



Visual Impact Analysis

Bluestone Wind Project (Case No. 16-01988)

Towns of Sanford and Windsor, Broome County, New York

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GLOSSARY/LIST OF ACRONYMS, ABBREVIATIONS AND TERMS

AMSL	Above Mean Sea Level
APA	Adirondack Park Agency
Applicant	Bluestone Wind, LLC
BLM	Bureau of Land Management
CRIS	Cultural Resources Information System
DEM	Digital Elevation Model
DSM	Digital Surface Model
DPS	Department of Public Service
EDR	Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C.
ESRI	Environmental Systems Research Institute
extended study area	The area within a 10-mile radius of all Project components
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GPS	Global Positioning System
JCCC	Jefferson County Community College
kV	Kilovolt
leaf-off	No foliage or a reduced amount of foliage on the tree or shrub species
leaf-on	Presence of foliage on tree or shrub species
lidar	Light Detection and Ranging
LSZ	Landscape Similarity Zone. Area of similar landscape/aesthetic character based on patterns of landform, vegetation, water, land use, and user activity.
Met	Meteorological
MLRI	Macaulay Land Research Institute
MW	Megawatt = One million watts
NLCD	National Land Cover Dataset. Land cover types classified and mapped by U.S. Geological Survey
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory

NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSEG	New York State Electric and Gas Corporation
NYSOPRHP	New York State Office of Parks, Recreation, and Historic Preservation
O&M	Operations and Maintenance
POI	Point of Interconnection
Project	Bluestone Wind Project
Project Site	5,657 acres of leased private land in Towns of Windsor and Sanford in Broome County, NY; roughly bound by State Route 8, State Route 79, /Interstate 86
PSS	Preliminary Scoping Statement
PFR	Public Fishing Right
Photolog	Form of photo sharing and publishing; document predominantly utilizing and focusing on photographs rather than text
Recommended Viewpoint	Viewpoint location visited during visual fieldwork recommended by visual specialist for use of in Project simulations
study area	The area within a 5-mile radius of all Project components
USDA	U.S. Department of Agricultural
USDI	U.S. Department of the Interior
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VIA	Visual Impact Assessment
viewshed	Area of potential Project visibility defined by maximum structure height and mapped topography, vegetation, and structures within the study area.
VSR	Visually Sensitive Resource – Sites characterized by sensitive land uses (i.e. high aesthetic value, cultural/historical significance, etc.) and/or high use that may be subject to visual impact
visual study area	Includes the area within both the 5-mile study and 10-mile extended study areas
Wireframe	Project renderings that illustrate potential screening effects at a given viewpoint; portions of proposed Project components that are screened are shown in bright green color
WMA	Wildlife Management Area

1.0 Introduction

On behalf of Bluestone Wind, LLC, Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) prepared this Visual Impact Assessment (VIA) for the proposed Bluestone Wind Project (the Project). The Project is a wind energy generating facility proposed to be located in the Towns of Sanford and Windsor, Broome County, New York (See Inset 1). This VIA was prepared in support of the Project's review under Article 10 (Certification of Major Electrical Generating Facilities) of the New York State (NYS) Public Service Law. The information and conclusions included in this report are intended to assist the NYS Department of Public Service (DPS), other state agencies, interested stakeholders, and the general public in their review of the proposed Project in accordance with the requirements of Article 10. The purpose of this VIA is to:

- Define the visual character of the Project visual study area
- Inventory and evaluate visually sensitive resources (VSR) and viewer groups within the visual study area
- Describe the appearance of the visible components of the Project
- Evaluate potential Project visibility within the visual study area
- Identify key views for visual assessment
- Assess the visual impacts associated with the proposed Project



Inset 1. Regional Project Location

This VIA was prepared by environmental professionals and registered landscape architects experienced in the preparation of visual impact assessments. It is also consistent with the policies, procedures, and guidelines contained in established visual impact assessment methodologies (see Literature Cited/References section), and complies with the requirements of Article 10 (16 NYCRR § 1001.24, and Stipulation 24 for this Project).

2.0 Project Description

Bluestone Wind, LLC (the Applicant) is proposing to construct and operate a wind energy generating facility in the Towns of Sanford and Windsor, Broome County, New York. The proposed facility, herein referred to as the Project, consists of the following components:

- Up to 33 wind turbines, with a total maximum generating capacity of 124 megawatts (MW).
- Up to two permanent meteorological (met) towers.
- Approximately 39 miles of underground 34.5 Kilovolt (kV) collection line.
- Approximately 18 miles of gravel access roads.
- An Operations and Maintenance (O&M) Facility.
- A concrete batch plant.
- A collection substation.
- A point of interconnection (POI) substation with battery storage/ DC battery bank and charger
- A temporary construction staging/laydown yard

Various wind turbine models are being considered for the Project. The analyses conducted in this VIA assume a layout consisting of 33 Vestas V150-4.2 MW wind turbines, each with a 130 meter (427 foot) hub height, 150 meter (492 foot) rotor diameter, and 205 meter (673 foot) total height. This is the tallest turbine presently under consideration for the Project.

2.1 Project Site

The proposed Project Site includes approximately 5,657 acres of leased private land in the Towns of Sanford and Windsor. The Project footprint (the area occupied by Project components) will occupy a smaller portion of the total Project Site.

As measured to the nearest proposed turbine, the Project is located 1.8 miles northwest of the Village of Deposit, and 3.8 miles northeast of the Village of Windsor. The Project Site is bounded to the east by County Route 19 (Lumber Road), to the west by Ostrander Road, to the south by State Route 17/Interstate Route 86, and to the north by Marsh Pond State Forest (Figure 1).

Land within the Project Site is dominated by mixed deciduous/coniferous forest, limited open fields, areas of successional shrubland, and open water, with elevations ranging from 899 feet (274 meters) above mean sea level (AMSL) to 2,089 feet (637 meters) AMSL. Land use is dominated by undeveloped second growth forest that is used for natural resource

extraction (logging and bluestone quarrying) and recreational purposes (hunting, fishing, etc.). The Project Site also includes areas of active and reverting agricultural land interspersed with farms and low density rural residential development (full-time and seasonal) along area roadways. Higher density residential and commercial development in the vicinity of the proposed Project is concentrated in the Village of Deposit and in the hamlets of North Sanford and Stilesville. Information on the individual municipalities that include the Project Site is presented below.

2.1.1 Town of Sanford



Inset 2. View of the State Route 41 corridor from County Route 241 (North Sanford Road), entrance to the hamlet of Sanford

Physical Characteristics:

The Town of Sanford lies in the eastern part of Broome County. It is bounded on the north by Chenango County, on the east by Delaware County, to the south by the Pennsylvania State Line (bordering Wayne and Susquehanna Counties), and on the west by the Towns of Colesville and Windsor. The town has a total area of 91 square miles, of which 90.1 square miles is land and 0.9 square miles is water. State Route 17/Interstate 86 crosses the town and is intersected by State Route 41. The West Branch of the Delaware River forms part of the eastern border of the Town of Sanford.

Cultural Characteristics:

The Town of Sanford was formed on April 2, 1821. The Village of Deposit is the only village in Sanford and was the first village to be incorporated in Broome County. North Sanford and McClure are the largest of the unincorporated hamlets that occur within the town. Sanford is a rural town with a population of approximately 2,407 residents according to the 2010 census. The majority of the land is undeveloped forest, including the Oquaga Creek State Park. Approximately 70% of the residential housing stock consists of single family homes. The Village of Deposit and several hamlets consist of densely situated homes and commercial development along main roads such as Front Street. Outside the village and hamlets, development becomes sparse with occasional homes and farms situated along rural roads, surrounded by large open lots, farm fields, and forest land.

Land Use Planning:

The Town of Sanford's Land Use Management Local Law is actively updated to reflect the goals and needs of the town, and was most recently revised on January 10, 2017 to address the potential for future renewable energy development within the town. The local law provides guidance for the orderly growth of the town, encourages the most appropriate use of land, and aims to protect and conserve the value of property, prevent the overcrowding of land, and promote the health, safety and general welfare of the public in accordance with the 1992 Town of Sanford Comprehensive Plan (see Appendix H).

Proposed Project Site:

Physical Features: Twenty-nine of the 33 turbines proposed for this Project fall within the Town of Sanford, as well as the majority of associated Project facilities (i.e., O&M facility, temporary laydown yard, temporary concrete batch plant, collection line, and the POI and collection substations). The proposed Project falls centrally within the Town of Sanford, and spans the width of the town from north to south.

Land Use: According to the U.S. Geological Survey (USGS) 2011 National Land Cover Dataset (NLCD), the Town of Sanford is comprised approximately of 1% open water, 3% developed (open space), 0.5% developed (low intensity), 0.09% developed (medium intensity), 0.02% developed (high intensity), 0.05% barren land, 53% deciduous forest, 6% evergreen forest, 19% mixed forest, 1% shrub/scrub, 0.2% grassland/herbaceous, 11% pasture/hay, 3% cultivated crops, 1% woody wetlands, and 0.4% emergent herbaceous wetlands.

Topography: The Project Site within the Town of Sanford is characterized by forested rolling hills and gentle valleys, with elevations ranging from 860 feet to 1,910 feet AMSL. The proposed turbines are primarily located along gentle hillsides or on the tops of ridgelines. A wide valley associated with Page Pond Brook cuts through the proposed turbine array.

Vegetation: The majority of the land within and adjacent to the Project Site is forested, containing a mix of oak, white pine and northern hardwoods. The vegetation is generally mature, reaching average heights of 60 feet in the majority of the forested areas. Most of the Project turbines and associated support facilities within the Town of Stanford occur within open fields adjacent to these forest areas.

Land Use: Land use in the immediate vicinity of the Project Site is predominately forested and dominated by State Forest lands. Pockets of low density residential development and farm complexes, along with active and non-active bluestone quarries, are also present.

2.1.2 Town of Windsor



Inset 3. State Route 79 (Main Street) at intersection with Piper Hill Road, looking at the mountains east of the Village of Windsor.

Physical Characteristics:

The Town of Windsor lies within the southeastern portion of Broome County, east of the City of Binghamton. Windsor is bounded on the north by the Town of Colesville, on the east by the Town of Sanford, on the south by the Pennsylvania State Line, and on the west by the Town of Kirkwood. The town includes the Village of Windsor, which is located on the

Susquehanna River. The Susquehanna River flows southward through the town, to the east of the village. State Route 17/Interstate 86, is a major divided highway that crosses the town from east to west. State Route 79, a north-south highway, intersects Route 17 at the Village of Windsor. The Town of Windsor is the largest, by area, in the county. Windsor has a total area of 93.0 square miles, of which 91.7 square miles is land and 1.3 square miles is water.

Cultural Characteristics:

The Town of Windsor is one of the oldest towns in Broome County, having been formed on March 27, 1807 from the Town of Chenango. The incorporated Village of Windsor is located within the Town of Windsor. The larger unincorporated hamlets within the town include Damascus, East Windsor, and West Windsor. Windsor is a mostly rural town of about 6,274 residents according to the 2010 census. The majority of the town is undeveloped forest land, with more dense development concentrated around the Village of Windsor. Rural residential and Agricultural land use are scattered throughout the town, but are primarily concentrated along State Route 79. Approximately 74.9% of the existing residential housing stock is made up of single family dwellings.

Land Use Planning:

The Town of Windsor Comprehensive Plan was adopted in September 2006 under the direction of the Town of Windsor Planning Board. The plan provides guidance for development in order to maintain the town's rural residential character, protect sensitive resources, and foster residential and commercial/industrial development. The Town of Windsor zoning ordinance divides the town into residential, Agricultural, commercial, industrial, and flood hazard zoning districts (see Appendix G).

Proposed Project Site:

Physical Features: Four of the 33 turbines proposed for this Project fall within the Town of Windsor. The proposed turbines are clustered on the eastern border of the town.

Land Use: According to the USGS 2011 NLCD, the Town of Windsor is comprised approximately of 1% open water, 3% developed (open space), 1% developed (low intensity), 0.2% developed (medium intensity), 0.03% developed (high intensity), 0.1% barren land, 44% deciduous forest, 8% evergreen forest, 26% mixed forest, 1% shrub/scrub, 0.3% grassland/herbaceous, 11% pasture/hay, 2% cultivated crops, 1% woody wetlands, and 0.6% emergent herbaceous wetlands.

Topography: The four proposed turbines are positioned as pairs atop adjacent forested hills at elevation of approximately 1,815 feet AMSL. These hills are separated by a wide valley, with an elevation of approximately 820 feet AMSL, that

includes William Law Road. The turbines are positioned roughly between Sky Lake and Deer Lake, immediately to the west of these two bodies of water.

Vegetation: The majority of the land within and adjacent to the Project Site is forested, containing the same mix of oak, pine and northern hardwoods as described for the Town of Sanford. Within the Town of Windsor, the proposed turbines are situated on undeveloped forest land.

Land Use: Land use in the vicinity of the portion of the Project Site that is within the Town of Windsor is predominately forested. Pockets of low density residential development are scattered within the forest. The proposed Project Site within the Town is bisected by William Law Road and immediately north of State Route 17/Interstate Route 86.

2.2 Proposed Project

The proposed Project layout is illustrated in Figure 1. The major components of the Project are described as follows:

2.2.1 Wind Turbines

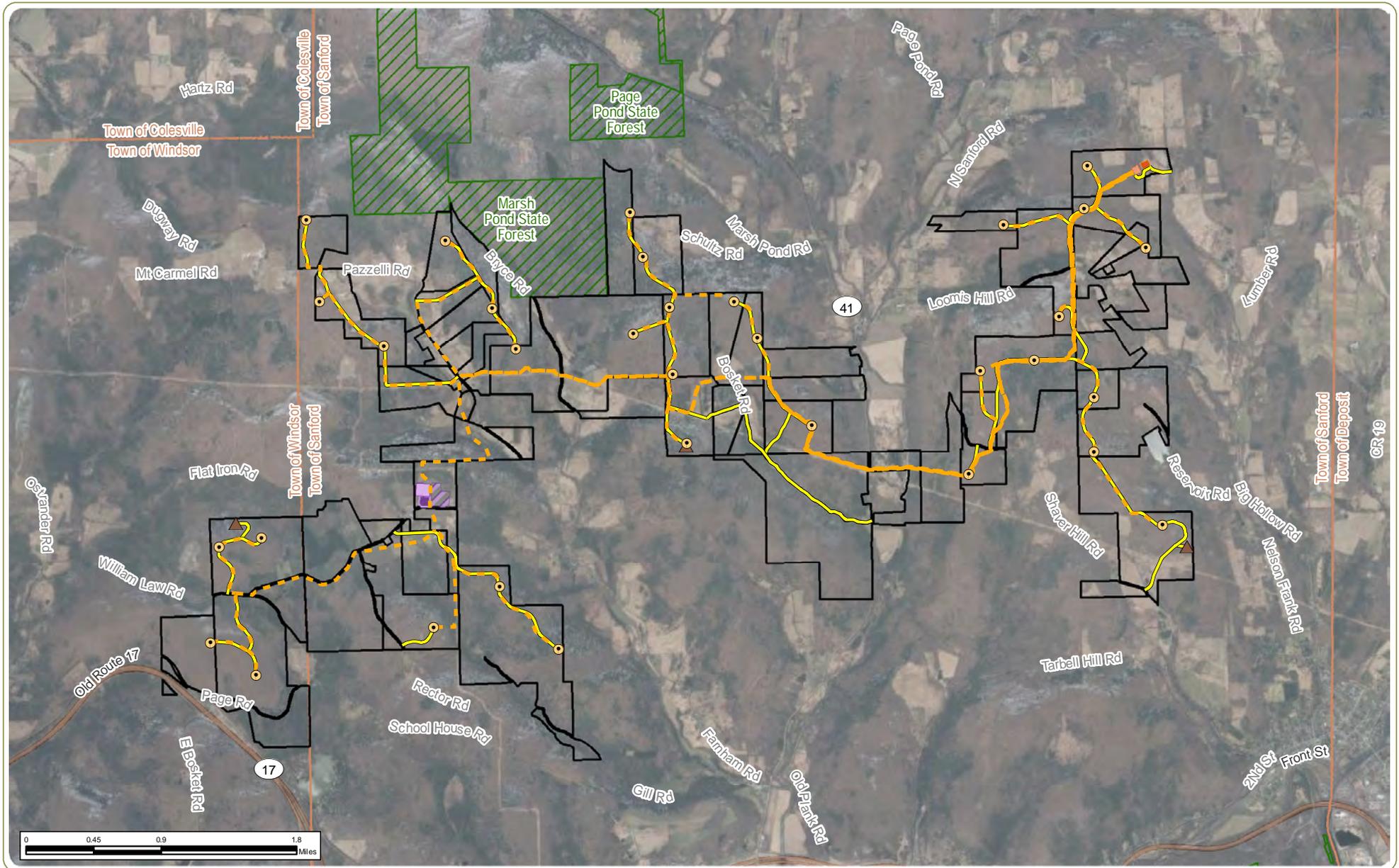
The Project will include up to 33 wind turbines with a total generating capacity of up to 124 MW. Due to their height and size, the proposed wind turbines are the Project components that will be the most visible and have the greatest potential for visual impact. Therefore, the turbines are the primary focus of the visual impact analyses presented in this report.

The turbine models that are currently under consideration for this Project are listed in Table 1. For the purposes of this VIA, it is assumed that the wind turbine selected for the Project will be the Vestas Model V150, which represents the tallest turbine presently under consideration. The rotor diameter of this turbine is 150 meters and the anticipated hub height is 130 meters, resulting in a maximum blade tip height of 205 meters (673 feet) above the ground surface.

Table 1. Turbines Models Under Consideration.

Turbine Model	Rated Power	Hub Height	Rotor Diameter	Total Height
GE 3.8-137	3.8 MW	131 meters (430 feet)	137 meters (449 feet)	200 meters (655 feet)
Nordex N149	4.0 – 4.5 MW	125 meters (410 feet)	149 meters (489 feet)	200 meters (655 feet)

Turbine Model	Rated Power	Hub Height	Rotor Diameter	Total Height
Senvion M148	4.2 MW	130 meters (427 feet)	148 meters (486 feet)	204 meters (669 feet)
SGRE SG4.2-145	4.2 MW	127.5 meters (418 feet)	145 meters (476 feet)	200 meters (656 feet)
Vestas V150	4.2 MW	130 meters (427 feet)	150 meters (492 feet)	205 meters (673 feet)



Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 1: Proposed Project Layout

Notes: 1. Basemap: NYSDOP 2014 orthoimagery map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the

- | | | |
|-----------------|-----------------------|-----------------------|
| Met Tower | Batch Plant | Point of Interconnect |
| Wind Turbine | Collection Substation | NYSDEC Land |
| Access Road | Laydown Area | Facility Site |
| Collection Line | O&M Facility | Town Boundary |



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Major visible components of the turbines are illustrated in Figure 2 and described below.

Tower: The tubular towers to be used to support the wind turbines are conical steel structures manufactured in sections, each of which is trucked separately to the site and bolted together using internal flanges. Each tower is anticipated to have a hub height of 130 meters (427 feet), and will be equipped with an access door at the base. The towers will be painted white or light grey in compliance with Federal Aviation Administration (FAA) guidance to avoid the need for daytime obstruction warning lights (FAA, 2016).

Nacelle: The main mechanical components of the wind turbine are housed in the nacelle. These non-visible components include the drive train, gearbox, and generator. The visible portion of the nacelle is a white or light grey steel-reinforced fiberglass shell, and as modeled for this study, is approximately 12.9 meters long (42 feet), 4.1 meters wide (13.5 feet) and 4.3 meters tall (14 feet). The nacelle includes a rear fin (cooler top) that extends 3.4 meters (11 feet) above the main body of the nacelle. Attached to the top of each nacelle will be two medium intensity aviation warning lights in accordance with FAA specifications. These will be synchronized flashing red lights (L-864 or similar) and illuminated only at night. The nacelle is mounted on a sliding ring that allows it to rotate or “yaw” into the wind to maximize energy capture.

Rotor: A rotor assembly is mounted on the drive shaft, and is operated upwind of the tower. Each rotor consists of three 73-meter long (240 foot) fiberglass composite blades, and has a total diameter of 150 meters (492 feet). The rotor attaches to the drive shaft at the front of the nacelle. Electric servo motors within the rotor hub vary the pitch of each blade according to wind conditions, which enable the turbine to operate efficiently at varying wind speeds. Like the tower and nacelle, the rotor will be white or light grey in color.

At each turbine location, there will be a radial, temporary work area with a diameter of approximately 400 feet. If the turbine is located in a vegetated area, this work area will require vegetative clearing to accommodate the crane pad and component laydown area. Once the turbine has been installed, a 20-foot wide gravel ring will remain around the turbine base, along with an approximately 60 x 100 foot gravel crane pad for maintenance use. The remaining area disturbed during construction will be revegetated.

2.2.2 Electrical System

The proposed Project includes an electrical system that consists of 1) a network of buried 34.5 kV cables that will collect power from each wind turbine (collection lines), 2) a collection substation and switchyard to step up the power from 34.5 kV

to 230 kV, and 3) a POI substation to allow interconnection to New York State Electric and Gas Corporation's (NYSEG) existing high voltage power grid. Each of these components is described below.

Collection lines: The total length of all collection lines required to collect power from the turbines and deliver it to the collection substation is approximately 39 miles. Of this total, 21.5 miles of that will be collocated within proposed Project access roads, leaving 17.5 miles of independent collection line right-of-way (ROW). All of the collection lines will be buried, and for the purposes of this study, the collection lines are assumed to require a cleared ROW 50 feet in width. The location of the collection lines are indicated in Figure 1.

Collection Substation: The terminus of the 34.5 kV collection system is the collection substation, which will step up the voltage of the power delivered by the collection lines from 34.5 kV to 230 kV. The collection substation will be located in a successional old field west of County Route 245 (Big Hollow Road) adjacent to the NYSEG Afton-Stilesville 115 kV transmission line in the Town of Sanford. The collection substation will be approximately 1.5 acres in size, enclosed by a chain link fence, and accessed via a gravel service road. It will include 34.5-kV and 230-kV busses, a transformer, circuit breakers, towers, a control building, and related structures, with a maximum height of approximately 60 feet. All electrical equipment will be gray/silver in color, while the control building is assumed to be a neutral earth tone color with a green metal roof. The collection substation is proposed in a location that is away from existing residences and other visually sensitive resources/receptors.

DC Battery Bank and Charger: Included within the collection substation footprint is an approximately 50 x 100-foot building that will house the equipment associated with a DC battery bank and charger. The visible exterior of the building will resemble a pole barn construction similar in appearance to other agricultural structures present in the area. The color will match the neutral earth tone and green of the collection substation control building.

POI Substation: To allow Project interconnection with NYSEG's 230 kV transmission line, a POI substation will be constructed directly adjacent to the collection substation, on the west side of Country Route 245 (Big Hollow Road). The POI substation will be approximately 1.7 acres in size, enclosed by chain link fencing and accessed via the same service road as the collection substation. The POI substation will include an approximately 100-foot long overhead transmission line to connect the POI substation to the collection substation, a breaker, motor operators, revenue meter, and associated equipment. Components required for the POI substation will be similar in height, color and appearance to those inside the proposed collection substation and will be equal to or lower than 60 feet.

The proposed substations are illustrated in Figure 2.

2.2.3 Access Roads

The area within and around the Project Site includes a pre-existing network of state, county and local roads. Existing public roads will be used to access the Project Site to the extent practicable, and some existing public roads will likely need to be improved to facilitate the passage of oversized construction vehicles. Roadway improvements are envisioned to be temporary features which could include the widening of intersections and constructing of “jug handles” to accommodate the turning movements of oversized vehicles. Improvements to public roads would be removed at the end of construction and the areas restored to pre-construction conditions. Because they are anticipated to be relatively minor and temporary, these public road improvements are not evaluated in this study.

New or improved private roads are proposed to access individual turbine and substation sites from the public road network. The proposed length of Project access roads is approximately 18 miles, some of which will be upgrades to existing farm lanes and logging roads, and some of which will be entirely new construction. During construction, access road corridors will be cleared to a width of up to 100 feet. The roads themselves will be 16 feet wide with a gravel surface and compacted shoulders to accommodate construction vehicles and component deliveries to the turbine sites. Following construction, the 16-foot gravel surface will remain in place for Project maintenance purposes, and adjacent vegetation will be allowed to regrow to within 10 feet of the road surface. These access roads will generally take on the appearance of farm lanes, and so will not have a significant long-term visual impact. Access roads that require additional grading and tree removal will remain visible for a longer period of time as the vegetation becomes reestablished. Access roads and associated clearing are shown in any simulations where they would be visible. Temporary and permanent visual impacts associated with the construction of the access roads are discussed in Section 5.2.5 of this VIA.

2.2.4 Meteorological Towers

Two permanent 130-meter (426.5-foot) tall met towers will be installed to collect wind data and support performance testing of the Project. Although these structures may be supported by guy wires, for the purposes of this VIA, it is assumed that the towers will be free-standing galvanized lattice steel structures (see Figure 2). The met towers will be equipped with wind velocity meters and directional measuring instruments at three different elevations, and temperature and humidity monitors near ground level. Visual impacts from the met towers are considered to be small compared to the turbines. Met towers are shown in the simulations where they would be visible; however, the visibility and visual impact of the met towers, on their own, are not evaluated in this study.

2.2.5 Temporary Construction Staging/Laydown Yard

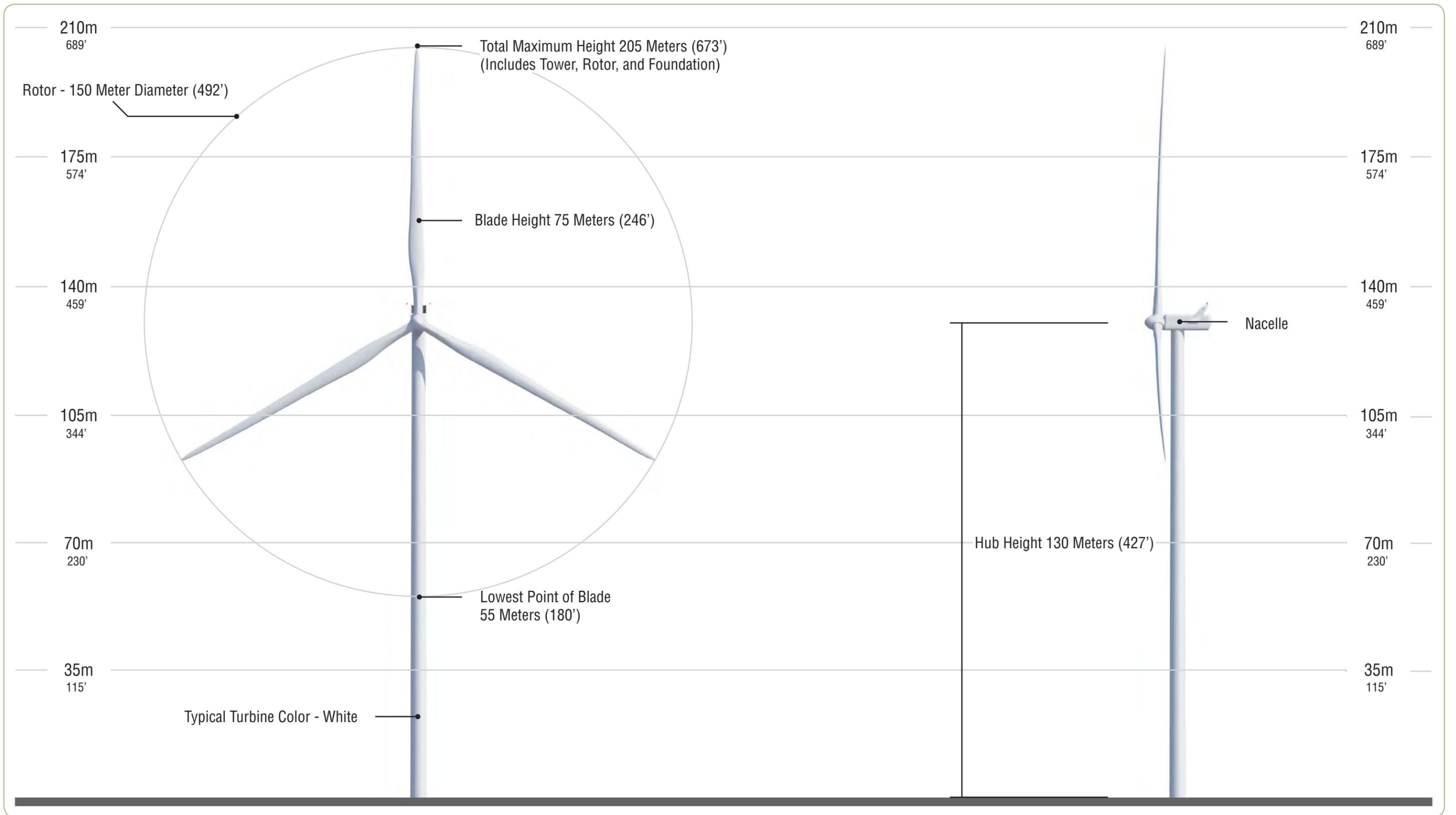
Construction of the Project will require the development of a temporary construction staging/laydown yard to accommodate trailers, storage containers, cable reels, construction equipment/materials, and parking for construction workers. The staging area is proposed to be in an active agricultural field on the north side of William Law Road in the Town of Sanford, and is anticipated to be approximately 10 acres in size. The staging area is a temporary feature associated with construction of the Project. No permanent fencing or lighting of the staging areas is proposed, and it is predicted that this area will be restored to agricultural use when construction of the Project is complete. Temporary visual impacts associated with the construction of these facilities are discussed in Section 5.2.5 of this VIA.

2.2.6 Temporary Batch Plant

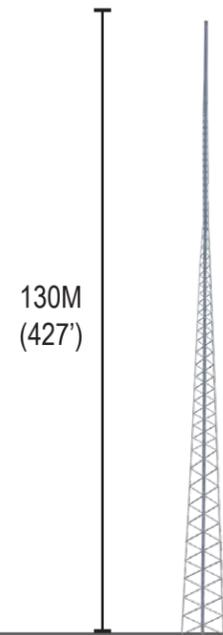
The temporary batch plant is anticipated to be sited on an approximately 5-acre site located adjacent to and west of the temporary laydown yard and adjacent to and north of the permanent O&M Facility (Figure 1). Temporary concrete batch plants typically consist of silo(s) that will hold cement, large square bins which will hold aggregate, a water pump, a compressor, additional small ancillary equipment, and stockpile of materials. Batch plant components typically range in height from 30 to 70 feet, and in length from 40 to 60 feet. The exact arrangement of the temporary concrete batch plant will be determined by the Contractor, who will not be identified until the Facility receives its Certificate. Just like the Project laydown yard the visual impacts of the batch plant are temporary and not reviewed as part of this VIA.

2.2.7 Operation & Management (O&M) Facility

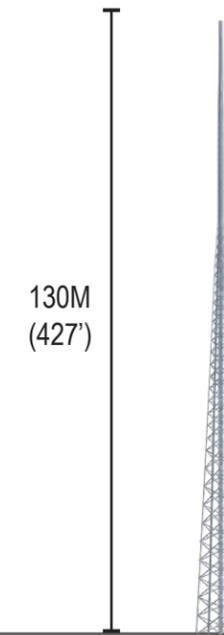
Two O&M buildings are proposed to be located on a 3-acre site adjacent to the staging/laydown yard on the north side of William Law Road in the Town of Sanford. The smaller of the two buildings is approximately 3,200 square feet, while the larger building is approximately 7,200 square feet. Both buildings will be single story structures that house the permanent O&M staff offices and storage. The color of the two buildings will be similar to that of the substation control buildings with the walls assumed to be a neutral earth tone color with a green metal roof (see Figure 2). Land adjacent to the O&M facility will also be used to store materials and equipment as necessary. The visual impact of the O&M facility, which is expected to be minimal, is briefly addressed in this study as part of Section 5.2.4.



