Visual Impact Assessment

High Bridge Wind Project

Town of Guilford
Chenango County, New York

Case No. 18-F-0262

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August 2019

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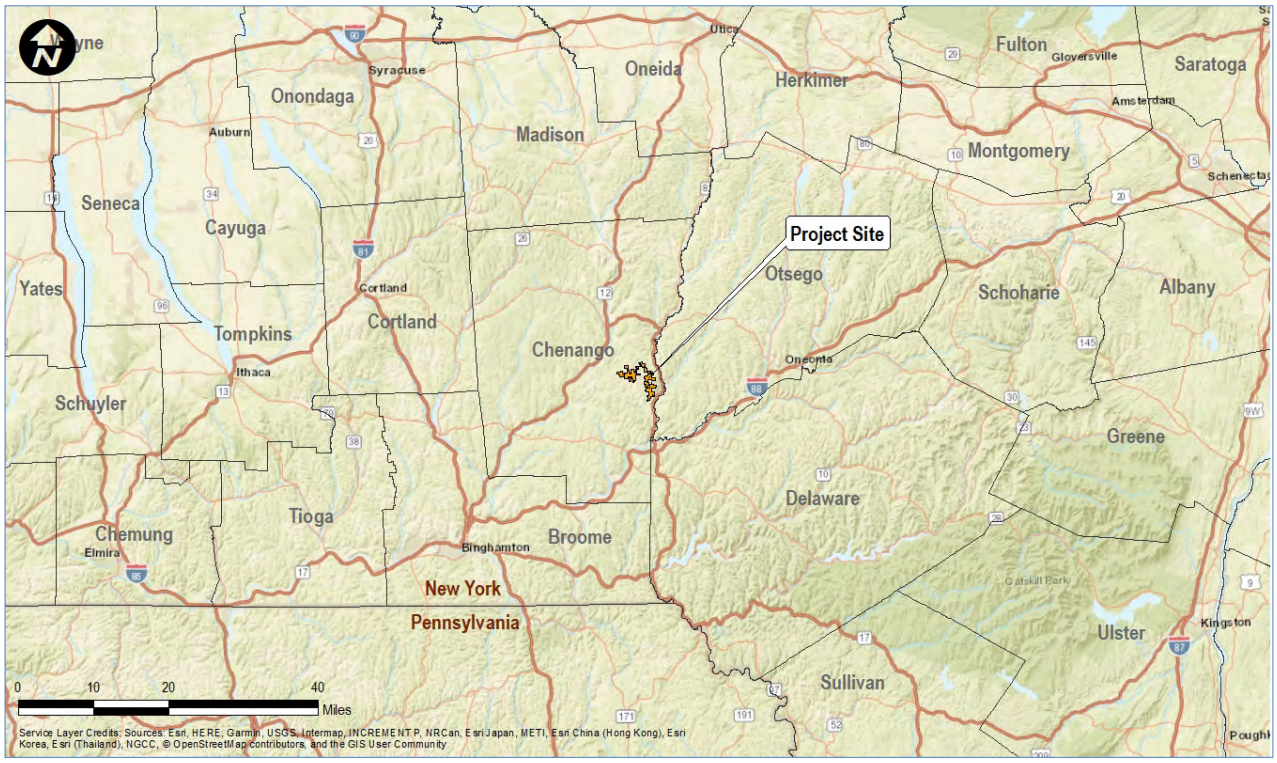
1.0 Introduction

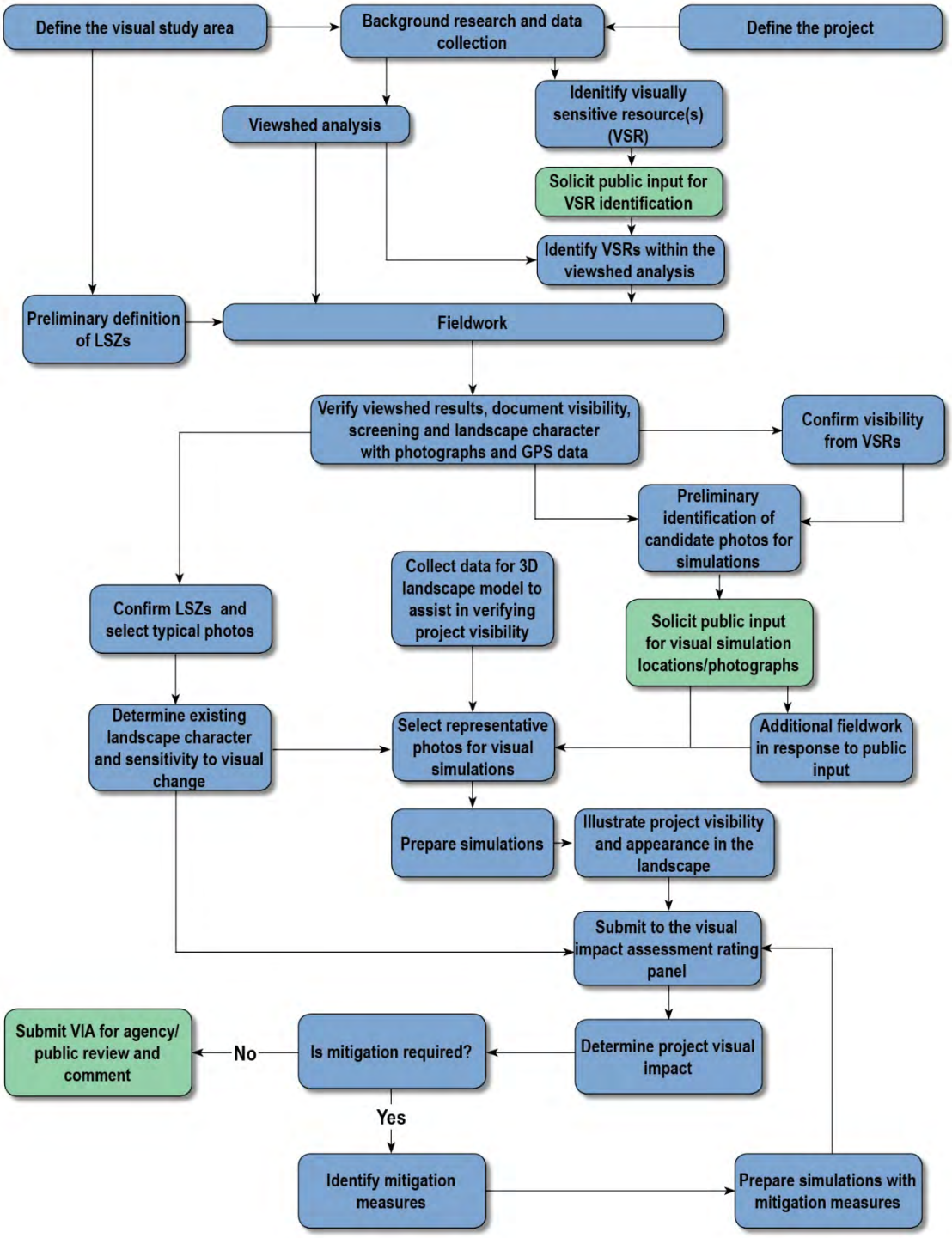
On behalf of High Bridge Wind, LLC, Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) prepared this Visual Impact Assessment (VIA) for the proposed High Bridge Wind Project (the Project). The Project is a wind energy generating facility proposed to be located in the Town of Guilford, Chenango 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

This VIA was prepared by environmental professionals with educational and career experience in the visual/aesthetics field and the evaluation of visual impact. Its methodology and content are 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 Section 24 of the Project's Preliminary Scoping Statement (PSS), which was prepared in accordance with the requirements of 16 NYCRR § 1001.24 (Article 10). The VIA process followed by EDR is outlined in Inset 2, below.



Inset 1.0-1. Regional Project Location



Inset 1.0-2. Visual Impact Assessment Process

2.0 Project Description

High Bridge Wind, LLC (the Applicant) is proposing to construct and operate a wind energy generating facility in the Town of Guilford, Chenango County, New York (see Inset 2.1-1). The visible components of the Project (the subject of this report) will consist of up to 25 wind turbine generators (WTG) and related components Collectively, these components will be referred to as the "Project" and consist of the following:

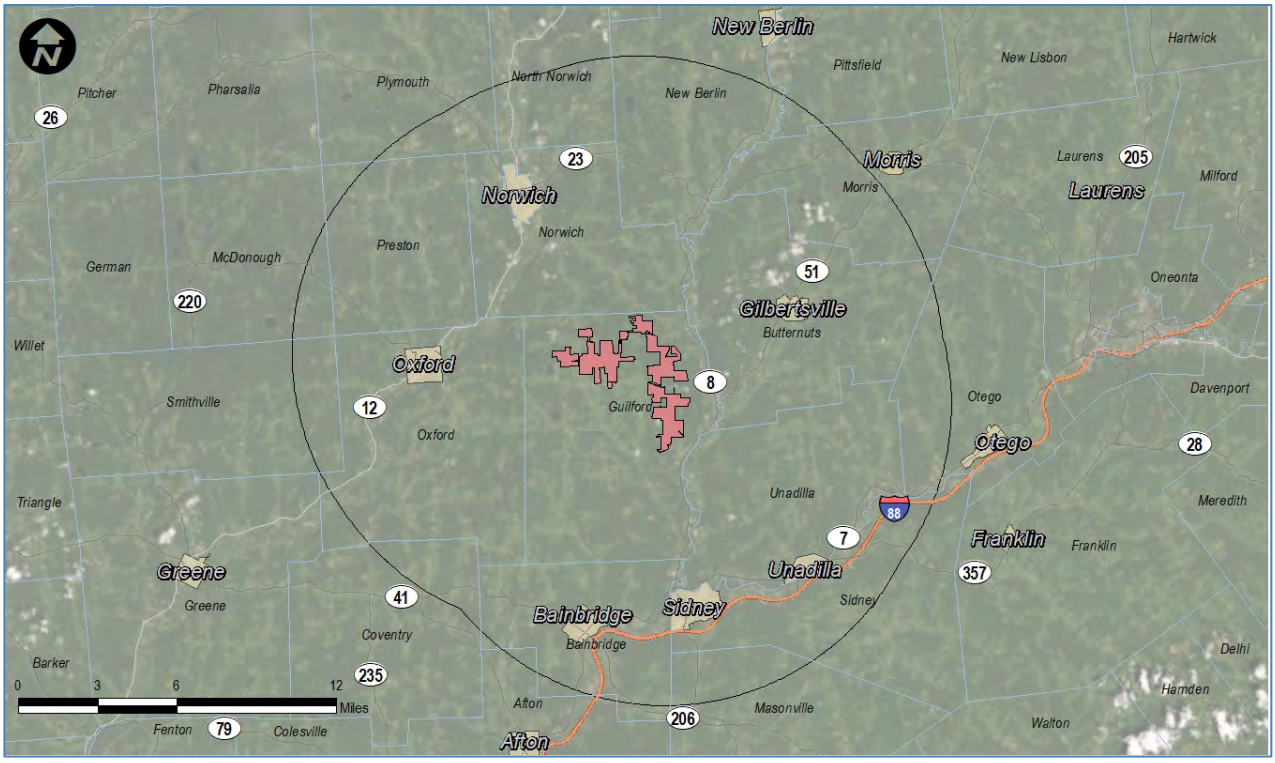
- Up to 25 wind turbines, with a total maximum generating capacity of 100.8 megawatts (MW)
- One permanent meteorological (met) tower.
- Approximately 33.6 miles of 34.5 kilovolt (kV) collection line contained within 18.3 linear miles of collection line corridor (multiple circuits collocated in a single corridor)[1].
- Approximately 11.4 miles of gravel access roads
- An operation and maintenance (O&M) facility consisting of two buildings on a 3-acre fenced lot
- A collection substation
- A point of interconnection (POI) substation with battery storage/DC battery bank and charger
- A temporary construction staging/laydown yard

The analyses presented in this VIA assume that the WTGs for the Project will be General Electric 4.8-158 turbines with a hub height measuring 411.4 feet, and rotor diameter measuring 518.4 feet, which represents the tallest overall turbine (670.6 feet above ground level) under consideration at the time this report was prepared. The proposed Project components are described in greater detail in Sections 2.1 and 2.2 below.

2.1 Project Site

The proposed site of the Project includes approximately 3,921 acres of leased private land in the Town of Guilford (hereinafter the "Project Site"). The Project footprint (the area occupied by Project components) will occupy a substantially smaller portion of the total Project Site. As measured to the nearest proposed turbine, the Project is located 4.7 miles southeast of the City of Norwich, 4.3 miles east of the Village of Oxford, 4.1 miles west of the Village of Gilbertsville, and approximately 5.0 miles north of the Villages of Bainbridge, Sidney, and Unadilla. The Project Site is bounded to the east by State Highway 8, to the west by State Highway 12, to the north by State Highway 23, and to the south by Interstate Route 88 (Inset 2.1-1).

[1] At the time this report was prepared, underground collection lines were the preferred method for turbine interconnections. However, in locations where environmental or physical limitations prevent burial of the collection lines, overhead lines may be utilized.



Inset 2.1-1. Bounding Features of the Project Site

Land within the Project Site is dominated by a mix of deciduous and coniferous forest, agricultural lands, and rural residences, with elevations ranging from 1,192 feet above mean sea level (AMSL) to 1,929 feet AMSL. Land use is dominated by large tracts of undeveloped second growth forest which hosts recreational activities, such as hunting, fishing, and hiking. 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). While there are no villages or cities within the Project Site, slightly higher density residential and commercial development occurs along portions of Blower Road and County Road 37, particularly on the eastern edge of the Project Site, which borders the Hamlet of Mount Upton. Natural resource extraction appears to be relatively sparse within the Project Site and include a few stone quarry operations, and active forestry operations within adjacent state forests. A representative photograph of the Project Site is included as Inset 2.1-2 below. The Project layout is provided in Figure 2.2-1.

Inset 2.1-2. Representative Project Site Photograph from Viewpoint 40 (County Road 37 in Guilford)

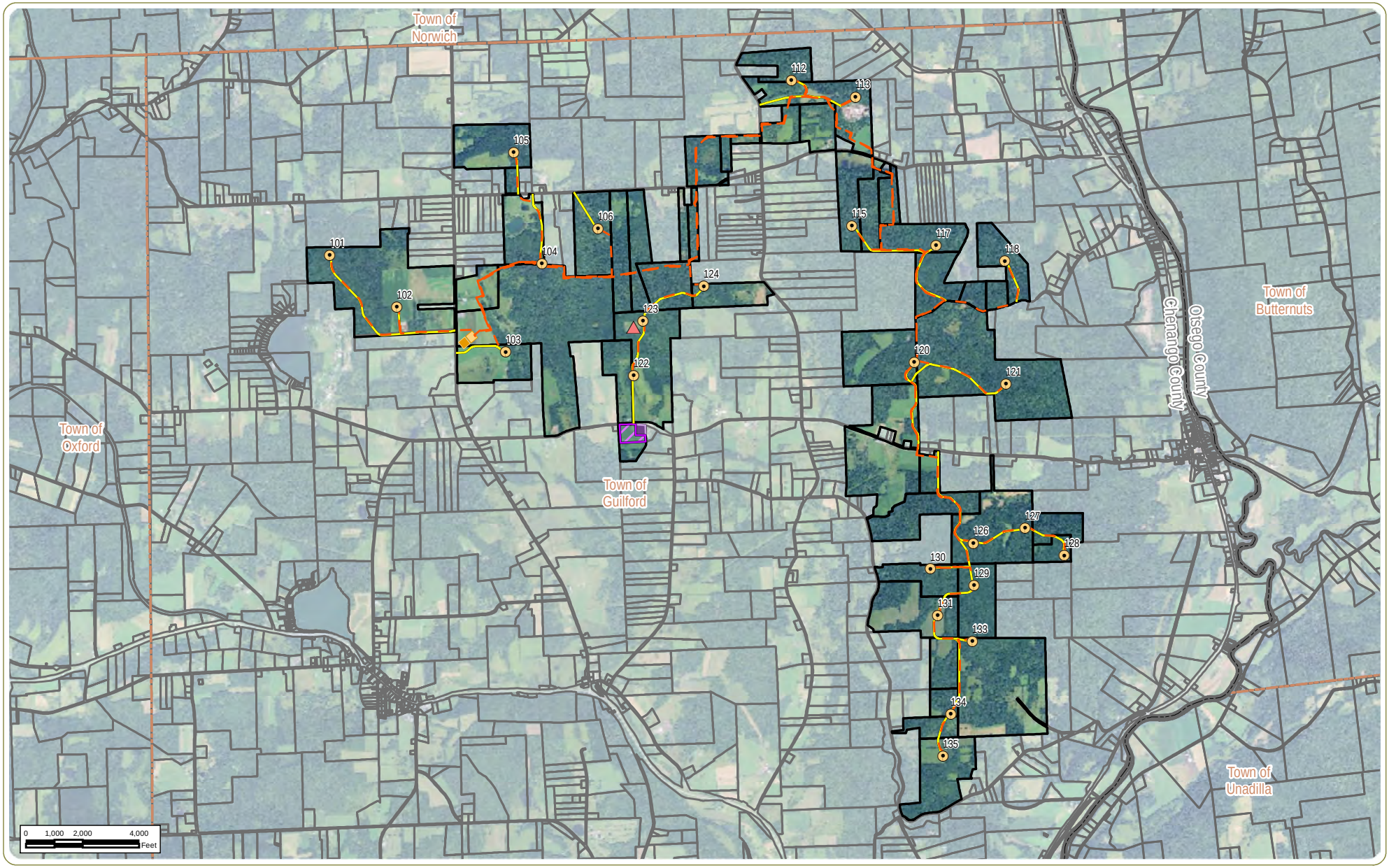


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Figure 2.2-1 - Project Layout

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" map service. 2. This map was generated in ArcMap on July 2, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Wind Turbine
- Met Tower
- Collection Line
- Access Road
- Collection Substation
- POI Substation
- Laydown Area and Batch Plant
- O&M Facility
- Facility Site
- Parcel Boundary
- Town Boundary
- County Boundary

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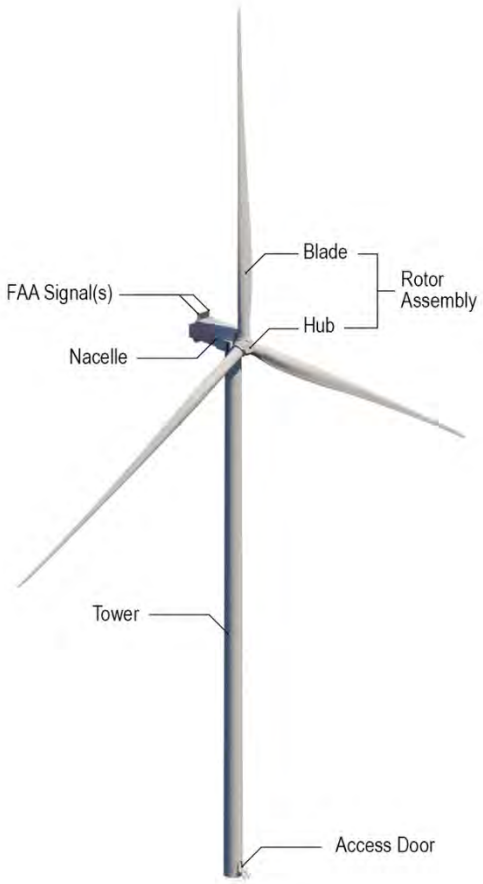
2.2 Proposed Project

The proposed WTGs will be the most visible components of the Project, and as such, will be the focus of this VIA. However, as mentioned previously, the Project also consists of access roads, electrical collection lines, a met tower, a collection substation, a POI substation, and an O&M facility. These components of the Project are described below:

2.2.1 Wind Turbines

The Project will include up to 25 WTGs with a total generating capacity of up to 120 MW. Due to their height and size, the proposed WTGs are the Project components that will be the most visible and have the greatest potential for visual impact (see Inset 2.2-1 and Figure 2.2-1 Sheet 1, below).



Inset 2.2-1. Wind Turbine Components

Each WTG consists of three major components, the tower, nacelle, and rotor assembly. Each of these components will be painted light grey to pure white as recommended by the Federal Aviation Administration (FAA) for the purpose of daytime conspicuity to aircraft (FAA, 2018) and to avoid the need for daytime obstruction warning lights. Each of the WTG components is described below.

Tower: The tubular towers used for this Project are tapered conical steel structures manufactured in sections. Each tower is anticipated to have a maximum (hub) height of 411 feet and will be equipped with an access door at the base. The maximum diameter of the tower will be approximately 14 feet at the base and 12 feet at the top.

