;
- Road setbacks are assumed to apply to year-round roads, but not to seasonal roads, private roads, or roads no longer maintained by the towns or county; and
- Because landowner discussions are ongoing, no properties are considered to be non-participating.

Exhibit 6 will discuss the degree to which the Application layout complies with the local setback requirements, the setback guidelines of potential manufacturers and how choice of wind turbine model would affect compliance.

As discussed in PSS Section 31, the Project will not meet the local laws' tip height requirements, and BRE will ask the Siting Board to not apply them.

6.2 Project Design Review

Exhibit 6 will describe Invenergy's process for internal and third party review of the Project design that it will use, including selection of the turbine model and the turbine layout.

6.3 Wind Studies

BRE has collected on-site wind data since June 2015 from two 60 m-tall guyed meteorological towers, and in May 2016 it supplemented this data collection effort by installing four additional 80 m meteorological towers at the site. Invenergy's engineering department uses data from these towers to estimate the long term wind speeds and directions at all proposed turbine locations, which it then uses to predict the Project's net energy production.

With the application, BRE will provide a confidential report documenting the location of the on-site meteorological towers and Invenergy's internal assessment of the wind resource, losses, and net electricity production. The public version of the application will summarize the approach used for the wind resource assessment and the range of net capacity factors BRE expects the Project will achieve.

Exhibit 7 Natural Gas Power Facilities

Exhibit 7 will be empty as the proposed facility is not a natural gas power facility.

Exhibit 8 Electric System Production Modelling

8.1 Monthly Production Estimates

Exhibit 8 will provide the estimated net capacity factor for the facility and a diurnal table showing the estimated hourly production for a typical day of every month of the year, e.g., a "12x24 table." Using these figures, the application will also provide estimated electric energy production for every month of the year, including on-peak (7am -11pm) and off-peak (11pm-7 am) hours as defined by NYISO.

8.2 Electric System Modelling

Exhibit 8 will discuss inputs, methods, and results of an analysis of the electric system with and without the facility using GEMAPS, PRO-MOD, or a similar computer model. The computer model will estimate future amounts of SO2, NOx and CO2 emissions with and without the Project and average zonal prices with and without the Project.

Analyses will model the NYISO electric system for a single year as close in time to the facility's first year of operation as possible, using available base case assumptions typically used by NYISO in similar studies.

BRE will provide DPS a copy of the digital files used to model the electric system.

8.3 Effect on "Must Run" Facilities

In New York generating resources unable to obtain sufficient revenue selling capacity, energy and ancillary services, but that the PSC judges as necessary for reliability, have historically entered into Reliability Support Services (RSS) or Reliability Must Run (RMR) agreements. An RMR Agreement requires the generator to participate in the energy markets in return for compensation based on its cost, rather than market-based compensation.

On Feb 19, 2015, the FERC provided NYISO guidance on determining which generation resources should qualify for RSS and RMR agreements, RSS and RMS compensation levels, and allocation of RMR costs. The FERC emphasized that, while RMR agreements may be appropriate, they should be of limited duration and not prolong out-of-market solutions that potentially could undermine price formation. The only two RMR generators in the NYISO, Dunkirk Power LLC and Cayuga Operating Co., are located in NYISO zones outside of the zone where Bull Run is proposed, and Bull Run should have no impact on these RMR generators.

Article 10 section 1001.8(a)(8) requires Article 10 applications consider existing wind, hydroelectric, nuclear, and co-generator facilities to be considered "must-run" resources, regardless of whether these generators are market participants or under an RMR agreement. The "with and without" system studies in the Application will show expected annual energy generation from the facilities in the region that qualify under the above definition of must-run resources.

Exhibit 9 Alternatives

9.1 Alternate Locations

Unlike a fossil-fuel project that can be located on a relatively small site, wind farms on a utility scale require large land areas with proven wind quality located in areas that are receptive to their presence. The number of suitable sites is finite and relatively small. In developing a utility scale wind farm to the stage where sufficient information for filing a PSS is in hand it is simply not practical to present alternatives for consideration. To be clear, BRE's affiliate, Invenergy Wind Development LLC, is developing other wind sites, but only for the purpose of building projects at these sites in addition to this Project, not as alternatives to the BRE facility.

Moreover, for New York to meet its renewable energy goals, New York may need to develop all suitable wind sites. In addition, the Applicant is a private company without eminent domain authority to procure alternative wind sites, even if such an approach were considered appropriate by the Siting Board. For these reasons, the Application will not evaluate alternative sites in detail. Rather, BRE will examine potential alternatives listed in Section 9.2, and where and if specific issues may arise with respect to a particular wind turbine location, alternative locations for such turbines may need to be evaluated in the Application.

9.2 Alternate Project Designs

Exhibit 9 will briefly compare the proposed Project to the following alternatives:

- Larger wind turbines, with the same total generating capacity.
- Smaller wind turbines, with the same total generating capacity.
- Fewer wind turbines, in the same project area.
- More wind turbines, in the same project area.
- Fewer wind turbines, in a smaller area.

For each alternative, BRE will discuss differences in energy production, economic benefits, cost of energy, and visual, noise, and area impacts.

9.3 Advantages of Proposed Site

Exhibit 9 will identify the reasons why the proposed site is appropriate for wind energy development and the proposed configuration is better than alternative configurations.

9.4 No Build Alternative

Exhibit 9 will briefly list the main benefits and impacts of the propose Project to the "no build alternative."

9.5 Alternative Energy Sources

BRE affiliates develop and operate wholesale electric generating facilities powered by natural gas and solar energy. Exhibit 9 will discuss the differences of having the same amount of energy generated at the site by a natural gas-powered facility or by a solar facility. The discussion will cover land use, electric reliability, environmental impacts, and cost of generated electricity relative to that of the proposed Project.

Exhibit 10 Consistency with Energy Planning Objectives

10.1 State Energy Plan

The most recent NYS State Energy Plan was issued as a final document in June 2015. It identifies a number of guiding principles and goals relevant to the development of the Project.

Energy Plan Guiding Principles

The first guiding principle of the NYS Energy Plan is Market Transformation, which specifically includes reducing soft costs of development of clean energy generation. For wind developers, the soft costs related to developing wind projects favor larger wind farms, since the cost of permitting is the predominant soft cost, and is substantially fixed for projects that exceed the Article 10 minimum size threshold. Because BRE will be the largest wind farm built in New York State to date (in terms of generating capacity, not number of wind turbines), it strives to push the envelope on driving down the cost of renewable energy for consumers, including soft costs as outlined in this guiding principle.

The second guiding principle is Community Engagement. BRE is not a retail energy facility, so its primary community engagement interface is through the extensive community involvement process initiated in the PIP, and to be continued throughout the development process. Additionally, one of the expressly named components of Community Engagement is economic sustainability, particularly for otherwise disadvantaged locations. The PILOT payments from BRE to towns, schools, and Clinton County will add to the already substantial benefit produced by existing wind projects in the area: presently there are no county land taxes levied on residents, because the budget is entirely paid for by PILOTs on existing projects. Additional PILOT revenues from BRE will further drive down town property tax rates, and allow improved local services, increasing the long term financial sustainability of the communities in which it will operate.

The third guiding principle is Private Investment. As the largest private wind developer in North America, the BRE's affiliate Invenergy is well-positioned to bring in private capital to develop the proposed Project. BRE's scale maximizes the efficiency of private capital required to develop renewable resources at the level necessitated by the State Energy Plan and the 50x30 goal (discussed below).

The fourth guiding principle is Innovation and Technology. Although neither the turbines nor business model of BRE are novel concepts, but rather tried-and-true methods of developing large wind projects, they will indeed employ wind turbines representing current yet proven technology of one of the fastest evolving sectors of the electric generating industry – the wind energy sector.

Energy Plan Initiatives and Goals

The first initiative and goal of the NYS Energy Plan is Renewable Energy, and its first component is Large Scale Renewables Strategy. As a large-scale renewable project, BRE

directly responds to this primary goal, and will contribute a significant amount of wholesale renewable power into the grid.

An additional goal that is relevant is Clean Energy Financing. The stated goal is to increase the access to capital for renewable energy projects. BRE's affiliate Invenergy will likely employ conventional private financing to fund the Project, but its success and the success of similar projects will attract new sources of capital to renewable energy in general.

The fifth stated goal is Energy Infrastructure Modernization. Although BRE is not in and of itself a transmission project, it will be making significant upgrades to the local transmission infrastructure in the project area to accommodate its energy.

Lastly, BRE directly answers two of the three 2030 Targets described in the State Energy Plan, which will be elaborated on in the following section.

10.2 Climate Change Goals

Regional Greenhouse Gas Initiative (RGGI)

In December 2005, governors of Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont signed a Memorandum of Understanding that resolved to work together to implement a CO2 budget and trading program to reduce emissions from fossil-fueled electric power generators of capacities of 25 MW or more. By generating carbon-free electricity, the Project will assist New York meeting the goals established under RGGI.

Governor Cuomo's 40% Greenhouse Gas Emission Reduction Goal

The 2015 New York State Energy Plan pledges to reduce state-wide greenhouse gas emissions by 40% by 2030, with an eventual target of 80% reduction by 2050. Governor Cuomo followed this by signing a memorandum of understanding, "Under 2 MOU", in which 128 jurisdictions, including 28 countries on six continents made the same pledge.

Governor Cuomo's 50% Renewable Energy Mandate

In December of 2015, Governor Cuomo directed the Public Service Commission to develop a clean energy standard that will support a mandated target of meeting 50% of NYS's energy needs with renewables by 2030, accompanied by a 40% reduction in greenhouse gas emissions from 1990 levels. Analysts and others widely regard this as an aggressive target, and facilities such as BRE will be critical to accomplishing it through the construction of large renewable facilities to replace the retirement of fossil plants. New York State has a total available generation base of 39,000 MW. To convert 50% of that to renewable sources will require substantial onshore wind developments such as BRE.

US Clean Power Plan

With the US Environmental Protection Agencies (EPA's) August 2015 issuance of the Clean Power Plan (CPP), the EPA established power plant carbon emissions limits for every U.S. state. The CPP allows states a great deal of latitude to determine how best to meet carbon

targets, but even with aggressive adoption of solar, natural gas, efficiency, and nuclear generation, the U.S. Energy Information Administration (EIA) expects wind power projects such as the BRE facility to be the largest single technology contributing toward CPP goals.

Because New York has set emissions targets more aggressive than those of the CPP (CPP targets 30% reduction by 2030, NYS targets 50% reduction by 2030), it's reasonable to expect the state will require new wind projects such as the proposed Project to meet its goals.

NY Clean Energy Standard

In early January 2016, DPS issued a white paper on a proposed NY Clean Energy Standard (CES) describing a plan the state could follow to meet its renewable and clean energy goals. Although the Public Service Commission has yet to finalize the CES program specifics, it's clear that projects such as the BRE facility, which can provide large quantities of renewable energy at relatively low cost, will be important in helping New York meet its goals in a cost-effective manner.

10.3 Impact on Reliability and Ancillary Services

Studies being performed by the NYISO are reviewing potential impacts of the Project on electric transmission reliability. The Application will discuss the impacts of the Project on reliability and ancillary services in NYISO Zone D.

10.4 Impact on Fuel Diversity

New York uses seven main fuel sources to generate its electricity: coal, oil, natural gas, nuclear, hydro, wind, and 'other renewables'. In 2015, wind power matched coal and pumped hydro, each at 4% of the total fuel mix used. However, 46% of the energy supply relied on dual fuel oil/gas thermal plants, primarily burning natural gas, with the other technologies making up the balance. The proposed Project will increase wind generation capacity, help to reduce New York's dependence on oil and gas, and bolster diversity of the state's energy mix by (NYISO 2015).

Exhibit 11 Preliminary Design Drawings

11.1 Site Plan

Exhibit 11 will contain site plan drawings (Site Plan) drawn with AutoCAD, or a similar program, showing the proposed final project configuration (i.e., at the completion of construction and restoration) at a scale of 1" = 300'. The Site Plan will be of sufficient scale to show proposed buildings, structures, and access road travel lanes. The Site Plans will be prepared by a New York-licensed professional engineer or landscape architect and will depict the following items:

- Property boundaries from public tax records,
- Grading information:
    - Contour lines for pre-construction grades
    - Locations where significant cut or fill is expected
- Outlines of the following permanent Project components:
    - Access road travel lanes,
    - Turbine foundation, tower perimeters, and crane pads,
    - Above and below ground electric collection system lines (centerlines only),
    - Project substation (driveway outline and fence lines),
    - POI substation (driveway outline and fence lines),
    - O&M building and parking area, and
    - Permanent meteorological towers
- Outlines of the following construction items:
    - Limits of ground disturbance expected during construction[1]
    - Routes other than Project access roads where crawler cranes may be expected to travel.
    - Outline of the planned construction laydown area
    - Outline of the concrete batch plant
    - Outline of turning radius improvements on public roads
- The following items to show potential impacts on wetlands and streams:
    - Delineated boundaries of wetlands and streams near Project components
    - Locations of potential wetland disturbance
- Locations and estimated sizes of culverts and any permanent storm water management features expected to be installed based on a preliminary design and engineering judgement

[1] Because the site is generally rolling terrain with few, if any, access roads or turbines expected in areas of steep slopes or where significant cut and fill is expected, the limits of disturbance will be based on typical requirements for grading, topsoil stockpiling, and other construction activities, but not on three dimensional grading contour calculations.

11.2 Construction Operations Plan

Exhibit 11 will describe the on-site processes to construct the facility, including:

- Discussion of the general order of activities for: access road construction, wind turbine construction, substation construction, O&M building construction, laydown yard preparation, met tower construction, and installation of buried and overhead electric circuits.
- Discussion of how contractors will temporarily store excavated topsoil and subsoil at the various construction areas. Note, BRE expects no major soil storage stockpiles will be created during construction, so this discussion will describe typical practices at various areas, but not a plan for managing specific stockpiles.
- Locations of the construction laydown yard and concrete batch plant.
- Drawings showing typical usage of areas during construction at a typical wind turbine site, the laydown yard, and the concrete batch plant.
- Plans for worker parking.
- An estimated number of truck trips per day from the batch plant.

11.3 Environmental Monitoring

Exhibit 11 will present an environmental monitoring plan designed to ensure the Project is constructed in accordance with permit conditions. The plan will include hiring an independent monitor qualified in construction practices and environmental resources.

11.4 Grading Plans

Exhibit 11 will discuss the general plans for grading and controlling soil erosion once Project construction and restoration is complete. The discussion of grading will address soil types, depth to bedrock, areas where significant cut and fill are anticipated, and any expected needs for retaining walls. Locations of significant grading changes, culverts, and permanent stormwater retention areas will be shown on the Site Plans discussed in Section 11.1.

11.5 Aerial Photographs and Landscaping Plan

Exhibit 11 will include a discussion of areas to be cleared, how disturbed areas will be replanted, and how during Project operation BRE will maintain vegetation in the disturbed areas.

Exhibit 11 will also include a set of drawings consisting of aerial photographs of the Project Area at a scale to enable the viewer to identify structures and vegetation types (e.g., wooded or pasture or agricultural field). The aerial photographs will have an overlay showing planned facility locations and the limits of clearing during construction. As required by PSL 1001.4, the application will identify the company that took the photographs, the owner of the photographs, and the date they were taken.

11.6 Lighting Plan

Exhibit 11 will discuss various types of non-FAA lighting BRE plans to install at the Project, including safety lights at the wind turbine entrances, exterior lighting at the O&M building, and work lights at the Project substation and at the POI substation to be built for NYPA. Discussions will cover the general types of fixtures to be used and measures to be taken to minimize lighting of areas outside of the facility.

The application will discuss FAA obstruction lights in Exhibit 18.

11.7 Architectural Drawings

O&M Building

BRE is evaluating the suitability of renovating an existing building in the Project Area for use as the Project O&M Building or replacing the existing building with new construction on the same site.

Exhibit 11 will include elevation and plan drawings for a typical wind facility O&M building. It will also include a site plan showing the parcel layout, proposed driveways and parking, zoning requirements, utility connections, and locations of well and septic systems. A text discussion will describe proposed O&M building landscaping, foundation type, finishes and materials.

Substation Control House Buildings

The Project substation(s) and POI switchyard will contain prefabricated control buildings (one per substation or switchyard), and Exhibit 11 will present typical design details for these buildings.

11.8 Turbine Drawings

Exhibit 11 will include one or more figures showing outline drawings of candidate wind turbine models for the facility. Either the text or figures will provide key specifications and dimensions of the candidate wind turbine models such as nameplate capacity, tower height, rotor diameter, and tower diameter.

11.9 Electrical Collection System Drawings

Exhibit 11 will include a one-line diagram of the Project's planned electrical collection system. Additionally, it will describe design and installation of buried cable and any overhead electrical collection circuits. Sketches will show the arrangement of electrical and fiber optic cables in a typical collection circuit trench, splices and vaults, and the configuration of any overhead collection lines.

11.10 Project Substation Drawings

Exhibit 11 will include an elevation drawing of a typical project substation. The drawing will be to scale, and either the drawing or the text will specify approximate heights of key substation components.