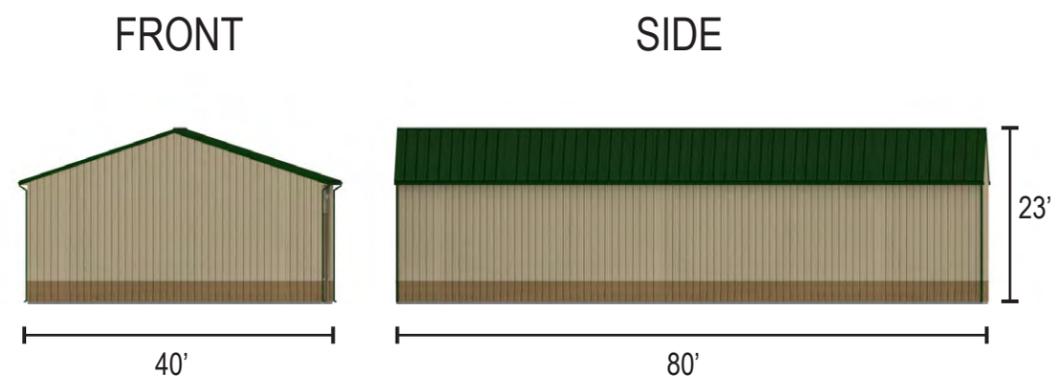
MET TOWER - FRONT VIEW



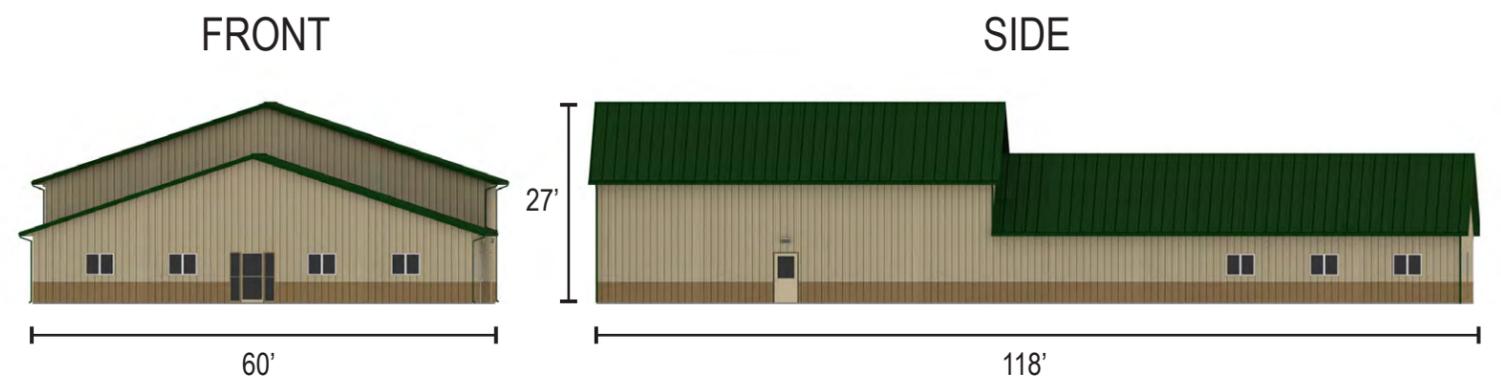
MET TOWER - SIDE VIEW



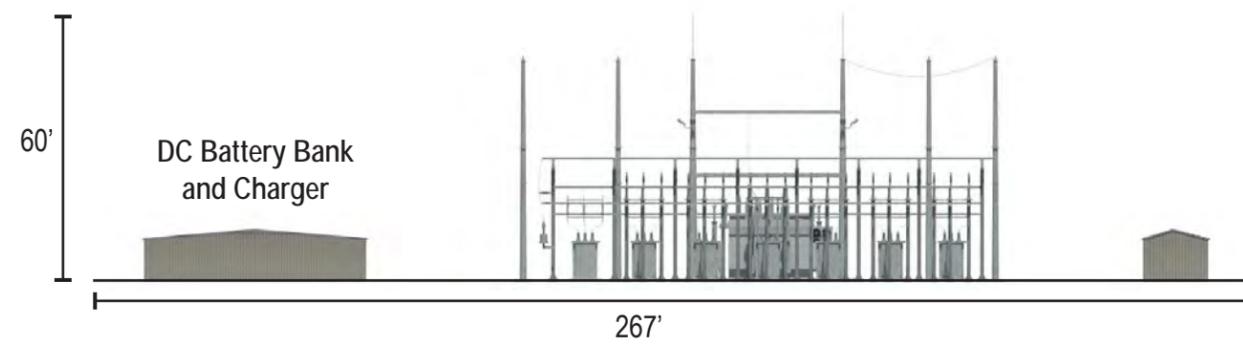
OUT BUILDING



O&M FACILITY BUILDING



COLLECTOR SUBSTATION



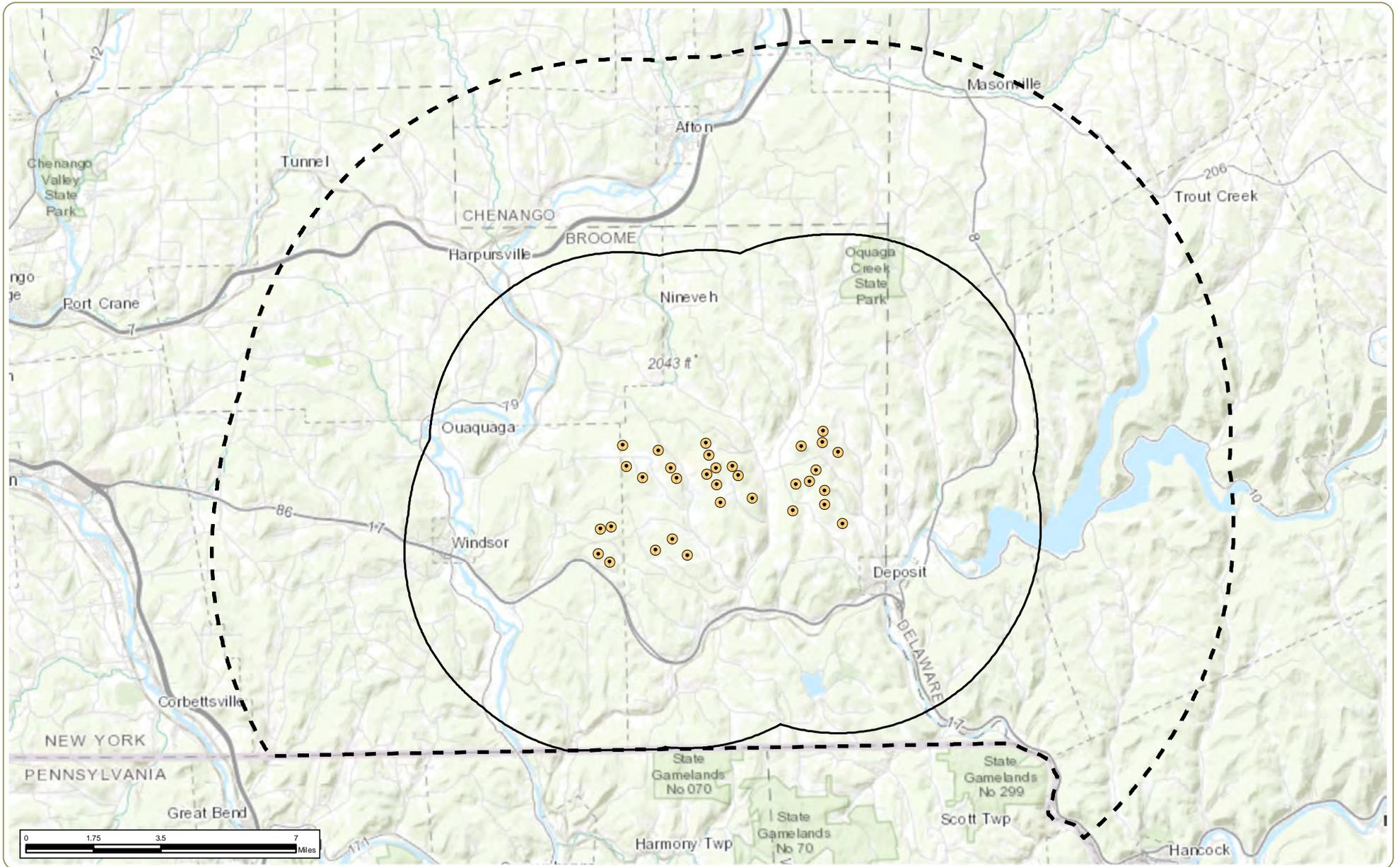
POINT OF INTERCONNECT



3.0 Existing Visual Character

3.1 Visual Study Area

According to the requirements of Article 10 (as set forth in 16 NYCRR § 1000.2[ar]) the visual study area to be used for analysis of major electric generating facilities is defined as “*an area generally related to the nature of the technology and the setting of the proposed site. For large facilities or wind power facilities with components spread across a rural landscape, the study area shall generally include the area within a radius of at least five miles from all generating facility components, interconnections and related facilities and alternative location sites. For facilities in areas of significant resource concerns, the size of a study area shall be configured to address specific features or resource issues.*” Consequently, a 5-mile radius study area and 10-mile radius extended study area were delineated and mapped. Combined, these two study areas constitute the visual study area for the Project. The 10-mile extended visual study area was used to identify visually sensitive resources (VSRs) of regional and statewide significance. A more comprehensive inventory, including locally significant VSRs, was conducted for the 5-mile study area of the proposed Project. The visual study area boundaries are depicted on Figure 3.



Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 3: Visual Study Area

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the

-  Wind Turbine
-  5-Mile Study Area
-  10-Mile Extended Study Area



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3.2 Physiographic Setting

3.2.1 Landform and Vegetation

The visual study area lies within the Northern Allegheny Plateau physiographic region of New York State (Bryce et al., 2010). This region is glacially smoothed with flattened hilltops and wide stream valleys. The landform can generally be described as an elevated plateau of rolling hills, open valleys, and low mountains covered by till and dissected by stream valleys. The dissection by both water and ice erosion has given the upland a somewhat rugged relief. The plateau is thought to represent ancient erosion surfaces and has a rather flat-topped appearance when viewed from a distance. The plateau transitions to relatively flat valleys and troughs, some containing large lakes and major rivers, such as the Susquehanna, the West Branch of the Delaware River, while others that include smaller wetlands, ponds and streams. Both of the major river valleys run generally north to south through the visual study area. The Susquehanna River is west of the proposed turbine array, a tributary of the West Branch of the Delaware River cuts through the eastern portion of the Project Site.

Vegetation throughout the visual study area is dominated by dense, mature forest with agricultural and successional old fields interspersed within the landscape. Forestland is prevalent throughout the more elevated portions of the visual study area and on steeper slopes. Forests in the visual study area are primarily deciduous, consisting of oak and pine forest on drier slopes and northern hardwoods (including eastern hemlock) mixed in on north slopes, ravines, and within riparian areas. Forestland can also be found in woodlots, hedgerows, and wooded wetlands abutting the more agricultural portions of the visual study area. Open fields occur primarily in the northwestern corner of the visual study area, on some level hilltops and within the major valleys. Agricultural/open fields are primarily associated with relatively small farmsteads, which typically include a single-family residence and associated farm structures.

3.2.2 Land Use

Land use within the visual study area is dominated by undeveloped forest and widely scattered single-family rural residences. The primary agricultural activity is livestock farming, and consequently, pastures and hay fields are more common than row crop production. Higher density residential and commercial development is concentrated in settlements along Interstate Routes 86 and 88 and State Routes 17, 79, 8, 41, 206, and 7, including the Villages of Windsor, Deposit, and Afton, and the hamlets of Damascus, Hale Eddy, Stilesville, East Windsor, Center Village, Harpursville, Belden, Nineveh, Middle Bridge, and Bennettsville. The villages are characterized by a well-defined central business district surrounded by traditional residential neighborhoods and commercial development along the outskirts. Hamlets within the visual study area are relatively small communities within the larger rural landscape. They are typically located at major crossroads and consist of residences, stores, and churches.

Outside the villages and hamlets, scattered pockets of commercial and industrial land use occur within the Susquehanna River Valley and along portions of the state highways. These commercial and industrial businesses include apartment complexes, hotels, restaurants, retail and convenience stores, distribution warehouses, automobile dealerships and body shops, and small manufacturing operations. Interstate Route 86 crosses the Susquehanna River before it turns into State Route 17/Interstate 86, which runs along the West Branch of the Delaware River. In the northern portion of the visual study area, Interstate Route 88 runs along the Susquehanna River Valley before crossing the river and proceeding west. A Norfolk Southern railway runs southwest from Deposit, crossing State Route 17/Interstate 86. The St. Lawrence and Hudson railway originates in the same location and runs east-west along Interstate Route 88. The lateral connection from the existing Bluestone Gathering System, a natural gas pipeline, runs through the middle of the visual study area and the southwestern corner of the proposed Project Site, north of State Route 17/Interstate 86. The Bluestone Gathering System ROW corridor is cleared to 50 feet and is often visible within the landscape. The Millennium Gas Transmission Pipeline originates just outside of the Village of Deposit and runs west across the visual study area. The pipeline's 50-foot cleared ROW bisects the proposed Project Site. Just north of the Millennium Pipeline, a NYSEG overhead transmission line traverses the northeastern corner of the proposed Project Site within a ROW corridor cleared to approximately 100 feet.

3.2.3 Water Features

As mentioned previously, major rivers within the visual study area include the Susquehanna River and the West Branch of the Delaware River. Other water features include Oquaga Creek (along with numerous associated tributary streams), Cannonsville Reservoir, Blueberry Lake, Columbia Lake, Crystal Lake, Deer Lake, Laurel Lake, Oquaga Lake, Sky Lake, White Birch Lake, Cronk Pond, Fly Pond, Griffins Pond, Marsh Pond, Page Ponds 1 and 2, and Perch Pond. These water features are used for fishing, boating, and swimming. Many of these lakes and ponds host communities of seasonal and year-round residential properties along their shorelines, including Columbia Lake, Crystal Lake, Deer Lake, Laurel Lake, Oquaga Lake, and White Birch Lake, while other water bodies are bordered by state forest lands. The Cannonsville Reservoir is part of the New York City drinking water system, and therefore has no residential properties/development along its shoreline. Many of the water features within the visual study area are generally hidden from view because they lie within wooded areas and/or private properties, well removed from adjacent roads or other public vantage points.

3.3 Landscape Similarity Zones

In accordance with the requirements set forth in 16 NYCRR § 1000.24(b)(1), Landscape Similarity Zones (LSZs) were defined and mapped within the visual study area. Defining distinct landscape types within a given study area provides a useful framework for the analysis of a project's potential visual effects. LSZs within the visual study area were defined

based on the similarity of various landscape characteristics including landform, vegetation, water, and land use patterns, in accordance with established visual assessment methods (notably, U.S. Forest Service [USFS], 1995; Smardon et al., 1988; U.S. Department of Transportation [USDOT] Federal Highway Administration, 1981 & 2015; U.S. Department of the Interior [USDI] Bureau of Land Management [BLM], 1980). Within the visual study area, the following five distinct LSZs were identified:

- Forest
- Rural Residential/Agricultural
- Open Water
- Village
- Transportation Corridor

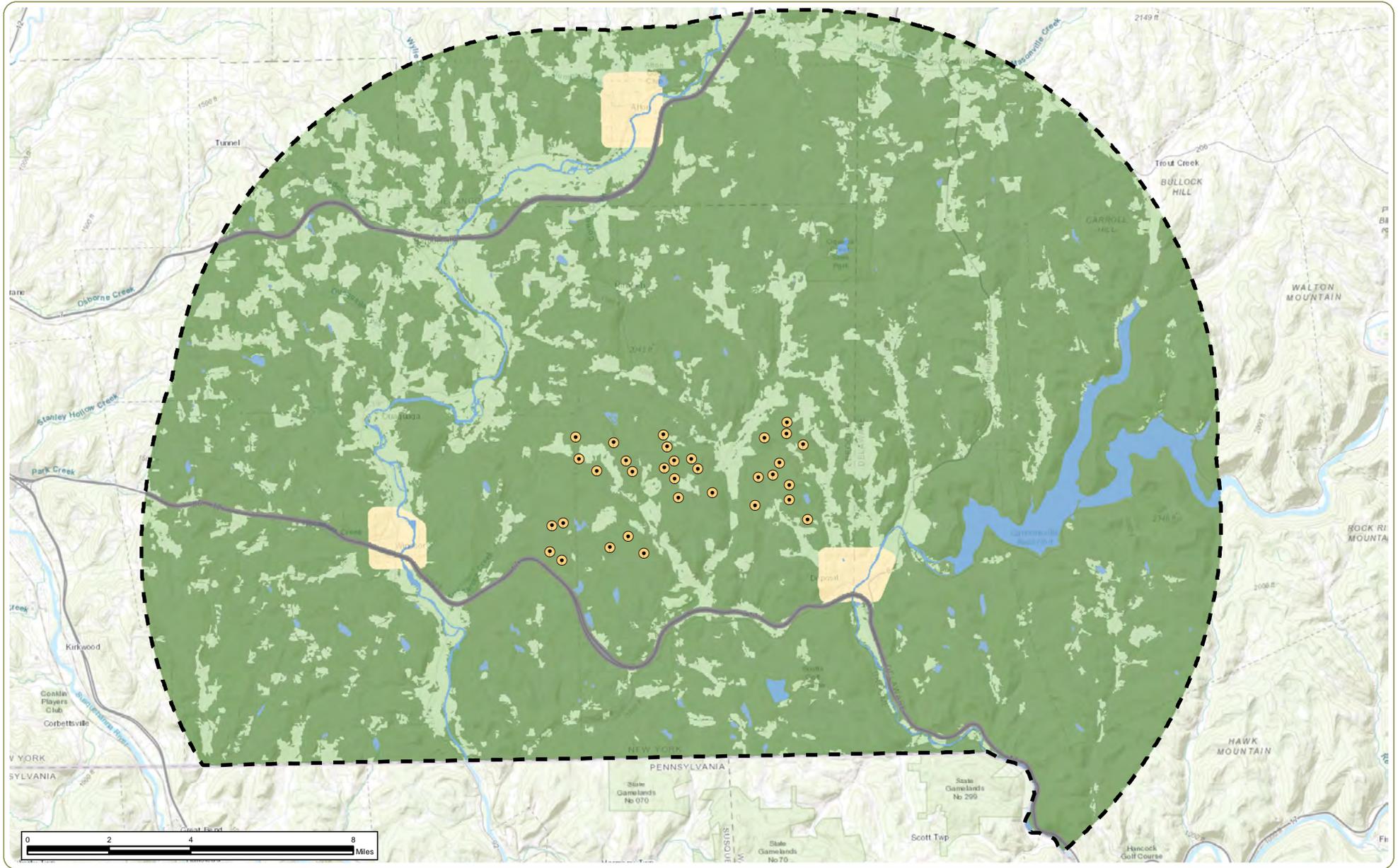
LSZs within the visual study area were mapped using a Geographic Information System (GIS) classification exercise. The LSZ classifications are based on mapped land cover and proximity to various landscape or land use features. The mapping of LSZs is a generalization exercise intended for viewing the entire visual study area at a macroscopic scale. Therefore, it is possible that field review at a given location would change the initial GIS-derived LSZ classification based on observed landscape characteristics that are beyond the scale of the GIS analysis. The classification analysis is subtractive, meaning that a given criterion is used to classify a portion of the visual study area as a particular LSZ, and then the next criterion is applied to classify portions of the remaining land, and so forth until the entire visual study area is mapped. The classification and mapping of LSZs within the visual study area was conducted as follows:

- The Forest LSZ was defined as areas identified as deciduous, evergreen, and mixed forest, in the USGS 2011 National Land Cover Dataset (NLCD).
- The Rural Residential/Agricultural LSZ was defined as any area classified as grassland/herbaceous, pasture/hay, cultivated crops, or old field scrub shrub in the USGS 2011 NLCD.
- The Open Water LSZ was identified as any area classified as open water in the USGS 2011 NLCD.
- The Village LSZ was identified as the area included within a 1,000-foot buffer around the mapped boundary of any incorporated village.
- The Transportation Corridor LSZ was identified as the area within 300 feet of State Route 17/Interstate 86 and Interstate Route 88.

The extent of each LSZ within the visual study area is summarized in Table 2 and depicted in Figure 4. Descriptions of the visual characteristics of each LSZ, along with representative photographs, are provided in Section 3.3 below.

Table 2. Landscape Similarity Zones by Total Square Miles within the Visual Study Area.

Landscape Similarity Zone	Total Area of LSZ within the Visual Study Area (square miles)	Percent of Total Area within the Visual Study Area
Forest	327.6	76.8%
Rural Residential/Agricultural	75.7	17.7%
Open Water	11.0	2.6%
Village	7.7	1.8%
Transportation Corridor	6.4	1.5%



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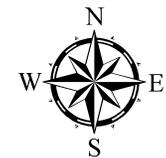
Figure 4: Landscape Similarity Zones

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the

-  Wind Turbine
-  Visual Study Area

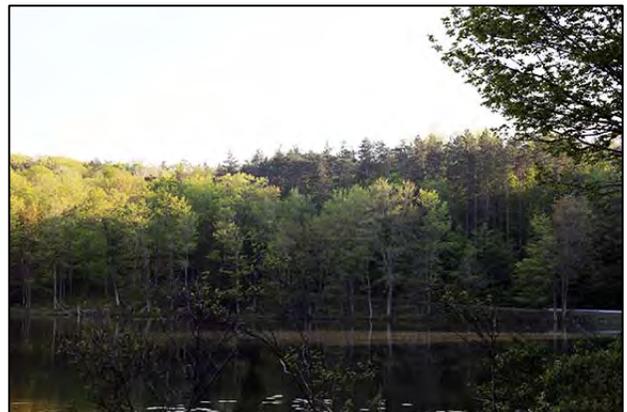
Landscape Similarity Zones:

-  Forest
-  Open Water
-  Rural Residential/Agricultural
-  Transportation Corridor
-  Village



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3.3.1 Forest



Inset 4. Representative photographs from the Forest LSZ.

Upper Left: Page Pond State Forest, Huggins Road (Viewpoint 49); Upper Right: Arctic State Forest, Hellerud Road (seasonal), (Viewpoint 76);

Lower Left: State Route 41 (Viewpoint 46); Lower Right: Marsh Pond State Forest, Marsh Pond Road (Viewpoint 103).

Forest is the largest LSZ, covering 76.7% of the visual study area. This zone is characterized by the dominance of mixed deciduous and coniferous tree species, often in association with moderately steep topography. The Forest LSZ is less prevalent in the northwestern corner of the visual study area, where gentler topography creates more opportunities for agricultural and residential development. The forests are dissected by small streams and unpaved seasonal roads, which often run through small valleys between the hills. Views within this zone are generally restricted to areas where small clearings and road cuts provide breaks in the tree canopy. Long-distance views from roads within this LSZ are not common, as the sloping topography and rock outcrops result in numerous twists and turns in the existing roads that traverse the forested mountainous portions of the study area. Where long distance views are available, they are typically of short duration, limited distance, and tightly framed by trees and adjacent slopes. Land use in this zone includes low-density residential development, small quarries, logging and recreational activities such as hiking, hunting, and snowmobiling.

Examples of this zone are shown in Inset 4. These forested areas occur on both private lands with limited public access, as well as public lands such as Oquaga Creek State Park and Marsh Pond State Forest.

3.3.2 Rural Residential/Agricultural



Inset 5. Representative photographs from the Rural Residential/Agricultural LSZ.

Upper Left: Pazzelli Road (Viewpoint 56); Upper Right: Farnham Road at Pazzelli Road (Viewpoint 100); Lower Left: Pazzelli Road (Viewpoint 57); Lower Right: State Route 8 (Viewpoint 89).

The Rural Residential/Agricultural LSZ comprises 17.4% of the visual study area and is characterized by open agricultural and successional fields mixed with woodlots and widely-spaced farms. Low density residential development within this LSZ consists of older single-family residences located along the road frontage and newer residential construction set back into the landscape. Topography in this LSZ is generally a mix of gently rolling hills and valleys dissected by a network of county and local roads. This zone also includes several more heavily traveled two-lane roads such as State Routes 8, 10, 41, and 79, which in places offer open views of the surrounding landscape. Interstate Routes 86 and 88 also run through the Rural Residential/Agricultural LSZ, but have a distinctly different visual character and therefore were included within the Transportation Corridor LSZ described below. The Susquehanna and the West Branch of the Delaware River Valleys also

fall within this zone. The banks of these rivers are lined with mature trees and brush in most places, which tends to shield views to and from the rivers. Dominant activities in the Rural Residential/Agricultural LSZ include typical residential activities, along with farming and local travel. Due to the presence of open farm land in this LSZ, open views tend to be more available than in most other LSZs within the visual study area. These views typically include open fields in the foreground, including scattered homes and farms, backed or bordered by forested hills that define the horizon. In valley portions of this LSZ the surrounding hills typically limit long-distance views of landscape features.

3.3.3 Village



Inset 6. Representative photographs from the Village LSZ.

Upper Left: Front Street, Village of Deposit (Viewpoint 6); Upper Right: Lippincott Place, Village of Deposit (Viewpoint 92); Lower Left: Main Street Historic District, Village of Afton (Viewpoint 44); Lower Right: Chapel Street at Main Street, Village of Windsor (Viewpoint 109).

The Village LSZ occupies 1.8% of the visual study area and includes the Villages of Windsor, Deposit, and Afton. This landscape similarity zone is characterized by moderate to high-density residential with commercial development situated along an organized street network, and often adjacent to a river or creek. Buildings are typically 1-3 stories tall, and in combination with other man-made infrastructure, are the dominant features of this LSZ. The character of buildings and

structures within this zone can be highly variable in design and condition, but the main streets within the Village LSZ are typically characterized by limited building setbacks, sidewalks, street lighting and other pedestrian amenities. In all three cases within the visual study area, a bridge across a waterway acts as the gateway to the village. Views into the village and along the river corridor are highlighted, and form the initial visual impression. The density of buildings, and their organization along village streets, focus views down the open streets and limit the availability of open, long-distance views. In some areas, trees along the gridded street network and within residential yards also tend to enclose and screen views from this zone. However, open street corridors and the edges of the Village LSZ, where there is often less dense development, offer more unobstructed views of the surrounding landscape. Because these settlements are in valley settings, long-distance views are also limited by the surrounding ridges, which block views of more distant landscape features.

3.3.4 Transportation Corridor



Inset 7. Representative photographs from the Transportation Corridor LSZ.

Upper Left: Eastbound rest area off Interstate 86/State Route 17, east of Exit 81 (Viewpoint 5); Upper Right: Bosket Road Overpass (Viewpoint 20);

Lower Left: Westbound rest area off Interstate 86/State Route 17, east of Exit 84 (Viewpoint 18); Lower Right: Exit 84 Deposit Walton (Viewpoint 17).

The Transportation Corridor LSZ occupies approximately 1.5% of the visual study area and includes divided, multi-lane highways with limited access. These include Interstate Route 88, which transects the northern portion of the visual study area, and State Route 17/Interstate Route 86 which runs adjacent to the southern end of the Project Site. Views along these transportation corridors are dominated by automobiles, pavement, guard rails, and roadway signage, backed by vistas of adjacent forested hills interspersed with small open fields and widely scattered structures. The broad areas of pavement and wide medians that characterize these highways allow for open views of the surrounding landscape. However, hills that surround their valley location generally limit long-distance views, perpendicular to the highway. Two rest areas are present within the visual study area, one eastbound and one westbound, both associated with the State Route 17/Interstate 86 corridor. No open views or overlooks are available at either of the rest areas. Representative views in this LSZ are shown in Inset 7 above.

3.3.5 Open Water



Inset 8. Representative photographs from the Open Water LSZ.

Upper Left: Cannonsville Reservoir Parking Area, off of State Route 10 (Viewpoint 25); Upper Right: Arctic Lake Beach, Oquaga Creek State Park (Viewpoint 31);

Lower Left: West Branch of the Delaware River, NYSDEC designated fishing access off of County Route 48 (Laurel Bank Road) (Viewpoint 68); Lower Right: Marsh Pond Road, Marsh Pond State Forest (Viewpoint 103).

The Open Water LSZ occupies 2.6% of the visual study area and is defined by the presence of open water that provides unobstructed views of the surrounding landscape. Representative views of this LSZ area are shown in Inset 8. Land use within this LSZ includes year-round and seasonal residences along some of the lake shores, as well as water-based recreation. Within the visual study area, this LSZ occurs at Blueberry Lake, Cannonsville Reservoir, Crystal Lake, Columbia Lake, Cronk Pond, Deer Lake, Fly Pond, Griffins Pond, Laurel Lake, Marsh Pond, Oquaga Lake, Page Pond 1 and 2, Perch Pond, Sky Lake, and White Birch Lake. Cannonsville Reservoir has considerable visual importance within the study area due to its size, undeveloped shoreline, high public use, recreational value, and scenic quality. Outward views from boats on the lake's surface and from points along the lake shore typically include a sizeable expanse of open water backed by a forested shoreline and wooded hills. Views from smaller water bodies, such as Sky Lake, Page Pond 1, and Columbia Lake, among others, are more typically surrounded by hills and forest vegetation along the shoreline that screen outward views and create a sense of enclosure.

The Susquehanna and West Branch of the Delaware Rivers, which also fall within this zone, are lined with mature trees and brush in most places, which tends to shield immediate views to and from the rivers. The valleys in which these rivers occur are enclosed by wooded hills, which further limit long distance views from these water features.

3.4 Distance Zones

Three distinct distance zones are typically defined in visual studies. Consistent with well-established protocols (e.g., Jones and Jones, 1977; USFS, 1995), EDR defines these zones as follows:

- *Foreground:* 0 to approximately 0.5 mile. At these distances, a viewer is able to perceive details of an object with clarity. Surface textures, small features, and the full intensity and value of color can be seen in foreground objects.
- *Middle Ground:* Approximately 0.5 to 3.5 miles. The midground is usually the predominant distance at which landscapes are seen. At these distances, a viewer can perceive individual structures and trees but not in great detail. This is the zone where the parts of the landscape start to join together; individual hills become a range, individual trees merge into a forest, and buildings appear as simple geometric forms. Colors will be clearly distinguishable, but will have a bluish cast and a softer tone than those in the foreground. Contrast in color and texture among landscape elements will be reduced.

- *Background:* Over 3.5 miles. The background defines the broader regional landscape within which a view occurs. Within this distance zone, the landscape has been simplified; only broad landforms are discernable, and atmospheric conditions often render the landscape an overall bluish color. Texture has generally disappeared and color has flattened, but large patterns of vegetation are discernable. Silhouettes of one land mass set against another and against the skyline or horizon are the dominant visual characteristics in the background. The background contributes to scenic quality by providing a softened backdrop for foreground and mid-ground features, an attractive vista, or a distant focal point.

The land area of each LSZ within the visual study area, broken down by distance from the proposed turbine locations, is summarized in Table 3.

Table 3. Distance Zones by Landscape Similarity Zone within the Visual Study Area.

Landscape Similarity Zone	Total Area (square miles) and Percent of LSZ		
	Foreground (<0.5 mile)	Middle Ground (0.5 – 3.5 miles)	Background (>3.5 miles)
Forest	20.8 (4.9%)	70.1 (16.4%)	236.7 (55.4%)
Rural Residential/Agricultural	4.6 (1.1%)	16.0 (33.7%)	53.9 (12.6%)
Open Water	0.1 (0.02%)	1.2 (0.3%)	9.7 (2.3%)
Village	4.8 (1.1%)	2.9 (0.7%)	1.2 (0.3%)
Transportation Corridor	0.1 (0.03%)	2.1 (0.5%)	4.2 (1.0%)

3.5 Viewer/User Groups

Three categories of viewer/user groups were identified within the visual study area. These groups include local residents, through-travelers/commuters, and tourists/recreational users.

3.5.1 Local Residents

Local residents include those who live and work within the visual study area. They generally view the landscape from their yards, homes, local roads, schools, and places of employment, and are the group with the greatest opportunity for views of the proposed Project. The largest concentration of local residents can be found in the Villages of Afton (population 822),

Deposit (population 250), and Windsor (population 916). Residents living outside of these main population centers occur at relatively low density throughout the visual study area, with higher concentrations to the north. Except when involved in local travel, residents are likely to be stationary and have frequent or prolonged views of the landscape. Local residents may view the landscape from ground level or from elevated viewpoints such as windows in the upper stories of their homes. Residents' sensitivity to visual quality is variable. However, it is assumed that local residents may be very sensitive to changes in views from their homes and yards.

3.5.2 Through-Travelers/Commuters

Through-travelers and commuters passing through the area view the landscape from motor vehicles on their way to work or other destinations. They are moving, have a relatively narrow field of view, and are destination oriented. Drivers on major roads in the area (e.g., Interstate Routes 86 and 88; and State Routes 8, 17, 41, and 79) will most often be focused on the road and traffic conditions, but will also have the opportunity to observe roadside scenery. However, these views will generally be peripheral and fleeting. Passengers in moving vehicles will have greater opportunities for prolonged views of the surrounding countryside than will drivers, and so may have greater perception of changes in the visual environment. Commuters' and travelers' sensitivity to visual quality is variable. However, it is assumed that through-travelers will generally have limited perception of, or sensitivity to, visual change, while local commuters may be more sensitive to changes in views of areas that they travel through on a regular basis.

3.5.3 Tourists/Recreational Users

Tourists and recreational users include full time residents, seasonal residents, and out-of-town visitors/vacationers involved in cultural and recreational activities at parks, historic sites, and in undeveloped natural portions of the study area, such as lakes, rivers, state forests and trails. These viewers are concentrated at the recreational and cultural sites located within the visual study area, and view the landscape from these sites, as well as from area highways while on their way to these destinations. This group includes snowmobilers, cyclists, boaters, hunters, fishermen, hikers, and those involved in more passive recreational activities such as family vacations, picnicking, sightseeing, and walking. Tourists and recreational users will often have continuous but changing views of landscape features over relatively long periods of time. Visual quality may or may not be an important part of the recreational experience for these viewers. However, for many, scenery will be a very important part of their recreational experience.

3.6 Visually Sensitive Resources

In accordance with standard visual impact assessment practice in New York State, visually sensitive resources (VSRs) were identified in accordance with New York State Department of Environmental Conservation (NYSDEC) Program Policy DEP-00-2, *Assessing and Mitigating Visual Impacts* (NYSDEC, 2000), which defines specific types of properties as VSRs of statewide significance. The types of resources identified by NYSDEC in Program Policy DEP-00-2 are consistent with the types of resources identified in 16 NYCRR § 1000.24(b)(4). These include landmark landscapes; designated wild, scenic or recreational rivers; forest preserve lands, designated scenic vistas, conservation easement lands, and scenic byways designated by the federal or state governments; designated scenic districts and scenic roads; designated Scenic Areas of Statewide Significance; state parks or historic sites; sites listed on National or State Registers of Historic Places; areas covered by scenic easements, public parks or recreation areas; locally designated historic or scenic districts and scenic overlooks; and high-use public areas.

To identify VSRs within the visual study area, EDR consulted a variety of data sources including digital geospatial data (shapefiles) obtained primarily through the NYS GIS Clearinghouse or the Environmental Systems Research Institute (ESRI); numerous national, state, county, and local agency websites as well as websites specific to identified resources; the DeLorme Atlas and Gazetteer for New York State; USGS 7.5-minute topographical maps; and web mapping services such as Google Maps. In addition, a thorough examination of local and regional planning documents was undertaken as well (see Appendix A). VSRs of statewide significance were identified within a 10-mile radius of the Project Site. National Register of Historical Places (NRHP)-eligible sites, as well as locally significant VSRs and areas of intensive land use were identified within a 5-mile radius of the Project Site. The complete inventory of VSRs within the visual study area is presented in Appendix C. Their locations are shown in Figure 5, and also on the composite overlay map included in Appendix A.

In accordance with the requirements set forth in 16 NYCRR § 1000.24(b)(4) as well as the Article 10 Preliminary Scoping Statement (PSS) for the Project dated August 2017, the Applicant also conducted a systematic program of public outreach to assist in the identification of VSRs. Copies of the correspondence sent by the Applicant as part of this process, as well as responses received from stakeholders, are included as Appendix G of this VIA. This outreach included the following:

- The Applicant distributed a request on January 19, 2018 to 49 municipal planning representatives, regional organizations, state agencies, and other interested parties. Feedback was requested regarding the identification of VSRs and representative viewpoints in the Project vicinity to inform field review efforts and the eventual selection of candidate viewpoints for the development of visual simulations. The materials provided as part of this outreach effort included: a summary of the purpose and necessity of consultation per the requirements of Article 10; a definition, explanation, and map of the visual study area; a preliminary inventory and map of VSRs identified in

accordance with NYSDEC Program Policy DEP-00-2; a preliminary Project viewshed (visibility) analysis; a discussion of anticipated subsequent steps, including additional consultation regarding the eventual selection of viewpoints for development of visual simulations; the visual stakeholder distribution list and a request for feedback regarding additional VSRs to be included in the analysis.

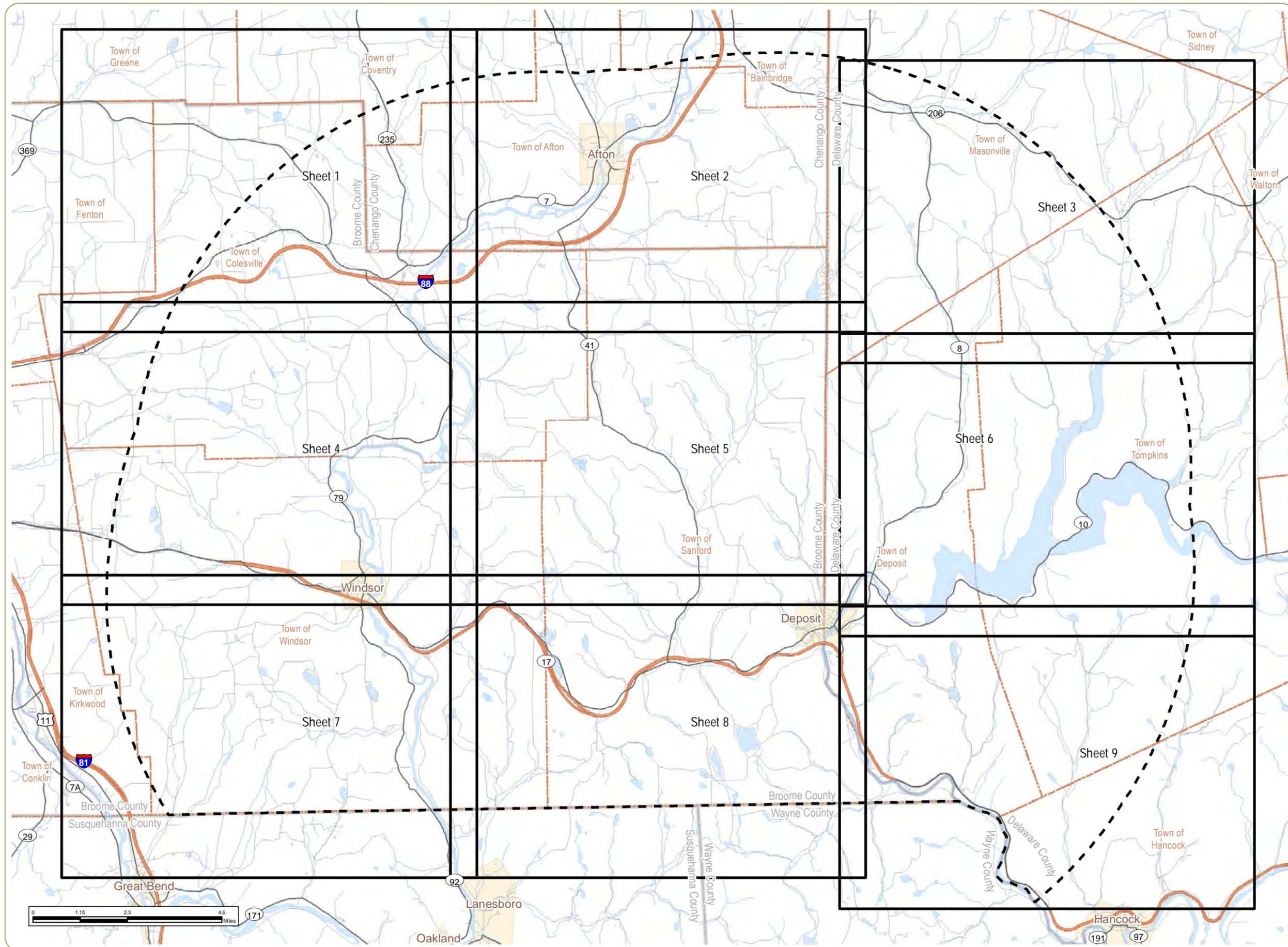
- In response to this request, EDR received feedback from five of the visual stakeholders, including the NYSDEC, New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP), and representatives of the Towns of Colesville, Tompkins, and Windsor. An additional 30 resources were identified from the outreach process and cross-referenced with the viewshed mapping to determine the need for field review. For a full list of the resources recommended by the individual responding parties refer to Appendix G.
- In addition, EDR conducted a historic resources survey (in consultation with the NYSOPRHP) of the study area to identify potential historic sites (EDR, 2018). The results of this survey are presented in a final report that is included as an appendix to the Article 10 application. It was determined that 53 NRHP-listed sites were present within the 10-mile radius study area and 20-NRHP-eligible sites were located within the 5-mile radius study area.