Nacelle: The main mechanical components (drive train, gearbox, and generator) of the wind turbine are housed in the nacelle (turbine housing). The visible portion of the nacelle is a white or light grey steel-reinforced fiberglass shell that measures approximately 15 feet in height, 19 feet wide, and 46 feet long (Inset 2.2-1). The nacelle is mounted to the tower on a sliding ring that allows it to rotate or "yaw" into the wind to maximize energy capture. The nacelle is externally equipped with an anemometer and a wind vane that measure wind speed and direction. Each nacelle will be equipped with two medium intensity aviation warning lights in accordance with FAA specifications. These will be synchronized flashing red lights (FAA L-864) and illuminated only at night.

Rotor Assembly: A rotor assembly is mounted on the drive shaft and is operated upwind of the turbine (Inset 2.2-1). Each rotor consists of three 259-foot fiberglass composite blades and has a total diameter of 518 feet. The blades are attached at a hub which is typically concealed by an aerodynamic nose cone. 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.

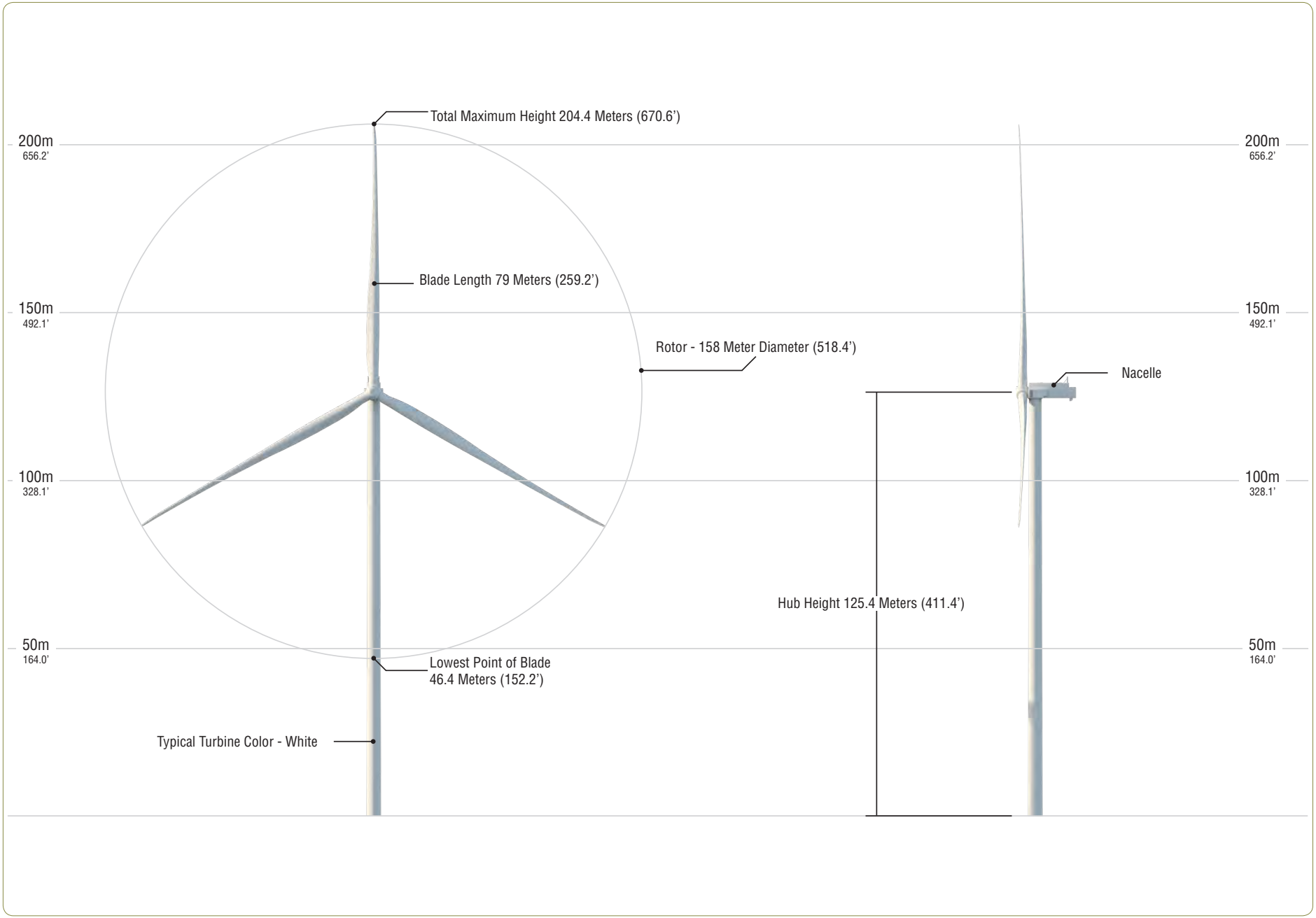


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Figure 2.2-2: Proposed Project Components: Wind Turbine

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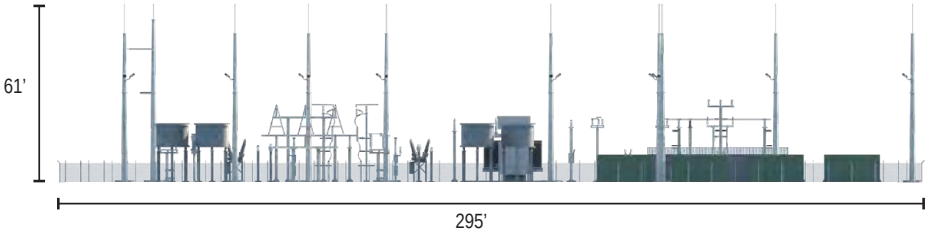
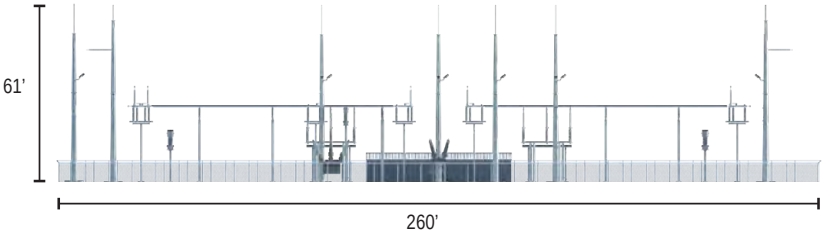
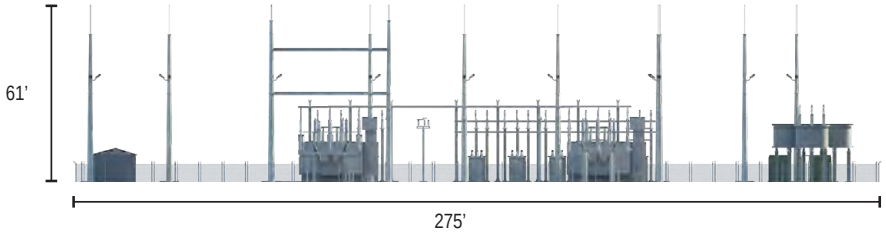
Collection Substation: Front



Point of Interconnection Substation: Front



Collection Substation: Side



Point of Interconnection Substation: Side

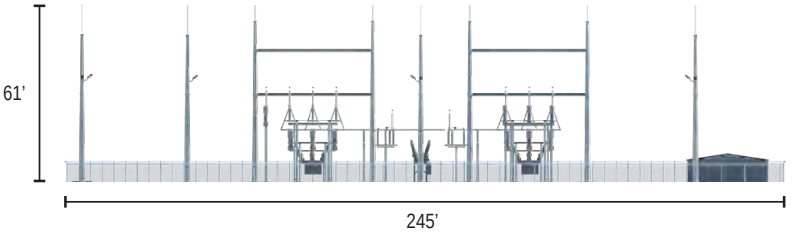


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Figure 2.2-2: Proposed Project Components: Collection and Point of Interconnection Substations

Operations and Maintenance Facility

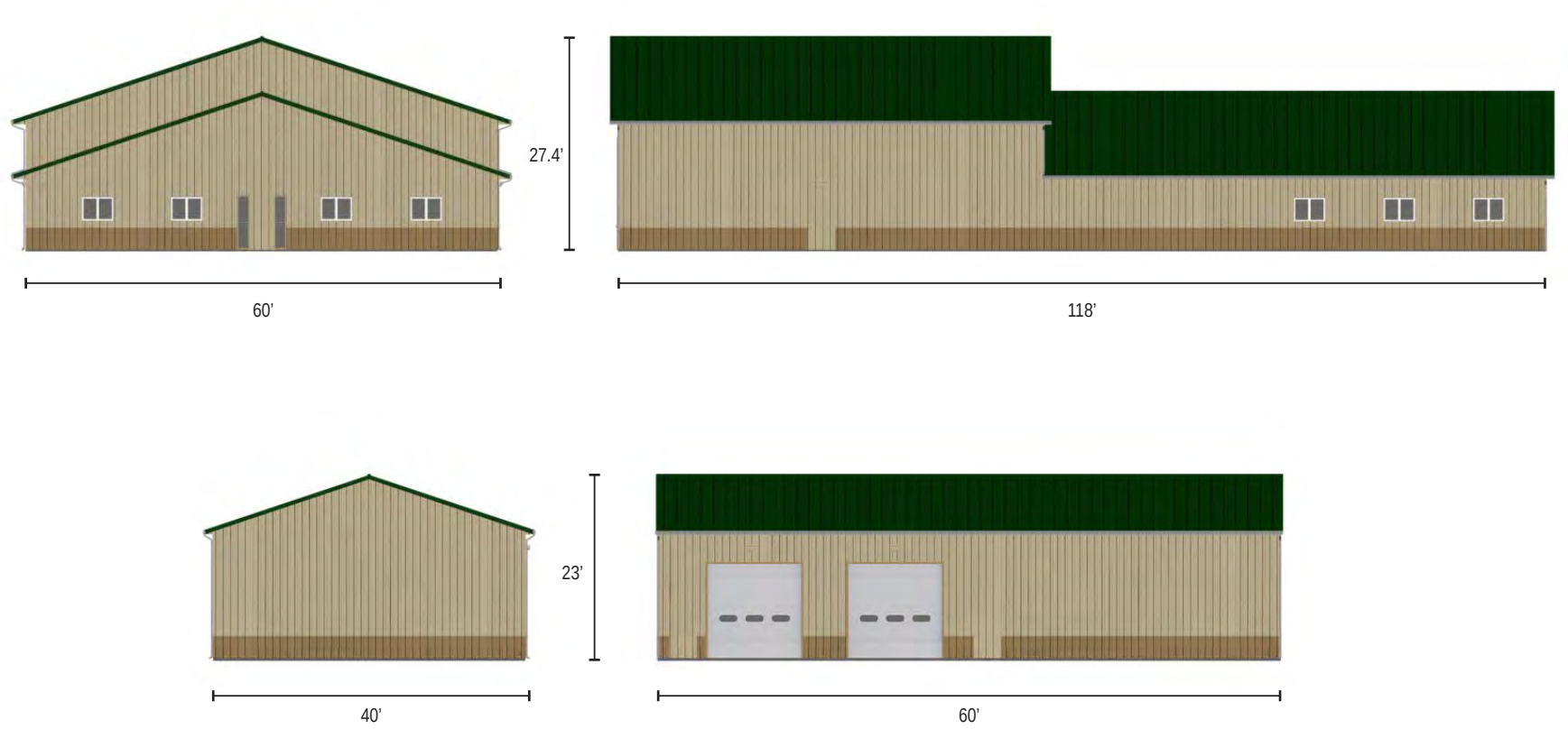

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Figure 2.2-2: Proposed Project Components: Operations and Management Buildings

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2.2.2 Electrical System

The energy generated by the WTGs is delivered to the existing electrical grid via a network of electric cables. These cables extend from each turbine and terminate at a collection substation, which converts the power from 34.5 kV to 115 kV. From the collection substation the energy is then transferred to the high voltage electrical grid through the POI substation. These electrical system components are described in greater detail below.

Collection lines: The Project consists of approximately 33.6 miles of 34.5 kV collection line contained within 18.3 linear miles of collection line corridor. Generally, the collection lines will be buried within existing cleared land/road corridors, and therefore will not result in any noticeable visual change. However, some overhead lines are possible, and buried lines can have a visual effect in locations where vegetation clearing is necessary to facilitate the line burial.

Collection Substation: The terminus of the 34.5 kV collection system is the collection substation, which will likely be located on County Road 36 between Walberg Road and County Road 37, in the Town of Guilford. The collection substation transformer will increase the voltage of the power delivered by the collection lines from 34.5 kV to 115 kV. The substation will occupy an area measuring approximately 315 feet by 295 feet. (approximately 2.1 acres) and a chain-link fence will encompass 34.5 and 115 kV bus structures, a transformer, circuit breakers, towers, a control building, a battery storage system and related structures. The collection substation is illustrated in Figure 2.2-1, Sheet 3.

POI Substation: The POI substation will be located immediately adjacent to the collection substation and the existing New York State Electric and Gas Company (NYSEG) Jennison to East Norwich 115 kV transmission line in the Town of Guilford. The dimensions of the POI substation will be approximately 280 feet by 265 feet (approximately 1.7 acres) and will include electrical switches and related equipment necessary to tie into an existing circuit on the NYSEG 115 kV electric transmission line. Short segments of overhead electrical lines will connect the collection substation to the POI substation, and the POI substation to the existing 115 kV transmission line. The POI substation is illustrated in Figure 2.2-2, Sheet 3.

The potential visual effect of above-ground electrical collection and interconnection facilities are described in Section 5.3 of this VIA.

2.2.3 Access Roads

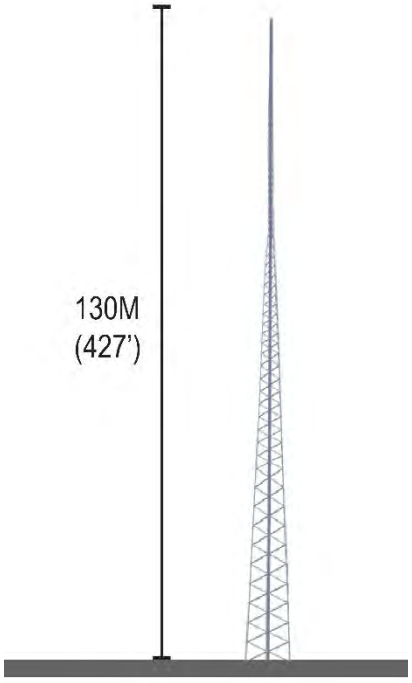
The Project Site includes an extensive network of existing state, county and local roads. Wherever it is practical, existing roads will be used to access the proposed Project. However, it is possible that some existing public roads will need to be improved to facilitate Project construction. These Although the location and extent of these public road improvements is currently unknown, any expansion of the road surface would generally be temporary (e.g., intersection widening and "jug handles" to accommodate oversized vehicles), and would be removed at the end of construction. Some tree clearing is also possible along the edges of narrow, lightly used public roads that will accommodate large construction vehicles.

New or improved private roads are proposed to access individual turbine sites from the existing public road network. The proposed length of all Project access roads is approximately 11.4 miles, some of which will be upgrades to existing farm lanes. During construction, access roads will be gravel surfaced and approximately 40 feet wide to accommodate construction vehicles/component delivery. Following construction, roads will be modified for use as permanent access/service roads. The permanent roads will be gravel-surfaced and typically 20 feet in width (Inset 2.2-2). These access roads generally take on the appearance of gravel driveways, and do not have a significant long-term visual impact. However, permanent access roads and associated clearing are shown in any simulations where they would be visible. A typical wind turbine access road is depicted in Inset 2.2-2 below. Temporary visual impacts associated with the construction of these facilities are discussed in Section 5.6 of this VIA.

Inset 2.2-2: Typical Turbine Access Road During Project Operation

2.2.4 Met Towers

One permanent 427-foot tall wind measurement met tower will be installed to collect wind data and support performance testing of the Project. The tower will be a self-supported lattice steel structure, and will be equipped with wind velocity and directional measuring instruments at three different elevations. Additionally, temperature and humidity monitors will be mounted near ground level. A typical met tower is depicted in Inset 2.2-3. The met tower is shown in any simulations in which it would be visible.



Inset 2.2-3: Illustration of the proposed met tower

2.2.5 Temporary Staging/Laydown Yards

Construction of the Project will require the development of a temporary construction staging/laydown area, which will accommodate construction trailers, storage containers, large project components, and parking for construction workers. The staging area will be located on the south side of County Road 37, west of Keach Road, in the Town of Guilford, and is anticipated to be up to 10 acres in size. The staging area is a temporary feature associated with construction of the Project, and no additional permanent fencing or permanent lighting of the staging area is proposed. Temporary visual impacts associated with the construction of this facility are discussed in Section 5.6 of the VIA.

2.2.6 O&M Facility

Two O&M buildings are proposed to be located within a fenced 3-acre site (collectively referred to as the "O&M facility") adjacent to the staging/laydown yard on the south side of County Road 37, west of Keach Road, in the Town of Guilford. The smaller of the two buildings will be approximately 3,200 square feet, while the larger building will be approximately 7,200 square feet. Both buildings will be single-story structures that house the permanent O&M staff offices, maintenance equipment, and storage. The buildings will be a neutral earth tone color with a green metal roof (see Figure 2.2-2, Sheet 3). The remainder of the 3-acre O&M facility site will also be used to store materials and equipment as necessary. The O&M facility is included in the visual simulations (Appendix D, Sheet 29), and an illustration of the proposed facility is also provided in Figure 2.2-2, Sheet 3.

3.0 Existing Visual Character

3.1 Definition of the Visual Study Area

Per the requirements 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*." To establish an inclusive visual study area based on the current range of turbine technology available, the High Bridge Wind Project visual study area has been defined as the area within 10 miles of the Project Site (visual study area), the boundaries of which are depicted on Figure 3.1-1. The visual study area was utilized for the various visual analyses presented herein (e.g., visual fieldwork, viewshed analysis, and visual simulations).

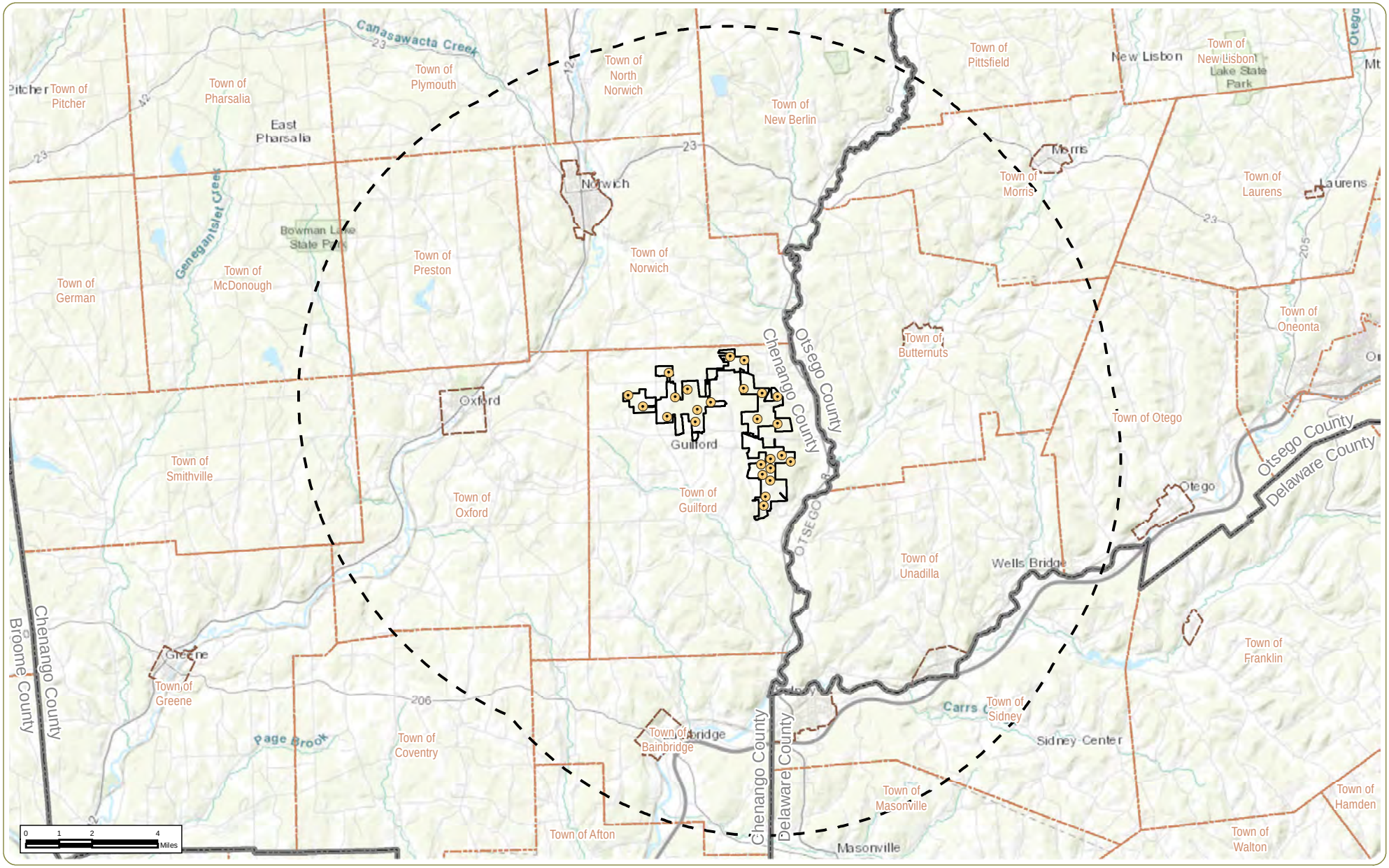


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Figure 3.1-1: Visual Study Area

Notes: 1. ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on July 2, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data. 4. Facility radius and visual area based facility site.