11.11 POI Switchyard Drawings

Exhibit 11 will include an elevation drawing of a typical POI switchyard. The drawing will be to scale, and either the drawing or the text will specify approximate heights of key switchyard components.

Elevation and arrangement drawings of the actual POI switchyard will not be available until after NYISO and NYPA complete the Project's Facilities Study, which BRE expects will occur well after it submits its Article 10 application.

11.12 Electrical Interconnection Line Drawings

BRE is evaluating the merits of locating one or more Project substations away from the POI switchyard and connecting these stations with an overhead electric interconnection line. If the final design includes an above-ground electric interconnection line, Exhibit 11 will describe the design of the transmission line. Exhibits will include typical design drawings of proposed transmission line structures and an elevation profile of the transmission line.

11.13 Engineering Codes

BRE and its contractors will design, specify, and construct the Project and the electrical substation(s) in accordance with applicable codes and standards. The primary and most likely applicable standards applicable to the Project's construction are listed in PSS Appendix 11-1.

Exhibit 12 Construction

12.1 Quality Assurance

To build the Project's "balance-of-plant" (BOP) structures (excluding wind turbine design, manufacturing, delivery, and installation and construction of interconnection facilities to be turned over to the transmission owner) BRE will contract with one or more general contractors experienced in the construction of large-scale, commercial wind farms (BOP Contractors). The BOP Contractors will be responsible for constructing the Project in accordance with applicable codes and permit conditions and implementing a project-specific Quality Assurance and Control Plan (QA/QC Plan) to be approved by BRE prior to the commencement of construction. BRE's contract with its BOP Contractors will require implementation of the QA/QC Plan.

During construction, BRE will have a Construction Site Manager on-site to ensure the BOP Contractors properly construct the Project and comply with the terms of the BOP contracts, including implementation of the QA/QC Plan. BRE's Construction Site Manager will have at least five years of experience with construction of heavy industry and commercial power generation projects.

The BRE QA/QC Plan will include responsibilities for QA/QC Plan implementation, documentation requirements, procedures to address non-conformances, and checklists to document plan compliance. PSS Appendix 12-1 presents a foundation construction checklist from a project-specific QA/QC Plan for another Invenergy wind project built in New York.

12.2 Dig Safely and Pole Numbering

Exhibit 12 will include written statements by a company officer stating BRE's commitment to complying with the Dig Safely New York program and pole numbering and marking requirements. BRE and its contractors will comply with PSL 119-b, specifying protection of underground facilities.

12.3 Disruption to Existing Utilities

Exhibit 12 will discuss potential interference with existing overhead electric transmission lines, overhead electric distribution and telecommunication lines, and buried gas pipelines. The discussion will reference maps showing locations of potential utility interference, will cover steps BRE will take to coordinate with the utilities to minimize disruptions to service during Project construction, and will specify minimum separation distances BRE plans to maintain from Project components and existing utility infrastructure, and any codes or regulations that specify these distances.

12.4 Complaint Resolution Plan

BRE will implement a complaint resolution plan to manage and resolve complaints received during Project construction and operation. BRE's complaint resolution plan will be provided with

the application, most likely as part of Exhibit 19. It will include a procedure for communicating complaints and their handling to DPS staff.

Exhibit 13 Real Property

13.1 Parcel Ownership and Zoning

Exhibit 13 will include maps showing land ownership and zoning in the Project area. The map will show all parcels where BRE proposes Project components and any parcels abutting these parcels. Map contents will include:

- Parcel boundaries, owners, and parcel ID numbers from the most recently available data from Clinton County tax mapping department.[2]
- Town boundaries.
- Zoning districts and designations, if any.
- Public roads.
- Easements or other restrictions on the shown parcels. Easements and restrictions shown will be those that BRE is aware of through its normal course of doing business, and not an exhaustive list as a result of title searches on all properties. The map will show will show known easements for overhead electric transmission lines and public roads. It will not show leases or other agreements recorded by BRE and its affiliates.

13.2 Interconnection Right-of-Way Map

Exhibit 13 will include a map showing land ownership along the route proposed for the overhead interconnection line to be built between the Project substation and the POI switchyard. This Right-of-Way (ROW)map will show the easement area, the planned points for accessing the easement area from public roads, and any areas outside of the standard easement width that BRE anticipates may be used as construction laydown areas.

13.3 Project Property Rights

BRE plans to lease or purchase from private landowners all the land on which it will install Project components. In general, turbines, roads, and electrical collection system components will be located on land leased to BRE. The O&M building, Project substation(s), and POI Switchyard will be located on land purchased by BRE. As of the date of this PSS, BRE and its affiliates have executed purchase options for substation and O&M building parcels and wind leases for over 30,000 acres of private land in the Project Area.

Exhibit 13 will contain a statement as to the Applicant's land under lease, easement, or option as of the time of the application and confirming BRE's ability to obtain all necessary land rights to construct and operate the facility, if it has not done so already. BRE will provide a business confidential property rights map that shows:

- Parcel boundaries,

[2] Invenergy's experience is that county tax mapping departments generally update and reissue their tax mapping information once per year.

- Shading of parcels to indicate property rights held by BRE and its affiliates,
- parcels known to be leased to other wind companies, if any,
- parcels owned by the State of New York,
- Public roads, and
- Project facilities.

13.4 Easement Crossings

The Project will require agreements from several parties to allow the BRE electrical collection system and interconnection facilities to cross over or under existing roads and utility easements. As of the time of this PSS, these parties are expected to be:

- Town of Altona,
- Town of Clinton,
- Town of Ellenburg,
- Town of Mooers,
- Clinton County Highway Department,
- NYS Department of Transportation (NYSDOT),
- NYS Electric and Gas Corporation (NYSEG), and
- New York Power Authority (NYPA).

Exhibit 13 will list crossings of roads, electric transmission lines, and other easements that the Applicant will likely need to construct and operate the Project. As part of this discussion, the Applicant will describe its plans for obtaining agreements to allow such easement crossings.

13.5 Improvement District Extensions

Improvement Districts are an urban public-private partnership structure. No Improvement Districts exist in Clinton County, and BRE will not seek extensions thereof.

Exhibit 14 Cost of Facilities

BRE will develop and construct the Project in the most efficient and cost effective manner so that it can provide electricity to the wholesale market at the lowest cost to consumers. Exhibit 14 will provide a good faith estimate of the Project's capital costs. Final costs of construction will obviously differ from these estimates due to items such as Project design refinement, equipment market changes, construction and labor market changes, and construction variables such as weather.

14.1 Capital Cost

The application will include a cost estimate with ranges of expected costs for the categories below.

- Development
- Wind turbine supply
- Interconnection, including:
    - POI switchyard
    - Utility charges
    - Network upgrades, and
    - Interconnection transmission line
- Balance of plant, including:
    - Civil, mechanical, and electrical construction, including mobilization, management, road construction, cable installation, foundation construction, turbine erection, commissioning, restoration, gravel and re-bar purchases, and equipment rental.
    - Project substation,
    - Cable purchases, and
    - Other equipment purchases.
- Financing,
- Other, including:
    - O&M mobilization,
    - Fees to owners and local governments during construction, and
    - Internal costs.

14.2 Source of Information

BRE intends to develop capital cost estimates for Exhibit 14 using a combination of Invenergy's experience building wind facilities in NY and elsewhere, wind industry standards and guidelines, and price quotes supplied by service and equipment providers. Exhibit 14 will state BRE's basis for developing the capital cost information provided in the application and any key assumptions made in developing these capital costs.

Exhibit 15 Public Health and Safety

Wind energy facilities are one of the least harmful ways to generate electricity from the point of view of public health and safety (Markandaya and Wilkinson 2007; Jacobsen, M. 2009). They do not generate air pollution or otherwise contribute to climate change, which is a major threat to human safety. It is also one of the primary reasons New York State energy policy strives to encourage significant future development of wind and other renewable energy generation. However, wind turbines are not without some risks that must be addressed to maintain their excellent safety record.

15.1 Project Waste

The Project will not generate significant volumes of waste. The following discussions describe the limited wastes BRE expects will be generated during construction and operation and measures to dispose of this waste.

Waste from Project Construction

BRE expects to generate the following types of waste during Project Construction:

- Concrete truck washouts;
- Plastic, wood, and paper packaging materials;
- Sanitary waste from portable toilets; and
- General office-type waste from construction trailer offices.

BRE will require the construction contractor to collect packaging materials and dispose of them at one of the collection facilities described for waste from Project operation. BRE will also require the construction contractor to keep construction sites clean of miscellaneous debris such as food packaging and other materials. These materials will be collected in construction vehicles or turbine site waste bins.

At every turbine site, contractors will create a limited amount of waste concrete when concrete trucks are washed out after they deliver concrete for turbine foundations. To control this waste, BRE will require the contractor to dig a small concrete washout pit alongside each turbine access road or crane pad, and contractors will confine the washout from the concrete trucks to these areas. Waste concrete and relatively small quantities of unused concrete materials are also likely to be present at the concrete batch plant. At the end of concrete activities, BRE will require the construction contractor to collect this waste concrete and dispose of it appropriately.

Waste from Project Operation

The Project will generate the following types of waste during operation:

- Sanitary waste from O&M building;
- General waste from O&M building offices;
- Used mineral oil;
- Failed components.

Wastewater and solid waste from the O&M Building will be limited to sanitary waste and modest quantities of paper and packaging waste. BRE will dispose of O&M building sanitary waste through a septic system installed in accordance with Clinton County Department of Health regulations. Solid waste will be stored in a dumpster at the O&M building that will be emptied periodically by a waste management contractor to be hired by BRE and disposed of per the procedures of the Clinton County Solid Waste Department, which maintains collection facilities in Altona, Churubusco, Mooers, and Ellenburg, and a landfill in Morrisonville.

BRE will recycle or appropriately dispose of used oil. Failed or worn components will be rebuilt, recycled or placed in municipal trash depending on their material composition.

15.2 Wind Turbine Blade Failure

Failures of wind turbine blades where significant portions of the blade separate from the wind turbine during operation occur infrequently, but can occur. To minimize risk to human safety from blade failure, wind turbines are set back appropriate distances from areas that people frequently occupy.

Exhibit 15 will discuss the potential for blades to fail and fall to the ground, the distance from the turbine base that debris from such failure can reasonably be expected to land, the risk to human health posed by such failures, and appropriate measures to minimize the risk of blade failure.

15.3 Wind Turbine Tower Collapse

Failures of wind turbine towers where the entire wind turbine collapses or falls to the ground occur infrequently, but can occur. To minimize risk to human safety from tower collapse, wind turbines are setback appropriate distances from areas that people frequently occupy.

Exhibit 15 will discuss the potential for a wind turbine tower to collapse or fall over, the distance from the turbine base that debris from any such failure can reasonably be expected to land, the risk to human health posed by such failures, and appropriate measures to minimize the risk of tower collapse.

15.4 Ice and Snow

Snow and ice can accumulate on wind turbines installed in cold climates. Buildup can occur on the turbine tower, nacelle and blades, and it can occur on rotating or idle blades. Ice and snow will fall from the turbines as warming air or direct sunlight melts the snow or ice. Ice and snow can land several hundred feet away from the area directly underneath a turbine if the wind is blowing when the snow or ice is melting. To minimize risk to human safety from ice and snow shedding, wind turbines are setback appropriate distances from areas that people occupy or use frequently during the winter.

Exhibit 15 will discuss the potential for snow and ice to accumulate on wind turbines, the distance that such accumulations have been known to land from the base of the wind turbine based on discussions with people living and working near wind turbines in areas where snow and ice are frequent, and published research on the subject, and measures to avoid or

minimize impacts from snow or ice falling from the wind turbine, particularly in light of current and anticipated future winter land uses in the area, such as farming and snowmobiling. (Cattin et al 2007; Biswas et al 2011).

15.5 Shadow Flicker

PSS Section 24 describes shadow flicker and addresses visual impacts of wind turbine shadows that will be addressed in Exhibit 24 of the Application. Concerns that shadow flicker might cause potential health impacts will be addressed in Exhibit 15.

People have questioned whether shadow flicker could cause health effects with people vulnerable to photosensitive epilepsy, but wind turbine shadows "flicker" at a frequency too low to trigger such problems. According to the Epilepsy Society, approximately five percent of individuals with epilepsy have sensitivity to light. Most people with photosensitive epilepsy are sensitive to flickering around 16-25 Hz, although some people may be sensitive to rates as low as 3 Hz and as high as 60 Hz (Harding et al 2008; Smedley et al 2010).

Due to the relatively slow rotational speed of commercial wind turbine rotors, the frequency of wind turbine shadow flicker would be 1 Hz or less,[3] significantly below the lowest levels reported to trigger photosensitive epilepsy in vulnerable individuals. Further, BRE is not aware of evidence that wind turbines can or have triggered seizures.

15.6 Audible Frequency Noise

Exhibit 15 will briefly mention the potential impact of noise from wind turbines, but it will refer to Exhibit 19 for a more thorough assessment of potential noise impacts.

15.7 Low-Frequency Sound

Low-frequency sound is commonly considered to range from 10 Hz to 100 Hz, although these values are flexible. Some earlier wind turbine designs used downwind rotors (rotors downwind of the support tower), which could produce higher levels of low-frequency sound than turbines with the rotor located upwind of the nacelle.

When low-frequency sound substantially exceeds the background sound, it may be noticed in the community and can cause annoyance. Intense levels of low-frequency sound can induce vibration in a building structure.

Modern wind turbines, including the types BRE proposes for this Project, incorporate the upwind rotor design, which greatly decreases the generation of low-frequency sound. Such modern,

[3] Wind turbine vendors typically specify turbine rotations speeds in terms of revolutions per minute (rpm), and as wind turbine rotors have increased in diameter, the maximum rpms have decreased. For example, the GE 1.6-100 and GE 3.2-130 turbines have rotor diameters of 100m and 130m respectively, and the vendor specifies the maximum rpm for these machines as 16.2 rpm and 12.1 rpm respectively. For a turbine rotating at 12 rpm, three blades pass through a given point 12 times every minute, or 36 blade passes per minute. This translates to a frequency of 0.6 Hz. 16 rpm translates to a frequency of 48 blade passes per minute, or 0.8 Hz.

upwind-rotor wind turbines generate no more low-frequency sound than what is already present in windy rural areas as background noise. Therefore, there is no expected impact of low-frequency noise from the proposed facility (Snow 1997; Bollin et al 2011; O'Neal et al 2011).

15.8 Public Water Sources

PSS Exhibit 23 discusses locations of the nearest public water sources.

15.9 Existing Hazards

BRE is unaware of any unique landslide, geological, or hydrological hazards in the Project Area.

However, one former ICBM (intercontinental ballistic missile) silo that was part of the Atlas ICBM system exists on Bull Run Road in the Project Area. The U.S. Air Force built several Atlas missile systems in the early 1960's in Nebraska, Wyoming, Kansas, Washington, Texas, New Mexico, California, and Upstate New York. The silo in the Project Area was one of 12 Atlas F systems operated out of the Plattsburgh Air Force Base. The Air Force managed these as active missile sites from December 1962 until June 1965, when they were deactivated and replaced by Titan II systems that used solid fuel rockets and could be launched from within their silos. The Atlas sites were subsequently sold off to private owners, some of whom converted the silos into residences (Wikipedia). In recent years, concerns have been raised about possible contamination of local water supplies from trichloroethylene, or TCE, that may have been used at the missile sites when they were operational (NBC News). BRE is not aware of reports of contamination in the Project Area. Further, because Project construction will not involve excavating soil on the parcel that houses the former silo, Project construction will not introduce any new hazards.

PSS Exhibit 4 discusses locations of flood zones.

15.10 Community Emergency Response Services

The Project Area is served by five volunteer fire departments:

- Altona Volunteer Fire Department,
- Churubusco Volunteer Fire Department,
- Ellenburg Center Volunteer Fire Department,
- Ellenburg Depot Volunteer Fire Department, and
- Mooers Volunteer Fire Department.

Law enforcement is provided by the Clinton County Sheriff's Office and NYS Troopers. Emergency medical response service is provided by local volunteer fire companies, Champlain EMS, Inc., Morrisonville Ambulance Service, EMT of CVPH, and the nearest hospitals are located in Plattsburgh and Malone.

Exhibit 15 will describe emergency response services in the area and provide a map showing the location of these service providers relative to Project components.

15.11 Unavoidable Environmental Impacts

As required by subdivision (h) of 1001.15, Exhibit 15 will identify, in summary form, those Project impacts that cannot be eliminated or avoided. Unavoidable impacts on the environment include those temporary impacts associated with construction activity such as noise, dust, traffic disruption and vehicle emissions, and permanent impacts associated with the dedication of land, including some wetlands, to turbine foundations, access roads and electric infrastructure, and visual, flicker and noise impacts from turbine operation and the potential for impacts to birds and bats due to the turbine operation.

BRE will minimize temporary construction-related impacts by following a Quality Assurance /Quality Control Plan as described in PSS Section 12, hiring an on-site environmental monitor as discussed in PSS Section 11, and publicizing and following a complaint resolution procedure.