All of the VSRs that were identified as a result of the research, stakeholder outreach, and subsequent consultation described above are included in Appendix C and further described below.

Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources Index



- River or Stream
- Waterbody
- Index Sheet
- Visual Study Area
- City/Village
- Town Boundary
- County Boundary

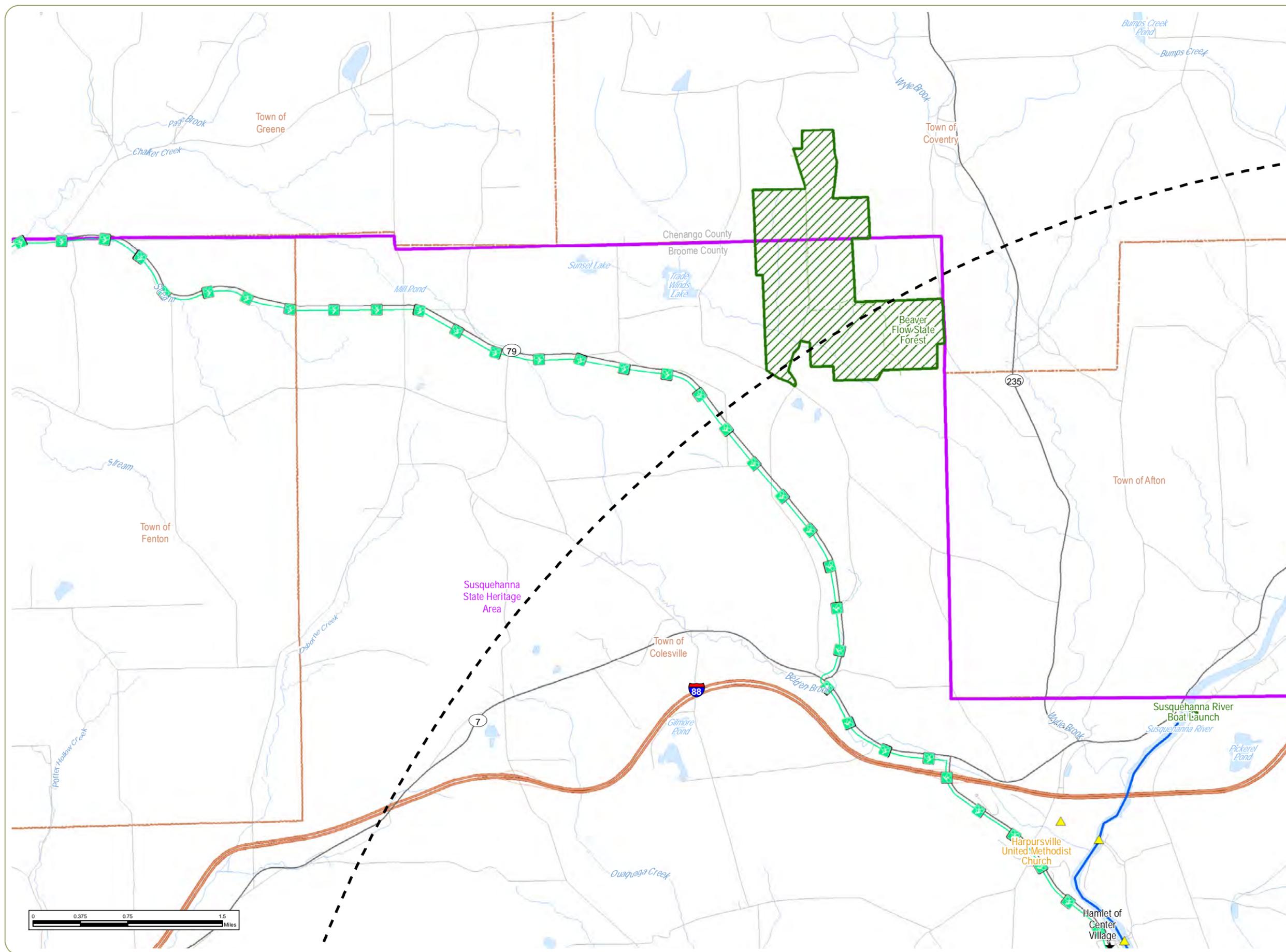
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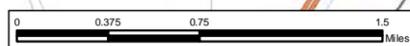
Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources Sheet 1 of 9



- ★ Hamlet
- ▲ NRHP-Eligible Site
- Scenic Overlook
- Designated Inland Waterway
- - - Finger Lake Trail
- NYSDEC Public Fishing Rights
- - - NYSDEC Trail
- Other Local Resource (Local Road)
- River or Stream
- - - Snowmobile Trail
- 🚲 State Bike Route
- Cemetery
- Fishing Access
- Golf Course
- Library
- Local Park
- NRHP-Listed Site
- NYSDEC Land
- NYS Heritage Area
- Other Local Resource
- State Park
- School
- Waterbody
- Visual Study Area
- City/Village
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- County Boundary

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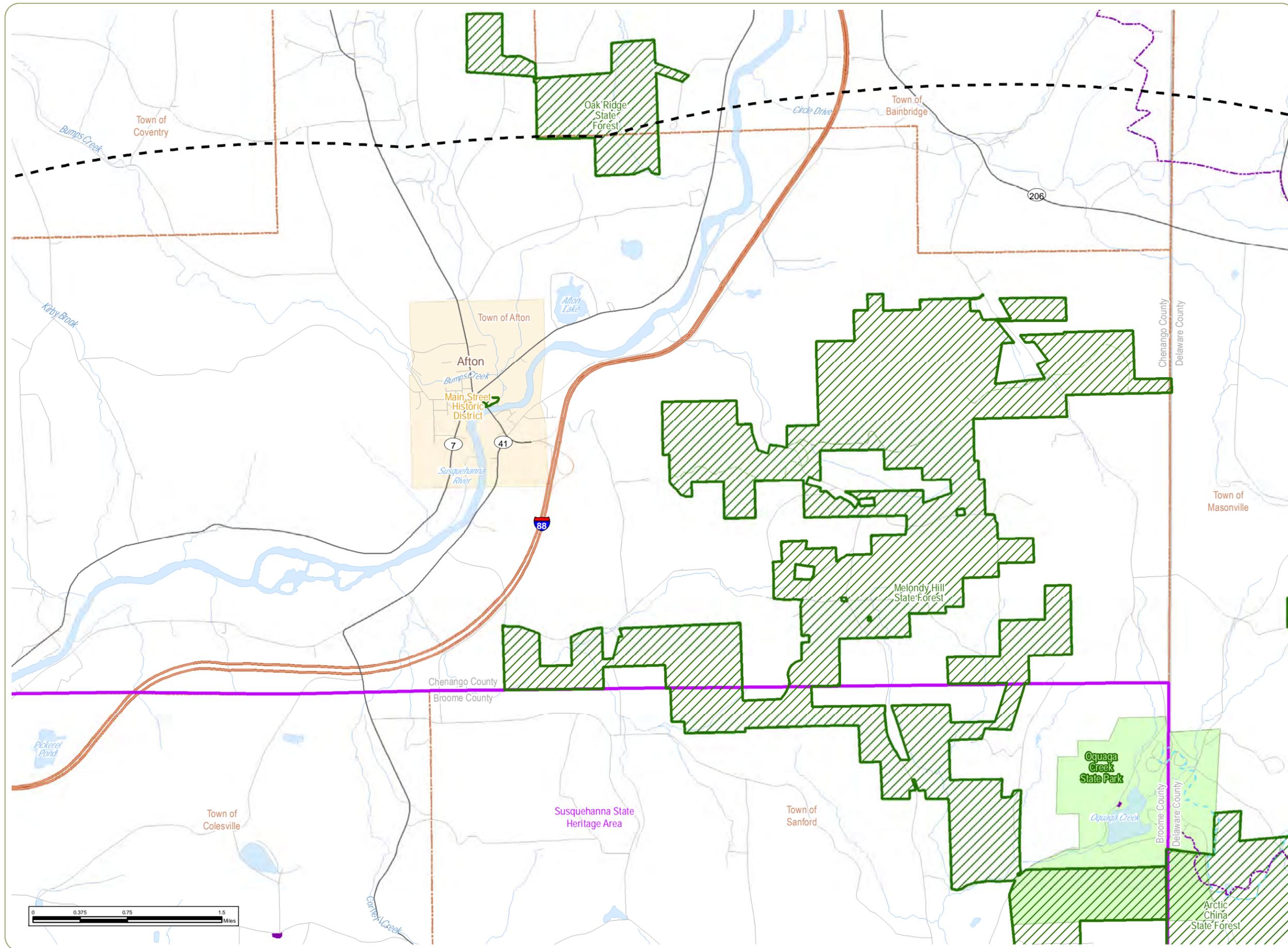


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Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources
Sheet 2 of 9



- ★ Hamlet
- ▲ NRHP-Eligible Site
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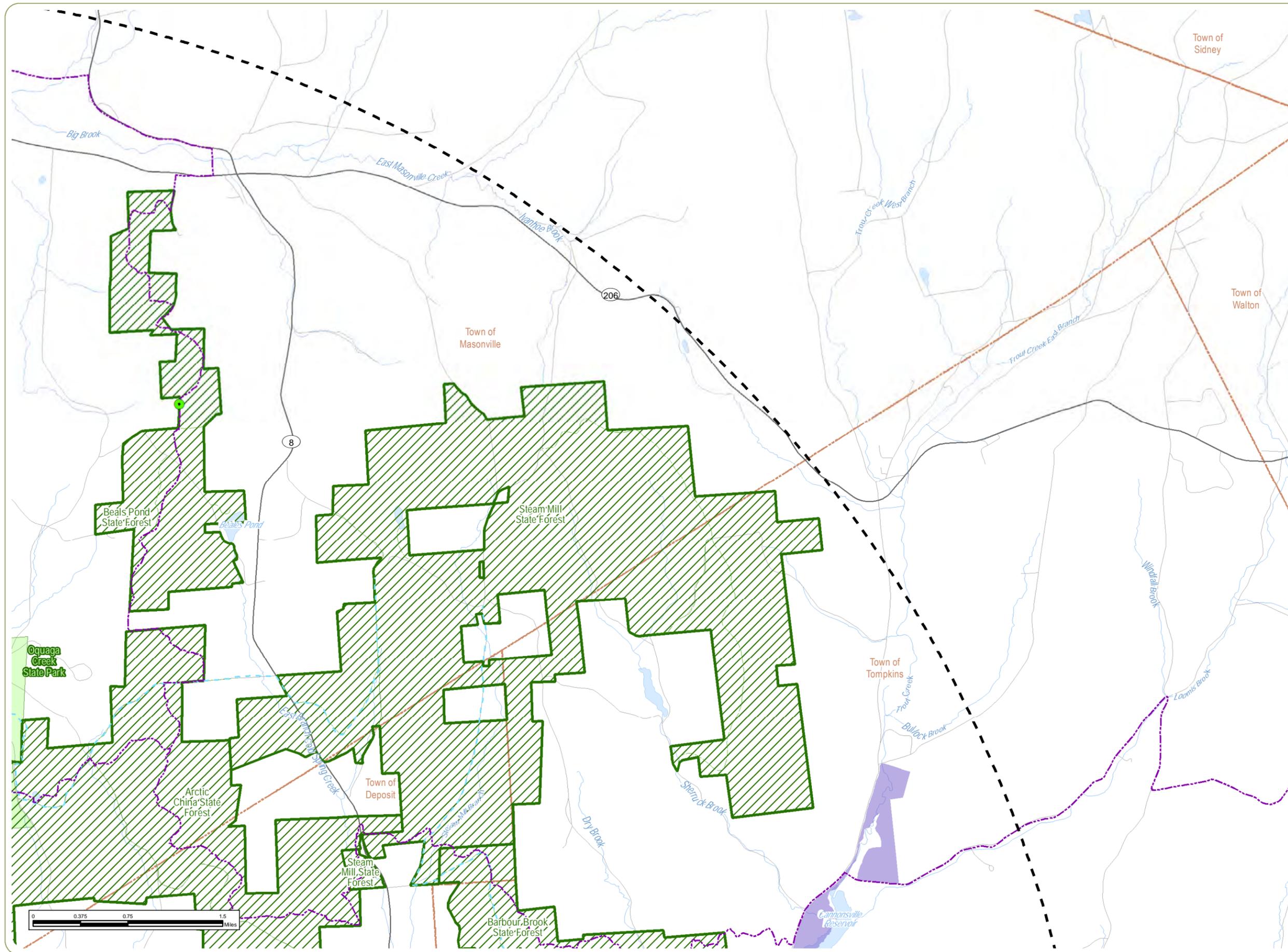
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Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources
Sheet 3 of 9



- ★ Hamlet
- ▲ NRHP-Eligible Site
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- 🏛 Cemetery
- 🎣 Fishing Access
- 🏌 Golf Course
- 📖 Library
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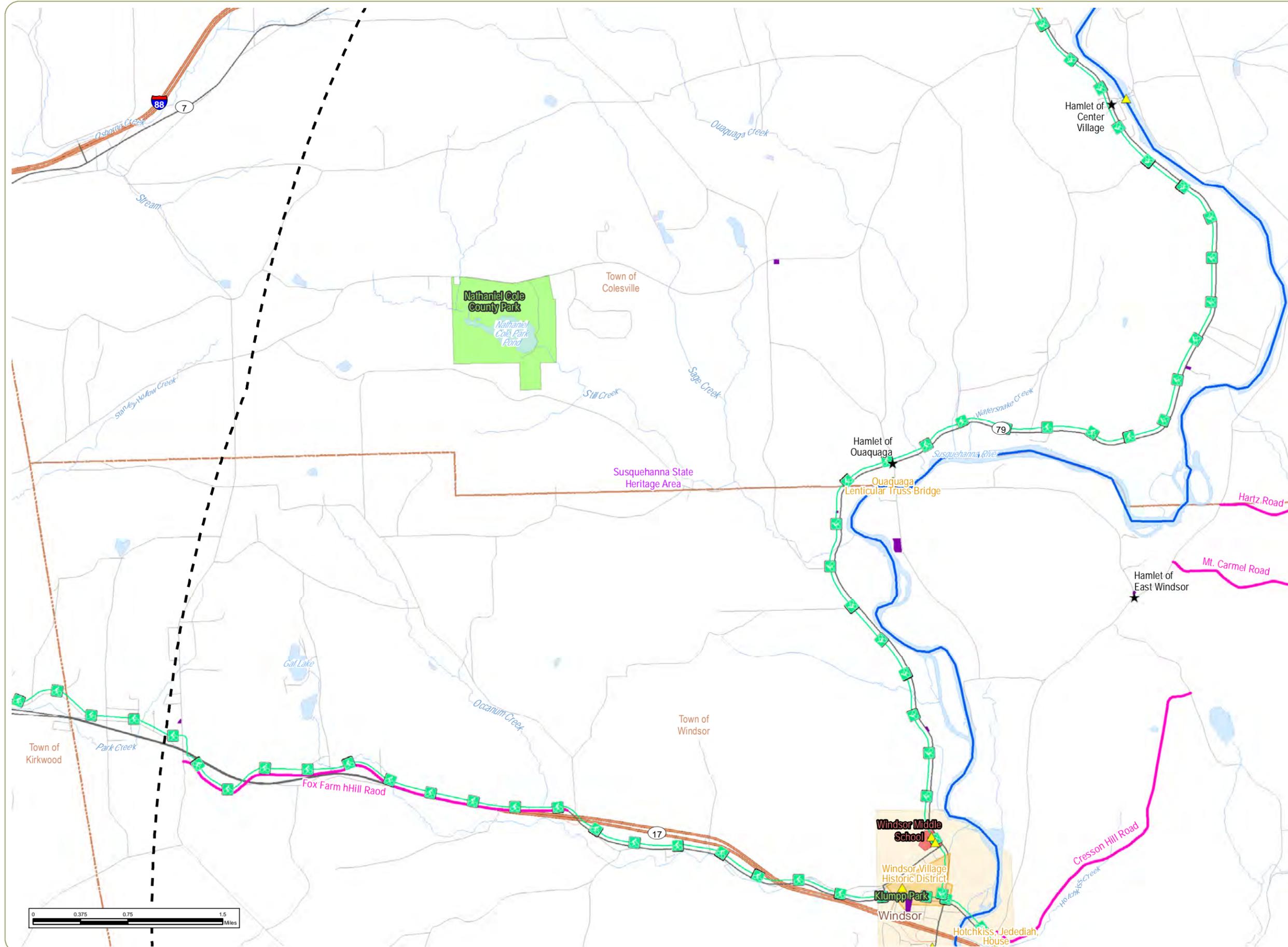
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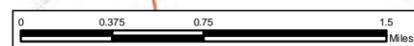
Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources
Sheet 4 of 9

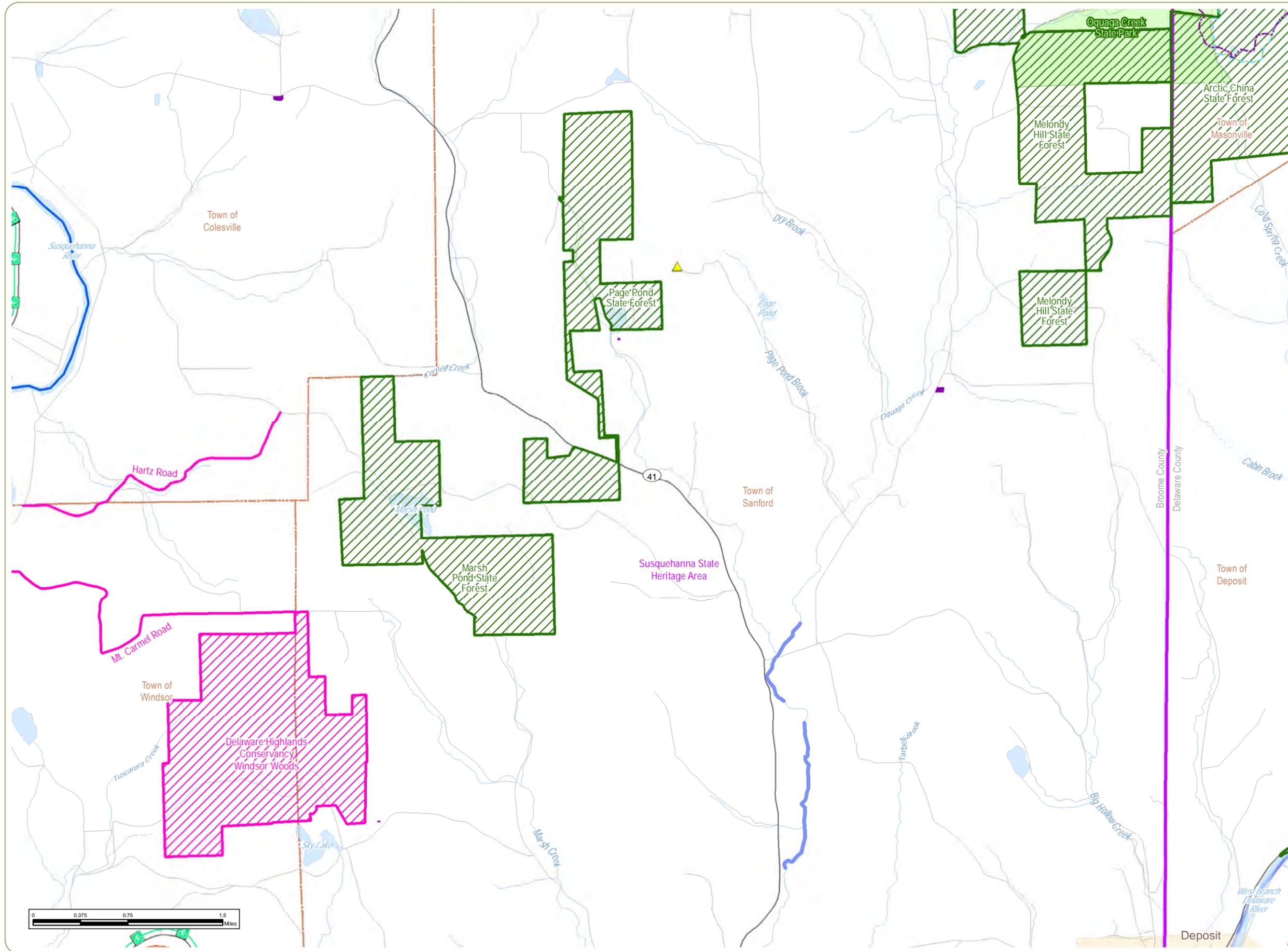


- ★ Hamlet
- ▲ NRHP-Eligible Site
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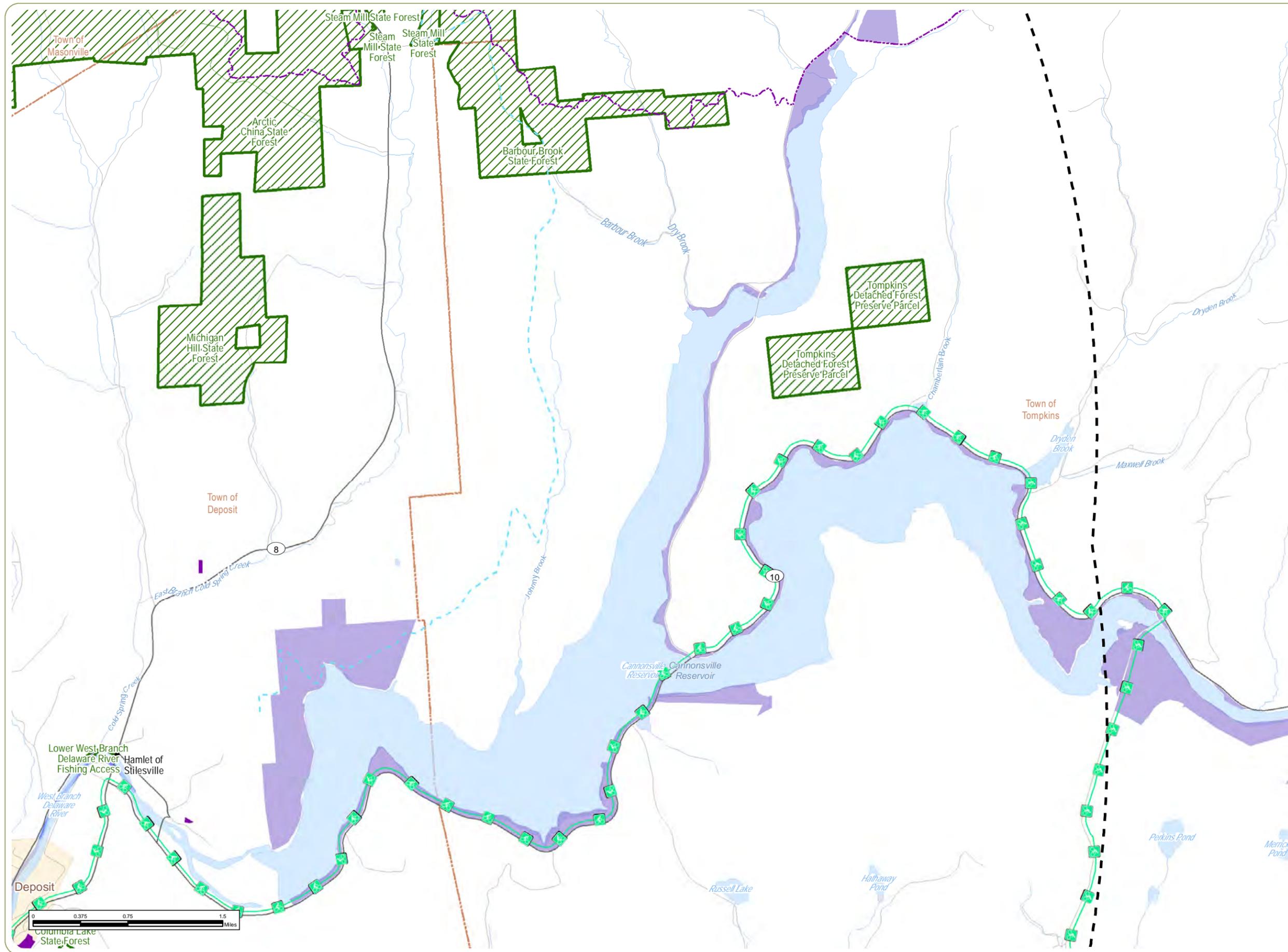
Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources Sheet 5 of 9

- ★ Hamlet
- ▲ NRHP-Eligible Site
- Scenic Overlook
- Designated Inland Waterway
- Finger Lake Trail
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- Fishing Access
- Golf Course
- Library
- Local Park
- NRHP-Listed Site
- ▨ NYSDEC Land
- ▭ NYS Heritage Area
- ▨ Other Local Resource
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- ▭ County Boundary

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Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources Sheet 6 of 9

- ★ Hamlet
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- State Park
- School
- Waterbody
- ⬜ Visual Study Area
- ⬜ City/Village
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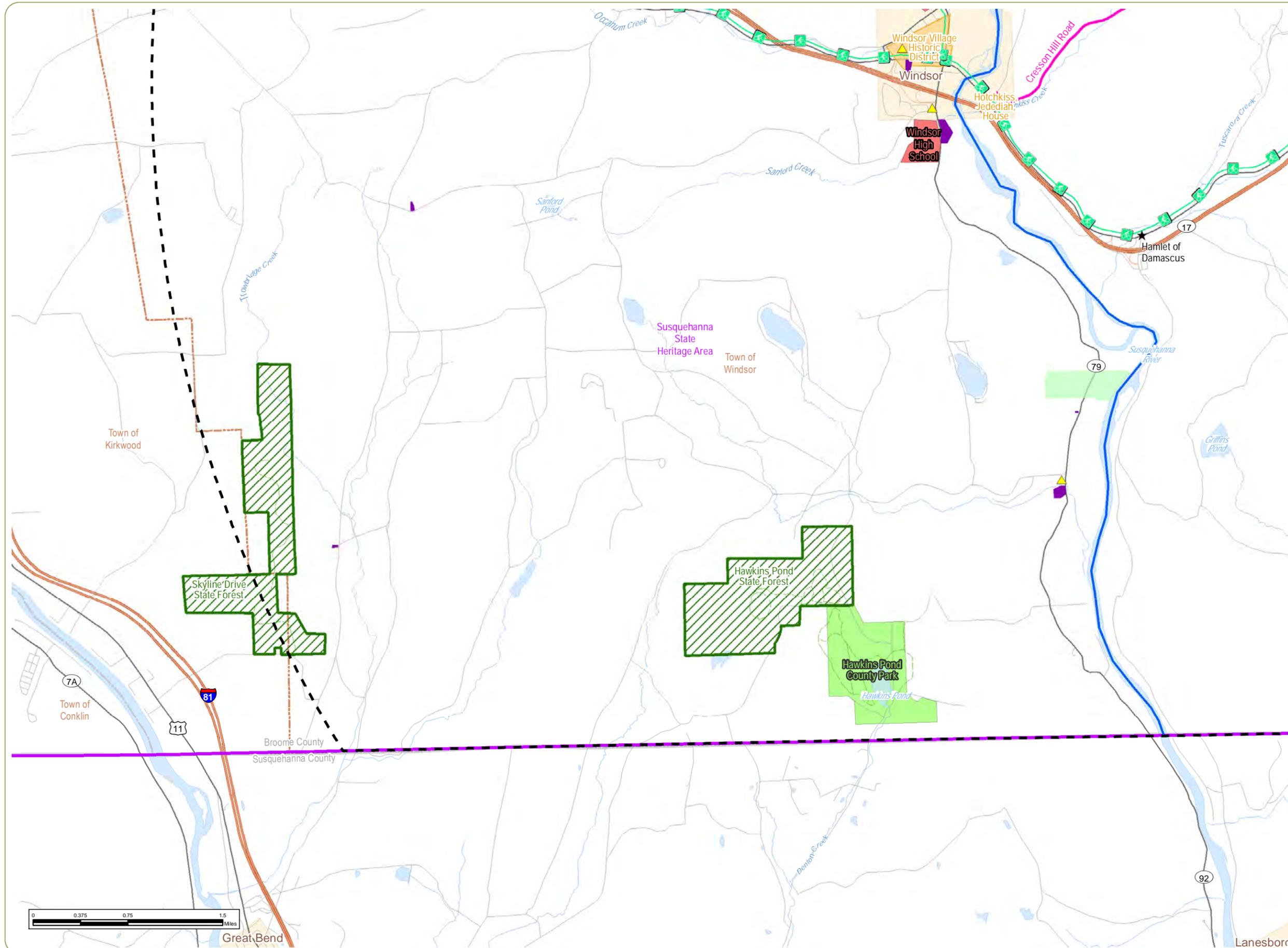
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Figure 5: Visually Sensitive Resources Sheet 7 of 9



- ★ Hamlet
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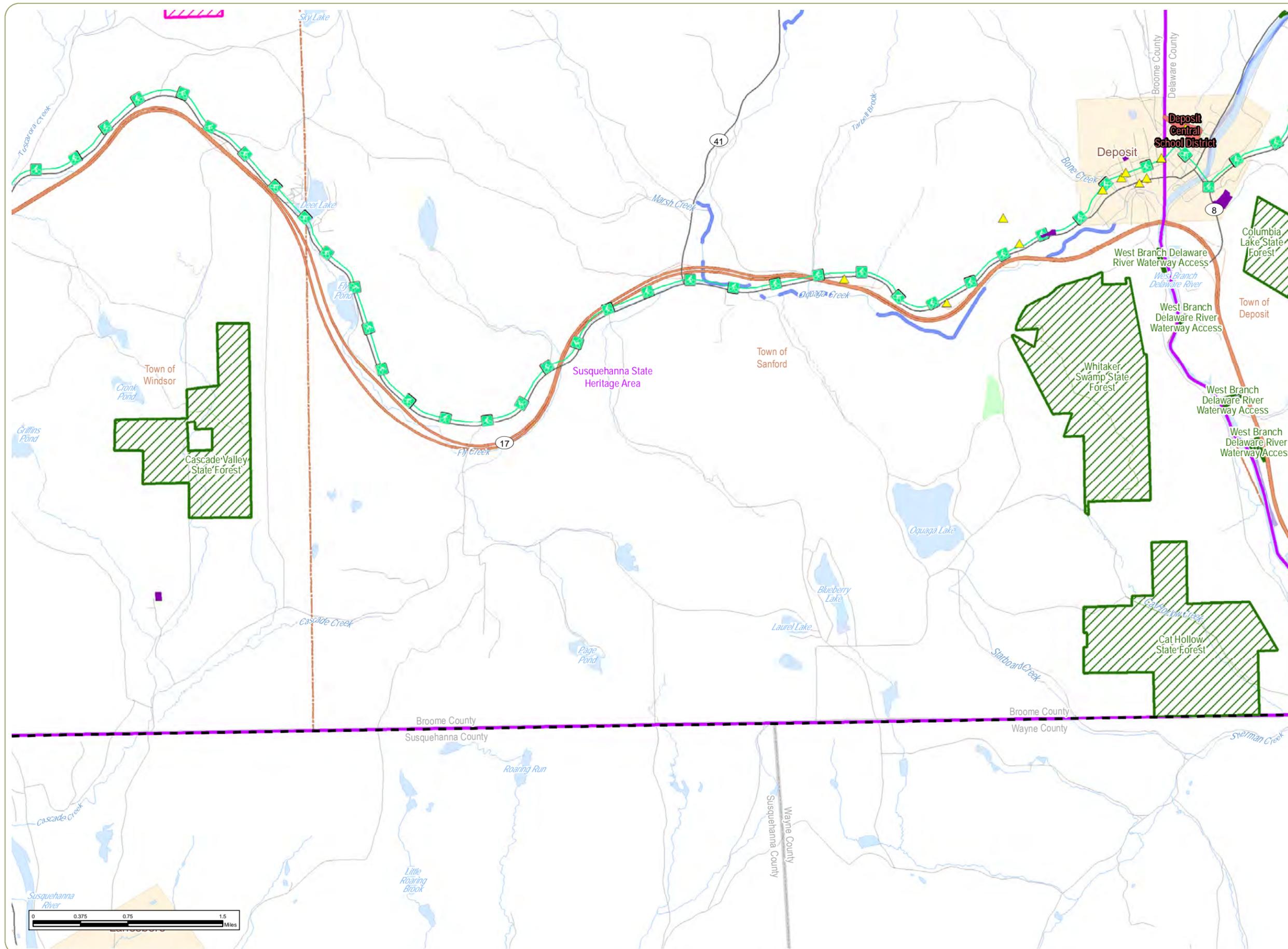
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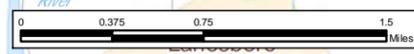
Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources Sheet 8 of 9

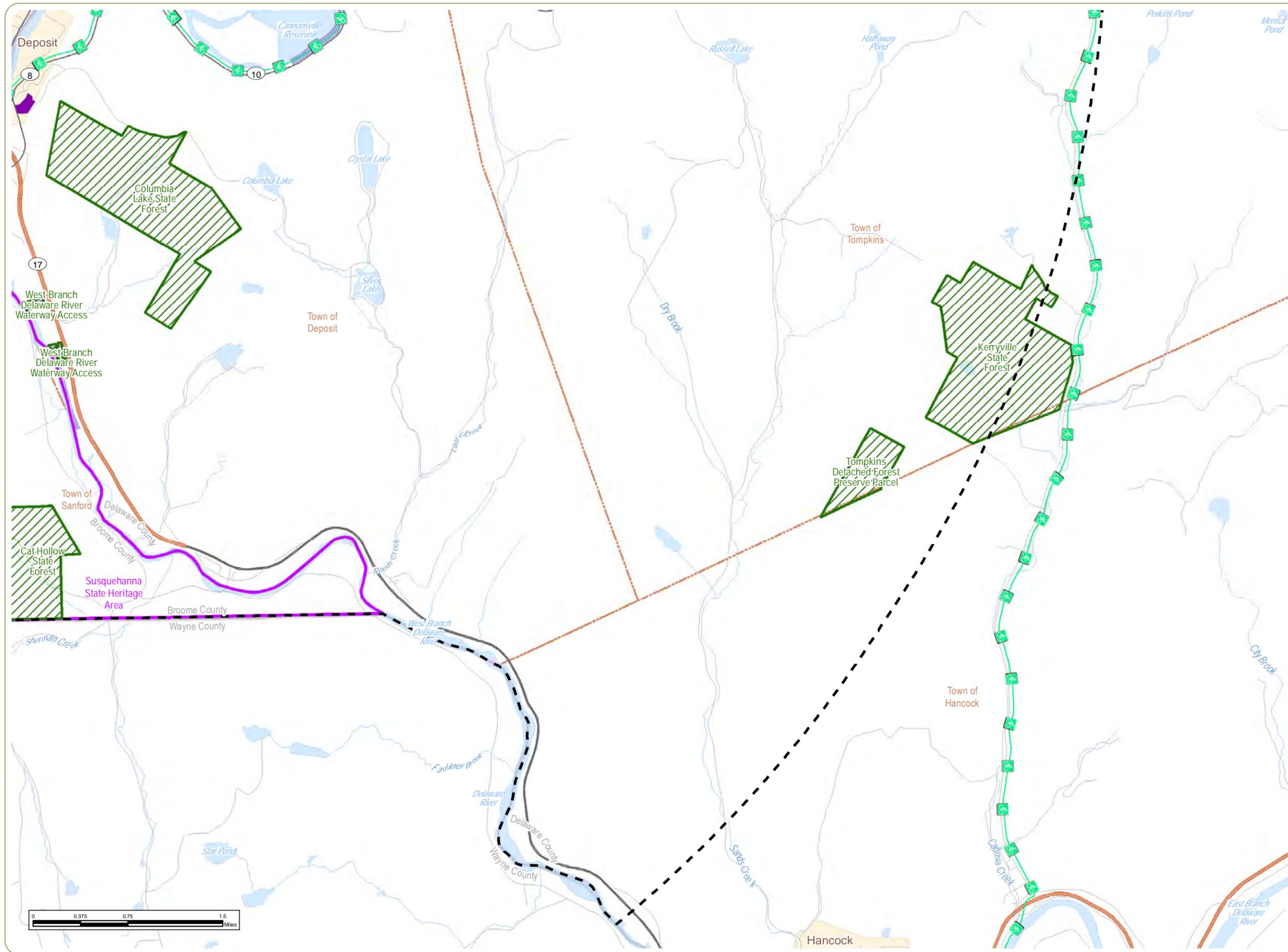


- ★ Hamlet
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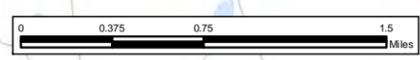
Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 5: Visually Sensitive Resources Sheet 9 of 9

- ★ Hamlet
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3.6.1 VSRs of Statewide Significance

Among the categories of VSRs identified in NYSDEC Visual Policy as resources of statewide significance, there are no national parks, national forests, national wildlife refuges, national natural landmarks, state nature preserves, designated scenic sites, areas, lakes, reservoirs or highways, Scenic Areas of Statewide Significance (SASS), exceptionally beautiful or Open Space Bond Act properties and no federally or state designated wild, scenic or recreational rivers within the visual study area. However, database research and visual outreach efforts identified 96 sites as VSRs of statewide-significance within the 10-mile radius study area (see Appendix C). These include 52 sites and two districts listed on the NRHP; one state park; one state heritage area; one area of state forest preserve land; 17 state forests; one state-designated trail; and one state-designated bike route. Additionally, the 5-mile study area includes 20 sites that have been determined by NYSOPRHP to be eligible for NRHP-listing (see Figure 5). Descriptions of the VSRs of statewide significance within the visual study are presented below.