- Wind Turbine
- Facility Site
- 10 Mile Visual Study Area
- City/Village Boundary
- Town Boundary
- County Boundary

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3.2 Physiographic/Visual 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 characterized by rolling hills, open valleys, and low mountains covered by glacial till and dissected by stream valleys. The dissection by both water and ice erosion has given the upland a somewhat rugged relief. The low, rolling hills in this region are divided by valleys and troughs, some containing lakes and rivers, such as Guilford Lake, North Pond, and the Susquehanna, Chenango, and Unadilla Rivers. While the valleys are relatively flat, the valley walls can be rather steep (NYSDOT, 2013). Within the visual study area, two of the major valleys generally run north to south while one is oriented east to west. The Unadilla River and Chenango River are located east and west, respectively, of the proposed WTG array and the Susquehanna River is south of the array, traversing the southeastern portion of the visual study area.

Vegetation throughout the visual study area is dominated by a mosaic of cropland, pastureland, and woodland. Forestland is prevalent throughout the more elevated portions of the visual study area and on steeper slopes. Forestland can also be found in woodlots, hedgerows, and wooded wetlands abutting the more agricultural portions of the visual study area. Forests in the visual study area are primarily deciduous (oak, maple and ash) but also include white pine and areas of planted conifers (pine and spruce plantations). Open fields occur primarily on some level hilltops and within the major valleys associated with rivers and transportation corridors. Agricultural/open fields are primarily associated with relatively small farmsteads, which typically include a single-family residence, a barn, 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 dairy farming followed by field crop agriculture, 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 Route 88 and State Routes 12, 23, 206, and 8, including the City of Norwich and the Villages of Bainbridge, Gilbertsville, Morris, Otego, Oxford, Sidney, and Unadilla. The villages are characterized by a central business district along a main street surrounded by traditional residential neighborhoods, with agricultural lands and undeveloped forest along the outskirts. Hamlets within the visual study area, including Coventryville, West Bainbridge, South Plymouth, South New Berlin, Holmesville, Mount Upton, Guilford Center, Guilford, Rockdale, Bennettsville, Wells Bridge, East McDonough, and Tyner, 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, Chenango, and Unadilla River valleys and along portions of the state highway system. These commercial and industrial businesses include restaurants, automobile body shops, gas stations, storage and warehouse facilities, and manufacturing and processing operations, interspersed with residential uses, such as apartment complexes and mobile home parks. Interstate Route 88 roughly parallels the Susquehanna River where it traverses the southeast portion of the visual study area. An existing 115 kV transmission line operated by NYSEG crosses the entire visual study area, running from Bainbridge in a northly direction to Norwich.

3.2.3 Water Features

As mentioned previously, major rivers within the visual study area include the Susquehanna River, Chenango River, and Unadilla River. Other water features include Glen Lake, Guilford Lake, Lake Shirdon, Tank Pond, Trestle Lake, Whites Pond, North Pond, Brackett Lake, Warn Lake, Youngs Pond, Buck Horn Lake, Morris Pond, Hunt Pond, Allen Pond, Pickens Pond, and Silver Lake. These water features are used for a variety of recreational activities, including fishing, boating, wildlife observation, and swimming. Several of these lakes and ponds host communities of seasonal and year-round residential properties along their shorelines, including, Guilford Lake, North Pond, Buck Horn Lake, and Glen Lake, while other water bodies are bordered by state parks or forest lands. 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 § 1001.24(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. Department of Agriculture [USDA] Forest Service, 1995; Smardon et al., 1988; U.S. Department of Transportation [USDOT] Federal Highway Administration, 1981; 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
- City/Village

- Open Water
- 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 classification analysis is subtractive, meaning that a given criterion is used to classify a portion of the study area as a certain LSZ, and then the following criterion is used to classify the remaining portion not yet classified, and so forth until the entire visual study area is classified. The classification of LSZs within the visual study area followed this order of criteria:

- The Transportation Corridor LSZ was identified as areas that are within 300 feet of Interstate Route 88.
- The Waterfront/Open Water LSZ were identified as areas of Open Water in the U.S. Geological Survey (USGS) 2016 National Land Cover Dataset (NLCD).
- The City/Village LSZ was identified as areas that are within 1000 feet of the mapped boundary of any village or city.
- Areas defining the Forest LSZ were identified as areas that are classified as Deciduous, Evergreen, or Mixed Forest in the NLCD.
- Areas defining the Rural Residential/Agriculture LSZ are composed of Pasture/Hay and Cultivated Crops in the NLCD.

The extent of each LSZ within the visual study area is summarized in Table 3.3-1 and depicted on Figure 3.3-1. Please note that the mapping of LSZs is a generalization exercise intended for viewing at the macroscopic scale of the entire visual study area. Therefore, it is possible that field review at a given viewpoint would change the initial GIS-derived LSZ classification based on observed landscape characteristics that are beyond the scale of the GIS analysis. Descriptions of the visual characteristics of each LSZ, along with representative photographs, are provided in Sections 3.3.1 through 3.3.5, below.

Table 3.3-1. Landscape Similarity Zones by Total Area within the Visual Study Area

Landscape Similarity Zone	Total Area of LSZ within the Visual Study Area (square miles)	Percent of Total Area[1] within Visual Study Area
Forest	289.8	61.9
Rural Residential/Agriculture	156.7	33.5
City/Village	15.9	3.4
Open Water	3.2	0.7
Transportation Corridor	2.4	0.5
Total	468.2	100

[1] The visual study area includes approximately 468.3 square miles, or approximately 299,697 acres.

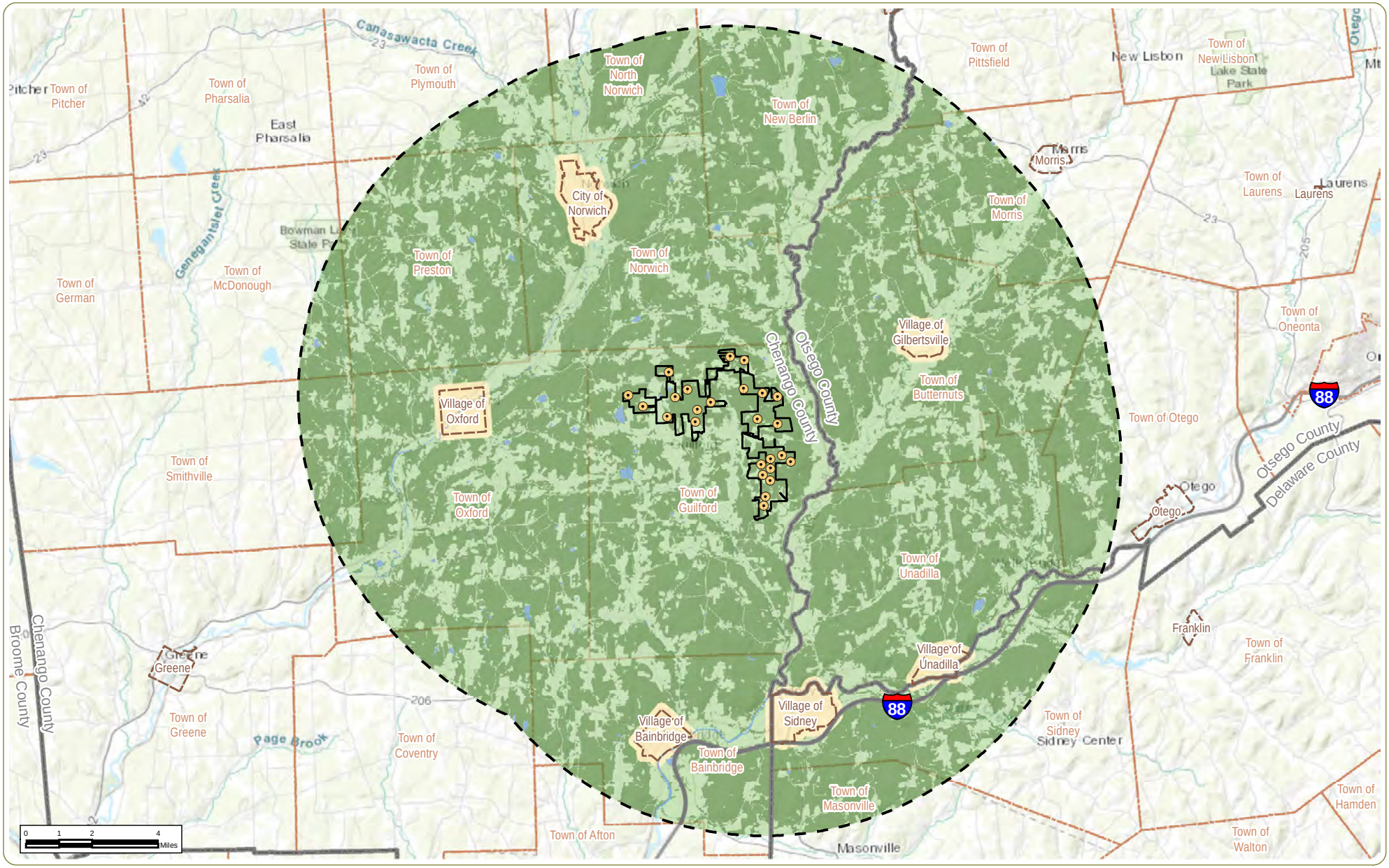

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Figure 3.3-1: Landscape Similarity Zones

Notes: 1. ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on July 2, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data. 4. Facility radius and visual area based facility site.

- Wind Turbine
- Facility Site
- 10 Mile Visual Study Area
- City/Village Boundary
- Town Boundary
- County Boundary

Landscape Similarity Zones

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

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3.3.1 Forest

Inset 3.3-1. Photo of the Forest LSZ from Basswood State Forest in the Town of Oxford (VP 10)

Inset 3.3-2. Photo of the Forest LSZ from Whites Hill Road in the Town of Guilford (VP 55)

Forest is the largest LSZ, covering 61.9% 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 within the three major river valleys (Chenango, Unadilla, and Susquehanna Rivers) in the visual study area, where gentler topography creates more opportunities for agricultural, residential, and commercial development. Views within the Forest LSZ are typically limited due to the screening provided by dense vegetation associated with both tree canopy and understory growth. Outward views 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 results in numerous twists and turns in the existing roads that traverse the forested hilly portions of the visual 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 uses in this zone include low-density residential development, logging, and recreational activities such as hiking, hunting, and snowmobiling. Examples of this zone are shown in Insets 3.3-1 and 3.3-2. These forested areas occur on both private lands with limited public access, as well as public lands such as Coventry, General Jacob Morris, Hunts Pond, Lyon Brook, Pine Hill, and Wiley Brook State Forests.

3.3.2 Rural Residential/Agricultural

Inset 3.3-3. Photo of the Rural Residential/Agricultural LSZ from Furnace Hill Road in the Town of Guilford (VP 61)

Inset 3.3-4. Photo of the Rural Residential/Agricultural LSZ from Tyner Road in the Town of Oxford (VP 23)

The Rural Residential/Agricultural LSZ comprises 33.5% 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 12, 206, 220, 23, 320, 357, 51, 7, and 8, which in places offer open views of the surrounding landscape. Interstate Route 88 also runs through the Rural Residential/Agricultural LSZ but has a distinctly different visual character and therefore was included within the Transportation Corridor LSZ described below. Dominant activities in the Rural Residential/Agricultural LSZ include typical residential activities, along with farming and local travel. Due to the presence of open farmland 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 with, scattered homes and farms in the foreground and/or middle ground, backed or bordered by forested hills that define the background/visible horizon (see Insets 3.3-3 and 3.3-4). In valley portions of this LSZ, the surrounding hills typically limit long-distance views of landscape features.

3.3.3 City/Village

Inset 3.3-5. Photo of the City/Village LSZ from Elm Street, Village of Gilbertsville (VP 62)

Inset 3.3-6. Photo of the City/Village LSZ from West Park Place Road in the City of Norwich (VP 23)

The City/Village LSZ occupies 3.4% of the visual study area and includes the City of Norwich and the Villages of Bainbridge, Gilbertsville, Morris, Otego, Oxford, Sidney, and Unadilla. This LSZ is characterized by moderate to high-density residential and 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 City/Village LSZ are typically characterized by limited building setbacks, sidewalks, street lighting and other pedestrian amenities (see Insets 3.3-5 and 3.3-6). In most cases within the visual study area, a bridge across a waterway acts as the gateway to the village. The density of buildings, and their organization along city/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, river corridors, and the edges of the City/Village LSZ where there is often less dense development, offer more unobstructed outward views to the surrounding landscape. Because these settlements are generally in valley settings, long-distance views are also limited by the surrounding hills and ridges, which block views of more distant landscape features.

3.3.4 Open Water

Inset 3.3-7. Photo of the Open Water LSZ from North Pond in the Town of Guilford (VP 46)

Inset 3.3-8. Photo of the Open Water LSZ from Guilford Lake in the Town of Guilford (VP 26)

The Open Water LSZ occupies 0.7% 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 are shown in Insets 3.3-7 and 3.3-8. 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 along rivers such as the Chenango River, Susquehanna River, and Unadilla River, and lakes and ponds such as Guilford Lake, North Pond, Lake Gerry and Tank Pond. These water features have considerable visual importance due to their public use, recreational value, and/or scenic quality. Public use in this LSZ consists primarily of recreational activities such as boating, fishing, and swimming, which are particularly prominent activities at North Pond which hosts Camp Mesorah (a boys and girls summer camp), situated on the east shore of the Pond. Outward views from these waterbodies typically include a shoreline characterized by a mix of trees and structures (see Inset 3.3-7), backed by forested ridges. Due to the forested nature of many portions of the visual study area, the majority of the smaller water bodies are enclosed by forest vegetation along the shoreline, which screens outward views and creates a sense of enclosure (see Inset 3.3-8). Additionally, the banks of rivers within this zone are lined with mature trees and brush in most places, which tends to partially or completely obscure views to and from the rivers.

3.3.5 Transportation Corridor

Inset 3.3-9. Photo of the Transportation LSZ from Interstate Route 88 in the Town of Bainbridge (VP 1)

Inset 3.3-10. Photo of the Transportation LSZ from Interstate Route 88 in the Town of Bainbridge (VP 2)

The Transportation Corridor LSZ occupies approximately 0.5% of the visual study area and consists of one divided, multi-lane highways with limited access. This LSZ consists of Interstate Route 88, which transects the southeastern portion of the visual study area. Views along this transportation corridor 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, viewer attention is generally focused on the roadway and associated traffic. Travel is at high speed, and outward peripheral views are fleeting. The surrounding scenery is variable, but within the visual study area is dominated by forest and successional vegetation along the edges of the highway with intermittent views toward the forested hills and ridges in the background. Representative views in this LSZ are shown in Insets 3.3-9 and 3.3-10 above.

3.4 Distance Zones

Distance zones are typically defined in visual studies to divide the visual study area into distinct classifications based on the various levels of landscape detail available to the viewer. Four distinct distance zones were developed for this purpose. To define these zones, EDR consulted several well-established agency protocols, including those published by the U.S. Forest Service, BLM, and USDOT, to determine the appropriate values for each distance zone. It is important to note that each of the protocols consulted for this exercise are not specific to this Project Study Area. For example, the BLM recommends a combined foreground-middle ground zone extending from 0-5 miles. While this is appropriate in a western landscape with frequent, unscreened views over very long distances, it does not translate to northeastern landscapes where views can frequently be contained to within 1.0 mile of the viewer. Conversely, the U.S. Forest Service (1995) suggests the foreground be defined as an area extending 0.5 mile from the viewer. Due to the scale of the specific landscape being evaluated in this VIA, EDR defined the distance zones (as measured from the proposed Project) as follows:

- *Near-Foreground*: 0 to 0.5 mile. At this distance, 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 on foreground objects.

- *Foreground*: 0.5 to 1.5 miles. At this distance, elements in the landscape tend to retain visual prominence, but detailed textures become somewhat muted. Larger scale landscape elements remain as a series of recognizable and distinguishable landscape patterns, colors, and textures.

- *Middle ground*: 1.5 to 4.0 miles. The middle ground 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 distinguishable but subdued by a bluish cast and a softer tone than those in the foreground. Contrast in texture among landscape elements will also be reduced.

- *Background*: Over 4.0 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/or the skyline are often the dominant visual characteristics in the background. The background contributes to scenic quality by providing a softened backdrop for foreground and middle ground features, an attractive vista, or a distant focal point.

The area of each LSZ lying within each distance zone in the visual study area is summarized in Table 3.4-1.

Table 3.4-1. Distance Zones by Landscape Similarity Zone

Landscape Similarity Zone	Total Area[1] (square miles) and Percent of LSZ			
	Near-Foreground (0 – 0.5 mile)	Foreground (0.5 – 1.5 miles)	Middle Ground (1.5 – 4.0 miles)	Background (>4.0miles)
Forest	9.1 *(3.2%)*	13.4 *(4.6%)*	52.0 *(17.9%)*	215.4 *(74.3%)*
Rural Residential/ Agricultural	0.01 *(0.008%)*	11.2 *(7.1%)*	27.6 *(17.6%)*	115.0 *(73.3%)*
City/Village	0.0 *(0.0%)*	0.0 *(0.0%)*	0.05 (0.3%)	15.9 *(99.7%)*
Open Water	0.01 *(0.4%)*	0.3 *(8.6%)*	0.6 (18.3%)	2.3 *(72.3%)*
Transportation Corridor	0.0 *(0.0%)*	0.0 *(0.0%)*	0.0 *(0.0%)*	2.4 *(100.0%)*
Total Distance Zone Area	9.16	24.8	80.2	350.9

[1]The visual study area includes approximately 468.3 square miles, or approximately 299,697 acres.

3.5 Viewer/User Groups

Three categories of viewer/user groups were identified within the visual study area. These include the following:

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. Residents are concentrated in and around the City of Norwich, the Villages of Bainbridge, Gilbertsville, Morris, Otego, Oxford, Sidney, and Unadilla, and various hamlets, but occur in relatively low density throughout the visual study area. 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 elevated viewpoints (typically upper floors/stories of homes). Residents' sensitivity to visual quality is variable. However, it is assumed that residents may be very sensitive to changes in views from their homes, and yards and local communities.

3.5.2 Through-Travelers/Commuters

Commuters and travelers passing through the area view the landscape from motor vehicles on their way to work or other destinations. Commuters and through-travelers are typically moving, have a relatively narrow field of view, and are destination oriented. Drivers on major roads in the area (e.g., Interstate Route 88, NYS Routes 12, 206, 220, 23, 320, 357, 41, 51, 7, and 8) will generally be focused on the road and traffic conditions, but do have the opportunity to observe roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and

accordingly, may have greater perception of changes in the visual environment. Commuters and travelers' sensitivity to visual quality is variable. However, it is assumed that regular commuters and local travelers may be 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 visual 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

Visually Sensitive Resources (VSRs) within the visual study area were identified in accordance with guidance provided by New York State Department of Environmental Conservation (NYSDEC) Program Policy DEP-00-2 *Assessing and Mitigating Visual Impacts* (NYSDEC, 2000) and the requirements of Article 10, as described in 16 NYCRR § 1001.24(b)(4). In addition, EDR identified other resources that could be considered visually sensitive based on the type or intensity of use they receive. The categories of VSRs that would be typically required for consideration in VIAs include the following:

- Properties of Historic Significance (National Historic Landmarks, Sites Listed on the State or National Registers of Historic Places [S/NRHP]; Properties Eligible for Listing on the NRHP or SRHP; National or State Historic Sites). It should be noted that the New York State Historic Preservation Office (SHPO) recommends a study area of 5 miles for wind projects (NYSOPRHP, 2006). Subsequent comments from the DPS on the Historic Resources Survey (HRS [Appendix 20D of the Article 10 Application]) recommended an extension of this 5-mile study area to include the City of Norwich and the Village of Sidney. For this reason, the HRS considers a modified 5-mile study area for the identification of historic resources. This VIA considers only properties eligible for the National Register of Historic Properties identified within the modified HRS study area. All other designated/listed historic sites are identified within the full 10-mile visual study area.