Unavoidable, permanent impacts will be minimized by using the least amount of land needed to safely operate Project facilities and by siting turbines, roads and electric lines away from sensitive environmental resources. Impacts associated with operations, noise, visual and flicker will be minimized by careful siting and screening where needed and will be monitored for continued compliance with certificate condition requirements.

15.12 Irreversible and Irretrievable Commitment of Resources

As required by Subdivision (i) of 1001.15, the purpose of this section of Exhibit 15 is to provide, in one place, a summary of the impacts, of whatever nature, that will result from Project construction and operation that are not susceptible to elimination or avoidance. This section of Exhibit 15 will identify and describe those resources which construction and operation of the Project will use to the exclusion of any other use. Such resources include the wind resources in this Project Area and the land devoted to turbine foundations, access roads, substation and overhead electric line pole foundations. Exhibit 15 will provide a detailed listing of all such land requirements.

Exhibit 16 Pollution Control Facilities

The Project will not require pollution control facilities, so this Exhibit will be empty.

Exhibit 17 Air Emissions

17.1 Compliance with Air Emission Standards

During operations, BRE will emit no air pollutants, and thus is not regulated by local, state or federal requirements.

17.2 Ambient Air Quality

DEC data shows all sampling points in the Clinton County and Adirondack region are within NAAQS acceptable levels (DEC AQI).

17.3 Emissions Table

As a wind energy facility, the Project will not involve combustion of fossil fuels for purposes of generating electricity. As such, the table specified by Section 1001.18(c) is not applicable.

17.4 Impacts to Ambient Air Quality

The Project will not negatively impact air quality as it does not involve the combustion of fossil fuels for the purpose of generating electricity. During construction, the heavy equipment will emit air pollutants as they do on any jobsite. However, recent phase-in of ultra-low sulfur diesel in all off-road fuels helps ensure minimal impacts.

To minimize air quality impacts from potential road dust, BRE will deploy a water truck to periodically spray water on the surface of access roads in areas of high construction traffic during excessively dry periods. BRE will apply these measures judiciously to (i) prevent unnecessary siltated runoff from the access roads that could affect adjacent streams or wetland areas and, (ii) maintain the structural integrity of the access roads.

17.5 Ammonia Storage

The Project does not involve storage of ammonia, so the requirements of Section 1001.17(e) are not applicable.

Exhibit 18 Safety and Security

18.1 Site Security During Construction

All construction will take place on private property, generally set far back from roads and public spaces, reducing access to general public traffic. The large setback distances to turbine locations that protect public safety during the operations phase also perform the same function during the construction period of the project. However, BRE will undertake security measures to prevent public tampering with the construction sites during off-hours.

Exhibit 18 will describe measures BRE will take to prevent tampering and theft of Project components during construction. In short, these will include fencing of the construction laydown yard and locking gates to the yard during off-work hours, and posting signs warning the public to not intrude on active construction sites. Invenergy has found these practices to be adequate for the three projects it has completed in NYS to date. This section will also discuss additional security measures, such as lighting, cameras, or roving security patrols that could be employed if security problems occur.

One month or more prior to the start of Project construction, BRE will provide DPS a written security plan developed by BRE and its BOP Contractor.

18.2 Site Security During Operation

BRE will own and operate the facility, and its staff will be responsible for the site's safety and security on an ongoing basis. Turbine doors will be kept locked and substations will be fenced and locked at all times. Based on Invenergy's experience at other wind facilities in New York, the locked doors, cabinets, and gates have proven adequate deterrents against unauthorized access. Local experience at the four operating wind facilities near Bull Run indicates that the locked turbines and substations are likely to be adequate security at this site as well. Invenergy has not found electronic surveillance to be necessary at its other operating wind sites in New York, and does not anticipate it being required at Bull Run. Exhibit 18 will discuss any further details necessary for site security during Project operation.

Setbacks will be examined in Exhibit 6 of the Application.

18.3 Site Lighting

In general, BRE will install lighting to be the minimum levels needed to accomplish the purpose and will not operate lights when not required. BRE anticipates the following types of lights will be installed on Project components:

- Wind turbine entrance lights;
- Wind turbine aviation warning lights;
- O&M building exterior lighting,
- Project substation work lights,

- POI switchyard lights.

Exhibit 18 will describe the purposes, equipment and planned usage for the above-listed lighting. Aviation warning lights will be addressed in a dedicated Exhibit 18 section.

Lighting equipment and practices for the POI switchyard will be dictated by the transmission owner, not BRE. The application will provide information available from the transmission owner, if any, but BRE will not be able to control lighting practices in the transmission owner's facilities.

18.4 Aviation Warning Lights

As structures taller than 200 feet above ground level, the Federal Aviation Administration (FAA) will require the wind turbine towers to be lit to warn aviation traffic of potential obstructions. Current FAA regulations require wind project operators to install red lights on the nacelles of turbines on the perimeter of the project and select turbines within the Project and that these lights be synchronized to turn on and off simultaneously. This regulation typically results in between one third and one half of all the wind turbines of a project being lit.

To comply with FAA regulations, the developer of a proposed wind project submits to the FAA a proposed lighting plan containing exact turbine coordinates, turbine dimensions, and lighting specifications. The FAA reviews the lighting plan and replies with its approval and any required changes. Typically, FAA completes its review 3-4 months after submittal of a plan, and FAA prefers that submitted plans are based on final turbine locations so as to avoid multiple reviews of the same Project.

BRE will submit a lighting plan to the FAA once final turbine coordinates have been permitted through Article 10 and finalized through any other engineering reviews.

Exhibit 18 will include a draft aviation lighting plan for the proposed layout designed by BRE to comply with FAA regulations, but not yet approved by the FAA.

18.5 Cybersecurity

The New York Power Authority (NYPA) will manage SCADA and cybersecurity of the POI switchyard. As part of the NYISO interconnection process, BRE anticipates that NYPA will require BRE to design and install this system. The POI switchyard and its SCADA system will need to comply with the requirements of NYPA and, because the switchyard will be part of the bulk power transfer system operating at over 230 kV, of the North American Electric Reliability Corporation (NERC). In general, these cover operational status and control of critical equipment while meeting associated cyber security requirements.

BRE will install and manage a separate SCADA system for monitoring the status of the Project substation and wind turbines. SCADA for the 230-kV equipment in the Project substation will also be monitored by the transmission owner or NYISO and will need to meet applicable NERC requirements.

Exhibit 18 will discuss the computer systems to be used to manage the POI switchyard, the Project substation, and the wind turbines. It will identify security standards these systems will be designed to and any steps to be taken during Project operation to verify cybersecurity measures are current and functioning.

18.6 Emergency Response Plan

Exhibit 18 will include a preliminary emergency response plan that will identify potential emergency situations and how project operators will respond to, and notify the public of, such situations. BRE will develop the plan with input from local emergency responders, and it will make it available to BRE employees, visitors, contractors, community organizations, and emergency service providers. The plan will not include evacuation procedures for events caused by operation of the wind facility, since, unlike thermal generation plants, wind facilities do not generate community-scale hazards necessitating local evacuation. But the plan will include procedures for BRE staff to follow in the event of rare natural disasters such as floods or tornadoes that may require local evacuations. The plan will also include procedures for BRE to notify the local community in case of emergency, and it will identify communication paths for facility emergencies such as fire or significant hazardous spills.

18.7 NYS Division of Homeland Security Review

BRE has included the NYS Division of Homeland Security (Homeland Security) as a stakeholder for the Proposed Project. As such, Homeland Security will receive a copy of the application as part of the Article 10 process. However, to ensure this department's review focuses on the items in Exhibit 18, BRE will provide Homeland Security a printed copy of Exhibit 18 along with a letter requesting it review and provide written comments on the exhibit. The application will include a statement confirming this letter has been sent.

18.8 Local Emergency Service Providers Review

BRE has included the Clinton County Office of Emergency Services (CCOES) as a stakeholder for the Proposed Project. As such, CCOES will receive a copy of the application as part of the Article 10 process. However, to ensure CCOES's review focuses on the Safety Response Plan, BRE will provide CCOES a printed copy of the Safety Response Plan along with a letter requesting it review and provide written comments on the plant. The application will include a statement confirming this letter has been sent.

BRE's review of the US Department of Transportation's National Pipeline Mapping System shows that no gas pipelines exist in the Project Area. If one or more pipeline companies construct a pipeline in the Project Area, BRE will include those pipeline owners on the emergency responder lists.

Exhibit 19 Noise and Vibration

19.1 Noise Receptors

PSS Appendix 19-1 is a Noise Impact Assessment Protocol (Noise Protocol) with a map of noise-sensitive receptors. BRE is using this map to guide its ambient noise assessment, and it will assess operating noise levels at these locations. Exhibit 19 will contain an updated version of this map with any adjustments deemed necessary as BRE further identifies and classifies potential receptors.

19.2 Ambient Noise Levels

BRE has hired a noise expert to assess Project Area ambient noise levels during winter and summer conditions using the protocol described in PSS Appendix 19-1. Exhibit 19 will include a report summarizing the noise expert's assessment of the ambient noise environment using the sound statistics collected on-site.

19.3 Construction Noise

The Project will create short-term noise impacts due to Project construction. Project construction will require use of earthmoving machinery, trucks for hauling materials, large cranes, and other construction equipment that will result in elevated noise levels. Most, but not all of this noise will be generated by equipment operating at wind turbine sites which are relatively distant from sensitive noise receptors.

Exhibit 19 will discuss typical equipment to be used during Project construction and the noise levels expected from this equipment. A computer analysis will be performed in accordance with PSS Appendix 19-1 to estimate construction noise levels at noise-sensitive receptors.

The discussion of construction noise will include reasonable noise abatement measures to be implemented and steps that can be taken to respond to any noise complaints that might be received during construction.

19.4 Blasting Noise

Based on discussions with landowners and contractors familiar with the Project Area, the Applicant expects to encounter sandstone and limestone rock at and near the ground surface. Contractors indicate this rock is removable without blasting, but the Applicant will plan for, and evaluate the effects of, blasting should contractors and BRE determine it is necessary to most efficiently construct the Project.

The computer modelling of construction noise levels will not include potential noise levels from blasting, but noise impacts from potential blasting will be discussed in the Exhibit 19 text. This discussion will cover the intermittency of blasting noise, the times of day it might occur, and the magnitude of noises from blasting.

19.5 Operating Noise

Once operational, the Project will generate low levels of aerodynamic noise from the wind turbines and noise from the transformer in the Project substation.

BRE's noise expert will characterize the sound levels from the Project using a computer model and in accordance with the PSS Appendix 19-1 protocol. Exhibit 19 will include a noise report containing the results specified in PSS Appendix 19-1. In addition to these results, the noise report or the application will include:

- Name and credentials of the noise expert.
- A description of the Project's noise-producing features, both during project construction and project operation.
- A description of the computer model used to estimate Project noise levels during construction and operation.
- Turbine manufacturer's noise specifications and available field testing data for all audible and low-frequency sounds, infrasound, pure tone and repetitive/impulse sound characteristics.
- A discussion on whether the Project will generate significant levels of low-frequency sound or infrasound.
- Information needed to evaluate the Project's ability to comply with the noise requirements of the local laws on wind energy of the towns of Clinton, Ellenburg, and Altona.

19.6 Potential Health Impacts

The potential health effects of wind turbine noise on nearby human receptors depends on a number of factors including sound type and intensity, frequency and timing, background noise levels, terrain, and personal characteristics of the person, such as general noise sensitivity, and attitude towards the noise source. The reasons some people are bothered by the relatively low levels of sound produced by wind turbines are complex, and are a combination of technical, sociological and personal characteristics.

Although BRE is not aware of scientific literature supporting a direct link between wind turbine noise and actual health outcomes, a potential exists for community complaints regarding wind turbine noise. BRE anticipates that careful siting of the turbines will minimize negative subjective noise impacts.

In accordance with 16 NYCRR §1001.19, Exhibit 19 will discuss the potential for Project noise to cause hearing damage, interfere with speech, generate complaints, damage structures, or cause other detrimental impacts to health and well-being of local residents. This discussion will reference peer-reviewed literature, to the extent available.

BRE is not aware of any technical, industrial, or medical activities in the Study Area that would be affected by wind turbine sounds.

19.7 Post Construction Noise Monitoring

After the project begins commercial operation, BRE will perform a post-construction noise study to quantify actual noise levels during Project operation and verify compliance with local laws. This study will be performed in accordance with a post-construction noise monitoring plan that BRE will provide with Exhibit 19.

19.8 Complaint Resolution

Any noise complaints received during Project construction or operation will be managed in accordance with a Complaint Resolution Plan that BRE will provide as part of Exhibit 19. The plan will include establishment of a toll-free number to be made readily available in the Study Area, procedures for collecting and documenting complaints, for resolving complaints, and for elevating complaints that are not resolved to the resident's satisfaction.

Exhibit 20 Cultural Resources

Project construction could impact archeological resources by disturbing sensitive areas during excavation for WTG sites, access roads, electrical collection system, construction laydown area, operations and maintenance facility and substation. In addition, the Project could have a visual impact on historic resources in the Study Area.

20.1 Cultural and Historic Context (Phase 1A Study)

BRE hired Panamerican Consultants, Inc. (PCI), a cultural resources consulting firm, to assess Project Area cultural and historic resources by reviewing archeological site files maintained by NYS Office of Office of Parks, Recreation and Historic Preservation (OPRHP), reviewing the OPRHP Sphynx model, and interviewing local historians. PCI's report, documented in PSS Appendix 20-1, describes the Project Area's history, cultural resources, and historic resources.

The Phase 1A report was submitted to the OPRHP on December 15, 2015. OPRHP has assigned the Project consultation tracking number 15PR07108.

20.2 Archeological Resources

PCI's Phase 1A study identified 25 historic archeological sites and no prehistoric archeological sites in the OPRHP's database in the Project Area. PCI classified the Project Area as sensitive for archeological sites and recommended additional Phase 1B archeological surveys be conducted to document specific resources and the potential for the Project to impact these resources.

BRE and PCI are developing a proposed plan for Phase 1B surveys that will follow OPRHP guidance for the proposed Project layout. BRE intends to submit this plan for OPRHP review in the next 1-2 months and to perform the Phase 1B archeological surveys in 2016.

If BRE consultants encounter archeological materials during the Phase 1B archeology surveys, they will clean, catalogue, inventory, and curate the materials according to NY Archaeological Council standards.

Exhibit 20 will include results of the Phase 1B archeological surveys, documented in a survey report and summarized in the text of Exhibit 20.

Based on the results of the Phase 1A report and its expected flexibility in adjusting plans to avoid any known or discovered archeological resources, BRE does not anticipate any Phase II archeological studies will be required.

Exhibit 20 will also contain an Unanticipated Discovery Plan that BRE will follow during Project construction. The plan will specify the process BRE will follow if significant archeological materials are discovered during Project construction, including stopping work until a qualified archaeologist assesses the materials and specifies a protocol to be followed.

20.3 Historic Resources and Potential Impacts

PCI's Phase 1A study identified several farmsteads, schools, cemeteries, churches and other buildings that are National Register Eligible and located in the Study Area. However, further work is needed to determine the exact number and nature of these properties as many of the records did not include GIS coordinates.

BRE will have a Phase 1B historic resources survey conducted by a qualified architectural historian to clarify the nature, number, and location of historic resources that are at least 50 years old and potentially eligible for listing in the State or National Register of Historic Places. The survey will consider the proposed Project layout and Project visibility from the identified resources. Exhibit 20 will include a report documenting the Phase 1B survey, and it will summarize the historic resources in the Study Area and the potential for the Project to impact these resources.

Exhibit 21 Geology, Seismology and Soils

21.1 Geology and Tectonic Setting

The Project Area consists of bedrock formed of sandstone and limestone, overlaid with soils strongly influenced by the last glacial period. The dominant bedrock in the Project Area is Potsdam Sandstone, deposited in the Cambrian and Ordovician eras, with pockets of Paleozoic Chazy Limestone. The St. Lawrence and Champlain River Valleys are part of a long-sinking basin, later uplifted by repeated mountain-building events. There are multiple semi-dormant fault lines running north-south up the Hudson River valley, and continuing under Lake Champlain, twenty miles to the east of the Project Area, which originate from the various continental collisions along that seam over the past billion years or so.

The Adirondack Mountains, the dominant geographic feature in the area, are a continuously-rising dome of rock, which, abutting a sinking basin and next to a series of old faults, makes the Project Area, though less active than many other parts of the world, the most seismically-active area of New York (Fisher 1968, USGS 2005, NYGS 2016).

The salient recent geologic event in the area was the last glaciation, which retreated from the area approximately 12,000 years ago. The associated scouring of soils, deposition of moraines and tills, and glacial outwash areas, all shaped the current topography and ecological communities we see today (Denny 1974).

21.2 Soils and Slopes

PSS Appendices 21-1 and 21-2 are maps of the soil types and slopes in the Project Area. Slopes are calculated from digital elevation model (DEM) data available from the US Geological Survey (USGS). Soil types are those reported by the USDA NRCS Web Soil Survey.

Soils in Clinton County are dominated by four main types; glacial outwash, marine and lake sediments, non-acidic glacial till, and acidic glacial till. Text in Exhibit 21 will describe the characteristics and construction suitability of the different soils types for construction of wind turbine foundations, access roads, buried cables, substations, and overhead transmission or collection lines.