Sites Listed on or Eligible for Listing on the State and National Register of Historic Places:

EDR reviewed the NRHP and the NYSOPRHP Cultural Resources Information System (CRIS) websites, as well as the NYSOPRHP shapefile for buildings, structures, objects and historic districts listed in the NRHP to identify significant historic buildings and/districts located within the Project's 10-mile radius extended study area (NPS, 2018a; NRHP, 2018, 2018a; NYSHPO, 2018). EDR also conducted a *Historic Architectural Resources Survey* for the Project (EDR, 2018), which identified historic buildings and resources located within 5 miles of the proposed Project. Representative examples of NRHP-listed and eligible properties within the study area are shown in Inset 9, below.

As indicated above, the visual study area includes 52 individual sites and two historic districts that are listed in the NRHP. Of these 54 listed sites/districts, two were determined to have potential views of the Project: the State Theater in the Village of Deposit and the Windsor Village Historic District. Of the 20 eligible sites, seven were determined to have potential Project visibility, with two of them (Page Pond Fire Tower and Observers Cabin) being private with no public access. Representative historic properties and districts within the visual study areas are discussed below.



Inset 9. Representative Photographs of NRHP-listed and NRHP-eligible Properties within the Visual Study Area.

Upper Left: State Theater, Village of Deposit (90NR00089) (Viewpoint 6); Upper Right: State Theater, Village of Deposit (90NR00089) (Viewpoint 8);

Lower Left: Center Village Bridge, Town of Colesville (Viewpoint 59); Lower Right: Windsor Village Historic District (90NR00091) (Viewpoint 2).

Historic properties within the visual study area include residences, cemeteries, farms, bridges, parks, and various other structures. These properties are scattered throughout the visual study area, but are most concentrated in village and hamlet centers.

State Theater (90NR00089): The State Theater is located on Front Street in the Village of Deposit. The theater survives as a fragment of a larger building erected in two phases, in 1925 and 1937. The theater is a rectangular one-story building with its short side oriented to the street. It is an outstanding example of the Art Deco aesthetic as applied to small movie houses in this period and is remarkably intact, including furnishings. Its sophisticated design is unusual within the context of a small rural village in the Southern Tier of New York and is a graphic statement of changing community social activities with the advent of movie entertainment. The surviving original facade and lobby spaces adequately convey the resource's decorative, functional and symbolic associations (NRHP, 1995).

Windsor Village Historic District (90NR00091): Encompassing a triangular area located in the center of the Village of Windsor, the Windsor Historic District includes eighty buildings and two landscaped areas; the Village Cemetery and Village Green. The district includes the core of the business district and many older residential streets but excludes residential areas that have lost their historical integrity. Included within the district are structures representing a variety of functions and styles, with the oldest building dating from ca. 1810. The buildings are similar in scale and nearly all are simple, local adaptations of architectural styles popular during their respective periods of construction, including Greek Revival, 19th-century, and Victorian. The business district is concentrated along the south end of Main Street. Most of the commercial structures are of brick, a material selected to withstand fires, which destroyed large sections of the business district in the late nineteenth century. Commercial buildings are most densely clustered on the east side of Main Street along the edge of a steep bank which divides the area from the floodplain of the Susquehanna River (NRHP, 1979).

The NRHP-eligible sites located within the 5-mile radius study area include schools, residences, commercial and industrial buildings, libraries, fire towers and observer cabins, and bridges. Most of the NRHP-eligible properties occur in areas of concentrated settlement such as the Villages of Windsor and Deposit.

State Parks:

Review of the NYSOPRHP website indicates that there is one New York State Park located within the visual study area (NYSOPRHP, 2018).

Oquaga Creek State Park: Oquaga Creek State Park is located in the Towns of Masonville and Sanford, approximately 3.3 miles from the nearest proposed turbine. The park is comprised of the 55-acre Arctic Lake, which is surrounded by rolling, wooded hills. Visitors to the park are afforded waterfront views enclosed by the surrounding ridgelines. In addition to wooded hiking trails, paved roads run through the park connecting the winter and summer entrances. Within the hiking and cross-country skiing trails and road network, views are generally restricted to areas where small clearings and road cuts provide breaks in the tree canopy. Amenities provided include 90 campsites, one full-service cottage, several "rustic" cabins, seasonal campsites, row boat rentals, nature trails, pavilions, a snack bar, picnic tables, playgrounds, showers, a swimming beach, and tent/trailer sites. Activities include biking, disc golf, camping, hiking, hunting, picnicking, fishing, swimming, ice fishing, ice skating, sledding, cross-county skiing, and snowshoeing.

Urban Cultural Parks/Heritage Areas:

Review of the NYSOPRHP website indicates that there is one State Heritage Area located within the visual study area (NYSOPRHP, 2018a).

Susquehanna State Heritage Area: The Susquehanna State Heritage Area encompasses the Counties of Broome and Tioga in south-central New York, directly north of the Pennsylvania border. The defining natural feature of the region is the Susquehanna River, which flows through the Susquehanna Heritage Area. State Route 17/Interstate 86 extends east to west through both counties. There are 25 towns, 13 villages, and one city contained within the Heritage Area. The region is known for its contributions to industry and the arts, its ethnic heritage and immigrant stories, and rich Native American and agrarian history. The Susquehanna Heritage Area ranges from a densely populated urban center defined by the converging Susquehanna and Chenango Rivers, to rolling hills, meandering valleys, and rural farmlands interspersed with crossroad villages (Susquehanna Heritage Area, 2011).

State Forest Preserve:

Review of the NYSOPRHP website indicates that there is one area of Detached State Forest Preserve land located within the visual study area (NYSOPRHP, 2018).

Thompkins Detached Forest Preserve Parcel: Detached Forest Preserve parcels are classified as Forest Preserve but located outside the Catskill and Adirondack Park boundaries. The Thompkins Detached Forest Preserve Parcel is not managed for timber production, nor does it have a designated access, developed trails or facilities. The land is preserved to provide wildlife habitat and watershed protection values. The parcel is forested with no clearings or overlooks.

State Forests:

Review of the NYSDEC website indicates that there are portions of 17 NYSDEC-owned forests within the visual study area (NYSDEC, 2018a). These forests include:

- *Marsh Pond State Forest*
- *Beaver Pond State Forest*
- *Melondy Hill State Forest*
- *Cascade Valley State Forest*
- *Whitaker Swamp State Forest*
- *Columbia Lake State Forest*

-
- *Michigan Hill State Forest*
 - *Arctic China State Forest*
 - *Cat Hollow State Forest*
 - *Steam Mill State Forest*
 - *Hawkins Pond State Forest*
 - *Barbour Brook State Forest*
 - *Beals Pond State Forest*
 - *Skyline Drive State Forest*
 - *Kerryville State Forest*
 - *Beaver Flow State Forest*
 - *Oak Ridge State Forest*

National Wildlife Refuges and State Wildlife Management Areas:

Review of the U.S. Fish and Wildlife Service (USFWS) National Wildlife Refuge System and the NYSDEC websites indicate that there are no National Wildlife Refuges or State Wildlife Management Areas (WMA) within the visual study area (USFWS, 2018; NYSDEC, 2018e).

National Natural Landmarks:

Review of the National Park Service (NPS) National Natural Landmarks Program website indicates that there are no National Natural Landmarks within the visual study area (NPS, 2018).

National Parks, Recreation Areas, Seashores and Forests:

Review of the NPS and USFWS websites indicates that there are no National Parks, National Recreation Areas, National Seashores or National Forests within the visual study area (NPS, 2017a; USFS, 2013).

National or State Designated Wild, Scenic and Recreational Rivers:

Review of the National Wild and Scenic Rivers website and the NYSDEC Wild, Scenic and Recreational Rivers website indicates that there are no formally designated wild, scenic or recreational rivers within the visual study area (National Wild and Scenic Rivers, 2018; NYSDEC, 2018). The NPS Nationwide Rivers Inventory (NRI) was also consulted, as it is roughly equivalent to an eligible-for-listing designation. The NRI lists “free-flowing river segments in the United States that are believed to possess one or more outstandingly remarkable natural or cultural values judged to be of more than local or regional significance” (NPS, 2017). Review of the NRI indicates that no free-flowing river segments located within the visual study area met these criteria.

Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible as Scenic:

Per the New York State Department of Transportation (NYSDOT) (2018), there are no sites, areas, lakes, reservoirs, or highways designated or eligible as scenic within the visual study area in accordance with New York Environmental Conservation Law § 49-0205.

Scenic Areas of Statewide Significance:

According to the New York State Department of State (NYSDOS) (2018), there are no Scenic Areas of Statewide Significance within the visual study area.

State or Federal Designated Trails:

One state-designated trail, the Finger Lakes Trail, traverses the northeastern portion of the visual study area, and at its closest point is approximately 4 miles from the nearest proposed turbine (NYSOPRHP, 2018b). The Finger Lakes Trail system passes through several state-owned properties in the area, as well as private lands, and also connects to Oquaga Creek State Park. The Finger Lakes Trail is over 950 miles long and runs from the Pennsylvania-New York border in Allegany State Park to the Long Path in the Catskill Forest Preserve (Finger Lakes Trail Conference, 2018).

One state-designated bike route, State Bike Route 17, traverses the southern and western portions of the visual study area, and at its closest point is approximately 0.3 mile from the nearest proposed turbine (NYSDOT, 2018a). State Bike Route 17 is a shared roadway route that extends 442 miles from State Bike Route 9 in the Village of Wappingers Falls in Dutchess County to State Bicycle Route 517 in the Village of Westfield on the shores of Lake Erie.

There are also trail systems in several nearby State Forests which fall within the visual study area. See Appendix J for a description of these trails.

Adirondack Park Lands and Scenic Vistas:

No portions of the Adirondack Park are located within the visual study area.

Palisades Park Land:

No portions of the Palisades Park are located within the visual study area.

State Nature and Historic Preserve Areas and Bond Act Properties (Exceptional Scenic Beauty, Open Space):

Review of existing data did not identify any state nature or historic preserve areas or Open Space Bond Act properties within the visual study area that were purchased under the exceptional scenic beauty or open space category.

3.6.2 VSRs of Local Significance

In addition to the VSRs of statewide significance listed above, the 5-mile radius study area includes 93 VSRs that are regionally and locally significant, sensitive to visual impact, and/or receive significant public recreational use (see Figure 5). These VSRs include local parks and recreation facilities, public open spaces, population centers, schools, heavily used transportation corridors, rivers and lakes, libraries, cemeteries, and other sites identified during the VIA public outreach effort. Local VSRs are listed in Appendix C. Notable local and regional VSRs within the visual study area are described below:



Inset 10. Representative Photographs of Recreational Resources within the Visual Study Area

Upper Left: Klumpp Park, Village of Windsor (Viewpoint 4); Upper Right: Warner Field, Village of Deposit (Viewpoint 90);

Lower Left: Golden Oak Golf Course, State Route 79 (Viewpoint 117); Lower Right: Roods Creek Boat Launch, Cannonsville Reservoir, Town of Thompkins (Viewpoint 24)

Park and Recreational Facilities:

Recreational resources within the visual study area include trails, local parks, water resources, state forests, and golf courses (see examples in Inset 10). Klumpp Park, approximately 4.0 miles away from the nearest proposed turbine, is situated in the center of the Village of Windsor next to Occanum Creek. Amenities include baseball and softball diamonds, basketball courts, walking trails, swing sets, playgrounds, pavilions, picnic areas, and a concession stand. The park hosts hundreds of young athletes each year for baseball and softball programs, an Easter egg hunt, and other seasonal activities (Windsor Partners, 2018). Although other local parks exist within the visual study area, they were not identified as having visual sensitivity and therefore were not added to the list of VSRs. During field review, a selection of these additional parks were visited and photographed (e.g., Warner Field in the Village of Deposit).

NYSDEC-owned or easement lands of local significance within the visual study area include five designated fishing access points and two state waterway access points (NYSDEC, 2018b, 2018d).

Public Fishing Access or Public Fishing Rights (PFR) are permanent easements purchased by the NYSDEC from willing landowners that give anglers the right to fish and walk along the bank up to 33 feet on one or both sides of the stream. The NYSDEC Oquaga Creek Fishing Rights easement is located in Broome County near the Town of McClure, 0.3 mile from the nearest proposed turbine. There are 4.2 miles of PFRs on Oquaga Creek. The creek provides access to wild brown trout and brook trout and is also stocked annually with brown trout (NYSDEC, 2018d).

The NYSDEC West Branch Delaware River PFR is located in the Town of Sanford, approximately 1.9 miles away from the nearest proposed turbine. Downstream of the Cannonsville Reservoir, the West Branch is a tailwater fishery that supports excellent wild populations of brown, rainbow, and occasional brook trout, plus seasonal anadromous runs of American shad with reports of occasional striped bass. Upstream of the Cannonsville reservoir, the river is stocked with over 14,000 brown trout by the NYSDEC. The West Branch Delaware River also includes two State fishing access points, which are located in the Town of Deposit approximately 2.0 and 2.9 miles away from the nearest proposed turbine, respectively.

Fishing access to the Cannonsville Reservoir is provided at separate locations in the Towns of Deposit and Tompkins, the closest being approximately 3.5 miles away from the nearest proposed turbine. The reservoir is most popular for its brown trout and smallmouth bass fishery. The reservoir is stocked annually with approximately 6,500-7,000 brown trout (NYSDEC, 2018d).

Other named water resources that offer recreational opportunities within the visual study area (several of which have been previously described) include Sky Lake, Oquaga Creek, Tarbell Brook, Big Hollow Creek, Page Pond Brook, Deer Lake,

West Branch Delaware River, Page Pond, Susquehanna River, East Branch Cold Spring Creek, Griffins Pond, Oquaga Lake, Cannonsville Reservoir, Occanum Creek, Cat Hollow Creek, Cascade Creek, and Oquaga Creek.

Two golf courses occur within the 5-mile radius study area. The Scott's Oquaga Golf Course includes two nine-hole public golf courses and is located in the Town of Sanford, approximately 3.0 miles from the nearest proposed turbine (Scott's Family Resort, 2018). The Golden Oak Golf Club is a private 18-hole golf course located in the Town of Windsor, approximately 3.3 miles away from the nearest proposed turbine (Golden Oak Golf Course, 2018).



Inset 11. Representative Photographs of VSRs within the Visual Study Area

Upper Left: Arctic Cemetery, Town of Sanford (Viewpoint 38); Upper Right: Beaver Pond State Forest, Huggins Road (Viewpoint 49); Lower Left: Oquaga Creek State Park, camping cabin (VP 43); Lower Right: State Route 8 bridge over the West Branch of the Delaware River (Viewpoint 91)

Public Schools:

Two schools within the Deposit Central School District occur within the 5-mile radius study area. The Deposit Elementary School and Deposit Middle School/High Schools are both located on Second Street in the Town of Deposit, 1.5 miles from

the nearest proposed turbine. During the 2016-2017 school year, 488 students, kindergarten through 12th grade, were enrolled within this school district (NYSED, 2017).

Three schools within the Windsor Central School District also occur within the study area. The A.F. Palmer Elementary School and Windsor Middle School are located on Main Street in the Town of Windsor, approximately 3.8 and 3.9 miles from the nearest proposed turbine, respectively. During the 2016-2017 school year, a total of 574 students, kindergarten through 8th grade, were enrolled in these schools. Windsor Central High School is located on Route 79 in the Town of Windsor, approximately 3.9 miles from the nearest proposed turbine. A total of 526 students, 9th through 12th grade, were enrolled in this school during the 2016-2017 school year (NYSED, 2017a).

Areas of Intensive Land Use:

Areas of concentrated settlement within the visual study area are considered visually sensitive due to the type/intensity of land use they receive. Two villages and several hamlets lie within the 5-mile radius study area. The villages are listed below, along with their distance from the nearest proposed turbine:

- The Village of Deposit has a population of 1,712 and is 1.0 mile southeast of the Project.
- The Village of Windsor has a population of 6,274 and is 3.3 miles west-southwest of the Project.
- The Village of Afton has a population of 2,851 and is 8.3 miles north-northwest of the Project.

Hamlets within the 5-mile radius study area include Stilesville, Damascus, East Windsor, Center Village, and Ouaquaga.

Cemeteries:



Inset 12. Representative photograph of the typical conditions associated with cemeteries within the visual study area. Arctic Lake Cemetery, County Route 241 (North Sanford Road), Town of Sanford (Viewpoint 38).

Multiple cemeteries occur throughout the 5-mile radius study area, typically on flat, open to partially wooded sites. Tombstones are arranged in orderly rows and, in some cases, occur in conjunction with an adjacent church. There may be mature trees or shrubs along the edges of the cemeteries, but generally there is little planted vegetation within the cemeteries with the exception of flowers placed by grave sites.

Many of the cemeteries occur within the Rural Residential/Agricultural LSZ where adjacent agricultural fields provide opportunities for open, long-distance views. In some directions, outward views may be screened by hedgerows and woodlots that back the cemeteries. Several cemeteries are within the Forested LSZ. These cemeteries are often small cleared plots with 3 to 4 sides of surrounding forest and no outward views available.

Transportation Corridors:

The 5-mile radius study area includes two interstate routes and five state routes that are considered visually sensitive due to the number of vehicles that travel these roads on a daily basis. Table 4 includes NYSDOT 2015 traffic counts for major roadways within the visual study area, and the distance of these roads from the nearest proposed turbine

Table 4. Traffic Counts for Major Transportation Corridors within the Visual Study Area.

Roadway	Total length within the visual study area (miles)	Average vehicle counts per day on segments within the visual study area	Closest distance to the nearest turbine (miles)
Interstate Route 88	16.7	9,946 – 13,298	5.33
State Route 17/Interstate 86	30.5	6,730 – 10,834	0.36
State Route 8	17.4	1,629 – 4,105	2.15
State Route 79	20.2	464 – 3,193	2.86
State Route 41	17.1	524 – 2,935	0.37
State Route 7	16.1	1,401 – 2,597	6.02
State Route 206	9.8	1,141 – 1,664	9.13
State Route 235	4.2	564 - 946	6.24
State Route 10	13.2	429 - 573	2.27

Other VSRs of Local Significance:

Another VSR of local significance located within the 5-mile radius study area is the Delaware Highlands Conservancy Windsor Woods. The Delaware Highlands Conservancy is an accredited land trust dedicated to conserving the natural heritage and quality of life in the Upper Delaware River region in partnership with the region's landowners and communities. The property known as "Windsor Woods" is composed of approximately 1,243 acres in Broome County. A conservation easement was conveyed to the Delaware Highlands Conservancy by the landowner in 2006. Windsor Woods is a wooded tract with small streams and wetlands. The Conservancy accepted the easement which prohibits commercial or industrial uses of the property to protect the property's conservation values. However, in 2012, a portion of Windsor Woods was condemned for construction of a natural gas gathering line and metering station by Bluestone Gas Corporation of New York (Delaware Highlands Conservancy, 2018).

3.6.3 Municipal and Regional Document Review

As part of the research on VSRs, a thorough search of the available local and regional planning, tourism and recreational documents was conducted. These documents generally included broad land use, resource protection and/or economic development goals, but relatively little information regarding the identification or protection of specific VSRs. However, additional resources that were identified were added to the VSR table and analyzed. See Appendix H for a full review of the documents that were identified and an evaluation of how they relate to the proposed Project.

4.0 *Visual Impact Assessment Methodology*

The VIA procedures used for this study are consistent with methodologies developed by the BLM (1980), USFS (1995), USDOT, Federal Highway Administration (1981 & 2015), U.S. Army Corps of Engineers (Smardon, et al., 1988) and the NYSDEC (2000). These procedures are widely accepted as standard visual impact assessment methodology for wind energy projects (CEIWEF, 2007) and are consistent with the requirements of Stipulation 24 of the Project's Article 10 proceedings. The specific techniques used to assess potential Project visibility and visual impacts are described in the following section.

4.1 Project Visibility

An analysis of Project visibility was undertaken to identify those locations within the visual study area where there is potential for the proposed wind turbines and substations to be seen from ground-level vantage points. This analysis included identifying potentially visible areas on viewshed maps and verifying Facility visibility in the field. The methodology employed for each of these assessment techniques is described below.

4.1.1 Viewshed Analysis

Topographic viewshed analyses of the proposed turbines and substation were based on 2-meter resolution Digital Elevation Model (DEM) data downloaded from New York State's GIS Program Office FTP server; the location and height of all proposed turbines; the tallest proposed substation components (see Figure 2); an assumed viewer height of 1.83 meters; and ESRI ArcGIS® software with the Spatial Analyst extension. To evaluate "worst case" potential turbine visibility, two topographic (or DEM) viewshed analyses were conducted, one to illustrate daytime visibility (based on a maximum blade tip height of 205 meters, or 673 feet above existing grade), and the other to illustrate potential visibility of FAA obstruction warning lights at night. The nighttime viewshed was based on an estimated FAA warning light height of 131 meters, or 430 feet, above existing grade, and the assumption that all turbines will be equipped with lights. Viewshed analysis of the proposed collection and POI substations was based on coordinates of the proposed substations and a maximum lightning mast height of 60 feet. The viewshed analyses evaluated potential turbine visibility within a 10-mile radius and potential substation visibility within a 1-mile radius.

The ArcGIS program defines the viewshed by reading every cell of the DEM data and assigning a value based upon the existence of a direct, unobstructed line of sight to the proposed location/elevation coordinates of Project components from observation points throughout the visual study area. The resulting viewshed maps define the maximum area from which any portion of the major above-ground components of the completed Project could potentially be seen within the visual

existing vegetation and structures. The turbine viewshed results also indicate the number of wind turbines that would be potentially visible from any given point within the visual study area. Results were therefore grouped by number of potentially visible turbines, and presented on a viewshed map.

Results of the topographic viewshed analysis described above represent a true "worst case" assessment of potential Project visibility. Topographic viewshed maps are very accurate in identifying area where there is no possibility of Project visibility due to topographic interference. However, they are less accurate in identifying areas from which the Project could actually be visible because they do not consider the screening provided by trees and buildings, which can limit or eliminate visibility in areas indicated as having potential Project visibility in the topographic viewshed analysis.

In order to more accurately identify areas with potential Project visibility, a second-level analysis was conducted to incorporate the screening effect of structures and vegetation by utilizing the Federal Emergency Management Agency (FEMA) light detection and ranging (lidar) data for the Susquehanna Basin (2007) and Delaware County (2007). Lidar is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth to generate precise, three-dimensional information about the shape of the Earth and its surface characteristics (National Oceanic and Atmospheric Administration [NOAA], 2018). A Digital Surface Model (DSM) of the visual study area was created from these lidar data, which includes the elevations of buildings, trees, and other objects large enough to be resolved by lidar technology. However, these lidar datasets only cover approximately 90% of the 10-mile radius study area. In areas lacking lidar data, the 2011 USGS NLCD was used to identify the mapped location of forest land (including the Deciduous Forest, Evergreen Forest and Mixed Forest NLCD classifications) within the visual study area. Potential screening provided by structures and non-forest vegetation (i.e., yard trees, hedgerows, etc.) was not accounted for in these locations because these features are not identifiable in the NLCD or other available data. Based on standard visual assessment practice, the NLCD-mapped locations of forest land were assigned an assumed height of 40 feet and added to the DEM. A new, continuous 2-meter resolution DSM for the visual study area was then created, utilizing the more detailed FEMA lidar data when available and the NLCD forest data (added to the DEM) in the remainder of the visual study area.

To account for clearing of forest vegetation that would be required for Project construction, the DSM was modified to reflect the bare-earth elevation within an approximated limit of clearing around proposed Project components. This was based on generalized assumptions that areas within 265 feet of turbines, as well as areas within a 100-foot wide corridor along access roads, and a 70-foot wide corridor along collection lines, would be cleared of forest vegetation and maintained in an open condition. This modified DSM was then used as a base layer for the second-level viewshed analysis. Once the viewshed analysis was complete, a conditional statement was used to set Project visibility to zero in locations where the DSM

elevation exceeded the bare earth elevation by six feet or more. This was done for two reasons: 1) because in locations where trees or structures are present in the DSM, the viewshed would reflect visibility from a vantage point on the tree tops or building roofs, which is not the intent of this analysis and 2) to reflect the fact that ground-level vantage points within buildings or areas of vegetation exceeding 6 feet in height will generally be screened from views of the Project.

As with the topographic viewshed analysis previously described, this second-level DSM viewshed analysis was conducted for the proposed wind turbines twice, once to illustrate daytime visibility (based on the maximum height of 673 feet above existing grade) and once to illustrate potential visibility of FAA warning lights (based on an approximate FAA warning light height of 430 feet above existing grade and the assumption that all turbines could be equipped with lights). A DSM viewshed analysis was also conducted to further evaluate potential visibility of the proposed substations based on a maximum structure height of 60 feet.

Because it accounts for the screening provided by structures and trees, this second-level analysis is a more accurate representation of potential Project visibility. However, it is worth noting that because certain characteristics of the turbines and substation that may influence visibility (color, narrow profile, distance from viewer, etc.) are not into taken consideration in the viewshed analyses, being located within the DSM viewshed does not necessarily equate to actual Project visibility.

4.1.2 Field Verification

EDR personnel conducted visual field review in the visual study area on March 27, April 29, and May 24, 2018. Various weather and foliage conditions were encountered during each field visit, which allowed for photographic and experiential documentation of the landscape during different seasons and under different sky conditions. During the field visits, EDR staff members drove public roads, visited identified VSRs, and verified areas of potential visibility from publicly-accessible sites throughout the visual study area. Locations from which the turbines and other Project components would likely be visible, partially screened, or fully screened, were assessed and documented. This determination was made based on the visibility of distinctive ridges/landforms, existing transmission and gas ROWs, and temporary met towers on or around the Project Site, which served as locational references. These site visits resulted in photographs from 117 representative viewpoints within the visual study area. The viewpoints document the extent of potential visibility of the Project from the various LSZs, distance zones, directions, VSRs, and areas of high public use throughout the visual study area. A photolog, including viewpoint information, a representative photograph from each viewpoint toward the Project Site, or the direction of the dominant view if the site was not visible, is included in Appendix B. The locations of viewpoints documented during field review are shown in Figure 9 in Section 5.1.3, and in the viewshed/VSR overlay map in Appendix A

The March 27, 2018 field review focused on documenting existing landscape characteristics and verifying potential Project visibility from identified visually sensitive sites, all with the idea that the viewpoints/photographs might be selected for the subsequent development of visual simulations. Weather conditions during the March site visit were not consistent with the forecast, and remained cloudy/overcast throughout the day with only a few openings in the clouds. Representative photos were taken throughout the day and represent foliage and sky conditions typical of the dormant (winter) season. The photographs also document the distinctive landforms of the foreground and middle ground that occur within the visual study area, providing scale and location references to allow for production of 'wire frame' renderings and the determination of potential Project visibility from the sensitive sites visited. It is worth noting that access to roads through portions of the visual study area, including Oquaga Creek State Park and the numerous state forests, were not maintained or closed to motor vehicle travel during this initial site visit.

A second site visit was conducted on April 29, 2018 to supplement the photography obtained in March with photos taken under winter/leaf-off conditions with clear skies. As shown in the photo log included in Appendix B, the weather during this site visit was variable, with limited clear skies, resulting in a set of photographs and observations similar to those obtained in March. However, a few viewpoints were documented under clear sky conditions, allowing for the documentation of a range of weather/sky conditions and visibility during the winter/leaf-off season. The photographs captured on the March and April field visits during winter/leaf-off conditions also depict the most conservative scenario in terms of potential Project visibility.

On May 24, 2018, a third site visit was conducted to document summer/leaf-on conditions and visit VSRs that were inaccessible during the prior two trips. The weather conditions were favorable, with clear blue skies, intermittent clouds and a clear horizon. Although the time of year was on the early side of the summer recreation season, foliage conditions were representative of the leaf-on cover common throughout the summer, with the understanding that the color will change hue as the season progresses.

During the field surveys, photographs were taken with a Canon EOS 5D Mark IV with a fixed 50 mm lens, and a Nikon D7100 with a lens setting between 28 and 35 mm (equivalent to between 45 and 55 mm on a full frame 35 mm camera). A 50 mm focal length most closely approximates the relative scale and perspective relationship of objects in the view (minimal distortion between foreground, middle ground, and background elements). Viewpoint locations were determined using hand-held global positioning system (GPS) units, high resolution aerial photographs, and high-resolution lidar data (to determine elevation). The time and location of each photograph were documented on all electronic equipment (camera, GPS unit, etc.) and noted on field data sheets. Where views toward the Project Site existed, photographs obtained during field review generally represented the most open, unobstructed available views toward the proposed Project Site.

4.2 Project Visual Impact

Beyond evaluating potential Project visibility, the VIA also examined the visual impact of the proposed Project on the LSZs, identified VSRs, and viewer groups within the visual study area. This assessment involved creating a computer model of the project layout (including the proposed turbines, met towers and substations), selecting representative viewpoints, and preparing computer-assisted visual simulations of the proposed Project. All turbine simulations were evaluated by a rating panel consisting of three professionals with experience in the visual/aesthetics field to determine the type and extent of visual impact likely to result from installation of the proposed Project. Renderings of the collection substation and POI substation and the permanent O&M facility were also prepared from representative viewpoints. However, the renderings were not evaluated by the rating panel due to the very limited visibility of these Project components (see Figure 10). Details of the visual impact assessment procedure are described below.

4.2.1 Viewpoint Selection

16 NYCRR § 1000.24(b)(4) includes the requirements that *“the Applicant shall confer with municipal planning representatives, DPS, DEC, OPRHP, and where appropriate, APA [Adirondack Park Agency] in its selection of important or representative viewpoints.”* Building on the previous consultation with municipal representatives and stakeholders to identify visually sensitive sites (as described above in Section 3.6 of this VIA), EDR conducted additional outreach to agency staff and stakeholder groups to determine an appropriate set of viewpoints for the development of visual simulations. Copies of the correspondence sent by EDR as part of this process, as well as responses received from stakeholders, are included in Appendix F. This outreach effort included the following:

On April 27, 2018, in accordance with Article 10, Exhibit 24, Part 1001.24(b)(4), EDR distributed a letter entitled “Bluestone Wind LLC (DPC Case 16-F-0559) - Recommended Viewpoints – Official Request for Information,” to appropriate municipal planning representatives and State of New York interested parties (see Appendix F). This memo included 1) a summary of research and consultation undertaken as part of the VIA to date, 2) a description of the field review/photography conducted for the Project, 3) a rationale for viewpoint selection, and 4) recommendations that 11 specified viewpoints be selected for the preparation of visual simulations. The rationale provided for selection of the recommended viewpoints included the following factors:

- They provide representative views of the Project from the various LSZs and distance zones within the visual study area.
- They include VSRs within the visual study area, including sites recommended by the DPS and other stakeholders during review of the Project’s PSS and the first round of visual outreach.

- A significant portion of the Project would likely be visible based on viewshed analysis and field review.

In response to the April 27, 2018 visual outreach, EDR received feedback and viewpoint recommendations from the Towns of Deposit and Windsor, as well as two state agencies, DPS and NYSOPRHP. These recommendations were added to our VSR table (Appendix C) and visited during the May 24, 2018 field visit. For a complete list of the resources recommended through the visual outreach process, see Appendix F.

Based on the outcome of local stakeholder, regional interest group, and state and regional agency consultation, a total of 19 viewpoints were ultimately selected for the development of visual simulations of the proposed turbines, with eight additional locations identified for 'wire frame' renderings to document views of concern where the turbines were largely screened (as documented in June 15, 2018 email correspondence with the DPS). The viewpoints were selected based upon the following criteria:

- They provide open views of proposed turbines (as indicated by field verification) or provide representative views of the screening effects of vegetation and/or buildings from selected areas.
- They illustrate Project visibility from VSRs identified by local stakeholders and state agencies.
- They illustrate typical views from LSZs where views of the Project will be available.
- They illustrate typical views of the proposed Project that will be available to representative viewer/user groups within the visual study area.
- They illustrate typical views of different numbers of turbines, from a variety of viewing distances, and under different lighting/sky conditions, to illustrate the range of visual change that will occur with the Project in place.
- The photos obtained from the viewpoints generally display good composition, lighting, and exposure.

Locational details and the criteria for selection of each simulation viewpoint are summarized in Table 5 below:

Table 5. Viewpoints Selected for Simulation.

Viewpoint Number	Location and/or Visually Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance ¹	Town
12	2nd Street, Village of Deposit	Village	Local Residents, Tourists/Recreational Users	1.78	Deposit
15	Elm Street, at Deposit Middle/High School Track	Village	Local Residents	1.83	Deposit
17	State Route 17/Interstate 86	Transportation Corridor	Through-Travelers/Commuters	2.58	Deposit
22	State Route 8, Town of Deposit	Rural Residential/Agricultural	Through-Travelers/Commuters	2.28	Deposit

Viewpoint Number	Location and/or Visually Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance ¹	Town
39	Orange Ski Trail, Oquaga State Park	Rural Residential/Agricultural	Tourists/Recreational Users	6.63	Sanford
48	CR 241 (North Sanford Road) at Oquaga Creek Fishing Access, NYSDEC,	Rural Residential/Agricultural	Local Residents, Tourists/Recreational Users	0.79	Sanford
55	William Law Road	Rural Residential/Agricultural	Local Residents	0.86	Sanford
58	Pazzelli Road	Rural Residential/Agricultural	Local Residents	0.9	Sanford
59	Center Village Bridge over the Susquehanna River	Rural Residential/Agricultural, Open Water	Local Residents, Tourists/Recreation Users	4.72	Colesville
61	State Route 79	Rural Residential/Agricultural	Local Residents, Through-Travelers/Commuters	2.96	Colesville
64	State Route 17/Interstate 86/	Transportation Corridor	Through-Travelers/Commuters	1.95	Windsor
67	State Route 10/NYS Bicycle Route 17, at Cannonsville Reservoir	Open Water	Tourists/Recreational Users	4.1	Deposit
69	Pine Street Extension Bridge over the West Branch Delaware River	Village, Open Water	Local Residents, Tourists/Recreational Users	2.06	Deposit
83	Page Pond Road	Forest	Tourists/Recreational Users	1.77	Sanford
85	Loomis Hill Road	Forest	Local Residents	0.4	Sanford
102	Marsh Pond State Forest, water access, Marsh Pond Road at Bryce Road	Open Water	Local Residents, Tourists/Recreational Users	1.48	Sanford
104	Bryce Road	Forest	Local Residents, Tourists/Recreational Users	0.5	Sanford
107	Mountain View Drive, Deer Lake	Forest, Open Water	Local Residents	0.98	Sanford
113	Piper Hill Road, west of White Birch Lake Road	Rural Residential/Agricultural	Local Residents	4.2	Windsor

¹Distance from viewpoint to nearest visible turbine (in miles)

Along with the viewpoints selected for the development of turbine simulations, two additional viewpoints were selected to illustrate the appearance of the proposed POI and collection substations (with battery storage) located west of Big Hollow Road in the Town of Sanford, and the O&M facility north of William Law Road, also in the Town of Sanford. These locations

offered the most unobstructed views of these proposed Project components, including required site grading and vegetation removal (see Figure 10).