- Designated Scenic Resources (Rivers Designated as National or State Wild, Scenic, or Recreational; Adirondack Park Scenic Vistas; Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic; Scenic Areas of Statewide Significance; Other Designated Scenic Resources);
- Public Lands and Recreational Resources (National Parks, Recreation Areas, Seashores, and/or Forests; National Natural Landmarks; National Wildlife Refuges; Heritage Areas; State Parks; State Nature and Historic Preserve Areas; State Forest Preserve Lands; Wildlife Management Areas & Game Refuges; State Forests; Other State Lands; State Boat Launches/Waterway Access Sites; Designated Trails; Palisades Park Lands; Local Parks and Recreation Areas; Publicly Accessible Conservation Lands/Easements; Rivers and Streams with Public Fishing Rights Easements; Named Lakes, Ponds, and Reservoirs);
- High Use Public Areas (State, U.S., and Interstate Highways, Cities, Villages and Hamlets; Schools); and
- Locally Identified Resources (Other resources identified through the agency/public outreach process – see discussion below).

To identify VSRs within the visual study area, EDR consulted a variety of data sources including geospatial resources provided by state, county, town, and village entities, and stakeholders. A complete documentation of resources used in the identification of VSRs is included in the Literature Cited section of this report (see Section 7.0).

In addition, per the requirements set forth in 16 NYCRR § 1001.24(b)(4), as well as the FSS for the Project, the Applicant 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 5 state, county, town, city, and village stakeholders, are included as Appendix F of this VIA. This outreach included the following:

- The Applicant distributed a request on February 19, 2019 for information on possible VSRs to municipal planning representatives, town and village historians, local and regional chambers of commerce, along with multiple local environmental groups. For a full distribution list of the 75 identified contacts please see Appendix F.
- The Applicant received three responses to this outreach and added an additional 14 locally identified VSRs to the VIA inventory. The additional resources identified through the consultation process are included in Table 3.6-1.
- The Applicant has initiated consultation with the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) in order to evaluate the Project's potential effect on historic resources listed or eligible for listing in the S/NRHP (EDR, 2019). This analysis is on-going at the time of this report, and if additional resources are identified through the process, NYSOPRHP can request further analysis at such a time.

As a result of the database review and outreach effort described above, VSRs of national, regional and statewide significance, as well as locally significant aesthetic resources, were identified within the visual study area. The mapped

locations of inventoried VSRs are shown in Figure 5.2-1 and in the composite overlay map included in Appendix A. Table 3.6-1 includes a summary of all of the types of identified VSRs within the visual study area.

Table 3.6-1 Summary of Visually Sensitive Resource Types Identified in the Visual Study Area

Visually Sensitive Resources	Total Number of Resources within the Visual Study Area[2]
Properties of Historic Significance [6 NYCRR 617.4 (b)(9)]	Total 106
National Historic Landmarks (NHL)	0
Properties Listed on National or State Registers of Historic Places (NRHP/SRHP)	35
Properties Eligible for Listing on NRHP or SRHP	71
National/State Historic Sites	0
Designated Scenic Resources	Total 0
Rivers Designated as National or State Wild, Scenic or Recreational	0
Adirondack Park Scenic Vistas [Adirondack Park Land Use and Development Map]	0
Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic (ECL Article 49 Title 1 or equivalent)	0
Scenic Areas of Statewide Significance [Article 42 of Executive Law]	0
Other Designated Scenic Resources (Easements, Roads, Districts, and Overlooks)	0
Public Lands and Recreational Resources	Total 67
National Parks, Recreation Areas, Seashores, and/or Forests [16 U.S.C. 1c]	0
National Natural Landmarks [36 CFR Part 62]	0
National Wildlife Refuges [16 U.S.C. 668dd]	0
Heritage Areas [Parks, Recreation and Historic Preservation Law Section 35.15]	0
State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]	1
State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution]	0
State Forest Preserves [NYS Constitution Article XIV]	0
Other State Lands	0
Wildlife Management Areas & Game Refuges	0
State Forests	16
State Boat Launches/Waterway Access Sites	8
Designated Trails	6
Palisades Park [Palisades Interstate Park Commission]	0
Local Parks and Recreation Areas	15
Publicly Accessible Conservation Lands/Easements	2
Rivers and Streams with Public Fishing Rights Easements	3
Named Lakes, Ponds, and Reservoirs	16
High-Use Public Areas	Total 69
State, US, and Interstate Highways	10
Cities, Villages, Hamlets	37
Schools	22
Other Resources Identified by Stakeholders	Total 4
Total Number of Visually Sensitive Resources in the Visual Study Area	246

[2] Five VSRs identified by stakeholders occur outside the visual study area and therefore are not included in this table or the determination of Project visibility. However, they are listed in the inventory in Appendix C.

4.0 Visual Impact Assessment Methodology

The Visual Impact Assessment (VIA) procedures used for this study are consistent with methodologies developed by the BLM (1980), USDA, National Forest Service (1974), the USDOT, Federal Highway Administration (1981), U.S. Army Corps of Engineers (Smardon, et al., 1988) and the NYSDEC (2000). These procedures are widely accepted as standard visual impact methodology for wind energy projects (CEIWEP, 2007). 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 to be seen from ground-level vantage points. This analysis included identifying potentially visible areas on viewshed maps and verifying Project visibility in the field. The methodology employed for each of these assessment techniques is described below.

4.1.1 Viewshed Analysis

Wind Turbine Viewshed Analysis

Topographic viewshed maps for the proposed turbines were prepared using 2-meter lidar digital elevation model (DEM) data for the visual study area, the location and height of all proposed turbines (see Figure 2.2-1), an assumed viewer height of 5.6 feet above ground level (AGL), and ESRI ArcGIS® software with the Spatial Analyst extension. Two topographic viewsheds were mapped, one to illustrate "worst case" daytime visibility (based on a maximum blade tip height of 671 feet AGL, and the other to illustrate potential visibility of FAA obstruction warning lights at night. The FAA warning light viewshed was based on the maximum nacelle height of 418 feet AGL, and the assumption that all turbines would be equipped with lights as required by the FAA for turbines exceeding 499 feet AGL.

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 turbine locations from observation points throughout the visual study area. The resulting viewshed maps define the maximum area from which any portion of any turbine in the completed Project could potentially be seen within the visual study area during both daytime and nighttime hours based on a direct line of sight, and ignoring the screening effects of existing vegetation and structures. A turbine count analysis was also performed to determine how many wind turbines are potentially visible from any given point within the study area. The results of this analysis were then grouped by number of turbines potentially visible and presented on a viewshed map.

Because the screening provided by vegetation and structures is not considered in this analysis, the topographic viewshed represents a true "worst case" assessment of potential Project visibility. Topographic viewshed maps assume that no trees or structures exist and therefore are very accurate in predicting where visibility will not occur due to topographic interference. However, they are less accurate in identifying areas from which the Project could actually be visible. Trees and buildings 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) lidar data for the Susquehanna Basin (2007), Madison Otsego (2015), 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. Henceforth, this type of viewshed analysis will be referred to as a DSM viewshed analysis, which considers the screening effects of topography, vegetation, and structures.

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. Additionally, to account for features such as local distribution lines (the DSM would project these lines to ground level, creating screening features), thin hedgerows, and other minor screening features, a corridor of 70 feet along all public roads was cleared to conservatively eliminate these elements. The 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 six 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 670 feet AGL)

and a second time to illustrate potential visibility of FAA warning lights, based on an approximate FAA warning light height of 418 feet AGL.

A DSM viewshed analysis was also conducted to further evaluate potential visibility of the proposed collection and POI substations based on a maximum structure height of 55 feet.

Because it accounts for the screening provided by structures and vegetation, 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 taken into 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 within the visual study area on April 18, 2019. During the site visit, EDR staff members drove public roads and visited public vantage points within the visual study area to document Project visibility and confirm the results of the viewshed analysis. This determination was based on the visibility of the distinctive ridges/landforms, as well as existing tall structures (such as silos and temporary meteorological towers) on the Project Site, which served as locational and scale references. These site visits resulted in photographs from 85 representative viewpoints within the visual study area. The viewpoints document potential visibility of the Project from the various LSZs, distance zones, directions, VSRs, and areas of high public use throughout the visual study area. During the field visit, weather conditions consisted of partly cloudy to clear skies which represented generally favorable conditions for long distance viewing. A representative photograph documenting the general view toward the Project Site from each viewpoint is included in Appendix B.

During the site visit, photographs were taken using digital SLR cameras with a minimum resolution of 24 megapixels.[3] All cameras utilized a focal length between 28 and 35 mm (equivalent to between 45 and 55 mm on a 35mm sensor). This focal length is the standard used in visual impact assessment because it most closely approximates normal human perception of spatial relationships and scale in the landscape (CEIWEP, 2007). To assist with viewer orientation and potential Project visibility in the field, global positioning system (GPS) units were combined with a live mapping unit in ESRI Collector® (Collector). The data contained in the Collector unit included the viewshed analysis results, VSRs, a topographic and aerial base map, and the current user location. At each of the viewpoints, the GPS was used to document the camera location, direction of view, time, and notes for each photo position. Viewpoints photographed during field review generally represented the most open, unobstructed available views toward the Project site.

[3] Digital SLR cameras used in the photography fieldwork included Canon EOS Mark IV, and Nikon D7100.

4.2 Project Visual Impact

Beyond evaluating potential Project visibility, the VIA also examined the visual impact of the proposed wind turbines and other visible Project components on the LSZs, aesthetic resources, and viewer groups within the visual study area. This assessment involved preparing visual simulations of the proposed Project (including turbines, substation, met towers, and O&M Facility) from representative viewpoints. These simulations were then evaluated by a rating panel consisting of five professionals to determine the type and extent of visual impact resulting from installation of the proposed Project. Further information on rating panel personnel and procedures can be found in Appendix E. Details of the visual impact assessment procedures are described below.

4.2.1 Viewpoint Selection

16 NYCRR § 1001.24(b)(4) includes the requirements that "*the applicant shall confer with municipal planning representatives, DPS, DEC, OPRHP, and where appropriate, APA in its selection of important or representative viewpoints.*"[4] Building on the consultation with municipal representatives and stakeholders to identify VSRs (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 as Appendix F of this VIA. This outreach included:

- On May 14, 2019, in accordance with 16 NYCRR § 1001.24(b)(4), EDR distributed a memorandum entitled *High Bridge Wind LLC (DPS Case 18-F-0262) Recommended Viewpoints - Official Request for Information* to 135 state, county, town, city, and village representatives and stakeholders that were previously engaged to identify VSRs (see Appendix F). This memo included: a summary of research and consultation undertaken as part of the VIA to date; description of the field review/photography conducted for the Project; a rationale for viewpoint selection; and, recommendations for 15 viewpoints to be considered for the preparation of visual simulations. The rationale provided for viewpoint selection included the following factors:
    - Providing representative views from the locally identified LSZs within the visual study area
    - Providing representative views from the designated distance zones within the visual study area. Because of the forested nature of the visual study area, obtaining near foreground views was a challenge. Field

[4] Note: "DPS" is the New York State Department of Public Service, "DEC" is the New York State Department of Environmental Conservation, "OPRHP" is the New York State Office of Parks, Recreation, and Historic Preservation, and "APA" is the Adirondack Park Agency. The APA is not applicable in this instance due to the Project's location (i.e., not in the vicinity of the Adirondack Park).

photography was focused on obtaining foreground and middle ground views which included multiple turbines.

- The locations of VSRs within the visual study area, including areas/sites recommended by the DPS and other stakeholders during review of the Project's PSS.
- Locations that are predicted to have visibility of a large number of turbines based on viewshed analysis.
- The availability of open views towards the proposed Project as determined by field reconnaissance.

- In response to the May 14, 2019 request for public input (described above) EDR was contacted by the City of Norwich Planning and Community Development Department on May 20, 2019. The City of Norwich determined that the viewpoint selection was adequate and did not recommend any views beyond those recommended in the viewpoint selection outreach letter.
- On July 2, EDR received an email from NYSDPS stating that it had not identified any additional locations to add to the inventory.
- No other responses to the May 14, 2019 outreach letter were received.

Based on the outcome of stakeholder and agency consultation, 15 viewpoints were selected for the development of visual simulations. These viewpoints were selected based upon the following criteria:

1. They provide open views of proposed turbines or provide representative views of the screening effects of vegetation, topography, or structures from selected areas;
2. They illustrate Project visibility from VSRs;
3. They illustrate typical views from identified LSZs;
4. They illustrate typical views of the proposed Project that will be available to representative viewer/user groups;
5. They illustrate typical views of different numbers of turbines, from a variety of viewer distances, and under different lighting/sky conditions, to illustrate the range of visual change that will occur with the Project in place; and
6. The selected photos displayed appropriate composition, lighting, and exposure.

Locational details and the criteria for selection of each simulation viewpoint are summarized in Table 4.2-1, below:

Table 4.2-1. Viewpoints Selected for the Production of Simulations

Viewpoint Number	Location and/or VSR Represented	LSZ Represented	Viewer Group Represented	Viewing Distance[1]	View Orientation[2]
1	Interstate Route 88	Transportation Corridor	Through-Travelers/Commuters	11.8[3]	N
5	Sidney Historic District/Sidney Veterans Memorial Park	Rural Residential/Agricultural	Local Residents, Tourists/Recreational Users	6.0	NNW
29	Furnace Hill Road	Rural Residential/Agricultural	Local Residents	1.7	N
30	High Bridge Road	Rural Residential/Agricultural	Local Residents	1.3	NE
33	NYS Route 51	City/Village	Local Residents, Through-Travelers/Commuters	1.3	WSW
34	Furnace Hill Road	Rural Residential/Agricultural, Open Water	Local Residents, Tourists/Recreational Users	1.0	NNE to ENE
35	County Road 37	Rural Residential/Agricultural	Local Residents	2.8	ESE
41	North Pond Road (County Road 37)	Rural Residential/Agricultural, Open Water	Local Residents, Tourists/Recreational Users	1.0	NE
42	County Road 36	Rural Residential/Agricultural	Local Residents	0.8	NNW
58	NYS Route 12	Rural Residential/Agricultural	Local Residents, Through-Travelers/Commuters	3.9	ESE
66	Gibbon Road	Rural Residential/Agricultural	Local Residents	3.2	SSE
70	East Side Road	Rural Residential/Agricultural	Local Residents	9.8	SW
74	NYS Route 23	City/Village	Local Residents, Through-Travelers/Commuters	5.2	SSW
80	St. Paul Cemetery	City/Village	Local Residents, Tourists/Recreational Users	7.5	SSE
81	NYS Route 8	Rural Residential/Agricultural	Local Residents, Through-Travelers/Commuters	7.6	SSW

[1]Distance from viewpoint to nearest visible turbine (in miles)
[2]N = North, S = South, E = East, W = West
[3]The nearest visible turbine from this location is not the nearest geographic turbine position relative to the viewer.

4.2.2 Visual Simulations

To show anticipated visual changes associated with the proposed Project, three dimensional (3D) software was used to create realistic photographic simulations of the proposed Project from each of the 15 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 were modeled using detailed lidar data representing existing landscape elements such as roads, buildings, and topography. 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 to the model space (i.e., 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.

A computer model of the proposed turbine layout was prepared based on specifications and data provided by the Applicant (see Section 2.2.1 for turbine dimensions). All turbine rotors were modeled facing into the prevailing wind (i.e., oriented to the southwest). Using the camera view as guidance, the visible portions of the modeled turbines were imported to the landscape model space described above, and set at the proper coordinates. Coordinates for proposed turbines were provided to EDR by the Applicant.

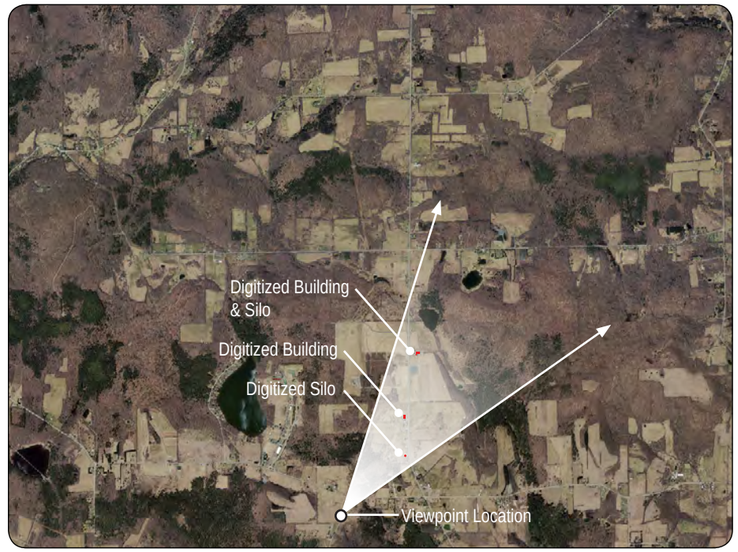
Once the proposed Project was accurately aligned within the camera view, a lighting system was created based on the actual time, date, and location of the photograph in order to accurately represent light reflection, highlights, color casting, and shadows. The rendered Project was then superimposed over the photograph in Adobe Photoshop® and portions of the turbines that fall 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 were added to the photograph, any shadows cast on the ground by the proposed structures were also included by rendering a separate "shadow pass" over the DEM model in 3ds Max ® and then overlaying the shadows on the simulated view with the proper fall-off and transparency using Photoshop. A graphic illustration of the simulation process is included in Figure 4.2-1.

"Wireframe" Renderings

In addition, for some views where the turbines were substantially screened from view, "wireframe renderings" were prepared to illustrate the potential screening effect of landscape features within the photograph. In these wireframe renderings, the portions of the proposed turbines that would be screened by intervening vegetation, topography or structures are shown in a bright green color (for illustrative purposes). The wireframe renderings produced for this report are included in Appendix D.

1. Photos are selected to illustrate typical views of the proposed project that will be available to representative viewer/user groups from the landscape similarity zones and sensitive sites identified 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 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 lidar computer model representing the existing topography and vegetation is also overlayed on the existing photograph to refine camera alignment, and target elevation.

6. The proposed exterior color/finish of the turbines is 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.

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Figure 4.2-1: 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 15 selected viewpoints. These "before" and "after" photographs, identical in every respect except for the Project components shown in the simulated views, were provided to the rating panel, who were then asked to determine the effect of the proposed Project in terms of its contrast with existing elements of the landscape. The methodology utilized in this evaluation 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*: These are the four major compositional elements that define the perceived visual character of a landscape, as well as a Project. 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 and is usually evident as the edges of shapes or masses in 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 significant aesthetic resources, have the greatest potential for visual impact.

- *Atmospheric Conditions*: Clouds, precipitation, haze, and other ambient air related conditions, which affect the visibility of an object or objects. These conditions can temporarily impact the visibility and contrast of landscape and project components, and 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 landscape. 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*: Moving project components can make them more noticeable. Wind turbines are designed to rotate in order to generate electricity and evidence suggest that static wind turbines may introduce a perceptional visual impact associated with a lack of function or production value.

5.0 Visual Impact Assessment Results

5.1 Project Visibility

5.1.1 Viewshed Analysis Results

Wind Turbine Viewshed Analysis

Potential wind turbine visibility, as indicated by the viewshed analyses, is illustrated in Figure 5.1-1 and summarized in Table 5.1-1. Based only on the screening provided by topography, the blade tip viewshed analysis indicates some portion of the proposed turbine array could potentially be visible from approximately 55% of the visual study area. This "worst case" assessment of potential visibility indicates the area where any portion of any turbine could potentially be seen, without considering the screening effect of existing vegetation and structures. Areas where there is no possibility of seeing the Project include large portions of the river valleys associated with the southern portions of the Chenango River and the Susquehanna River, much of Interstate 88 where it intersects the visual study area, and valleys associated with smaller creeks in the visual study area, such as Thompson Creek, Indian Creek, and Sand Hill Creek. Based solely on the results of topographic viewshed analysis, potential visibility of the Project is most concentrated within the Project Site and along the ridgetops throughout the visual study area. Additionally, where the river valleys are aligned with the Project, outward views could become available. This is particularly the case in the northern reaches of the Chenango River valley, in and around the City of Norwich. As indicated in Appendix C, 202 of the 246 identified VSRs within the visual study area theoretically could have views of some portion of the Project (based on maximum blade tip height and screening provided by topography alone).