The discussion of suitability for wind turbine foundations shall consider soil bearing capacity, bedrock competence, potential for de-watering during excavation, subsurface hydrologic characteristics, and soil corrosivity.

The discussion of suitability for construction of buried cables shall consider the potential for de-watering, soil resistivity, and mechanical protection of the cables.

21.3 Geotechnical Data and Wind Turbine Foundation Design

Based on anecdotal evidence and BRE visual observations, bedrock in the Project Area lies close to the ground surface with little to no soil in many locations. For example, an area north of

Irona Road in the town of Altona is a relatively flat area of exposed sandstone that was reportedly used for storage of wind turbine components by Noble Environmental Power prior to construction of its North Country wind parks in 2006-2008. Similar areas, sometimes called "ledge" or "concrete barrens" exist west of Cannon Corners Road, called the Gadway and Cannons Corners Sandstone Barrens, are discussed further in PSS Exhibit 22.

PSS Appendix 21-3 shows depth to bedrock in the Project Area using data from the USGS Online Spatial Geology Data and the USDA NRCS Web Soil Survey. This data confirms the anecdotal evidence and visual observations discussed above. Much of the Project Area has shallow soil depths, and with wind turbine foundations requiring excavation to fifteen feet below grade or more, BRE anticipates it will encounter bedrock frequently during excavations. Based on discussions with contractors with experience building wind turbine projects in the Study Area, BRE anticipates it can excavate this bedrock and build turbine foundations using a standard gravity, spread-footing design. Because of relatively shallow bedrock, BRE does not anticipate piles will be required at wind turbine foundations.

Prior to construction of the Project, BRE will conduct geotechnical borings of all, or most of, the final wind turbine sites. However, such surveys are costly and not prudent to perform until wind turbine locations are final. As such, BRE does not plan to have full geotechnical data for all wind turbine sites in its application.

Exhibit 21 will include results from preliminary geotechnical testing performed at a range of sites selected to sample different conditions expected in Project Area. These results will include vertical profiles to sufficient depths for the needs of foundation design engineers, and information on the water table. In addition to the preliminary geotechnical results, Exhibit 21 will include a preliminary engineering assessment on the foundation designs expected to be appropriate for the conditions and the scale of wind turbines being contemplated, and it will discuss special steps, such as "buoyant" foundations, that may be required for Project wind turbines.

21.4 Geotechnical Data and Buried Cable Installation

Based on discussions with contractors that have constructed wind projects and buried collection circuit systems in the North Country, BRE anticipates it can excavate buried cable trenches with relatively little difficulty using a rockwheel.

In some locations, it may be preferable to install cables by horizontal directional drilling (HDD) to minimize surface impacts to wetlands, streams, or public roadways. BRE's ability to employ such HDD installation techniques could be impacted by presence of shallow bedrock which could significantly increase the cost, time, and environmental impacts of HDD installations. Exhibit 21 will discuss expected challenges and potential environmental impacts with buried cable installation considering the results of the preliminary geotechnical surveys.

21.5 Seismology

Seismic Risk

Northern New York experiences low-level earthquakes (magnitudes of 4 or less) relatively frequently. For instance, between 2002 and 2016, five earthquakes of magnitude 3.0-3.7 occurred in the Adirondack region. The region also experiences moderate-sized but infrequent seismic events. The most recent moderate-sized earthquake in the vicinity occurred in 2002, with a quake magnitude of 5.1, centered approximately 30 miles south of the Project Area. A few instances of chimney damage and wall cracking were reported after this event. Prior to that event, the next most recent earthquake was magnitude 5.3 in Blue Mountain Lake, NY, 80 miles to the southwest of the Project Area, in 1983. The largest recorded earthquake in the vicinity was in Charlevoix, Quebec in 1663 at an estimated magnitude of 7, which is located 240 miles to the northeast of the Project Area. (USGS 2002).

PSS Appendix 21-4 shows seismic activity levels of the Project Area relative to other areas of New York. As discussed in PSS Section 21.1, older faults exist approximately 20 miles east of the Project Area, but no faults with displacement in Holocene time exist in the vicinity of the Project.

Seismic Design

IEC standard 61400-1, to which the Project wind turbines will be designed, requires the turbines to sustain no damage during a 475-yr earthquake.

Research by Sandia National Labs and others show that only the most seismically active areas of the world are likely to result in any damage to wind turbines. Few instances of significant seismic activity have been recorded in the vicinity of wind farms; however, California offers a useful case study, being famous for both earthquakes and as an early adopter of wind technology. For the two earthquakes recorded near Palm Springs, CA since turbines have been installed there, significant damage occurred to homes and businesses, but no damage occurred to the wind turbines or their foundations. IEC and GL standards concur with the Sandia findings (Prowell 2009, GL 2010, IEC 2005)

The final design of the wind turbine foundations will include consideration of the seismic risk of the area.

21.6 Grading and Excavation Plans

The Site Plans to be provided in application Exhibit 11 will show topographic 2-foot contour intervals of the existing terrain.

Wind projects have relatively small footprints and are designed to blend into the existing topography with little to no cut and fill. Any excess soil, such as soil displaced by installation of a wind turbine foundation, is usually distributed in the immediate area and graded to blend into the existing topography and drainage patterns. BRE does not anticipate any fill will be transported out of the Project Area as part of construction activities. Exhibit 21 will state whether this

expectation remains at the time of the application. Any local areas where BRE expects significant cuts or fill will be noted in the Exhibit 11 Site Plans.

Exhibit 21 will describe the excavation techniques planned for installation of the construction laydown yard(s), access roads, wind turbine foundations, and buried cables. As part of this discussion, the application will:

- Estimate of the amount of topsoil and subsoil (or rock) to be excavated for each wind turbine foundation;
- Discuss materials expected to be used to construct access roads, including quantities of these material(s);
- Identify areas where more than nominal amounts of cut and fill are expected to be required;
- Delineate the areas around the construction laydown yard where topsoil will be stored during Project construction; and
- Reference discussion of an invasive species plan discussed in Exhibit 22.

21.7 Blasting Plans

Based on discussions with contractors experienced in working in the vicinity of the Project, BRE anticipates excavation for wind turbine foundations, buried cable trenches, and overhead transmission line poles can be completed without blasting. However, based on geotechnical tests or experience during construction, BRE and its contractors may determine blasting is needed to construct the Project in the most efficient and cost effective manner. As such, BRE will prepare blasting plans to ensure blasting will be done safely and with minimal disruptions to the public in the event that it is necessary.

Exhibit 21 will include a preliminary drafting plan for the Project including contractor qualifications; warning measures to be used; measures to ensure safe transportation, handling, and storage of blasting materials; use of blasting mats; coordination with local fire and EMS districts; and procedures on when and how to conduct pre-blasting condition surveys of nearby buildings.

Exhibit 21 will discuss potential impacts of blasting to residences, hunting camps, drinking water wells, and beaver dams. Exhibit 21 will also discuss potential alternatives to blasting such as excavation with chisel backhoes and impact hammers.

Exhibit 22 Terrestrial Ecology and Wetlands

22.1 General Plant Communities

The Project Area lies in the Lake Champlain ecological region and the Champlain Transition and Western Adirondack Transition subecological regions (NYSDEC 2008b).

The Lake Champlain ecological region is characterized by lowland deciduous, mixed, and evergreen forests as well as higher-elevation boreal forests. Emergent marshes, bogs and fens, floodplain forests, and forested wetlands occur throughout the ecoregion.

The Champlain Transition subecological region, covering approximately 90% of the Project Area, is characterized by low elevations, relatively flat and uniform topography, and good soil quality, and land use is a mixture of commercial forests, active agriculture, idle farmland reverting to forests, and development. Where they occur, forests are primarily deciduous forest of birches (*Betula*) and aspen (*Populus*), with incursions of mixed evergreen forests of eastern white pine (*Pinus strobus*), red spruce (*Picea rubens*), and balsam fir (*Abies balsamea*)

The Western Adirondack Transition subecological region (covering approximately 10% of the Project Area) is higher elevation, and has more varied topography and poorer soils associated with Precambrian bedrock. Vegetation in the Western Adirondack transition is characterized by old fields, successional forests, and farmland. Tree species are similar to those that occur in the Champlain Transition region.

Further information on Project Area plant communities, including photographs is presented in the Site Characterization Report provided as PSS Appendix 22-1.

Agricultural vegetative communities are dominated by permanent grasslands in pasture and hay crops; vacant land is typified by successional ecology, converting former grasslands into shrub and forest. Corn is the dominant annual field crop produced in the area, with 24,000 acres in corn production in the county overall according to the 2013 Census of Agriculture.

Exhibit 22 will summarize the areas of different types of vegetation to be disturbed during construction, with categories including:

- Evergreen forest
- Deciduous forest
- Recently timbered forest
- Agricultural field
- Agricultural pasture
- Scrub-shrub
- Other

Exhibit 11 will include maps showing aerial photography and the expected limits of disturbance during Project construction, and Exhibit 22 will discuss alternative construction methods that will be used or that could be considered to minimize impacts to plant communities.

22.2 Unusual Habitats and Natural Communities

Per the Site Characterization Report, PSS Appendix 22-1, the areas known as the Gadway Road Flat Rock Area and the Cannon Corner Flat Rock Area, both located in the eastern portion of the Project Area, are home to significant natural communities summarized below and described more specifically in the site characterization study.

- Perched bog. Less than one acre of open peatlands.
- Sandstone pavement barrens. Approximately 50 acres of thins soils, thin jack pine woodlands, and rock outcrops containing patches of shrubs, herbs, and mosses.
- Black spruce tamarack bog. Approximately 40 acres of boggy wetlands, pavement barrens, and bogs with peat over 24 inches deep.

No USFWS-Critical Wildlife Habitat, National Wilderness Areas, National Audubon Important Bird Areas, or NYSDEC Bird Conservation Areas occur in the Project Area.

Exhibit 22 will describe potential direct and indirect impacts the Project may have on these communities.

22.3 Protected and Declining Species

The Site Characterization Report lists species of concern identified by consultation with the New York Natural Heritage Program, U.S. Fish and Wildlife Service iPaC website, U.S. Geological Survey Breeding Bird Survey, New York Breeding Bird Atlas, post-construction monitoring reports from operating wind projects in Clinton County, and consultations with staff at the U.S. Fish and Wildlife Service and the NYS DEC.

Table 4-1 of the Site Characterization Report lists federally or state-listed species for which habitat or known ranges may exist in the Project Area. In summary, the table identifies:

- 3 mammals. All bats. Includes Indiana bat federally-listed as endangered and Norther long-eared bat which is federally-listed as threatened.
- 26 birds. No federally-listed species.
- 2 amphibians. No federally-listed species.
- 1 reptile. No federally-listed species.
- 1 insect. No federally-listed species.
- 14 plants. No federally-listed species.

The New Natural Heritage Program identified several of the species in Table 4-1 of the Site Characterization Report, plus nine additional species of moth that are not federally or state

listed, but the Heritage Program lists as possibly occupying the Gadway Road Flat Rock area and with status of uncertain, imperiled or critically imperiled in New York.

Exhibit 22 of the application will include a habitat study that will identify habitat in the Project Area that could reasonably be expected to support listed and unlisted species of concern. The exhibit will discuss the potential Project impacts to the identified species and potential measures for BRE to avoid and minimize impacts.

22.4 Unlisted Species

Public sources of mammal species ranges are not readily available. However, plant communities that could support whitetail deer, black bear, porcupine, beaver, red fox, gray fox, coyote, racoon, oppossum, cottontail, and a range of small mammals such as woodchuck, chipmunk, rabbit, gray squirrel, red squirrel, mice, vole, shrew and mole exist in the Project Area. Unlisted birds and bats are discussed in other sections.

Exhibit 22 will discuss the potential direct and indirect impacts to unlisted species, including any potential mitigation and avoidance measures.

22.5 Birds

The Project could affect birds by altering the habitat, by displacing resident birds, and by presenting a collision risk to migrating and resident birds.

To assess bird use of the Project Area and the Project's potential impact, BRE began a year-long series of avian surveys in August 2015 that include:

- Raptor point counts (year-round surveys)
- Migratory songbird counts (fall survey)
- Breeding bird surveys (spring survey)
- Raptor nest searches (spring survey)

The studies follow the protocols provided in PSS Appendices 22-2 and 22-3. BRE reviewed these protocols in advance with the NYS DEC and the U.S. Fish and Wildlife Service (FWS).

Exhibit 24 will include reports summarizing the reports of the on-site bird surveys conducted by BRE's biologists. In addition, Exhibit 24 will discuss potential impacts of the Project on bird species, including potential displacement and collision impacts.

22.6 Bats

The Project will present a collision risk to bats that migrate or reside in the area in the summer months and it could displace bats that use trees where Project facilities are planned.

To assess bat use of the Project Area and provide information on potential mitigation measures, BRE is conducting the following on-site bat surveys:

- Bat acoustic surveys (Fall ’15 and Spring ’16)
- Mist netting surveys (Summer ’16)
- Telemetry surveys (Summer ’16)

The studies follow the protocols provided in PSS Appendices 22-2, 22-3, and 22-4. BRE reviewed these protocols in advance with the NYS DEC and the U.S. Fish and Wildlife Service.

Exhibit 24 will include reports summarizing on-site bat surveys conducted by BRE’s biologists. In addition, Exhibit 24 will discuss the Project’s potential impacts on bats, including potential displacement and collision impacts.

22.7 Post-Construction Bird and Bat Monitoring

BRE will coordinate with the NYS DEC to develop a post-construction bird and bat mortaility monitoring program, similar to programs conducted at other New York wind farms. Typically these involve searchers, with or without trained dogs, walking transects under turbines at specified time intervals over a period of a year or two. Searchers collect and document any carcasses found, and a qualified wildlife biologist analyzes findings to estimate the Project’s bird and bat impacts.

Exhibit 22 will include a proposed post-construction bird and bat monitoring plan for the Project.

22.8 Wetlands Mapping and Characterization

PSS Appendix 22-5 shows NWI and DEC mapping of the Project Area. Aware of the need to confirm the NWI and DEC boundaries, BRE hired a wetland consultant to perform a one-week field survey and to subsequently review infrared aerial photographs and LIDAR to better estimate wetlands and streams throughout the Project Area. The resulting map, provided as PSS Appendix 22-6, presents a comprehensive, but not definitive, mapping of wetlands across the majority of the Project Area. BRE has used this mapping to guide its preliminary layout provided in this PSS, and it will continue to update this mapping of wetland resources as it collects more field information.

To quantify the temporary and permanent impact of the Project on area wetlands, BRE will hire a wetland consulting firm to survey wetlands in corridors expected to be disturbed by installation of Project components. The width and dimensions of the delineation corridors will vary depending on the type of component, the complexity of nearby wetlands, if any, and the need for flexibility in future adjustments of that component. In general, the delineations will include areas within:

- 500 ft of turbine locations,
- 150 ft along access road corridors,
- 250 ft along access road corridors in the vicinity of DEC wetlands,
- 100 ft of areas planned for Project substation(s), construction laydown yard, O&M building, and POI switchyard.

Exhibit 22 of the application will include reports documenting methods and results of the wetland delineations, including the Cowardin classifications and descriptions of vegetation, soils, and hydrology. The application will also include maps showing the areas delineated and the wetlands identified in these areas. The methodology to be used for delineations is specified by the 1987 Corps of Engineers (USACE) Wetlands Delineation Manual and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0, January 2012) to perform a delineation of Federal jurisdictional wetlands within the site. DEC's wetland delineation manual will be referred to, in addition to the USACE methodology, when delineating DEC-regulated wetlands in the Project Area.

22.9 Wetland Impacts

BRE anticipates the Project will result in some temporary and permanent impacts to wetlands. However, it is designing the Project to minimize these impacts to the extent reasonably practicable, through measures such as:

- Siting wind turbines, access roads, and ECS to avoid wetlands,
- Avoiding trenching or use of heavy equipment in streambeds,
- Restoring temporarily impacted wetlands to pre-construction conditions,
- Implementing a SWPPP to minimize impacts to wetlands during construction, and
- Implementing a spill prevention and response plan.

Exhibit 22 will tabulate expected wetland and stream impacts and maps and show the locations of these impacts. In addition to discussing methods to minimize impacts, BRE may propose compensatory mitigation for wetland impacts. If BRE proposes wetland mitigation Exhibit 22 will discuss BRE plans for grading, planting and monitoring of the mitigation area.

22.10 Invasive Species Management

Invasive species can be spread accidentally when contractors move soil between different areas. Because Project construction should not entail large scale trucking of soils between areas the potential to spread invasive species by this mechanism is considered low. However, construction will require large scale movement of aggregate from quarries to access roads, and depending on the conditions at the quarry, invasive species could be spread by movement of this aggregate.

Exhibit 22 will include an Invasive Species Management Plan describing the invasive species known to be present on site and the best management practices (BMPs) BRE will employ to prevent further spread of these species or colonization by new invasive species. These will include measures to (i) educate workers, (ii) minimize the risk of imported fill introducing invasive species, (iii) clean equipment, (iv) develop site grading plans and erosion and sediment control plans that help minimize the chance of spreading of invasives, (v) monitor for invasive species after BRE completes construction. The plan will also identify plant and seed materials BRE anticipates using in site restoration.