4.2.2 Visual Simulations

To show anticipated visual change associated with the proposed Project, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the proposed turbines, met towers, and associated clearing from each of the 19 selected viewpoints. The photographic simulations were developed by using Autodesk 3ds Max Design® to create a simulated perspective (camera view) to match the location, bearing, and focal length of each existing conditions photograph. Existing elements in the view (e.g., topography, buildings, and roads) were modeled based on aerial photographs and DEM data in AutoCAD Civil 3D®. A three dimensional (3-D) topographic mesh of the landform (based on DEM or DSM data) was then brought into the 3-D model space. At this point, minor adjustments were made to camera and target location, focal length, and camera roll to align all modeled elements with the corresponding elements in the photograph. This assures that any elements introduced into the model space (e.g., the proposed turbines) will be shown in proportion, perspective, and proper relation to the existing landscape elements in the view. Consequently, the alignment, elevations, dimensions and locations of the proposed Project structures will be accurate and true in their relationship to other landscape elements in the photograph.

Computer models of the proposed turbines, met towers, and limits of vegetation clearing were prepared based on specifications and data provided by the Applicant. For the purposes of this analysis it was assumed that all turbines would be Vestas V150 (4.2 MW) machines with a hub height of 130 meters (427 feet) and a rotor diameter of 150 meters (492 feet), and the met towers would be a 130-meter self-supporting steel lattice structure (see Figure 2). All turbine rotors were modeled facing into the prevailing wind (i.e., oriented to the southwest). Clearing limits were assumed to have a radius of between 300 and 400 feet based on guidance provided by Project engineers. Using the camera view as guidance, the visible portions of the modeled Project components and clearing limits were imported to the landscape model space described above and set at the proper coordinates. Coordinates for proposed turbines and met towers were provided to EDR by the Applicant.

Once the proposed Project was accurately aligned within the camera view, a lighting system was created based on the actual time, date, and location of the photograph. Using the Mental Ray Rendering System® with Final Gather and Mental Ray Daylight System® within the Autodesk 3ds Max Design® software, light reflection, highlights, color casting, and shadows were accurately rendered on the modeled Project based on actual environmental conditions represented in the photograph. The rendered Project was then superimposed over the photograph in Adobe Photoshop® and portions of the Project components that fell behind vegetation, structures or topography were masked out. Photoshop was also used to

take out any existing structures or vegetation proposed to be removed as part of the Project. Once the turbines or met towers were added to the photo, any shadows cast on the ground by the proposed structures were also included by rendering a separate “shadow pass” over the DEM model in Autodesk 3ds Max Design® and then overlaying the shadows on the simulated view with the proper fall-off and transparency using Adobe Photoshop®. A graphic illustration of the simulation process is presented in Figure 6.

Substation and O&M Building

Modeled renderings of the substations and O&M facility were prepared to illustrate the anticipated visual changes associated with these Project components from selected viewpoints on Big Hollow Road and William Law Road, respectively. Models were prepared based on preliminary designs provided by the Applicant (see Figure 2). Following the visual simulation process described above, the rendered structures were superimposed over the photographs and portions of the Project components that fell behind vegetation, structures, or topography were masked out to reflect their potential visibility at the selected viewpoints. Existing vegetation proposed to be cleared during Project construction was removed using Photoshop®. Once the substations and O&M facility renderings were added to the photos, any shadows created by the proposed structures were also added to the simulated view with the proper fall-off and transparency. The substation and O&M facility renderings were prepared from those limited viewpoints where public views of these Project components would be available.

Wireframe Renderings

In addition, for some views, wireframe renderings were prepared to illustrate the potential effect of vegetation, topography, or other screening features in photographs where the proposed Project would either not be visible, or be substantially screened from view. In these wireframe renderings, portions of the proposed turbines that will be screened by vegetation (or other landscape features) are shown in a bright green color (for illustrative purposes). In some instances, these wireframe renderings were prepared for viewpoints that were being considered as candidates for visual simulations to determine the potential visibility of the Project (and therefore, whether the viewpoint was a good candidate for a visual simulation). In other instances, wireframe renderings were prepared for the explicit purpose of illustrating the effects of screening from a specific viewpoint of concern. The wireframe renderings are included as Insets to support the discussion of potential Project visibility in Section 5.1.3 of this VIA, and are listed in Table 6 below.

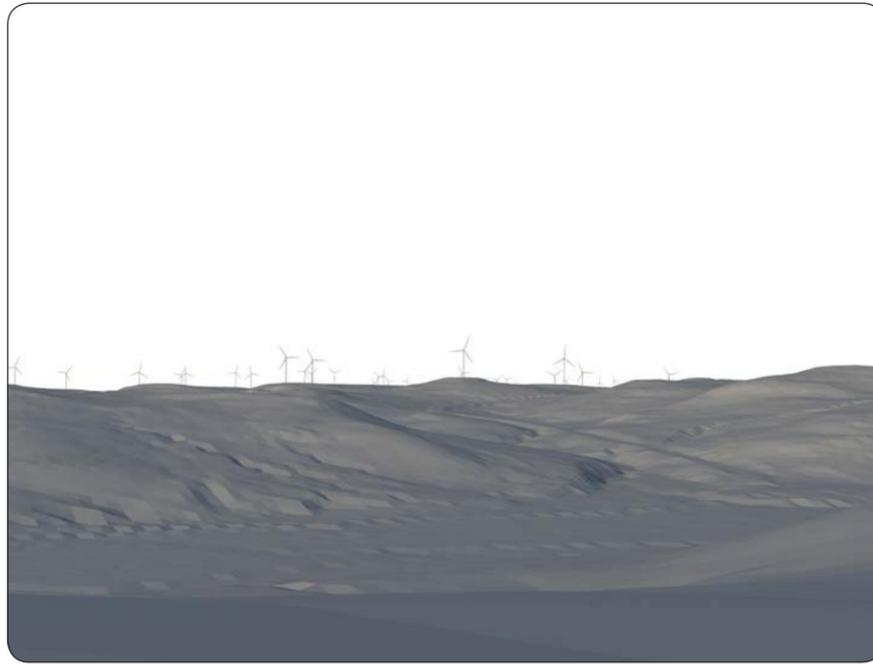
Table 6. Viewpoints Selected for Wireframe Renderings.

Viewpoint Number	Location and/or Visually Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance ¹	Town
2	Chapel Street, Windsor Village Historic District	Village	Local Residents, Tourists/Recreational Users	1.78	Windsor
6	Front Street, Village of Deposit Historic District at the State Theater	Village	Local Residents, Tourists/Recreational Users	1.83	Deposit
24	Roods Creek Boat Launch, Cannonsville Reservoir	Open Water	Tourists/Recreational Users	2.62	Deposit
33	Arctic Lake, Oquaga Creek State Park	Forest, Open Water	Tourists/Recreational Users	2.36	Sanford
60	Nathaniel Cole Park, Public Beach	Forest, Open Water	Tourists/Recreational Users	4.83	Colesville
79	Finger Lakes Trail Scenic Overlook, Beals Pond State Forest	Forest	Tourists/Recreational Users	0.79	Masonville
115	White Birch Lake Road	Open Water	Local Residents	0.87	Windsor
116	County Road 548 (Edson Road)	Rural Residential/Agricultural	Local Residents	0.9	Windsor

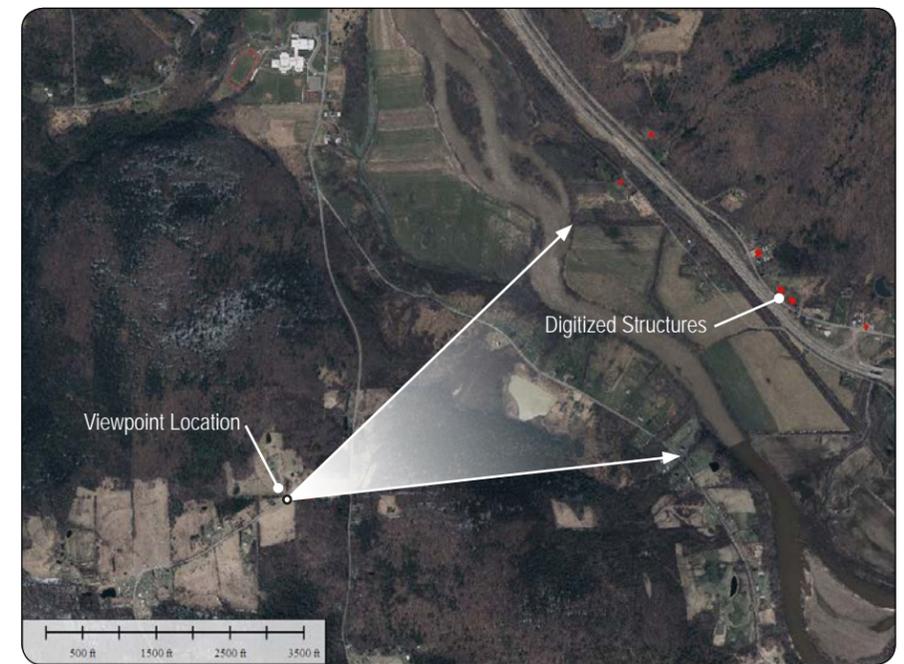
¹Distance from viewpoint to nearest visible turbine (in miles)



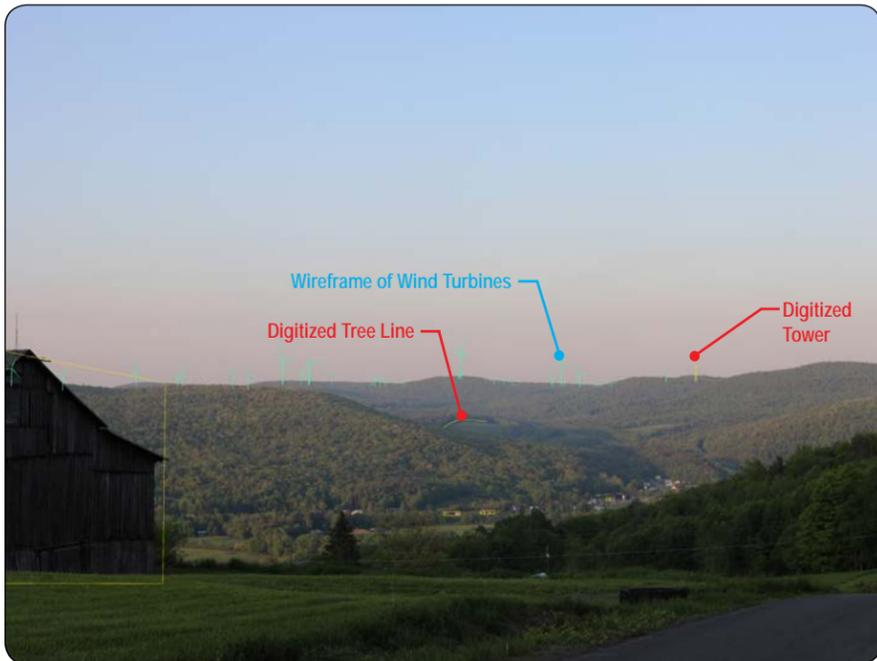
1. Photos are selected to illustrate typical views of the proposed project that will be available to representative viewer/user groups from the major landscape similarity zones and sensitive sites within the study area.



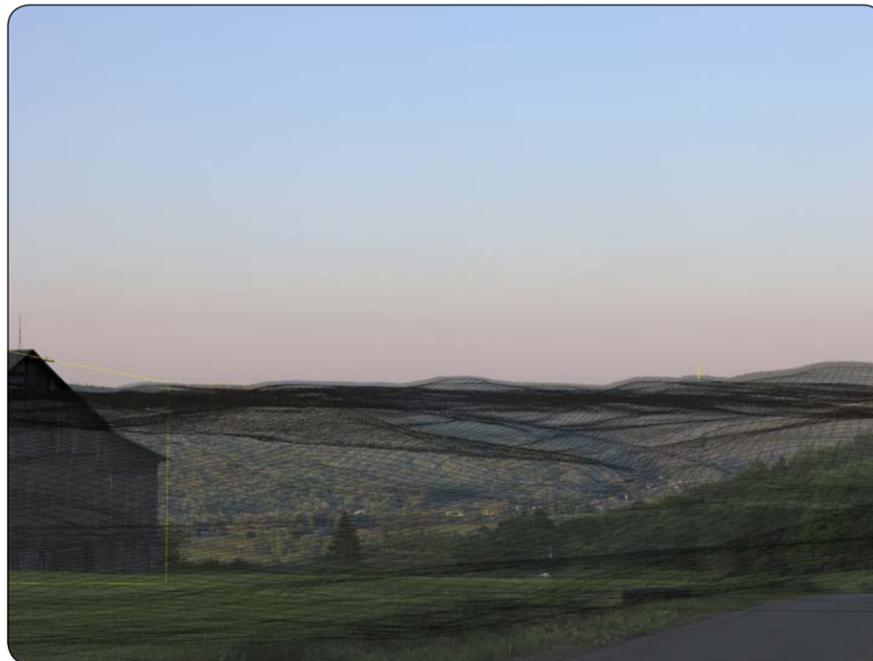
2. A three-dimensional computer model of the project is built based on proposed turbine specifications and tower site coordinates.



3. Aerial photographs and GPS data collected in the field are used to create an AutoCAD Civil 3D 2018® drawing.



4. These data are superimposed over photographs from each of the viewpoints, and minor camera changes are made to align all known reference points within the view.



5. A digital terrain model representing the existing topography is also overlaid on the existing photograph to refine camera alignment, and target elevation.



6. The proposed exterior color/finish of the turbines was then added to the model and the appropriate sun angle is simulated based on the specific date, time and location (latitude and longitude) at which each photo was taken.

Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 6: Visual Simulation Methodology

4.2.3 Visual Contrast Rating

To evaluate anticipated visual change associated with the Project, the photographic simulations of the completed Project were compared to photos of existing conditions from each of the 19 selected viewpoints. These “before” and “after” photographs, identical in every respect except for the Project components shown in the simulated views, were provided as 11 x 17-inch color prints to three experienced visual professionals (one in-house and two independent), who were then asked to determine the effect of the proposed Project in terms of its contrast with existing elements of the landscape. Further information on the rating panel members, and information they were provided, is included in Appendix E. The methodology utilized in this impact evaluation is a modified version of the BLM contrast rating methodology (USDI BLM, 1980) that was developed by EDR in 1999 (and subsequently updated) for use on wind power projects. It involves using a short evaluation form and a simple numerical rating process. Along with having proven to be accurate in predicting public reaction to wind power facilities, this methodology 1) documents the basis for conclusions regarding visual impact, 2) allows for independent review and replication of the evaluation, and 3) allows a large number of viewpoints to be evaluated in a reasonable amount of time. Landscape, viewer, and Project-related factors considered by the rating panel in their evaluation included the following:

- *Landscape Composition:* The arrangement of objects and voids in the landscape that can be categorized by their spatial arrangement. Basic landscape components include vegetation, landform, water and sky. Some landscape compositions, especially those that are distinctly focal, enclosed, detailed, or feature-oriented, are more vulnerable to modification than panoramic, canopied, or ephemeral landscapes.
- *Form, Line, Color, and Texture:* There are the four major compositional elements that define the perceived visual character of a landscape, as well as a project—form, line, color and texture. Form refers to the shape of an object that appears unified, often defined by edge, outline, and surrounding space. Line refers to the path the eye follows when perceiving abrupt changes in form, color, or texture; that is usually evident as the edges of shapes or masses in the landscape. Color refers to the perceived hue of elements within the landscape. Texture in this context refers to the visual surface characteristics of an object. The extent to which form, line, color, and texture of a project are similar to, or contrast with, these same elements in the existing landscape is a primary determinant of visual impact.
- *Focal Point:* Certain natural or man-made landscape features stand out and are particularly noticeable as a result of their physical characteristics. Focal points often contrast with their surroundings in color, form, scale or texture, and therefore tend to draw a viewer’s attention. Examples include prominent trees, mountains and water features. Cultural features, such as a distinctive barn or steeple can also be focal points. If possible, a proposed project should not be sited so as to obscure or compete with important existing focal points in the landscape.

-
- *Order*: Natural landscapes have an underlying order determined by natural processes. Cultural landscapes exhibit order by displaying traditional or logical patterns of land use/development. Elements in the landscape that are inconsistent with this natural order may detract from scenic quality. When a new project is introduced to the landscape, intactness and order are maintained through the repetition of the forms, lines, colors, and textures existing in the surrounding built or natural environment.
 - *Scenic or Recreational Value*: Designation as a scenic or recreational resource is an indication that there is broad public consensus on the value of that particular resource. The particular characteristics of the resource that contribute to its scenic or recreational value provide guidance in evaluating a project's visual impact on that resource.
 - *Duration of View*: Some views are seen as quick glimpses while driving along a roadway or hiking a trail, while others are seen for a more prolonged period of time. Longer duration views of a project, especially from VSRs, have the greatest potential for visual impact.
 - *Atmospheric Conditions*: This refers to clouds, precipitation, haze, and other ambient air-related conditions that affect the visibility of an object or objects. These conditions can greatly affect the perceived contrast of project components with the landscape in terms of the design elements of form, line, color, texture, and scale.
 - *Lighting Direction*: Backlighting refers to a viewing situation in which sunlight is coming toward the observer from behind a feature or elements in a scene. Front lighting refers to a situation where the light source is coming from behind the observer and falling directly upon the area being viewed. Side lighting refers to a viewing situation in which sunlight is coming from the side of the observer to a feature or elements in a scene. Lighting direction can have a significant effect on the visibility and contrast of landscape and project elements.
 - *Project Scale*: The apparent size of a proposed project in relation to its surroundings can define the compatibility of its scale within the existing landscaping. Perception of project scale is likely to vary depending on the distance from which it is seen and other contextual factors.
 - *Spatial Dominance*: The degree to which an object or landscape element occupies space in a landscape, and thus dominates landscape composition from a particular viewpoint.

-
- *Visual Clutter:* Numerous unrelated built elements occurring within a view can create visual clutter, which adversely impacts scenic quality.
 - *Movement:* Project components that are in motion are typically more noticeable, but in the case of wind turbines, have also been shown to also make them appear more functional and visually appealing. Numerous studies have documented that viewers prefer to see wind turbines in motion. The following quote and citations are taken from an on-line summary of perceptual studies of wind farms conducted by the Macaulay Land Research Institute (MLRI, 2010):

"Motion has also been indicated as a powerful predictor of preference (Gipe, 1993; Thayer and Freeman, 1987). This is a unique feature of wind turbines in comparison with other forms of static structures. People find wind farms that appear to be working by relating this with moving rotors as more attractive than those that do not. Motion is equated with lower perceived visual impact (Gipe, 1993). They are likely to find wind farms visually interesting because of their motion. In this mode, the turbines are perceived as abstract sculptures, arousing interest with their novel, unfamiliar forms and animation (Thayer, R.L. and Hansen, H. 1988)."

5.0 *Visual Impact Assessment Results*

5.1 Project Visibility

5.1.1 Turbine Viewshed

Potential wind turbine visibility, as indicated by viewshed analysis, is illustrated in Figure 7 and summarized in Table 7. As mentioned previously, the topographic/DEM viewshed results are most accurate at identifying areas where there is no potential for views of the Project due to topographic interference and less accurate at predicting actual turbine visibility due to its overly conservative nature (i.e., effectively assuming that no trees or structures exist in the landscape). Based only on the screening provided by topography, the blade tip DEM viewshed analysis indicates the proposed turbine arrays will be fully screened from view by intervening topography from approximately 27.6% of the 5-mile radius study area and from approximately 46.0% of the expanded visual study area (Figure 7, Sheet 1; Table 7). Portions of the visual study area where there is no possibility of seeing any turbines include large portions of the sizable valleys that lie to the east and west of the Project Site. This includes the valley associated with the Susquehanna River (the eastern valley wall and the river itself are primarily screened, however, potential visibility is indicated from the western valley wall), the valley associated with Cold Spring Creek/NYS Route 20, the valley associated with the East Branch Cold Spring Creek/US Route 8, and the Cannonsville Reservoir. Generally speaking, hillsides oriented away from the Project Site are typically screened from view. These screened areas begin to appear at a distance of 1 to 2 miles from the nearest turbine and increase in size and frequency with distance from the Project.

Project visibility beyond the 5-mile radius study area decreases rapidly. Visibility is particularly limited in the eastern and southwestern portions of the expanded study area where potential visibility is only indicated along hilltops and ridgelines. Topographic screening is less extensive in the northwestern portion of the expanded study area, but is indicated along sizable stretches of the Susquehanna River, Interstate 88, and other valley areas. VSRs that will be fully screened from view by topography alone include 30 NRHP-listed resources (all located within the Windsor Village Historic District), 10 NRHP-eligible resources, six streams, four state forest trails, one state fishing access area, two schools (Windsor Middle School and A.F. Palmer Elementary School), and seven cemeteries (see Appendix C).

Areas that will be screened from nighttime views of the turbines' FAA warning lights based on the topographic/DEM viewshed analysis (Figure 8, Sheet 2; Table 6), include approximately 33.3% of the study area and approximately 51.4% of the expanded study area. This analysis indicates that the FAA warning lights will generally be screened from view in the same areas where screening of daytime blade-tip height visibility was indicated, only slightly expanded due to the shorter height of the FAA warning lights resulting in a minor reduction in visibility. As stated above, this topographic analysis

presents a "worst case" assessment of potential nighttime visibility that does not take into account the screening effect of existing vegetation and structures.

Table 7. Summary of Turbine Viewshed Results for the Visual Study Area.

Number of Turbines Visible	5-Mile Radius Study Area ¹ Viewshed Results							
	Blade Tip DEM (Topography Only)		Blade Tip DSM (Topography, Structures, and Vegetation)		FAA/Nacelle DEM (Topography Only)		FAA/Nacelle DSM (Topography, Structures, and Vegetation)	
	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area
0	50.9	27.6	152.6	82.6	61.6	33.3	158.3	85.7
1-8	44.1	23.9	22.5	12.2	52.2	28.3	21.1	11.4
9-16	37.0	20.0	7.0	3.8	35.5	19.2	4.2	2.3
17-24	25.2	13.6	1.8	0.9	17.6	9.5	0.9	0.5
25-33	27.6	14.9	0.9	0.5	17.9	9.7	0.3	0.1
Total Visible	133.9	72.4	32.2	17.4	123.2	66.7	26.5	14.3
10-Mile Radius Visual Study Area ² Viewshed Results								
0	196.5	46.0	380.9	89.2	219.2	51.4	389.8	91.3
1-8	70.9	16.6	29.8	7.0	80.4	18.8	27.2	6.4
9-16	51.6	12.1	9.6	2.2	50.0	11.7	6.3	1.5
17-24	40.8	9.6	3.7	0.9	30.9	7.2	2.1	0.5
25-33	67.0	15.7	2.8	0.7	46.3	10.9	1.4	0.3
Total Visible	230.3	54.0	45.9	10.8	207.6	48.6	37.0	8.7

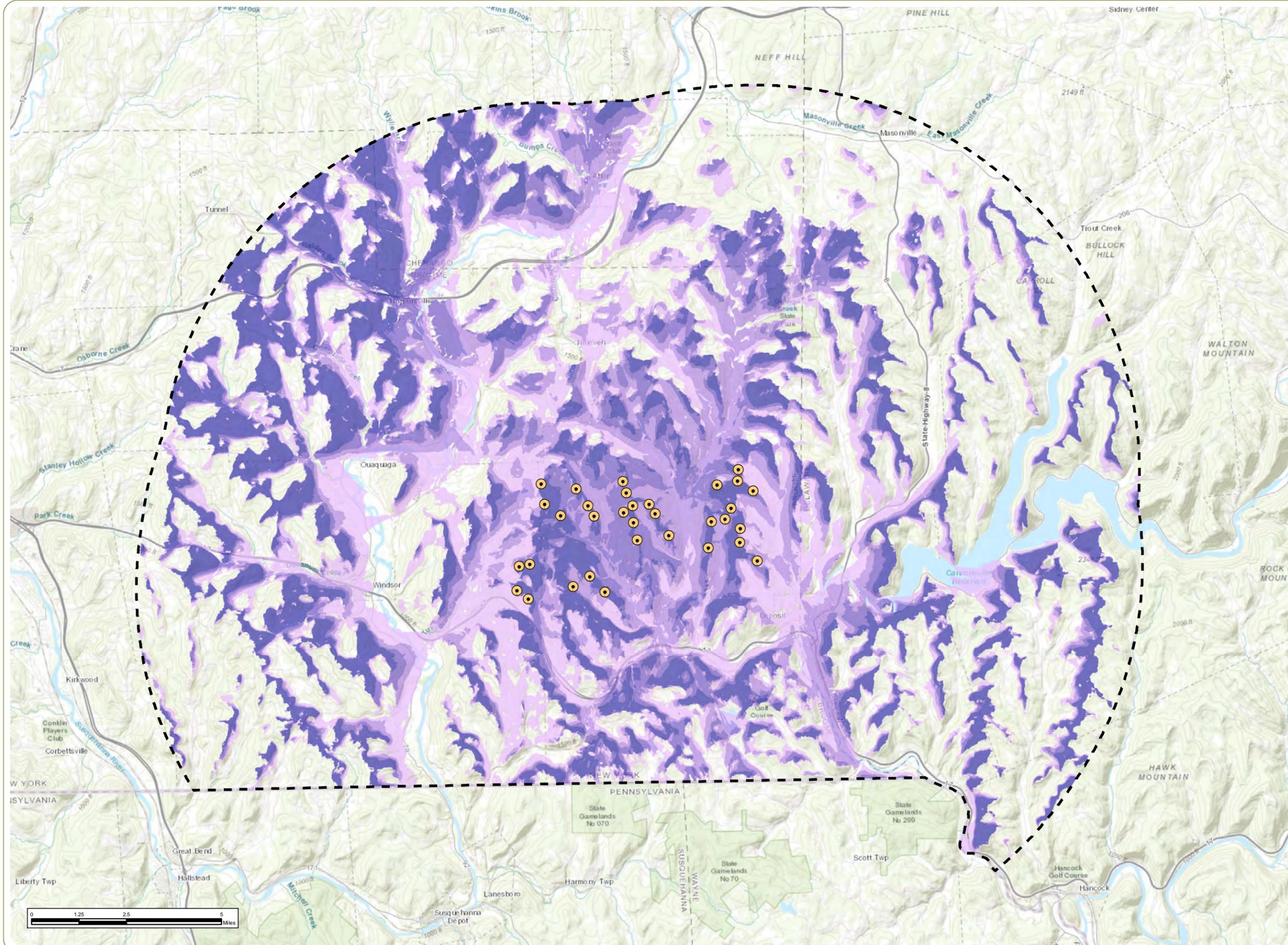
¹The 5-mile radius study area includes approximately 184.8 square miles, or approximately 118,299 acres.

² The 10-mile radius expanded visual study area is inclusive of the study area and covers approximately 426.8 square miles, or approximately 273,200 acres.

Bluestone Wind Project

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Figure 7: Viewshed Analysis
Sheet 1 of 4 - Wind Turbine Blade Tip Visibility Based on Topography Only



- Wind Turbine
- Visual Study Area
- Number of Turbines Potentially Visible:
- 1-8 Turbines Visible
- 9-16 Turbines Visible
- 17-24 Turbines Visible
- 25-33 Turbines Visible

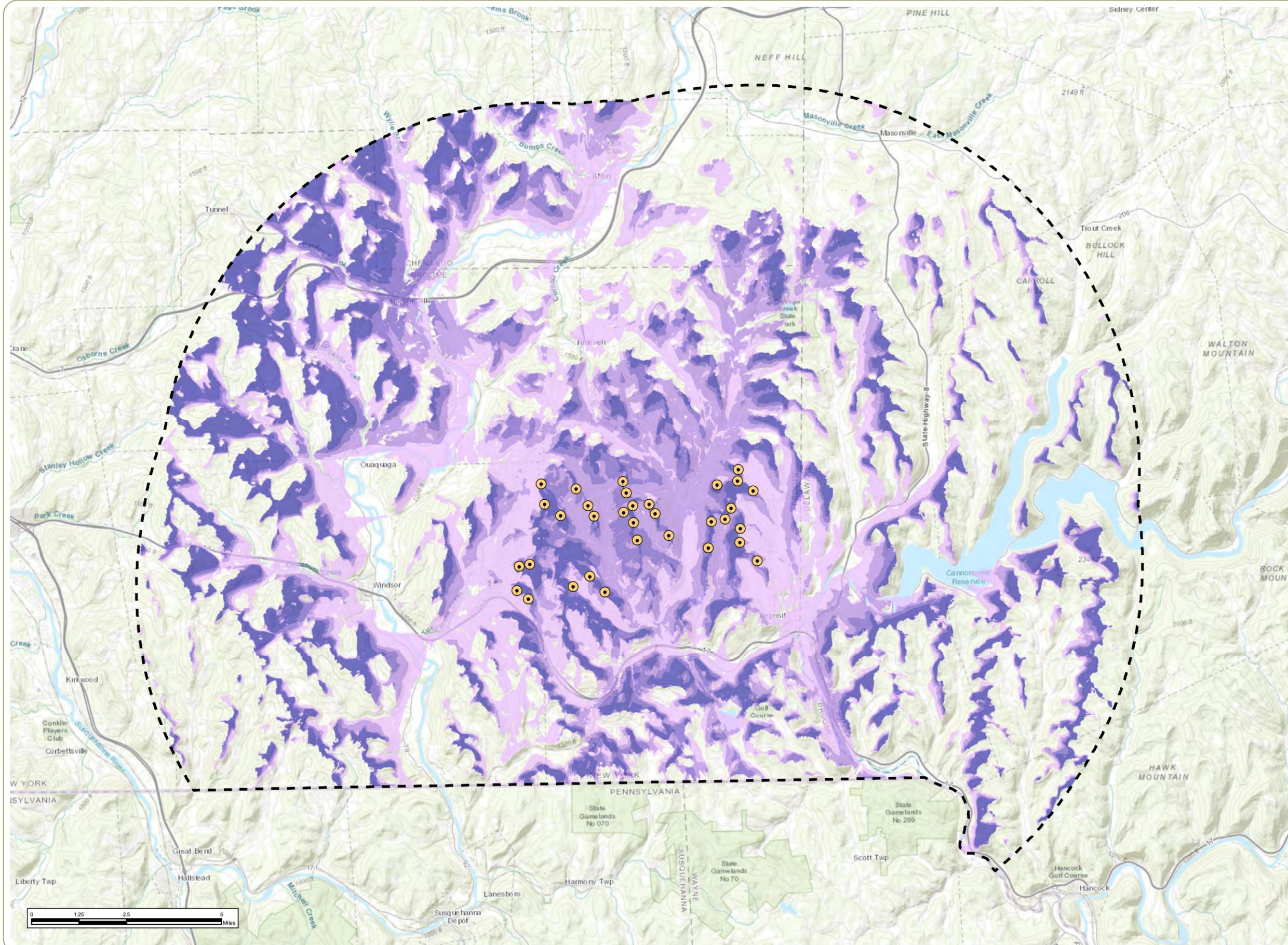
Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data. 4. Potential turbine visibility based on topography only. Screening effects of buildings, trees or other factors are not accounted for. Viewshed analysis based on maximum blade tip height of 205 meters (672.6 feet).

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Towns of Sanford and Windsor, Broome County, New York

Figure 7: Viewshed Analysis
Sheet 2 of 4 - Wind Turbine
FAA Warning Light Visibility
Based on Topography Only



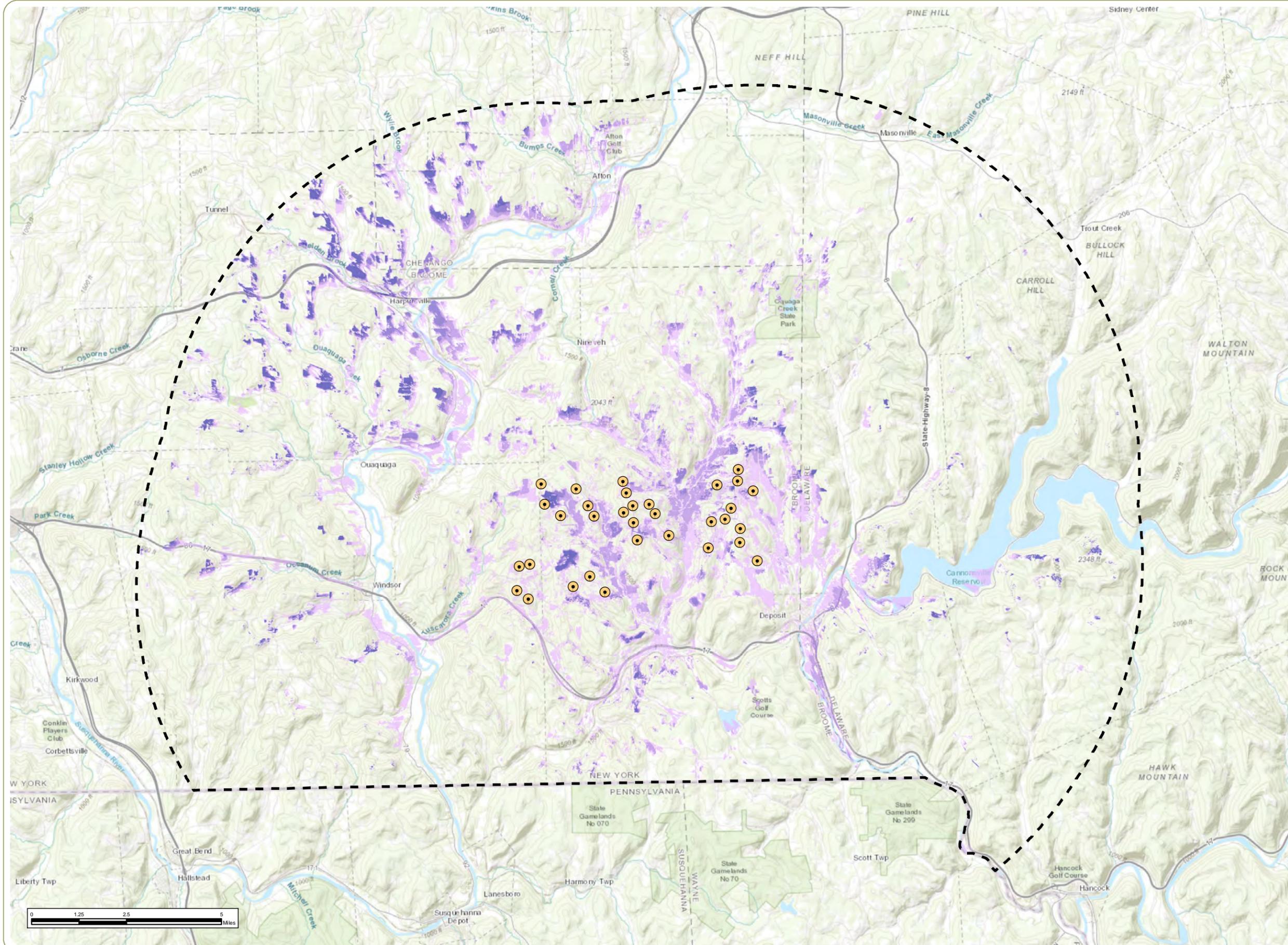
- Wind Turbine
- Visual Study Area
- Number of FAA Warning Lights Potentially Visible:
- 1-8 Lights Visible
- 9-16 Lights Visible
- 17-24 Lights Visible
- 25-33 Lights Visible

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data. 4. Potential FAA warning light visibility based on topography only. Screening effects of buildings, trees or other factors are not accounted for. Viewshed analysis based on maximum FAA warning light height of 131 meters (429.8 feet).