Areas of potential nighttime visibility, as indicated by the FAA topographic viewshed analysis (Figure 5.1-1, Sheet 2; Table 5.1-1) include approximately 47.8% of the visual study area. This analysis indicates that the potential visibility of FAA warning lights at a height of 411.4 feet will generally be concentrated in the same areas where daytime blade-tip height visibility was indicated. 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.

Factoring vegetation and structures into the viewshed analysis significantly reduces potential Project visibility throughout the visual study area (Figure 5.1-1, Sheets 3 and 4). According to the DSM viewshed analysis, the screening provided by structures and vegetation, in combination with topography, will serve to block daytime views of the Project from approximately 90.5% of the visual study area (i.e., only 9.5% of the visual study area is indicated as having potential Project visibility). Areas of potential nighttime visibility, as indicated by FAA DSM viewshed analysis, are limited to approximately 7.4% of the visual study area. Based on the results of the DSM viewshed analysis, Project visibility is likely to occur along the Unadilla River and within the foreground distance zone (1.5 miles) of the turbines. Minor visibility is also indicated in the

City of Norwich and the Villages of Gilbertsville, Oxford, Sidney, and the outskirts of Bainbridge. Views from these population centers are primarily concentrated within higher elevation areas and along street corridors that provide open views toward the Project. However, as mentioned previously, areas of actual visibility are anticipated to be more limited than indicated by the DSM viewshed analysis, due to the slender profile of the turbines, the effects of distance, and the intermittent nature of the views within these population centers. As indicated in Appendix C, 166 of the 246 identified VSRs within the visual study area theoretically could have views of some portion of the Project (based on maximum blade tip height and screening provided by vegetation, topography and structures).

Table 5.1-1. Summary of Viewshed Results for the Visual Study Area

Number of Turbines Visible	Visual Study Area[1] Viewshed Results							
	Blade Tip Topography Only		Blade Tip Topography, Vegetation, and Structures		FAA/Nacelle Topography Only		FAA/Nacelle Topography, Vegetation, and Structures	
	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area
0	210.8	45.0	423.9	90.5	244.7	52.2	433.7	92.6
1-5	47.3	10.1	21.7	4.6	54.8	11.7	20.4	4.4
6-10	48.8	10.4	11.4	2.4	51.7	11.0	8.5	1.8
11-15	42.3	9.0	6.2	1.3	41.9	9.0	3.8	0.8
16-20	35.3	7.5	3.2	0.7	32.3	6.9	1.3	0.3
21-25	83.7	17.9	1.9	0.4	42.9	9.2	0.5	0.1
Total Visible	257.5	55.0	44.3	9.5	223.6	47.7	34.5	7.4

[1]The visual study area includes approximately 468.3 square miles, or approximately 299,697 acres.

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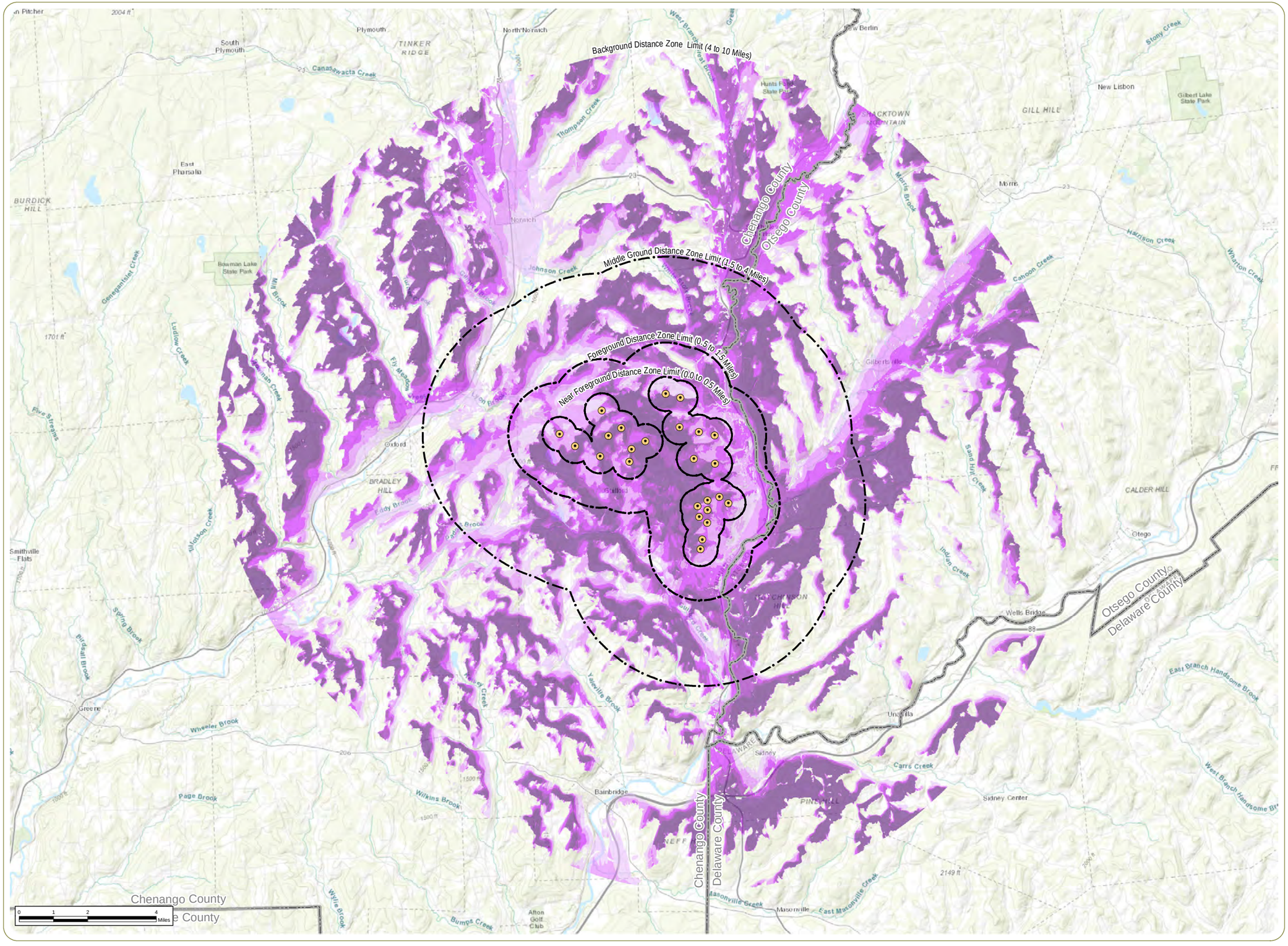
Figure 5.1-1: Viewshed Analysis

Sheet 1 of 4 - Wind Turbine Blade Tip Visibility Based on Topography Only



- Wind Turbine
- Distance Zone Limit

Number of Turbines Potentially Visible:

- 1-5 Turbines Visible
- 6-10 Turbines Visible
- 9-15 Turbines Visible
- 16-20 Turbines Visible
- 21-25 Turbines Visible

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on July 2, 2019. 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 204 meters (669.2 feet).

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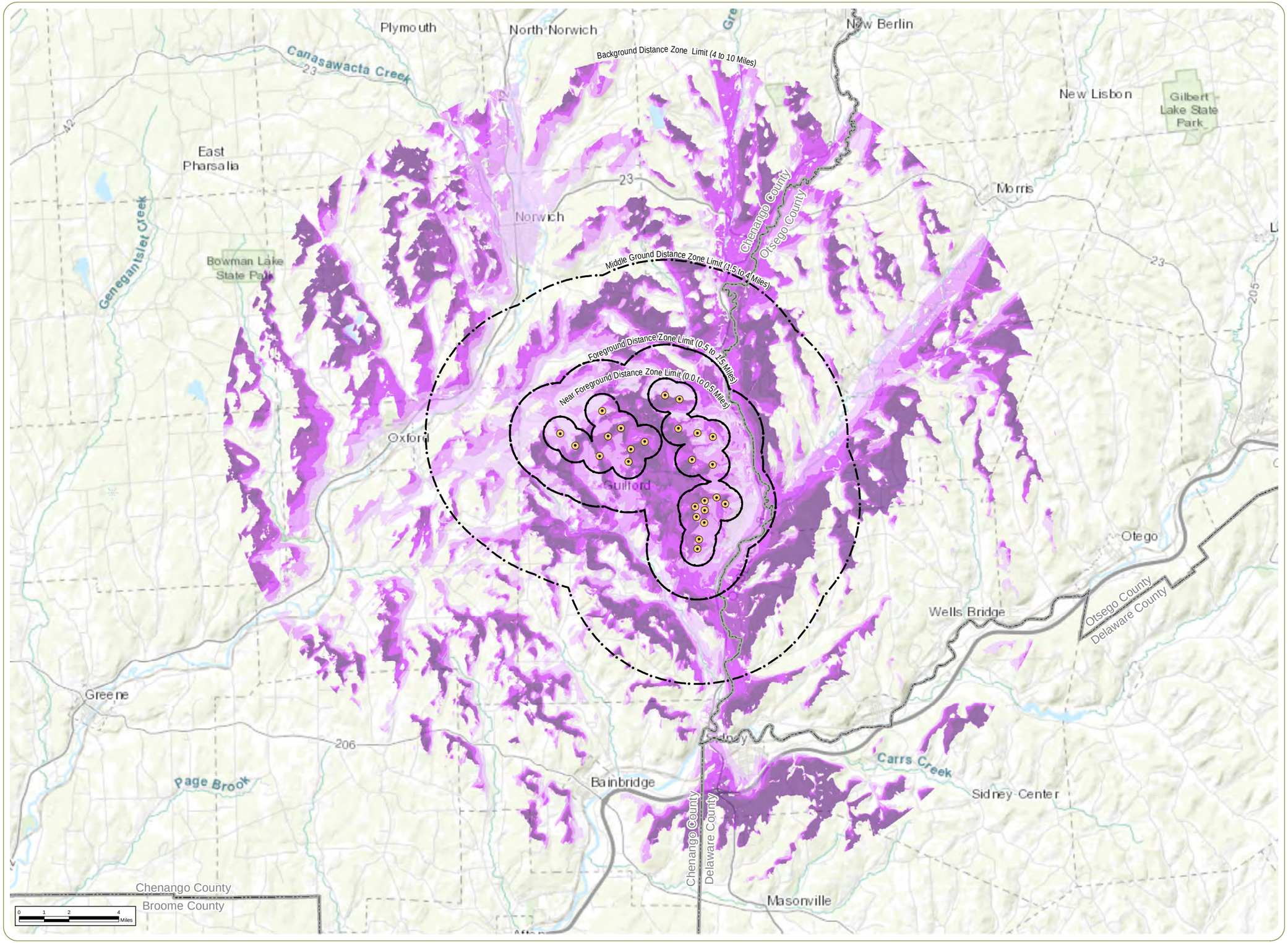
Figure 5.1-1: Viewshed Analysis

Sheet 2 of 4 - Wind Turbine FAA Warning Light Visibility Based on Topography Only



Wind Turbine

Distance Zone Limit

Number of Turbines Potentially Visible:

- 1-5 Turbines Visible
- 6-10 Turbines Visible
- 9-15 Turbines Visible
- 16-20 Turbines Visible
- 21-25 Turbines Visible

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on July 2, 2019. 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 127.5 meters (418 feet).

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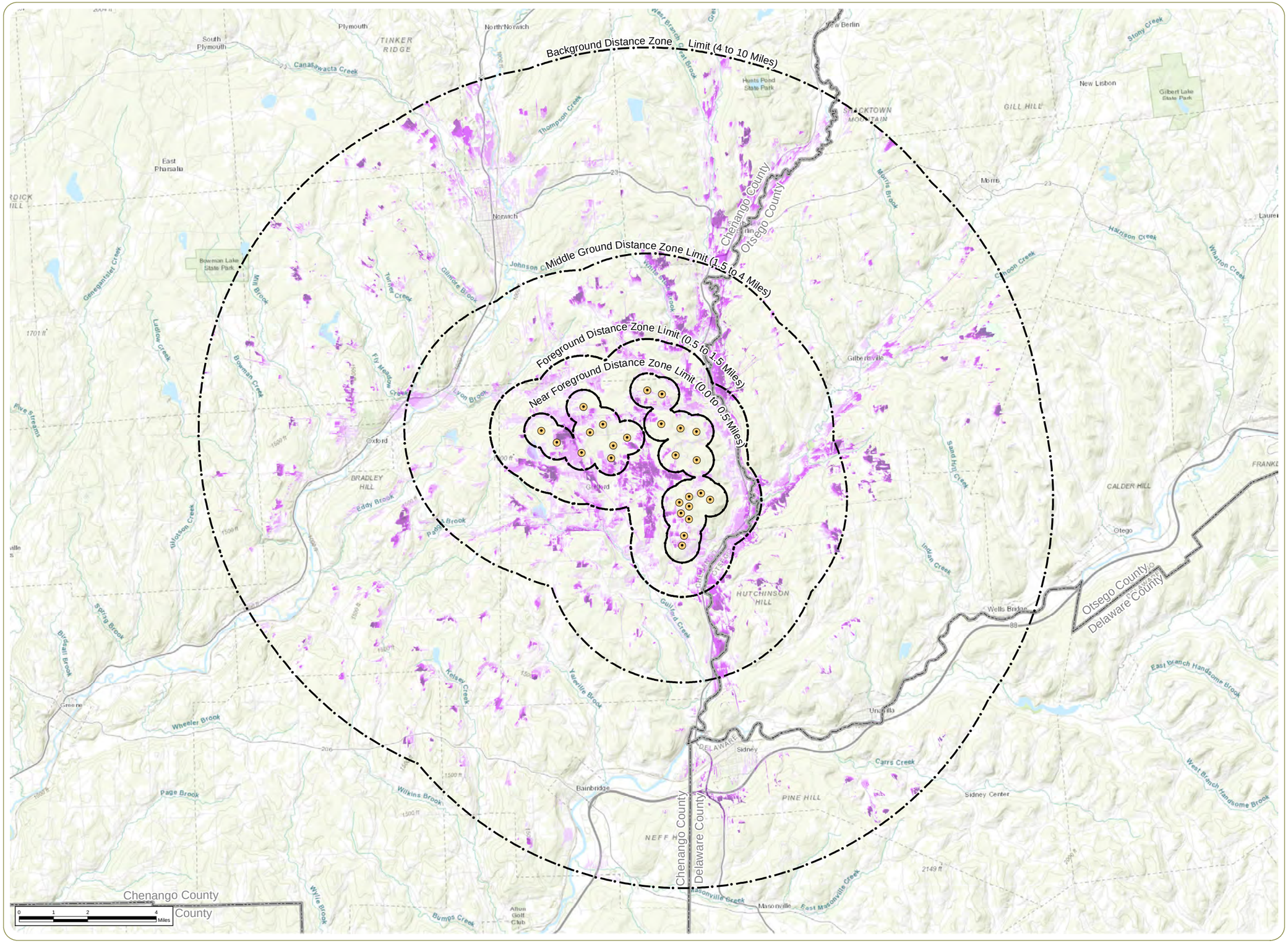
Figure 5.1-1: Viewshed Analysis

Sheet 3 of 4 - Wind Turbine Blade Tip Visibility Based on Topography, Vegetation and Structures



- Wind Turbine
- Distance Zone Limit

Number of Turbines Potentially Visible:

- 1-5 Turbines Visible
- 6-10 Turbines Visible
- 9-15 Turbines Visible
- 16-20 Turbines Visible
- 21-25 Turbines Visible

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on July 2, 2019. 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 lidar dataset. Viewshed analysis based on maximum blade tip height of 204 meters (671 feet).

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Figure 5.1-1: Viewshed Analysis

Sheet 4 of 4 - Wind Turbine FAA Warning Light Visibility Based on Topography, Vegetation and Structures

Background Distance Zone Limit (4 to 10 Miles)

Middle Ground Distance Zone Limit (1.5 to 4 Miles)

Foreground Distance Zone Limit (0.5 to 1.5 Miles)

Near Foreground Distance Zone Limit (0.0 to 0.5 Miles)

Chenango County

Otsego County

Delaware County

- Wind Turbine
- Distance Zone Limit

Number of Turbines Potentially Visible:

- 1-5 Turbines Visible
- 6-10 Turbines Visible
- 9-15 Turbines Visible
- 16-20 Turbines Visible
- 21-25 Turbines Visible

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on July 2, 2019. 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 127.5 meters (418 feet).

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An analysis comparing potential daytime Project visibility within the different LSZs is presented in Table 5.1-2 and indicates that the screening effects of topography, forest vegetation, and structures are highly variable between the different zones and result in substantially different levels of potential Project visibility.

Table 5.1-2. Summary of Blade Tip DSM Viewshed Results by Landscape Similarity Zone

Number of Turbines Visible	Visual Study Area[1] Viewshed Results by Landscape Similarity Zone (LSZ) (% of LSZ w/ Potential Project Visibility)				
	Forest	Rural Residential / Agricultural	City / Village	Open Water	Transportation Corridor
0	97.9	76.7	92.0	87.8	93.2
1-5	1.3	10.5	6.0	8.1	4.1
6-10	0.4	6.2	1.5	3.5	0.8
11-15	0.2	3.5	0.4	0.5	0.4
16-20	0.1	1.9	0.1	0	0.4
21-25	0	1.1	0	0	0.3
Total Percent Visible	2.1%	23.3%	8.0%	12.1%	6.7%

[1]The viewshed analysis area (within 10 miles of proposed Project) includes approximately 468.3 square miles, or approximately 299,697 acres.

Potential visibility of the Project (based on DSM viewshed analysis) from the various LSZs within the visual study area is summarized as follows:

- The Forest LSZ offers the least amount of potential Project visibility. This LSZ essentially offers no outward visibility due to the screening effects of the forest canopy. However, small portions of the Forest LSZ may offer limited outward views where farm fields directly abut the perimeter of the forests and where roads through forested areas are directly aligned with a portion of the Project. The occurrence of these areas is generally limited, and there will be little Project visibility beyond the periphery of the forest areas, particularly during the growing season. Additional 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 Transportation Corridor LSZ presents potential opportunities for Project visibility in 6.7% of its area within the visual study area. The Interstate Route 88 corridor runs north/south through the southeast portion of the visual study area, and at its nearest point is further than 6 miles from the Project. Although intervening topography, vegetation and structures provide screening in most areas, open views are available from portions of the Interstate near its intersection. However, in all cases, these views will be distant and fleeting.

- Approximately 8% of the more populated portions of the visual study area that make up the City/Village LSZ offer potential views of the Project. However, as demonstrated in the viewshed mapping, this visibility generally occurs when one or more turbines is directly aligned with the interior streets of the City/Village LSZ. Although the Project is indicated as potentially visible, buildings, overhead wires, signs, and other visual distractions will serve to minimize visibility or visual prominence in a City/Village setting. Additionally, it is important to note that the closest village with potential Project visibility is the Village of Gilbertsville, which is 4.0 miles from the nearest proposed turbine. At this distance, and considering that only one to five turbines could potentially be visible, it is likely that the competing features present in the City/Village LSZ will minimize Project visibility considerably.
- The Open Water LSZ only has potential views of the Project in 12.1% of its area within the visual study area. Open Water areas often provide opportunities for more distant views due to the lack of screening by foreground vegetation, topography and structures. However, within the visual study area for this Project, most of the waterbodies are small, and often surrounded by tall forest vegetation and/or residential structures. Therefore, the water surface generally does not cover a large enough area to provide obstruction-free views toward the Project Site. The exception to this occurs within water bodies located in close proximity to the Project and/or in agricultural and rural residential areas with fewer trees such as Guilford Lake, Tank Pond, North Pond, and the Unadilla River.
- The greatest potential for visibility of the turbines is indicated within the Rural Residential/Agricultural LSZ. The blade-tip DSM viewshed indicates that 23.3% of the acreage within this zone will potentially offer views of the Project. Although approximately 78% the Rural Residential/Agricultural zone is screened from view of the Project by both topography, vegetation, and structures, the open fields in this zone allow for a greater availability of outward views, especially in higher elevation areas.

POI and Collection Substation Viewshed Analysis

To determine the potential visibility of the collection and POI substations, a 1-mile visual study area was delimited around the boundaries of the two stations. As indicated in Figure 5.1-2, the DSM viewshed analysis suggests that vegetation, in combination with topography and structures, will serve to block views of the proposed substations from approximately 82.5% of the 1-mile substation study area (i.e., 17.5% of the 1-mile substation study area is indicated as having potential visibility of the substations). Based on the results of the DSM viewshed analysis, visibility of the structures will generally be limited to the area immediately surrounding the Project components and the southwestern corner of the 1-mile substation study area, including the area around Furnace Hill Road and from a small, unnamed water body.