22.11 Agricultural Land

Project construction will temporarily and permanently impact agricultural land due to site preparation, excavation and backfilling at the laydown yard, access roads, foundations, and buried electrical interconnect. These can impact agricultural field soils by rutting, mixing of topsoil and subsoil, and compaction. To minimize Project impacts to active agricultural land, BRE will coordinate with the New York Department of Agriculture and Markets (Ag & Markets) and follow its *Guidelines for Agricultural Mitigation for Windpower Projects*.

Exhibit 22 will tabulate the number of acres of active agricultural land BRE expects the Project will impact temporarily and permanently.

22.12 Forested Land

Many of the owners of forested lands in the Project Area regularly harvest the timber from their properties, reflected in the herringbone patterns clearly visible in aerial photographs of the site. Based on discussions with local owners, these properties are typically extensively cleared approximately every 20-30 years. Any clearing or habitat fragmentation impacts from wind turbines and access roads sited on these properties should be compared to the continued and regular impacts already occurring on these properties.

Where practicable, BRE will install its access roads along existing logging roads, a standard method of reducing impacts in forests. However, in many instances the logging roads go directly through wetlands, and BRE will need to balance the benefits of using existing roads to minimize clearing against the wetland impacts of the existing roads. In an effort to reduce wetland impacts, BRE may need to relocate some access roads away from existing logging roads, and will work closely with DEC to reduce total impacts to both forest and wetlands.

Exhibit 23 Water Resources and Aquatic Ecology

23.1 Watersheds

PSS Appendix 23-1 shows watersheds in the vicinity of the Project Area. The Project straddles two watersheds, each described below.

Lake Champlain Watershed

This watershed drains northeastern New York, including most of Clinton County, into Lake Champlain. The long, narrow and deep lake drains at its northern end through the Richelieu River into Quebec and into the Saint Lawrence River. All but the northern portions of the Project Area are part of the Lake Champlain watershed.

St. Lawrence Watershed

This watershed drains a large area of northern New York, including all of St. Lawrence County and most of Franklin County, northwestward into the St. Lawrence River which flows north and east through Canada into the Gulf of Saint Lawrence and the Atlantic Ocean. Only the northern most portion of the Project Area lies in this watershed. Water from this area drains northward into Canada and into the St. Lawrence River.

23.2 Streams

Stream Identification and Classification

PSS Appendix 23-2 shows the streams in the Project Area based on information from DEC, EPA, and USFWS National Wetlands Inventory. Table 23.2 lists the named streams in the Project Area. A number of small ponds and unnamed streams, in addition to those in Table 23.2, are also present in the Project Area.

Table 23.2 Named Streams in the Project Area

Name	Description / Size	Watershed	Drains Into	DEC Classification
North Branch Chazy River	1st, 2nd, 3rd order	Lake Champlain	Great Chazy River	C(T)
Brandy Brook	1st order	Lake Champlain	N. Branch Chazy River	D
Taylor Brook	1st order	Lake Champlain	N. Branch Chazy River	C(T)
Malark Brook	1st order	Lake Champlain	N. Branch Chazy River	D
Deer Pond Brook	1st order	Lake Champlain	N. Branch Chazy River	C(T)
Graves Brook	1st order	Lake Champlain	N. Branch Chazy River	D
Crystal Creek	1st order	Lake Champlain	English River	D
English River	1st and 2nd order	St. Lawrence	Chateaugay River (QC)	C(T)
Shea/Allen Brook	1st order	St. Lawrence	Lac Enchante (QC)	C(T)

DEC classifies streams according to the cleanliness and usage of the water. DEC stream classifications are:

- Class A and AA are assigned to waters used as a source of drinking water. No water bodies in the Project Area are designated as class A or AA.
- Class B indicates a best usage for swimming and other contact recreation, but not for drinking water.

- Class C is assigned to waters supporting fisheries and suitable for non - contact activities.
- Class D is the lowest classification.
- Additional classifications as “T” indicate a waterbody may support a trout population or “TS” indicate possible support of trout spawning. Special requirements apply to sustain these waters that support these valuable and sensitive fisheries resources. In the Project Area, all streams are classified as either C(T) or D as per DEC maps of the site.

Streams in the Project Site are highly variable, ranging from steep-gradient streams in deeply cut wooded ravines to low-gradient streams that meander through pastureland, wetlands, and valley settings. Most of these 1st order streams are less than 6-feet wide with substrate ranging from rock/gravel to silt/mud. Water depths are typically 1-4 inches in riffles, with pool depths of 1-2 feet. Aquatic vegetation is typically lacking. Most streams within the Project Site have well-defined and abrupt banks, while the banks of a small number of low-gradient streams transition into adjacent wetland vegetation, and thus are essentially indiscernible.

The North Branch of the Great Chazy River is the largest stream in the area. As it enters the Project Area in Ellenburg it is a second order stream 15-20 feet across, a foot deep. Exiting the Project Area in Mooers, it is a third order stream, in places fifty feet across and a foot deep (Duffy 2010).

Exhibit 23 of the application will include a map of streams in the Project Area updated with additional information, including locations of intermittent streams, that BRE collected as part of its work to delineate wetlands in Project corridors. The application will include publically available information on aquatic habitat and invasive species for streams in the Project Area.

Potential Impacts to Streams

BRE will design the Project to minimize the number of locations where Project components, particularly access roads and electrical collection system lines, cross streams and rivers. But some crossings will be necessary, and temporary and possibly permanent impacts will occur at these locations.

Access road crossings are typically constructed using a culvert or drainage pipe similar to what local road crews install where driveways and roads must cross streams and drainage ditches. These crossings will be mapped and designed as part of the SWPPP process. Where possible, unimproved farm crossings of streams will be upgraded to culvert crossings and be re-vegetated. This will improve local water quality by keeping farm equipment out of waterways.

Exhibit 23 of the application will further discuss locations of expected stream impacts and methods BRE will take to minimize and mitigate these impacts, including utilizing DEC’s stream crossing BMP’s. In addition, the application will identify locations of stream impacts and quantify the length of stream bed to be impacted at each crossing.

23.3 Open Water Areas

Lake Roxanne and Shea Brook Pond are named open waters in the Project Area. As currently proposed, the Project will not impact these waterbodies.

Several other open water areas are also interspersed throughout the Project Area. Many are beaver ponds that vary in size from time to time with the building and destruction of dams by beavers and landowners. The beaver ponds are particularly common north of Clinton Mills Road, and BRE will work to design the access roads and collection systems to minimize impacts to the ponds as they currently exist.

Other open water areas are in open field settings, adjacent to houses and barns. Typically, these ponds are excavated or diked, and are less than 0.5 acres in size. Banks are typically well-defined and emergent wetland vegetation tends to be limited or lacking. Water depths, although not verified, are anticipated to be 4 feet or more. They may be used as a source of water for livestock as well as for fishing and aesthetic purposes.

Exhibit 23 will examine known hydrologic databases for existing conditions, and then review potential impacts from construction and operation of BRE, including proposed mitigation and avoidance measures.

23.4 Public Drinking Water Sources

No municipal drinking water systems exist in the Project Area. The nearest municipal water systems to the Project Area are located in Chateauguay, Burke, Lyon Mountain and Dannemora. These systems are 15 miles or more from the Project Area. Supplies for these systems are in the vicinity of the supply systems, several miles from the Project Area, and highly unlikely to be impacted by the Project.

PSS Appendix 23-3 maps the locations of the 18 public water supplies in the Project Area. Public water supplies are defined as institutions which supply water to tenants or patrons, and which test their water regularly and report the results to the Clinton County Department of Health. These public water supplies range from convenience stores and motels to local restaurants and schools. In each case, they use drilled wells on-site to supply the water, since there are no municipal systems in the area. As with private water wells, these public water sources are unlikely to be impacted by BRE construction, as turbine foundations are shallower than water wells, and are set back at least 1300’ from any residence or business.

23.5 Groundwater

As discussed in PSS Section 21, throughout most of the Project Area bedrock lies close to the surface and is frequently exposed in the form of concrete barrens or “ledge.” Most farms and residences in the Project Area depend on ground water wells for their water supply. Based on interviews with local residents, wells range from approximately 25 to feet deep to 150’ deep or more. A few residents still use older dug wells of ten feet or less in depth. These depths indicate two separate water sources being tapped. The shallow wells (less than approximately 40 feet) pull from the unconfined aquifer, or perched water table, that is supplied from recent

precipitation and lies above an impermeable layer of soil or rock 30-40 feet under the surface. The deeper wells penetrate through the impermeable layer, and tap into the confined aquifers. Confined aquifers recharge more slowly, but are better protected from surficial contaminants. (DEC 2016, USGS 2016)

According to the DEC, no principal or primary aquifers are present in the Project Area. The USGS maintains a groundwater monitoring site in Mooers Forks where it has recorded data since 2006, showing an average water table 2 feet below the soil surface. Another USGS well south of Altona with a 15-yr dataset to the present is drilled 80 feet into Potsdam sandstone and records average groundwater at 20-25 feet below the surface (USGS 2016). These data match residents' experience of well water supplies.

During operation, other than the O&M building, the Project will consume no water and will therefore not impact groundwater supplies.

Project construction will involve localized but relatively shallow excavations for wind turbine foundations and buried cables. Due to their shallow and dispersed nature, BRE anticipates they will have no impact on local groundwater supplies at residences and farms. Compared to operation, though, Project construction will have greater water requirements to supply the concrete batch plant, dust suppression activities, equipment washing, and offices at the construction laydown yard. The application will include estimates of these water needs, identify potential supplies for this water, and assess potential impacts it could have on groundwater supplies for local residences and farms.

23.6 Stormwater

BRE will design and construct the Project in accordance with a Storm Water Pollution Prevention Plan (SWPPP) prepared in accordance with the applicable SPDES General Permit and the current New York State Standards and Specifications for Erosion and Sedimentation (E&S) Control. BRE or its BOP contractor will hire a NY-licensed engineer to prepare the SWPPP once the final Project configuration has been permitted and approved.

Preliminary design drawings in Exhibit 11 will show expected locations of any permanent stormwater features and preliminary sizes of culverts to be installed as part of Project access road construction.

Exhibit 23 will include a draft SWPPP showing typical E&S measures to be deployed at wind turbine sites and other construction locations. The draft SWPPP will also describe measures BRE will employ during and after construction to minimize stormwater runoff.

23.7 Hazardous Materials During Project Operation

Once operational, the Project will store a limited number of chemicals and petroleum on site. At the turbines sites, these materials will likely include mineral oil in pad-mount transformers, hydraulic fluid, and gearbox oil in the turbine nacelle.

Pad-Mount Transformers

Pad-mount transformers for 3.x MW turbines contain approximately 900 gallons of clear mineral oil. A tank in the transformer and integrated cooling fins contain the oil. Any oil leak would most likely be a slow leak at either the welded seams of the tank, or in the bushings where the power cables enter the tank. Catastrophic failures rarely occur, partly because the transformers contain no moving components, and partly because manufacturers design the transformers for a 25-year outdoor service life.

To identify any faulty pad-mount transformers likely to leak, BRE will perform infra-red or equivalent surveys of all pad-mount transformers within 90 days of the Project beginning commercial operations.

During Project Operations, visual inspections and fault detection equipment will help to identify any leaking pad-mount transformers. First, as part of regularly-scheduled wind turbine maintenance, BRE will visually inspect the pad-mount transformers and the nearby ground to identify any leaks. If technicians observe leaks, BRE will take prompt measures to prevent the leak from contaminating soil under the transformer, including possibly replacing or repairing the transformer. Second, the electrical collection system (ECS) will function as a fault detection system. A leaking pad-mount transformer will affect transformer performance and cause the circuit breaker for that ECS circuit to trip open. The open circuit breaker would alert BRE to a problem in the ECS circuit such as a pad-mount transformer with a low oil level.

Gearbox Oil

Each wind turbine will contain approximately 180 gallons of gearbox oil in the nacelle. Chances of gearbox oil or hydraulic fluid from the wind turbines impacting water resources are minimal because (i) leaks are infrequent, (ii) the turbine nacelle base includes a containment structure that helps to prevent oil from leaking out of the nacelle, (iii) most oil or fluid that leaks from the nacelle would be captured inside the turbine tower, and (iv) the volume of oil is relatively small and able to be contained by the various containments mentioned here.

Wind Turbine Hydraulic Fluid

Each wind turbine contains a relatively small quantity of hydraulic fluid (approximately 5 gallons). This fluid is held in components located in the nacelle, and for a leak to reach the ground it must breach the same containments and foundation paths described for the gearbox oil. Hydraulic fluid leaks occur, but are relatively infrequent. Over an approximate five-year period, while operating an average of 550 GE 1.x series turbines, Invenergy experienced no failures in operating turbines that involved hydraulic fluid leaks.[4] However, during construction and commissioning, crews identified approximately five failures where hydraulic fluid from the turbine was spilled. On-site crews quickly identified and corrected these leaks.

[4] From 2005 to 2010. Invenergy operated no GE turbines prior to 2005 and approximately 1,100 GE turbines by the end of 2010. 550 is a reasonable estimate of the average over this period.

Substation Transformers

At the substation, the main power transformer(s) will contain mineral oil, similar to that used for pad-mount transformers. Main power transformers will be physically larger than the pad-mount transformers and will contain over 1,000 gallons of mineral oil each.

Mitigation

As part of its O&M procedures, BRE will implement a spill prevention, control, and countermeasure plan (SPCC) that will identify hazardous materials to be housed on-site, precautions to minimize the risk of spills, and steps to be taken in the event of a spill including calling the DEC spill hotline. The Project O&M team will issue the SPCC prior to commercial operations, and BRE will provide a draft of the plan in Exhibit 23 of the Application.

BRE anticipates the only on-site materials subject to New York bulk storage regulation will be fuel oil or hydraulic oil tanks. Per discussion with Dan Rugar at the Clinton County Department of Health, except for sanitary wastewater, there are no county or town laws that would regulate BRE's storage of expected materials and wastes.

23.8 Hazardous Materials and Wastes During Project Construction

Fuels, lubricants and fluids used in construction vehicles will be in use and stored on site during construction. In addition, construction will use chemicals such as concrete plasticisers, antifreeze, and cleaning chemicals.

Fuel and hydraulic fluid leaks from construction vehicles present a risk of hazardous materials entering surface waters. Much of the diesel and gasoline powered equipment used for Project construction will also use hydraulic implements. During construction, a moderate risk of spills of diesel, gasoline, and hydraulic fluid exists from use of this equipment. BRE estimates the risk from such spills to be small due to the relatively small quantities of fluid contained in any one vehicle and the fact that most equipment will be operating at turbine sites that are located 1,000 feet or more from residences and their associated wells. To minimize the risk and mitigate impacts of any such spills, BRE will require its contractor to follow a SPCC drafted for construction activities, which will include (i) notification of the DEC spill hotline within two hours of a spill, (ii) spill clean-up in accordance with NYSDEC Final Commissioner Policy, CP-51, (iii) personnel training, (iv) and restrictions on refueling vehicles within 100' of a DEC wetland.

Exhibit 23 will include a draft of the Project construction SPCC.

23.9 Aquatic Species

Searches of the New York Natural Heritage Database, discussed in PSS Section 22, identified fish or other aquatic species in the area that were listed or of special concern. A report from the US FWS Information for Planning and Conservation (IPaC) database yielded similar results.

However, as discussed in PSS Section 23.2, the DEC designates several Project Area streams as T, meaning they support trout. Additionally, the Lake Champlain Chapter of Trout Unlimited, which covers all the tributaries to the Lake, suggested that the Ellenburg stretch of the Chazy

supports populations of brown, rainbow, and brook trout. These fish populations are mostly self-sustaining, but are also stocked annually by the DEC. Based on an interview with Rich Redman, president of the local chapter of Trout Unlimited, BRE anticipates these streams contain cold water fish communities including trout, creek chub, and slimy sculpin which are not listed but are valued as bait fish.

In addition to the abovementioned streams, smaller streams and creeks in the Project Area likely support minnows and other small fish that are a valuable part of the food chain. Also, ponds and beaver impoundments in the Project Area likely support warm water fish communities with species such as bass, sunfish, and shiners.

Project construction could have limited impacts on the streams and fish communities at locations where Project access roads and electric circuits must cross these streams. Exhibit 23 of the application will discuss where such impacts will occur and steps BRE proposes to avoid, minimize, and mitigate impacts to aquatic communities.

Project operation will not impact the streams and fish in the area.

Exhibit 24 Visual Impacts

24.1 Existing Conditions

The Study Area is a mix of farm properties and wooded parcels with no dominant topographic features. Several unincorporated hamlets line within the Study Area, but they are not densely populated. Residents and visitors to the Study Area can see wind turbines of the Marble River Wind Farm and Noble Wind Parks from most areas.