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Figure 7: Viewshed Analysis
Sheet 3 of 4 - Wind Turbine Blade Tip Visibility Based on Topography, Vegetation and Structures



- Wind Turbine
- Visual Study Area
- Number of Turbines Potentially Visible:
- 1-8 Turbines Visible
- 9-16 Turbines Visible
- 17-24 Turbines Visible
- 25-33 Turbines Visible

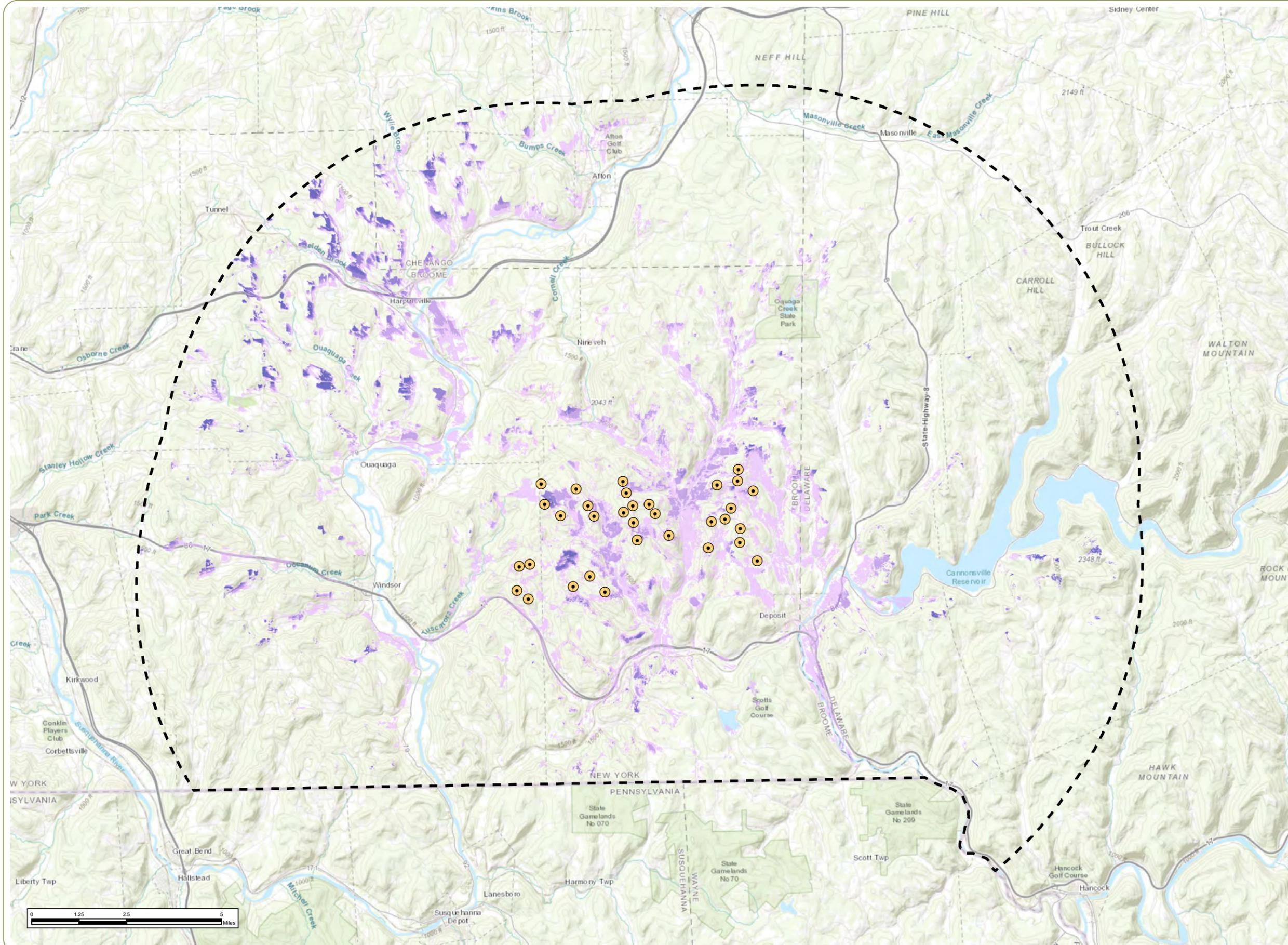
Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data. 4. Potential turbine visibility is based on the screening effects of topography, vegetation, and man-made structures as represented in the FEMA Susquehanna Basin 2007 and FEMA Delaware County 2007 lidar datasets. Viewshed analysis based on maximum blade tip height of 205 meters (672.6 feet).

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Bluestone Wind Project

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Figure 7: Viewshed Analysis
Sheet 4 of 4 - Wind Turbine
FAA Warning Light Visibility
Based on Topography,
Vegetation and Structures



- Wind Turbine
- Visual Study Area
- Number of FAA Warning Lights Potentially Visible:
- 1-8 Lights Visible
- 9-16 Lights Visible
- 17-24 Lights Visible
- 25-33 Lights Visible

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data. 4. Potential FAA warning light visibility is based on the screening effects of topography, vegetation, and man-made structures as represented in the FEMA Susquehanna Basin 2007 and FEMA Delaware County 2007 lidar datasets. Viewshed analysis based on maximum FAA warning light height of 131 meters (429.8 feet).

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Accounting for screening by vegetation and structures in the second-level DSM viewshed analysis drastically reduces potential turbine visibility throughout the visual study area (Figure 8, Sheets 3 and 4). These features, in combination with topography, will serve to block daytime views of the turbines from approximately 82.6% of the 5-mile radius study area and approximately 89.2% of the expanded study area (i.e., 17.4% and 10.8% of the study areas, respectively, are indicated as having potential Project visibility). Areas of potential nighttime visibility, as indicated by FAA DSM viewshed analysis, are limited to approximately 14.3% of the 5-mile radius study area and approximately 8.7% of the expanded study area. This drastic reduction in Project visibility, in comparison with the DEM viewshed analyses, is due to the prevalence of forestland throughout the visual study area, providing little opportunity for open views of the Project. Based on the results of the DSM viewshed analysis, views of the turbines will generally be most available in open agricultural areas, which are concentrated in relatively gently sloped valley bottoms. Project visibility is indicated along roadways that follow these valleys, including County Routes 19 and 543, NYS Routes 17 and 41, Interstate 86, Shaver Hill Road, Big Hollow Road, Farnham Road, William Law Road, Pazzelli Road, and Clark Road. Areas of potential visibility are scattered intermittently through the Susquehanna River Valley, primarily within agricultural fields on Project-facing slopes. Visibility is also indicated from portions of the Cannonsville Reservoir and the West Branch of the Delaware River. Open long-distance views of the Project may be available from locations northwest of the Project where gentler topography has allowed for hilltop agricultural use. Long-distance Project visibility is also indicated along portions of Interstate 88. Elsewhere, the combination of topography and forest vegetation is quite effective in limiting long-distance Project visibility.

Visually sensitive sites that were not fully screened by topography alone but are indicated as fully screened by a combination of topography, vegetation, and/or structures include an additional 22 NRHP-listed resources (most of which are located within the Windsor Village Historic District), four NRHP-eligible resources, one local park (Klumpp Park), six surface water resources, nine state forest trails, two state waterway access areas, and one cemetery. The DSM viewshed analysis also indicates reduced (but not eliminated) Project visibility at the remainder of the inventoried VSRs as a result of screening provided by vegetation and structures.

An analysis comparing potential daytime Project visibility within the various LSZs is summarized in Table 8 and discussed below.

Table 8. Summary of Blade Tip DSM Viewshed Results by Landscape Similarity Zone.

Number of Turbines Visible	Percent of LSZ with Potential Project Visibility				
	Forest	Open Water	Transportation Corridor	Rural Residential/ Agricultural	Village
0	94.7	89.2	75.9	67.0	80.3
1-8	3.9	10.1	18.6	18.2	16.3
9-16	0.8	0.6	3.7	8.5	3.2
17-24	0.3	<0.1	1.4	3.5	0.2
25-33	0.2	<0.1	0.4	2.8	<0.1
Total Visible	5.2	10.8	24.1	33.0	19.7

¹The viewshed analysis study area (within 10 miles of proposed project components) includes approximately 426.8 square miles, or approximately 273,200 acres

- Facility visibility will be most limited within the Forest LSZ, with potential turbine views indicated from approximately 5.2% of this 328 square mile LSZ. Portions of the Forest LSZ with potential turbine views include areas where project-related forest clearing will occur, as well as natural clearings or areas of sparse/low vegetation within forested settings. The Facility will not be visible from the vast majority of this LSZ due to the screening effects of the tree canopy, which will limit or eliminate outward views.
- The Open Water LSZ occupies 11 square miles within the visual study area, with views of the Facility potentially available from 10.8% of its area. Turbine visibility is indicated from several small, centrally located, water bodies including Marsh Pond, Beaver Pond, Sky Lake, Deer Lake, Fly Pond, and the southern portion of Oquaga Lake. Visibility is also indicated along limited portions of the Susquehanna River and the West Branch of the Delaware River. Minimal visibility is indicated from the Cannonsville Reservoir, with turbines screened from view from the vast majority of this VSR. Many smaller water bodies toward the outer extent of the expanded visual study area also have little to no visibility indicated.
- Viewshed results indicate that approximately 19.7% of the more populated portions of the visual study area that comprise the Village LSZ may have views of the proposed wind turbines. The majority of this visibility occurs within the higher elevation portions of the Villages of Deposit and Afton, while visibility within the Village of Windsor is extremely limited. In general, the buildings and associated landscaping vegetation that typify this LSZ will provide a great deal of screening, restricting the majority of potential views to the village/hamlet outskirts.
- The proposed turbines may be visible from approximately 24.1% of the Transportation Corridor LSZ, which consists of the Interstate Route 88 and Interstate Route 86/NYS Route 17 corridors. While visibility is indicated almost continuously along State Route 17/Interstate 86, the Facility will be screened from view where the corridor

crosses the Susquehanna River, as it passes south of Tarbell Hill and extends east from Hungry Hollow. Visibility from Interstate Route 88 occurs primarily to the west of the Susquehanna River.

- The greatest potential for Facility visibility is indicated within the Rural Residential/Agricultural LSZ, with approximately 33.0% of this 75.7 square mile LSZ having potential turbine views. These areas of visibility are concentrated within the agricultural fields that line the stream valleys running through the Facility Site, including Marsh Creek, Oquaga Creek, and Big Hollow Creek. While many of the foreground and midground views available from these close-range areas will be limited to 1-16 turbines, potential visibility of 25-33 turbines is indicated in agricultural areas along a portion of Pazzelli Road and William Law Road and from a few other small areas. Visibility is also fairly common within this LSZ in the northwestern portion of the extended visual study area, within open agricultural fields on hilltops or Project-facing slopes. This portion of the visual study area has a higher occurrence of small areas where (distant) views of 25 turbines or more are potentially available.

5.1.2 Collection and POI Substation Viewshed

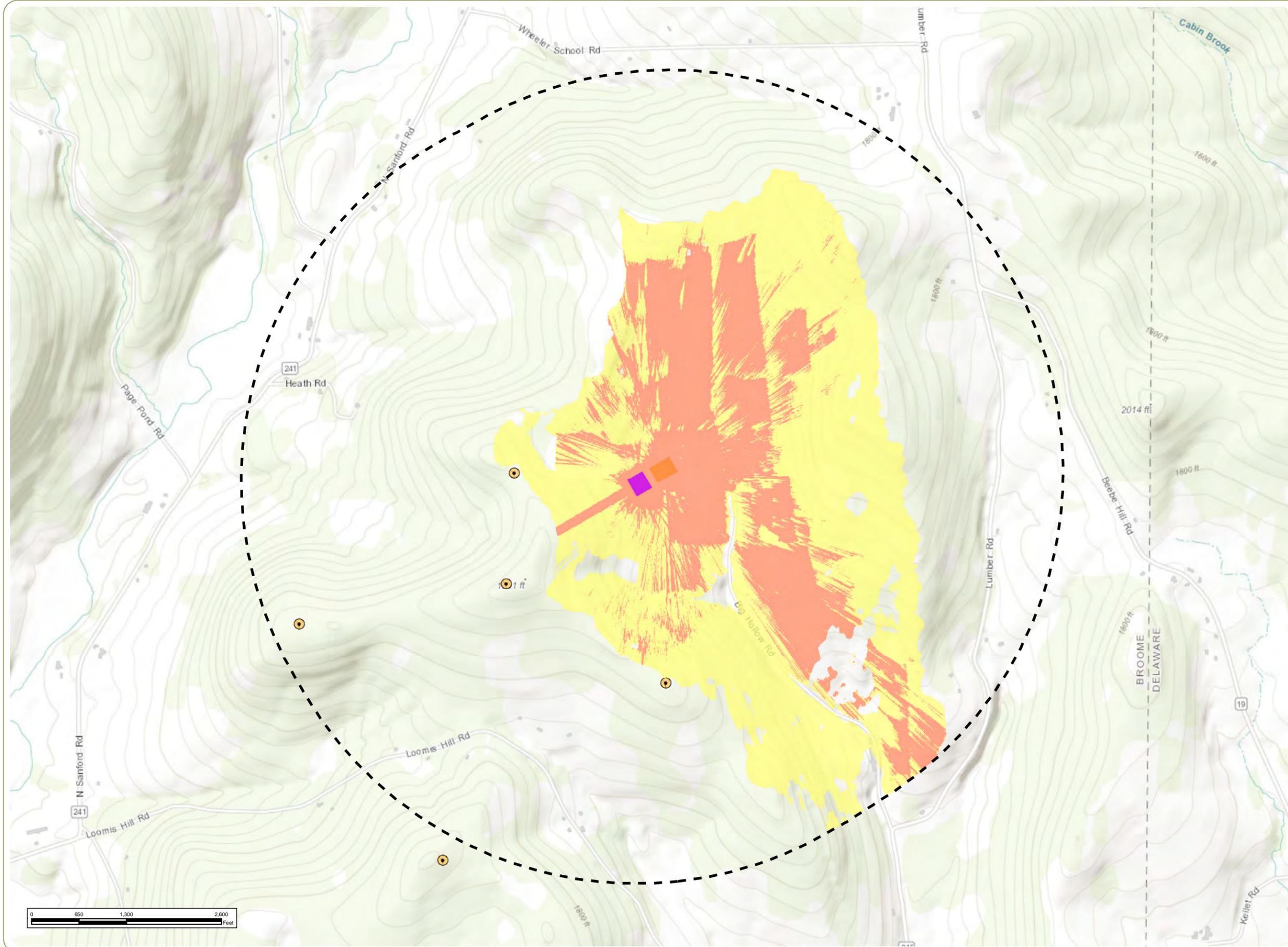
Potential visibility of the collection and POI substation, as indicated by the viewshed analysis, is illustrated in Figure 8. The analysis, based on 60-foot maximum structure height and topography alone, indicates that the stations would be fully screened from view from approximately 69.1% of the 1-mile radius study area. Visibility is limited by relatively high topographic relief within the 1-mile radius study area. The stations are located at the northern end of Big Hollow Road, and the surrounding ridgelines limit visibility from publicly accessible locations other than this road. Visibility is indicated from Big Hollow Road and the adjacent Big Hollow Creek headwater stream. Two other Big Hollow Creek headwater streams that occur within the 1-mile radius study area are screened from view by intervening topography.

When vegetation and structures are factored into the analysis, potential visibility of the proposed stations is further reduced to approximately 10.8% of the 1-mile study area. Views from the remaining 89.2% of the 1-mile radius study area are screened by the combination of topography, forest/tall vegetation and the limited number of structures that occur therein. Remaining areas of potential substation visibility are limited to the abandoned and successional open fields that extend to the north and southeast of the proposed collection and POI substation locations. Within these fields, visibility will be intermittent in some places due to the presence of roadside vegetation, hedgerows and areas of successional growth sufficient enough to provide some level of screening. Visibility will also extend a short distance from the stations to the west along a corridor that will be cleared for the installation of the collection line. This analysis indicates that the stations will be visible from Big Hollow Road and the adjacent headwater stream to the north of the proposed access road to the substations, but will be screened from view from Big Hollow Road and the stream extending south of the access road.

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Figure 8: Collection and POI Substation Viewshed



- Wind Turbine
- 1-Mile Substation Study Area
- Collection Substation
- Point of Interconnect
- Potential Visibility Considering Topography Only
- Potential Visibility Considering Topography and Vegetation

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data. 4. Potential collection substation and point of interconnect visibility is based on the screening effects of topography only and topography, vegetation, and man-made structures as represented in the FEMA Susquehanna Basin 2007 and FEMA Delaware County 2007 lidar datasets. Viewshed analysis based on maximum structure height of 18.3 meters (60 feet)

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5.1.3 Field Evaluation

As noted in Section 4.1.2, visual field review for the Project was conducted on multiple dates between March 2018 and May 2018, and resulted in photographic documentation of views from 117 representative viewpoints within the visual study area (see Figure 10 and Appendix A). A representative photograph documenting the general view toward the Project Site or in the direction of the dominant view, from each viewpoint recorded during the field review, is included in the photo log in Appendix B.

Field review confirmed that potential Project visibility is consistent with the results of the DSM viewshed analysis mapping (see Figure 6). The limited number of potential views of the proposed Project from within the visual study area is attributable to the curving valleys, forested hillsides and ridgelines, limited long distance views, and vegetated roadsides that occur throughout the study area. These common characteristics also lead to the observation that actual Project visibility is likely to be more limited than suggested by the viewshed mapping in some areas. The results of EDR's field review, organized according to LSZ, are summarized below.



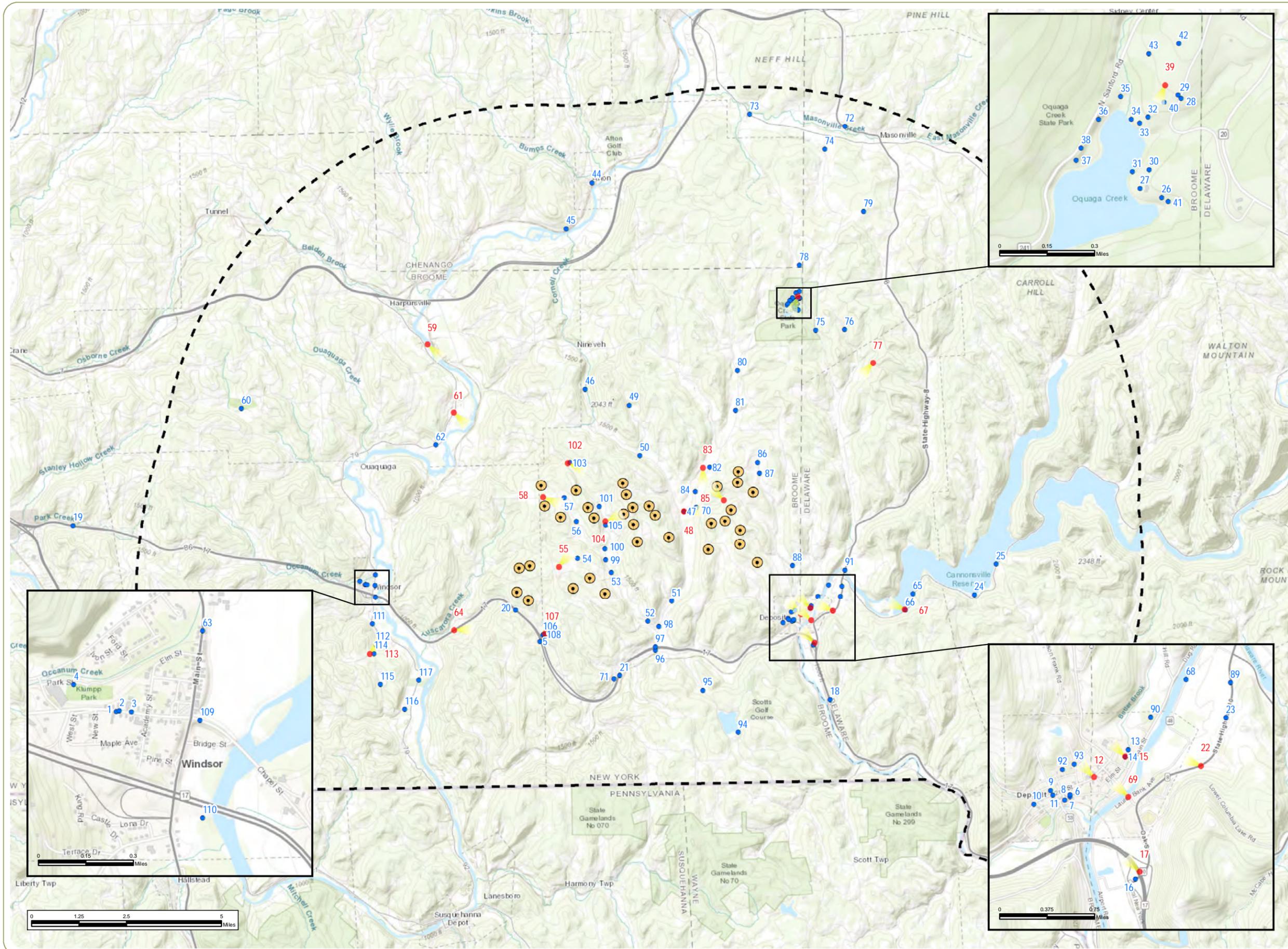
Inset 13. Representative photographs from field review

View from the Pine Street Extension Bridge, in the Village of Deposit looking northeast. No turbines are proposed within this view. (Viewpoint 69)

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Figure 9: Viewpoint Locations



- Simulated Viewpoint Location
- Viewpoint Location
- Wind Turbine
- Visual Study Area

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on September 6, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

Forest LSZ

Field review confirmed that actual visibility of the Project from VSRs, and roadways within the Forest LSZ, which covers a large majority of the visual study area, is very limited. Photographs of typical views from the Forest LSZ are included in Section 3.3.1 (see Inset 4). Even under leaf off conditions, the density of tall forest vegetation in this LSZ blocks nearly all outward views toward the Project Site. Residential properties that were observed from the roadways within this zone are often associated with a small yard clearing. Where turbines are proposed in the foreground, residences may have views of individual turbines. However, at the middle ground and background distances, it is likely that the surrounding dense vegetation will screen outward views. A few observed properties that had larger clearings, or were built on steeper slopes, may have visibility of the proposed turbines through their individual clearings. VSRs in this LSZ where field review confirmed no (or minimal) Project visibility include Oquaga Creek State Park (Arctic Pond), Nathaniel Cole Park, Finger Lakes Trail, Beals Pond State Forest, Beaver Pond, Marsh Pond State Forest, and Melondy State Forest (see Appendix B).

Field review from the Oquaga Creek State Park confirmed viewshed analysis results. Of the 1,273 total acres within the park, only 80.0 acres (6.3%) has potential turbine visibility and 50.0 acres (3.9%) have potential FAA warning light visibility. The areas of the park associated with potential visibility were concentrated in a clearing above Arctic Lake adjacent to the west side of the state park road before the small creek crossing. During the field review, the Orange Ski Trail and yellow unnamed trails were traversed and possible views documented (See Appendix D, Sheet 13-15 for the visual simulation that conveys the potential visibility, and see section 5.2.1 for the analysis of this view). As part of the field review, the camping area loop roads were traveled and assessed as well. Open views towards the Project were not available from these roads due to the dense forest cover and topography of the park grounds (see Inset 14 below). The most heavily used area of the park is the beach and picnic area associated with Arctic Lake. This area is also the only portion of the park that is open to users in the winter months. Field review confirmed that views of the Project from this area during both summer and winter months will be unavailable or very limited. A wireframe rendering prepared as a follow-up to the fieldwork shows that the surrounding forested hills successfully screen the Project turbines from this heavily-used location (see Appendix E, Sheet 4).

Field review of Nathaniel Cole Park indicated that foreground and middle ground topography and vegetation will effectively screen the majority of the park lands from views of the proposed Project. This includes the play areas, picnic shelters, group camping area and nature trail that all fall within the vegetated or forested areas. The greatest potential for turbine visibility was observed from the beach area across the open water. As a follow-up to fieldwork, a wireframe rendering was produced for the beach area. The rendering indicates that the blade tip of one turbine is likely to be visible from this location. However, at a distance of approximately 8 miles, the blade tip would be hard to discern among the tree tops and would likely not be noticed by most users of the park (see Appendix E, Sheet 5).

A portion of the Finger Lakes Trail that travels north to south through the Beals Pond State Forest was hiked and available open views documented during field review. In general, the Finger Lakes Trail remains in the forest as it traverses the northeastern portion of the visual study area, with limited on-road sections. However, the Beals Pond State Forest section of the Finger Lakes Trail offers an identified scenic overlook that was the destination of the field review hike. The overlook was well marked with a small memorial wooden bench that provides open long-distance views in the direction of the Project, which were documented. Because field review could not confirm that the Project would be visible from the overlook, a wireframe rendering was created. The wireframe rendering confirmed that views of the turbines will be screened by the intervening topography (see Appendix E, Sheet 6).

Field review from other state forests within the visual study area confirmed that views are generally limited to roadway corridors, small forest clearings and open water associated with small ponds, wetlands and marshes. As shown in Inset 14, even along roadways and at overlooks and clearings, outward views from interior forest areas are fully or substantially screened. This is consistent with the viewshed analysis results indicating that only 240 acres of the total 23,012 acres, or just over 1%, of all the state forest lands had potential visibility of the proposed Project. Field review confirmed that even this percentage likely overestimated the potential visibility to users of these VSRs, as they generally occurred away from formally designated trails or roads, including snowmobile trails and seasonal forest roads. For an analysis of all 17 state forests that have part or all of their lands in the visual study area see Appendix J.

Field review also confirmed the results of the viewshed analysis showing that the local public roads in the immediate vicinity of the turbines were screened by dense roadside vegetation and, to a lesser extent, topography. Roads such as Mt. Carmel Road, Hartz Road, Cresson Hill Road, and Fox Farm Hill Road in the Town of Windsor, although in close proximity to the proposed Project, will have limited, if any, view of the turbines. This is due to the fact that the dense vegetation creates a tunnel effect which only allows for views down the road corridors. Because of the area topography, the roadways are quite curvilinear and have short straightaways that usually do not align with Project components.



Inset 14. Factors Affecting Visibility from the Forest LSZ.

Left: Dunbar Road (seasonal), within the Arctic China State Forest, Town of Deposit (Viewpoint 77);

Right: Pazzelli Road, Town of Sanford (Viewpoint 56).

Rural Residential/Agricultural LSZ

Field review indicates that potential Project visibility within the Rural Residential/Agricultural LSZ is highly variable within the visual study area, depending on the character of the individual viewpoint. Photographs of typical views from the Rural Residential/Agricultural LSZ are included in Section 3.3.2. The siting requirements of a wind energy project in this region dictate that the turbines be sited on hilltops or ridgelines, outside of valley areas. In the valleys within the visual study area, where outward visibility is not screened by foreground vegetation or structures, the most dominant visual characteristic is typically the adjacent ridge and/or series of hills and ridges that define the valley walls. Portions of this LSZ that are in agricultural use often provide open views across fields framed by forested hillsides. When located in close proximity to the proposed Project, such areas will provide unobstructed views of nearby wind turbines located on the adjacent ridgetops (see Appendix D, sheets 16-18). However, the ridges that define the valley walls will also be effective in screening views of the more distant turbines and, in some cases, the entire Project. While driving the roadways within this LSZ during the field review it was observed that, depending on direction, roadside vegetation and the road layout, potential Project views can include any number of turbines at varying distances. However, in most cases these are short, fleeting views that constantly change around each curve.

VSRs located in the Rural Residential/Agricultural LSZ that may afford views of the Project are primarily heavily traveled north/south roadway (i.e., State Route 8, State Route 49, and State Route 79). Additional VSRs associated with these road corridors include state and local fishing/river access, cemeteries, and a scattering of NRHP-listed and NRHP-eligible sites.

Field review of State Route 79 south of State Route 17/Interstate 86 confirmed that the adjacent forested ridges in the middle ground screen the open views toward the Project. State Route 79 follows the Susquehanna River Valley. An abundance of agricultural land within the valley provides opportunities for long distance open views. A wireframe rendering

was prepared as a follow-up to fieldwork from one of these readily available, long distance views (see Appendix E, Sheet 8). The wireframe indicates potential visibility of the blade tip from a single turbine. Although similar limited Project visibility is anticipated from many areas, views toward the Project Site will vary as the road curves to follow the river channel and roadside vegetation varies from scrub/brush, to forest, to suburban landscape plantings, to open agricultural fields. The constant landscape features that dominate this area are the forested slopes that enclose the valley and limit views of distant landscape features.



Inset 15. Factors Affecting Visibility from the Rural Residential/Agricultural LSZ.

Left: State Route 79, north of the Village of Windsor, Town of Windsor (Viewpoint 63);

Right: Farnham Road, Town of Sanford (Viewpoint 99).

Village LSZ

Actual visibility of the Project from the Village LSZ, as confirmed by field review, is anticipated to be variable. Photographs of typical views from this LSZ are included in Section 3.3.4. In most portions of the Villages of Afton, Deposit and Windsor, buildings, street trees and yard vegetation effectively screen outward views. The limited ROW width or distance between residences on many village streets, combined with mature street vegetation, constrict views down street corridors as well. In these villages, visibility of the Project will often be limited to partially screened views of turbines in gaps between buildings and vegetation. Field review showed that potential visibility from this LSZ is concentrated at the entrances and exits of the street grid, in locations where relatively large areas of unvegetated land occur (e.g., parks, ponds, school grounds, and athletic fields), or in open agricultural areas that are directly adjacent to the village. Appendix B includes representative views from Afton, Deposit, and Windsor.

This LSZ is the location of most of the NHRP-listed and eligible properties, including the two historic districts that are present in the visual study area. Views available from these visually sensitive sites will depend on their location and degree of foreground screening. As represented by the photos included in Inset 16, views from areas of dense development will be

partially screened or include a limited number of turbines (e.g., narrow views available between nearby structures or through gaps in vegetation), while open views are more likely from historic sites on the periphery of the smaller villages and hamlets.

The Village of Windsor Historic District (90NR00091) was visited during field review and potential views toward the Project were documented. However, field review was not able to confirm visibility from the district, so a wireframe rendering was produced as a follow-up. In the rendering it is clear that the Project turbines will remain below the intervening ridge just east of the village (See Appendix E, Sheet 1).

During field review, the historic State Theater (90NR00089) in the Village of Deposit was visited and analyzed for potential Project visibility. Field review confirmed that open views toward the Project Site were available between small openings in the street vegetation and village buildings, and where parking lots provided open space. A wireframe rendering was created to evaluate the view from the main entrance to the State Theater on Front Street. The rendering shows that a single turbine (including the nacelle and 1/3 of the tower) will be visible above the intervening forested hill. The remainder of the Project turbines fall behind this hill and are effectively screened from view.



Inset 16. Factors Affecting Visibility from the Village LSZ.

Top Left: State Route 79, Village of Windsor (Viewpoint 63);

Right: View north up Ford Hill Street, Village of Deposit.

Transportation Corridors LSZ

Field review revealed that potential Project visibility from the Transportation Corridors LSZ will also be highly variable. Due to their length and location within the visual study area, these road corridors run through a variety of different settings, from settled residential areas to agricultural valleys and forested hills. Photographs of typical views from the Transportation Corridors LSZ are included in Section 3.3.5. Field review confirmed that foreground, middle ground and background views to the Project Site are present along different sections of this LSZ. However, given the relative proximity of State Route 17/Interstate 86 (closest point 0.36 miles from a proposed turbine) in comparison to Interstate 88 (closest point 5.33 miles

from a proposed turbine), visibility of the proposed turbines from VSRs along the Interstates will be variable. For example, foreground views of portions of the Project will be possible from the eastbound rest area on State Route 17/Interstate 86 in the Town of Windsor, as the turbines rise above the adjacent foreground ridges, while long distance views from the westbound rest area in the Town of Hancock are screened by intervening topography.



Inset 17. Factors Affecting Visibility from the Transportation Corridor LSZ.

Left: Interstate 86 Johnson Road Overpass, Town of Kirkwood (Viewpoint 19). Right: Interstate 86 County Route 41 Overpass at Exit 82, Town of Sanford (Viewpoint 97).

Waterfront/Open Water LSZ



Inset 18. Factors Affecting Visibility from the Open Water LSZ.

Left: Oquaga Creek State Park (Arctic Lake), Town of Sanford (Viewpoint 31). Right: West Branch of the Delaware River, Town of Deposit (Viewpoint 91).

Field review of the areas that make up the Open Water LSZ within the visual study area indicated that Project visibility is likely to be limited, with the exception of Marsh Pond. Photographs of typical views from the Open Water LSZ are included in Section 3.3.6, and shown in Inset 18 above. Waterfront and open water areas offer relatively open outward views when compared to other landscape types due to the expanse of open water and the lack of screening by foreground topography, vegetation or buildings. This holds true for the larger lakes in the visual study area, while views from smaller water bodies

(small ponds and meandering rivers) are typically screened by shoreline trees and adjacent hills. Waterbodies in this LSZ that were visited during the field review included Cannonsville Reservoir, Arctic Lake, Clarks Pond, Beaver Pond, Marsh Pond, Nathaniel Cole Park Lake, White Birch Lake, Beaver Lake, Oquaga Lake, Susquehanna River and the West Branch of the Delaware River. Viewshed analysis suggested that potential Project visibility from Oquaga Lake and White Birch Lake was limited to the southern shorelines. Field review of White Birch Lake showed, and a follow-up wire frame rendering confirmed, that the proposed turbines will not be visible from the water's surface (Inset 19). Screening at this site is provided by the mature shoreline vegetation and surrounding higher topography.

The largest area of the Open Water LSZ is the Cannonsville Reservoir. The total acreage of the reservoir within the visual study area is 4,215.5 acres, with viewshed analysis indicating that 223 acres (5.3%) having potential Project visibility. The viewshed showed the largest concentration of potential views to be from the Rood Creek boat launch. Field review and a follow-up wireframe rendering from the boat launch suggest that the majority of the reservoir will not have visibility of the proposed Project (see Appendix E, Sheet 3). This is due to the steep topography and dense vegetation along the reservoir's shoreline.



Inset 19. Wireframe view – White Birch Lake, Town of Windsor

5.2 Project Visual Impact

5.2.1 Analysis of Existing and Proposed Views

To illustrate anticipated visual change associated with the proposed Project, photographic simulations of the installed turbines were prepared from the 19 selected viewpoints indicated in Table 5. Two additional simulations, one of the proposed collection and POI substations and one of the O&M facility, are addressed in Section 5.2.4. Simulations of the proposed Facility are presented as Insets on the following pages and are also included as stand-alone images in Appendix D. Review of these images, along with photos of the existing view, allowed for comparison of the aesthetic character of each view with and without the proposed Project in place. Results of this evaluation are presented below.

Viewpoint 12 (see Appendix D – Sheets 1-3)

Inset 20: Existing view from Second Street, Village of Deposit

Existing View

Viewpoint 12 is located along Second Street in the Village of Deposit, approximately 1.8 miles from the nearest proposed turbine that would be visible in this view. The existing view is representative of the Village LSZ and looks northwest toward the proposed Project. The typical viewer will be a local resident or tourist. The foreground is dominated by a commemorative statue, which serves as a focal point in the existing view. Past the statue, the view looks across Second Street toward the parking lot of a church. The reddish-orange brick exterior of the church contrasts with the neutral tones in the rest of the view. A portable mammogram trailer is parked in the lot, though most of the trailer is shielded by mature shrubbery along the side of the road. Beyond the edge of the parking lot, closely-situated residential structures can be seen through a sparse row of mature trees. The houses are backed by dense forest which covers the ridge in the background. The dark ridgeline against the light sky forms the visible horizon. The view is highly complex with various types of structures present, as well as overhead utility lines, which form strong horizontal lines across the sky. Scenic quality is considered moderate to low.