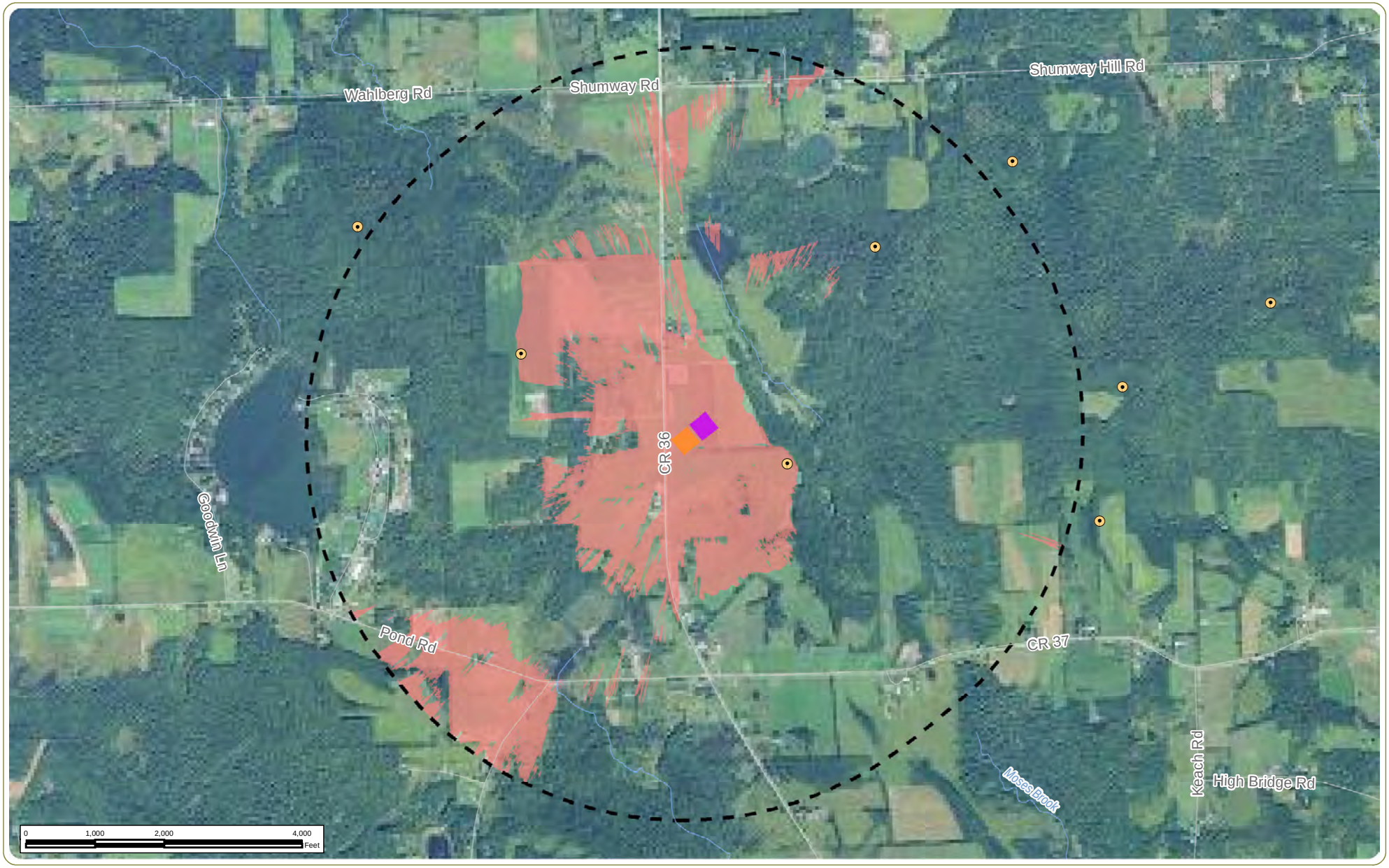

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Figure 5.1-2: Collection and POI Substation Viewshed

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" map service. 2. This map was generated in ArcMap on July 2, 2019. 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 structures as represented in the FEMA Susquehanna Basin 2007 and FEMA lidar dataset. Viewshed analysis based on maximum structure height of 16.7 meters (55 feet)

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

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5.1.2 Area of Potential Effect

Definition of an Area of Potential Effect (APE) allows visual impact evaluations to focus on the resources with the highest probability of Project visibility. The DSM viewshed analysis used to define the APE for the High Bridge Project considered the screening effects of topography, vegetation, and structures, in order to delineate those areas that could potentially have views of any portion of the wind farm, including blade tips (the tallest components of the turbines). As discussed in Section 4.1, viewshed analysis results indicated that the APE consists of approximately 44.3 square miles, or 9.5% of the visual study area. While the VIA considers the existing environment for the entire visual study area, the APE was used to define those areas in which further analysis is warranted to determine the degree of Project visibility and visual impact (see discussion in Section 5.2).

5.1.3 Field Evaluation

As noted in Section 4.1.2 of this VIA, visual field review for the Project was conducted on April 18, 2019 and resulted in photographic documentation of views toward the Project Site from 85 representative viewpoints within the visual study area (see Figure 5.1-3 and Appendix A). A representative photograph from each viewpoint is included in Appendix B. A summary of field verified Project visibility from VSRs and representative LSZs considered in this VIA is presented in Appendix C.

Field review suggests that the DSM viewshed results provide a remarkably accurate indication of Project visibility within the visual study area (Figure 5.1-1). As discussed in Section 4.1.2, field crews had the advantage of observing their position relative to the viewshed results while travelling public roads throughout the visual study area. Field observations suggested that larger areas of potential Project visibility, as indicated by the viewshed analysis, generally had expansive views toward the Project Site, while small pockets of potential visibility indicated by the viewshed analysis were typically characterized by specific locations with short duration, long distance views toward the Site. The results of EDR's field review are summarized below. All photographs referenced in this summary can be found in the viewpoint photolog (Appendix B).

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Figure 5.1-3: Viewpoint Location Map

- Viewpoint Location
- Simulation Location
- Wind Turbine
- Project Potentially Visible
- 10 Mile Facility Study

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on July 2, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Forest LSZ

Field review confirmed that visibility of the Project from the Forest LSZ, which covers a majority of the visual study area, is very limited. Under leaf-off conditions, the density of tall forest vegetation in larger forest stands, as well as small woodlots, block most outward views toward the Project Site. This lack of visibility within the Forest LSZ was reflected by the fact that field photographers had difficulty obtaining views from within the near-foreground distance zone due to the presence of dense forest vegetation within 0.5 mile of the Project. The highest likelihood for Project visibility within this zone occurs along the forest edge directly adjacent to open land associated with residences or open farm fields. For example, Viewpoint 69 from General Jacob Morris State Forest illustrates potential visibility toward the Project Site from a high point coincident with a residence and sparse forest vegetation. However, this type of view is rare throughout the visual study area. Conversely, Viewpoint 10 from Basswood State Forest demonstrates dense forest vegetation completely screening the horizon and views toward the proposed Project. An additional view from the outer boundary of Basswood State Forest (Viewpoint 16) demonstrates an open view over agricultural land toward the Project Site. However, this type of view, while technically within the State Forest boundary, does not represent the Forest LSZ characteristics due to the prevalence of open fields.

Rural Residential/Agricultural LSZ

Field review within the Rural Residential/Agricultural LSZ revealed the greatest concentrations of open views toward the Project Site, confirming the results of the viewshed analysis. The open fields and relatively sparse vegetation and structures in this LSZ allow for longer distance views. This was particularly the case in the Chenango and Unadilla River Valleys where concentrated areas of visibility are available across open fields along public roads (e.g., Viewpoints 50, 58, and 61). However, due to the steep topography bordering the river valleys, views of the Project will generally be limited to the upper portions of a limited number of turbine towers, nacelles, and blades. However, small pockets of the Rural Residential/Agricultural LSZ also occur within 2 miles of the Project Site, where highly variable terrain offers some sweeping foreground and middle ground views of multiple turbines and other Project components (e.g., Viewpoints 30, 34, and 35).

City/Village LSZ

Field review revealed that visibility from within the City/Village LSZ is somewhat more limited than the viewshed analysis results suggested. Visibility from the City of Norwich was significantly reduced by the presence of street signs, overhead utilities, and roadside vegetation. As described in Section 4.1.1 the viewshed analysis conservatively eliminated many of these potential screening elements within 70 feet of public roads, which resulted in an overstatement of potential Project visibility within this LSZ. Examples of these roadside screening elements are illustrated in Viewpoints 71, 72, 75, 76, and 78. Other villages within the visual study area had varying degrees of potential Project visibility. The Village of Sidney, which is approximately 6 miles from the nearest proposed turbine, had very limited open views toward the Project Site (e.g., Viewpoint 5). The viewshed analysis suggested visibility from the Sidney Veterans Memorial Park in the Sidney Historic

District, but field verification determined that this visibility would likely be restricted to very small portions of turbine blades appearing through forest and hedgerow vegetation. Views toward the Project Site were available from within the Hamlet of New South Berlin, which has a distinct village character with lower profile buildings and roads directly aligned with one or more Project turbines.

Open Water LSZ

Field review generally confirmed the results of the viewshed analysis within the Open Water LSZ. However, many of the waterbodies within 3 miles of the Project were noted as having visibility from the water surface and field review did not include boating out to these locations. Rather, visibility was documented from the shoreline where visibility was typically partially screened by the presence of shoreline vegetation and structures. For example, North Pond (Viewpoint 46) was noted as having visibility of several turbines from the western shoreline. Photography from the public road, directly adjacent to the shoreline, revealed the presence dense forest vegetation and scattered homes along the full length of the road. However, the vegetation and structures will not completely screen views of the Project, rather they will frame intermittent views along the public road. Views from the homes and camps along the western shore of North Pond, which are situated to take advantage of the open water and backdrop of vegetation, will likely include unobstructed views of multiple turbines at varying distances. However, these areas are not publicly accessible and therefore were not visited during field review.

Potential visibility was also noted at Guilford Lake in the Town of Guilford (Viewpoint 26). This popular fishing area has relatively steep, vegetated banks around the southern lake access point. However, visibility of the upper portions of multiple turbines will likely be available when viewed from the southern and western shores. The lower portions of the turbines will likely be screened by the trees and steeply rising topography on the east and north shores of the lake.

Waterbodies throughout the remainder of the visual study area present similar visibility characteristics. Many of these water bodies are surrounded by steeply rising topography which, in combination with the water, create opportunities for long distance views across the lake or pond, as demonstrated from viewpoints 34 and 41. These types of views are generally considered to have higher scenic quality due to the presence of water and dynamic topography.

Transportation Corridor LSZ

Field review of the Transportation Corridor LSZ confirmed the viewshed results, which predicted very limited Project visibility. Viewpoint 1 and 2 were photographed from two areas along Interstate Route 88 (the only highway defining this LSZ) and were characterized by intermittent and limited visibility through hedgerow and forest vegetation. Due to the distance of the highway from the Project, the turbines are unlikely to be seen or noticed by passing motorists. Stationary

viewers adjacent to the highway corridor may see the Project, but the turbines are unlikely to be perceived as prominent landscape features from within the Transportation Corridor LSZ.

5.2 Visually Sensitive Resources

A total of 246 VSRs were identified within the visual study area, with 167 of those showing potential Project visibility according to the viewshed analysis. Results of this analysis are presented in Table 5.2-1, followed by a brief description of the VSRs that occur within the APE of the proposed Project.

Table 5.2-1. Total Visually Sensitive Resources with Visibility

Visually Sensitive Resources	Total Number of Resources within the Visual Study Area	Total Number of Resources within the APE
Properties of Historic Significance [6 NYCRR 617.4 (b)(9)]	Total 106	Total 70
National Historic Landmarks (NHL)	0	0
Properties Listed on National or State Registers of Historic Places (NRHP/SRHP)	35	17
Properties Eligible for Listing on NRHP or SRHP	71	53
National/State Historic Sites	0	0
Designated Scenic Resources	Total 0	Total 0
Rivers Designated as National or State Wild, Scenic or Recreational	0	0
Adirondack Park Scenic Vistas [Adirondack Park Land Use and Development Map]	0	0
Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic ([ECL Article 49Title 1] or equivalent)	0	0
Scenic Areas of Statewide Significance [Article 42 of Executive Law]	0	0
Other Designated Scenic Resources (Easements, Roads, Districts, and Overlooks)	0	0
Public Lands and Recreational Resources	Total 67	Total 47
National Parks, Recreation Areas, Seashores, and/or Forests [16 U.S.C. 1c]	0	0
National Natural Landmarks [36 CFR Part 62]	0	0
National Wildlife Refuges [16 U.S.C. 668dd]	0	0
Heritage Areas [Parks, Recreation and Historic Preservation Law Section 35.15]	0	0
State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]	1	1
State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution]	0	0
State Forest Preserves [NYS Constitution Article XIV]	0	0
Other State Lands	0	0
Wildlife Management Areas & Game Refuges	0	0
State Forests	16	13
State Boat Launches/Waterway Access Sites	8	6
Designated Trails	6	6
Palisades Park [Palisades Interstate Park Commission]	0	0

Visually Sensitive Resources	Total Number of Resources within the Visual Study Area	Total Number of Resources within the APE
Local Parks and Recreation Areas	15	11
Publicly Accessible Conservation Lands/Easements	2	1
Rivers and Streams with Public Fishing Rights Easements	3	3
Named Lakes, Ponds, and Reservoirs	16	6
High-Use Public Areas	Total 69	Total 48
State, US, and Interstate Highways	10	9
Cities, Villages, Hamlets	37	26
Schools	22	13
Other Resources Identified by Stakeholders	Total 4	Total 2
Total Number of VSRs in the Visual Study Area	246	167

5.2.1 Properties of Historic Significance

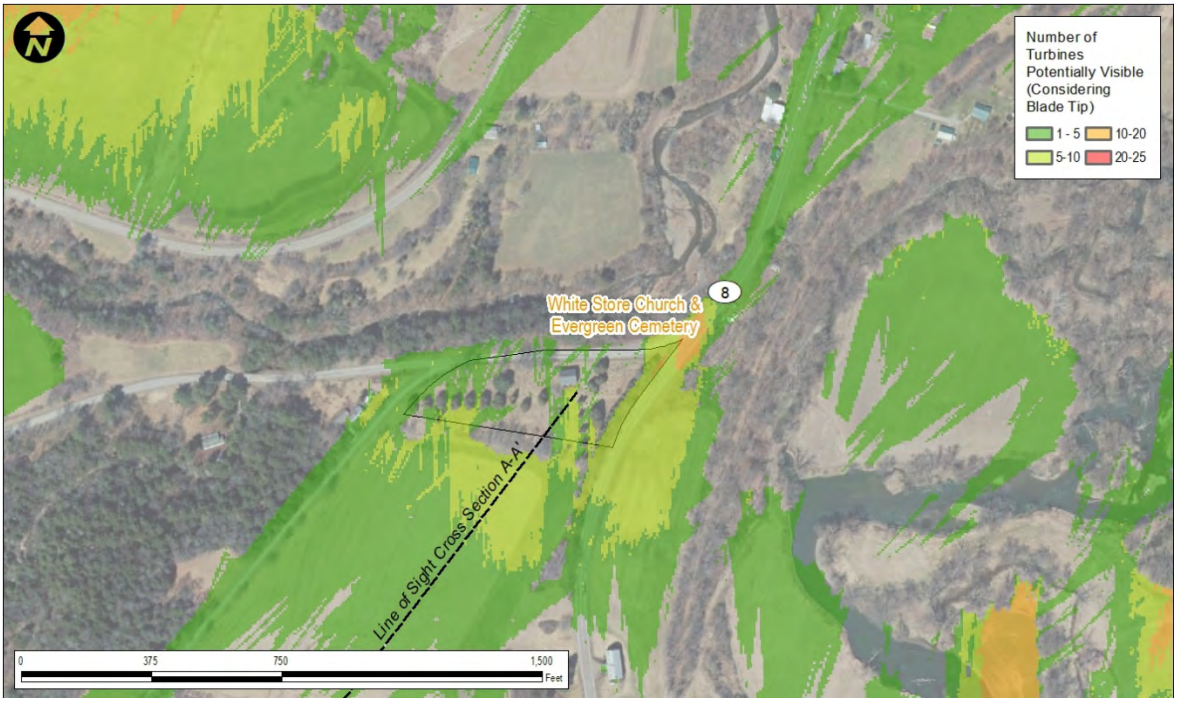
EDR reviewed the NRHP website, the NYSOPRHP Cultural Resources Information System (CRIS) website, and the NYSOPRHP shapefile for buildings, structures, sites and historic districts listed in the NRHP to identify significant historic buildings and/or districts located within 10 miles of the Project Site (National Park Service [NPS], 2019a, 2019b; NRHP, 2019a, 2019b; New York State Historic Preservation Office [NYSHPO], 2019).

The Project's visual study area includes 106 resources of historic significance, including 35 sites and/or districts listed on the NRHP and 71 sites and/or districts eligible for listing on the NRHP (eligible properties identified within 5 miles). There are no National Historic Landmarks or National or State Historic sites located in the visual study area. Representative examples of NRHP-listed and eligible properties within the visual study area are shown in Inset 5.2-1, below.

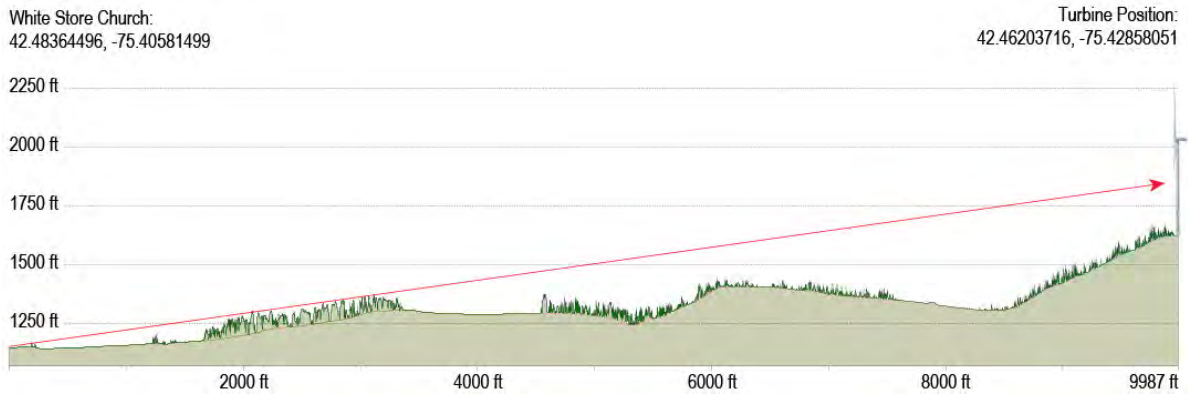
The NRHP-listed sites found throughout the visual study area include churches, cemeteries, farm and homesteads, post offices, and other historic properties. According to the viewshed analysis, of the 35 identified sites (including 25 individual properties and 10 historic districts), 18 sites were indicated as having no visibility of the proposed Project and 17 were shown to have some degree of potential Project visibility. Of these 17 resources with potential visibility, one individual site and five districts had scenic views or an intact setting as the reason for listing on the NRHP. These resources are discussed in more detail below:

- *White Store Church & Evergreen Cemetery* (94NR00742) is comprised of 10 contributing resources in the Town of Norwich. This site is located approximately 1.8 miles north-northeast of the Project (nearest proposed turbines). The early-nineteenth-century church and cemetery property are representative of the Rural Cemetery Movement with developments in architecture, funerary art, and landscape architecture. The church is an intact example of

traditional New England meetinghouses in Central New York (Peckham, 1994). As shown in Inset 5.2-1 the church and cemetery could have views of between one and ten wind turbines from discrete locations throughout the property.