Exhibit 24 of the application will include a visual resource assessment (VRA) with a detailed description of the area's character and visual quality using methods and terminology used by the DEC standard for assessing visual impacts. The VRA will also include photosimulations and other materials to help assess the Project's visual impact

24.2 Potential Aesthetic Resources

PSS Appendices 24-1 and 4-4 list and map potential aesthetic resources located in the Study Area, including those portions of the Study Area in Canada. BRE identified these resources by reviewing the following references for the 15 categories of aesthetic resources in Section V(A) of the NYSDEC Program Policy DEP-00-2 *Assessing and Mitigating Visual Impacts* (NYSDEC, 2000):

- NYS Parks, Recreation and Historic Preservation website (State parks),
- NYS Department of Environmental Conservation website (fishing stream access points, State forests, snowmobile trails, and wild, scenic and recreation rivers),
- Clinton and Franklin Counties tourism websites,
- Adirondack Park State Land Master Plan (forest preserve land and scenic vistas);
- The Nature Conservancy maps (conservation areas),
- NYS Department of Transportation website (scenic byways),
- Canadian provincial parklands and roadways, large community centers, and land based major tourist attractions (i.e. Parc Safari),
- National Registry of Historic Places (listed historic sites), and
- Interviews with local residents to identify areas used for youth sports.

In summary, the potential aesthetic resources BRE identified as in the Study Area include:

- Travel corridors such as Military Highway, US Route 11, and State, county and local roadways;
- The Adirondack Park;
- Businesses located primarily at Ellenburg Corners;
- Schools, specifically the Adirondack Central School located at Ellenburg Corners;

- Residences located throughout the Study Area, but concentrated mostly in the hamlets of Ellenburg Corners, Ellenburg Station, Ellenburg Center, Churubusco, Altona, and Mooers Forks;
- Community recreation resources, and
- Snowmobile trails.

Notably, BRE's review did not identify any of the following in the Study Area: urban cultural parks or heritage areas; national wildlife refuges; national natural landmarks; national parks, recreation areas, seashores, or forests; national or state designated wild, scenic, and recreational rivers; scenic areas of statewide significance; Adirondack Park Scenic Vistas; state nature or historic preserves; Palisades Park resources; or Bond Act properties.

While not fitting any of the aforementioned categories, Historic Military Trail (U.S. Route 11) is a linear feature in the Study Area that qualifies as a resource of statewide significance. In additional a number of NYS DEC lands are scattered throughout the Study Area. Views will vary from the DEC lands; however, most of these tracts are wooded which makes it difficult to see wind turbines from the parcel. In addition, most of these parcels are at locations where if a visitor could see outside of the woods, they would have views of existing turbines to the west.

Lyon Mountain lies approximately 11 miles to the south of the Project Area boundary, well outside of the Study Area. But Lyon Mountain is worth noting because a fire tower atop Lyon Mountain is a known scenic overlook at the highest point in Clinton County. Viewers can reach this point via a strenuous 3.4-mile-long trail that rises 1,900 feet in elevation. On a clear day, fire tower visitors can see the Noble and Marble River wind turbines operating approximately 11 miles to the north, and the turbines from the Project would be similarly visible.

The application will have an updated version of PSS Appendix 24-1 that includes properties BRE's consultants identify in surveys as eligible for listing on the National Register of Historic Places, resources identified in preparing the VRA, and changes based on input from the local community and other stakeholders.

24.3 Landscape Similarity Zones

To help describe the visual character of the Project Area, the VRA will include a landscape similarity zones map that will show areas with common visual characteristics. BRE will prepare this map based on observations made during site visits, review of aerial photographs, and available GIS and maps data.

24.4 Viewshed Analysis

Exhibit 24 will include two maps showing visibility of the Project wind turbines in the Study Area. One map will consider screening from topography only, and the second will consider screening from topography and mature vegetation. Both maps will be based on USGS topographical data. To create the second map, BRE will rely on vegetation data from the USGS National Land Cover Data (or similar) with adjustments made by comparison to aerial photographs taken in November 2015.

BRE will color code the viewshed maps according to number of turbines visible from any given location. Each color will represent a grouping of turbines (e.g. 1-5 turbines visible).

In addition to the viewshed maps of the Study Area, BRE will also provide versions of the maps showing visibility for areas within 10 miles of the outer most turbines. For areas between 5 and 10 miles from the outermost wind turbines, BRE will note resources of statewide significance, as recommended by the NYSDEC Visual Policy.

The VRA will describe the methodology used to prepare the maps, including sources of data and software used. The viewshed maps will assume:

- Installation of the tallest wind turbine BRE anticipates installing.
- If any portion of a turbine could be seen, it is "visible" from that location.
- All trees are 50 feet tall.
- Buildings and other built structures provide zero screening.

In addition to presenting the viewshed maps, the VRA will summarize various analyses of the viewshed maps that can be used to quantify the Project's visual impact. These analyses will include visibility acreage, number of turbines visible from aesthetic resources, and distances between aesthetic resources and the nearest turbine.

24.5 Photographic Simulations

The VRA will include photographic simulations of the Project from multiple Study Area locations. BRE proposes the photographic simulations be performed from the following locations that BRE has selected from the PSS Appendix 24-1 list of aesthetic resources as having views that are typical, experienced by many viewers, or important to the local community or the state:

- In front of the Northern Adirondack School in the hamlet of Ellenburg,
- Hamlet of Altona,
- Military Highway,
- St. Antoine-Abbé Church in Franklin, Quebec,
- State, county, and local roadways based on viewshed analysis and field confirmation,
- The Gulf Unique Area or other NYS DEC lands based on viewshed analysis and field confirmation, and
- A location along the Adirondack Park Blue Line.

BRE will adjust the list of simulations based on field evaluation, stakeholder input, and review of the viewshed maps.

Exhibit 24 will also include a simulation of the proposed Project electric interconnection line. BRE does not propose the VRA include a photographic simulation of the Project access roads. Due to the relatively low topographic variation in the Project Area, Project access roads will require minimal levels of cut and fill, and therefore will have relatively minor visual impacts.

The simulations will be based on single frame digital photographs taken with a lens setting of approximately 50mm in order to simulate normal human eyesight relative to scale. For each simulation, the VRA will provide a photo of existing conditions for comparison.

24.6 Mitigation

The NYS DEC visual policy outlines a series of potential mitigation measures for projects to consider. BRE will review these potential measures, and in Exhibit 24 it will identify any that it judges are applicable and potentially effective for the proposed Project and its potential impacts.

24.7 Cross-Section Figures

BRE proposes no cross-section figures for the application, as none are needed to demonstrate sight lines from specific resources of statewide significance. If the VRA identifies a resource of statewide significance in the Study Area, BRE proposes the VRA include a photographic simulation, and not a cross-section figure, to evaluate the visual impact to this resource.

24.8 Impact Assessments

The VRA will contain a table with the following information for each of the Study Area aesthetic resources:

- Potential number of visible turbines,
- Landscape unit (e.g. rural agricultural, community center),
- Viewer groups (e.g. local residents/workers, travelers),
- Distance to nearest turbine,
- Distance zone (i.e. foreground, middle-ground, background), and
- Whether viewers are stationary or moving.

BRE will rate the visual simulations using an abridged form of the Bureau of Land Management (BLM) Visual Resource Management (VRM) procedure. Specifically, it will assign numerical values to the contrast of the Project against land use and surrounding activities, landform, and vegetation. Results of this assessment will be presented in the VRA.

24.9 FAA Light Viewshed

The application will discuss FAA-required lighting in Exhibit 18. However, the VRA will include a viewshed map showing the portions of the Study Area where FAA turbine lights might be visible. The map will consider screening effects of topography and vegetation.

24.10 Shadows

Background

Wind turbines will cast shadows when the sun shines from behind the turbine, and if the wind is blowing when a shadow is cast, the shadows from the rotating blades can “move” across the

ground. If these moving shadows are cast on a building with an un-curtained window, the alternating shadows can produce an “on and off again” affect referred to as “shadow flicker.”

Shadow flicker will not occur every day or for extended time periods, as it can only occur when the sun is out, the turbine is rotating, and the position of the sun and receptor are in proper positions. Shadow flicker is most pronounced in northern latitudes during winter months because of the lower angle of the sun in the winter sky. However, it is possible to encounter shadow flicker at any time of the year for brief periods before sunset and after sunrise. For houses with a wind turbine to the east, shadows could occur shortly after sunrise. For houses with a wind turbine to the west, shadows could occur before sunset.

Distance from the wind turbine also affects shadow flicker intensity. With greater distance from a wind turbine shadows become less intense and less sharp, reducing the potential impact of shadow flicker if it occurs. Beyond ten turbine rotor diameters (approximately 4,500 ft) the intensity of shadows from wind turbines is often considered negligible (Harding et al 2008, Smedley et al 2010).

Potential Impacts

The primary concern with shadow flicker is the annoyance it can cause for adjacent residents. As discussed in PSS Exhibit 18, some people have postulated that wind turbines could trigger epileptic seizures in vulnerable individuals, but this has not been found to be a real impact.

Shadow Analysis

Exhibit 24 will include the results of a computer shadow analysis performed using the following assumptions:

- Wind turbine locations;
- Locations of inhabited residential structures, commercial and community buildings;
- Wind turbine dimensions for the tallest anticipated wind turbine;
- Blade rotation speed;
- Shadows are not significant, and won’t be evaluated, for locations more than 10 times the rotor diameter away from the turbine base;
- Monthly sunshine probability will be based on weather data from the National Oceanic and Atmospheric Administration (NOAA) or other suitable resource for the nearest metropolitan area;
- Annual wind direction and frequency will be based on site specific meteorological data; and
- Topography from the USGS’s National Elevation Dataset (NED) or suitable equal.

The shadow analysis will report the annual average expected shadow hours at every year round inhabited residential structure within ten times the rotor diameter of any proposed wind turbine. Any community buildings, churches, commercial buildings, or schools within this distance will also be evaluated. If more than one wind turbine will cast shadows on a receptor, the analysis will include shadow hours from all turbines that could cast shadows on the receptor.

Results of the shadow analysis will also be reported on a map shaded to show the annual average expected shadow hours for all of the Study Area.

Evaluation Criteria

None of the Project Area towns, the host county, or New York State have published regulations or guidelines establishing an acceptable amount of shadow-flicker impact on a potential receptor. However, many European countries have identified 30 hours of shadow-flicker as an allowable threshold and suggested anything above this level would be considered a nuisance and require mitigation. Towns and wind companies have employed this 30-hour threshold in studying many of the wind projects built in New York and elsewhere in the United States and BRE proposes using it here.

Exhibit 24 will identify any year-round houses that the shadow analysis predicts will experience average annual shadow hours of 30 hours or more. For those houses, Exhibit 24 will discuss whether the owner is participating in the Project, potential for vegetation to screen the shadows, and mitigation measures that BRE could employ to minimize the impact of the shadows.

Exhibit 25 Effect on Transportation

25.1 Access Road and Driveway Designs

BRE will strive to construct access roads that can serve Project needs during both construction and operation with minimal reclaiming required after construction. Generally, the routing and grading of the access roads is driven by the requirements of the wind turbine component delivery vehicles which are oversized highway vehicles. Accommodating the turning requirements of these vehicles also requires large radii at locations where access roads intersect public roads.

Wind companies often design access roads and driveways with minimum radii in the range of 130 to 150 ft. In its Application, BRE will specify the turning radius it used to design the Project access roads and driveways.

Exhibit 11 will include site plan drawings that show the routing of access roads and proposed driveway locations.

Exhibit 25 will include figures showing a typical access road cross section and driveway at a location where a drainage ditch runs alongside the road. The cross section figure will show the width of the gravel travel lane, any cleared and compacted shoulders, and areas that might be used for installation of buried electrical collection circuits, soil stockpiles, and cleared timber. The driveway figure will show the planned radii of the access road and the required length of culvert for the drainage ditch.

25.2 Modifications to Public Road Intersections

To accommodate large-radius delivery vehicles, construction of a wind project often requires modification at locations where two public roads intersect. Modifications can include adding gravel at inside corners, adding gravel to widen roads where vehicles enter the intersection, and temporarily moving roadside signs. Usually the construction company makes these modifications as a temporary measure, returning the intersection to pre-constructing conditions after it completes the wind turbine deliveries. But in some cases, local jurisdictions prefer some or all of the modifications be left in place.

BRE anticipates it will need to modify some intersections to support Project construction, but at this time it is uncertain on the location and extent of these intersections. Locations and specifics of intersection modifications will depend on delivery vehicle routes, types of delivery vehicles, road restrictions that may be in place at the time of deliveries (e.g., summer road work can alter planned delivery routes), road widths, signs and intersection configurations.

Exhibit 25 will include an assessment of locations where BRE anticipates intersection modifications and the extent of modifications expected at each location. The assessment will evaluate possible wind turbine delivery routes and identify at least one that will allow deliveries to the turbine sites from a major interstate without passage through any major obstacles such as underpasses too low to allow passage or bridges that cannot support expected weights.

For the identified delivery route, the assessment will identify locations where vehicles would turn onto different roads and any modifications expected at these intersections. For intersection where BRE anticipates modifications, Exhibit 25 will include preliminary drawings showing existing conditions and proposed modifications. Existing conditions will include topography, paved areas, culverts, signs and other items that could affect the ability of delivery vehicles to navigate the turns.

25.3 Local Road Survey

PSS Appendix 25-1 shows the town, county, and state roads in the Project Area. Local towns have designated several of these roads as seasonal roads, meaning the towns do not plow snow from them and, thus, they have no year round residences. PSS Appendix 25-1 shows locations of these seasonal roads based on BRE's discussions with town high superintendents.

Historically, more public roads existed in the Project Area, but local governments abandoned several road segments that have now reverted to trails on private land. Some of these private trails still show up on internet maps and other GIS map layers even though they are not maintained public roads. Use of these routes for access roads may provide a benefit of reduced tree clearing, but some pass through wetland areas and may result in more wetland impacts or longer road routes compared to use of more direct but new routes. BRE will evaluate these factors as part of its design of the access roads.

Military Turnpike (state route 190) and US Route 11 are the main public thoroughfares serving the Project Area. Both are two lane paved highways seemingly in good condition. Other than these two roads, a network of county and town roads serve the Project Area. The majority of the town roads and county are paved roads surfaced with chip and seal or hot mix asphalt, but some of the town roads are gravel.

Traffic during Project construction, particularly from concrete and gravel trucks could damage town and county roads in the Project Area where construction traffic volumes will be greatest. To mitigate such impacts, BRE intends to enter into road agreements with the towns and county that will require BRE to (i) check roadways after to construction to verify that roadways are in a condition no worse than what existed immediately prior to Project construction, and (ii) repair or resurface roads that are shown to have been damaged by Project construction. Further, BRE proposes to conduct a road survey prior to construction to identify bridges or weak road spots where BRE may elect to install steel plating or other reinforcements to minimize road impacts during construction.

Exhibit 25 will include a preliminary road survey that characterizes the condition of the local roads at the time of the application; identifies any bridges, culverts or other locations that could benefit from reinforcements during construction; and provides load-bearing and structural information of the roads to the extent such information is readily available.

25.4 Traffic

Once operational, the Project will create no appreciable increase in local traffic. BRE will employ a permanent staff of approximately ten employees who will report to work at the O&M building for regular business hours. During the day, these employees will drive in standard pickup trucks over the wide geographic area of the Project Area, usually with two employees to a truck.

Project construction will generate considerably more traffic than Project operation. But due to the already low traffic volumes in the area, and the fact that construction traffic will be spread over a large geographic area, BRE does not anticipate Project construction will create noticeable traffic impacts. Construction traffic can be attributed to the following major activities:

- Mobilization: Pickup trucks, delivery of construction trailers, delivery of earthmoving equipment.
- Road construction: Gravel delivery trucks.
- Foundation construction: Concrete delivery trucks, re-bar delivery trucks.
- Turbine deliveries and installations: Turbine component deliveries, main crane deliveries and installation.
- Electrical collection system: Cable deliveries, directional boring equipment.
- Commissioning: Pickup trucks.

For the activities above, Exhibit 25 will estimate duration and vehicle quantities, sizes, weights, and trip frequencies by time of day.

Of the above-listed construction activities, BRE expects that turbine deliveries will most likely cause minor traffic delays in the Project Area. These minor delays are likely to occur when turbine component delivery vehicles first navigate tight intersections. These delays typically last less than approximately 10 minutes and do not occur on subsequent deliveries once crews determine the most efficient way for vehicles to navigate the intersections. Impacts of such delays will be mitigated by escort vehicles, flag persons, or temporary traffic signals that will slow or stop traffic temporarily.

To help assess the impact of Project construction traffic on existing traffic patterns, Exhibit 25 will include a road use survey, with traffic patterns, accident rates, and school bus routes. To help assess impacts to emergency services, Exhibit 25 will include a map showing locations of emergency services providers relative to the Study Area.

25.5 Airport Traffic

Like telecommunication towers, tall buildings, and other tall structures, wind turbines can present obstacles to aircraft following low trajectories near airport runways. Table 25.5 lists the commercial airports in the vicinity of the Project.