Inset 21: Project simulation from Second Street, Village of Deposit

Proposed Project

With the proposed Project in place, one turbine can be seen rising above the ridgeline. A portion of the tower is shielded by the existing ridge, although a full view of the rotor and nacelle is available. When facing into the prevailing wind (as shown in the simulation), only a side view of the turbine is available, which, along with the overcast sky conditions, lessens its prominence and contrast in line and form. The turbine appears light bluish-gray and under existing conditions presents minimal color contrast against the overcast sky. The vertical line of the turbine is consistent with foreground structures and trees present in the view. Additionally, foreground trees may provide a degree of shielding during leaf-on conditions, making the turbine less visible during the growing season. The monument and church in the foreground remain the focal points in the view, and there are numerous distractions that a viewer could focus on from this location that would draw attention away from the turbine on the horizon. Due to the complexity of this view, the addition of the turbine along the ridgeline does not significantly charge the character of the view. However, the turbine will become more noticeable when it is in motion.

Viewpoint 15 (see Appendix D – Sheets 4-6)

Inset 22: Existing View from Deposit Central School, Village of Deposit

Existing View

Viewpoint 15 is located along Elm Street, at the Deposit Central School track in the Village of Deposit. The viewpoint is located approximately 1.8 miles from the nearest proposed turbine and looks northwest toward the proposed Project Site. This view is representative of the Village LSZ, and the typical viewer will be a local resident involved in, or watching, an athletic event. The foreground of the view is dominated by a track and field facility which is surrounded by a chain link fence. Past the track, the yellow brick exterior of the Deposit Central School building, along with a substation, utility poles, and parked cars, dominates the middle ground. Rolling hills covered in mature forest rise up behind the school and continue to the horizon. The focus of this view is the middle ground, which is somewhat cluttered due to the arrangement of school buildings, athletic facilities, vehicles, and utility structures. Although this is a developed area, the background landscape of trees and woodland emphasize a rural character and enhance its overall scenic quality.



Inset 23: View of simulated Project from Deposit Central School, Village of Deposit

Proposed Project

With the proposed Project in place, three turbines can be seen extending above the ridgeline. Views of the towers are partially shielded by the hills, but the blades and nacelles are visible. Due to the orientation of the rotor (facing into the prevailing wind), the viewer can only see the turbines in profile and is not afforded a full view of the rotating blades. The line and scale of the turbines are consistent with other vertical features in this viewpoint, such as the flag pole and utility poles, and at this distance, do not appear substantially out of scale with built features in the middle ground. The turbines appear light gray against the pale blue sky. While their color contrast with the sky is not extreme, the clear atmospheric conditions represented in this photo may render the turbines slightly more prominent than if they were to be viewed under overcast conditions. Conversely, low-angle sunlight or back-lighting would likely increase their contrast against the sky. The turbines are noticeable along the ridgeline but their presence does not change the existing visual character of the viewpoint. Addition of the turbines to the existing view will draw viewer attention, but would not substantially alter the character of the view, viewer activity/enjoyment, or the dominance of the built features in the foreground and middle ground at this viewpoint.

Viewpoint 17 (see Appendix D – Sheets 7-9)

Inset 24: Existing view from State Route 17/Interstate 86, Town of Deposit

Existing View

Viewpoint 17 is located along State Route 17/Interstate Route 86 in the Town of Deposit. This viewpoint is located 2.6 miles from the nearest proposed turbine that would be visible in this view to the northwest. This viewpoint is representative of the Transportation Corridor LSZ, and the typical viewer will be a through-traveler/commuter. The existing view features a divided four-lane highway as the dominant foreground feature. The paved lanes are bordered by metal guard rails and separated by a sloping grass median. The highway proceeds away from the viewer, curving towards the west. The curve of the roadway leads the viewer's eyes to rolling, forest-covered hills in the background. The wooded hills along the horizon dominate the view due to their rolling form and color contrast against the sky. Visual focus is concentrated on the road, but the wooded background defines the character of the surrounding landscape and improves the visual quality of the view. Scenic quality at this viewpoint is considered moderate.



Inset 25: View of simulated Project from State Route 17/Interstate 86, Town of Deposit

Proposed Project

With the proposed Project in place, multiple turbines can be seen extending above the wooded hilltops. The hills partially screen the towers, but the towers, blades and/or nacelles are clearly visible above the hilltops. While the light color of the turbines limits their contrast with the sky at the horizon, shadowing created by the strong sunlight highlights the presence of the turbines. The turbines may present greater contrast during low-angle lighting conditions at sunrise and sunset. The addition of the turbines to this viewpoint creates new focal points in the view and adds a new man-made feature to the forested hills in the background. The highway does have a strong presence in the existing view, but the turbines now compete for viewer attention. The addition of the turbines to the viewpoint has a moderate to appreciable effect on scenic quality. Some viewers may react favorably to the turbines while others may see them as incompatible with the natural landscape.

Viewpoint 22 (see Appendix D – Sheets 10-12)

Inset 26: Existing view from State Route 8, Town of Deposit

Existing View

Viewpoint 22 is located along State Route 8 in the Town of Deposit. This viewpoint is approximately 0.14 mile east of the Village of Deposit and 2.3 miles from the nearest proposed turbine that would be visible in this view to the west-northwest toward the Project Site. This view is representative of the Rural Residential/Agricultural LSZ, and the typical viewer will be a resident or through-traveler/commuter. A wooden fence and cable guard rail cut through the immediate foreground, backed by an open grass slope. A few shrubs are present on either side of the fence, and the mowed grassy field beyond the fence slopes gently downward toward a broad level agricultural field in the middle ground. The corner of the field is abutted by two residential structures and multiple rows of wrapped hay bales. The far side of the field is also bordered by single-family dwellings, some of which are partially obscured by trees. To the right of these dwellings, several red barns and farm structures are clustered along the edge of the field. The field is nestled in a shallow valley backed by rolling hills that include a patchwork of forest and open fields. Dark forested hilltops form the visible horizon, and present strong color contrast with the partly cloudy sky. The overall scenic quality of this working agricultural landscape is considered moderate.



Inset 27: Visual simulation from State Route 8, Town of Deposit

Proposed Project

With the proposed Project in place, multiple turbines are visible above the forested hill that defines the horizon line. Most of the closer turbines are fully visible and extend well into the sky above the hill tops, while only portions of the rotors of the more distant turbines are visible above the horizon. The white/light blue color of the sky moderates the impacts of the turbines, as does the angle of the sun, which limits strong shadows. The generally horizontal lines of the existing topography and field edges contrast with the vertical lines of the turbines, which present appreciable contrast with the existing vegetation and landform. However, this contrast is limited by the distance of the turbines from the viewer, which reduces their scale contrast, and the presence of existing man-made features in the view, including residential structures and fencing, as well as a cleared right-of-way corridor in the background. The turbines are clearly noticeable, as they are numerous and prominently situated on the hilltops. They will become new focal points, but the character of the view will continue to be defined by the existing rural structures and agricultural fields in the foreground. The turbines appear compatible with the working agricultural landscape. Different lighting/sky conditions, and changes in seasonal foliage color could increase the visual impact of the turbines.

Viewpoint 39 (see Appendix D – Sheets 13-15)

Inset 28: Existing view from Oquaga Creek State Park, Town of Sanford

Existing View

Viewpoint 39 is located at Oquaga Creek State Park in the Town of Sanford. This view is approximately 4.8 miles from the nearest proposed turbine that would be visible in this view to the south-southwest toward the Project Site. This viewpoint is representative of the Rural Residential/Agricultural and Forest LSZs, and the typical viewer would be a tourist or recreational user. The existing view features a grassy, open field in the foreground, backed by a band of shrubs and young trees, which partially screen Oquaga Creek in the middle ground. The creek is surrounded by low, rolling hills covered in dense forest. The dark green hills against the blue sky form a distinct horizon line, and block views of more distant landscape features. There are no obvious man-made features in the existing view and the open water of Arctic Lake serves as the focal point in this view. The scenic quality of this view is considered relatively high due to landscape variety and the lack of discordant features. Viewer sensitivity in this park setting is also considered to be relatively high.



Inset 29: Project simulation from Oquaga Creek State Park, Town of Sanford

Proposed Project

With the proposed Project in place, portions of the blades of three turbines are faintly visible above the ridgeline in the west-southwest portion of the view. The sky is lighter near the horizon, which minimizes the contrast presented by the white turbines. The turbine blades can be seen but are not very noticeable in this view due to the lack of color contrast with the sky, the significant screening provided by the intervening hills, and the distance of the turbines from the viewer. Although different atmospheric conditions could increase Project visibility, the turbines would still have relatively little impact on the existing view. The lake remains the focus of the view, and casual viewers may not even notice the turbines, although they may be more obvious when in motion. Despite their being the only visible man-made feature, the addition of the turbines to this viewpoint does not alter the scenic quality or visual character of the view. It is also worth noting that views of these turbines would be completely screened from the surface or shoreline of the lake itself.

Viewpoint 48 (see Appendix D – Sheets 16-18)

Inset 30: Existing view from Oquaga Creek Fishing Access Site on County Route 241, Town of Sanford

Existing View

Viewpoint 48 is located along County Route 241 (North Sanford Road) at the Oquaga Creek Fishing Access Site in the Town of Sanford. This viewpoint is located 0.8 mile from the nearest proposed turbine that would be visible in this panoramic view to the east toward the Project Site. This view is representative of the Rural Residential/Agricultural LSZ, and the typical viewer would be a local resident or tourist/recreational user. The existing view is oriented down County Route 241 and features a pastoral view down a rural road. The road is lined with a low fence to the north and dotted with occasional street signs. To the south, the road is bordered by a harvested crop field in the foreground, while the other side of the road is bordered by pastureland. As the two-lane road proceeds away from the viewer, it climbs gentle, rolling hills, and the open fields in the foreground transition to mature forested hills in the middle ground and background. A farmstead can be seen on the north side of the road at the base of the forested hills, consisting of a traditional white home and a red barn. The overall scenic quality of this view is moderate to high.



Inset 31: Project simulation from Oquaga Creek Fishing Access Site on County Route 241, Town of Sanford

Proposed Project

With the proposed Project in place, multiple turbines can be seen extending above the forested hilltops. The rolling hills shield portions of the more distant turbines, but the nearest turbines provide the viewer with full views of the blades, nacelles, and towers. While the turbines do not feel out of place in the working agricultural landscape, at this distance the contrast of their line, scale, and form with the rolling hills and farmstead structures is appreciable to strong. Clear blue skies and strong sunlight highlight the color contrast of the turbines against the sky. Due to the proximity of the turbines and their location atop defined hills, the turbines stand out as significant additions to the landscape and become focal points. Although the view maintains its rural character, the presence of the turbines redefines the dominant land use.

Viewpoint 55 (see Appendix D – Sheets 19-21)

Inset 32: Existing view from William Law Road, Town of Sanford

Existing View

Viewpoint 55 is located along William Law Road in the Town of Sanford. This viewpoint is located approximately 0.9 mile from the nearest proposed turbine that would be visible in this view to the west-northwest. The view is representative of the Rural Residential/Agricultural LSZ, and the typical viewer will be a local resident. The existing view features a rural property on the left with a broad, dormant field in the foreground. The residential property on the left includes a single-story home, along with a nearby trailer, shed, and children's swing set. Three small, ornamental conifers line the property, and a much larger tree extends into the sky from behind the house. Fields adjacent to and beyond the yard are backed by low wooded hills, which create a strong vertical horizon line against the light blue sky. Although the existing forest may partially screen outward views, the slightly elevated position of the viewer offers a long-distance glimpse of a distant ridgeline in the background. The view is not particularly dynamic but presents a balanced composition of natural and cultural elements. The overall scenic quality is low to moderate.



Inset 33: Visual simulation from William Law Road, Town of Sanford

Proposed Project

With the proposed Project in place, several turbines are prominently visible across the horizon in the middle ground and background of the view. The turbine on the right is the nearest, and extends well above the tree line into the sky. Due to its proximity to the viewer, it presents appreciable scale contrast with the existing forest vegetation and creates a strong vertical element which contrasts with the existing horizontal landforms. Although the turbines in the distance are not as strongly contrasting due to their minimal color contrast with the sky, they still present contrast in color, scale, form and texture with the existing vegetation, landform, and land use. Due to the proximity of the nearest turbine, and the lack of other character-defining features in the view, the turbines attract viewer attention and become the dominant focal points in the view. However, addition of the turbines also provides an element of visual interest in the landscape.

Viewpoint 58 (see Appendix D – Sheets 22-24)

Inset 34: Existing view from Pazzelli Road, Town of Sanford

Existing View

Viewpoint 58 is located on Pazzelli Road in the Town of Sanford. This viewpoint is approximately 0.9 mile from the nearest proposed turbine location and looks east-southeast toward the Project Site. This view is representative of the Forest and Rural Residential/Agricultural LSZs, and the typical viewer on this lightly used rural road will be a local resident. The road is flanked by successional old fields on either side and proceeds away from the viewer toward rolling, forest-covered hills. The branches of a foreground tree directly adjacent to the viewer extend into the photo, framing the left side of the view. Following the road, the landscape descends into a middle ground valley comprised of fields, hedgerows, and blocks of forest land on the level to gently rolling topography. Street signs and portions of widely-scattered single-family residences are the only visible man-made features. The middle ground valley rises into a rolling wooded ridgeline in the background that forms the visible horizon. The view at this location is from an elevated vantage point and feels open and expansive. However, the lack of foreground elements/focal points and color variation within the larger landscape results in moderate scenic quality.



Inset 35: Visual simulation from Pazelli Road, Town of Sanford

Proposed Project

With the proposed Project in place, the introduction of multiple turbines in the middle ground and background add prominent new focal points to the view. The turbines extend well into the sky, and evidence of the forest clearing necessary to accommodate their construction can be seen at the base of each turbine. Due to the proximity of the turbines within the view, they present strong line and scale contrast with the vegetation and landform. Although clearly visible, under the sky conditions illustrated in this photograph, color contrast with the sky is limited. The largely rural landscape now takes on more of a utilitarian character due to the large quantity of turbines, and their prominence within the landscape. The overlap of turbines within the landscape and their proximity to the viewer, create a significantly altered experience. However, because this setting is largely undeveloped and lacks VSRs, relatively few sensitive viewers will experience this type of view. The resulting effect of the turbines on viewer activities will be reduced due to the limited use this viewpoint receives.

Viewpoint 59 (see Appendix D – Sheets 25-27)

Inset 36: Existing view from Center Village Bridge, Town of Colesville

Existing View

Viewpoint 59 is located at the Center Village Bridge on Bridge Street in the Town of Colesville. This viewpoint is approximately 4.8 miles from the nearest proposed turbine and looks southeast toward the Project Site. This view is representative of the Rural Residential/Agricultural and Open Water LSZs, and the typical viewer will be a tourist/recreational user or a local resident traveling to and from their residence and daily destinations along the roadway. The existing view is from an elevated vantage point and looks out over the Susquehanna River. The river is the dominant, character-defining feature of this view. The water appears dark greenish-gray in color, with a noticeable current. The river is bordered on either side by mature shrubs and trees, and in this particular location appears relatively shallow, with small, scrubby islands emerging through the water's surface. On the western shore, a road and a few structures are visible through the shoreline vegetation. A forest-covered hilltop frames the curving river in the background and forms the visible horizon. The bright sky is hazy blue and streaked with clouds, in contrast with the dark ridgeline vegetation. The overall scenic quality of this view is moderate to high.



Inset 37: Visual simulation from Center Village Bridge, Town of Colesville

Proposed Project

With the proposed Project in place, three turbines now extend above the horizon on the background ridge in the center of the view. Under existing conditions, they are back-lit, and appear as dark vertical lines against the bright sky. Due to their distance from the viewer, the turbines appear narrow and delicate, and their color contrast is somewhat muted by cloud cover. The orientation of the rotors also lessens the overall impact, as the viewer is only afforded a sideview of the structures. The more distant turbines appear closer to the treeline, which partially shields views of the towers. While the turbines compete with the water for viewer interest, the river remains the primary focal point of this view. The addition of the man-made structures contrasts with the natural scene, but the effects of distance moderate this impact. Due to its distance from the viewer, and the dominant presence of the Susquehanna River in the foreground, the Project will not have an adverse impact on the overall viewer experience or scenic quality of the viewpoint.

Viewpoint 61 (see Appendix D – Sheets 28-30)

Inset 38: Existing view from State Route 79, Town of Colesville

Existing View

Viewpoint 61 is located at the intersection of State Route 79 and Windsor Place. This viewpoint is approximately 3 miles from the nearest proposed turbine that would be visible in this view to the southeast toward the Project Site. This view is representative of the Rural Residential/Agricultural LSZ, and the typical viewer will be a local resident or through-traveler. The view looks out onto a broad undulating agricultural field covered in a coarse layer of grass. The field gently rolls down toward the neighboring tree line, which extends upward onto the surrounding forested hills. To the right of the viewer, a narrow farm lane cuts through the fields in the middle ground, traveling toward the forest in the background. The opposite side of the road is bordered by a harvested crop field and the edge of an undeveloped, scrubby berm. This vantage point lacks strong focal points, but offers expansive views of the surrounding ridgeline, which is dark, and presents a strong contrast with the white, hazy sky. The existing view is a secluded relatively bucolic, working agricultural landscape with moderate scenic quality.



Inset 39: Visual simulation from State Route 79, Town of Colesville

Proposed Project

With the addition of the proposed Project, three turbines are now visible, rising above the horizon on the left-hand side of the view. Under the current lighting conditions, the turbines appear dark gray against the white, cloud-streaked sky, and the vertical line of the towers contrasts with the dominant horizontal landforms. While the turbines present contrast with the natural character of the forested ridgeline, their contrast with the cultivated land in the foreground is minimal. Although distant, the turbines are a prominent addition to the background of the view, and become a visual focal point. While the rural landscape is altered by the addition of the turbines, but their presence adds interest to the view and does not appear inappropriate in a working agricultural landscape. Limited viewer exposure and the lack of VSRs at this location further reduces the Project's visual impact.

Viewpoint 64 (see Appendix D – Sheets 31-33)

Inset 40: Existing view from State Route 17/Interstate 86, Town of Windsor

Existing View

Viewpoint 64 is located along State Route 17/Interstate Route 86 in the Town of Windsor. This viewpoint is located approximately 1.4 miles from the nearest proposed turbine that would be visible in this view to the east. The existing view is representative of the Transportation Corridor LSZ and the typical viewer will be a through-traveler. The view features a broad expanse of striped pavement (three east-bound lanes) which are separated from the west-bound lanes by a concave grass median. The paved surface of the highway dominates the foreground of the view and carries the viewer's eye to the forested hill in the background. The highway is bordered on either side by shrubs, mature trees, and signs (both temporary and permanent). The existing viewpoint is fairly monochromatic, with the exception of the light blue sky which accentuates the contrast presented by the bare trees and dark ridgeline. The overall scenic quality of this view is moderate to low.



Inset 41: Project simulation from State Route 17/Interstate 86, Town of Windsor

Proposed Project

With the proposed Project in place, three turbines are clearly visible above the ridgeline in the background. Due to the proximity of the turbines and their location atop the hills, the turbines stand out as significant new additions to the landscape. The most visible turbine is located in the center of view and sits in an axial relationship to the highway, which draws the viewer's attention to the turbine. While the turbines do not feel out of place in a landscape dominated by man-made features, their scale, form, and color offer appreciable contrast with the existing natural features in the view. Existing man-made structures help to mitigate the impact, but the position of turbines, their novel form, large size, and motion will make them the focal points of this view. Their presence will alter the experience of the viewer and redefine the visual character of the viewpoint. However, viewer experience will be fleeting in nature, and the turbines may also present a component of visual interest for through-travelers or passengers in vehicles traveling the highway.

Viewpoint 67 – Leaf-On Conditions (see Appendix D – Sheets 34-36)

Inset 42: Existing view from Cannonsville Reservoir off of State Route 10, Town of Deposit

Existing View

Viewpoint 67 is located along State Route 10 at a roadside pull-off adjacent to the Cannonsville Reservoir. The viewpoint is approximately 4.1 miles from the nearest proposed turbine that would be visible in this view to the west-northwest toward the Project Site. The existing view is representative of the Open Water LSZ and the typical viewer will be a tourist or recreational user. The view is framed by the branches of trees and shrubs in the foreground and looks out from an elevated vantage point over the surface of the reservoir. In the middle ground of the view, the far edge of the reservoir is defined by a man-made cobble dike/embankment which contains the impoundment. A maintained walkway is faintly visible along the top of the embankment, which is bordered by young conifers and a mowed, grassy field. Beyond the reservoir, the land descends into a valley that is largely blocked from view by trees in the middle ground. Forest-covered hills rise up on the opposite side of the valley to form the visible horizon. In this photograph, the sky is light blue and contrasts with the dark ridgelines. To the left of center on the horizon, a cleared utility ROW cuts through the forest in the background, interrupting

an otherwise natural horizon line. The overall scenic quality of this view is moderate to high due to the attractive composition and balance among sky, landform, and water.



Inset 43: Visual simulation from Cannonsville Reservoir off of State Route 10, Town of Deposit

Proposed Project Leaf-on

With the proposed Project in place, several turbines have been added to the background, and can be seen protruding above the horizon in the right center of the view. The park-like setting of the reservoir and natural composition of the view are interrupted by the turbines, which present a competing focal point. Despite their distance from the viewer, the turbines are clearly visible along the ridgeline, and contrast with existing features of the landscape in line, scale and form. The contrast of the turbines against the sky is somewhat muted by hazy conditions along the horizon, and clearer atmospheric conditions could increase visibility. The turbines are arranged in a cluster along the ridgeline, which limits the degree to which they alter the character of the view. The presence of other man-made features in the existing view (reservoir, dike, cleared right-of-way) also lessens the contrast between the proposed Project and the naturalistic scene. While the turbines are clearly visible, they do not impact viewer activity, and the reservoir remains the dominant, character-defining element of the view.



Inset 44: Visual simulation from Cannonsville Reservoir off of State Route 10, Town of Deposit

Proposed Project Leaf-off

With the proposed Project in place under winter conditions, six turbines are now clearly visible above the horizon in the center of view. However, under current lighting conditions they present limited contrast with the overcast sky and monochromatic landforms, and are not prominent in the view. The engineered embankment that forms the far shoreline of the reservoir and the ice-covered surface of the lake remain the dominant focal points of the view. The distance of the new turbines from the viewer help minimize their visual dominance, and the presence of other man-made features (reservoir, dike, cleared right-of-way) lessens the contrast between the character of the existing view and the proposed Project. The turbines may appear more dominant under different lighting conditions, but the Project remains compatible with the existing mix of natural and altered features that define the landscape in this view.

Viewpoint 69 (see Appendix D – Sheets 37-39)

Inset 45: Existing view from Pine Street Extension Bridge, Village of Deposit

Existing View

Viewpoint 69 is located on the Pine Street Extension Bridge over the West Branch of the Delaware River in the Village of Deposit. This viewpoint is located approximately 2.1 miles from the nearest proposed turbine that would be visible in this view to the northwest toward the Project Site. The viewpoint is located in the Village and Open Water LSZs, but the view in this direction is dominated by the road surface and surrounding forest vegetation. The typical viewer in this location will be a local resident, tourist, or recreational user. The existing view features an open road and guardrails in the foreground, with residential and commercial structures and roadside utility lines present in the middle ground. To the left of the bridge, mature trees along the river's bank partially shield views of the adjacent residences and background hills. Rising hills covered in forest vegetation form the backdrop to this view and block views of more distant landscape features. The West Branch of the Delaware River is not visible but is a dominant feature in views to the north, northwest, and west from this location. The existing view in this direction is not particularly dynamic, and scenic quality is compromised by the bridge railings and overhead utility lines that dominate the foreground and middle ground. Overall scenic quality of this view is moderate.



Inset 46: Visual simulation from Pine Street Extension Bridge, Village of Deposit

Proposed Project

With the proposed Project in place, three turbines can be seen extending above the ridgeline in the background of the view. The turbines present moderate contrast with the existing vegetation and landform, and their large size is obvious relative to the height of the forest vegetation on the hilltop. However, their distance from the viewer, and the presence of other vertical features that pierce the skyline reduce the line and scale contrast presented by the Project. The limited number of visible turbines, and their compatibility with man-made elements of the landscape, also serve to limit the Project's impact on land use and scenic quality. The addition of the turbines introduces a new land use, but the turbines are not dominant in the landscape. Foreground structures and the adjacent river will remain the focal points in views from this location. The change in character and added contrast from the proposed turbines will have little effect on viewer activity or the visual character of this viewpoint.

Viewpoint 83 (see Appendix D – Sheets 40-42)

Inset 47: Existing view from Page Pond Road, Town of Sanford

Existing View

Viewpoint 83 is located on Page Pond Road overlooking Oquaga Creek in the Town of Sanford. This viewpoint is approximately 1.7 miles from the nearest proposed turbine that would be visible in views to the south from this location. This view is representative of the Forest and Open Water LSZs, and the typical viewer would be a tourist or recreational user. The existing view features Oquaga Creek below the viewer in the foreground. The creek is flanked on either side by a complex mix of shrubs and mature trees. Although partially screened by foreground trees, forested rolling hills can be seen in the background. The ridgeline in the background creates a strong sloping horizon line against the clear blue sky. In the foreground, the creek appears relatively shallow, with a small bar of cobbles partially covered in vegetation at the water's edge. The surrounding vegetation is dense and overhangs the creek, partially shielding the more distant portions of the creek from view. Scenic quality of this view is relatively high due to the presence of the creek, variability in vegetation and land form, and the lack of man-made intrusions.



Inset 48: Visual simulation from Page Pond Road, Town of Sanford

Proposed Project

With the proposed Project in place, portions of four new turbines are visible on and behind the ridgeline in the background of the view. The turbines are noticeably larger than the existing vegetation, and rise prominently above the ridgeline. Due to their elevated position in the landscape and the lack of other man-made features, the turbines become a new focal point and alter the perceived land use. Although their impact is somewhat mitigated by the complexity of the vegetation in the foreground and middle ground, the turbines now compete with the creek as the character-defining feature of the view. Under the conditions illustrated in this photograph, the turbines appear light gray and contrast with the blue sky. This contrast might be lessened under less clear atmospheric conditions, but changes in the surrounding foliage (i.e., leaf-off season) and low-angle sunlight could also increase their visual impact. The addition of the proposed Project has a moderate to appreciable impact on the scenic quality of the view.

Viewpoint 85 (see Appendix D – Sheets 43-45)

Inset 49: Existing view from Loomis Hill Road, Town of Sanford

Existing View

Viewpoint 85 is located along Loomis Hill Road in the Town of Sanford. This viewpoint is approximately 0.4 mile from the nearest proposed turbine that would be visible in views northwest from this location. This view is representative of the Forest LSZ and the typical viewer will be a local resident. The existing view looks out from an elevated vantage point on the roadside onto a simple view of a rising forest-covered hillside in the foreground and middle ground. The sky is clear blue and feels open and expansive. In the foreground, a roadside utility line spans the view in front of the trees and across the sky at the top of the view. The utility lines are the only man-made features in the view. Due to a lack of landscape variability or focal points, the overall scenic quality of this view is relatively low.



Inset 50: Visual simulation from Loomis Hill Road, Town of Sanford

Proposed Project

With the proposed Project in place, one new turbine is prominently visible above the tree line. The turbine extends well into the sky, accentuating its scale contrast with the existing landform and vegetation, and dominating the skyline. Additionally, the turbine presents strong contrast with the existing vegetation and landform in terms of line, color, form, and texture. Along the top of the ridgeline, some tree-clearing has occurred around the base of the turbine, but the visibility of this clearing is limited. With the exception of the utility lines, the turbine is the only man-made feature in a largely natural landscape. The presence of the utility lines and lack of VSRs somewhat mitigates the impact of the turbine, but with the Project in place, the turbine becomes the clear focal point and character-defining feature of the view. However, it should be noted that addition of the turbine will not be perceived negatively by all viewers. To some, it will add an element of interest to a previously uninteresting view.

Viewpoint 102 (see Appendix D – Sheets 46-48)

Inset 51: Existing view from Bryce Road at Marsh Pond Road, Marsh Pond State Forest in the Town of Sanford

Existing View

Viewpoint 102 is located along Bryce Road near the intersection with Marsh Pond Road on the Marsh Pond State Forest in the Town of Sanford. This viewpoint is located 1.5 miles from the nearest proposed turbine that would be visible in views to the east-southeast toward the Project Site. This view is representative of the Forest and Open Water LSZs, and the typical viewer will be a local resident or tourist. The existing view looks out from the shoreline of Marsh Pond onto the calm, open water of the pond's surface. Under the existing calm conditions, the pond is reflecting the clear blue sky and the forested edge surrounding the pond's banks. Along the opposite shore, a low band of herbaceous vegetation occurs between the trees and the pond's surface. Trees along the pond's edge block views of more distant landscape features, but due to the presence of the open water, the view feels open and expansive. The view is simple, natural and uncluttered, and overall scenic quality is considered to be high.



Inset 52: Visual simulation from Bryce Road at Marsh Pond Road, Marsh Pond State Forest in the Town of Sanford

Proposed Project

With the proposed Project in place, numerous turbines rise prominently above the middle ground tree line and become the dominant features of the view. The turbines break the skyline and present appreciable to strong line, color and scale contrast with the landform, vegetation, and sky. Although the turbines are well-spaced within the view, their reflection on the pond's surface accentuates their presence. Addition of the turbines alters the natural character and changes the perceived land use, which may impact viewer experience at this viewpoint. The effect on scenic quality is appreciable due to the change from a natural landscape to one that is now dominated by turbines. However, the existing lighting/sky conditions are demonstrative of worst case scenario views; under less clear and calm conditions, the impact of the proposed Project would be reduced to some degree. However, overall impact at this location is relatively high due to the natural character of the existing view and the expectations of viewers in the state forest setting.

Viewpoint 104 (see Appendix D – Sheets 49-51)

Inset 53: Existing view from Bryce Road, Town of Sanford

Existing View

Viewpoint 104 is located on Bryce Road in the Town of Sanford. This viewpoint is located approximately 0.5 mile from the nearest proposed turbine that would be visible in views to the east-northeast. This view is representative of the Forest LSZ and the typical viewer will be a local resident. The existing view features a forest-covered hill, which dominates the middle ground of the view. A flat, open field leading up to the woods edge can be seen in the foreground. Under the light conditions illustrated in this photo, strong shadows extend over the field and portions of the hill behind it. There are no visible man-made features present in this view, and the natural forested landscape is typical of rural settings throughout the visual study area. The view is simple and uncluttered, but lacks landscape variability and visual focal points. It has a moderate to high scenic quality.



Inset 54: Visual simulation from Bryce Road, Town of Sanford

Proposed Project

With the proposed Project in place, portions of three wind turbines extend into the sky above the hillside. The vegetated hill shields portions of the turbine towers, but the majority of the turbines are still visible. Due to their proximity to the viewer, the turbines dominate the skyline and become major focal points in the view. Under the lighting conditions illustrated in this photo (which are demonstrative of worst case visibility), the turbines are illuminated against the sky and contrast with the darker features in the foreground and middle ground. The relative proximity of the turbines accentuates their line, scale, texture and form contrast with the existing vegetation and landform. The turbines also introduce modern, utilitarian features to the view and alter the natural character of the existing landscape. While the scenic quality and the character of the landscape are strongly affected due to the visual dominance of the turbines, this viewpoint will not have frequent viewers due to its remote location, which limits the Project's visual impact.

Viewpoint 107 (see Appendix D – Sheets 52-54)

Inset 55: Existing view from Mountain View Drive along Deer Lake, Town of Sanford

Existing View

Viewpoint 107 is located on Mountain View Drive along Deer Lake in the Town of Sanford. This viewpoint is located approximately 1.0 mile from the nearest proposed turbine that would be visible in views to northwest. This viewpoint is located in the Forest and Open Water LSZs, but in this particular view, a shoreline home is the dominant foreground feature in the view (open views across the lake were not available from public vantage points). This is a classic waterfront residential view, and the typical viewer will be a local resident. A few tall trees frame the foreground scene and are co-dominant with the residential structures. Deer Lake can barely be seen in the middle ground beyond the structures. There is varying color, texture, and form to the landscape. The middle ground hillside on the opposite shore of the lake is blanketed in trees, and variations in light and shadow among the trees captures the viewer's interest. The low late-afternoon light creates strong shadows that contrast with light color of the lake surface and the sky. The view is somewhat busy due to the diversity structures and vegetation, and contrast of light and shadows. There is no dominant focal point, and the overall scenic quality of this view is moderate.



Inset 56: Visual simulation from Mountain View Drive along Deer Lake, Town of Sanford

Proposed Project

With the proposed Project in place, the turbines are clearly visible on the middle ground ridge on the far side of the lake. The two closest turbines rise above the ridgeline and create substantial line and scale contrast with the surrounding hills, although this contrast is lessened somewhat by the tall trees in the foreground. The clear weather conditions and low-angle sunlight on the turbines create strong shadows that highlight color contrast with the sky. Because of their proximity, the foreground structures and vehicles compete with the turbines for visual dominance, but the turbines add strong new focal points in the view. The existing view is not particularly pristine as there is significant complexity in the foreground, but the presence of the turbines on the background hillside draws viewer attention away from the lake and redefines the character of the view. Their overall impact on scenic quality and viewer activity could be appreciable at this location. It is worth noting, however, that turbine visibility and dominance will be substantially reduced from the shoreline and surface of the lake itself due to screening provided by shoreline trees.

Viewpoint 113 (see Appendix D – Sheets 55-57)

Inset 57: Existing view from Piper Hill Road, Town of Windsor

Existing View

Viewpoint 113 is located along Piper Hill Road, west of its intersection with White Birch Lake Road in the Town of Windsor. This viewpoint is approximately 4.2 miles from the nearest proposed turbine that would be visible in this view to the northeast towards the proposed Project Site. This view is representative of the Rural Residential/Agricultural LSZ, and the typical viewer will be a local resident. The existing view features an expansive open vista from a higher elevation that looks across a valley to rolling forested hills that extend into the background. The foreground is dominated by a mowed, grassy field, flanked by a barn and a road to the north and east, respectively. The road disappears from view as it descends into the valley, which includes visible homes and other man-made structures. Utility poles and wires can be seen along the road in the middle ground where it turns north down the hillside, but these discordant features are subservient to the attractive composition and variety of landform, vegetation and land use present in this view. All distance zones are represented, and shadows and sky coloration resulting from the low-angle sunlight add to the picturesque character of the view.



Inset 58: Visual simulation from Piper Hill Road, Town of Windsor

Proposed Project

With the proposed Project in place, the background ridgeline has been populated with multiple turbines. Due to positioning of the turbines at the horizon line, and the direct illumination provided by the late afternoon sunlight, the turbines stand out as bright white against the muted tones of the sky at the horizon. This accentuates, their line, color and scale contrast with the sky, vegetation, and landform. Their size, form, and movement will make them new focal points in view, drawing viewer attention away from the valley in the middle ground. While the turbines are not the only man-made features in this view, they are dominant and re-define the character of the view. However, under different lighting and sky conditions their effect would be greatly diminished. While this does not appear to be a highly frequented or prolonged view, the large cluster of turbines across the background ridgelines refocuses the viewer and appreciably alters the scenic quality of this view. Whether this impact is positive or negative may depend on a viewer's perception of the turbines. For some viewers, the turbines will add an element of interest that complements the existing view.

5.2.2 Visual Impact Assessment Rating

As described in Section 4.2.3 of this VIA, three visual professionals (one in-house, two independent) evaluated the visual impact of the proposed Project. Utilizing 11 x 17-inch digital color prints of the 20 visual simulations (including two from Viewpoint 67) described above, the landscape architects reviewed the existing and proposed views, evaluated the contrast/compatibility of the Project with various components of the landscape (landform, vegetation, land use, water, sky, and viewer activity), and assigned quantitative visual contrast ratings on a scale of 0 (insignificant) to 4 (strong). The average contrast score assigned by each member of the rating panel was calculated for each viewpoint, and a composite average score for each viewpoint was determined. Copies of the completed rating forms are included in Appendix F, and the results of this evaluation process are summarized in Table 9 below.