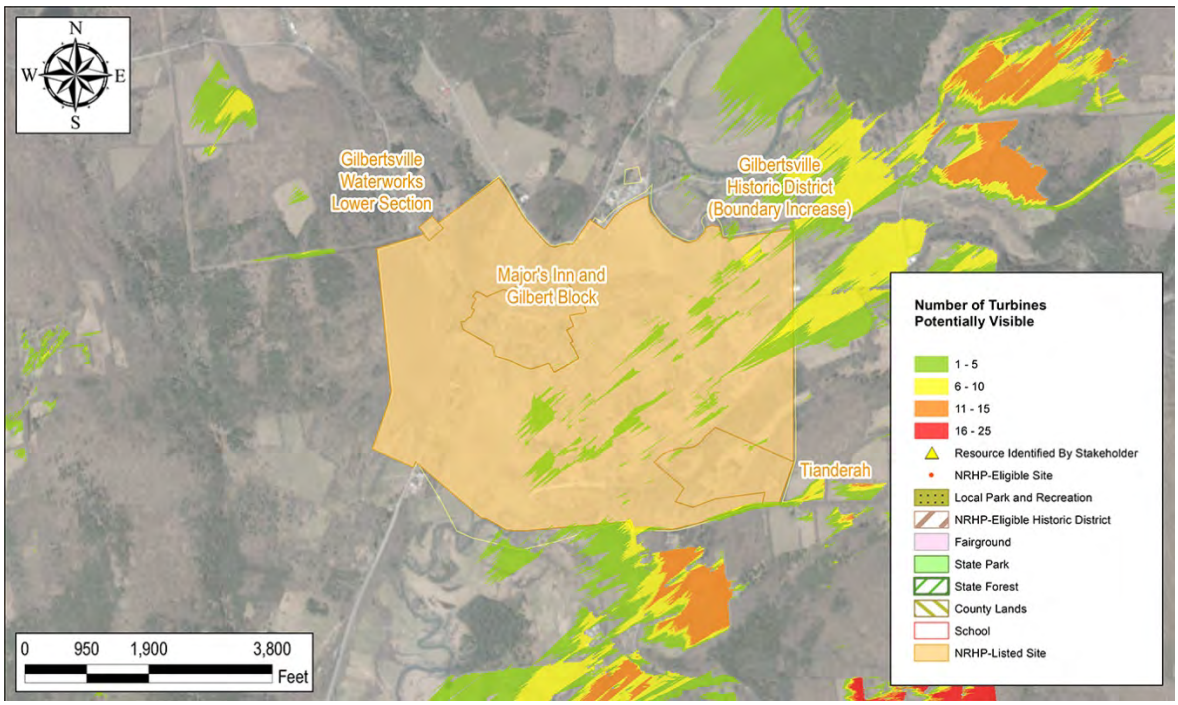
Inset 5.2-1. DSM viewshed visibility from White Store Church and Evergreen Cemetery



Inset 5.2-2. Line of sight cross section demonstrating potential Project visibility from White Store Church

- *Gilbertsville Historic District* (90NR02194) and *Gilbertsville Historic District* (Boundary Increase) (90NR02196) are historic districts approximately 42 acres and 552 acres in size, respectively. There are 69 contributing properties in the Gilbertsville Historic District and 114 contributing properties in the boundary increase area (Breyer, 1982).

Both districts occur within the Village of Gilbertsville, which is located in the eastern portion of the visual study area. The Gilbertsville Historic District is approximately 4.4 miles from the Project, while the boundary increase district is approximately 4.0 miles from the Project. The nineteenth-century commercial and residential buildings present in the districts reflect the village's various stages of development and distinction as a resort community (Manley and Mangold, 1973). Visibility from within these districts occurs mainly along roads that are aligned with one or more of the proposed wind turbines as demonstrated in Inset 5.2-3. The DSM viewshed and field review suggest that these small areas of visibility will include one to five turbines, and be fleeting and intermittent in nature.

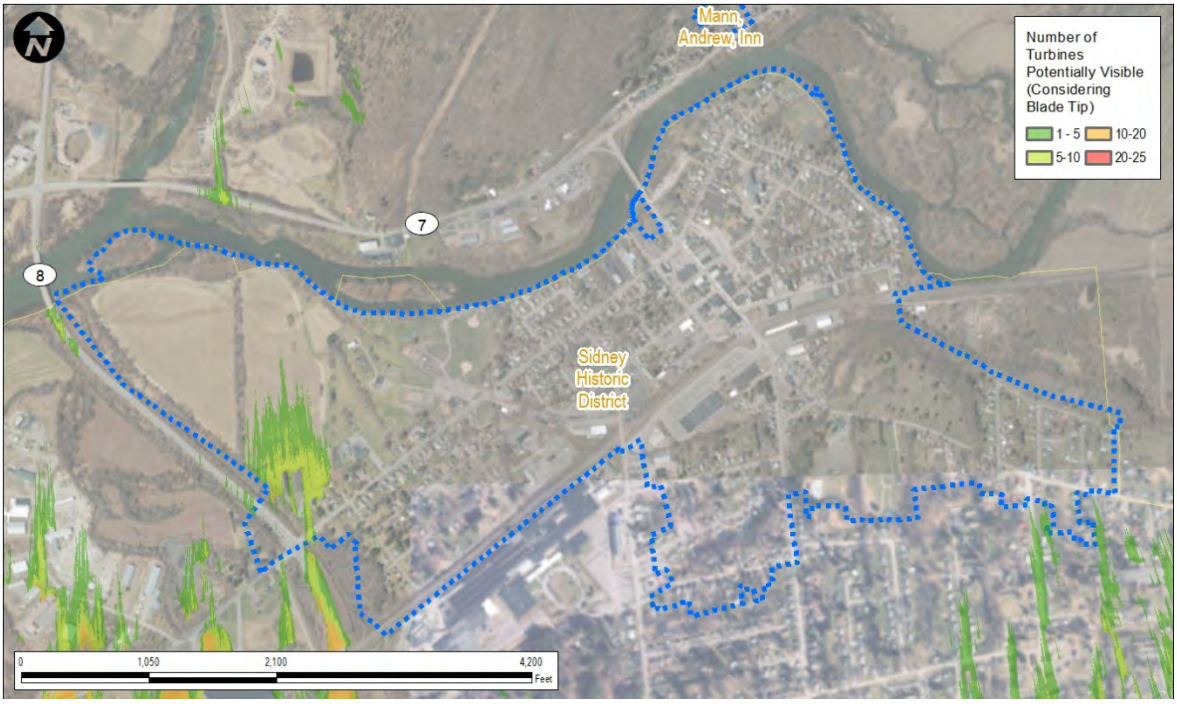


Inset 5.2-3. DSM viewshed visibility from Gilbertsville Historic District

- *Chenango County Courthouse District* (also known as Broad Street – Main Street Historic District) (90NR00157) is an approximately 18-acre historic district comprised of 24 contributing buildings within the City of Norwich. The closest portion of the district is located in the northwestern portion of the visual study area, 5.6 miles from the Project. The variety of nineteenth-and twentieth-century commercial and residential buildings reflect the City's development into an important industrial center. The village greens are representative of New England style community planning (McDougall, 1975). Inset 5.2-4 illustrates the extent of predicted visibility within the Chenango County Courthouse District. As indicated by this analysis, the wide streets that are aligned with one or more Project turbines could have visibility of one to five turbines. These linear corridors of visibility are slightly more concentrated than in other villages within the study area, due to the prevalence of open-space, wide streets, and greater building spacing.

Inset 5.2-4. DSM viewshed visibility from Chenango County Courthouse District

- *Sidney Historic District* (13NR06446) is a 420-acre district comprised of 912 contributing resources in the northern half of the Village of Sidney. The closest portion of the district is located in the southern portion of the visual study area, 5.6 miles from the Project. Significant resources within the district range from archaeological sites dating to the nineteenth century to residences built in 1963. It is representative of the development of an agricultural river valley through the centuries and was listed on the S/NRHP in 2013 (Cole, 2013). The DSM viewshed analysis results presented in Inset 5.2-5 indicate a pocket of potential Project visibility from an open agricultural field within the district, north of County Road 39 and south of the Susquehanna River. The analysis suggests that between one and 10 turbines could be visible from this location. However, field evaluation suggests that, due to the distance from the Project and vegetative screening, the Project would be difficult to see from this location. Further discussion on visibility from the Sidney Historic District is include in Section 5.3.1.



Inset 5.2-5. DSM viewshed visibility from Sidney Historic District

Per the requirements set forth in 16 NYCRR § 1001.20(b), a *Historic Architectural Resources Survey* (EDR, 2019) was conducted that identified a total of 71 historic properties within the visual study area that have been determined by NYSOPRHP to be NRHP-eligible. The NRHP-eligible sites include mostly residences that retain a high level of integrity, but also farmsteads and agricultural buildings, cemeteries, bridges, schools, and hospital buildings. Fifty-three of the 71 resources could have potential partial visibility of the proposed Project according to the viewshed analysis. A separate *Historic Resources Effects Analysis* (EDR, 2019) will be prepared and submitted to NYSOPRHP. This analysis will further assess the Project's potential visual effect on NHRP-eligible and other historic properties.

5.2.2 Designated Scenic Resources

No designated scenic resources were identified within the Project's visual study area (NYSDOS, 2019; NYSDOT, 2019; National Wild and Scenic Rivers, 2019; NYSDEC, 2019).

5.2.3 Public Lands and Recreational Resources

The Project's visual study area includes 67 public lands and recreational resources, including state parks, state forests, state boat launches/waterway access sites, designated trails, local parks and recreation areas, publicly accessible conservation lands/easements, rivers and streams with public fishing rights easements, and named lakes, ponds, and

reservoirs. Of the 67 identified resources, the viewshed analysis indicated that 45 resources potentially fall within the Project's APE. These resources are described below:

State Parks:

The visual study area includes Bowman Lake State Park, a remote 967-acre state park located in the Town of McDonough, Chenango County, New York. At its closest point, the park is approximately 9.4 miles from the nearest proposed turbine. Scenic park roads wind through evergreen and hardwood forests to provide access to one of the largest campgrounds in central New York, including 188 campsites and several rustic cabins. The park also hosts a lakefront and beach, 13 miles of trails (including a portion of the Finger Lakes Trail) for hiking, biking, cross-country skiing, and snowmobiling, as well as a variety of opportunities for wildlife viewing (NYSOPRHP, 2019d). The viewshed analysis indicates a very small pocket of potential visibility in an open meadow within the park, on the east side of Steere Road. The viewshed predicts this area could potentially have visibility of up to 10 turbines. However, due to the distance of the park from turbines, and adjacent dense forest vegetation, it is anticipated that views from this area will include only a portion of the turbine blades.

State Forests:

Within the visual study area, portions of 13 state forests fall within the Project APE. These include the Ambler, Basswood, General Jacob Morris, Hunts Pond, Ludlow Creek, Lyon Brook, McDonough, New Michigan, Pine Hill, South Hill, Wagner Farm, Whaupaunaucau, and Wiley Brook State Forests. These areas are used for resource management (timber production) and outdoor recreation, including hiking, biking, hunting and enjoyment of nature. The size of each state forest, along with the area of each forest with predicted visibility of the proposed Project, is listed in Table 5.2-2, below. As this table indicates, only a small portion of each forest has potential views of the proposed turbines. A comprehensive list of state forests within the visual study area and their respective distances to the proposed Project can be found in Appendix C.

Table 5.2-2. Areas of State Forests with Predicted Project Visibility

State Forest	Total Area within Study Area[1]	Area (acres) and Percent of Blade Tip Visibility	Area (acres) and Percent of FAA Light Visibility
Ambler	642.1	3.7 *(0.6%)*	2.4 *(0.4%)*
Basswood	938.9	3.4 *(0.4%)*	0.7 *(0.07%)*
General Jacob Morris	1,192.0	0.4 *(0.03%)*	0.07 *(0.006%)*
Hunts Pond	1,375.1	0.2 *(0.01%)*	0.2 *(0.01%)*
Ludlow Creek	1,136.7	0.6 *(0.05%)*	0.6 *(0.05%)*
Lyon Brook	526.7	2.5 *(0.5%)*	1.6 *(0.3%)*
McDonough	2,039.6	1.3 *(0.06%)*	0.4 *(0.02%)*
New Michigan	500.6	0.01 *(0.002%)*	0.009 *(0.002%)*
Pine Hill	1,092.7	3.3 *(0.3%)*	0.07 *(0.006%)*
South Hill	1,315.6	11.0 *(0.8%)*	10.0 *(0.8%)*
Wagner Farm	463.3	0.02 *(0.004%)*	0.003 *(0.0006%)*
Whaupaunaucau	619.4	1.5 *(0.2%)*	1.4 *(0.2%)*
Wiley Brook	1,214.6	2.7 *(0.2%)*	0.7 *(0.06%)*

[1]The visual study area includes approximately 299,697 acres.

State Fishing/Waterway Access Sites:

The visual study area includes a total of eight state fishing/waterway access sites. Of these sites, six are indicated as having potential views of the proposed Project. These sites and their distance to the Project at its closest point are listed below:

- Unadilla River DEC Boat Launch (Towns of Guilford and Unadilla), 1.1 miles
- Unadilla River Fishing Access (Town of New Berlin), 5.1 miles
- Unadilla River DEC Boat Launch (Town of New Berlin), 7.0 miles
- Guilford Lake DEC Boat Launch (Town of Guilford), 2.2 miles
- Chenango River DEC Boat Launch (Town of Norwich), 3.0 miles
- Chenango River DEC Boat Launch (Town of Norwich), 5.0 miles

Trails:

The visual study area includes six trails that could have views of the proposed Project, including one state trail and five snowmobile trails. These trails are described below:

- *Finger Lakes Trail:* The Finger Lakes Trail is a 580-mile long trail that extends from the Pennsylvania-New York Border in Allegany State Park to the Long Path in the Catskill Forest Preserve. The trail passes over a mixture of public and private land, including state parks, state forests and wildlife management areas, a national forest, and over 400 private landowners' property (Finger Lakes Trail Conference, 2019). The Finger Lakes trail traverses the southwestern portion of the visual study area for 29.2 miles and at its closest point is approximately 4.9 miles from

the nearest proposed turbine. The areas of Project visibility from the Fingerlakes Trails are intermittent and theoretically include approximately five areas along the trail. These areas range in length from 7 to 2,630 feet long and total approximately 3,360 feet. The number of potentially visible turbines from these locations ranges from 1 to 25 and averages 15 turbines. Inset 5.2-6, below illustrates a line of sight cross section from the section of trail with the greatest number of potentially visible turbines (25).

Inset 5.2-6. Line of sight cross section demonstrating potential Project visibility from The Finger Lakes Trail

- *Snowmobile Trails:* Five snowmobile clubs maintain trails within the visual study area. The Delaware-Otsego-Chenango Snowriders (DOCS) snowmobile club maintains approximately 52 miles of snowmobile trails within the visual study area, a portion of which runs directly adjacent to a proposed turbine. The Unadilla Valley Snow Drifters maintain approximately 21 miles of snowmobile trails within the visual study area. At their closest point, these trails are located approximately 0.6 mile east of the Project. The Chenango Sno Riders maintain approximately 24 miles of snowmobile trails within the visual study area, the closet of which is approximately 3.0 miles northwest of the Project. O-T-Go Snowgoers maintain approximately 20 miles of snowmobile trails within the visual study area, the closet of which runs approximately 4.0 miles east of the Project, and the Maywood Snow Riders maintain 1.0 mile of trail, approximately 9.6 miles southeast of the Project.

Local Parks and Recreation Areas:

The visual study area includes a total of 11 local parks and recreation areas. Of these sites, eight were indicated as being within the Project APE. These sites are described further below:

- *Mount Upton Park:* The Mount Upton Park is a local park located in the Town of Guilford, approximately 1.0 mile east of the proposed Project. The park hosts open fields, basketball courts, and picnic areas. Viewshed analysis suggests that one to 10 turbines could potentially be visible from this park.
- *Sundown Golf and Country Club:* The Sundown Golf and Country Club is a nine-hole golf course and restaurant located approximately 2.1 miles south of the proposed Project. The course features scenic views of the surrounding landscape. Visibility from this country club potentially includes a maximum of five turbines according

to the viewshed analysis. However, these areas of potential visibility are represented by discrete narrow bands that occur sporadically throughout the property.

- *Otsego County Lands:* Copes Corner County Recreation Park is 3.2 miles from the nearest proposed turbine and is a camping area in the Town of Butternuts, New York. This campground is bordered to the north by Butternut Creek and is bisected by Dry Brook. The camping facilities accommodate both RV and tent sites, and include comfort stations, picnic facilities, trails, and recreational activities. Visibility from this location is generally restricted to the outer boundary of the park due to the presence of vegetation along the bordering roads. Otsego County lands within the visual study area also include two small (60 to 100 acre) tracts of forest land which appear to include several hiking trails. However, these facilities are not included in the APE due to a lack of Project visibility.
- *Gilbertsville Village Lands:* Located in the heart of the Village of Gilbertsville, this area consists of multiple athletic fields, including baseball diamonds and soccer pitches. The village lands are located approximately 4.8 miles from the nearest turbine, and viewshed analysis results suggest two small areas of Project visibility including up to five turbines.
- *Blue Stone Golf Course:* Blue Stone Golf Course is an 18-hole public golf course featuring tree-lined fairways and open water features. The course is located approximately 4.9 miles west of the proposed Project and is noted for its views of the surrounding scenery. The viewshed analysis suggests that one to five turbines could potentially be visible from a very limited portion of the golf course.
- *Chenango County Fairgrounds:* The Chenango County Fairgrounds is a collection of 18 agricultural buildings where the annual Chenango County Fair is held. The fairgrounds are located in the City of Norwich, approximately 5.2 miles north-northwest of the proposed Project. The viewshed analysis suggests a very localized area of potential visibility of one to five turbines at the entry road of the fairgrounds.
- *Canasawacta Country Club:* Canasawacta Country club is a semi-private club in the Town of Norwich that hosts an 18-hole course and restaurant. The property includes 158 acres of rolling and hilly terrain located approximately 7.7 miles north-northwest of the proposed Project. The viewshed indicates potential views of one to five turbines from several of the greens on the golf course.
- *Otsego County Forest:* Otsego County Forest is located in the Town of Morris, approximately 8.9 miles northeast of the proposed Project. The viewshed analysis indicates a discrete area of visibility in the northern corner of the forest, adjacent to an open field.

Publicly Accessible Conservation Lands and Easements:

- *Otsego County Lands:* See above for description of Otsego County Lands.

Rivers and Streams with Public Fishing Rights Easements:

The visual study area includes three rivers with public fishing rights easements that could have views of the proposed Project. These rivers are described below:

- *Unadilla River:* The Unadilla River is a roughly 70-mile long river stretching from Herkimer County to Delaware County, approximately 27 miles of which are contained within the visual study area. At its closest point, the Unadilla River flows within 1.0 mile of the nearest proposed turbine. For most of its length, the river is characterized by tree-lined, long deep pools, and provides excellent canoeing (NYSDEC, 2019g).
- *Chenango River:* The Chenango River flows for roughly 90 miles through Madison, Chenango, and Broome Counties, approximately 23 miles of which are contained within the visual study area. At its closest point, the Chenango River comes within 2.9 miles of the nearest proposed turbine. The Chenango River offers fishing opportunities for a variety of species and is also stocked annually with brown trout (NYSDEC, 2019h).
- *Susquehanna River:* The Susquehanna River flows for over 440 miles from Otsego lake to the Chesapeake Bay. It traverses approximately 21 miles of the visual study area and at its closest point comes within 5.4 miles of the nearest proposed turbine. In New York, the Susquehanna River flows through a mix of rural and urban environments and supports a diverse community of warmwater sportfish (NYSDEC, 2019i).

Named Lakes, Ponds, and Reservoirs:

The visual study area includes a total of 16 named lakes, ponds, and reservoirs. Of these sites, six were indicated as being within the Project APE. These waterbodies and their respective distances to the proposed Project are listed below.

- *North Pond* (Town of Guilford), 0.4 mile
- *Tank Pond* (Town of Oxford), 1.8 miles
- *Glen Lake* (Town of Norwich), 1.8 miles
- *Guilford Lake* (Town of Guilford), 1.8 miles
- *Trestle Lake* (Town of Oxford), 3.8 miles
- *Lake Shirdon* (Town of Preston), 6.5 miles

Potential Project visibility in these areas is largely as described for the Open Water LSZ in Section 5.1.

5.2.4 High-Use Public Areas

Major Transportation Corridors: The visual study area includes a total of 10 state and federal highways that all have potential views of the Project and could be considered visually sensitive due to the number of vehicles that travel these roads on a daily basis. Table 9 indicates NYSDOT 2015 traffic counts for the major roadways within the visual study area.

Table 5.2-2. Traffic Counts for Major Transportation Corridors

Road	Total Length within the Visual Study Area (miles)	Average Vehicles/Day on Segments within the Visual Study Area
Interstate 88	34.6	9,075 – 11,139
NYS Route 12	19.4	4,277 – 17,581
NYS Route 206	9.8	1,664 – 6,596
NYS Route 220	6.9	615 – 3,341
NYS Route 23	18.6	1,629 – 5,010
NYS Route 320	3.5	1,829 – 4,909
NYS Route 357	3.3	1,578 – 2,374
NYS Route 51	11.0	698 – 1,732
NYS Route 7	19.3	2,051 – 5,342
NYS Route 8	29.7	1,750 – 7,646

Source: NYSDOT, 2015

Cities, Villages, and Hamlets:

The visual study area includes a total of one city, five incorporated villages, and 31 hamlets. Of these 37 areas of high public use, 26 were indicated to have potential views of the proposed Project.[5] The cities and villages within the APE and their distance to the Project Site at its closest point are listed below:

- The City of Norwich has a population of 7,190 and is located approximately 4.7 miles northwest of the proposed Project.
- The Village of Gilbertsville has a population of 399 and is located approximately 4.0 miles east-northeast of the proposed Project.
- The Village of Oxford has a population of 1,450 and is located approximately 4.4 miles west of the proposed Project.
- The Village of Sidney has a population of 3,900 and is located approximately 4.7 miles south of the proposed Project.
- The Village of Bainbridge has a population of 1,355 and is located approximately 6.9 miles south of the proposed Project.