Table 25.5 Public-Use Airports in the Vicinity of the Project

Name	FAA Code	Owner	# Runways	Daily Operations	Distance
Plattsburgh International	PBG	Clinton County	1 paved	35	20 miles
Malone-Dufort	MAL	Town of Malone	2 paved	24	20 miles
St. Jean	CYJN	n/a (publically-owned)	3 paved	n/a	28 miles
Franklin County State	FSO	State of Vermont	1 paved	28	29 miles
Adirondack Regional	SLK	Town of Harrietstown	2 paved	122	36 miles
Burlington International	BTV	City of Burlington	2 paved	194	38 miles
Lake Placid	LKP	No. Elba Park District	1 paved	33	41 miles

Notes:
1. Distance is the shortest distance between one of the airport runways and the Project Area.
2. Owner, runway, and daily operations information are from www.airnav.com.

The nearest public-use airports are Plattsburgh International Airport (PBG), located in Plattsburgh, NY, approximately 20 miles southeast of the Project Area and Malone-Dufort Airport (MAL), located west of Malone, NY, approximately 20 miles west of the Project Area. Existing projects currently operate closer to these airports than the Project. The Altona Wind Park lies about 12 miles from PBG, and the Chateauguay Wind Park lies about 12 miles from MAL. Turbines for both projects stand 386 feet tall.

Based on its preliminary discussions with PBG airport officials, BRE does not anticipate the Project turbines will impact air traffic to the Plattsburgh airport. However, despite the relatively large distance between the Project and runways, the Project could impact instrument flight paths and other navigation tools used by public-use airports.

The FAA will identify potential impacts to air navigation as part of its review that commences upon submittal of Notice of Prosed Construction or Alteration by BRE. FAA requires a Notice of Proposed Construction or Alteration be filed prior to construction of a structure 200 feet or taller and that such Notice include planned location of the proposed installation. BRE will file such notices for every planned wind turbine site later in 2016 after turbine sites have been adjusted to account for results of field studies currently underway. Generally, within approximately 90 days of submittal of a notice, the FAA will complete its evaluation and issue a Determination of No Hazard, Determination of No Hazard with Conditions, or Determination of Presumed Hazard. Because the turbines exceed 499 feet, they will automatically exceed FAA Part 77 Obstruction Standards, and BRE anticipates the FAA will issue a response of Presumed Hazard for all of the wind turbines. BRE will consult with FAA to identify specific impacts to air traffic and potential mitigation.

Exhibit 25 will include any determinations BRE has received from the FAA at the time of the application.

Exhibit 18 will address plans for installation of FAA obstructions lights on the wind turbines.

25.6 Military Airspace

The nearest military airbase to the Project Area is 122 miles southwest at Fort Drum, NY. BRE anticipates that because of this distance and because wind turbines currently operate approximately 16 miles southeast of Fort Drum (Maple Ridge wind project) and in other towns in

the Study Area, the Project will not impact air operations at Fort Drum or other air bases. As part of the FAA reviews, FAA will submit the turbine coordinates to the DoD Siting Clearinghouse. BRE will include any results of the DoD Siting Clearinghouse in Exhibit 25.

Exhibit 26 Effect on Communications

26.1 NTIA Submittal

Wind turbines have the potential to affect federal radio communications and radar. The federal government, through the National Telecommunications and Information Administration (NTIA), provides a method for wind farm developers to check whether or not a proposed project is likely to interfere with federal telecommunications including those that use microwave, radio and radar technologies. Nineteen federal departments and agencies which make up the Interdependent Radio Advisory Committee (IRAC) have the opportunity to assess whether interference is likely from a proposed project.

BRE will submit a request to the NTIA to determine the potential for the Project to interfere with federal radio and radar equipment, and Exhibit 26 will include the NTIA's response.

Specific topics that the NTIA correspondence may address, such as Doppler weather radar, will be addressed in Exhibit 26 subsections dedicated to that topic.

26.2 Microwave Communications

Microwave communications are line-of-sight links that pass between antennae usually located about 10-40 miles apart on towers on local high spots. Microwave transmissions can be weakened by wind turbine structures or blades passing through the signal path.

The FCC licenses microwave transmissions and keeps records on the location of licensed microwave paths. Users may also install microwave equipment and operate it without an FCC license. Such installations are legal, but are vulnerable to interference if other users are operating in a similar frequency.

BRE identified the FCC-licensed microwave paths passing through the Project Area as of March 2016. PSS Appendix 26-1 shows these paths. These paths include those used by the Clinton County Office of Emergency Services. BRE's preliminary review of these paths against the PSS layout finds at least five of the turbines may be in locations where turbine blades could pass through a microwave path.

For the Project layout in the application, BRE will adjust turbine locations to minimize or eliminate potential for turbine blades to pass through microwave paths. Exhibit 26 will include maps to demonstrate any potential for interference between the wind turbines and FCC-licensed microwave paths. These maps will show wind turbines in the vicinity of microwave paths, the maximum width of the microwave path, and the rotor-swept areas of the proposed wind turbines.

26.3 AM/FM Radio

Wind turbines can attenuate the strength of AM and FM broadcasts when the turbines are located close to a broadcast antenna. In general, wind turbines will not affect broadcasts from

AM transmitters that are 2 miles or more away, and they will not affect broadcasts from FM transmitters that are 2.5 miles or more away. Turbines could also operate closer than these distances to AM and FM transmitters in many instances, but these are basic limits beyond which there should be no problem in any situation.

BRE is not aware of AM or FM radio towers in the Study Area. BRE's review of publically available information found the nearest communications tower to be on Rand Hill in Beekmantown, 13 miles south of the Project Area.

26.4 Telephone

Wind turbines do not affect land line telephone communication. Similarly, wind turbines do not affect cellular telephone communications, which operate as radio frequency devices unaffected by wind turbines. In fact, most wind farm O&M teams use cell phones to communicate when working on the wind farm. Further, cell phone tower operators recognize that wind turbines do not affect their transmissions. In the Town of Sheldon, Verizon Wireless, a major provider of cellular telephone service, installed a cellular tower in a field where five wind turbines were located within 2,000 feet of the tower.

The Project will have no impact on telephone service, thus no mitigation is required.

26.5 Television

Wind turbines do not affect cable television or satellite television (aka "direct broadcast service"), but can disrupt reception of off-air broadcast television.

The level of disruption to off-air broadcast television depends on factors such as location of the broadcast source, location of the turbines, and the television antennae being used. In Invenergy's experience, these impacts are difficult to predict prior to the Project being in operation, and after operation they can often be corrected by installing specialized antennae. In cases where an antenna change does not correct the problem, alternate measures such as switching to cable or satellite service or installing local booster antennas has proven effective.

Based on discussions with local residents and Time Warner, the local cable television provider, Time Warner offers cable television service along Military Turnpike, US Route 11, and some of the roads branching off of these two main roads. Despite the availability of cable television, the majority of residences, in the Study Area receive television via off-air broadcasts.

Exhibit 26 will include any updates to the above information and proposed mitigation for potential television service disruptions.

26.6 Weather Monitoring Radar

The National Weather Service (NWS) of the U.S. Ocean and Atmospheric Administration (NOAA) operates NEXRAD Doppler radar systems at several locations across the country for

the purpose of monitoring weather. These systems can identify precipitation or violent thunderstorms up to approximately 80 nautical miles (92 miles) of the radar location.[5] When wind turbines are installed in an area monitored by the current generation of NWS Doppler radars, the radar will detect the movement of the wind turbine blades and report it as high levels of activity similar to what would be seen with an extreme thunderstorm. Such representations inhibit the ability of the NWS to detect true thunderstorms in the area of the wind turbines.

The nearest Doppler radar to the Project Area is approximately 36 miles away in Burlington, VT. Given the proximity of the Project Area to this radar, the Project's wind turbines might appear as severe weather on the NWS Burlington radar images. Notably, however, the existing wind turbines around the Franklin and Clinton county line, which are 43-60 miles away from Burlington do not appear on radar images, but the Altona wind turbines which are 30 miles away from Burlington do seem to appear on the Burlington radar images.[6]

At other locations where wind turbines operate in the range of an NWS Doppler radar, NWS and turbine owners have agreed on a procedure for a limited number of temporary shutdowns of the wind turbines during periods when forecasters desire greater visibility to check on extreme weather events in the vicinity of the wind turbines. In addition, further development of the NWS Doppler radar software might be able to filter out the movement of the turbine blades so that it is not reported as weather activity.

BRE will consult with NWS on the operations of its Burlington radar, possible impacts to operations, and possible mitigations. Results of this consultation will be provided in Exhibit 26 of the application.

26.7 Air Traffic Radar

Potential effects of the Project on air traffic radar are discussed in Exhibit 25.

26.8 DOD Radar

Similar to the potential impacts on Doppler weather radars, wind turbines have the potential to affect long range radars operated by the Department of Defense (DOD). Effects may include reduced radar sensitivity, increase in radar clutter, and potential areas of lost coverage. For these effects to occur, a wind turbine must be within the line-of-sight of the radar.

Through the FAA, the DOD provides a preliminary screening tool to provide information for wind energy developers regarding the potential impacts to long range radar(s) and military operation areas prior to filing Notices of Proposed Construction with the FAA. The long range radar tool provides a desensitized figure indicating whether a particular geographic area is within line-of-sight of a long range radar.

[5] http://www.srh.noaa.gov/radar/radinfo/radinfo.html

[6] https://www.wunderground.com/weather-radar/united-states/vt/burlington/cxx/

The preliminary screening tool produces a color-coded map, with colors indicating the likelihood of the turbines impacting air defense and homeland security radars. Green, yellow, and red indicate no, likely, and highly likely anticipated impacts, respectively. Regardless of the results of the preliminary screening tool, the FAA obstruction evaluation process will provide the definitive analysis of impacts to air defense and homeland security radars.

BRE has completed a screening of the Project Area using the preliminary screening tool. The screening tool shows the Project Area to be 'yellow,' indicating that impacts are likely to impact air defense and homeland security radars.

Exhibit 26 will include available results of the FAA's reviews of BRE's notices of proposed construction that deal with potential impacts to military radar systems.

26.9 Emergency Services Communications

County fire, sheriff, and emergency medical services providers often operate radio and microwave communication systems to manage dispatch of providers in the county. Depending on the configuration of these systems, particularly if they employ microwave links, wind turbines could affect these communications.

As part of its PIP implementation, BRE met with the Clinton County Office of Emergency Services (CCOES) and learned that that the County employs a system of microwave paths and radio towers to communicate with local fire departments, sheriff deputies, ambulances, and public buses. Radio towers in Churubusco, Ellenburg and Champlain communicate with vehicles in the field and microwave links between these towers transmit communications between CCOES headquarters and these radio towers.

All of the CCOES radio towers are outside of the Project Area and should not be affected by the Project.

The microwave portion of the system is an FCC-licensed 800 MHz system that is addressed in the portion of this PSS Exhibit on microwave communications.

26.10 School District Communications

School districts sometimes operate radio and microwave communication systems to manage dispatch of school buses. Depending on the configuration of these systems, particularly if they employ microwave links, wind turbines could affect these communications.

As part of its PIP implementation, BRE met with superintendents of the two school systems that serve the Project Area. Both use Land Mobile System two-way radios designed to operate reliably in a no-line-of-sight environment unlikely to be affected by turbines. Comsearch, a telecommunications consulting firm, recommends a conservative distance of 78 meters between fixed base stations and wind turbines to prevent possible interference. Turbine setbacks will ensure this distance is more than met.

26.11 Buried Communication Cables

Based on discussions with local Verizon representatives, BRE understands a limited number of buried copper and fiber optic communication cables exist in the Project Area, predominantly along public roads. To minimize disruption to these cables, BRE consulted with Dig Safely NY (DSNY) to identify steps toward obtaining maps of these cables. As advised by DSNY, BRE submitted a 'design ticket' to DSNY, which should initiate a process resulting in utilities and DSNY providing planning-level maps to BRE.

Exhibit 27 Socioeconomic Effects

27.1 Construction Employment

BRE estimated construction jobs and expenditures using the National Renewable Energy Laboratory's (NREL) Jobs and Economic Development Impact (JEDI) model. The JEDI model estimates 216 jobs created on-site during construction, with estimated wages of $17.7 Million. These jobs will include on-site construction management and administration, supervisors, machinery operators, ironworkers, carpenters and other trades assembling turbines and foundations, drivers hauling gravel for roads and equipment, laborers, electricians installing buried cables and electrical equipment inside and adjacent to turbines.

Exhibit 27 of the application will include an updated estimate of construction jobs and expenditures based on Invenergy's experience building wind projects in New York and elsewhere. The updated estimate will provide estimates by quarter and discipline.

27.2 Construction Expenditures Locally

BRE will purchase many of the basic materials and services required during Project construction in the North Country region. These will likely include gravel for roads, equipment rentals, fuel, re-bar, concrete, miscellaneous tools, meals and hotel rooms. Based on Invenergy's experience constructing other wind projects in New York, BRE estimates these local purchases will exceed $14 million.

Exhibit 27 will include any updates to this estimate.

27.3 Construction Secondary Employment

In addition to the direct employees hired by Invenergy and its contractors, the Project will create additional jobs in the area through indirect effects of Project spending for materials and hiring of contractors for various services. The JEDI model estimates this to be over 500 jobs.

Exhibit 27 will include an updated estimate on secondary employment and economic activity. Any economic multipliers used in the analysis will be clearly specified.

27.4 Operations Employment

BRE plans to maintain the Project using a permanent staff based at an O&M building in the Project Area. BRE estimates it will hire one permanent employee for every ten turbines installed, or 10-15 employees for the full project. BRE's estimates the annual payroll for this team, including cost of benefits, at $1.0 to $1.5 Million.

Exhibit 27 will include a preliminary list of on-site O&M positions and a range of compensation for each.

27.5 Operations Expenditures

Project O&M teams generally purchase or contract for a wide range of goods and services provided by businesses in the local community, including fuel, tools, vehicle maintenance, snow plowing services, cleaning services, and landscaping services. BRE estimates this spending will average $90,000 during a typical year.

Exhibit 27 will include an updated estimate of operations expenditures by category of expenditure.

27.6 Operations Secondary Employment

Operations expenditures are relatively small compared to construction, and thus fewer indirect jobs are likely to be created. BRE anticipates that one full time equivalent job will be created as a result of a contract to provide winter road maintenance services.

Exhibit 27 will include any updates to this estimate.

27.7 School District Services Required

Given the planned number of full time employees for the Project and the fact that BRE plans to hire the majority of its employees from the local community, construction of the Project should add few if any new students to the school district.

27.8 Additional Services Required of Emergency Responders

The sheriff, fire, and emergency response departments have adequate personnel and equipment to respond to routine emergency needs (e.g., traffic accidents or medical conditions such as heat stroke or heart attack) during Project construction and operation.

During construction, BRE could be vulnerable to vandalism problems that would require involvement of the Sheriff's office, but based on experience with other New York wind projects, BRE does not anticipate this to be a significant impact.

Presence of the Project will not create a significantly higher risk of fire or accidents beyond what the local fire and emergency response departments are capable of handling.

BRE crews will train its employees to rescue workers that may be injured inside the turbine (e.g., tower rescue, working in confined spaces, high voltage, etc.) so that emergency response personnel can tend to any injuries on the ground and outside of the turbine.

Any fires in the wind turbines would be handled by allowing the fire to burn out with the local fire department securing the site and attending to any debris that may fall to the ground. The local fire departments should be able to provide this level of service, and based on meetings with local fire departments, they provide this level of protection for existing wind turbines in the area. BRE will coordinate with the fire departments on emergency procedures as discussed in PSS Section 18.

Exhibit 27 will include any adjustments to the fire and rescue plans above that result from consultations with local emergency response providers.

27.9 Additional Services Required of Municipal Governments

Construction of the Project should not require significant changes to or costs of services provided by local governments.

As discussed in Exhibit 25, once operational, Project traffic on county and town roads will be minimal and will not change the maintenance requirements or costs of these roads.

Local municipalities do not provide public water supply and wastewater services, and thus the Project will place no water or wastewater requirements on the municipalities for the limited needs of the O&M building.

BRE and its contractors will dispose of solid waste generated during Project construction and operation as discussed in PSS Section 15.

27.10 Impacts on Taxing Jurisdictions

The following entities assess taxes on parcels in the Project Area:

- Clinton County
- Towns of Clinton, Ellenburg, Mooers, Altona
- Central School Districts: Northern Adirondack and Northeastern Clinton
- Fire Districts: Altona, Churubusco, Ellenburg, Ellenburg Depot, and Mooers Volunteer Fire Departments

Exhibit 3 provides maps of the districts of the above entities and the preliminary locations of Project wind turbines. In general, these districts will benefit from increased taxes the Project will pay based on the number of wind turbines installed in their district.

By application submitted in July 2016, BRE requested financial assistance from the Clinton County Industrial Development Agency (IDA) that would exempt the Project from paying county, town, and school taxes. The IDA assistance would not exempt the Project from fire department taxes which would be levied based on the assessed value of the wind turbines and the fire departments' tax rate. In exchange for the IDA's tax exemptions, BRE would enter into a Payment-In-Lieu of Taxes (PILOT) agreement that would require it to make annual payments based on the number of megawatts of generating capacity installed. BRE also proposed entering into Host Community Agreements (HCAs) with the host towns that would require BRE to make annual payments to each town based on the number of megawatts of generating capacity installed in the town. Based on the terms of similar agreements entered into by previous Clinton County wind projects and a nominal project size of 449 MW, BRE estimates annual payments by the Project will be:

- $2.2 Million in PILOT payments,

- $1.3 Million in HCA payments, and
- $0.4 Million in Fire Department taxes, based on current tax rates.