Table 9. Summary of Results of Contrast Rating Panel Review of Simulations.

Viewpoint Number	Distance to Nearest Visible Turbine ¹	Distance Zone	Landscape Similarity Zone	Viewer Groups			Contrast Rating Scores ²				
				Local Residents	Through Travelers/ Commuters	Tourists/ Recreation	#1	#2	#3	Average	Contrast Rating Result
22	2.4	Mid-Ground	Rural Residential / Agricultural		•		2.3	0.9	2.0	1.8	Minimal / Moderate
39	4.8	Background	Rural Residential / Agricultural			•	0.5	0.4	1.6	0.8	Insignificant / Minimal
48	0.8	Mid-Ground	Rural Residential / Agricultural	•	•		2.7	2.8	2.5	2.6	Moderate / Appreciable
55	0.9	Mid-Ground	Rural Residential / Agricultural	•			2.7	1.7	2.2	2.2	Moderate
58	0.9	Mid-ground	Rural Residential / Agricultural	•			3.2	2.6	3	2.9	Moderate / Appreciable
59	4.8	Background	Rural Residential / Agricultural			•	2.3	1.4	1.6	1.8	Minimal / Moderate
61	3.0	Mid-Ground	Rural Residential / Agricultural	•	•		2.3	1.2	2.2	1.9	Minimal / Moderate
113	4.2	Background	Rural Residential / Agricultural	•			2.8	0.8	2.2	1.9	Minimal / Moderate
Total average rating for the Rural Residential / Agricultural LSZ										2.0	Moderate
83	1.7	Mid-Ground	Forest & Open Water			•	2.1	3.5	3.7	3.1	Appreciable
85	0.4	Foreground	Forest	•			3.2	3.1	2.4	2.9	Moderate / Appreciable

Viewpoint Number	Distance to Nearest Visible Turbine ¹	Distance Zone	Landscape Similarity Zone	Viewer Groups			Contrast Rating Scores ²				
				Local Residents	Through Travelers/ Commuters	Tourists/ Recreation	#1	#2	#3	Average	Contrast Rating Result
102	1.5	Mid-Ground	Forest & Open Water	•		•	3.3	2.8	3.6	3.2	Appreciable
104	0.5	Foreground	Forest	•			3.1	2.8	2.8	2.9	Moderate / Appreciable
107	1.0	Mid-Ground	Forest & Open Water	•			2.9	2.3	2.8	2.7	Moderate / Appreciable
Total average rating for the Forest LSZ										3.0	Appreciable
67 (Leaf On)	4.1	Background	Open Water			•	3.3	2.7	3.1	3.0	Appreciable
67 (Leaf Off)	4.1	Background	Open Water			•	2.8	1.3	2.4	2.2	Moderate
69	2.1	Mid-Ground	Open Water & Village	•		•	1.0	2.1	1.4	1.5	Minimal / Moderate
83	1.7	Mid-Ground	Open Water & Forest			•	2.1	3.5	3.7	3.1	Appreciable
102	1.5	Mid-Ground	Open Water & Forest	•		•	3.3	2.8	3.6	3.2	Moderate / Appreciable
107	1.0	Mid-Ground	Open Water & Forest	•			2.9	2.3	2.8	2.7	Moderate / Appreciable
Total average rating for the Open Water LSZ										2.6	Moderate / Appreciable
12	1.8	Mid-Ground	Village	•		•	0.6	0.9	1.2	0.9	Insignificant / Minimal
15	1.8	Mid-Ground	Village	•			0.8	1.9	1.8	1.5	Minimal / Moderate
69	2.1	Mid-Ground	Village & Open Water	•		•	1.0	2.1	1.4	1.5	Minimal / Moderate
Total average rating for the Village LSZ										1.3	Minimal
17	2.6	Mid-Ground	Transportation Corridor		•		2.4	1.3	2.0	1.9	Minimal / Moderate
64	1.4	Mid-Ground	Transportation Corridor		•		2.7	2.8	2.8	2.8	Moderate / Appreciable
Total average rating for the Transportation Corridor LSZ										2.4	Moderate

¹Distance in miles.

²Contrast Rating Scale: 0.0 - 0.4 (Insignificant), 0.5 – 0.9 (Insignificant/Minimal), 1 – 1.4 (Minimal), 1.5 – 1.9 (Minimal/Moderate), 2 - 2.4 (Moderate), 2.5 – 2.9 (Moderate/Appreciable), 3 – 3.4 (Appreciable) 3.5 – 3.9 Appreciable/Strong), 4 (Strong).

As Table 8 indicates, the average overall composite contrast ratings for the 20 visual simulations ranged from 0.8 (Insignificant/Minimal) to 3.2 (Appreciable). The results of this evaluation are summarized as follows.

Rural Residential/Agricultural (Viewpoints 22, 39, 48, 55, 58, 59, 61, and 113)

Simulations of the Project from viewpoints located within the Rural Residential/Agricultural LSZ received average contrast rating scores that ranged from 0.8 for Viewpoint 39, to 2.9 for Viewpoint 58. The low contrast rating for Viewpoint 39 is largely attributable to the background distance at which the proposed turbines are viewed. Comments from the rating panel indicated that the turbines would be barely visible and would not have a substantial impact on the existing character or scenic quality of this viewpoint. Viewpoint 58 received a composite contrast rating of 2.9 due largely to the number of turbines visible and their proximity to the viewer. Under these conditions the turbines become the dominant features of the landscape and focal points in the view. The overall conclusion from the rating panel is that the Project will have a generally moderate effect on viewpoints in the Rural Residential/Agricultural LSZ. Their general impact is limited due to the lack of VSRs found within this LSZ, the screening provided by topography, and the compatibility of the turbines with the working agricultural land use that characterizes most existing views.

Forest LSZ (Viewpoints 83, 85, 102, 104, and 107)

Viewpoints located within the Forest LSZ received average contrast rating scores that ranged from 2.7 for Viewpoint 107, to 3.2 for Viewpoint 102. Rating panel results indicated a moderate to appreciable contrast due to the scenic quality of existing views and the presence of VSRs. Comments from the rating panel indicated that there may be a significant effect on viewer enjoyment due to the contrast of scale and form of the turbines within the Forest LSZ. Depending on viewer perspective of wind energy, some viewers may find the presence of the turbines interesting due to their novel form and movement, while others may find the height and character of the turbines to be inappropriate in a natural forested setting. Viewer sensitivity at the state forests where these viewpoints are located may contribute to perceived visual impact at viewpoints where the turbines are closer or less well screened. However, as noted previously, the availability of open views in forested portions of the study area is very limited.

Open Water LSZ (Viewpoints 67 Leaf-On, 67 Leaf-Off, 69, 83, 102, and 107)

Viewpoints located within the Open Water LSZ received average contrast rating scores that ranged from 1.5 for Viewpoint 69, to 3.2 for Viewpoint 102. Rating panel results indicate that the proposed Project will add highly visible, utilitarian features to an otherwise natural landscape, which present strong contrast with current land use and viewer activity. The focal point in the view will re-align upward from the water surface and shoreline to the skyline and the proposed turbines. The overall conclusion from the rating panel is that the Project will present moderate to appreciable contrast on multiple features of the

landscape within the Waterfront/Open Water LSZ. Viewer sensitivity at ponds, lakes, and fishing access points may contribute to perceived visual impact. However, for many of the viewpoints within this LSZ, the existing view represents “worst case” Project visibility in regard to lighting conditions, clear weather, and time of year.

Village LSZ (Viewpoints 12, 15, and 69)

Simulations from viewpoints located within the City/Village/Hamlet LSZ received average contrast rating scores that ranged from 0.9 at Viewpoint 12, to 1.5 at Viewpoints 15 and 69. At Viewpoint 12, rating panel results indicate that the proposed Project has insignificant to minimal contrast with other landscape features in this view. The treetops at the horizon distract from the turbines and multiple focal points in the view compete for viewer attention. At Viewpoints 15 and 69, rating panel results suggest that the visual contrast would be moderate due to the novel form and scale of the turbines, and their contrast along the horizon. However, visual impact was mitigated by the already compromised scenic quality of the existing views. Within the Village LSZ, outward views from most locations within this zone are well screened by structures and street/yard trees that limit potential Project visibility.

Transportation Corridor LSZ (Viewpoints 17 and 64)

Simulated views of the Project from viewpoints located within the Transportation Corridor LSZ received average contrast rating scores that ranged in value from 1.9 at Viewpoint 17 to 2.8 at Viewpoint 64. The relatively low contrast rating received by Viewpoint 17 can be attributed to the strong presence of the highway in the existing view and the fleeting nature of the view. The moderate to appreciable contrast noted for Viewpoint 64 is due primarily to the proximity of the unscreened turbines and their placement on an axis with the road. Impact of the Project in this LSZ is mitigated by the limited sensitivity and relatively short duration of views typical of viewers traveling the Interstate highways. Although prolonged views are available at the designated rest stops, in these venues the turbines are likely to add interest to the view and actually enhance the experience of travelers passing through the area.

As indicated by the contrast ratings/summary in Table 8 (see also Appendix F), the rating scores provided by the three rating panel members were generally consistent, with few outliers or conflicting scores. Although appreciable to strong contrast was noted for some viewpoints, the overall contrast presented by the Project is considered moderate. Rating panel results indicate that the number of turbines visible, and their scale and form contrast with the landform, vegetation, and sky, were the primary sources of visual contrast with the existing landscape. The greatest perceived visual impact typically occurs when numerous turbines are visible, where the turbines are in close proximity to the viewer, or where the turbines

appear out of place in their setting (e.g., in an otherwise undeveloped natural landscape). These conditions tend to heighten the Project's contrast with existing elements of the landscape in terms of line, form, and especially scale. Factors mitigating visual impact within the visual study area include, 1) the rolling topography that limits the number of turbines visible from valley locations, 2) the relatively few viewers present on the elevated hills and ridgetops where views of numerous turbines and near foreground views will be available, 3) the substantial screening provided by existing foreground landscape features in forested areas and areas of concentrated human settlement, and 4) the working agricultural character of portions of the landscape in which the Project would be viewed.

Although at times offering appreciable contrast with existing elements of the landscape, the proposed Project will not necessarily be perceived by viewers as having an adverse visual impact. Wind turbines are unlike most other energy/infrastructure facilities, such as transmission lines or conventional power plants, that are almost universally viewed as aesthetic liabilities. Wind turbines have a clean sculptural form that is considered attractive by some viewers (Pasqualetti et al., 2002). In EDR's experience, operating wind power projects in New York State have generally received a positive public reaction following their construction. This observation is supported by several surveys conducted by Jefferson County Community College (JCCC) in Lewis County, New York (location of the 195-turbine Maple Ridge Farm Project in operation since 2006), which revealed strong community support for wind power (JCCC, 2008, 2010, 2011, 2012). The 2008 survey indicated that 77% of individuals that were able to see and/or hear turbines from their homes indicated that the wind farms have had a positive impact on Lewis County. Additionally, only 7.5% of participants who live within 1 mile of the nearest wind turbine felt that wind farms have had a negative impact (JCCS, 2008).

This finding is consistent with a number of broader studies that have found increased local support for wind projects once they are constructed and become operational. Public support often follows a "U" pattern, in which acceptance is initially high, drops during the planning and construction, and then rebounds after the wind farm commences operation and impacts are found to be less detrimental than feared (Firestone et al., 2009). Similar results have also been documented in public opinion/acceptance surveys regarding constructed wind power projects in other locations (Bishop and Proctor, 1994; Gipe, 2003). A study of public perception of wind power in Scotland and Ireland (Warren, et. al., 2005) provided the following conclusions:

"A remarkably consistent picture is emerging from surveys of public attitudes to wind power, and the case studies provide further evidence that this picture is a representative one. Large majorities of people are strongly in favour of their local windfarm, their personal experience having engendered positive attitudes. Moreover, although some of those living near proposed windfarm sites are less convinced of their merits, large majorities nevertheless favour their construction. This stands in marked contrast with the impression conveyed in much media coverage, which typically portrays massive grassroots opposition to windfarms."

The recently completed *Reconsidering barriers to wind power projects: community engagement, developer transparency and place* (Firestone, et al., 2017) is the largest survey its kind regarding neighbors' attitudes toward wind power projects. This survey included 1,705 homeowners living within 5 miles of one of 250 wind farms throughout the United States. The preliminary results suggest that overall attitudes regarding wind turbines are generally positive, even amongst individuals living as close as 0.5 mile from turbines. Only about 8% of the respondents had negative attitudes toward wind turbines within 5 miles of their home (Firestone et al., 2017).

Based on the analysis in this VIA, it is expected that similar overall reactions, with some individual variability in acceptance, will result for this Project.

5.2.3 Nighttime Impacts

The potential visibility of FAA warning lights on the proposed turbines, based on viewshed analysis, is described in Section 5.1.1 of this VIA (see Table 6 and Figure 7). Nighttime photos from the Fenner Wind Power Project (Appendix I, sheet 14), which is located in Madison County, New York, and has been in operation since 2001, are included to illustrate the type of nighttime visual impact that could occur at certain viewpoints. The contrast of the aviation warning lights with the night sky could be appreciable in dark, rural settings, and their presence suggests a more commercial/industrial land use. Viewer attention is drawn by the flashing of the lights, and any positive reaction that wind turbines engender (due to their graceful form, association with clean energy, etc.) is lost at night. While generally not an issue from roads and VSRs visited almost exclusively during the day (parks, trails, historic sites, etc.), turbine lighting could be perceived negatively by area residents who may be able to view these lights from their homes and yards in dark rural settings. However, this impact will be limited along major roadways and in villages where more concentrated human settlement exists. Nearby hills and ridgelines will generally screen views of large numbers of turbines, and existing light sources will limit the visibility and contrast of the aviation warning lights. It should be noted that the size and brightness of the lights depicted in Appendix I, sheet 14 are due to the use of a long exposure during photography to ensure that the lights were visible in the photographs, and therefore, are not representative of what would be seen with the naked eye. It should also be noted that the Fenner example has one light per turbine where the proposed Project will have two lights per FAA requirements. Depending on angle of view, distance and direction the turbine is facing, the lights will appear as one.

5.2.4 Visual Impact of Above-Ground Interconnection Facilities

The proposed wind turbines are the visually dominant feature of the proposed Project and therefore are the focus of the detailed analyses presented in this VIA. However, the Project also includes above-ground electrical components, which could also have an effect on the visual study area.

Substations

As described in Section 2 of this VIA, the Project includes construction of a collection substation and POI substation adjacent to the existing NYSEG Afton-Stilesville 115 kV transmission line in the Town of Deposit.

Field review indicates that the proposed substation is well screened by surrounding vegetation and topography and is located at the end of a lightly used dirt road. There is one residence adjacent to the site at approximately 1,200 feet that will have views of the substations from their yard and driveway. However, because of the screening provided by adjacent vegetation, views from the home will not be available. The site is set into a small valley that consists of only Big Hollow Road and the Afton-Stilesville transmission corridor. Views from adjacent roadways, such as Lumber Road and County Route 248 (North Sanford Road) are fully blocked by the valley walls. Thus, visibility and viewer exposure at this site are anticipated to be minimal. Engineering designs for the substations have not yet been finalized. However, based on an assumed maximum structure (lightning mast) height of 60 feet, viewshed analysis confirmed that substation visibility will be very limited within 1 mile of the proposed stations. In addition, co-location of the collection substation with the POI substation directly adjacent to an existing overhead transmission line minimizes the overall contrast presented by the proposed facilities. Consequently, visibility and visual impact of the proposed substations is anticipated to be localized and minor. To illustrate the potential appearance of the collection and POI substations a visual simulation was produced from Big Hollow Road (see Figure 10).

O&M Facility

The Project will also include a permanent Operations and Maintenance facility that will be kept in place for the duration of the Project's life. A description of the facility can be found in Section 2 of this VIA.

Field review indicates that the proposed O&M facility will be readily visible from William Law Road, but screened from view by topography and forest vegetation from the adjacent surrounding roadways (Rector Road to the southwest, Pazzelli Road to the north and Farnham Road to the east). William Law Road traverses east to west over a mountainous ridge that connects two north/south valley floors. The proposed O&M facility is currently active agricultural field, most recently planted with corn. Adjacent to the site is a farm complex with large out buildings and three associated residential structures. The site is located at the top of the ridge that divides the Farnham Road valley to the east and the School House Road valley

to the west, both of which have no visibility of the proposed facility. Although the facility is proposed for an open site, visibility is anticipated to be localized to an approximately 0.75 mile stretch of William Law Road that is flanked by open agricultural fields. Roadside forest vegetation screens outward views along the remainder of the road corridor. To illustrate the potential appearance of the O&M facility, a visual simulation was produced from William Law Road (see Figure 10).

5.2.5 Visual Impacts During Construction

Visual impacts during construction are anticipated to be relatively minor and entirely temporary in nature. Representative photographs of typical wind farm construction activities are included in Appendix I. As shown on these photographs, anticipated visual effects during construction include the following:

- There will be a temporary increase in truck traffic on area roadways. Construction vehicles for the Project will include pick-up trucks, dump trucks, crane transporters, concrete trucks, and oversized semi-trailers, including specialized transportation vehicles. For instance, wind turbine blades are transported on trailers with one blade per vehicle, and tower sections are typically transported in three to four sections depending on the supplier (one section per truck). The size of the proposed blades and tower segments generally control the length and width of the transportation vehicle.
- It is anticipated that temporary widening of some public roads with an aggregate material will be required to accommodate the turning movements of over-sized delivery vehicles in certain locations (e.g., road intersections). These temporary improvements will generally be removed at the completion of construction. Public roads may also be damaged by the heavy vehicle traffic during the course of construction. However, as required by road use agreements, all such damage will be repaired at the end of construction.
- The construction laydown yard will be developed by stripping the topsoil, grading as necessary, and installing a level gravel-surfaced work area. Electric and communication lines will be brought in from existing distribution poles to allow connection with construction trailers. During Project construction, the yard will be occupied by vehicles, construction trailers and stockpiled materials, all of which will be removed, and the site restored, at the end of construction.
- Project access roads will be sited on existing farm lanes and forest roads wherever possible, and areas of disturbance will be confined to the smallest area possible. However, construction of access roads will involve clearing, topsoil stripping, grubbing of stumps, and grading as necessary. Stripped topsoil will be stockpiled along the road corridor for use in site restoration. Following removal of topsoil, subsoil will be graded, compacted, and surfaced with approximately 12 inches of gravel or crushed stone. During construction, access road corridors will be cleared to a width of up to 100 feet. The roads themselves will be 16 feet wide with a gravel surface and

compacted shoulders to accommodate construction vehicles and component deliveries to the turbine sites. Following construction, the 16-foot gravel surface will remain in place for Project maintenance purposes, and adjacent vegetation will be allowed to regrow to within 10 feet of the road surface. The access roads generally take on the appearance of farm lanes, driveways or state forest roads.

- Once the roads are complete for a particular group of turbine sites, turbine foundation construction will commence on that completed access road section. Initial activity at each tower site will typically involve clearing and leveling (as needed) up to a 400-foot maximum diameter around each tower location. Topsoil will be stripped from the excavation area, and stockpiled for future site restoration. Following topsoil removal, tracked excavators will be used to excavate the foundation hole. Subsoil and rock will be separated from topsoil and stockpiled for reuse as backfill. Once the foundation is poured and sufficiently cured, the excavation area around and over it will be backfilled with the excavated on-site material. The base of each tower will be surrounded by a 6-foot wide gravel skirt, and an area approximately 100 feet by 60 feet will remain as a permanent gravel crane pad. Otherwise, the turbine sites will be revegetated. Because turbines are typically well removed from public roads and adjacent residences, visibility of earth work at these sites is generally limited.
- Underground collection lines will be installed by direct burial, which involves the installation of bundled cable (electrical and fiber optic bundles) directly into a narrow cut or “rip” in the ground. The rip disturbs an area approximately 24 inches wide with bundled cable installed to a minimum depth of 36 inches. Depending on the number of circuits, multiple cables could be installed with the collection line corridor. Where direct burial is not possible, an open trench will be excavated. Using this installation technique, topsoil and subsoil are excavated, segregated, and stockpiled adjacent to the trench. Both methods require the clearing of a 50 foot ROW. Following cable installation, the trench is backfilled with suitable fill material and any additional spoils are spread out or otherwise properly disposed of. Following installation of the buried collection lines, areas will be returned to pre-construction grades and revegetated.
- Turbine assembly involves the use of large tracked cranes, smaller rough terrain cranes, boom trucks, and rough terrain fork-lifts for loading and off-loading materials. The tower sections, rotor components, and nacelle for each turbine will be delivered to each turbine site by flatbed trucks and unloaded by crane. A large assembly crane will set the tower segments on the foundation, place the nacelle on top of the tower, and install the rotor either by individual blade installation or, following ground assembly, placing the assembled rotor onto the nacelle. The visibility of these cranes will be comparable to the visibility of the proposed turbines (in terms of height). However, no more than two or three assembly cranes will be operating at any one time, and use of cranes at each turbine site will be limited to the time necessary to complete turbine erection (generally 1-2 days).
- Restoration of temporarily disturbed areas will be achieved by restoring original grades (where feasible) and seeding with a native seed mix to reestablish vegetative cover in these areas. Other than in active agricultural

fields, native species will be allowed to revegetate these areas. This will minimize visual impacts associated with soil and vegetation disturbance during construction.

Existing Conditions



Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 10: Visual Simulation of Proposed Substations and O&M Facility

Proposed O&M Facility

Viewpoint Number: 54

View from William Law Road

Location:

Town of Sanford,
Broome County

Direction of View:

West-Northwest

Photo Date:

March 27, 2018

Visual Simulation



Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 10: Visual Simulation of Proposed Substations and O&M Facility

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Existing Conditions



Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 10: Visual Simulation of Proposed Substations and O&M Facility

Proposed Collection and POI Substations

Viewpoint Number: 87

View from County Route 245 (Big Hollow Road)

Location:

Town of Sanford,
Broome County

Direction of View:

Northwest

Photo Date:

May 24, 2018

Visual Simulation



Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

Figure 10: Visual Simulation of Proposed Substations and O&M Facility

Proposed Collection and POI Substations

Viewpoint Number: 87

View from County Route 245 (Big Hollow Road)

Location:

Town of Sanford,
Broome County

Direction of View:

Northwest

Photo Date:

May 24, 2018

6.0 Conclusions

The VIA for the Bluestone Wind Project allows the following conclusions to be drawn:

1. Viewshed analysis conducted as part of this VIA indicates that the proposed turbines will be fully screened by topography alone in approximately 27.6% of the 5-mile radius study area and approximately 46% of the 10-mile extended study area. The DSM visibility analysis (i.e., viewshed analysis based on lidar data) provides a more accurate estimate of potential turbine visibility, and indicates that vegetation and structures, in combination with topography, will serve to block views of the turbines from approximately 82.6% of the 5-mile study area and approximately 89.2% of the 10-mile study area (i.e., approximately 17.4% and 10.8% of the study areas, respectively, are indicated as having potential Project visibility).

Potential turbine visibility (based on DSM viewshed analysis) from the various LSZs and distance zones within the visual study area is summarized as follows:

- The LSZ with the least amount of potential turbine visibility is the Forest LSZ. Outward views from within this zone are limited and sporadic, confined to road corridors, and small clearings that provide openings in the dense forest canopy. During the summer/leaf-on season the tree foliage in this LSZ effectively screens views in the foreground, middle ground, and background. During the winter/leaf-off season the forest canopy will effectively screen views of turbines in the middle ground and background. Foreground views may experience less visual screening where filtered views of the turbines are available between the branches and trunks of trees.
- The greatest amount of potential Project visibility is indicated within the Rural Residential/Agricultural LSZ. The blade-tip DSM viewshed indicates that 33.0% of the acreage within this LSZ could potentially have views of the proposed turbines. The majority of open views from the Rural Residential/Agricultural LSZ will be available in the middle ground and background distance zones.
- The Open Water LSZ has potential Project visibility from 10.8% of the water surfaces within the visual study area. Most of the potential visible areas within this LSZ are in the background distance zone. However, it is worth noting that within the 10-mile radius visual study area for this Project, this LSZ makes up only 2.6% of the total area.

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- The Transportation Corridor LSZ presents potential opportunities for turbine visibility in 24.1% of its area within the visual study area. However, this is the smallest LSZ within the study area, making up only 1.5% of the total area.
 - Approximately 19.7% of the more populated portions of the visual study area that make up the Village LSZ are indicated as having potential turbine visibility. However, field review suggests that buildings and vegetation in village settings provide even greater screening than the viewshed analysis indicates (see discussion below).
2. Topographic viewshed analysis indicates that 31% of the identified VSRs of statewide and local significance that occur within the visual study area (see Appendix C), will be fully screened from view of the proposed turbines, while the DSM viewshed analysis indicates that 46% (105 out of 226) of the VSRs could have views of some portion of one or more of the proposed turbines. Viewshed analysis results for specific VSRs within the visual study area include the following:
- There are portions of 17 state forests within the visual study area with a total of 23,012 acres. Only 240 acres, or 1% of that area, are indicated as having potential visibility of the Project, with most of the areas consisting of open water and locations that are not accessible by roads or designated trails.
 - Oquaga Creek State Park, including Arctic Lake, has a total acreage of 1,273 acres with potential Project visibility available from only 6.3% of that area.
 - Cannonsville Reservoir is over 4,650 acres in size with approximately 4,215 acres falling within the visual study area. Only 5.3% of that area will have potential views of the Project.
3. Viewshed analysis of the proposed collection and POI substations indicate that potential visibility of these Project components will be very limited and will affect no VSRs. Visibility and visual impact of the proposed collection and POI substations will be limited due to: 1) lack of nearby viewers, 2) existing natural screening that will remain in place following Project construction, 3) surrounding hillsides that effectively screen the substation site from high use travel corridors and all other identified VSRs, and 4) the presence of the existing Afton-Stilesville 115 kV transmission line.
4. Field review confirmed that the area with greatest potential for Project visibility occurs on agricultural land within the valley floors adjacent to the ridges that host the Project Site, and from isolated open areas within the forested

mountainous terrain of the adjacent landscape. Forested areas, including state forests and many of the designated trails, offered the fewest opportunities for open views of the Project Site. Field review also indicated the Project will generally be at least partially screened by structures and trees from most locations in village and hamlet settings. Partial views of a relatively small number of turbines or turbine blades may be available from some open areas within the villages and hamlets, and along their outskirts. The majority of VSRs visited during field review will be fully or substantially screened from view of the proposed Project, such as the various state forests, and the village historic districts.

5. Simulations of the proposed Project indicate that the visibility and visual impact of the wind turbines will be highly variable, based on landscape setting, extent of natural screening, presence of other man-made features in the view, baseline scenic quality, viewer sensitivity, distance of the viewer from the Project, and the number of turbines visible in the view.
 - Evaluation by a rating panel of visual professionals indicates that the Project's overall average contrast with the character of the existing landscape will generally be minimal to moderate. However, based on the contrast rating scores and comments provided by the rating panel, greater levels of visual impact can be anticipated where open views of large numbers of turbines are available from areas that include open water and little or no evidence of human development. Conversely, impact is reduced in instances where turbines are partially screened, viewed at greater distances, seen in the context of a working agricultural landscapes, or viewed in a setting with existing man-made features.
 - The simulations rated that received the highest visual contrast ratings were from Page Pond Road (Viewpoint 83) and Marsh Pond State Forest (Viewpoint 102). Both views have the following similar characteristics: 1) water is present, 2) there are no man-made elements in the existing view, 3) nature dominates the setting, and 4) the proposed turbines present strong contrast with the landscape in form, scale, color and texture.
 - The simulations that received the lowest visual contrast ratings were from 2nd Street in the Village of Deposit (Viewpoint 12) and from Oquaga Creek State Forest (Viewpoint 39). Both of these views have the following similar characteristics 1) dominant foreground elements that draw viewer attention, 2) low number of visible turbines or visible turbines at a great distance from the viewer, and 3) user enjoyment is unlikely to be impacted by the installation of the Project.
6. Based on the nighttime photos/observations of existing wind power projects, the red flashing lights on the turbines could result in a nighttime visual impact on certain viewers. The actual significance of this impact from a given

viewpoint will depend on how many turbines are visible, what other sources of lighting are present in the view, the extent of screening provided by existing structures and trees, and nighttime viewer activity/sensitivity. However, night lighting could be somewhat distracting, and could have an adverse effect on rural residents and recreational users that currently experience (or expect) dark nighttime skies. It is anticipated that nighttime visibility/visual impact will be reduced due to hills and forest vegetation that screen portions of the Project from many areas. Only 8.7% of the overall visual study area that will nighttime views of the turbines, based on the FAA warning light DSM viewshed analysis. The concentration of residences in villages, hamlets, and along highways where existing lights already compromise dark skies and compete for the viewer's attention will also limit nighttime visual impacts.

7. Visibility and visual impact of the proposed substations and O&M facility will be limited due to: 1) proximity to existing transmission infrastructure, 2) design of permanent structures to match existing pole barn/agricultural vernacular of the area, and/or 3) lack of nearby residences and traffic on adjacent local roads. Surrounding topography and/or forest vegetation effectively screen these Project components from high use travel corridors, residential areas, or other VSRs identified within the visual study area.
8. Based on the first-hand experience with operating wind projects in New York, and various published studies regarding on neighbor/public reaction to operating wind projects, public reaction to the visual effect of the proposed Bluestone Wind turbines is likely to be highly variable but generally positive. Reactions will be based on proximity to the turbines, the affected landscape, and personal attitude of the viewer regarding wind power.
9. Construction impacts are short term/temporary impacts that will last only for the duration of construction (typically less than one year). In addition, because the turbines are generally well removed from adjacent public roads and residences, most on-site construction activities (other than increased traffic on local roads) will be screened from the majority of viewers. Upon completion of construction, construction vehicles and equipment will depart, the laydown yard will be restored, and temporarily cleared areas on the Project Site will be allowed to revegetate.

Options for mitigating the visual impacts of the Project are limited, given the nature of the Project and its siting criteria (very tall structures typically located at the highest locally available elevations). However, in accordance with NYSDEC Program Policy (NYSDEC, 2000), various mitigation measures were considered. These included the following:

- Professional Design. All turbines will have uniform design, speed, color, height and rotor diameter. Turbines will be mounted on conical steel towers that minimize visual clutter. The placement of any advertising devices (including commercial advertising, lettering, or logos identifying the Project owner or turbine manufacturer) on the

turbines will be prohibited. Also, the buried collection lines will be located adjacent to the proposed access roads and existing pipeline ROWs where feasible to minimize new areas of clearing in the landscape.

- Screening. Due to the height of individual turbines and the geographic extent of the proposed Project, screening of individual turbines with earthen berms, fences, or planted vegetation will generally not be effective in reducing the visibility or visual impact of the proposed turbines. Additionally, based on site-specific field investigation, both the POI and collection substations are not anticipated to have significant visual effect on the nearby landscape. Therefore, visual screening of these Project components is not anticipated to be necessary.
- Relocation. Because of the limited number of suitable locations for turbines within the Project Site, and the wide geographic distribution of viewpoints from which the Project could potentially be seen, turbine relocation will generally not significantly alter visual impact. Moving individual turbines to alternative sites would not necessarily reduce impacts but rather, shift those impacts to other viewers/resources. Relocation to less windy sites could also affect the productivity and viability of the Project. Where visible from VSRs within the visual study area, views of the Project are highly variable and include different turbines at different vantage points. Therefore, turbine relocation would generally not be effective in mitigating visual impacts on VSRs. Additionally, the Project layout has been designed to accommodate various set-backs from roads, residences, private properties, wetlands and cultural resources, thus limiting options for relocation of individual Project components.
- Camouflage. The proposed white to light gray color of wind turbines (as mandated by the FAA to avoid daytime lighting) generally minimizes contrast with the sky under most conditions. This is demonstrated by the simulations, which were prepared under a variety of sky conditions. The size and movement of the turbines prevents more extensive camouflage from being a viable mitigation alternative (i.e., the turbines cannot be made to look like anything else). Nielsen (1996) notes that efforts to camouflage or hide wind farms generally fail, while Stanton (1996) feels that such efforts are inappropriate. She believes that wind turbine siting "*is about honestly portraying a form in direct relation to its function and our culture; by compromising this relationship, a negative image of attempted camouflage can occur.*" Other components of the Project will be designed to minimize contrast with the existing character of the adjacent landscape. For instance, the design of the O&M facility will be in the style of an agricultural pole barn, common to the visual study area and will use neutral earth-tone colors that minimize contrast with the landscape.
- Low Profile. A significant reduction in turbine height is not possible without significantly decreasing power generation. Less generating capacity (resulting from smaller turbines) could threaten the Project's economic

feasibility. To avoid generation losses, use of smaller turbines would require that additional turbines be constructed. The turbines under consideration were specifically chosen to provide the required power with the fewest turbines, so as to minimize visual and environmental impacts. Several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones (Thayer and Freeman, 1987; van de Wardt and Staats, 1988). There will be minimal visual impact from the electrical collection system because it will be installed underground.

- **Downsizing.** The number of proposed turbines on this project, anticipated to be up to 40 at the time the PSS was prepared, has been reduced to 33. Although further reducing the number of turbines could reduce visual impact from certain viewpoints, from most locations within the visual study area where more than one turbine is visible, the visual impact of the Project would change only marginally unless a substantial number of additional turbines were removed. As illustrated in the visual simulations, with only a few exceptions, the number of visible turbines rarely feels overwhelming. Along with affecting the financial viability of the Project, further elimination of turbines could significantly reduce the local socioeconomic benefits of the Project and reduce the Project's ability to assist the State in meeting its energy policy objectives and goals.
- **Alternate Technologies.** Alternate technologies for comparable power generation, such as gas-fired or solar-powered facilities, would have different, and perhaps more significant, visual impacts than wind power. A solar project capable of generating an equivalent 124 MW of power would require approximately 800 to 1,000 acres of open land. Within the Project Site, this would require significant clearing of existing forest vegetation. Viable alternative wind power technologies (e.g., vertical axis turbines), that could reduce visual impacts, do not currently exist in a form that could be used on a commercial/utility-scale Project.
- **Non-specular Materials.** Non-reflective paints and finishes will be used on the wind turbines and other Project structures to minimize reflected glare.
- **Lighting.** To comply with FAA guidance all of the turbines must be lit with two FAA warning lights. Medium intensity flashing red lights will be used at night, rather than white strobes or steady burning red lights. Fixtures with a narrow beam path will be utilized as a means of minimizing the visibility/intensity of FAA warning lights at ground-level vantage points. Lighting at the substations will be kept to a minimum, and turned on only as needed, either by switch or motion detector.
- **Maintenance.** The turbines and turbine sites will be maintained to ensure that they are clean, attractive, and operating efficiently. Research and anecdotal reports indicate that viewers find wind turbines more appealing

when the rotors are turning (Pasqualetti et al., 2002; Stanton, 1996). In addition, the Project developer will establish a decommissioning fund to ensure that if the Project goes out of service and is not repowered/redeveloped, all visible above-ground components will be removed.

- Offsets. Given the limited feasibility or effectiveness of the other mitigation measures described above, correction of an existing aesthetic problem within the viewshed can be a viable mitigation strategy for wind power projects that result in substantial adverse visual impacts. Based on rating panel results and local sentiment, adverse visual impacts could be experienced by certain viewers at Marsh Pond and other nature-dominated settings throughout the visual study area. Projects that provide enhanced public access, recreational opportunities or aesthetic quality at VSRs within the study area could be proposed as offset mitigation for Project-related visual impacts. In the review of planning documents undertaken as part of this VIA, several projects are identified by regional planning groups and town boards that could be funded to provide offset mitigation. For example, the *Broome County Four Rivers Intermunicipal Waterfront Public Access Plan* and the *Village of Deposit Comprehensive Plan*, have the goal of upgrading River Street Park in the Village of Deposit. Funds to facilitate this upgrade could be made available to offset the proposed Project's visual impacts.

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