Hamlets within the APE include the Hamlets of Rockwell Mills, Lathams Corners, Mount Upton, Rockdale, Guilford Center, Parker, Guilford, Ives Settlement, Copes Corners, Holmesville, East Guilford, South New Berlin, Amblerville, Davis

[5] Villages and hamlets within the visual study area where viewshed analysis and/or field review indicate that the Project will not be visible, such as the Village of Unadilla, are not discussed here because there is no potential visibility of the Project from these areas.

Crossing, Youngs, West Bainbridge, Preston, Maple Grove, Plasterville, Sages Crossing, and South Plymouth. Potential Project visibility within these areas is largely as described for the City/Village LSZ in Section 5.1.

Public Schools:

The visual study area includes 12 schools that could have views of the proposed Project. From the majority of the schools, viewshed analysis results predict that between one and five turbines could be visible from narrow corridors of visibility that occur in recreation fields and parking lots associated with the school. Appendix A illustrates the potential visibility from each of these resources. The schools and their distance from the proposed Project are described below:

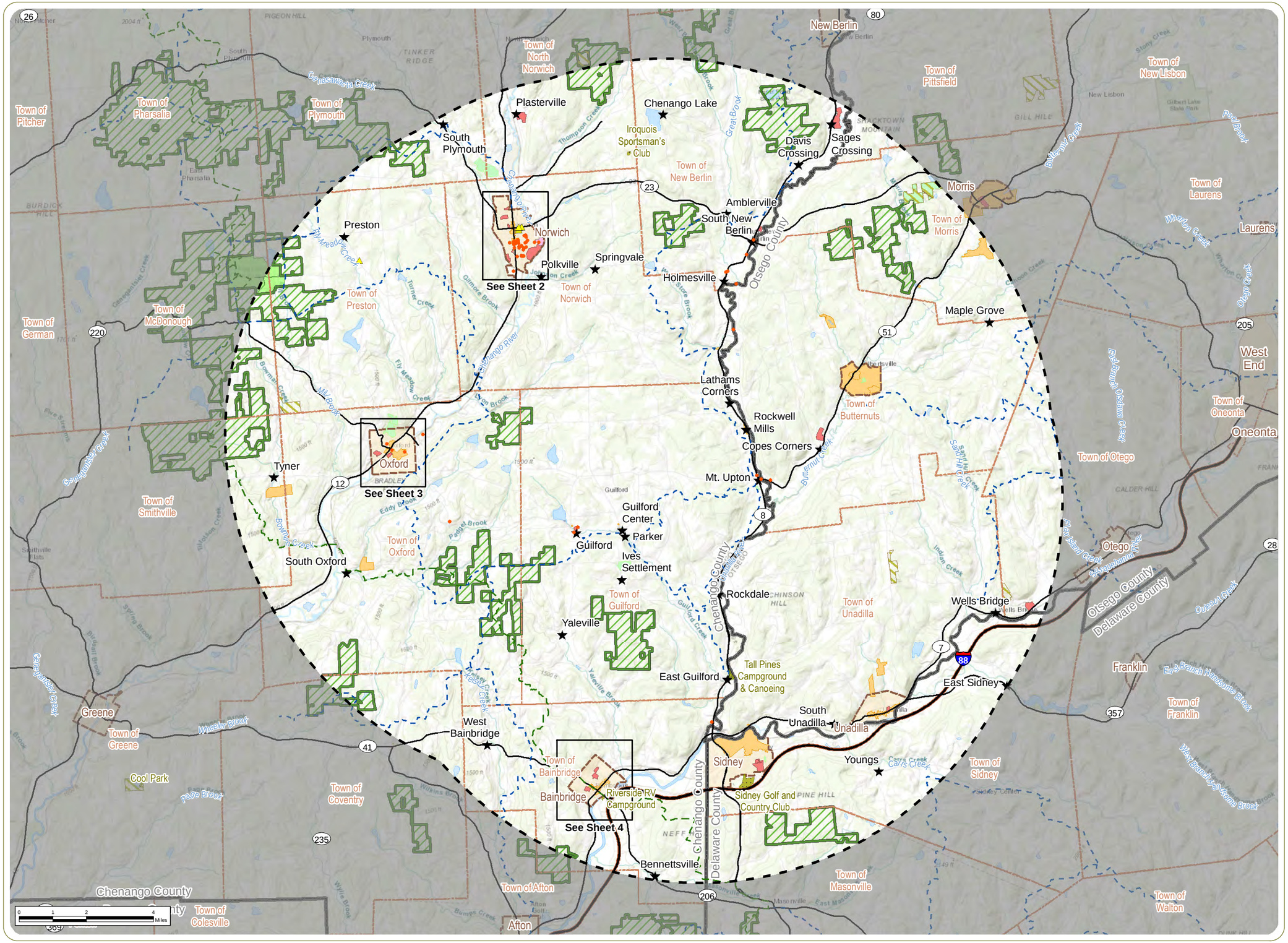
- *Guilford Elementary School:* Guilford Elementary School is a public school located in the Town of Guilford, approximately 2.2 miles southwest of the proposed Project. The school serves 137 students in grades prekindergarten-1 (Public School Review, 2019).
- *Gilbertsville-Mount Upton Central School:* Gilbertsville-Mount Upton Central School is a public school located in the Town of Butternuts, approximately 3.1 miles east of the proposed Project. The school serves 340 students in grades kindergarten-12 (NYSED, 2018).
- *Norwich High School:* Norwich High School is a public school located in the City of Norwich, approximately 5.0 miles north-northwest of the proposed Project. The school serves 567 students in grades 9-12 (NYSED, 2018b).
- *Perry Browne Intermediate School:* Perry Browne Intermediate School is a public school located in the City of Norwich, approximately 5.3 miles northwest of the proposed Project. The school serves 407 students in grades 3-5 (NYSED, 2018c).
- *Unadilla Valley Elementary and Central Schools:* Unadilla Valley Elementary and Central Schools are public schools located in the Town of New Berlin, approximately 5.5 and 9.4 miles, respectively, from the proposed Project. The elementary school serves 369 students in grades prekindergarten-5 and the central school serves 508 students in grades 6-12 (Great Schools, 2019; 2019b).
- *Holy Family School:* Holy Family School is a private, Catholic school located in the City of Norwich, approximately 6.1 miles northwest of the proposed Project. The school serves 115 students in grades prekindergarten-8 (Niche, 2019).
- *Stanford J. Gibson Primary School:* Stanford J. Gibson Primary School is a public school located in the City of Norwich, approximately 6.4 miles northwest of the proposed Project. The school serves 424 students in grades prekindergarten-2 (Niche, 2019b).
- *Sidney Elementary and High Schools:* Sidney Elementary and High Schools are public schools located in the Village of Sidney, approximately 6.5 miles south of the proposed Project. The elementary school serves 621 students in grades prekindergarten-6 while the high school serves 314 students in grades 9-12 (Niche, 2019c; 2019d).

- *Valley Heights Christian Academy:* Valley Heights Christian Academy is a private school located in the City of Norwich, approximately 6.6 miles northwest of the proposed Project. The school serves 70 students in grades prekindergarten-12 (Private School Review, 2019).
- *Delaware-Chenango-Madison-Otsego (DCMO) Board of Cooperative Educational Services (BOCES):* BOCES is a career and technical education program located in the Town of North Norwich, approximately 8.9 miles northwest of the proposed Project. It serves approximately 24,000 students throughout 16 component school districts in Delaware, Chenango, Madison, and Otsego Counties (DCMO BOCES, 2019).

High Bridge Wind Project

Town of Guilford, Chenango County, New York

Figure 5.2-1: Visually Sensitive Resources Sheet 1



- Resource Identified By Stakeholder
- NRHP-Eligible Site
- Hamlet
- Snowmobile Trail
- Finger Lakes Trail
- Major Road
- NRHP-Listed Site
- State Park
- State Forest
- NYSDEC Boat Launch
- Golf Course
- County Lands
- Fairground
- School
- Local Park and Recreation
- Water Body
- City/Village
- Visual Study Area
- Town Boundary
- County Boundary

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on August 5, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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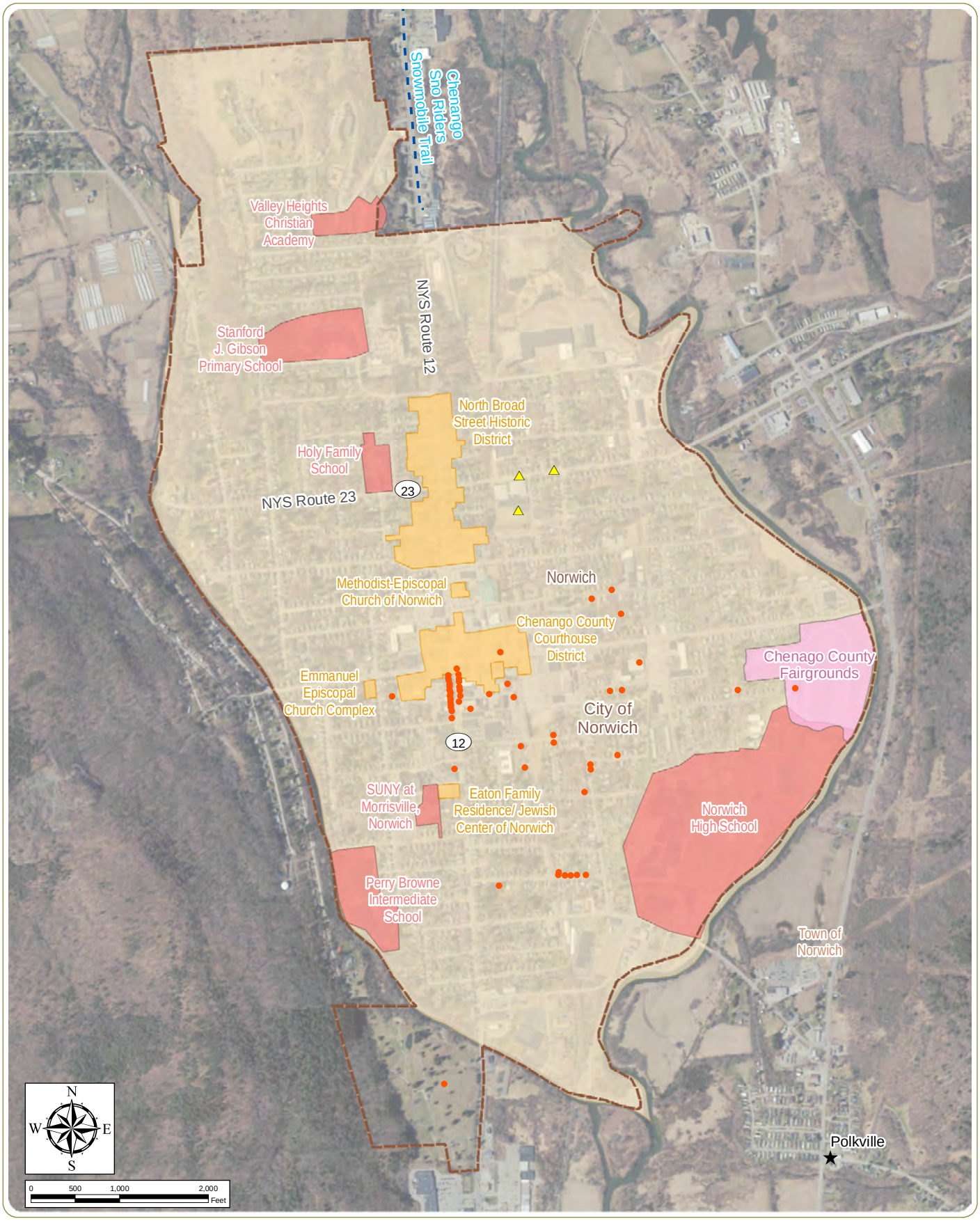

High Bridge Wind Project

Town of Guilford, Chenango County, New York

Figure 5.2-1: Visually Sensitive Resources

Sheet 2

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" map service. 2. This map was generated in ArcMap on August 5, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Resource Identified By Stakeholder
- NRHP-Eligible Site
- Hamlet
- Snowmobile Trail
- Visual Study Area
- Fairground
- School
- NRHP-Listed Site
- City/Village Boundary

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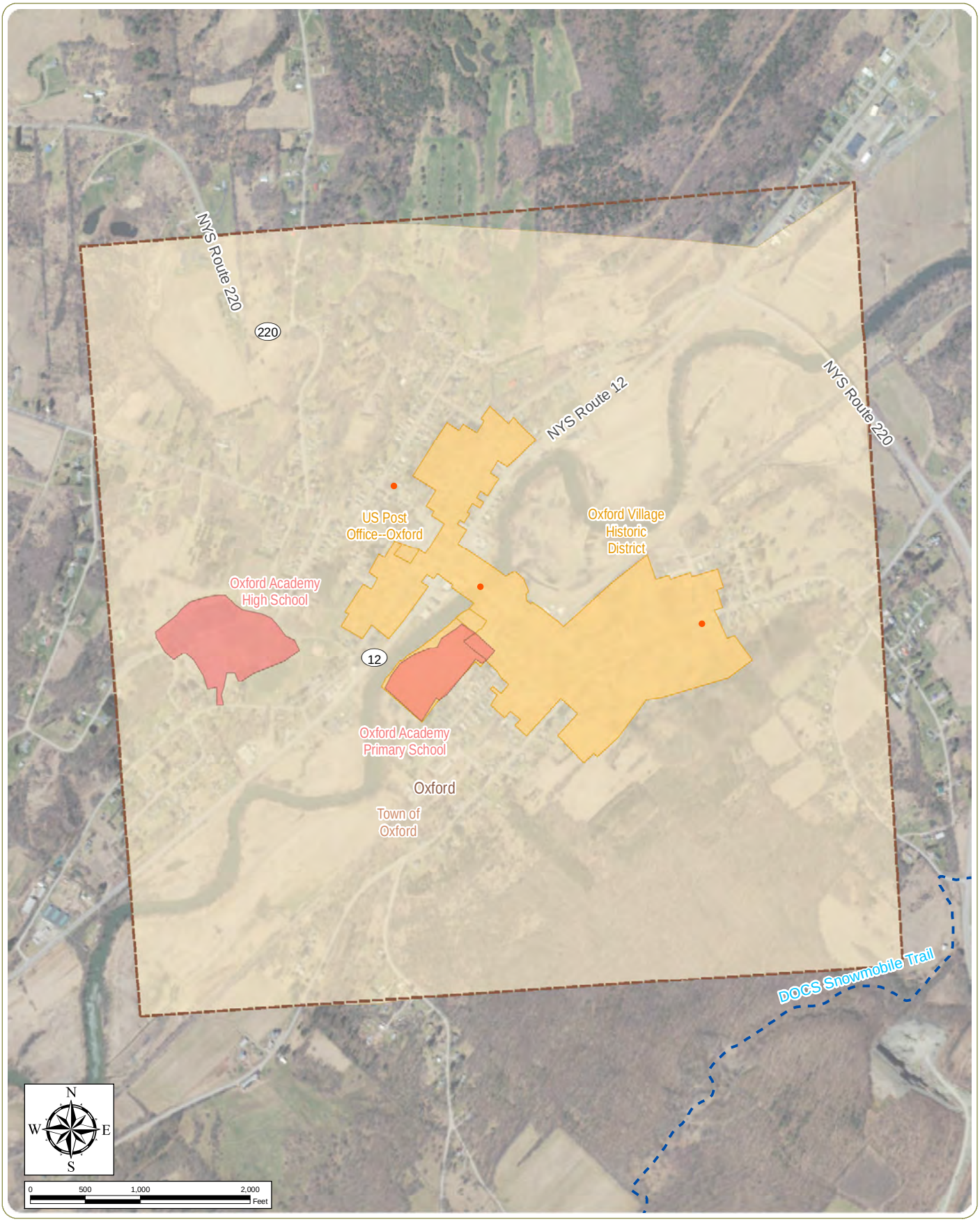

High Bridge Wind Project

Town of Guilford, Chenango County, New York

Figure 5.2-1: Visually Sensitive Resources

Sheet 3

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" map service. 2. This map was generated in ArcMap on August 5, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- NRHP-Eligible Site
- Snowmobile Trail
- Visual Study Area
- School
- NRHP-Listed Site
- City/Village Boundary

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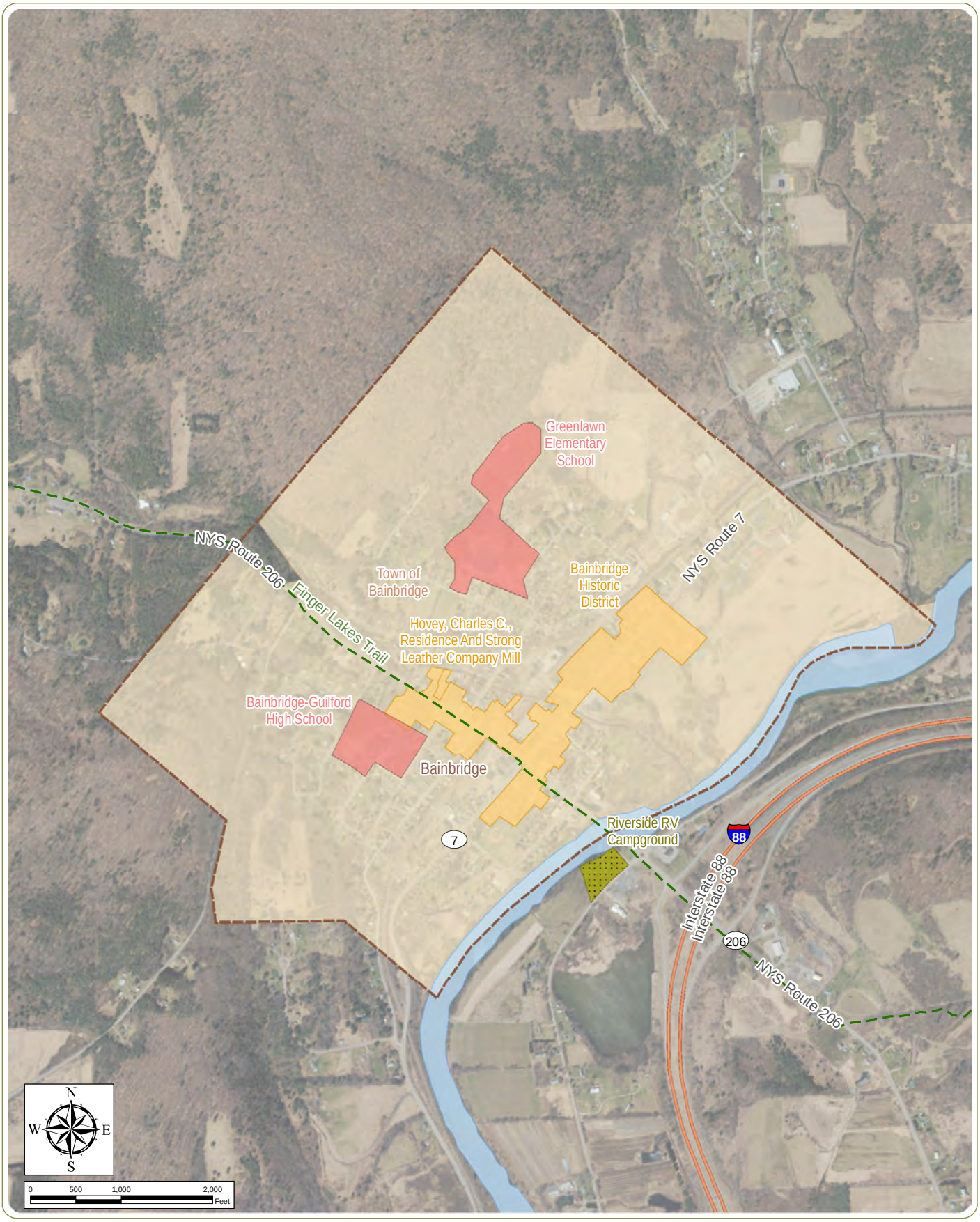

High Bridge Wind Project

Town of Guilford, Chenango County, New York

Figure 5.2-1: Visually Sensitive Resources

Sheet 4

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" map service. 2. This map was generated in ArcMap on August 5, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Finger Lakes Trail
- Local Park and Recreation
- Visual Study Area
- School
- NRHP-Listed Site
- City/Village Boundary

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