Exhibit 27 will include an analysis breaking out the above estimated payments by taxing jurisdiction and comparing this to the entity's most recent tax levy.

27.11 Smart Growth Compliance

The NYS Smart Growth Infrastructure Policy Act requires public infrastructure projects to minimize unnecessary urban sprawl. BRE is not a public infrastructure project and will not contribute to urban sprawl. Nevertheless, BRE will demonstrate in Exhibit 27 that even if the Project were to be a "public infrastructure project", its construction would be consistent with or not conflict with the criteria set forth in Environmental Conservation Law, section 6-0107(2).

Exhibit 28 Environmental Justice

Environmental Justice refers to the fact that historically, power generation and other industrial facilities often have had disproportionally large negative effects on air and water quality in the areas immediately surrounding them, commonly impacting disadvantaged socioeconomic groups. The NYSDEC maintains a digital tool called GIS Tools for Environmental Justice that identifies areas where significant portions of the population are at or below the federal poverty level.

As described in the Project's Public Involvement Plan (PIP) no environmental justice areas exist in the Study Area. The closest environmental justice areas to the Project Area are:

- Census Block Group ID 360191004001 is located approximately 8 miles south of the Project Area. This area is in Clinton County in and near the Village of Dannemora. It is categorized as an urban area, and 2000 census statistics show 58% are minorities and 17.33% are below the federal poverty level.
- Census Block Group ID: 360191006002 is located approximately 12 miles southeast of the Project Area. This area is in Clinton County in the vicinity of Beekmantown. It is categorized as a rural area, and 2000 census statistics show 1.6% are minorities and 29.4% are below the federal poverty level.

Due to the distance between these areas and the Project Area, BRE does not expect to negatively impact these communities, and further examination is not necessary.

Exhibit 29 Site Restoration and Decommissioning

29.1 Decommissioning Criteria

BRE will decommission the Project at the end of its useful life, which BRE estimates will be 40 years or more after the start of commercial operation. After decommissioning, the Project Area will be suitable for essentially all uses for which it is currently suitable, including farming, timbering, and hunting – the three primary current uses.

As part of decommissioning, BRE would remove wind turbines, pad-mount transformers, foundations to a depth of 3 feet below grade, overhead collection and transmission lines, and the Project substation. Roads would be left in place for landowner use.

Exhibit 29 will include a more specific decommissioning plan that will describe conditions for when it would be appropriate to decommission the Project, any further details on the steps to be taken as part of decommissioning, and possibilities for salvaging or recycling removed materials.

29.2 Decommissioning Funding

Exhibit 29 will contain an estimate of the net cost to decommission the facility according to the criteria described in the exhibit. The net cost will factor in the estimated revenues that could be earned by selling Project components for re-use or scrap.

Exhibit 29 will also discuss possible mechanisms for ensuring necessary funds are available to complete decommissioning at the appropriate time.

29.3 Decommissioning Commitments

BRE anticipates its host community agreements with towns will include provisions for decommissioning the Project. Exhibit 29 will provide further detail on how these plans can be incorporated into town agreements.

Exhibit 30 Nuclear Facilities

Exhibit 30 is not applicable and will be empty

Exhibit 31 Local Laws and Ordinances

31.1 Local Laws

PSS Section 4 summarizes the status of zoning in the Project Area towns, and PSS Section 6 summarizes the local laws regarding wind energy in place in the four host towns. PSS Appendices 31-1, 31-2, and 32-3 provide copies of the local laws and letters from the towns confirming these are the most current versions of these laws. No other local laws, including those of a procedural nature, apply to the Project.

All of the towns except Mooers have wind energy laws. BRE presented the Project to the Mooers Town Board in August 2015 and received no negative feedback. The procedural requirements of the local wind energy laws are supplanted by PSL Article 10. These include:

- for Clinton, the following sections of Local Law #1 of 2005: Sections 5(B), 10, 11, 17, 20 and 30, the last, as amended by Resolution #52 of 2016;
- for Altona, the following sections of the Zoning Law (Local Law #1 of 2004, as amended by LL #1 of 2006: Sections 1213, 1220 – 1222, 1228, 1231 and 1241(A); and
- for Ellenburg, the following sections of Local Law #4 of 2005: Sections 5, 11, 12, 18, 19, 21, and 32(A)(1) and (2).

Exhibit 31 will provide any updated laws, amendments, or resolutions, applicable to the Project.

31.2 Variations from Local Law Requirements

The Project will comply with all substantive requirements of the local laws, with the exception of the following:

Tip Height Limits

As described in PSS Section 6.1, BRE's anticipated turbines will exceed the 400 – 440 ft height limits of the three existing local laws. Exhibit 31 will detail why building a wind project with tip heights less than 400 feet would require use of older wind turbines that would not be able to produce electricity at a cost competitive with other wind projects under development. Ultimately, this would result in the Project not receiving financing and not being built.

Construction Time Restrictions

The following town law sections restrict times of day for wind project construction:

- Clinton wind law Section 12(A)14. Restricts construction to 7 am to 7 pm.
- Altona wind law Section 1223(A)14 and Ellenburg Section 13(A)14. Restrict construction to 6 am to 8 pm, unless unduly hot weather requires different timing and subject to towns' approval of a variance.

Exhibit 31 will explain how these time of day restrictions would unreasonably impact a contractor's ability to build a project efficiently in the Project Area, where there is a relatively short summer construction season with long summer days and would add significantly to Project costs. Contractors need to make best use of these long, warmer days especially when factoring

in likely down time due to wet and windy conditions, both of which restrict the ability to continue construction and wind turbine assembly.

BRE will request that the Siting Board allow performance of construction activities during all hours.

31.3 Building Codes and Inspections

BRE will design and construct the Project to the codes specified in PSS Appendix 11-1. Further, during construction BRE will hire, or it will require its contractor to hire, a third party company to perform quality inspections to verify the project is built according to the design specifications. These inspections will include review of wind turbine foundations at various stages of construction.

In its experience having several wind farms constructed since approximately 2006, Clinton County has developed a policy where it will not perform building code inspections of wind turbine construction, provided that the company building the wind farm can demonstrate it has hired a third party to perform appropriate inspections.

Clinton County will perform building code inspections for the O&M Building, for which BRE will obtain building permits from the town and county.

Exhibit 32 State Laws and Regulations

32.1 State Permits and Approvals

BRE anticipates the Project will require the state reviews, approvals, and consultations listed in Table 32.1. The application will contain an updated version of this table.

Table 32.1 State Reviews, Permits, and Approvals

Name	Agency	Start Date	Status, Notes
Article 10 Siting Certificate	Siting Board	May 2015	PIP filed in May 2015
Article VII Transmission Line Siting Certificate	PSC	TBD	TBD
Stream and Wetlands Permits	DEC	March 2016	Wetlands assessment kickoff meeting held at DEC offices in March 2016. Application for these permits expected to be provided with the Article 10 application. Delineations for this application are underway in Summer 2016.
Water withdrawal	DEC	TBD	May be required if Project wishes to draw material quantities of water from streams for batch plant or other purposes.
Stormwater	DEC	TBD	BRE will submit a stormwater pollution prevention plan (SWPPP) for DEC review once the Project configuration is final and far enough advance of start of construction to allow adequate review.
Listed Species Take Permit	DEC	May 2015	Initial consultation meeting held in May 2015. Wildlife studies underway will help determine whether there will be any impact to state protected species.
Highway Work Permits	DOT	TBD	Required for overhead or underground crossings of state highways, access road driveways from state highways, temporary widening of intersections at state highways. US Route 11 and State Route 190 are the two state highways in the Project Area.
Oversize Vehicle Permit	DOT	TBD	Required for wind turbine delivery vehicles. May also be required for transformer deliveries.
Cultural Resources Consultation	SHPO	Dec 2015	Phase 1A study report provided to SHPO in December 2015. Project ID is 15PR07108. BRE planning Phase 1B studies.
Ag & Markets consultation	DAM	TBD	Prior to application submittal, BRE will consult with DAM officials to collect input on Project plans.
Interconnection Studies	NYISO	April 2015	Interconnection request submitted April 2015. Feasibility study completed. System reliability impact study in progress.

Siting Board = Article 10 Siting Board
PSC = NYS Public Service Commission
DEC = NYS Department of Environmental Conservation
SHPO = State Historical Preservation Office, part of the NYS Office of Parks, Recreation and Historic Preservation
DAM = NYS Department of Agriculture and Markets
NYISO = New York Independent System Operator

32.2 Compliance with State Requirements

BRE intends to build and operate the Project in accordance with state laws. Exhibit 32 will include information to assist the Siting Board to reach a conclusion that the Project will be in compliance with all substantive state requirements.

32.3 State Approvals Applicant Requests Be Left with State Agencies

At this time, BRE anticipates it will prefer that the following approvals be left with the state agencies and not be issued by the Siting Board:

- DOT Permits for Oversize and Overweight Vehicles. These permits are usually obtained by the turbine supply vendor immediately prior to construction. They depend on the turbine delivery routes which will change depending on the selected turbine vendor and its starting points for shipments, road conditions and repairs at the time of the deliveries, final access road locations, and other changing factors that are best determined a short time prior to the start of shipments.
- DOT Highway Work Permits. Details of crossings with state highways are likely to change as BRE finalizes turbine delivery plans and detail design of the electrical collection system. As such, BRE anticipates it will want to delay receipt of the highway work permits until closer to the start of project construction.

Exhibit 32 will confirm whether BRE prefers that the Siting Board leave the permits listed above, and any other permits, with state agencies.

BRE understands that according to PSC Article 10 Section 1001.32(a), approval of its stormwater pollution prevention plan will not be included in the Siting Board decision.

Exhibit 33 Other Applications and Filings

33.1 Federal Permits and Approvals

Based on currently-available information, BRE believes the Project will require the federal reviews, approvals, and consultations listed in Table 33.1. The application will contain an updated version of this table.

Table 33.1 Federal Reviews, Permits, and Approvals

Name	Agency	Start Date	Status
Determination of No Hazard	FAA	May 2016	Submitted for the turbine locations shown in the PSS layout.
Endangered and Protected Species Consultations	FWS	May 2015	Wildlife studies underway in consultation with USFWS. BRE will further consult with the agencies following the surveys and will assist with evaluating potential impacts and determining possible avoidance and minimization measures.
Wetlands Permit	USACE	March 2016	BRE invited USACE members to wetlands assessment kickoff meeting. BRE anticipates impacts may require an individual permit, an application for which would be submitted with the Article 10 application. Delineations needed for this application are underway in summer 2016.

FAA = Federal Aviation Agency
USACE = US Army Corps of Engineers
FWS = US Fish and Wildlife Service

33.2 Other Approvals

Aside from the approvals listed in Tables 32.1 and 33.1, BRE is not aware of any other approvals required for the Project. If BRE is made aware of any such approvals before submittal of the application, they will be discussed in Exhibit 33.

Exhibit 34 Electric Interconnection

34.1 Point of Interconnection and NYISO Requests

NYPA owns and operates two overhead 230-kV circuits that run from Plattsburgh to Willis to Massena substation. These two circuits are built using two lines of wood H-frame structures that share a common right-of-way that runs through the southern part of the Project Area. Between Plattsburgh and Willis three new substations have been built in the past 10 years to allow connection of wind energy projects built in the region.

BRE has requested interconnection of the Project to the NY electric transmission system by connecting to either one or both of the NYPA's 230-kV circuits that run through the Project Area. The following sections describe the physical configurations required for these requests and status of NYISO studies. Exhibit 34 will provide updates to the Project's interconnection plans.

Queue Request #497

Under queue request #497, the NYISO is studying the interconnection of 300.8 MW to the NYPA circuit running between NYPA's Patnode and Duley switchyards, which serve as points of interconnection (POI) for the Marble River and Altona wind projects respectively. Of the two circuits in the NYPA ROW, this one is located toward the north.

To accomplish this interconnection, BRE would construct a new 230-kV switchyard adjacent to NYPA's existing ROW, and it would transfer ownership of this switching station to NYPA upon the completion of construction. The existing NYPA line would be rerouted to feed into and out of the new switchyard. The Project's POI would be a point in the switching station where BRE's interconnection line connects to the new switchyard.

NYISO has approved a final feasibility study for this queue request and approved a SRIS scope in May 2016.

Queue Request #521

Under queue request #521, the NYISO is studying the interconnection of 448.97 MW to the two NYPA circuits that run through the Project Area. One of these circuits runs between NYPA's Patnode and Duley switchyards, which serve as points of interconnection for the Marble River and Altona wind projects respectively. The second circuit runs between the Plattsburgh substation and the Ryan switchyard which contains the POI for Noble's wind projects in Franklin and western Clinton County.

To accomplish this interconnection, BRE would construct a new 230-kV switchyard adjacent to NYPA's existing ROW, and it would transfer ownership of this switching station to NYPA upon the completion of construction. Both of the existing NYPA lines would be rerouted to feed into and out of the new switchyard. The Project's POI would be a point in the switching station where BRE's interconnection line connects to the new switchyard.

NYISO is performing a feasibility study for this queue request.

34.2 Interconnection Line Overview

BRE is evaluating the optimal configuration of the electrical collection system, including whether to propose construction of an overhead interconnection line.

Exhibit 32 will describe the general configuration of the overhead electric interconnection line including its planned operating voltage, its length, and its route.

34.3 Interconnection Line Design

Exhibit 34 will provide further details on the overhead interconnection line proposed between the Project substation and the POI switchyard, including:

- Tower materials, designs, standards, dimensions, and foundations;
- Conductor types, sizes, and materials;
- Insulator designs,
- Any terminal facilities;
- Any additional switching equipment to be installed at the line end points; and
- The need for cathodic protection measures.

Exhibit 35 Electric and Magnetic Fields

35.1 Interconnection Line Right-of-Way

The right-of-way for the electrical interconnection line is expected to cross predominantly over active and abandoned farm fields. The only exception to this may occur where the line could cross US Route 11 and State Route 190 (Military Turnpike). At these locations, the line could be in the vicinity of existing homes, farms, and electric distribution structures.

Exhibit 11 of the application will include more detailed maps of the interconnection line, including locations of structures, roads, and other features in the right-of-way. Exhibit 35 will describe the right-of-way width, heights of structures in and adjacent to the right-of-way, and unique electromagnetic field (EMF) characteristics of these structures.

For locations where the electrical interconnection line crosses public roads, Exhibit 11 will also include cross section drawings showing the proposed dimensions of the electrical interconnection line relative to any houses or existing electrical infrastructure.

35.2 EMF Study

The New York PSC issued EMF standards in 1990, and with these standards it described measurement methods for compliance.

BRE anticipates its electrical interconnection line will be located sufficiently far from existing structures so as to not introduce EMFs at levels to justify concerns for public safety. Nonetheless, Exhibit 35 will include an EMF study that will show electric and magnetic field levels for cases with the interconnection line operating at:

- summer normal rating,
- winter normal rating,
- summer short term emergency rating,
- winter short term emergency rating, and
- average annual load, averaged for all hours of the year, for the year over the next 10 years in which the circuit is expected to be carrying the highest annual load.

For each case, the study will present predicted EMF levels at a point 1 meter above ground level for areas within 500 feet of the edge of the right-of-way.

Exhibit 36 Gas Interconnection

The Project will require no interconnection to high pressure gas lines. Thus, Article 36 will be empty.

Exhibit 37 Back-up Fuel

The Project will require no fuel or backup fuel. Thus, Article 36 will be empty.

Exhibit 38 Water Interconnection

The Project will not interconnect to a public water system, and Exhibit 38 will be empty.

Construction needs for water at the concrete batch plant and O&M building will be discussed in Exhibit 23.

Exhibit 39 Wastewater Interconnection

The project will not interconnect to a public sewer system.

Wastewater from the O&M building will be limited to effluent from the restroom in the O&M building, and small amounts of wash water from staff showers and equipment cleaning. This will be handled with a standard on-site septic system approved by the Clinton County Department of Health.

Exhibit 40 Telecommunications Interconnection

40.1 Project Telecommunication Needs

The Project will require internet service at the O&M building to enable Invenergy's central control center to monitor Project operating status continuously and to support business activities at the O&M building.

Exhibit 40 will describe the bandwidth required for these purposes, where it will need to be physically connected, what data networks and service providers are able to provide this service, physical work that must be completed to provide this service, and the status of discussions and negotiations with service providers.

40.2 Transmission Owner Telecommunication Needs

BRE anticipates the NYPA will use a microwave system to communicate with and monitor the POI substation, similar to the microwave stations that were installed on the 230-kv POI substations at Duley Road and Patnode Road for the Noble and Marble River wind projects.

As part of developing the application, BRE will consult with NYPA on its communication needs and will describe available information in Exhibit 40.

Appendices